



2005 Trails Master Plan

The Town with the Painted Past



Prepared for the:

Town of Stony Plain

By:



in association with:

ARMIN A. PREIKSAITIS
& ASSOCIATES LTD.



April 21, 2005

2005 Trails Master Plan

Prepared for the:



The Town with the Painted Past

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Many people have contributed advice, information and their willing assistance in the preparation of the 2005 Trails Master Plan for the Town of Stony Plain. We would like to extend our appreciation and cordially thank everyone for their efforts.

The preparation of this study was overseen by a Steering Committee comprised of the following individuals:

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1.0 INTRODUCTION

1.1 Basis and Purpose of the Plan

The purpose of the 2005 Trails Master Plan is to create a comprehensive, interconnected, recreational trail system to serve existing and newly developing areas within the Town of Stony Plain. Derivative aims of the 2005 Trails Master Plan were to:

- promote trail development, wellness and increase quality of life;
- support the idea of linked parks and open spaces;
- advance the establishment of a distinctive regional trail system that encourages the conservation of natural and heritage resources;
- integrate the regional trail system with other transportation systems and suggest links between existing and potential trails;
- provide opportunities for multi-jurisdictional cooperation in all aspects of trail planning;
- adopt trail construction standards that are environmentally sensitive, sustainable and have low impacts on the land; and,
- promote the use of trails as alternative transportation routes that connect activity centres, parks, open spaces, schools and civic amenities.

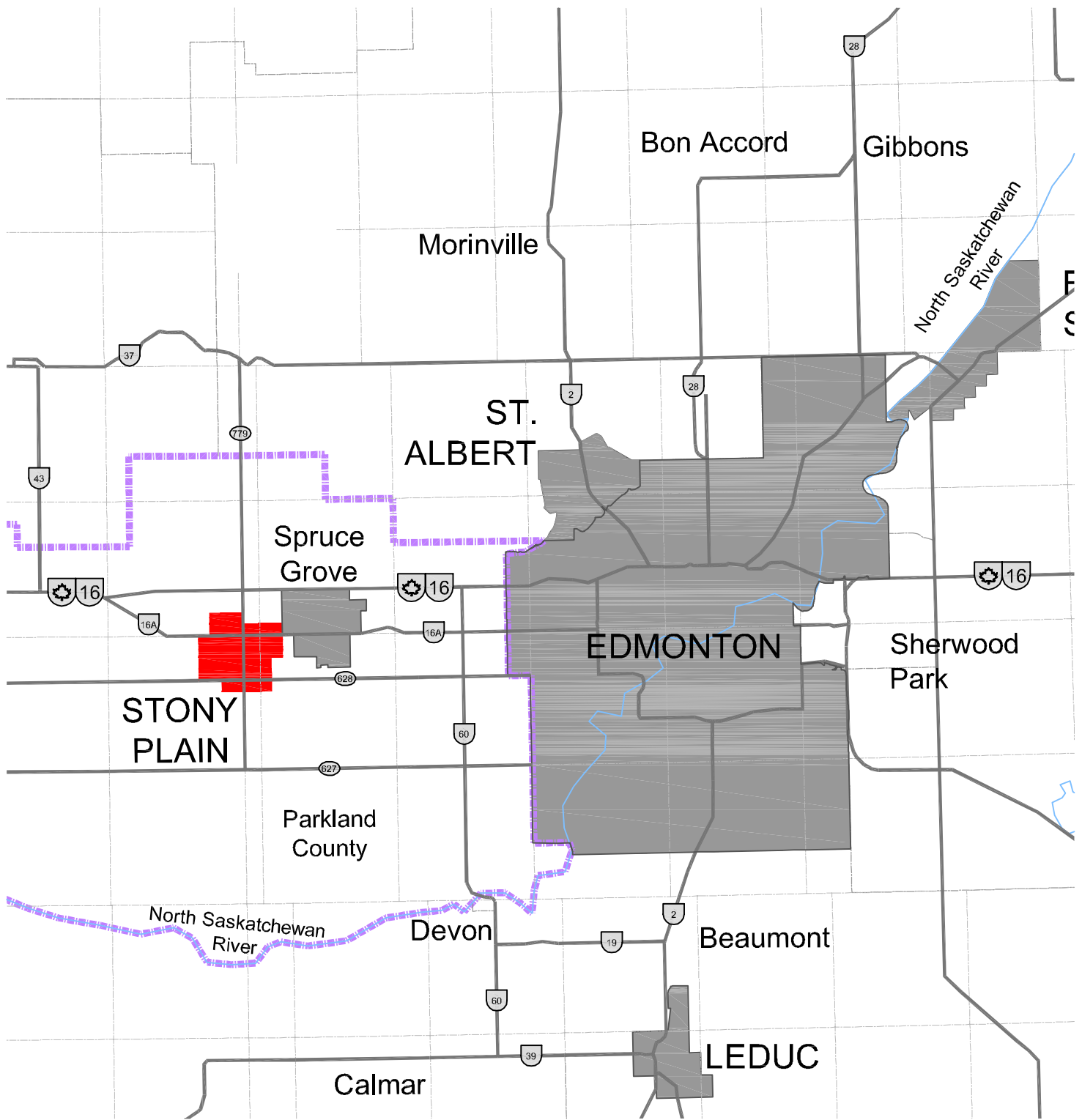
An attempt was also made in this study to bring a considerable amount of first-hand knowledge together to provide as comprehensive coverage as possible of the topic, in order to offer clear guidelines for recreational trail planning and management.

Finally, the 2005 Trails Master Plan is also intended to guide Town Administration on future decisions and plans related to open space, parks and trail planning and design. The Master Plan may be subject to periodic reviews to respond to new planning issues that may affect the Town.

1.2 Regional Setting

The Town of Stony Plain is located approximately 17 km west of the City of Edmonton on Highway 16A in and immediately west of the neighboring City of Spruce Grove - refer to *Map 1: Regional Context* from the *Municipal Development Plan 2005 - 2020*. Both the Town of Stony Plain and The City of Spruce Grove are enclosed by Parkland County.

Stony Plain is serviced by a Canadian National main railway line and two major highways – 16 and 16A – the Town has good access to major markets and serves a regional trade area population of 60,000. All rail lines and highways are aligned in a generally east-west manner.



Legend

- | | | | |
|--|--------------------------|--|-------------------|
| | Trans-Canada Highway | | Township Boundary |
| | Provincial Highway | | Town |
| | Parkland County Boundary | | River |

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Map 1 Regional Context



The Town with the Painted Past

Municipal Development Plan
2005-2020



Currently, the Town of Stony Plain encompasses approximately 16.9 square kilometers of land. The Town has numerous parks, open spaces and recreational facilities within its municipal boundaries. Many of the parks and open spaces are currently linked by sizeable municipal and environmental reserves; that has caused resultant land uses to be oriented to the north and south.

1.3 Population Growth

The Town of Stony Plain's population has grown steadily over the past 30 years. Its attractive setting, strong transportation links and proximity to a major urban centre have contributed to this growth. Since 1996, the population has increased by 27% from 8,274 to 10,544 in 2003. The community's annual growth rate since 1991 has averaged nearly 4%. Assuming that the current 4% annual growth pattern continues, a target population of 20,539 is projected for Stony Plain for the year 2020.

1.4 Organization Format of the Trails Master Plan

The 2005 Trails Master Plan has been organized into eight major sections:

INTRODUCTION. Section 1 contains the purpose and basis for the Trails Master Plan as well as regional setting and organizational format.

GENERAL PLANNING & DESIGN GUIDELINES. Section 2 provides general planning and design guidelines with respect to user requirements, environmental protection and related considerations. The items discussed here are common to all trail types.

PLANNING AND DESIGN PROCESS. Section 3 describes the procedure for developing recreational trail planning and design solutions within the Town of Stony Plain.

MAINTENANCE OPERATIONS GUIDELINES. Section 4 describes various considerations to provide effective construction and maintenance operations, and to minimize environmental disturbances often associated with such activities.

GUIDELINES FOR PARTICULAR TRAIL TYPES. Section 5 provides specific information for different types of recreational trails.

IMPLEMENTATION AND FINANCE. Section 6 describes the mechanisms and instruments available to Council to implement the policies contained in the Plan.

GENERAL DETAILS. Section 7 graphically illustrates recommended trail construction details. Specifications are not part of this study.

GLOSSARY OF TERMS. Section 8 provides an alphabetical listing and definition of terms used within this report.

2.0 GENERAL PLANNING AND DESIGN GUIDELINES

The following recreational trail planning and design guidelines are recommended as a minimum standard of trail development. Minimum standards are set to ensure a high quality trail network, able to withstand tremendous use over time, with minimal maintenance and environmental impacts, and to consistently offer trail users a memorable and safe outdoor experience. These guidelines are not a set of standards, but are intended as guidance and are to be used to compliment established design practices, policies and standards.

The following provides an overview of basic user and aesthetic requirements to include when routing trail segments within the overall Trails Master Plan.

2.1 Trail User Requirements

Recreational trails serve as critical links in the overall transportation network by providing access to various land uses within the municipality. Because trails provide such fundamental services to the public, they should be designed to meet the needs of the widest possible range of users. User requirements fall under two categories: functional and aesthetic. Functional requirements concern user needs relative to the physical use of trails. Aesthetic requirements concern user needs relative to the emotional and intellectual stimulation provided by trail environments.

2.1.1 Functional Trail Requirements

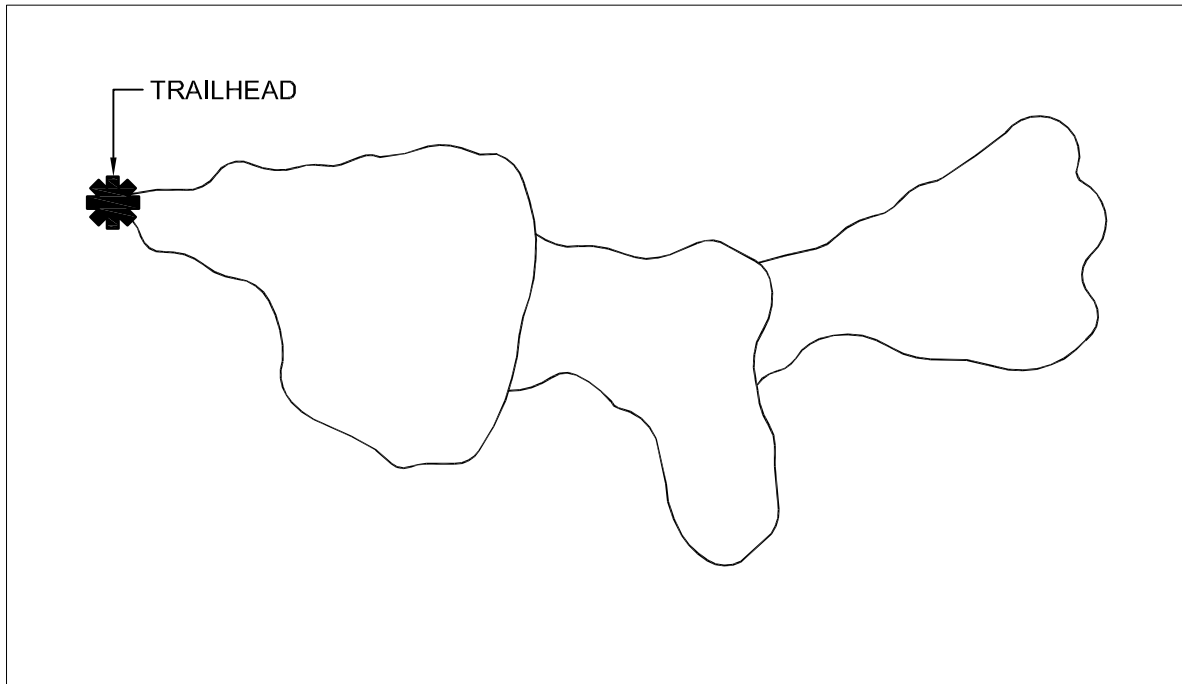
The many types of users and varied terrain along which recreational trails are constructed can place competing demands upon the resource. In practice, most recreational trails are used by more than one type of user and should be considered multi-use paths. For this reason, trail design guidelines are seldom written to accommodate a specific type of user; rather, the design needs of all potential user groups should be considered.

1. Forms of Recreational Trail Layout:

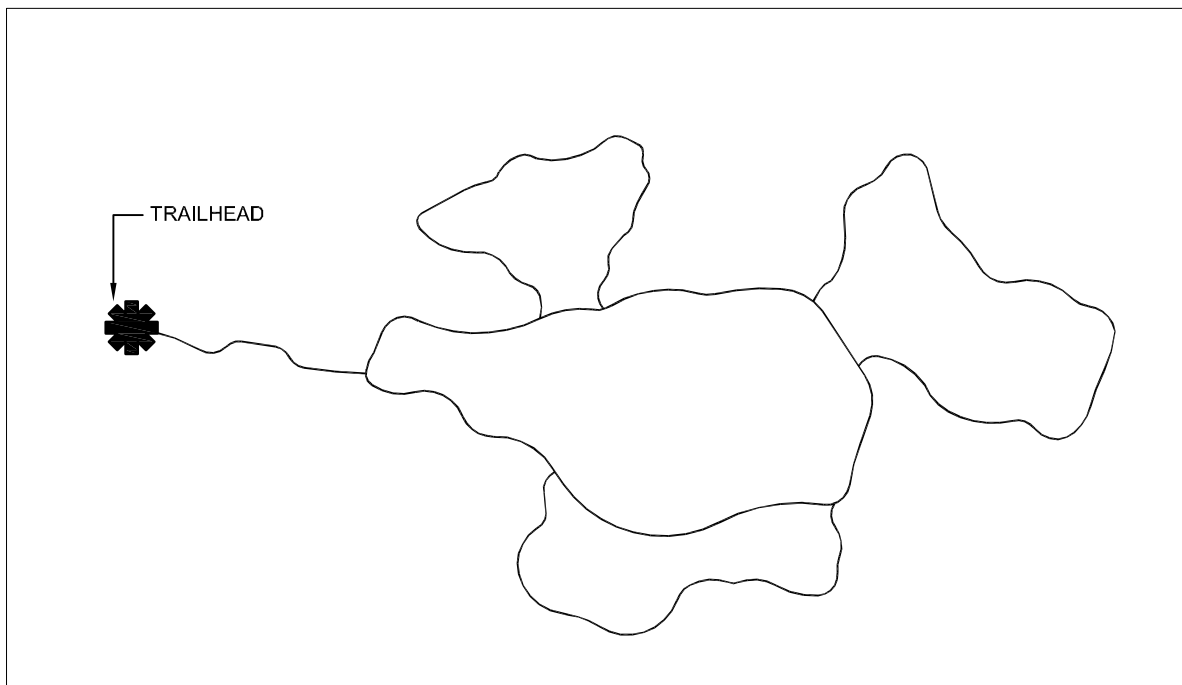
Careful assessment should be made to establish which form of trail layout will best suit the particular needs of individual users – refer to *Drawings 1 to 3* for a range of trail system configurations. The following forms are commonly used in trail planning and design:

Linear Form: Used for long distance trails and for destination-based attractions (e.g. *connections between facilities such as parking lots and swimming pools*). To allow for a greater variety of user experiences perpendicular trail sections or spurs can be added.

Loop Form: A single loop or multiple loops may be provided from a single trailhead, whereby users are led back to the trailhead on a circular trail route. This trail arrangement provides more interest because users do have to retrace their steps, and there is less wear on the trail and the local environment.



STACKED LOOP



SATELLITE LOOP

PROJECT No. 04-1928

DATE: APRIL 2005

APPROVED: APPROVED

SCALE: N.T.S.

DWG. No. DWG1

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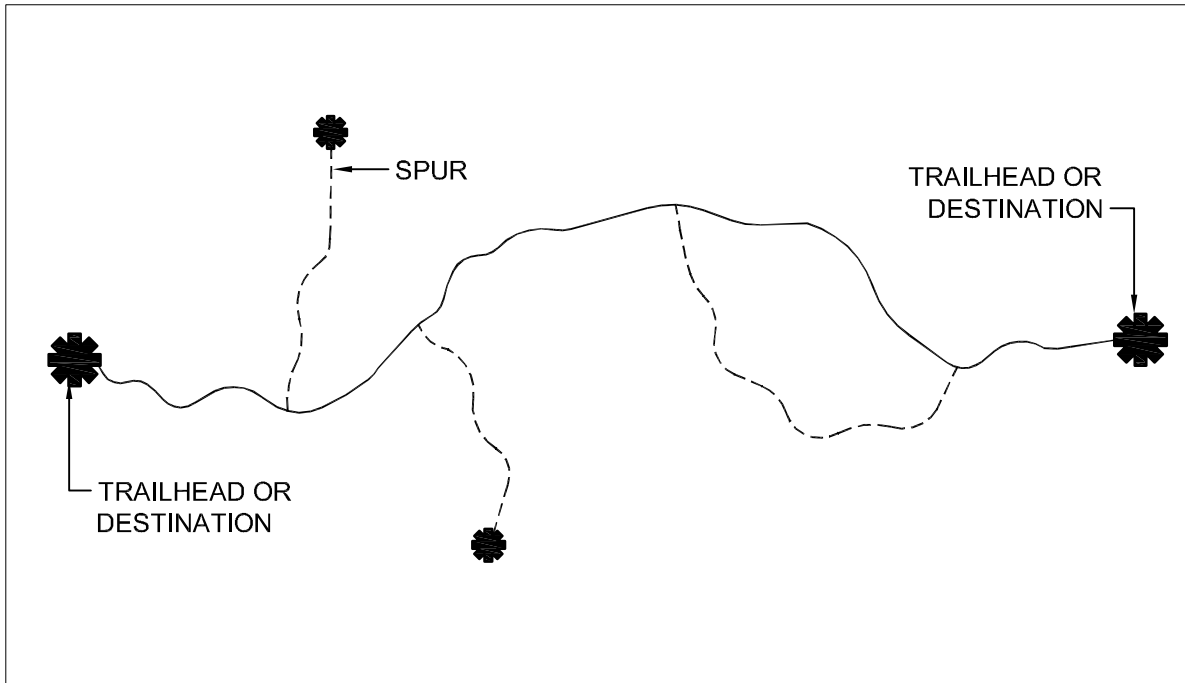
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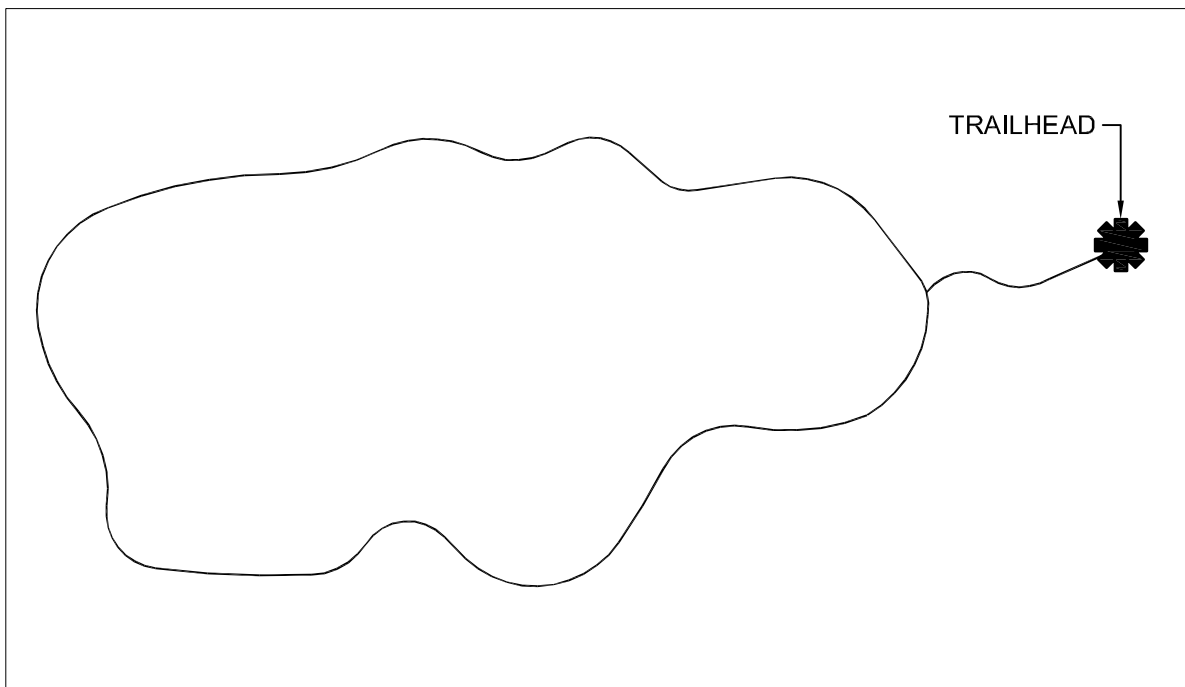
CLIENT

STONY PLAIN

TRAIL SYSTEMS - LINEAR & LOOP



LINEAR



LOOP

PROJECT No. 04-1928

DATE: APRIL 2005

APPROVED: APPROVED

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DWG. No. DWG2

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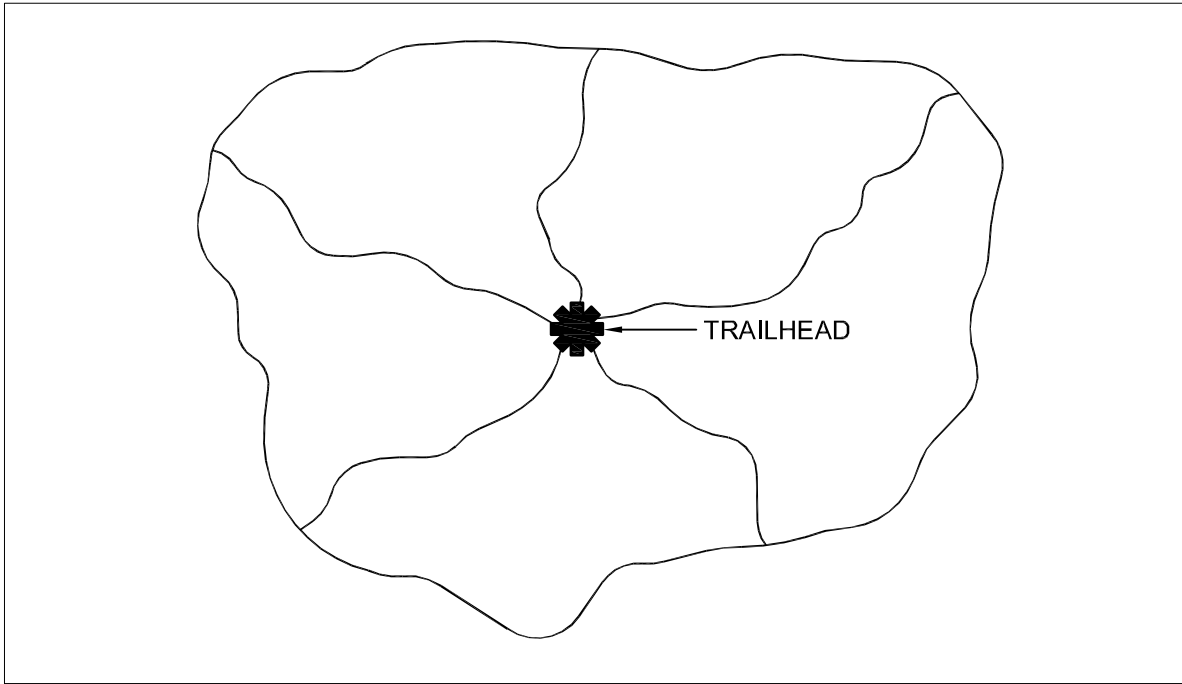
408-1110 Macleod Trail, Suite 100
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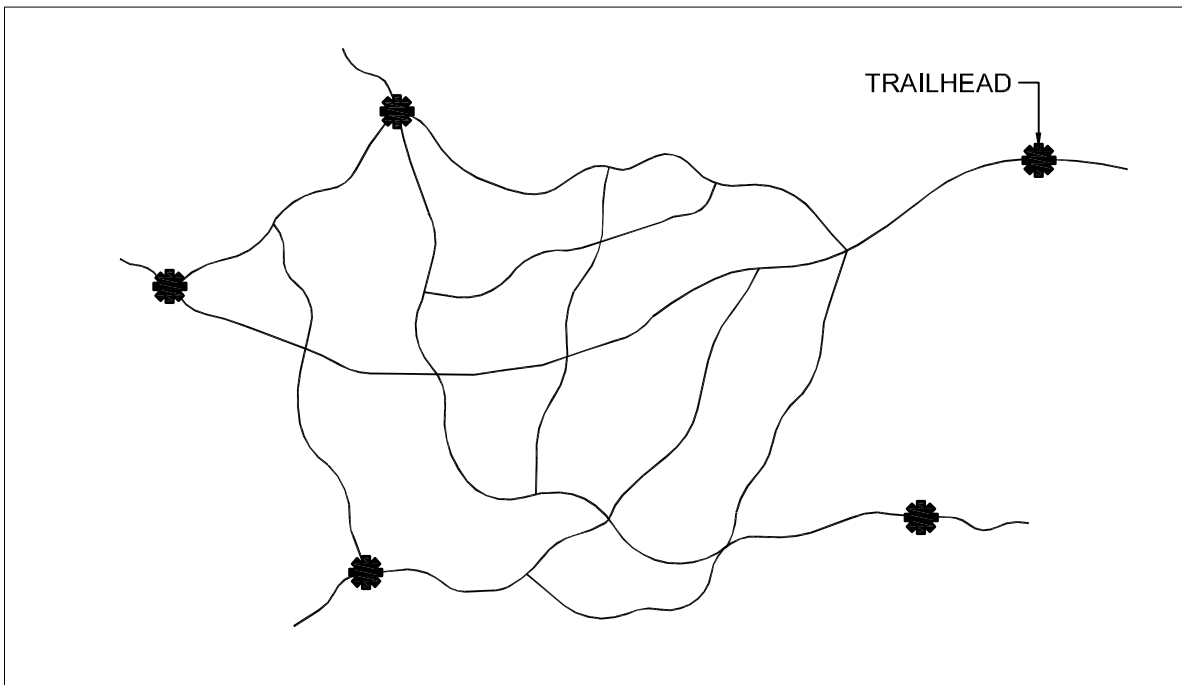
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STONY PLAIN

TRAIL SYSTEMS
STACKED LOOP & SATELLITE LOOP



SPOKED WHEEL



MAZE

PROJECT No. 04-1928

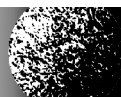
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STONY PLAIN

TRAIL SYSTEMS - SPOKED WHEEL & MAZE

Stacked Loop Form: This variant of the loop form arrangement offers opportunities for a variety of travel distances and trail difficulties (e.g. *terrain conditions*).

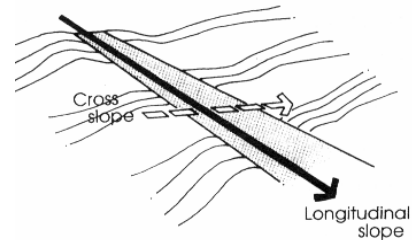
Satellite Loop Form: Another variant of the loop form with a central trail loop used as the primary pedestrian route with the satellite loops offering a wide range of opportunities for alternative outdoor experiences – such as terrain difficulty, interpretive themes, solitude, etc.

Spoked Wheel Form: This form offers a wide range of trail alternatives for travel distance. Users can return to the trailhead from a number of different points.

Maze Form: A great variety of terrain conditions and distances can be provided by such a trail layout. It maximizes use of an area by allowing users to “explore” their own routes, but such trails must be well marked.

2. Grade:

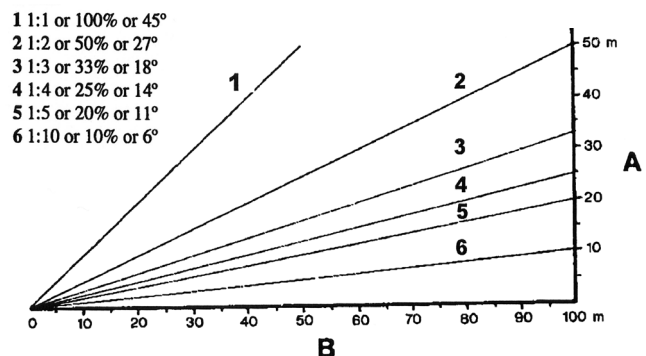
Some guidelines use the term “slope” to refer to grade. However, the term “grade” is used in this report to avoid confusion with “cross-slope”. Grade is defined as the slope parallel to the direction of travel and is calculated by dividing the vertical change (*rise*) in elevation by the horizontal distance (*run*) covered.



- For example, a trail that gains 2m in elevation over 40m of horizontal distance has a grade of 5 percent ($2m / 40m = .05 \times 100\% = 5\%$).

Maximum grade is defined as a limited section of trail that exceeds the typical running grade. It is desirable to avoid long sustained grades in favour of gently sloping variation. Maximum grade values can differ significantly from the running grade values.

- For example, a trail that gains 15m in elevation gradually over 1km has the same running grade as trail that is flat for 0.75km and then climbs 15m over the last 0.25km; however, the two trails have very different strength and endurance demands of users.



The rate of change of grade, or longitudinal slope, is defined as the change in grade over a given distance. The rate of grade change is determined by measuring the grade and the distance over which it occurs for each segment of the overall distance. Rate of change of

grade may compromise the ground clearance of the footrests or anti-tip wheels on some wheelchairs.

- 0.610m - the approximate length of 1 walking pace or wheelchair wheelbase

Type of trail activity and the abilities and interests of users must be considered when planning trails. It is generally better to provide variation, with gently sloping sections giving relief between steep climbs.

Recommendations:

- Table 1 provides the following recommended trail grades:

Table 1: Recommended Trail Grades for Multi-use Trails

Range of Grades	Maximum Grade - Sustained	Maximum Grade -Steep Sections	Rate of Change of Grade
0.5 to 5%	12.5% for a max. span of 3.00m	8.3% for a max. span of 61.0m	13% over a 0.610m interval

- Near the top and bottom of steep trail segments, grades should:
 - gradually transition to less than 5%; and,
 - rest areas provided within 7.6m of the top and bottom of the incline.
- In situations where grades are very steep, it may be more suitable to provide switchbacks or steps – see Item 1.4.1 Structures in this Section.

3. Changes in Level:

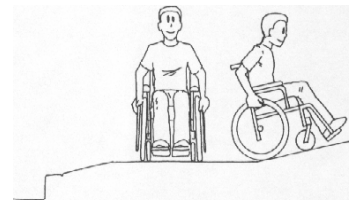
Changes in level are vertical height transitions along the surface of a path. Changes in level can cause great difficulties for people with mobility impairments (*e.g. cane or crutch users*) or who have limited vision, as they have difficulty lifting their feet high up off the ground or be unable to detect the change in level causing them to trip or fall. Similarly, people using wheeled devices such as bicycles, wheelchairs, and scooters can catch their wheels in small changes in level, which can cause them to trip over.

Common examples of changes in level along multi-use trails include:

- sudden change in the natural ground level (*e.g. roots of nearby trees*);
- trail cracks (*ruts*) caused by weather erosion (*e.g. freezing and thawing*); and,
- rocks protruding from crushed rock trail surfaces;
- interface between bridge and trail surfaces.

Recommendations:

- Maximum guidelines for changes in level are ambiguous and differ between public organizations. This report recommends that the vertical changes in level shall not exceed 13mm.
- Vertical changes in level should not be incorporated in new construction.
- If unavoidable, small changes in level up to 6mm may remain vertical and without edge treatment.
- A bevelled surface with a maximum slope of 5% percent should be added to small level changes in level between 6mm to 13mm; and
- Changes in level that exceed 13mm should be ramped or removed.



4. Vertical Clearance:

Vertical clearance is the minimum unobstructed vertical passage space required along a trail. Guidelines for vertical clearance vary according to the type of recreational trail and can even be influenced by the time of year (*e.g. blanket of snow on top of trail*).

Recommendations:

- Vertical clearance of 3.00m for all recreational trails to allow users to remain upright while proceeding along a trail.

5. Width:

The width of the multi-use trail tread not only affects pedestrian usability but also determines the types of users who can use the path.

There are two measurements used to distinguish trail width. Design width, also referred to as tread width, is the width specification the trail was intended to meet. Minimum clearance width is defined as the narrowest point on a trail. A minimum clearance width is created from trail obstacles such as fallen trees protruding into the trail and reducing the passing space that might impede the progress of those using strollers, wheelchairs or walkers. Passing space is a section of path wide enough to allow two wheelchair users to pass one another or travel abreast.

Factors, such as the movement patterns of designated user groups, also affect design width. In general, the faster a user travels, the wider the trail must be to accommodate turns, limit collisions and accommodate high-speed users (*e.g. bicycles, inline skaters, etc*) in both directions. Trails that accommodate fast-moving technologies may be made

narrower to limit user speed. However, more trail crashes and conflicts might occur on narrow trails if users travel fast despite width limitations. Movement patterns of trail users also affect the design width of a trail.

- For example, inline skaters use a lateral foot motion that is wider than the stride of most pedestrians and the width increases when ascending grades. As a result, trails permitting these user groups should be wider than pedestrian trails.

Recommendations:

- Design widths should be increased to the following dimensions:

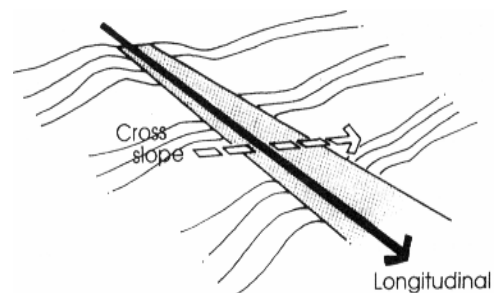
Table 2: Width Chart by Trail Type

	Multi-use Trails (Asphalt)	Accessible & Gravel Trails	Interpretive Trails
Design/ Tread Width	3.0m 2.0m – PUL's only.	2.4m	2.4m
Minimum Clearance Width	5.0m for 3.0m wide 4.4m for 2.4m wide	4.4m	4.4m

- Graded buffers to be typically 400mm on either side of the trail;
- Some existing multi-use trails within Stony Plain fall below recommended trail widths for a variety of reasons. Those trail segments should be reviewed and appropriate remedies be undertaken at the discretion of the Town.
- Trail widths should be increased at important intersections, trailheads and rest areas; and,
- The minimum width that two wheelchairs must pass is 1.52 metres for recreational trails.

6. Cross-Slope

Cross-slope is defined as the slope measured perpendicular to the direction of travel. Cross slope can be a barrier to people with mobility impairments, as they may have difficulty to maintain their lateral balance negotiating extreme cross-slopes even for short distances. Severe cross slopes can cause wheelchairs to veer downhill or create problems for individuals using crutches who cannot compensate for icy conditions or height differentials.



The impacts of cross slopes are compounded when combined with steep grades or surfaces that are not firm and stable. However, some cross slope is necessary to drain water quickly off of trails, but must be balanced against its precarious effects.

Recommendations:

- Table 3 provides a range of minimum and maximum cross-slopes for effective trail drainage in most weather conditions on high to low pavement surface standards.

Table 3: Cross-Slope Ranges by Surface Type

Pavement Surface Type	Cross-Slope Range
High (Paved: concrete and asphalt)	0.5 - 2.0%
Intermediate (slightly below high)	1.5 - 3.0%
Low (Non-paved: loose surface; gravel etc.)	2.0 - 5.0%

- Cross-sloping in one direction on the trail should be encouraged instead of crowning.
- Cross-slopes of 2% shall only be considered at critical curves.

7. Surfacing:

There are a variety of pavement surface materials that can be used on outdoor recreational trails. The surfacing material on recreational trails significantly affects which user groups will be capable of negotiating the terrain. Natural soft surfaces are more difficult for all users to negotiate. They present particular hazards for those using wheeled devices such as bicycles, strollers, and wheelchairs not designed for outdoor terrain. In contrast, unpaved surfaces might be preferred by runners to prevent excessive jarring of the joints and skeleton. Other user groups, such as mountain bikers often prefer unpaved surfaces for the challenge of negotiating rough terrain.

- Natural soft surfaces include: existing soil and overlaying layer, shredded wood mulch, chipped wood mulch; pine cones, etc.

Trails generally used for pedestrians, casual walking, wheelchair access, bicycling and in-line skating must have a constructed hard surfaces and durable trail treads.

- Constructed hard surfaces include: asphalt, concrete/ precast concrete pavers and compacted crushed gravel.



These types of trails also tend to be conducive for maintenance/ snow removal vehicles to travel along, because the tread is strong enough to support the weight of the vehicles. In addition to these considerations, surfaces should be visually compatible with the trail environment (*e.g. asphalt and concrete surfaces are better suited to urban-oriented trails, and woodchips, gravel or natural soil surfacing to natural trail settings*).

Key considerations for selecting pavement surfacing are dictated by:

- topography;
- type of use;
- soil/drainage characteristics;
- firmness;
- evenness;
- dryness;
- strength; and,
- visual appearance.

The firmness, stability, and slip resistance of the trail surface affects all users but is particularly important for people using mobility devices (*e.g. canes, wheelchairs, etc*).

- Firmness is the degree to which a trail surface resists deformation by indentation when a person walks or wheels across it. A firm surface would not compress significantly under the forces exerted as a person walks or wheels on it.
- Stability is the degree to which a trail surface remains unchanged by applied force so that when the force is removed, the surface returns to its original condition. A stable surface would not be significantly altered by a person walking or manoeuvring a wheelchair on it.
- Slip Resistance is based in the frictional force necessary to permit a person to ambulate without slipping. A slip-resistant surface reduces the possibility of a person's shoes, wheelchair tires, crutch tips, or tires sliding across the surface.

Recommendations:

- Multi-use trails should have asphalt surfacing to allow for:
 - a firmer;
 - more evenly-graded;
 - stable; and,
 - slip resistant treads for a diversity of trail users.
- Generally, under all weather conditions, asphalt pavement surfaces have a greater tendency to be slip resistant and dry allowing its tread surface to:
 - extend the season-of-use for the trail;
 - attain higher levels of user safety; and,
 - Minimize or eliminate environmental degradation.

- Asphalt paved trails should be provided in all areas that are:
 - subject to flooding or drainage problems;
 - have steep terrain;
 - where fast-moving technologies (e.g. *bicyclists or inline skaters*) are the primary users; and,
 - through fragile environments to minimize human impact.
- To maximize the longevity of other trail surfaces, supplemental paving materials that use compacted surfaces, such as:
 - crushed gravel; or,
 - soil stabilizing agents mixed with native soils can be utilized.
- Interpretive trail surfaces are most commonly composed of naturally occurring soils; however, surfaces ranging from concrete to wood chips may be used depending on the:
 - designated user types;
 - anticipated volume of traffic;
 - climate; and,
 - conditions of the surrounding environment.

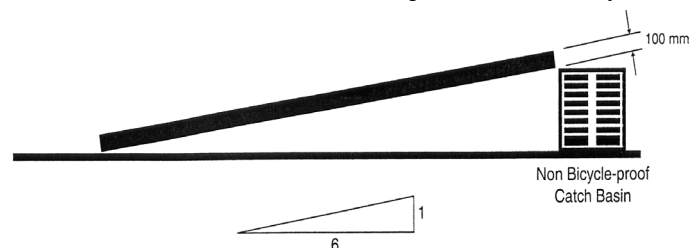
8. Trail Surface Openings and Irregularities:

Surface openings and irregularities are not desirable for people with mobility impairments; but are most harmful to bicyclists and inline skaters that create serious safety hazards. Openings and spaces in the tread surface commonly known as ruts, and irregularities such as holes and bumps can occur between pavement slabs or overlays that parallel the direction of travel – See Section 4 Maintenance Guidelines.

On gravel trails, openings may occur naturally, such as a crack in a rock surface. On multi-use trails, openings are usually constructed and can trap inline skate wheels, bicycle tires, wheelchair casters, walkers, crutches, cane tips, or a heel causing a loss of control.

- For example, expansion spaces between the planks of a boardwalk, a surface drainage grate, or a flange way gap at a railroad crossing.

Drainage grate inlets and utility covers are also potential problems to trail users. All such grates and covers should be kept out of the expected path of users. It is important that grates and utility covers be adjusted flush with the surface, including after a roadway is resurfaced. Parallel bar drainage grate inlets should be replaced with wheelchair/bicycle-safe and hydraulically efficient ones. When not possible, consideration should



be given to welding steel cross straps or bars perpendicular to the parallel bars to provide a maximum safe opening between straps. This is a temporary correction.

Recommendations:

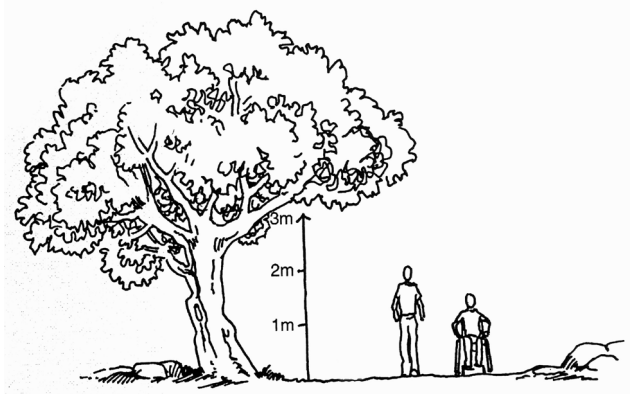
- To the greatest extent possible, pavement surfaces should be:
 - free of irregularities;
 - the pavement edge should be uniform in width; and,
 - located outside of the tread surface width.
- On older pavements it may be necessary to:
 - fill joints;
 - adjust utility covers; or,
 - overlay the pavement; in extreme cases.
- Curb inlets should be used wherever possible to completely eliminate exposure of trail users to grate inlets.
- When openings in the tread surface cannot be avoided because of existing design constraints, the following recommendations should be employed:
 - opening width – the size of the opening in the tread surface should not permit a 13mm (0.5 in) diameter to pass through it.
 - opening orientation – if the open space is elongated, it must be orientated so that the long dimension is perpendicular to the dominant direction of travel.

9. Trail Clearing:

Vegetation should be cleared of protruding objects only to the degree to provide for safe and unimpaired movement along the trail. Protruding objects are anything that overhangs or protrudes into the trail tread whether or not the object touches the surface.

- Common examples include: lighting posts, poorly maintained vegetation, signs, etc.

Vegetation should be removed to a minimum vertical clearance height that will allow unobstructed headroom, and must be allowed to compensate for the depth of snow on the ground. This should also take into consideration the fact branches will droop and block the right-of-way, when weighted down by the effects of snow, wind or rain. On narrow trails, shrubs and small trees that grow quickly into the right-of-way



should be removed. On wider trails this is less of a concern because there is more room for users to make their way between branches.

On multi-use asphalt trails where there is potential for emergency or maintenance vehicles to gain access to areas or bicyclists, it may be necessary to increase the vertical clearance height. However, it will be desirable to maintain some cover of arching branches over the trail. With complete clearing, increased penetration of sunlight will encourage plant growth at the trail edges and extra maintenance will be necessary.

Recommendations:

- Table 4 provides minimum clearance heights for effective trail use in most weather conditions by recreational trail types.

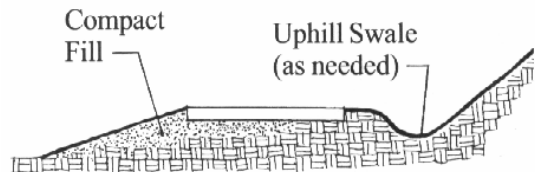
Table 4: Vertical Clearance Height by Trail Type

	<i>Asphalt Trail (Multi-use)</i>	<i>Accessible & Gravel Trail</i>	<i>Interpretive Trail</i>
Vertical Clearance Height	3.0m Ht.	3.0m Ht.	2.5m Ht.

- When an underpass such as a tunnel is used, a minimum of 3.05m of vertical clearance height is recommended.

10. Drainage:

The best trail alignment minimizes tread width with a configuration that confines major drainage practices to one side. Drainage methods causing the least impact on the natural environment should be used.



Recommendations:

- Water should be intercepted, collected and directed to culverts that pass under the trail at “natural” drainage points.
- Effective alignment and drainage practices should be stabilized with rock or deep-rooted grasses.

11. Trail Signs & Markers:

People select outdoor recreational trails based on a variety of criteria, including:

- personal interest;
- destinations;
- environment; and,
- desired difficulty.

Their decision to use a trail segment is based largely on the user's knowledge of the direct environment. Therefore, providing accurate, objective information about trail conditions allows users to assess whether a particular trail is appropriate, or provides access to their assistive devices; as well as instilling confidence and trust to trail users for the following reasons:

- Users are less likely to find themselves in unsafe situations if they understand the demands of the shared-use path before beginning;
- Frustration is reduced and people are less likely to turn around on a trail because they can identify impassable situations, such as steep grades before they begin.
- The level of satisfaction increases because the user is able to select a trail that meets their own interests and expectations; and
- If more difficult conditions will be encountered, users can prepare for the skill level and equipment required.

Objective information about trail conditions (*e.g. grade, access points, surface, width, obstacles, etc.*) is preferable over subjective difficulty ratings (*e.g., easier, most difficult*), because ratings of difficulty cannot be accurate, or appropriate, for the range of all trail users.

- For example, individuals with respiratory or heart conditions, as well as individuals with mobility impairments are more likely to have different interpretations of difficulty than other users.

A variety of formats can be used to convey trail information to prospective users, including:

- marker sign posts;
- plan maps;
- computer programs;
- posters at trailheads;
- audio descriptions; and,
- printed trail guides.

Typically, trail signs are the most common format of conveying information and are an essential component towards enhancing the overall outdoor experience of trail users. The following data is typically used in developing accurate, objective sign information:

Location:

Traditionally located at all trailheads and major trail junctions. However, the Town should use only as many signs and markers at their discretion and only as much information on signs to ensure the convenience and safety of trail users.

**Trail Names:**

Trail users have a far greater memory of recall of trail names than of trail numbers. Therefore, trail names must be memorable, easily recognizable or pronounceable (e.g. *Sidewinder*); rhythmic names are also useful (e.g. *Tough Bluff*).

Designations:

Symbols of international use designations can be reinforced at major intersections by attaching them to signs or marker posts. Reliance on



universal graphic symbols provides valuable information to individuals with limited reading abilities. Detailed technical information for trail signing and marking is provided in Section 7 – General Details.

Distances:

Distances, estimated travel times and direction to objectives can be indicated (e.g. *3 km Arena*).

Maps:

Graphic map information should include an overview of the entire trail network with an enlargement of that particular trial segment with trailhead, rest areas and other support facilities indicated.

Letters:

Letters on signs should be provided in an easy to understand format with limited text that is known by most users. Written information should be provided in alternative formats, such as Braille, large print, or an audible format.

- For example, trail users with visual impairments benefit from signs with large lettering, or audio boxes that play pre-recorded trail information.

Raised, routed letters can be highlighted with reflective “highway sign” paint to provide information for individuals with limited reading or seeing abilities.

Trail signing also requires a hierarchical system that employs aesthetically compatible materials in a durable design that discourages vandalism, minimizes maintenance and eases replacement time and costs.

Recommendations:

- Signs should not be placed in locations where they obstruct the minimum clearance width or vertical clearance height of the trail.
- No signs should ever be attached to trees.
- There is no existing signing program for the current trail network. The creation of an overall site signage system should be initiated; one that creates a strong community focus and identity for the entire trail network yet is distinctive enough for each trail segment.
- Trails signs should be appropriate for the environment in which they are located. Existing pressure treated posts should be the recommended standard to meet user expectations of a “natural” environment.
- The following trail sign information be objectively measured and conveyed to the user:
 - trail access points;
 - trail segment names;
 - recreational trail type (*e.g., interpretive, multi-use, etc.*);
 - trail destinations, length and layout form (*e.g. linear, loop, etc.*);
 - maximum grade and cross-slope;
 - tread surface types encountered;
 - significant hazard situations/ potential obstacles and suitable precautions (*e.g., alternative routes under adverse weather conditions*);
 - location of rest stops, washroom facilities, and availability of drinking water;
 - trail use regulations;
 - Town bylaws;
 - emergency contact numbers or procedures; and,
 - points of interest.
- Continue names for trails along the longest possible logical route and avoid names sharing the same segment of a trail.

- Sign Letter and Number Types:
 - in upper case, sans serif, or simple serif type;
 - Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 – not less than 13mm in height; and,
 - a width-to-height ratio between 1:5 and 1:10; and,
 - raised 5mm from the surrounding surface.
- Sign Background:
 - contrast with the colour of the lettering.
 - avoid glossy finishes.
- Trailhead sign information is accompanied by Grade 2 Braille lettering.

12. Other Factors:

Comfort:

Considerations should be given to climatic factors that may affect trail users. A balance of shade, sun and protection from strong winds should be provided for when planning trail routes.

Trail amenities can also enhance a user's comfort. Ample drinking water and rest areas are welcomed by all users, but are of particular benefit to those with limited strength and endurance.

Safety:

In addition to the various design factors, considerations must be given to hazards that exist within the vicinity of the trail. A careful assessment of the seriousness of trail hazards will determine the level of suitable safety features (*e.g. railings, slip resistant surfaces, barriers, etc.*) necessary to reduce potential danger. Safety measures adopted should be suited to user abilities and attitudes, and specific trail route segments.

The common sense of the user must be relied upon to an extent, as well as informing trail users of trail conditions to reduce the need for physical safety measures on trails.

2.1.2 Aesthetic Trail Requirements

In addition to functional requirements of trail use, aesthetic requirements are also an integral part of the recreational trail experience. Aesthetic requirements are concerned with those aspects of trail use relating to the emotional and intellectual stimulation provided by the immediate environment. It should be noted that while aesthetic considerations will be more important on some trails than others, the success of every trail network system will depend to some degree upon the quality of the aesthetic experience.

The way in which interpretive and scenic natural features are revealed to the viewer and the quality of design detail are the primary factors to be considered in the development of aesthetic quality.

1. Interpretive Opportunities:

Gaining an understanding of one's environment is an important part of choosing to walk along an interpretive trail. This knowledge can be provided in an informal or formal manner, but it is an essential design criterion in developing interpretive opportunities for outdoor recreational trails.

On self- interpreting trails, the sequence of interpretive features is carefully planned and includes a considerable amount of information to ensure that the interpretive potential of the trail is fully realized. Interpretive information media can be provided singly or in combination through various means, such as:

- Leaflets or brochures;
- Interpretive signs;
- exhibit displays; and,
- self-activated audio tapes.

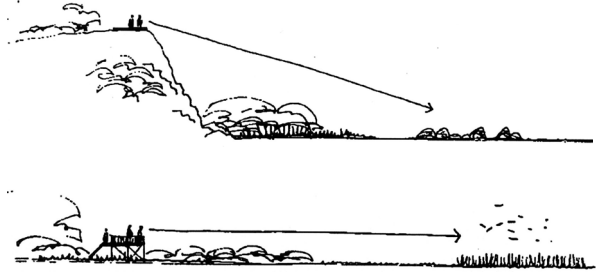
It should be kept in mind that the main portion of interpretive information communicated to the trail user comes from the environment itself. The success of this communication is largely dependant on the skill with which the trail route is arranged. A few basic interpretive viewing principles should be followed:

- The trail should provide enough variety to give an overall appreciation of the local area through which the trail passes. Where possible plan for:
 - Large-scale vistas that:
 - show the form of the landscape; and,
 - provide opportunities for understanding the processes that shape it.
 - Short-range views where attention is focussed more on the details of the landscape, for instance:
 - natural, cultural and historic interest features.
 - A variety of landscape conditions should be revealed.
- Interpretive information can be presented in a low-key manner, such as:
 - Trails can be named after a theme that they highlight.
 - Summary briefs of interpretive materials can be included on trail signs or marker posts at major intersections or access points.

2. Scenic Interest:

Scenic interest is closely associated with those described for interpretive opportunities. For both scenic and interpretive features, it is important to expose the trail user to a variety of natural conditions and features that exist within the local area. The design difference is to create visual stimulation, as opposed to informing the user.

Natural features and scenery should be evaluated in the field in order to develop the best views. Viewing position is defined as the relationship of the observer to the surrounding area. The following factors should be considered in determining optimal viewing positions:



- The trail should provide users with a variety of spatial effects along trails in order to heighten interest and provide views from a range of positions, such as:
 - High positions – hilltops and ridges can provide striking panoramic views and enable users to orient themselves to the overall landscape.
 - Medium positions – enframed views and partial landscape features.
 - Low points – strong sense of enclosure for trail users and their attention is more fixed on landscape details of the immediate surroundings.
- Variety can be found in the character of spaces provided. Spatial character can be determined by the:
 - Degree of Confinement – is dependant on the height of the 'walls' that surround the space. A great variety of natural materials can form the 'walls' of spaces.
 - Amount of Enclosure – there are 5 types of enclosures: completely enclosed, overhead enclosure, one-sided enclosure, two-sided enclosure, and completely open.
 - Scale of Space – the relationship between the sizes of spatial area relative to the viewer.
- When a trail approaches a feature of interest it is effective if several views are offered.
- Curvilinear trail alignments that fit the natural landform are more natural and attractive as opposed to long, straight segments.

3. Detail Design:

Trail design details should be carefully considered because they contribute to the overall aesthetic quality of the recreational trail. Design opportunities should be based on user requirements and construction costs, in relationship to a wide assortment of trail design parameters and site conditions (*e.g. structural integrity, materials, colours, finishes, etc.*).

The detail designs where people will remain for longer periods of time must be given careful consideration (*e.g. rest areas, bridges, etc.*). Section 7.0 – General Trail Details

provides a compilation of technical and construction details to help establish minimum trail construction standards that are environmentally sensitive, sustainable and have low impacts on the land.

2.2 Environmental Protection

The protection of the environment is of major design importance; if environmental quality is seriously affected the very attributes that make natural areas attractive in the first place may be lost. Every effort should be made to ensure that all recreational trails, existing and future, within the Town fit their environments as harmoniously as possible, so that ecological processes and environmental character are not significantly altered.



To minimize impact on the environment while maintaining user safety and avoiding potential user conflicts, trail designers must understand how trail requirements (*functional and aesthetic*) affect user interactions and activities. This subsection describes how to avoid or minimize disturbances through proper trail alignment, construction and maintenance practices.

2.2.1 Carrying Capacity

The amount of use by man that a local area can withstand without undue environmental degradation is known as its carrying capacity. Ironically, it is man who must define the level of change that will constitute the threshold of unacceptable degradation for a local area. To ensure that an area's carrying capacity is not exceeded, the following questions should be considered:

- What is the level of trail use desired?
- What will be the extent of detrimental impact upon the environment?
- Is this level of environmental impact acceptable?

If it is not acceptable, there are several questions to determine alternative trail routes, construction materials or procedures:

- Can a location with less sensitive environmental conditions be chosen?
- Can carrying capacity be increased by adopting measures to reduce the impact?
 - e.g. use of tread surfacing, drainage control devices or barriers.
- Can requirements relating to either the amount, or type, of trail use be altered?
 - e.g. use can be limited to fewer persons per day, or a gravel walking trail be developed in lieu of an asphalt multi-use trail.

There are two key factors to be considered in the assessment of potential impacts: the ecological sensitivity of the area and the type and intensity of trail use.

1. Ecological Sensitivity

The environment is made up of a series of ecosystems and communities of organisms, such as plants and animals, interacting with one another and with their physical environments. These systems and each area being considered for trail development will either be part of an ecosystem, or make up one or more ecosystems. It is important to understand that these ecological relationships exist, some ecosystems are more sensitive than others, and trail planners should be aware of the tolerances of different systems so that serious environmental disturbances can be avoided.

Damage to the environment should be thought of in terms of aesthetic effects, so as that the conditions that originally made the area attractive for trail development are not destroyed. Potential environmental effects can occur within four different trail development time frames:

- effects from survey activities;
- effects from construction activities;
- effects from the completed project; and,
- long term effects resulting from management practices and secondary developments that may be attracted by the initial trail development.

2. Type and Intensity of Use

Detrimental impacts on the environment are directly affected by type of trail activity and how intensively the trail is used.

- For example, around interpretive displays, lookouts, river crossings, will receive a greater degree of impact.

2.2.2 Sources of Disturbance and Recommendations for Limiting Environmental Impact

There are five principal ways in which trail development and use can cause damage to the local environment. Major sources of disturbances include: initial clearing of the trail route, increased human contact with wild life; soil erosion; shortcutting; and improper disposal of wastes (*e.g. litter, garbage, sewage*).

1. Clearing Trail Route:

Some damage is inevitable, and necessary, when clearing a route for a trail. Trees and brush will have to be removed or pruned back, and soils, small plants and rocks excavated for the trail surface.

Recommendations:

- The trail should be located where important ecological elements, interpretive features, rare plants, and important habitat zones will not be disturbed.
- Clear only the recommended clearance widths necessary for each trail type.

2. Human Contact:

Different species of wildlife have different levels of tolerance to the presence of humans. In some situations trail development may cause wildlife to:

- abandon important habitat zones (*i.e. areas that cannot be easily replaced by the species concerned*);
- areas containing rare or endangered species; or,
- areas where the absence of certain species could cause ecological imbalances.

The type and expected intensity of trail use must also be considered since the noisier the trail activity, the greater the human contact impact is likely to be. Similarly, the scale of the construction operation will be of consequence. Impact will be increased where machinery and large work crews are required, or where construction activity will be prolonged or take place during critical phases of seasonal wildlife cycles.

Recommendations:

- Avoid important habitat zones that might be adversely affected. Extremely sensitive habitat areas should be strictly avoided and trails should be kept sufficiently remote from these areas, so the curious are not tempted to infringe upon them. The benefit of any doubt should be in favour of the environment.
- It may be suitable to provide access to sensitive habitat areas through small tributary trails. The amount of use can be restricted by making tributary trails dead-ends, rather than loops. If users are forced to return by the same route, fewer people will follow them.
- Viewing stations can be provided to allow trail users to view sensitive areas from suitable distances. Such access should be allowed only where intrusion can be kept to a proper level.

3. Soil Erosion:

One of the most frequent forms of environmental disturbances resulting from trail development is soil erosion. The effects of erosion are both ecologically and aesthetically detrimental. In addition, functional utility of trails and user safety can be affected.

Maintenance costs must also be considered; without proper planning and construction these may become exorbitant.

Effects of erosion on the environment are evident in one, or more, of the following ways:

- Loss of topsoil and exposure of subsoils (*through sheet and/or gully erosion*);
- Root exposure, resulting in physiological stress in the case of trees;
- Susceptibility to windfall;
- Stream sedimentation, increased turbidity and adverse effects on flow regime and stream flora and fauna;
- Contamination of water supplies;
- Slides and slumping.

Serious erosion problems are likely to occur where trails are located on erosion susceptible soils, especially those in wet conditions. Once the protective surface layer of vegetation and litter has been removed, the mineral soil is exposed to elements of erosion (*water, wind and traffic*). On sloping trail sections this will flow and may result in gullying. On flat trail sections where water remains at the surface for long periods while trails are in use, soils will become muddy and users will detour and cause damage to trailside areas.

Soil erosion is also likely to occur where runoff is not properly controlled. This will result where trail grades are too steep, where adequate means are not provided for diverting surface water off the trail and improper installation of bridges and culverts. If adequate passage is not provided for peak flows (*e.g., five, ten year, etc spring floods/ storms*) erosion will result and the trail or the bridges may be washed out.

Recommendations:

- Locate trails where soils are most resistant to erosion. Natural grade dips should be incorporated into the trail surface so that drainage is diverted at frequent intervals.
- Where steep slopes are unavoidable switchbacks can be used to maintain optimum grades. Steps can also be used on steep slopes. Drainage water should be diverted from the top of steps.
- Various drainage control devices should be used to control the flow of surface water, including:
 - the cross-section of the trail should be crowned – also see 2.1 User Requirements, 7. Surfacing;
 - a ditch should be dug on the uphill side of the trail to carry runoff to suitable crossing points (*grade dips, fords, bridges, culverts*). Frequent crossing points should be provided to prevent the build-up of large volumes of water; and,
 - where scouring is likely to be a problem, the bottom of ditches can be filled with crushed rock or gravel.

- Vegetation should be left undisturbed as close to the trail edge as possible. Foliage helps break the impact of raindrops and the surface organic layer helps stabilize soil structure and porosity.
- Ensure proper siting and design of culverts and bridges.
 - Locate bridge crossings to minimize disturbance to streambeds and banks.
 - Preferable locations are those where bedrock is exposed or where stable soils prevail.
 - Straight sections of streams are preferable to locations on bends.
- In most situations, bridges are more suitable than culverts for crossing of large streams.
 - Stream flow is less likely to be altered at bridges.

4. Shortcutting:

If a trail alignment is too difficult and an easier route is visible, users may wander outside of designated trail routes causing environmental damage known as 'shortcutting'. Sometimes, shortcuts are a better alignment to the original route and should be adapted as part of the overall trail network. The original route can be kept open or blocked off and rehabilitated.

Recommendations:

- Natural landforms and vegetation should be used to prevent, or block, potential shortcut routes.
- Do not accept shortcuts that may be too close to environmentally sensitive areas. Place barriers and natural materials such as rocks, tree whips and fallen trees along the shortcut route.

5. Improper Disposal of Wastes:

Control and disposal of wastes is another concern of environmental protection. It is caused by improper maintenance and operations management procedures resulting in the deterioration of trail environments from littering and ineffective garbage disposal.

Littering is an unsightly distraction for trail users seeking enjoyment in the natural environment. Furthermore, broken glass, cans, caps and plastic bags are hazardous to wildlife. Waste receptacles are also often unsatisfactory if they have not been regularly serviced and full of garbage. Section 4 provides further information to prevent improper disposal of wastes.

Recommendations:

- An energetic management program is the most effective antidote against littering.
- Programs should be initiated to educate the public through posters and notices displayed at trailheads and rest areas.
- Frequent clean-up operations should be carried out to support the education programs.

2.3 Related Considerations

This section describes planning and design considerations for trail structures related to both user requirements and environmental protection.

2.3.1 Trail Structures

The scope and design of trail structures (*e.g. bridges, steps, etc.*) should be appropriate to the conditions of the trail and the full range of user needs. Key considerations regarding user requirements for trail structures have to do with determining when structures are needed and determining design requirements. Section 7 provides an assortment of trail structure details to help guide all design, construction and maintenance requirements of recreational trails within the Town of Stony Plain.

Structures should be used only where essential. They are costly to build and to maintain, and money saved can be well used in other areas. In addition, trail structures should be located and designed to blend with their surroundings. Their designs should be simple and functional, and avoid decorative features. Natural materials and finishes, as a general rule, are most suitable. However, steel and concrete are occasionally more suitable materials because they provide greater structural prospects, better longevity of finishes or have less maintenance concerns. Finish colours should compliment natural surroundings.

Landscape architectural and engineering expertise should be consulted in the siting of all major trail structures. The subject of structures is dealt with further in the subsections below, where factors relating to both user requirements and environmental protection are described.

1. Pedestrian Bridges:

The fundamental design goal for pedestrian bridges is to provide safe and pleasant access for pedestrians, bicycles, joggers, wheelchairs, parents pushing strollers, in-line skaters, and other non-motorized travelers. Secondary design goals include creating a facility which will actively attract use, and which can serve as a memorable landmark along the trail.

Substantial bridge forms are required for trails that will be used by a broader cross-section of the public. Surfacing should be laid out in right angles to the length of the bridge for easier walking. This arrangement provides better footing and a better surface where

wheeled vehicles may be used. Leave marginal openings for adequate drainage, air movement and material expansion.

Bridges must have a minimum 2.40m width sidewalk. Not all trail bridges require handrail systems, but must have a curb rail. As a general rule, hand railings should only be used where the trail surface is elevated more than 0.60m above an adjacent surface. Also, ensure a smooth transition from the trail surface to the trail surface. Where there are substantial changes between levels provide ramps with handrails.

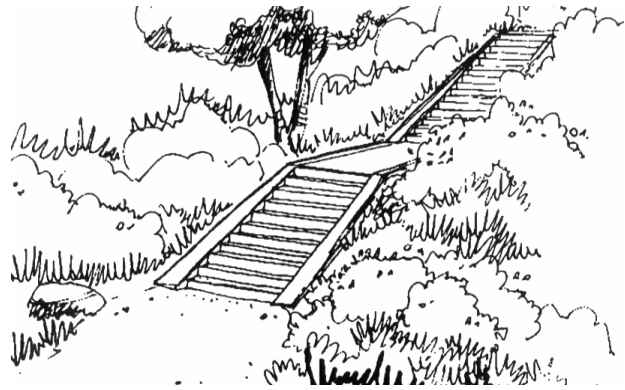


Abutment selection and design must take into consideration the stream's flood flow (when crossing a body of water) and the effects of stream scour. All bridge abutments and intermediate pier footings should be constructed at, or below, the anticipated scour elevation.

2. Steps:

Steps are best suited for short climbs on steep slopes to ensure the safety of trail users and to prevent soil erosion. The detailing of steps for the protection and comfort of people with diverse abilities is important. Provide handrails, preferably on both sides of the steps, and provide a series of short flights and generous landings rather than a long single long flight.

The proportion of the riser height to the tread depth is important for safety and comfort. See that all steps have uniform treads (*recommended depth is 28cm*) and risers (*preferred range is 10 to 17 cm in height*). A common formula for calculating a suitable proportion is riser height (*in centimetres*) multiplied by tread depth (*in centimetres*) equals 450.



- For example, 13cm Riser (*cm*) x Tread (*cm*) = 450. A riser height of 13cm results in a tread depth of 34cm as demonstrated $450 / 13 \text{ cm} = 34.6 \text{ cm}$.

Steps should be carefully detailed for the protection and comfort of people with diverse abilities. Provide handrails on both sides; each side should have two non-slip hand rails – one for children and another for adults. Extend all handrails a minimum of 450mm past the

top and bottom of steps. Use a short flight of steps (*6 to 7 maximum*) and generous landings (*min. 2.0m long*) for rest stops, rather than a single long flight. Finally, provide a strip of colour on the top stair edge so that it can contrast and be seen by a person with visual impairments.

3. Boardwalk

Boardwalks are most often used to provide safe and environmentally compatible trail access across ecologically sensitive landscapes. Boardwalks are almost always constructed of wood, often combined with galvanized or rust-resistant steel and concrete.

A wood boardwalk has a foundation, framing, decking, railing and such special features as benches, hand railings or overlooks. The foundation of wood boardwalk is almost always a pier or wood post. The post serves the same function as the foundation for a bridge, transferring the weight from the boardwalk down into the soil mass. As with bridges, boardwalk decking does more than serve as a walking surface, it also plays an important structural role. Decking should have a nominal thickness of at least 38mm to 50mm. Boardwalk hand railings follow the same requirements as those for bridges.



Special boardwalk features include benches, observation platforms and partially enclosed shelters. The boardwalk surface should also be high enough to avoid submersion during the trail use season and can be constructed for installation directly at grade or elevated above maximum water level to be able to withstand fluctuations in water level, provide adequate drainage in ecologically sensitive areas or constructed to endure flood conditions.

4. Culverts:

Where culverts are used, care should be taken that they are of adequate size (*diameter and length*) and that they are set at a level that will not block surface drainage. Rocks should be set around the ends of the culverts to stabilize the fill material and subgrade levelling courses, and to hide the flared ends of the pipes.

Culverts may be necessary where it would be too expensive to bridge a number of small streams and where crossing is impracticable (*e.g. wheelchairs or casual walking*).

5. Barriers:

Barriers serve several purposes on trails. They are used primarily to protect trail users from potentially dangerous situations, and secondarily to protect environmentally-sensitive

areas. Pedestrian barriers direct trail users to preferred circulation routes and help define immediate spaces. Barriers are also used to prevent undesirable traffic from using the trails. Choice of materials, strength and adequate design of barriers is essential. The family of barrier and control elements to be utilized in the 2005 Trails Master Plan will include: rail fences, handrails, retaining walls and bollard systems.

Trail conditions requiring railings and fencing shall be avoided wherever possible. If necessary, they should only be used on one side and meet provincial building code requirements. Bollards must be tall enough so they do not create a tripping hazard to trail users. Removable bollards can be used to block access to cars and trucks on multi-use trails. When access is required by service or emergency vehicles, the bollards can be unlocked or removed.



2.3.2 Trailheads:

Trailheads provide trail users a place to gather, rest and socialize and are usually developed next to public rights-of-way and serve as the primary public access onto the trail network. To enhance pedestrian activity, a trailhead should include barrier free site furniture to address the reality that people with disabilities will use all types of trails. The presence of pedestrian gathering spaces reminds other users that trails have other public applications. Furthermore, consistent building materials and design styles used within the trailheads can improve user recognition and understanding of the overall trail network. Plant materials, specific colours, lighting, solar orientation, natural materials (e.g. *stone and wood/ timber*) and local motifs are all potential design elements.

It is critical to introduce places to sit, such as benches, picnic tables, low walls or steps at all trailheads. Bicycle racks should be placed where people are apt to leave their bicycles unattended for short periods of time. Extra waste receptacles (*recycling bins are optional*) should also be situated in trailheads on well travelled trail segments.

- Note - Too many site furnishings can create a cluttered appearance. To avoid cluttered appearances, furniture should be set back from the trail edge and grouped close to trail access points.

Typical trailhead design should include the following items:

- Manoeuvring room for pedestrian, animals, bicycles, wheelchairs, etc.;
- Parking stalls for automobiles (if appropriate) or bicycle racks;
- Interpretive signs, site furniture, information booths and plant materials;
- Proximity to the main trail; and,
- Barrier systems to prevent unauthorized access to the trails.

Depending on the level of development, trailhead signing can be incorporated using photographs, topographic maps, map boards, and historical/ environmental interpretive signs in order to achieve appropriate visitor impression. Trailhead signing should be photogenic, distinctive and designed in a way that attracts users and evokes attention.

Parking spaces are at the discretion of the Town of Stony Plain, but should be encouraged if adequate space is available – refer to Municipal Engineering Standards. Identify parking spaces with the international symbol for disabled persons and reserve them as close as possible to the main entrances of trail heads. The number of accessible parking spaces required in any associated parking lots is listed in Table 5.

Table 5: Scoping Requirements for Accessible Parking Spaces

Total Parking Spaces in Lot	Required minimum number of Handicap Accessible Parking Spaces
1 to 25	1
26 to 50	2
51 to 75	3

2.3.3 Rest Areas

Rest areas are defined as level portions of a trail wide enough to provide wheelchair users and others a place to rest and gain relief from prevailing grade demands. Rest areas are especially crucial when grade demands increase, particularly on steep slopes or very exposed trails when resting opportunities are not provided. Rest areas are most effective when placed at intermediate points, scenic lookouts, or near trail amenities to provide an opportunity for users to move off the trail to pause from their exertions and enjoy the environment away from continuing traffic.

Periodic rest areas are beneficial for all multi-use trail users, particularly for people with mobility impairments that expend more effort to walk than other pedestrians. Rest area interval is defined as the distance between rest areas. The frequency of rest areas should vary depending on the terrain and difficulty of intended use.

- For example, heavily used trails should have more frequent opportunities for rest.

Recommendations:

- Construct rest areas at minimum intervals of 500m apart.
- If rest areas are only provided only on one side of the trail, it should be on the uphill side. Layout of site furniture must place these objects away from the trail.
- Having separate rest areas on both sides of the trail is preferred when there is a higher volume of high traffic speed. This reduces trail users from having to cross in front of other trail users moving in the opposite direction.

- The most inviting, and well-designed rest areas have the following design characteristics:
 - Grades that do not exceed 3%;
 - Cross slopes on paved surfaces that do not exceed 2% and cross slopes on non-paved surfaces that do not exceed 5%;
 - A firm and stable surface;
 - A minimum width equal to, or greater than, the width of the trail segment leading to the rest area;
 - A minimal change of grade and cross slope on the segment connecting the rest area with the main trail;
 - Provide areas large enough to accommodate a bench and a minimum space of 1.2 m for a wheelchair or baby stroller; and,
 - Accessible designs for site furniture should provide the same benefits for users without disabilities. Appropriate furniture would include a bench, a place to rest bicycles, and a waste receptacle. Benches can be particularly important for people with disabilities, who may have difficulty getting up from a seated position. Benches should also have backrests to provide support when resting, and at least one arm rest.

2.3.4 Roadway Crossings

At roadway crossings where a variety of trail users exists, or are anticipated, safety precautions should be taken. The amount of safety precautions should be governed by the type of roadway classification – see Town Municipal Engineering Standards.

Recommendations:

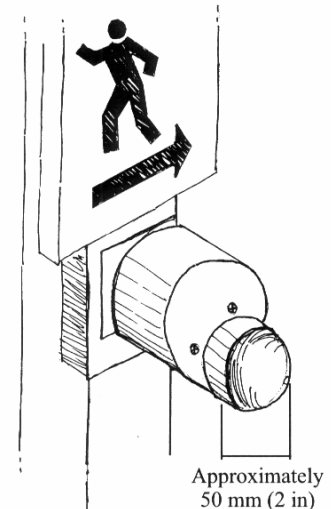
- Bikeway Traffic Control Guidelines for Canada as prepared by the Transportation Association of Canada (TAC) should be consulted for warning signs and pavement markings guidance.
- Minimum safety precautions for major collector and collector roads are:
 - pedestrian activated signals;
 - marked crosswalks;
 - curb crossings; and,
 - warning signs for vehicles.
- Minimum safety precautions for local roads are:
 - marked crosswalks; and,
 - warning signs for vehicles.

2.3.5 Highway Crossings

Trail users should be considered in the timing of the traffic signal cycle for traffic control devices, as well as the traffic detection devices. All of the highway intersections are signalized and pedestrian and bicyclists alike should be required to walk across the highway under the same signal phasing arrangement as motor vehicles; however, on multi-lane roads special consideration should be given to ensure that short clearance intervals are not used.

Detectors for traffic-actuated signals should be sensitive to pedestrians and bicycles and should be located in the expected path of travel, including left turn lanes. In some situations, the use of pedestrian actuated buttons may be a preferred alternative to the use of detectors provided they do not require bicyclists to dismount or make unsafe leaning movements.

Pedestrian crosswalk markings must be installed where they are needed to channelize users into a preferred path at intersections when the intended course is not readily apparent, or when their presence would minimize pedestrian-auto conflicts. Crosswalk markings are placed at intersections, representing extensions of the sidewalk lines, or on any portion of roadway distinctly indicated for pedestrian crossing.

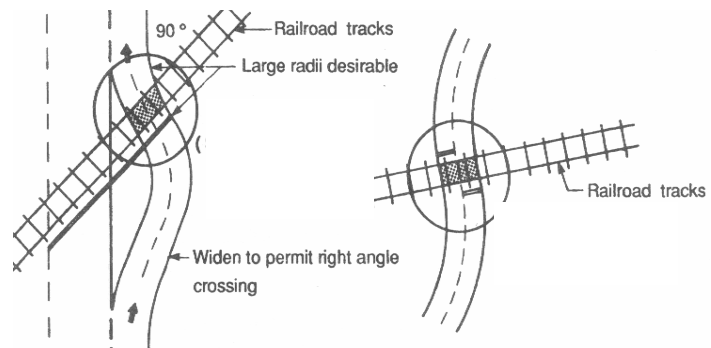


Recommendations:

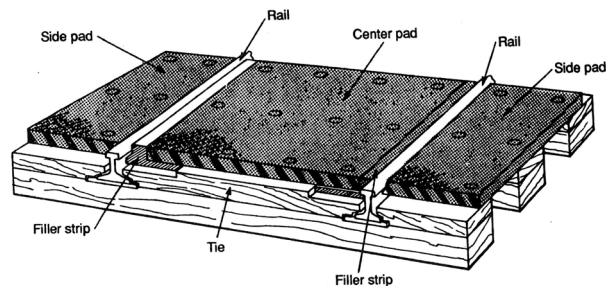
- Bikeway Traffic Control Guidelines for Canada as prepared by the Transportation Association of Canada (TAC) should be consulted for warning signs and pavement markings guidance.
- Where necessary, an all-red clearance interval should be used if an increase of mobility impaired users is expected.
- Where programmed visibility heads are used for traffic detection devices, they should be checked to ensure that they are visible to bicyclists who are properly positioned on the road.
- Where bicyclists are expected to use different routings (*bike lanes*) than pedestrians and motorists, directional signing should be used to confirm to bicyclists that the special routing leads to their destination.

2.3.6 Railway Grade Crossings

Railway grade crossings should be ideally at a right angle to the rails. The greater the crossing deviates from this ideal crossing angle, the greater is the potential for awkward gaps to trap inline skate wheels, bicycle tires, wheelchair casters, walkers, crutches, cane tips, or a heel in the flange way causing loss of steering control. It is also important that all trails, bike lanes or roadway approaches be at the same elevation as the rails.



Consideration should be given to the materials of the crossing surface and to the flange way depth and width. If the crossing angle is less than approximately 45 degrees, consideration should be given to widening the outside lane, shoulder,



or bicycle lane to allow bicyclists adequate room to cross the tracks at a right angle. Where this is not possible, commercially available compressible flange way fillers can enhance bicyclist safety. In some cases, abandoned tracks can be removed.

Recommendations:

- Warning signs and pavements markings should be installed in accordance with TAC standards.
- Railway crossings should ideally be at a 45 degree angle.
- All trails, bike lanes or roadway approaches are at the same elevation as the railway.

3.0 PLANNING AND DESIGN PROCESS

In recent years, the demand for recreational trails in Stony Plain has grown rapidly, and the adverse effects of increased pressures on the existing trail network have become evident. Currently, suitable recreational trail resources and amenities are limited and the cost of their development and maintenance is high. To cope with this growing demand for additional recreational trails and to maintain high trail standards throughout the Town of Stony Plain, a Steering Committee was formed to help guide our project team in the preparation of the 2005 Trails Master Plan.

This study commenced in October of 2004 with an onsite review of the existing trail network, potential trail corridor locations and future land uses – refer to *Map 2 Future Land Use Concept* from the *Municipal Development Plan 2005 - 2020*. The majority of the corridor locations reviewed was within municipal land reserves, utility rights-of-way, including underground pipeline or overhead power lines, and within railways right-of-ways.

Concurrent with the on-site inventory, the project team and the Steering Committee worked on development of a series of guiding principles for the Trails Master Plan. Once the principles were established, a conceptual master plan was prepared and presented at an Open house held in December of 2004. The plan was revised and refined over several months and is presented within this report in its most current form.

3.1 Stages of the Planning and Design Process

This section describes the planning and design process, in proper sequence, by which the 2005 Trails Master Plan was prepared.

3.1.1 Project Definition:

The project definition for the Trails Master Plan was to create a comprehensive, interconnected, recreational trail system to serve existing and newly developing areas within the Town of Stony Plain. Identification of individual trail segments was illustrated within the master plan and the design objectives achieved through its progression were to be clearly stated.

It is necessary, to point out the importance of master planning as it relates to trail development. Trail planning must be done within the context of a broad-scale plan, and not in isolation. Each trail segment should fit with, and contribute to, other existing or potential resource uses within municipal boundaries.

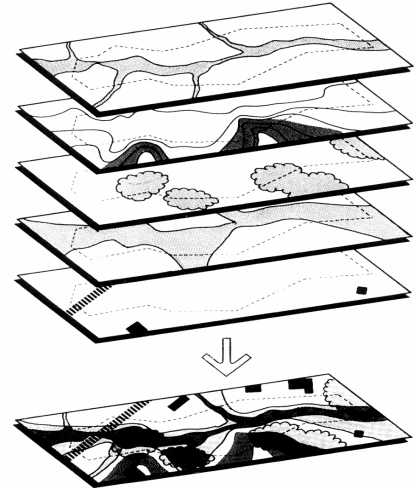
3.1.2 Resource Inventory:

An inventory of the man-made and natural resources within the Town of Stony Plain was compiled as planning tools for maintaining environmental integrity to parallel with community and economic activity within the municipality. Collecting and properly

interpreting this information is critical to determining whether the environment can support public access and trail use. Accurate recording of all of the information collected can be daunting. Three basic methods were employed:

- Overlay mapping - the environment is separated into component parts and evaluated independently;
- Field notes; and,
- Photographs of the landscape - provide essential information in visual form.

The location and extent of natural areas, parks, trails and schools is conceptually shown on *Map 3 – Parks, Recreation, Trails and Schools* from the *Municipal Development Plan 2005 - 2020*. The Town of Stony Plain should maintain an inventory of remaining natural areas as well as known historic and archaeological sites.



Below is a brief explanation of how a variety of characteristic environmental resources were documented as overlay mapping during this resource inventory phase. Those environmental resources were as follows:

Topography and Geology:

Topography is the determination of the slope or fall of the land. Slope, contour intervals, topographic features and geological base data can be found on a myriad of current municipal maps. *National Topographic Series Maps* at 1: 50,000 scale are available for most of Canada below the 60 degree latitude. Where contour information is not available or insufficient in detail, data can be gathered from field observations and aerial photographs.

For trail planning purposes, contour information was categorized as:

- Flat to gently sloping – 0 to 25% grades;
- Gently sloping to moderately steep – 5 to 25% grades; and,
- Steep to very steep – 25+% grades.

Soils:

The issue of soils includes the identification of the soil layer by taxonomic soil type, texture, development potential and engineering properties for the region is available from any current edition of the *Soils Atlas of Alberta*. Further field investigations will be required for collection of more site-specific conditions.

Hydrology:

Maps of the *National Topographic Series* are ideally suited for the identification of drainage patterns and capacity, watersheds, wetlands, water quality, stream bank erosion, local lakes, ponds, streams, flood plains, marshes and seasonal snow melt areas. Aerial photographs of the Town were used to ground-truth observances.

Vegetation:

Stony Plain lies within the Aspen Parkland vegetation zone. It is bordered to the north by the boreal forest and to the south by the prairie; thus, Aspen Parkland is the transitional area between the two. Aspen Parkland vegetation is predominantly aspen poplar, which is characterized by light coloured bark and circular, pointed leaves. Mixed forest stands of balsam – aspen poplar with white spruce on north or north-west facing slopes are still found within the municipal boundaries. However, further field investigations will be required during various times of the year for collection of more site-specific conditions.

Microclimate:

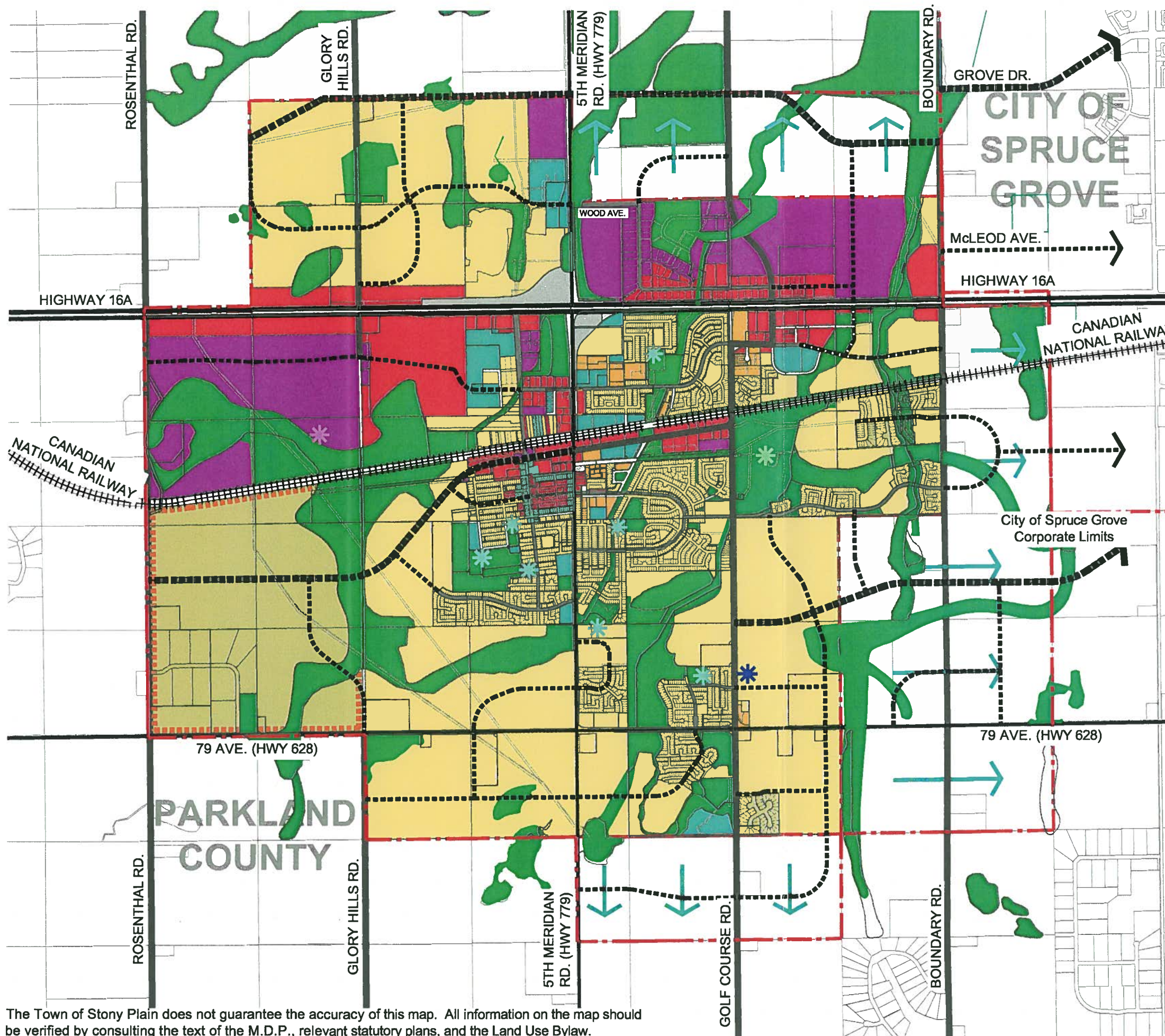
Meteorological data has been recorded for over a century in Alberta. Mean yearly precipitation is 450mm, of which 40% is accumulated during the winter months. Other pertinent data for the Town of Stony Plain such as: prevailing wind directions (*summer, winter*), annual amounts of precipitation (*snow and rainfall*), storm frequency can be accessed through provincial government sources.

Wildlife:

Wildlife numbers within municipal boundaries can not be accurately assessed for any one time. However, various inventory methods can be utilized to determine approximate habitat suitability and wildlife use, such as: track counts, browse and pellet group surveys for ungulates, seasonal waterfowl and raptor counts and observations, line transect surveys for song birds, live trapping sessions for small mammals, etc. Further field investigations will be required during various times of the year for collection of more site-specific conditions.

Man-made Conditions:

Stony Plain is bisected in a generally east to west manner by both the Canadian National Railway and Highway 16A. A series of secondary Highways also help to fragment the municipal corporate limits – refer to *Map 4 Transportation Network* from the *Municipal Development Plan 2005 - 2020*. Utility rights-of-way tend to run in a northwest to southeast fashion and resultant land uses have created a north to south urban fabric. Future collector and arterial roads are being planned for much of western half and south eastern corner of the Town. A new landfill site was also recently introduced west of Glory Hills Road.



Map 2 Future Land Use Concept

Legend

- Rural Residential
- Rural Residential Special Study Area
- Urban Residential
- Historic Downtown Core
- Commercial
- Industrial
- Parks / Open Spaces
- Institutional
- Public Utility
- Direction of Future Urban Expansion
- Existing School
- Future School
- Provincial Highway
- Arterial (Existing / Future)
- Collector (Existing / Future)
- Canadian National Railway
- Golf Course
- Waste Transfer Station (former Landfill)



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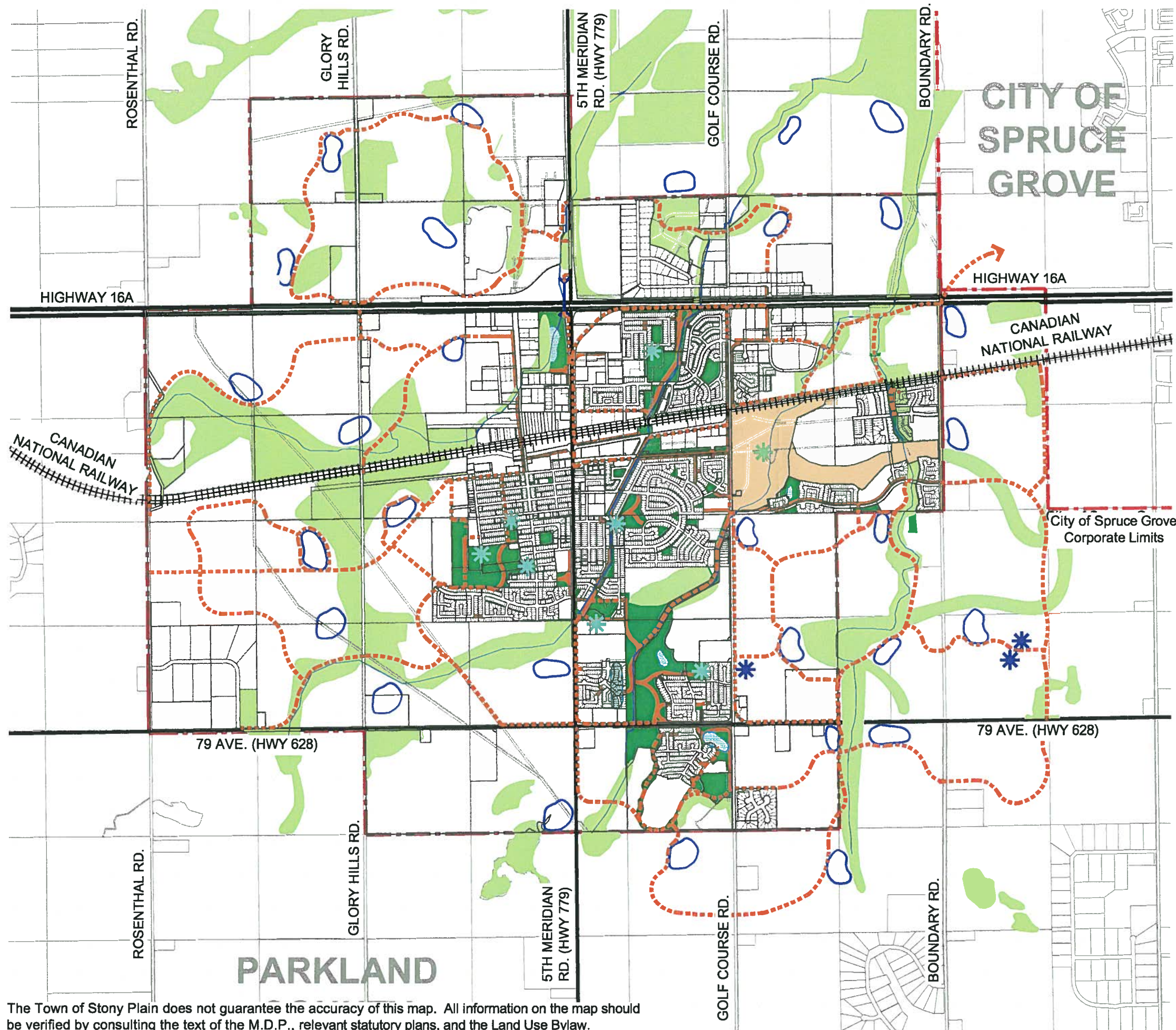


0 0.25 0.50 1.00 km



key map
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The Town of Stony Plain does not guarantee the accuracy of this map. All information on the map should be verified by consulting the text of the M.D.P., relevant statutory plans, and the Land Use Bylaw.



Map 3 Parks, Recreation, Trails, and Schools

Legend

- Natural Areas
- Parks / Open Spaces
- * Existing School
- * Future School
- Existing Trail
- Future Trail
- Railway
- * Golf Course
- Existing Storm Pond
- Proposed Storm Pond
- Stream Course and Atim Creek
- ⋈ Pedestrian Underpass
- ⋈ Pedway



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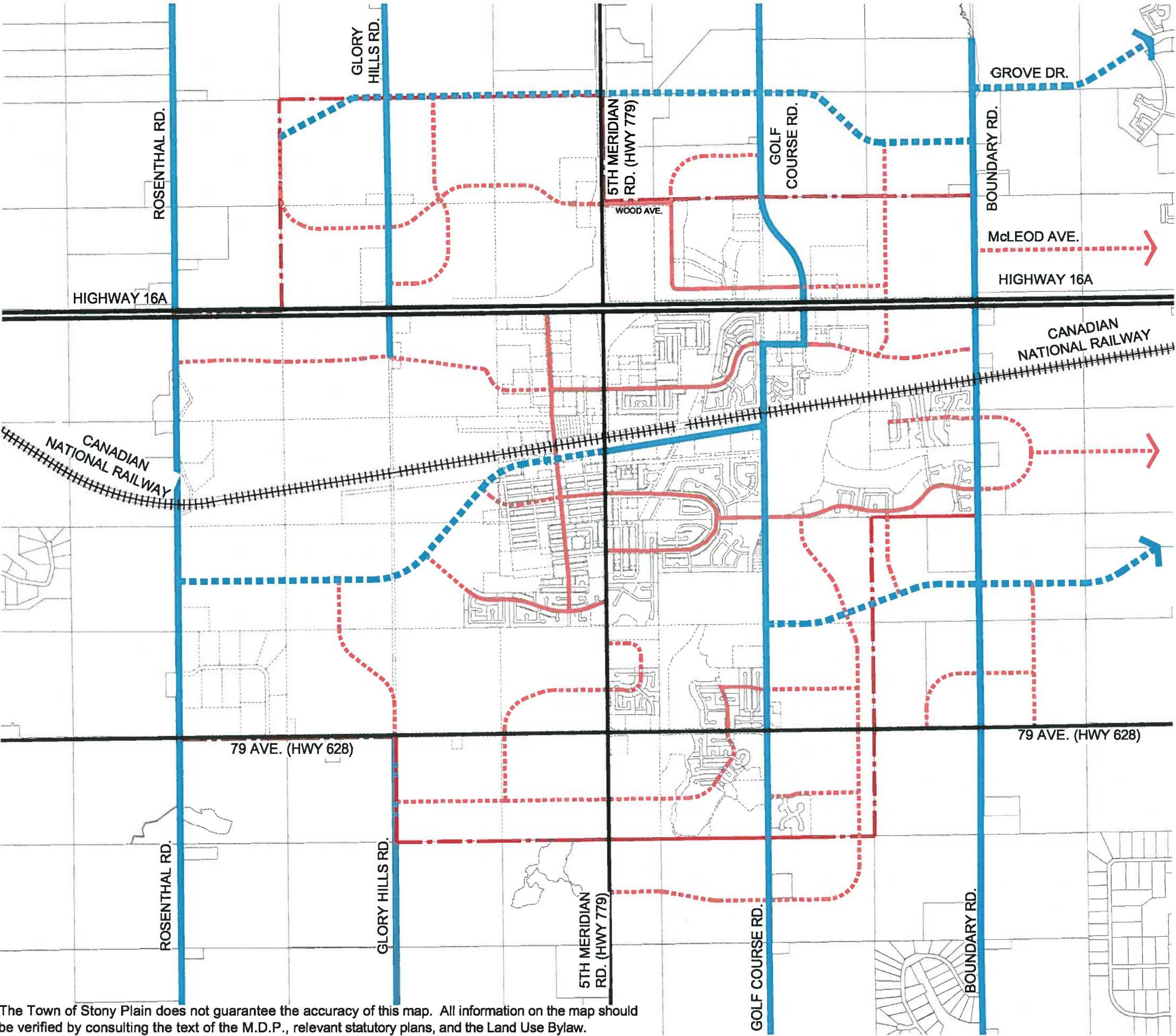


key map
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The Town of Stony Plain does not guarantee the accuracy of this map. All information on the map should be verified by consulting the text of the M.D.P., relevant statutory plans, and the Land Use Bylaw.

Map 4
Transportation Network

- Legend
- Provincial Highway
 - Existing Arterial
 - Future Arterial
 - Existing Collector
 - Future Collector
 - Railway



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0 0.25 0.50 1.00 km

**Municipal
Development
Plan 2005-2020**



key map
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To confirm the location and geographic extent of any historic or archaeological sites a detailed analysis shall be undertaken by a qualified consultant, acceptable both to the Town of Stony Plain and prospective developers.

3.1.3 Analysis:

The next planning and design stage was the analysis of all resource inventory data in accordance to our project definition. The results of our assessment were evaluated in relationship to opportunities and constraints with an emphasis on the impact of the proposed trail network on local environments, as well as existing and future open spaces, trail infrastructure and community developments.

3.1.4 Conceptual Planning:

A series of conceptual trail master plans were prepared from conclusions identified in the analysis stage of the planning and design process. The primary design focus of this stage is on the broad concern of locating the trail network, developing trail features, utilizing existing trail infrastructures and minimizing environmental disturbances. Concept plans indicated approximate trail alignments and employed a variety of forms of trail layouts.

3.1.5 Evaluation of Concepts:

Each concept plan was evaluated against the project definition, analysis framework and rechecking the alternatives against future MDP land uses and transportation frameworks. Next, a 'preferred' conceptual Trails Master Plan was selected to accommodate the best combination of positive planning and design factors from Section 2.

3.1.6 Community Consultation:

Community consultations were an important part of the planning and design process to both share information and allow opportunities for input in the preparation of the master plan. A Steering Committee with members from Town Council and Administration oversaw the project from November 2004 to April 2005. The following consultation activities were undertaken during this time period:

Stakeholder Consultation

- Representation was sought from a cross-section of stakeholders with diverse interests regarding trail development and use.
- Letters and the Project Backgrounder were mailed to the Stony Plain Chamber of Commerce, the Stony Plain and Spruce Grove Rotary Clubs, and land developers active in the Town.

Community Information Program

- A media release was issued in November 2004 at the project start up.
- An information pamphlet, Open House notices and media releases were posted on the Town's web site.

Open House on Draft Trails Master Plan

- At a key stage during the planning and design process, a broader cross-section of stakeholders was invited to participate through a public information display at Town Hall during December 16, 2004.
- The Open House invited public participation and comment on the Trails Master Plan was advertised in the local papers and on the Town's web site.



Consultation with Neighbouring Municipalities

- Notification letters were mailed in November 2004 to Parkland County and the City of Spruce Grove

3.2 Trails Master Plan

The overriding form of trail layout for the 2005 Trails Master Plan is the spoked wheel form offering a wide range of travel distances and destinations – refer to *Map 5 Future Multi-use Trail Network*. The layout of trails is dynamic and not symmetrical. Internal trail loops are generally based on small satellite and stacked loop trail forms where users can return to any number of trailheads.

Trailheads have been strategically positioned to provide easily identified and convenient access points for maintenance or emergency vehicles near existing and future collector roads and their intersections. A greater majority of the trailheads also offer opportunities to construct washroom facilities and small parking lots.

Rest areas have been sparsely dispersed along both sides of existing and proposed trails throughout the network system. Rest area intervals are generally spaced between 500m to 800m apart, although additional rest areas can be introduced at the municipality's discretion.

3.2.1 Northern Trail Section – North Business Park & Median Meadows

Boundaries:

The Northern Trail Section is bounded by Glory Hills Road and Boundary Road to the west and east respectively. Highway 16A serves as its southern limit and a future collector road demarks its northern limit. 5th Meridian Road bisects the section in a north-south manner, as well as Golf Course Road and Atim Creek further to the east – refer to *Map 6A and 6B Northern Trail Section*.

Trail Types:

- Multi-use trails - 10,927 linear meters
- Bike lanes - 1463.3 linear meters
- Existing trails - 65.1 linear meters

Trailhead Locations:

- Northwest corner intersection of Highway 16A and Glory Hills Road.
- North side along Derek Drive into the Meridian Meadows neighbourhood.

Opportunities:

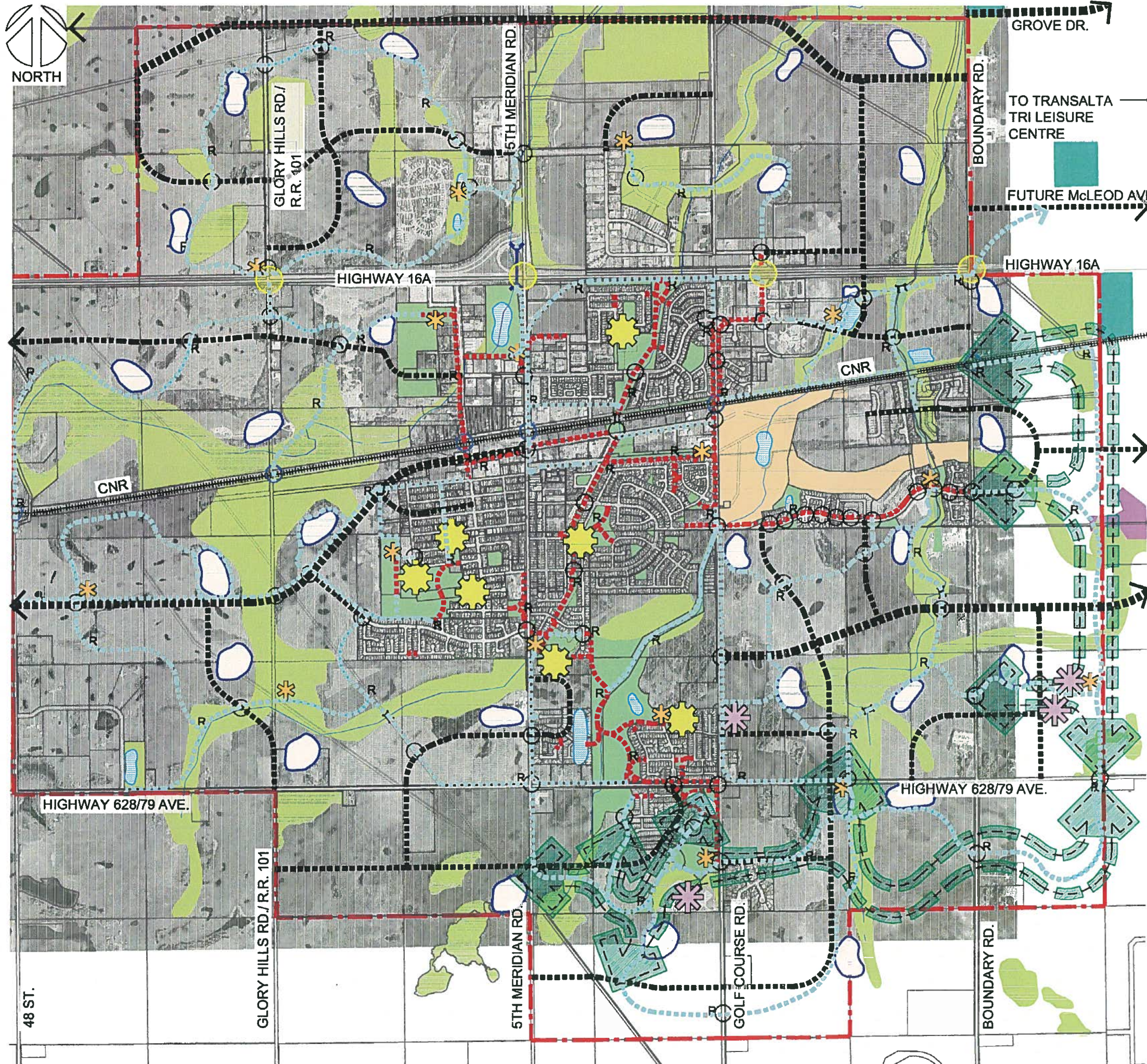
- Abundant opportunities for trail development along extensive agricultural lands, marshlands and remnant forest stands.
- Potential for Greenway Corridor development.
- Regional trail expansion opportunities with Parkland County and the City of Spruce Grove.

Constraints:

- Few residential districts exist north of Highway 16A. Meridian Meadows is isolated from existing trail infrastructure and currently has little open space, parks or civic destinations within this section.
- Highway 16A is a significant limitation to trail users and offers extreme hazards. Five crossings along Highway 16A have been proposed along key intersections to connect the Northern Trail Section with the Town of Stony Plain.
- The North Business Park is predominately industrial and has few existing parks or open spaces. Trail users will have to travel along bike lanes on certain trail segments.

Special Trail Features:

- Regional trail connections to the Transalta Tri Leisure Centre and into the City of Spruce Grove are afforded the Town of Stony Plain and its trail users. Although trail connections within Spruce Grove have been conceptually explored. To date no trail alignment has been accurately fixed; however, potential trail or bike route opportunities will exist along a proposed extension of McLeod Avenue to the facility.
- The vehicular overpass along 5th Meridian Road is actively used as a pedestrian crossing route across Highway 16A. Current site conditions do not allow for the creation of a designated bike lane or multi-use trail segment on the vehicular overpass. The feasibility of a separate pedestrian overpass should be explored.
- The alignment of Atim Creek is comparatively undisturbed with continuous and linear remnant forest stands along both sides of the creek. Multi-use or interpretive trail development opportunities should be explored further.



Map 5 Future Multi-Use Trail Network

Legend

- Existing Parks
- Golf Course
- Environmental Reserve, and/or Undevelopable Land
- Environmental Management Areas
- Wetland Areas
- Existing Storm Pond
- Proposed Storm Pond
- Stream Course and Atim Creek
- Existing Trail System
- Proposed Multi-Use Trail
- Proposed Bike Lane w/ Trails
- Proposed Bike Route w/ Trails
- Proposed Trail Head
- Pedestrian Underpass
- Pedestrian Bridge
- Proposed Rest Area
- Proposed Corporate Limits
- Arterial Road
- Collector Road
- Canadian National Railway
- Future School Site
- Existing Schools
- Street Crossing
- Hwy. 16A Crossing
- CN Railroad Crossing
- Pedestrian Pedway
- Proposed Greenway



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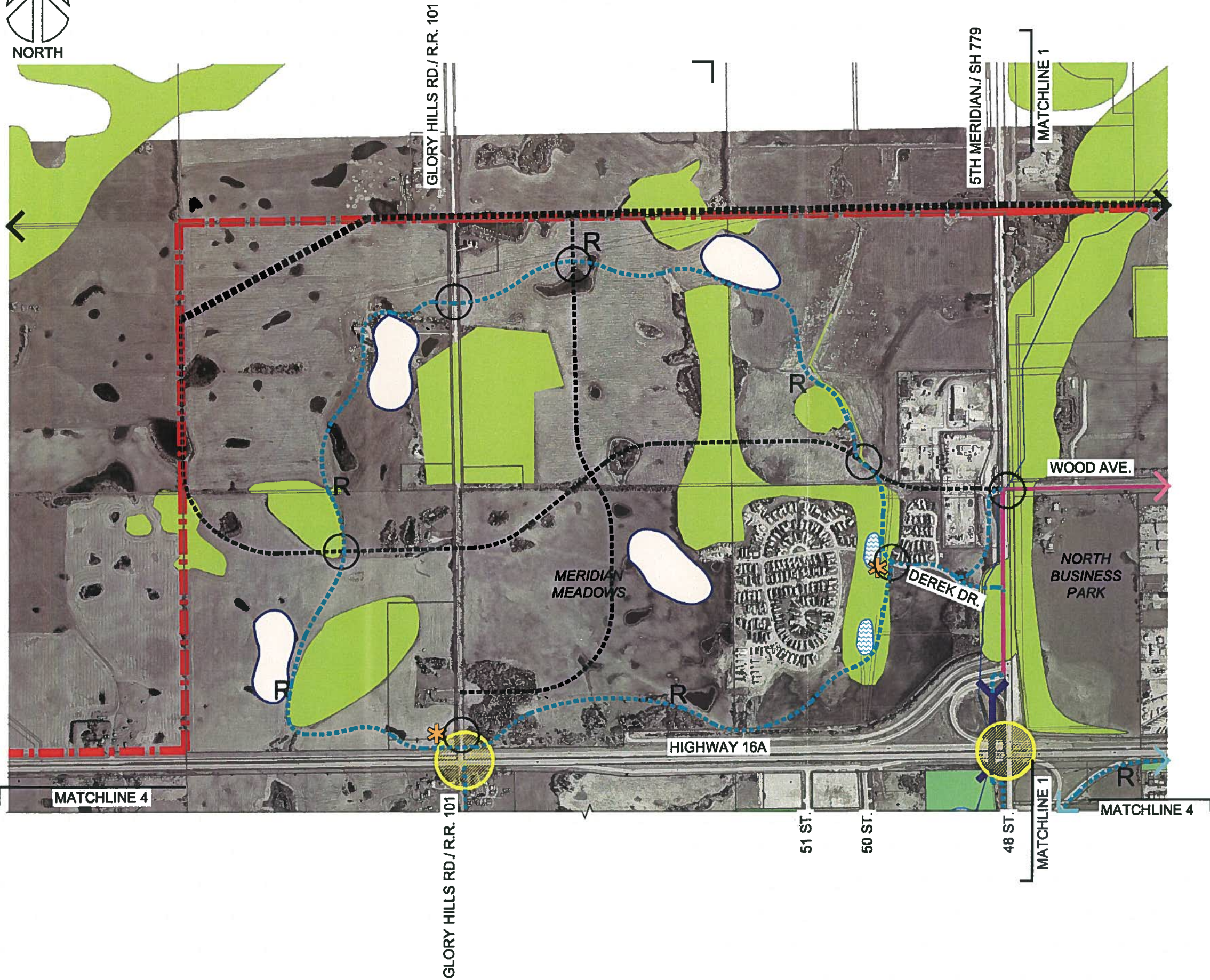
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0 250 500m
key map
1 : 40 000 000





Map 6a Northern Trail Network

Legend

- Existing Parks
- Environmental Reserve, and/or Undevelopable Land
- Existing Storm Pond
- Proposed Storm Pond
- Stream Course and Atim Creek
- Existing Trail System
- Proposed Multi-Use Trail
- Proposed Bike Lane w/ Trails
- Proposed Trail Head
- R Proposed Rest Area
- Proposed Corporate Limits
- Arterial Road
- Collector Road
- Future School Site
- Existing Schools
- Street Crossing
- Hwy. 16A Crossing
- CN Railroad Crossing
- Pedestrian Pedway



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key map
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5TH MERIDIAN RD.

NORTH

MATCHLINE 1

R.R. 280

WOOD BOULEVARD

CRYSTAL DR.

BOULDER RD.

HIGHWAY 16A

MATCHLINE 2

48 ST.

MATCHLINE 1

GOLF COURSE RD.

40 AVE.

BOUNDARY RD.

GROVE DR.

TO TRANSALTA
TRI LEISURE CENTRE

FUTURE McLEOD AVE.

HIGHWAY 16A

MATCHLINE 2

Map 6b Northern Trail Network

Legend

- Existing Parks
- Golf Course
- Environmental Reserve, and/or Undevelopable Land
- Environmental Management Areas
- Wetland Areas
- Existing Storm Pond
- Proposed Storm Pond
- Stream Course and Atim Creek
- Existing Trail System
- Proposed Multi-Use Trail
- Proposed Bike Lane w/ Trails
- Proposed Trail Head
- Pedestrian Bridge
- R Proposed Rest Area
- Proposed Corporate Limits
- Arterial Road
- Collector Road
- Future School Site
- Existing Schools
- Street Crossing
- Hwy. 16A Crossing
- CN Railroad Crossing
- Pedestrian Pedway



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Stony Plain Trail Master Plan 2005

0 250 500m



key map
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3.2.2 Eastern Trail Section – South Business Park, Homesteads, Stony Plain Golf Course, Graybriar & Fairways

Boundaries:

The Eastern Trail Section is bound on three sides by major transportation roadways. To the north is Highway 16A, to the south is 79 Avenue/ Highway 628 and to the west is Golf Course Road. Atim Creek runs through the middle of the section in a north to south manner with the Canadian National Railway bisecting it in an east to west orientation – refer to *Map 7 Eastern Trail Section*.

Trail Types:

- Multi-use trails - 14,147.2 linear meters
- Bike lanes - 1359.4 linear meters
- Bike routes - 594.6 linear meters
- Existing trails - 2709.5 linear meters

Trailhead Locations:

- North side along 39 Avenue in the South Business Park.
- North side along Fairway Drive and east of Atim Creek.
- ¼ Section north of 79 Avenue/ Highway 628 and east of two future school sites.

Opportunities:

- Abundant opportunities for trail development along extensive agricultural lands, marshlands and remnant forest stands.
- Excellent greenway development opportunities exist within lowlands and marshlands forming the Town's new eastern corporate limits. A greenway corridor along this particular section can help preserve the rural character of the Town and offers visual relief; its wooded breaks can frame and distinguish Town limits against an undifferentiated urban sprawl taking place in Spruce Grove.
- The Stony Plain Golf Course occupies a large portion of this section. Visual line-of-sight extensions of its manicured lawns and mature plantings are offered from adjacent trail segments along its perimeter.
- Anticipated residential growth will be greatest in this section and additional trail development opportunities should be explored with prospective developers – see Section 6.

Constraints:

- At present, residential districts in this section are sporadic and dispersed over a large area. Existing trail systems have been concentrated on the north side of Fairway Avenue in a linear trail form. Unfortunately, this current alignment creates a great number of street crossings. It is expected that future trail segments will lessen users along this particularly well-used trail section.
- Two CN Railway crossings will be necessary to provide convenient connections with other trail sections. Pedestrian underpasses would be a costly undertaking at this

preliminary juncture, as any capital costs would be better spent establishing the trail network.

- Boundary Road will have a lengthy trail segment running along its eastern edge. At the Town's discretion, there is an option of providing a multi-use trail as a replacement to any future sidewalk improvements along Boundary Road, or simply designate bicycle lanes in the interim.
- Additional intersection improvements and signalized crossings will be required along Golf Course Road and 79 Avenue/ Highway 628.
- The Stony Plain Golf Course can be crossed by a bicycle route via Briarwood Way to afford Graybriar residents additional trail access points other than along Boundary Road. Currently there are very little pedestrian opportunities within the neighbourhood.

Special Trail Features:

- The serpentine trail alignments indicated on the Trails Master Plan will require two pedestrian bridges to span Atim Creek. Trail widths should be sufficiently wide enough to accommodate maintenance/ snow removal vehicles – see Section 2, Trail Widths.
- Boardwalks may have to be constructed to replace proposed multi-use trail segments situated in marshlands.

3.2.3 Southern Section – Lake Westerra Estates, Westerra Campus & Country Plains Estates

Boundaries:

The Southern Trail Section is bound by 79 Avenue/ Highway 628 to its north and the 5th Meridian Road/ Sec. Highway 779 to the west. Country Plains Estates and Westerra Campus lands form this section's southern boundary. Both Golf Course Road and Boundary Road run in a north to south manner through the section – refer to *Map 8 Southern Trail Section*.

Trail Types:

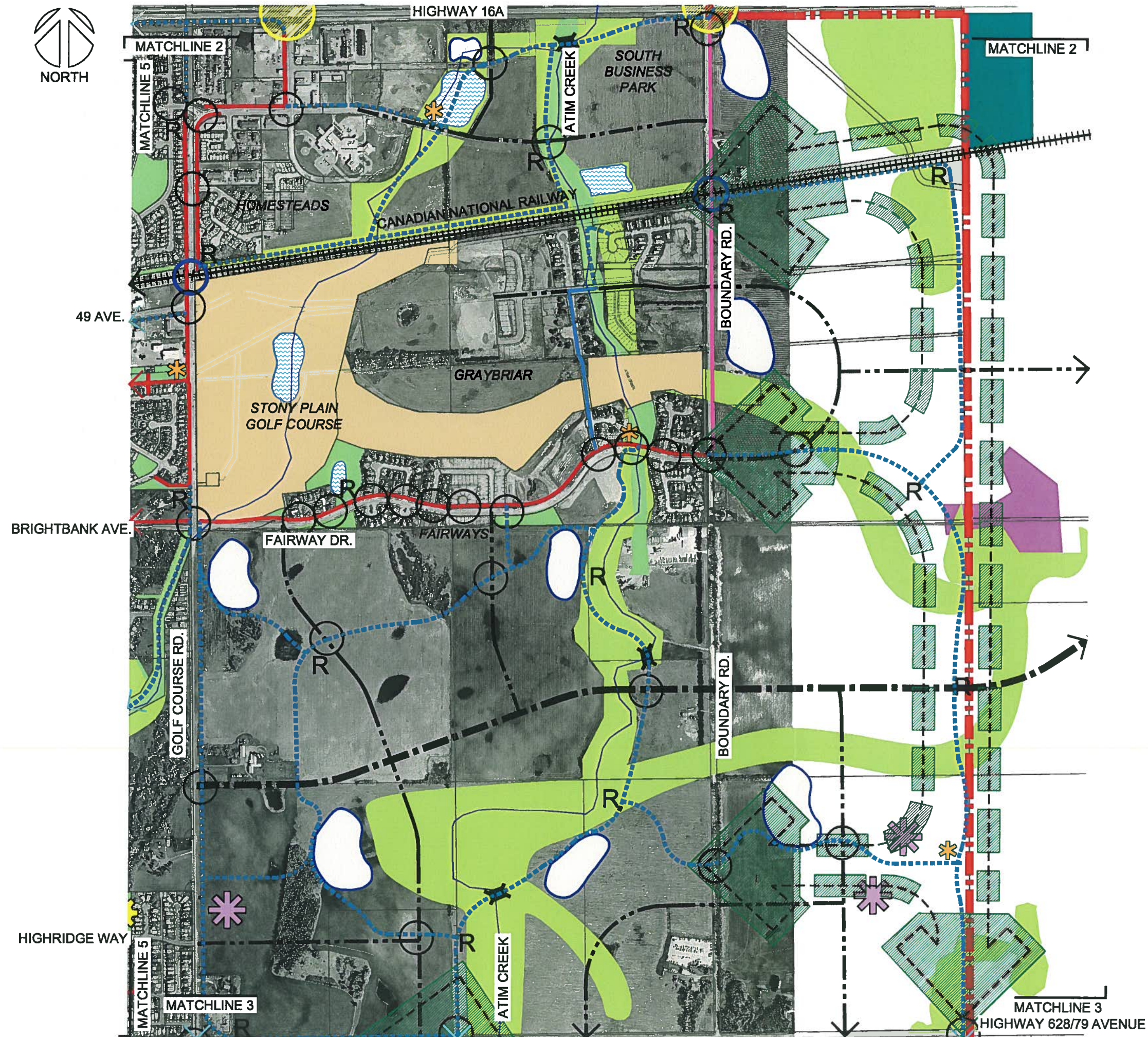
- Multi-use trails - 10,480.2 linear meters
- Existing trails - 1152.5 linear meters

Trailhead Locations:

- West side along Golf Course Road, west of Country Plains Estates and north of Westerra Campus.
- South side along 79 Avenue/ Highway 628 and ½ Section west of Golf Course Road.

Opportunities:

- Abundant opportunities for trail development along extensive agricultural lands, marshlands and remnant forest stands.
- Excellent greenway development opportunities exist within lowlands and marshlands forming the Town's new southern corporate limits.



Map 7 Eastern Trail Network

Legend

- Existing Parks
- Golf Course
- Environmental Reserve, and/or Undevelopable Land
- Environmental Management Areas
- Wetland Areas
- Existing Storm Pond
- Proposed Storm Pond
- Stream Course and Atim Creek
- Existing Trail System
- Proposed Multi-Use Trail
- Proposed Bike Route w/ Trail
- Proposed Trail Head
- Pedestrian Underpass
- Pedestrian Bridge
- Proposed Rest Area
- Proposed Corporate Limits
- Arterial Road
- Collector Road
- Canadian National Railway
- Future School Site
- Existing Schools
- Street Crossing
- Hwy. 16A Crossing
- CN Railroad Crossing
- Proposed Greenway Corridor



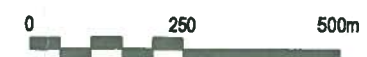
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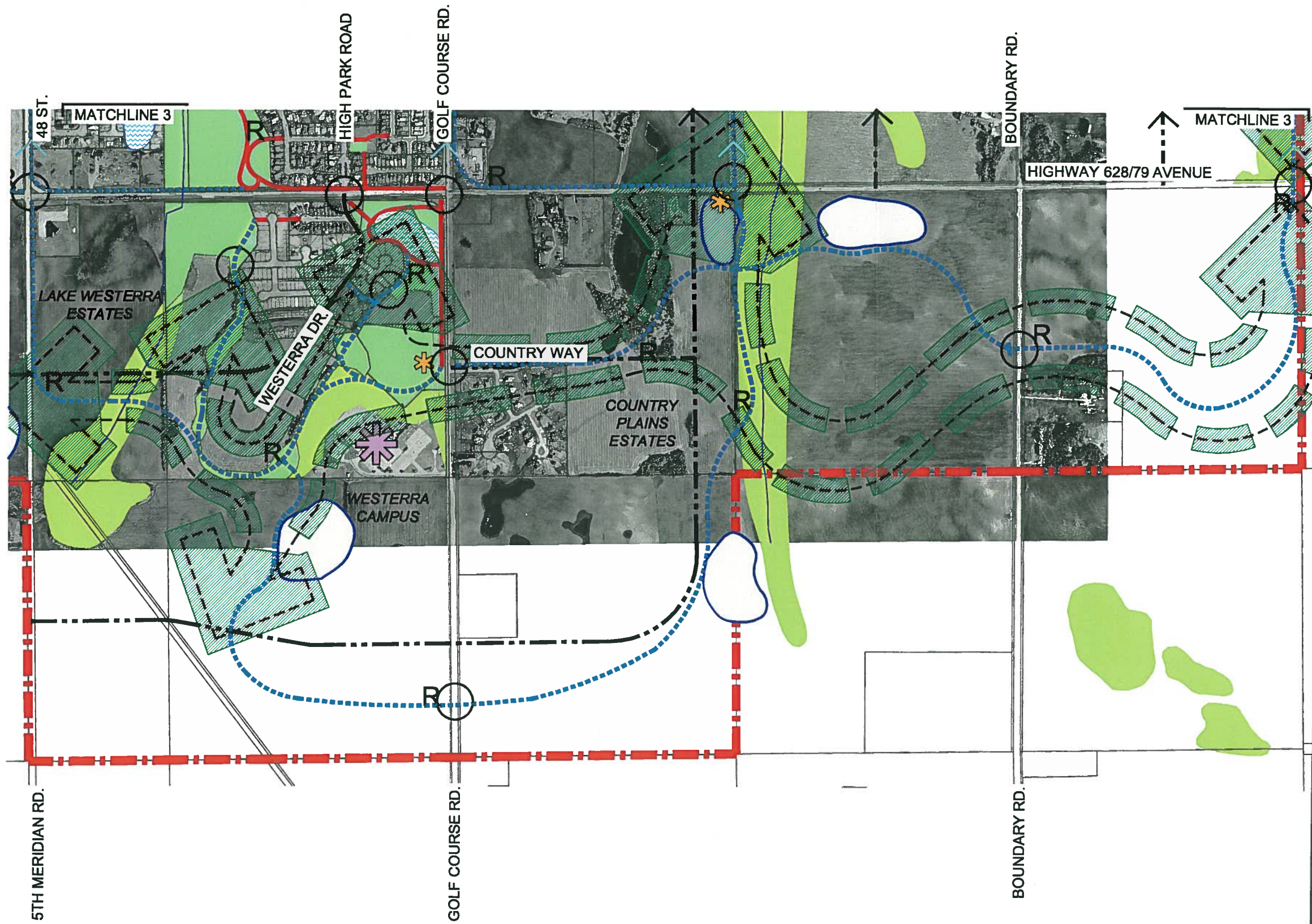
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Map 8 Southern Trail Network

Legend

- Existing Parks
- Environmental Reserve, and/or Undevelopable Land
- Existing Storm Pond
- Proposed Storm Pond
- Stream Course and Atim Creek
- Existing Trail System
- Proposed Multi-Use Trail
- Proposed Trail Head
- Proposed Rest Area
- Proposed Corporate Limits
- Future School Site
- Street Crossing
- Proposed Greenway Corridor



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- Anticipated residential growth is significant in this section and additional trail development opportunities should be explored with prospective developers – see Section 6.
- Existing trails are concentrated along the west side of Golf Course Road and terminate at Westerra Campus. Currently, a pedestrian crosswalk allows trail users from Country Plains Estates to access other trail segments.

Constraints:

- At present, residential districts in this section are centrally concentrated along Golf Course Road. Subsequent trail direction and development will be governed in large part by forthcoming subdivision plans.
- 5th Meridian Road/ Sec. Highway 779 will have a trail segment running along its eastern edge. At the Town's discretion, there is an option of providing a multi-use trail as a replacement to any sidewalk improvements, or simply designating bicycle lanes in the interim.
- Additional intersection improvements and signalized crossings will be required along Golf Course Road, 48 Street/ 5th Meridian Road and 79 Avenue/ Highway 628.

Special Trail Features:

- Boardwalks may have to be constructed to replace proposed multi-use trail segments situated in marshlands.
- Westerra Campus provides an excellent location for a regional trail head that will allow large user groups to park, gather and venturing out onto the trail network.

3.2.4 Western Trail Section – The Glens, Heritage Estates, Main Street & Exhibition Park

Boundaries:

The Western Trail Section is enveloped on all sides by major transportation roadways. Highway 16A to the north, 79 Avenue/ Highway 628 to the south, 5th Meridian Road to the east and Rosenthal Road to the west. Glory Hills Road runs through the middle of the section in a north to south fashion and the Canadian National Railway bisects it in an east to west manner. There are divergent land uses within the section that range from the new land fill site to Stony Plain's Main Street – refer to *Map 9 Western Trail Section*.

Trail Types:

- Multi-use trails - 15,879.3 linear meters
- Bike routes - 1158.9 linear meters
- Bike lanes - 1394.6 linear metres
- Existing trails - 3472.5 linear meters

Trailhead Locations:

- In Exhibition Park west of the existing trail terminus.
- In Rotary Park north of the existing trail terminus.
- East of the Swimming Pool and along existing trail alignment.
- East side along Glory Hills Road, west of t-intersection of future collector road and ¼ Section north of 79 Avenue/ Highway 628.
- Southside along future collector road, south of the CN Railway and ¼ Section east of Rosenthal Road.

Opportunities:

- Abundant opportunities for trail development along extensive agricultural lands, marshlands and remnant forest stands.
- Potential for Greenway Corridor development.
- Existing trails are few in this district.
- Outstanding civic and recreational destinations are centrally located within this section and are all within easy walking distance from existing neighbourhoods.
- Several wide utility rights-of-way transect the section and will provide convenient pedestrian and bicycle access for future land uses.

Constraints:

- Other than established neighbourhoods, residential growth is not significant in this section and not expected for the short term. Additional trail development opportunities from prospective developers will not be readily available until long-term utility infrastructure assessments are made for this section. Alternate trail funding techniques should be explored – see Section 6.
- Three CN Railway crossings will be necessary to provide convenient connections with other trail sections. Pedestrian underpasses would be a costly undertaking at this preliminary juncture, as any capital costs would be better spent establishing the trail network.
- Highway 16A is a significant limitation to trail users and offers extreme hazards. Two crossings along Highway 16A have been proposed at key intersections so as to connect with the Northern Trail Section.
- The land fill is centrally located within this section and all mitigation efforts, both visual and reclamation, should be followed to their fullest potential.
- 55 and 56 Avenues in within the Town will be designate bike routes, as there is not sufficient room within the current road rights-of-way to implement a 3.0m wide multi-use trail. Both sidewalk improvements and bicycle route posting along these roads should be pursued by the Town.
- Glory Hills Road will have a lengthy trail segment running along its eastern edge. At the Town's discretion, there is an option of providing a multi-use trail as a replacement to any sidewalk improvements, or simply designating bicycle lanes in the interim.
- Additional intersection improvements and signalized crossings will be required along Rosenthal Road, Glory Hills Road and 79 Avenue/ Highway 628.



MATCHLINE 4

ROSENTHAL RD.

ROSENTHAL RD.

HIGHWAY 628/79 AVENUE

ROSENTHAL WAY

GLORY HILLS RD.

GLORY HILLS RD.

TRAIL PROMENADE

TRAIL PROMENADE

CANADIAN NATIONAL RAILWAY

LANDFILL SITE

HERITAGE ESTATES

THE GLENS

WILLOW PARK

HIGHWAY 628/79 AVENUE

HIGHWAY 16A

50 ST.

50 ST.

52 ST.

51 ST.

50 ST.

52 AVE.

53 AVE.

52 AVE.

54 AVE.

55 AVE.

56 AVE.

57 AVE.

57 AVE.

48 ST.

48 ST.

50 ST.

MATCHLINE 5

MATCHLINE 4

Map 9 Western Trail Network

Legend

- Existing Parks
- Environmental Reserve, and/or Undevelopable Land
- Existing Storm Pond
- Proposed Storm Pond
- Stream Course and Atim Creek
- Existing Trail System
- Proposed Multi-Use Trail
- Proposed Bike Lane w/ Trails
- Proposed Bike Route w/ Trails
- Proposed Trail Head
- Pedestrian Underpass
- Pedestrian Bridge
- Proposed Rest Area
- Proposed Corporate Limits
- Arterial Road
- Collector Road
- Canadian National Railway
- Future School Site
- Existing Schools
- Street Crossing
- Hwy. 16A Crossing
- CN Railroad Crossing



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key map
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Special Trail Features:

- Large undisturbed tracts of forest stands remain within this section in continuous and linear alignments that are conducive for multi-use or interpretive trail opportunities.
- Both Exhibition Park and Rotary Park are ideally suited as regional trail heads that will allow large user groups to park their vehicles, assemble and access the trail network.
- A formal promenade is envisioned along the south side of a future collector road immediately south of the CN railway. The promenade would extend in entirety from Rosenthal Road to 52 Street. It would be a tremendous urban design compliment to Main Street and would function as its primary pedestrian “artery” leading trail users from the municipality’s western neighbourhoods into the “Heart of the Town”.
- Boardwalks may have to be constructed to replace proposed multi-use trail segments situated in marshlands.

3.2.5 Central Section – Meridian Heights, St. Andrews, Forest Green, Woodlands, Southridge, Willow Park & High Park**Boundaries:**

The Central Trail Section is geographically positioned as the center of the Town of Stony Plain. Its northern boundary is Highway 16A to the north, 79 Avenue/ Highway 628 is to the south, 5th Meridian Road constitutes its east boundary and Golf Course Road is to the west. The Canadian National Railway bisects this section in an east to west alignment. Befitting the large concentrations of people within these neighbourhoods, it is not surprising to observe that this section has the most extensive concentration of existing trail infrastructure, open spaces and parks refer to *Map 10 Southern Trail Section*.

Trail Types:

- Multi-use trails - 8504.8 linear meters
- Existing trails - 10,246.4 linear meters

Trailhead Locations:

- West side along Golf Course Road and north of McNabb Crescent on existing multi-use trail alignment.
- West side along Golf Course Road and south of Creekside Point residences.
- East side along 5th Meridian Road west of John Paul II School.
- West of High Park School along existing trail alignment.

Opportunities:

- A large remnant forest stand within High Park Willow Park and Southridge is an excellent natural amenity every effort should be made to preserve and augment existing trail features.
- There are many existing trail features already in place within this trail section and is intended within the Trails Master Plan to be the nucleus of the Town’s entire trail network and all trails will led into/ and out of this section.

- Many trail features and amenity spaces are currently in place within this trail section. Some modification and upgrading of these infrastructures and amenities will be required – see Section 7.
- Outstanding civic and recreational destinations are centrally located within this section and are all within easy walking distance from existing neighbourhoods.

Constraints:

- Residential growth will not be significant in this section. Alternate trail funding techniques should be explored – see Section 6.
- Two CN Railway crossings will be necessary to provide convenient connections with other trail sections. Pedestrian underpasses would be a costly undertaking at this preliminary juncture, as any capital costs would be better spent establishing the trail network.
- Highway 16A is a significant limitation to trail users and offers extreme hazards. An interim bicycle route designation along 48 Street/ 5th Meridian Road will be necessary until future intersection improvements can be completed. Bicycle route posting along this portion of Highway should be pursued by the Town.
- Some twinning of existing trail alignments occurs within this section. It is strongly recommended that portions of these trail segments be abandoned, or downgraded to gravel or shale trails. An on site-evaluation should be conducted of the existing pavement structure and tread condition.
- 48 Street/ 5th Meridian Road has a trail segment running along its east side extending from 50 Avenue up to the Provincial Courthouse Building. At the Town's discretion, there is an option of providing a multi-use trail as a replacement to any future sidewalk improvements, or simply designating bicycle lanes in the interim.
- Additional intersection improvements and signalized crossings will be required along Golf Course Road, 48 Street/ 5th Meridian Road and 79 Avenue/ Highway 628.

Special Trail Features:

- Both High Park School and John Paul II School are ideally suited as regional trail heads that will allow large user groups to park their vehicles, assemble and access the trail network.
- The current pedestrian underpass is a crucial link within this section and should be maintained to the highest municipal standards.

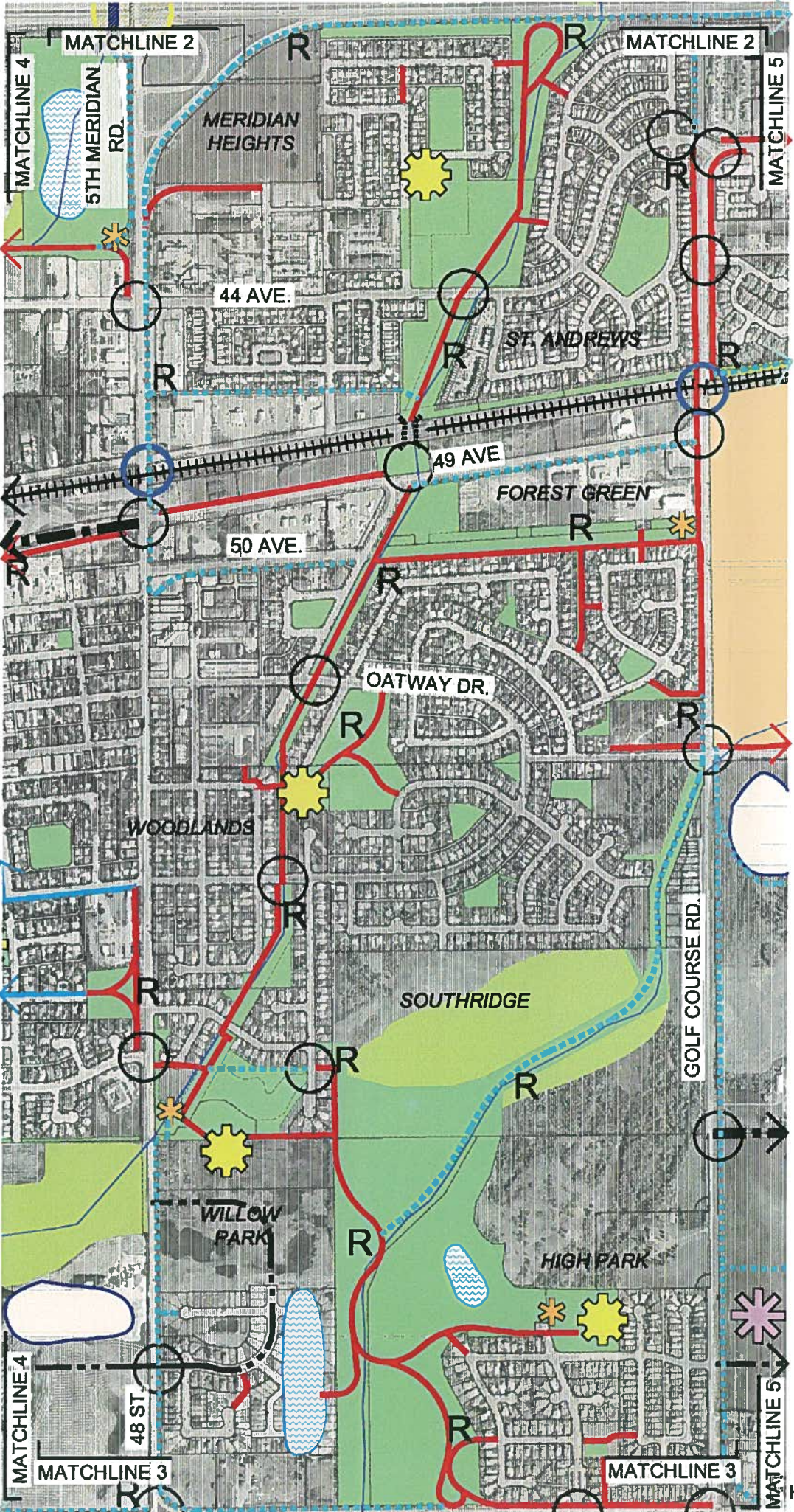


HIGHWAY 16A

HIGHWAY 16A

HIGHWAY 628/79 AVE.

HIGHWAY 628/79 AVE.



Map 10 Central Trail Network

- Legend**
- Existing Parks
 - Golf Course
 - Environmental Reserve, and/or Undevelopable Land
 - Existing Storm Pond
 - Proposed Storm Pond
 - Stream Course and Atim Creek
 - Existing Trail System
 - Proposed Multi-Use Trail
 - Proposed Bike Route w/ Trails
 - Proposed Trail Head
 - Pedestrian Underpass
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 - Proposed Rest Area
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 - Existing Schools
 - Street Crossing
 - Hwy. 16A Crossing
 - CN Railway Crossing



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4.0 MAINTENANCE OPERATION GUIDELINES

This section provides guidelines for proper maintenance operations to occur along recreational trails within the 2005 Trails Master Plan. A well coordinated trail system can be impaired by poor maintenance practices. Therefore, it is important that as much consideration be put into this phase as is put into the planning and design process.

All maintenance operations pertaining to the Trails Master Plan are intended to be completed in accordance with existing municipal, provincial and federal design practices, policies, standards and specifications. All construction techniques should be conducted in conformity with the expected use, using sound engineering judgement and construction safety measures.

4.1 Maintenance Operation Guidelines

Although not a glamorous part of any trail development project, maintenance operations plays an essential role in the planning and implementation of a trail network. The measure of success in trail operations and maintenance is illusive and subjective should be developed to suit the municipality's particular needs. Over use, improper design and reactive trail maintenance often make operational costs exorbitant and especially complex.



4.1.1 Standardized Maintenance Checklist

A standardized maintenance checklist, or commonly known as a trail log, should be developed to assess and catalogue problems within the proposed trail network so a comprehensive and understandable list of potential maintenance items can be kept of the conditions along all trail sections. The checklist provides an inventory of the physical features on or adjacent to the trail and should be regularly updated when inventoried features are modified, replaced or removed. There should also have comment spaces to document the general condition of the trail and local environments so that overall impacts can be assessed. A comprehensive list of maintenance items also helps Town administrators to prioritize and budget for trail repair and improvements projects.

4.1.2 Maintenance Levels and Standards

Assign maintenance levels to trails based on criteria such as amount of use, potential to affect resources, safety considerations, etc. Some Town maintenance standards already existing, but should be augmented with the recommendations of this report. Once consistent maintenance levels are established, they should be reviewed and updated annually.

4.1.3 Daily Maintenance Functions

Daily maintenance, inspection and clean-up functions can be performed by one person equipped with a vehicle complete with hand tools, power tools and necessary cleaning supplies. An experienced and dedicated worker with a broad knowledge of the entire trails network can really pay dividends to your trail maintenance operations.

Radio contact is a must for emergency situations and for reporting. The all-terrain vehicle is ideally designed to enable unobstructed passage between barriers (e.g. bollards, posts, stones, etc) positioned along the trail network. Other daily duties would include public relations, reporting damage, minor vandalism repairs, litter control, sweeping, minor pruning, painting, trail grooming, and inspection of facilities.

4.1.4 Trail Monitoring and Reporting

The single most important component of maintenance operations is checking and reporting trail deficiencies on a regular basis, thus enabling maintenance crews to respond quickly. Regular maintenance keeps trails at, or near, constructed conditions and can also:

- enhance visitor safety by identifying public safety issues;
- protect natural and cultural resources;
- enhance resource management by ensuring that trails continue to remain accessible, and in good condition to the public; and,
- identify routine maintenance needs.

Access to remote locations, or through steep inclines, may present problems. The type of maintenance vehicle used may determine the ability to reach most locations, however natural barriers, stairways, and heavy overgrowth may restrict access to some areas with conventional maintenance equipment.

4.1.5 General Trail Maintenance

General trail maintenance activities entail a number of preventative and corrective actions:

- By far the most time consuming activity is keeping the tread surface free of hazards and windfalls, such as broken glass, litter and fallen trees.
- The greatest maintenance challenge is continuous erosion, particularly after a series of rainstorms. Maintaining trail drainage features to minimize trail erosion and environmental damage should include careful attention to clearing culvert installations, cross slopes, drainage channels and parallel swales.

- Maintaining trail edge retainers installed to support/reinforce edge of asphalt or tread materials. Improved compaction of the surface material will help; however, it does not solve the problem.
- sweeping the trail system with a tractor-mounted broom to remove loose rocks, earth and snow on trails (limited to multi-use trails) – monitor trail conditions.
- root control cutting (*trenching machine*) or by installation of root control barrier;
- Mowing and pruning vegetation to the required trail edge to prevent growth of suckers through the trail surface and to define the established clearing distance and/or protect resources adjacent to the trail. Clearing should be supervised by persons with a sound knowledge of plants so that only species that block the trail are removed.

Other related maintenance functions, many of which are preventive measures, or activities that are necessary to maintain appearance and public safety. These duties are ongoing, and are often intended to provide long-term improvements where possible:

- minor root boils removed and patched;
- asphalt roller used to smooth out root-damaged areas (this is effective only as a temporary measure, and during hot weather when the asphalt is relatively soft);
- tree maintenance and landscape rehabilitation;
- nuisance animal control (*domestic and wild*); and,
- public relations and assistance.

Routine maintenance tasks can be scheduled and performed by town staff, contractors or volunteers at various intervals. The following table is a maintenance guideline that can be modified depending on the volume of use, season and type of feature.

Table 6: Routine Maintenance Tasks

Activity:	Interval:	By Whom:
Clean trail heads	Weekly	Staff
Garbage removal	Weekly	Staff or contractor
Vegetation control and brushing	As needed	Contractor
Horticulture and landscape rehabilitation	As needed	Staff or contractors
Grass cutting	Bi-Monthly	Staff or contractors
Nuisance animal control	As needed	Staff or contractor
Maintenance Inspections	Monthly	Staff
Clear culverts and drains	Every spring and after storms	Staff
Snow and trail debris removal	As needed	Staff or contractor
Trail feature inspections and repairs	As needed	Staff
Maintain trail edges	As needed	Staff or volunteers

4.1.6 Maintenance of Asphalt Trails:

Maintaining the asphalt tread in a condition that can be negotiated by trail users will greatly improve safety. General inspections should include an analysis of the trail surface conditions to identify and measure the extent of entrenchment, drainage, and obstacle problems. Any resulting asphalt tread maintenance will include one or combinations of the following:

- restoring sloped or crowned surfaces to facilitate drainage,
- extending the trail back to its original width,
- filling ruts and holes, and
- restoring raised approaches to bridges.

Tread maintenance operations can either be performed on a contract basis, or by Town crews. Tread maintenance operations can vary in complexity, preparation and cost. All operations shall be adequately signed for public safety requirements and maintained during repairs.

Standard asphalt trail maintenance tasks can be categorized accordingly:

- A. **Skin Patch:** Areas to be swept clean, tack coated and resurfaced with 6mm depth hot asphalt fines overlay to level minor depression and fill trip hazards resulting from settlement, compacted as required.
- B. **Reinstatement:** Areas shall be excavated to a depth of 225mm from finished grade level, existing subgrade shall be compacted, 150mm depth of 19mm crushed gravel placed and compacted and 75mm depth of hot asphalt (maximum aggregate 19mm) placed and compacted. All joints shall be tack coated prior to placement of hot asphalt.
- C. **Extra Depth Reinstatements:** Same treatment as Item B; however, area to be excavated to depth of 380mm below finished grade level and 150mm depth of pit-run placed and compacted prior to base work specified in Item B.
- D. **Overlay (Crown Paving):** Areas shall be swept clean and tack coated prior to overlay (minimum depth 38mm) of asphalt to repair areas with extensive frost heaving or root damage, placed and compacted.
- E. **Crack Filling:** Extremely labour intensive and requires adequate warning signage. Areas are to be blown or swept free of all dirt and organic material. A cold-pour application of RC1100, rubberized crack filler (*to Town standards*) shall be applied to all cracked surfaces and damaged asphalt surfaces. Caution: do not apply beyond approximately 100mm on each side of the crack.

4.1.7 Maintenance of Other Trail Types:

On trails other than hard surfaced multi-use trails, crews should perform similar general trail maintenance duties as described in the aforementioned subsection – General Trail Maintenance. Grooming should be conducted on a weekly basis because the trail tread is comprised of ‘softer’ surface pavements.

Regular grooming can be performed using hand rakes and with a chain drag. Major repairs will typically require a drum roller compactor. Tread materials may vary, but either 6mm depth crushed red shale, 10mm crushed gravel (*usually available at an asphalt plant*) or 25mm of wood mulch will rectify all levels in change along the trail surface.

Once again, maintaining trail drainage features to minimize trail erosion and environmental damage should include careful attention to clearing culvert installations, cross slopes, drainage channels and parallel swales.

4.1.8 Maintenance of Trail Features:

All human-built structures along the trail network, such as bridges, boardwalk, steps, railings retaining walls, etc., should be inventoried prior to the preparation of the standardized maintenance checklist. Trail feature maintenance should be largely comprised of checking the structural integrity of various trail features and repairing any reported incidents of vandalism or damage. New installations or major repairs and replacements can be completed in accordance to the construction details provided in Section 7. Buildings, in particular, will require long-term care and occasional renovation.

The following table contains items to be scheduled for long term maintenance tasks.

Table 7: Long-Term Maintenance Tasks

Activity:	Interval:	By Whom:
Inspect trail features	Yearly	Engineer
Resurface Trail Tread	Every 7 years or as needed	Staff or contractor
Renovate buildings or trailhead signs	Every 10 years or as needed	Contractors
Repaint/ stain bridges, steps or barriers	Every 5 years or as needed	Contractors
Replace trail signing	As needed	Staff or volunteers
Erosion control and rip rap protection	Yearly or as needed	Staff or contractor
Repair culverts and drains	Every spring and after storms	Staff
Cleaning, sanding, and repairs to park furniture	Yearly or as needed	Staff or volunteers

4.1.9 Maintenance of Trail Signing:

Good maintenance involves a regular schedule of inspecting, repainting, repairing, replacing and cleaning. The following outlines a maintenance schedule for trail signing elements:

Spring maintenance –

- Inspect sign panels for damage, vandalism and warping. Replace or repair panels as required.
- Inspect painted and stained surfaces for cracking, blistering and exposed areas. Paint or stain as required.
- Inspect sign posts for damage, solid placement and vertical alignment. Replace or repair posts and reset or stabilize loose posts as required.
- Inspect sign hardware (fasteners), and retighten or replace corroded hardware as required.
- Thoroughly clean sign panels with a soft brush and mild, nonabrasive detergent. Rinse with clear water.

Summer maintenance –

Weekly maintenance

- Inspect signs for damage, vandalism and vertical alignment. Repair and/or stabilize loose posts as required.
- Inspect sign panels for cleanliness. Clean as required.

Fall maintenance –

- Repaint or replace missing signs on a four year rotation, or as required.

Winter maintenance –

Weekly maintenance

- Inspect signs for damage, vandalism and vertical alignment. Repair and/or stabilize loose posts as required.
- Inspect sign panels for cleanliness. Clean as required.

Installations and major repairs/replacements to signing should be completed in accordance with the construction details provided in Section 7.

4.1.10 Bylaw Enforcement:

Primary maintenance duties have been previously addressed in other subsections; however, maintenance staff should also have limited enforcement authority to support local enforcement services, such as the R.C.M.P. and Town Bylaws Officers. Other bylaw enforcement opportunities have been developed in other municipalities within Alberta with similar urban park systems linked by multi-use trails. The most successful of those opportunities include the:

- establishment of a R.C.M.P. mountain bike patrol with enforcement and preventive measures, particularly during evening hours;
- creation of a “The Community Trail Watch” program that would include volunteers from local bicycle/ walking/ running clubs who could contribute as the “eyes and ears” of the trail system;
- designation of citizens-at-large who may come forth as ‘stewards’ of the trail system, reporting incidents of vandalism and other maintenance concerns;
- installation of emergency telephones so that users can find a telephone at convenient access points. Locations should be posted and made readily available to caller and dispatcher. Adding emergency phones would enable people to report safety incidents quickly and discourage criminal activity;
- stringent enforcement of current bylaws prohibiting large gatherings in park and open spaces along the trail system after 11:00 p.m., and empowering the police to disperse crowds when trouble is evident; and,
- development of a trail monitoring program by which users can report problems quickly and easily on a Town Web address.

5.0 GUIDELINES FOR PARTICULAR TRAIL TYPES

A good understanding of how all pedestrians, including people with disabilities, older people and children, perform in trail environments can help determine how best to implement improvements to outdoor trails. Having a solid knowledge in the capabilities and travel habits of all trail users can craft more informed decisions towards constructing trail sections to serve the entire community.



There is a wide range of improvements and facilities that can enhance outdoor recreational trails. Improvements can be simple and involve minimal design considerations or they can involve a detailed design. The controlling feature of every trail design is its location (*i.e., whether it is on the roadway or on an independent multi-use trail alignment*). Roadway improvements such as bicycle lanes depend on the roadway's design. On the other hand, bicycle paths are located in independent alignments; consequently, their design depends on many factors, including the performance capabilities of the user and the local environment.

Recreational trails take many forms and have many functions. The guidelines presented in this section are intended to help design and construct a variety of trail types within the Town of Stony Plain. These guidelines should be made in accordance with their expected use and using sound engineering judgment.

5.1 Multi-use Trails

Trail design guidelines are generally written to accommodate a specific type of user. In practice, most urban-oriented recreational trails are used by more than one type of user and should be considered multi-use trails. Multi-use trails are prepared hard-surfaced trails that serve as part of a transportation circulation system, support multiple recreation opportunities (*such as pedestrians, walking, running, bicycling and in-line cycling, etc.*) and can accommodate a variety of non-motorized users and wheelchairs/scooters for assisted travel.

Location:

Completely separated transportation facilities where all motorized vehicular traffic is excluded. Multi-use trails are used exclusively to connect with secondary development areas, recreational or civic facilities and major activity areas, such as school grounds or sports fields. Trails should be curvilinear and fitted to the natural form of the existing landscape.



Trail Tread:

Asphalt or Concrete - only skid resistant pavement materials should be used.

Trail Length:

Optimum trail length may vary from 0.8 km - suitable for short strolls, up to 5.0 km that might take several hours.

Recommended Trail Standards:

- Design/ Tread Width of 3.00m.
- Vertical Clearance of 3.00m.
- Cleared Width of 5.00m.

Desirable Grades:

- Maximum of 0.5 to 2% cross slopes.
- Maximum Sustained grade of 5%:
 - The sharpest curves should have a maximum inside radius of 10.5 m.
 - Corners should be super elevated at a rate of 10%.
- Short pitches up to 8% for distances up to 20.00m with level rest areas at the start and end of each trail segment, as well as level areas at turning points on slopes. Handrails may also be included to assist all users. Heavily used segments may require a double set of handrails.
- Switchbacks/ steps should be provided on slopes greater than 8%:
 - Curves should be avoided at the bottom of long or steep slopes.
 - Straight 'run out' sections are preferred so speed can be reduced before reaching the curve.
 - Visibility should be also clear so chances of collisions are minimized.

Trail Features:

- Paint centre line stripes on all multi-use trails to help direct two-way traffic.
- Install jogging distance markers every 0.5 km
- Post regulatory and etiquette signs at intersections and access points. Use the signs to educate users to "share the trail".
- Pedestrian bridges should be a minimum 2.4m wide and provide secure footing under seasonal and varying weather conditions.
- Provide steps with handrails. Handrails should extend at landings. Refer to provincial building codes. On trails to be used at night, steps may be hazardous and should be omitted or lighting provided.
- Where handrails are not included, use curb rails to delineate deck edges for persons with visual impairments and to act as wheel stops.
- Trail features should provide a range of recreational opportunities, and environmental awareness, for people with diverse abilities.

5.2 Accessible Trails

Accessible trails are safe, integrated and useable by people with disabilities of all ages and abilities. They can enrich a community's quality of life on many levels and are cost effective because they promote independence for people with disabilities.

Location:

Accessible trails are intended for people with visual or mobility disabilities, to allow them to better participate in all types of trail activities and at a wide range of skill levels. If accessible community facilities are available, these types of trails make it is easier for them to reach their desired destinations.

Trail Tread:

Asphalt or Concrete - only skid resistant pavement materials should be used.

Trail Length:

The appropriate length is dependant upon the user's ability, endurance levels and terrain conditions. The solution is to provide graduated challenging trail layout options.

Recommended Trail Standards:

- Design Width of 2.40m as a minimum.
- Vertical Clearance of 3.00m.
- Cleared Width of 4.40m.

Desirable Grades:

- Maximum of 0.5 to 2% cross slopes. People with mobility impairments have a difficulty time negotiating steep grades because of the additional effort required to travel over sloped surfaces. Manual wheelchair users may travel very rapidly on downhill pathways but will be significantly slower on uphill segments.
- Maximum sustained slopes of 5%.
- Provide level rest areas at the ends of each length of slope with sustained grades of 5%.
- Minimum 2% cross slopes. Steep cross slopes have significant impairments for people with mobility impairments. More energy is required to traverse sloped surfaces. Powered wheelchairs use more battery power on steep grades because the chair compensates for the difficult terrain. Furthermore, both powered and manual wheelchairs are less stable on sloped surfaces, particularly if wet or frozen.

Trail Features:

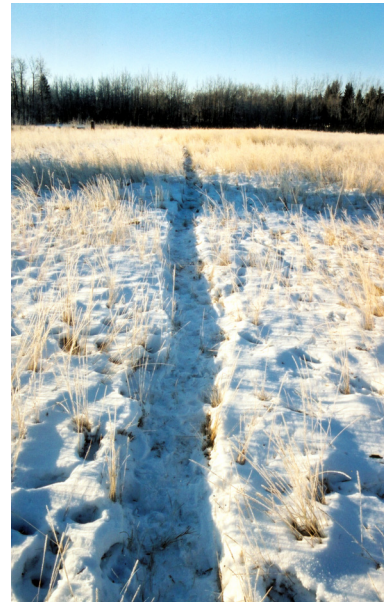
- Trail curb edge improvements to act as wheel stops
- Post clear trail information and etiquette signs at the trailhead, intersections and access points. Information should include: trail type, distance and tread surface.
- Passing spaces are recommended at regular intervals when the trail is narrow for long distances. Generally, passing spaces are not necessary on multi-use trails because the width of the trail exceeds the recommended dimensions that require a passing

space of at least 1.525m x 1.525m (60 in x 60 in). A T-intersection of two walkways is also an acceptable passing space.

- Provide two handrail heights for both children and adults in wheelchairs – Refer to Section 7.
- Curb cuts create unnecessary obstacles for disabled persons. Use them only when absolutely necessary. Ensure curb cuts are flush with adjacent paving and provide a non-slip travel surface – a broom finish on top of a concrete slab is commonly recommended. Refer to Municipal Engineering Standards.
- Refer to Multi-use trails of this section.

5.3 Interpretive Foot Trails

Interpretive foot trails provide the public with learning opportunities to enjoy and to gain an understanding of environments of natural or cultural interest. Interpretive trails may be developed on a theme basis with each trail segment functioning as an interpretive program. Other trails may represent various ecosystems found in the vicinity, and can be undertaken on a large or small scale.



Location:

Self-interpreting trails should be in a loop form of layout. Spur trails can be added to access special interest features, particularly where these are sensitive and might be jeopardized if situated on the main trail loop. Interpretive trails should be curvilinear, where all motorized vehicular traffic is excluded. Long, straight trail segments should be avoided, so as not all features are seen at once.

Trail Tread:

It is particularly important that surfacing materials be environmentally compatible, especially for interpretive nature trails. On lightly used trails, shredded wood mulch is well suited – quiet to walk on, clearly delineates trail edges and has a natural appearance. Trails that will receive heavy use will require gravel or shale surfacing and associated edge treatments to contain the granular mulch. Boardwalks with a curb edger (at a minimum) are ideal in areas subject to seasonal flooding, or where trailside trampling must be prevented.

Trail Length:

The appropriate length is dependant upon the distance required to communicate the message along the trail, on the terrain conditions, and on the abilities and interests of the users. Optimum length may vary - 0.8 km is suitable for short family strolls.

Recommended Trail Standards:

- Trail width should be a minimum of 2.4m wide.
- Vertical clearance of 2.50m.
- Cleared Width of 4.40m.

Desirable Grades:

- Range of grades from 2 to 5%.
- Maximum sustained grade of 10%.
- Short pitches up to 15% for distances up to 30.00m with level rest areas at the start and end of each trail segment, as well as level areas at turning points on slopes. Handrails may also be included to assist all users. Heavily used segments may require a double set of handrails.
- Switchbacks/steps should be provided on slopes greater than 8%.

Trail Features:

- Trail features should provide opportunities for people with curiosity and interest regarding the local resource.
- Interpretive trails are often most successful if they incorporate key features or focal points. These create an initial impression of the trail which provides visitors with a point of reference and stimulates curiosity and interest. Such features can be enhanced through the use of man-made elements, such as boardwalks, viewing blinds and towers.
- On boardwalks it may be desirable to provide additional deck area where features can be viewed. Hand railings may not be needed where the water is shallow, but should be included wherever there is significant hazard.
- Maintaining minimal cross-slope values can significantly increase the cost and environmental modifications required to build trails on steep terrain.
- Interpretive display information should provide a high degree of utility such exhibit displays in a “changeable” format.

5.4 Urban Bikeway Classifications

The following Urban Bikeway Classification System categorizes bicycle travel into three distinct classes of trail types. It is intended that the classification not be interpreted as a hierarchical ranking; rather, each of the three types has its own appropriate application. In selecting the proper trail layout, it is an overriding concern to assure that the proposed alignment will encourage bicyclists to operate in a manner that is consistent with the rules of the roadway or trail network.

5.4.1 Bicycle Trails – Class 1

A bicycle trail is defined as any path specifically designated as being open to bicycle travel, regardless of whether or not they are designated for the exclusive use of bicycles, or to be shared with other transportation modes not served by streets, railroads and highways. Overall, the decision whether to provide a bicycle trail should be based on the advisability of encouraging bicycle use on a particular trail segment, instead of on parallel roads. The

roadway width along with factors such as the volume, speed, and type of traffic, parking conditions, grade, and sight distance should be considered when determining the feasibility of a bicycle route.

Location:

Bicycle trails provide transportation corridors not served by streets, railroads and highways and should present alternate recreational and transportation opportunities not offered by these systems. Bicycle trails can either provide a recreational opportunity, or direct high-speed commuting route. Another common application of bicycle trails is to provide the opportunity to bicycle travel to areas that have been prevented by construction of freeways or because of the existence of natural barriers.

Trail Tread:

See Multi-use Trail – this Section.

Trail Length:

Bicycle trails are generally short to medium distances. Average bicycle speeds are 18 km/hr and would necessitate trail lengths ranging from 5 to 10 km.

Recommended Trail Standards:

- See Multi-use Trail – this Section.

Desirable Grades:

- See Multi-use Trail – this Section.
- Gently rolling terrain is suitable for most bicycle trails.

Trail Features:

- Crossing with streets should be kept at a minimum. The most common applications are along: streams/ rivers, utility right-of-ways, railway right-of-way, parks, institutional, open spaces and along major roadways in new subdivision developments.
- 'Pull-offs' or rest areas should be provided at the top of steep or long slopes.
- Bicycle trails should not end at a barrier or cul-de-sac.
- See Multi-use Trail – this Section.



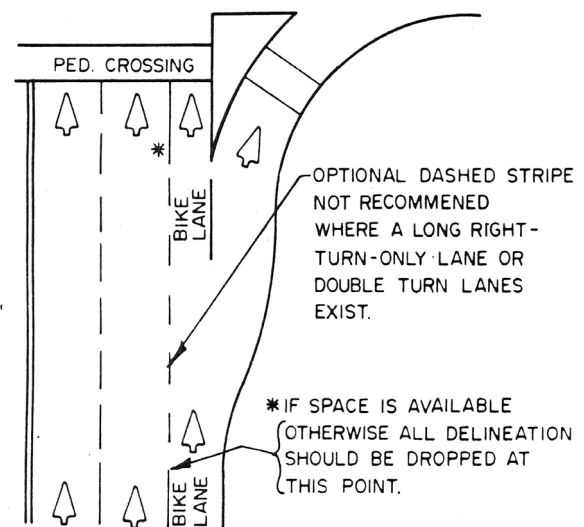
5.4.2 Bikeway (*designated bicycle lanes*) – Class 2

Bikeways are adjacent to the existing roadway, their pavement forming continuity with that of the roadway, but separate from the roadway by either a painted line or by a physical barrier; however, vehicular traffic can cross a bikeway to gain access (*or egress*) from private property. They are intended for the exclusive circulation of bicycles with a rights-of-way designation to provide for more predictable movements for both vehicles and bicycles. Bikeways are usually constricted to one-way bicycle traffic, but may be designed for a two-way flow. On one-way streets, bikeways should be on the right side of the street, except in areas where a bikeway on the left will decrease the number of conflicts (*e.g., those caused by heavy vehicle traffic*).

Location:

Bikeways are established along streets where there is a significant bicycle demand. Their purpose is to improve conditions for cyclists in roadways. A more important reason for constructing bikeways is to better accommodate the flow of cyclists through a transportation corridor where insufficient room exists for safe bicycling on existing streets.

- For example, a bikeway can be established by reducing the number of traffic lanes, decreasing the width of travel lanes or banning parking on given streets in order to delineate a bikeway.



There is a potential for conflicts, particularly at intersections, because neither cyclists nor motorists are generally accustomed to using bikeways. At intersection, bicyclists proceeding straight and motorists turning right must cross paths. Striping and signing configurations which encourage these crossings in advance of the intersection, in a merging fashion, are preferable to those that force the crossing in the immediate vicinity of the intersection. Where there are numerous left turning bicyclists, a separated turning lane should be considered. The design of bikeways should also include appropriate signing at intersections to reduce the number of conflicts. To a lesser extent, the same is true for left turning bicyclists; however, in this manoeuvre, most vehicle codes allow the bicyclist the option of making a “vehicular style” left turn.

Trail Tread:

As local conditions dictate and to TAC standards.

Recommended Trail Standards:

- As local conditions dictate and to TAC standards.
- Special efforts should be made to assure that high levels of maintenance are provided within bikeways. Under ideal conditions, the minimum bikeway width is 1.2m wide. However, certain edge conditions (*i.e. grates, regulatory signs, manholes, etc.*) can dictate additional space requirements totalling a recommended bicycle lane width of 1.5m from curb face.
- A bikeway should always be placed between the parking lane and the motor vehicle lanes. Bikeways between the curb and the parking lane can create obstacles for bicyclists from opening car doors and poor visibility at intersection and driveways, and they prohibit bicyclists from making left turns; therefore this placement should not be considered. Where parking is permitted but a parking lane is not provided, the combination lane, intended for both motor vehicle parking and bicycle use, should be a minimum of 3.7m wide. However, if it is likely the combination lane will be used as an additional motor vehicle lane; it is preferable to designate separate parking and bikeways. In both instances, if parking volume is substantial or turnover is high, an additional 0.3 or 0.6m of width is desirable for safe bicycle operation.
- To varying extents, bicycles will be ridden on all highways where they are permitted. All new highways, except those where bicyclists will be legally prohibited, should be designed and constructed under the assumption that they will be used by bicyclists. On highway sections without bicycle lanes or without curb or gutter, a right lane wider than 4.3m of usable width is desired, but 3.7m can accommodate both bicycles and motor vehicles in the same lane. In many cases where there is a wide curb lane, motorists will not need to change lanes to pass a bicyclist. Also, more manoeuvring room is provided when drivers are exiting from driveways or in areas with limited sight distances. Widths greater than 4.3m may encourage the undesirable operation of two motor vehicles in one lane, especially in urban areas, and consideration should be given to striping as a bicycle lane when wider widths exist. Restriping to provide wide curb lanes should be considered on some existing roads by making the remaining travel and left turn lanes narrower. This should only be performed after careful review of traffic characteristics along the corridor.
- Bikeways on a highway should be located between the motor vehicle lanes and the roadway shoulders. Bicycle lanes may have a minimum width of 1.2m, where the shoulder can provide additional manoeuvring width. A width of 1.5m or greater is recommended; additional widths are desirable where substantial truck traffic is present, or where vehicle speeds exceed 55km/h.

Desirable Grades:

- As local conditions dictate and to TAC standards.
- Bicyclists do not generally ride near a curb because of the possibility of debris, or hitting a pedal on the curb, or of a steeper cross slope. If the longitudinal joint between the gutter pan and the roadway surface is uneven and falls within 1.5m of the

curb face, a minimum of 1.2m should be provided between the joint and the motor vehicle lanes.

Trail Features:

Because most highways have not been designed with bicycle travel in mind, there are often many ways in which roadways should be improved to more safely accommodate bicycle traffic. Roadway conditions should be examined and, where necessary the following features should be included:

- Adequate pavement surface marking of bicycle lanes. Raised pavement markings and raised physical barriers such as buttons or split curbs are not generally recommended, due to snow removal and safety problems, and should not be used to delineate bikeways.
- Smooth asphalt pavements
- bicycle-safe drainage grate inlets,
- compatible roadway maintenance operations
- safe railroad crossings, and,
- traffic signals responsive to bicycles should always be provided on roadways where bicycle lanes are being designated.

5.4.3 Bicycle Routes (*shared road lane*) – Class 3

Bicycle routes consist simply of streets and roads which are shared equally by cyclists and motorists, and which are identified as such by traffic signs and no visible surface pavement markings. The traffic signing has two purposes:

- the identification of the bicycle route for the benefit of the cyclist; and,
- alerting motorists of the presence of cyclists.

For the cyclist, bicycle routes serve either to provide continuity to other recreational trails; or to designate preferred routes through high-demand transportation corridors. As with bikeways, designation of bicycle routes should indicate to cyclists that there are special advantages to using these routes, as compared to alternative classifications (*e.g. the route receives more maintenance – snow clearing, sanding etc.*).

Location:

Largely bicycle travel in Stony Plain, takes place on existing streets and roadways without formal bikeway designation, and this is more than likely to be true in the future as well. In some instances, entire street systems may be fully adequate for safe and efficient bicycle travel; signing and striping such would constitute an unnecessary expense of public funds. In other cases, routes may inherently unsafe for bicycle travel, and it would be inappropriate to encourage additional bicycle travel by designating the routes as bikeways. Finally, routes may not be along high bicycle demand corridors, and it would be inappropriate to designate bikeways regardless of roadway conditions (*e.g. local residential streets*).

Widened, smoothed shoulder surfaces will generally be more accommodating in rural circumstances and should be provided. Shoulder widths should be a minimum of 1.5m when intended to accommodate bicycle travel, but should be widened an additional 0.3 or 0.6m, if the following conditions apply:

- motor vehicle speeds exceed 55km/h,
- the percentage of trucks, buses, and recreational vehicles is high, or
- static obstructions exist at the right side,

Trail Tread:

- As local conditions dictate and to TAC standards.

Recommended Trail Standards:

- As local conditions dictate and to TAC standards.

Desirable Grades:

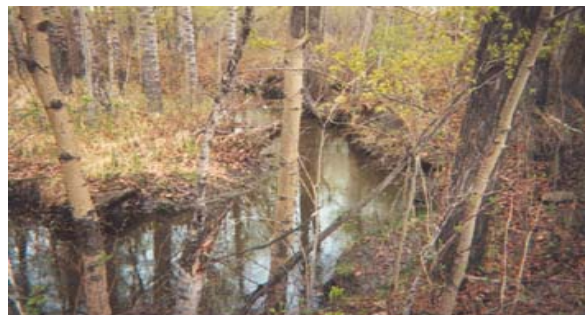
- As local conditions dictate and to TAC standards.

Trail Features:

- Adding or improving shoulder width is desirable and can often be the best way to accommodate bicyclists in rural areas, and they are also a benefit to motor vehicle traffic.
- Where funding is limited, adding or improving shoulders on uphill section first will give slow moving bicyclists needed manoeuvring space and decrease conflicts with faster moving motor vehicle traffic.
- Pavement edge lines supplement surface texture in delineating the shoulder from the motor vehicle lanes.
- Rumble strips can be a deterrent to bicycling on shoulders and their benefits should be weighed against the probability that bicyclists will ride in the motor vehicle lanes to avoid them.

5.5 Greenways

Greenways are of course not new. Perhaps North America's most recognizable greenway, the Appalachian Trail, was proposed in 1921. Greenways have traditionally been planned along water courses, ridgelines, hiking trails, country roads, abandoned railroads, waterfronts and other linear corridors. They give shape and definition to open spaces, by providing a type of green infrastructure for our existing and developing communities. Within the developed landscape, greenways serve dual purposes: they provide linear open spaces for human access and recreational use along either a natural corridor (stream, ridgeline, etc.) or overland along various easements, municipal reserves and rights-of-ways (railroad, canal, etc) to enhance and protect remaining natural and cultural resources.



Greenways can help preserve the rural character of a community or safeguard areas of visual interest by protecting ridgelines, stream corridors or other scenic resources. In rapidly urbanizing areas, a greenway offers visual relief; its wooded breaks can frame and distinguish neighborhoods in an otherwise undifferentiated urban sprawl. In the countryside, greenways can work to preserve farmland and expanses of scenic open space. In short, greenways are community amenities with an increasing economic value. They can even increase the value of surrounding properties; as elements of subdivision can benefit home buyers and developers alike.



With respect to the 2005 Trails Master Plan, a clear understanding of community goals, resource constraints, and recreational needs, spiced with local talent and imagination can shape a successful greenway into just about any form.

Location:

More open space and recreational opportunities are needed near growing urban centres, where most of us live. In our current fiscal times, when public funding for open space is greatly reduced, greenways can address a panoply of recreational and environmental needs with minimal amounts of cash. Because potential greenways often consist of relatively narrow corridors of land, often low-cost bottomlands, marshes or other undevelopable locations. Municipalities can make a true contribution to the quality of life within their communities at a relatively low cost by creating greenways.

Trail Tread:

- See previous trail types - this Section.
- As local conditions dictate and to TAC or Municipal Engineering Standards.

Recommended Trail Standards:

- The strength of the greenway movement, and the attraction of the concept itself, lies in the diversity of form and function.
- See previous trail types - this Section.
- As local conditions dictate and to TAC or Municipal Engineering Standards.

Desirable Grades:

- See previous trail types - this Section.
- As local conditions dictate and to TAC or Municipal Engineering Standards.

Trail Features:

- See previous trail types - this Section.

6.0 IMPLEMENTATION AND FINANCING

The question of how to get the Trails Master Plan implemented and funded is, of course, a very important one. Successful implementation of the 2005 Trails Master Plan will depend on a commitment to the principles of partnership. Partnerships are expressed through a mutual commitment of working together to develop the best trail implementation solutions; although each partner will have different roles and responsibilities to the community or the municipality.

Financing is never easy to come by and often seems a mysterious process. However, a lack of funds is seldom the real obstacle to overcome in trail development; rather it's a lack of political will and commitment on the part of decision makers and user groups. Funding opportunities run the gamut from government and foundation grants to individual sponsorship. Most urban trails are funded with a combination of public, private sector and local funds.

This section provides basic avenues for the funding, acquisition and implementation of recreational trails and greenway corridors within the Town of Stony Plain. The information contained is given for general information purposes only and does not constitute legal advice.

6.1 Traditional Sources

6.1.1 Subdivision Development Process

Where possible the Town of Stony Plain shall require as part of the plan of subdivision development process, that:

- recreational trail development, including assorted structures, be indicated in forthcoming Area Structure Plans that are:
 - in accordance to the standards and recommendations of this study; and,
 - at the discretion of the Town of Stony Plain.
- sustainable natural areas are integrated into the design of new development areas to form part of linked and integrated parks and open space system, including the retention of natural corridors and stormwater ponds to form continuous greenways.
- the municipality requires a certain portion of developable land be dedicated to environmental reserves in accordance to the *Municipal Government Act*.
- the dedication of 10% of the land to be subdivided, or cash-in-lieu of land, for municipal reserves. Within residential areas the dedication of land is preferred:
 - or, the Town of Stony Plain may consider providing up to 50% municipal reserve credit for that area located between the 1:100 year and the 1:25 year flood lines of stormwater dry and wet pond facilities provided that the developer agrees to provide several compromises, including the provision of trails, landscaping or other structures or amenities to the Town.

- tree conservation and replacement shall be considered in the review.
- a minimum lot setback of 10.0m to be dedicated as environmental reserve measured from the 1:100 year flood elevation or the top of the bank of watercourses, such as creeks, streams, or high water marks of wetlands.
- developers work with the Alberta Community Development in identifying heritage and archeological resources, recognizing heritage properties through its legislative powers and developing policies and incentives to encourage them to conserve land parcels with heritage value.

6.1.2 Direct Municipal Funding

Departments within the municipality, such as Community Services or Public Works, can come up with a substantial contribution to funding trail development projects in subsequent years. To secure this funding, the department(s) will need to “sell” the projects to the public, elected officials, Town Administration, and other decision makers.

A comprehensive trail network has been incorporated within the most recent Municipal Development Plan for the Town of Stony Plain and should receive appropriate funding amounts.

It is strongly recommended that the Town of Stony Plain commit an upset amount of \$200,000.00 on an annual basis from its Capital Budget for trail and amenity development.

6.1.3 Joint Development Techniques

Joint development involves the use of funds for private real-estate development in conjunction with new public facilities. The goal is to generate new sources of tax revenue and other benefits through public-private cooperative agreements, such as:

- Incentive zoning allows developers to build at a higher density in return for providing park land, open space amenities, landscaping and trail development.
- Lease-Back of Land – a public entity owns the land and provides a private developer with a long-term ground lease in return for lease income and certain public improvements, such as trail development.

6.1.4 Service Clubs

Never underestimate what a service club can do for a community. They may be willing to sponsor special fund-raising events and can provide volunteers and publicity.

6.1.5 Public Finance

Public financing to fund trail development are successful in communities where tourism and concerns about quality of life issues are prevalent. Public finance can take many forms, including:

- A Special Trail Tax to fund specific trail projects from property taxes.
- Percentage tax on real estate transactions toward local park improvements ;
- Improvement Districts - a special taxing district is established, and an assessment, usually a property tax, is levied in the district.
- Special Assessment Districts – commonly used for street improvements or special amenities and in certain instances trail improvements. The rate of taxation can decline with distances away from trail infrastructure.

6.1.6 Grants Programs

Under federal and provincial tax laws, companies or individuals can set aside some of their wealth for charitable purposes, commonly through the establishment of a special semi-independent entity called a foundation. Foundations generally fall into two categories: private and community foundations. Private foundations include independent sponsorships from an individual, families or companies. Community foundations represent a number of local donor sources. Projects that meet the respective grant guidelines of the various foundations, and are approved, receive funding.

There are a wide range of grants available at the federal and provincial levels which the municipality is advised to investigate. These grants are aimed at a range of topics from providing employment, tourism and environmental/ land management support. To access some of these grants, the municipality may need to review the constitution of the Steering Committee or form an alliance with another stakeholder group. For other grants, a substantial local match is often required and commitments or pledges for these funds usually must be obtained, in writing, prior to application.

6.1.7 Private Land Donations

Landowners interested in donating or opening a portion of their land to public use have a number of options. Private landowners may open their land to recreational use by formal or informal agreement, and may sell or donate conservation or recreation easements. No two landowner situations are alike, as each will have different goals and concerns regarding trail development. Often times, landowners will start with a less permanent option, but as their confidence and satisfaction with the trail grows, they feel more comfortable about entering into a more permanent arrangement, such as a deed. Deeds include warrant deeds, bargain or sale deeds and confer all rights to a property, except certain rights, such as mineral rights or rights-of-way across the property. Titles to land are usually acquired “in fee-simple”, through donation or outright purchase. An advantage to municipal ownership is that the existing Parks and Recreation Department can be assigned to manage the trail corridor and its maintenance and security.

Conversely, a trail corridor can remain in private ownership through:

- a conservancy (conservation easement) or
- public agency holding easement; or,
- an access and use agreement from the landowner.

An easement is a legal document that conveys ownership and control of a certain interest, right, or tangible element of a property to a second party, while the owner retains ownership of the land. While an access and use agreement is between a landowner and a second party that specifies how a portion of property may be used. The agreement should contain a termination for other clauses (i.e. sale of property) or renewal clause. It should detail obligations that the second party will take on, such as litter removal, security and trail maintenance, or note accepted and expressly forbidden activities.

Option, or Right of First Refusal, is an agreement reached with the property owner to have the first chance to purchase a piece of property. The prospective purchaser of the land is given a specified amount of time to match a bona fide offer on the property and conditions of the sale.

Given our litigious society, many municipalities have begun extending their liability insurance to landowners to increase their comfort and allow trail implementation to move forward.

6.1.8 Mutually Beneficial Relationships with Neighbouring Municipalities

Work in partnership with neighbouring municipalities (Spruce Grove, Parkland County), service clubs and other organizations to engage in joint trail planning to establish a regional framework and/or land use patterns that are mutually beneficial. Municipal partnerships should investigate and pursue equitable shared services, such as the coordination of regional trail networks, transportation and utility corridors, park facilities and services in cooperation with business, industry and provincial and federal agencies.

6.2 Non-Traditional Sources

6.2.1 Trail Mitigation

An increasingly popular financial source of support for trails is the idea of trail mitigation. When utilities such as gas, roads, power and telephone need to develop service corridors they have budgets for compensation of loss of amenity space to the community. This is called mitigation and can be used as a form of compensation, for the possible adverse effects of development. The same principle can be applied towards new trail development.

6.2.2 Sponsorship

Sponsorship is becoming an increasingly common and important way of attracting support for many community amenities. Cultivating both corporate and private donors may take months or years and there is a very tangible donor life cycle – from first contact, through small gifts, large gifts and finally legacy.

Trail projects can utilize sponsorship to attract 'gifts-in-kind' support for their project as well as monetary contributions. Membership campaigns to fund trail segments is a common strategy. A nominal fee is charged to build membership rolls, and then members are solicited for larger contributions, gifts-in-kind or for their volunteer efforts. Thereafter, membership fees are charged annually.

6.2.3 'Adopt-a-Trail' or 'Friends-of-the-Trail' Programs

Programs such as 'Adopt-a-Trail' or 'Friends-of-the-Trail' can provide additional maintenance support for the trail. Invite trail user groups, community groups, civic organizations and businesses to provide periodic maintenance work along the trail. The ownership that this gives members of the community is an important part of the success of any trail and provides many positive outcomes including:

- Keeping construction costs down - physical labour, construction, repairs, etc;
- Improving trail safety through surveillance of potential problems, like safety hazards or inappropriate activities;
- Fundraising – as a non profit association may be eligible for funding that the municipality may not;
- Building goodwill with adjacent landowners;
- Information to educate users: maps, newsletters, etc.; and,
- Promotion of the trail: at the provincial and federal levels.

6.2.4 Special Events and Fundraising

To successfully fund development of its trails, the municipality will need support from a critical mass of people from within the community. Community support is vital in raising funding through various events. The variety of fundraising events is limited only by the imagination of the organizers. Successful fundraising events from other municipalities have included:

- "Change for the Better" – Local merchants donate money to the trail for every sale they make at their stores and ask customers to match their contribution;
- "Buy-a-Meter-of-Trail" – successfully used for popular trail segments or trails that led to popular destinations.
- Hire a Fundraiser – often controversial as legitimate professionals do not work on commission; however, a few do.

- Sports Competitions (*such as in-line skating, fishing derbies, BMX bike races, triathlon, skateboarding, etc*) – help not only in fundraising but in building exposure and credibility for the trail network.
- Special Events Permits - many high-impact activities on the trails and at specific park locations require formal registration fees. Permits can generate additional funds towards trail development or as a maintenance income generator. Potential event examples include: BBQ shelter rentals; weddings; company picnics; concerts; festivals; and school events.

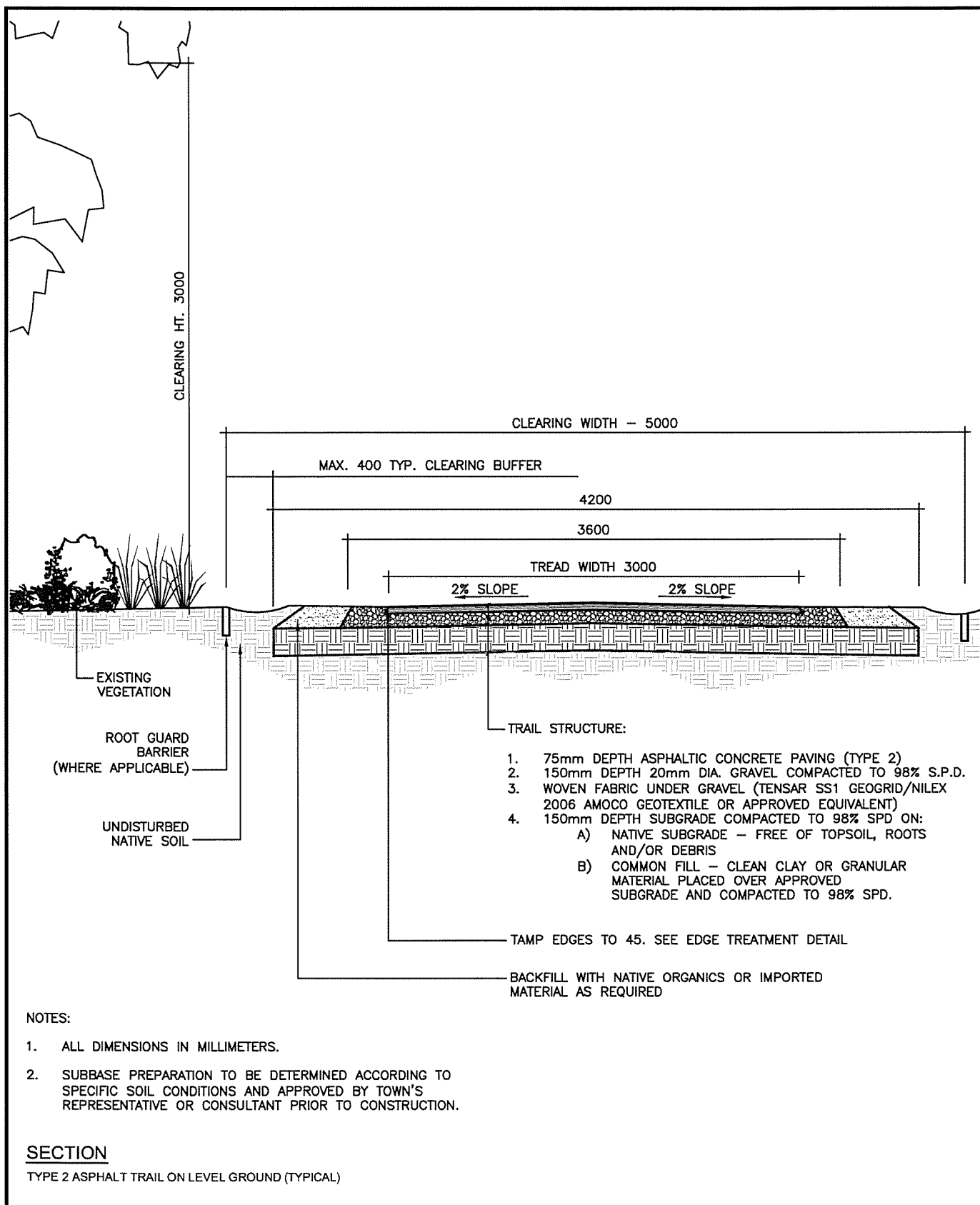
7.0 GENERAL TRAIL DETAILS

7.1 Construction Details

The following details have been established based on an assessment of current and future trail needs and the knowledge available to date of their preparation. The intent of the construction details is to help guide all design, construction and maintenance requirements of recreational trails within the Town of Stony Plain. In addition to fulfilling the Town's preference when there are no current trail planning standards, alternate technical options or construction documents to address a particular development issue.

These details are considered the minimum requirement and where variation may achieve a better technical, maintenance-free, environmental or economical solution a proposal should be presented to the Town for acceptance.

When applying these construction details, the agent or representative using them will remain fully responsible for the design, use and construction of all trail improvements according to best landscape architectural and engineering construction practices and made in accordance to sound judgment.



PROJECT No.	04-1928
DATE:	FEBRUARY 2005
APPROVED:	APPROVED
SCALE:	N.T.S.
DWG. No.	TS - 01

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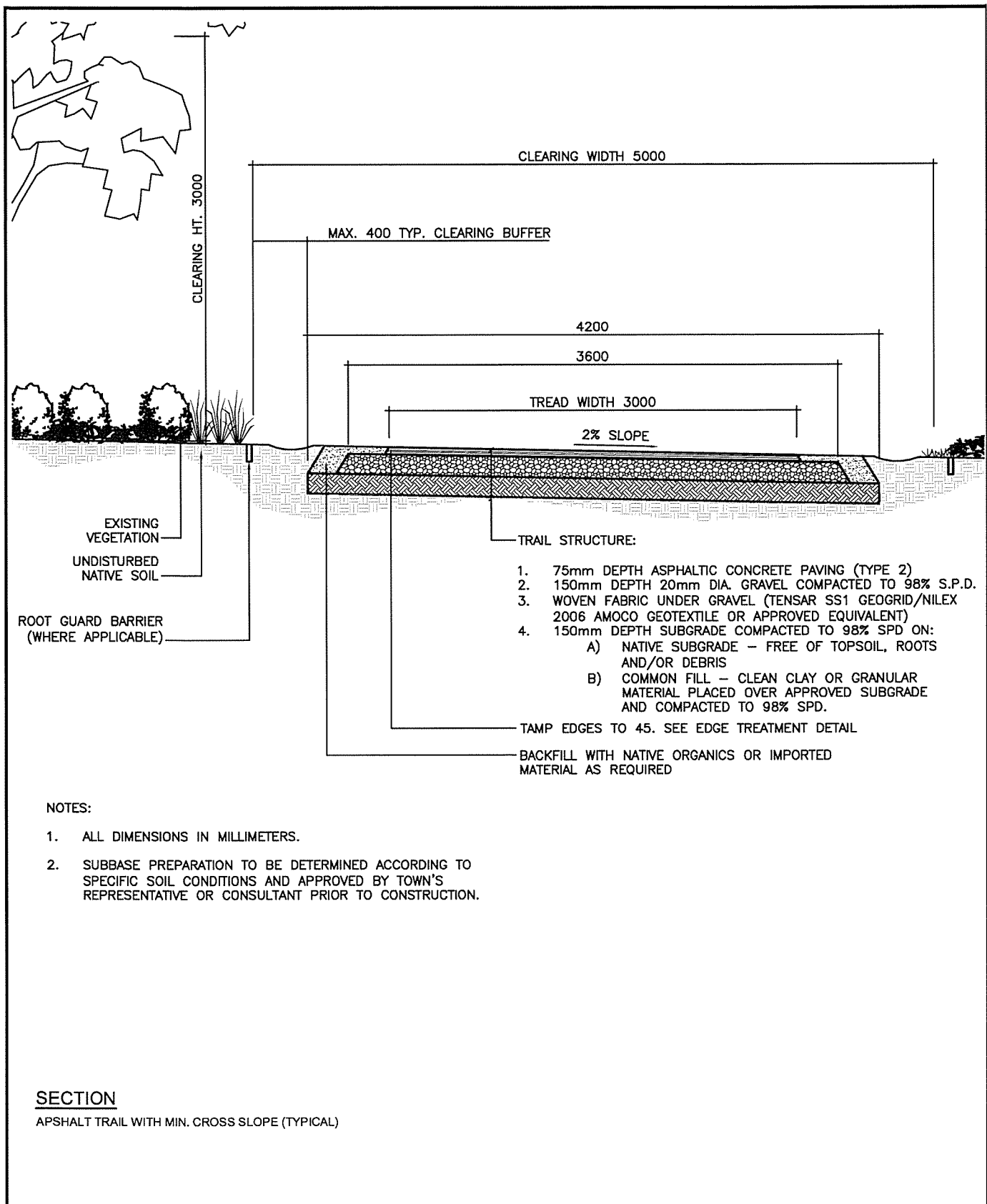
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TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS

ASPHALT TRAIL - 3000mm WIDE (CROWN)

1 OF 2

Town of Stony Plain
The town with the biggest heart

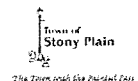


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 SCALE: N.T.S.
 DWG. No. TS - 01

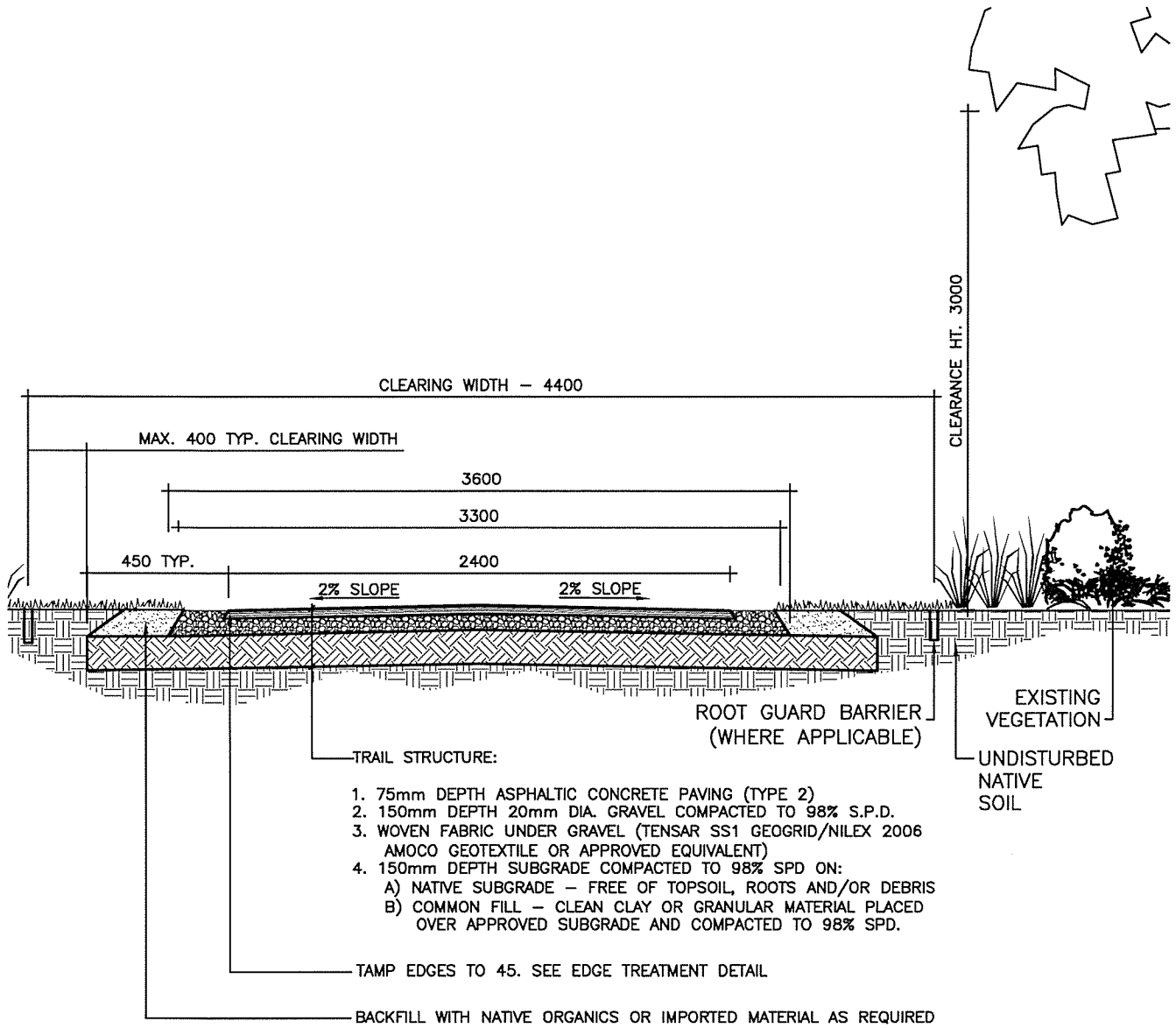
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 408 The Boulevard, 1220 - 122 Avenue
 St. John's, St. John's, NL A1B 1X1
 Tel: 709-528-2200
 Email: g.brown@gibbsbrown.com
 Web: gibbsbrown.com



TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS

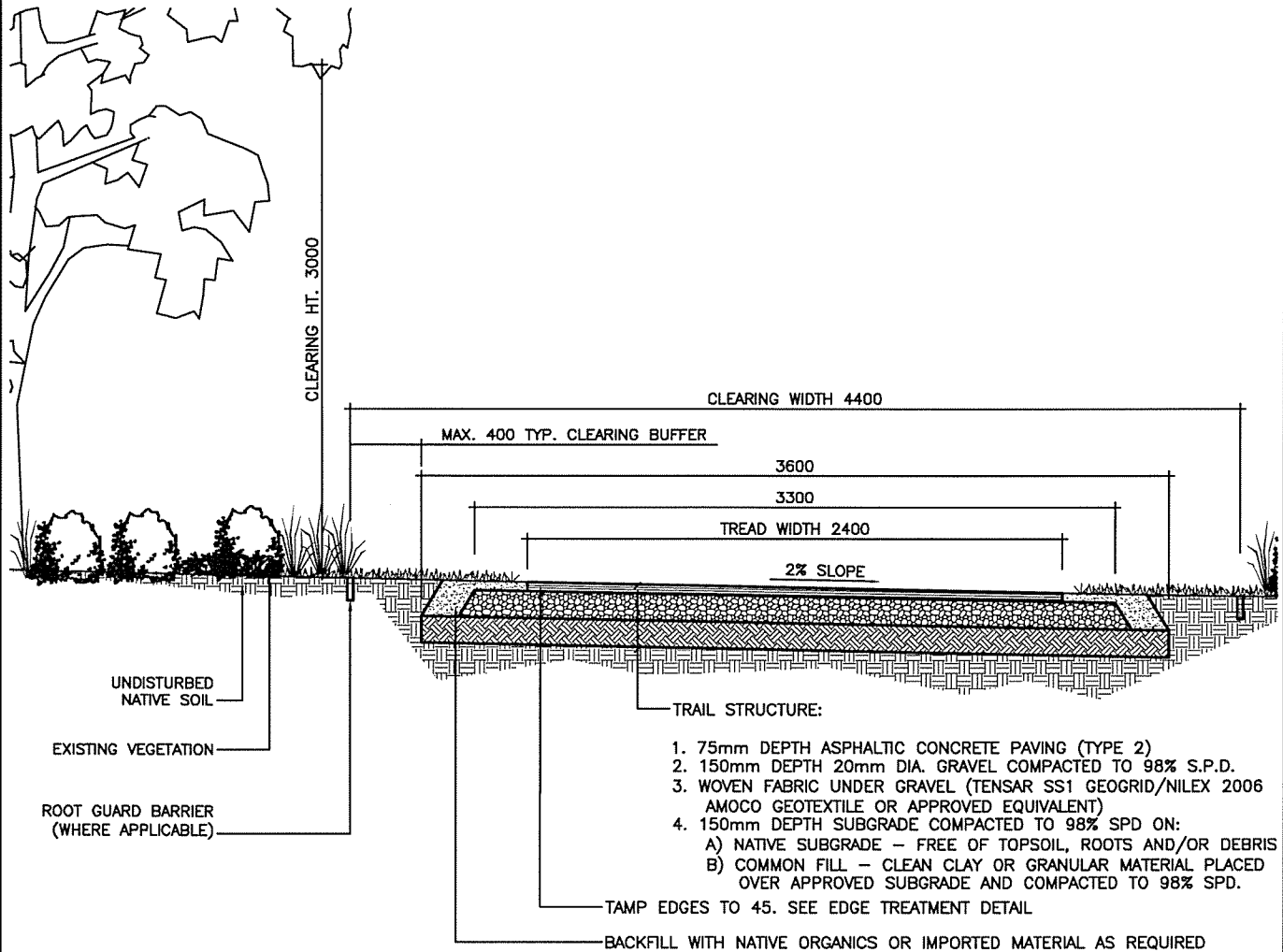


ASPHALT TRAIL - 3000mm WIDE (CROSS SLOPE)



- NOTES:
1. ALL DIMENSIONS IN MILLIMETERS.
 2. SUBBASE PREPARATION TO BE DETERMINED ACCORDING TO SPECIFIC SOIL CONDITIONS AND APPROVED BY TOWN'S REPRESENTATIVE OR CONSULTANT PRIOR TO CONSTRUCTION.

SECTION
TYPE 2 ASPHALT TRAIL ON LEVEL GROUND (TYPICAL)



NOTES:

1. ALL DIMENSIONS IN MILLIMETERS.
2. SUBBASE PREPARATION TO BE DETERMINED ACCORDING TO SPECIFIC SOIL CONDITIONS AND APPROVED BY TOWN'S REPRESENTATIVE OR CONSULTANT PRIOR TO CONSTRUCTION.

SECTION

ASPHALT TRAIL WITH MIN. CROSS SLOPE (TYPICAL)

PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 02

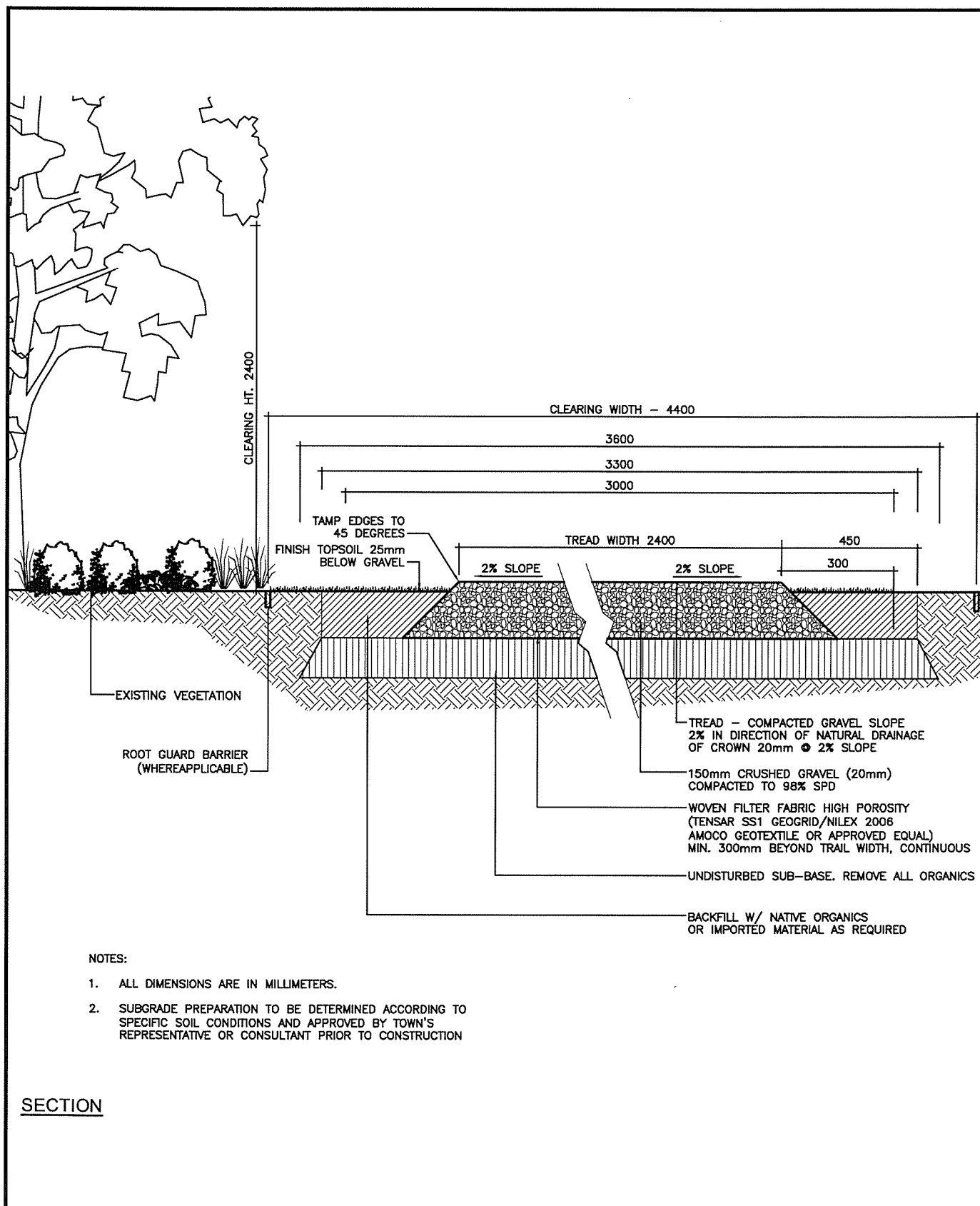
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 405-7th Avenue SW, Suite 400
 Edmonton, Alberta, Canada, T5J 1S2
 Tel: 780-443-1552
 Fax: 780-443-1553
 Email: gibbs@brown.com
 Web: www.gibbsbrown.com



TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



ASPHALT TRAIL - 2400mm WIDE (CROSS SLOPE)



PROJECT No. 04-1928

DATE: FEBRUARY 2005

APPROVED: APPROVED

SCALE: N.T.S.

DWG. No. TS - 03

GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.

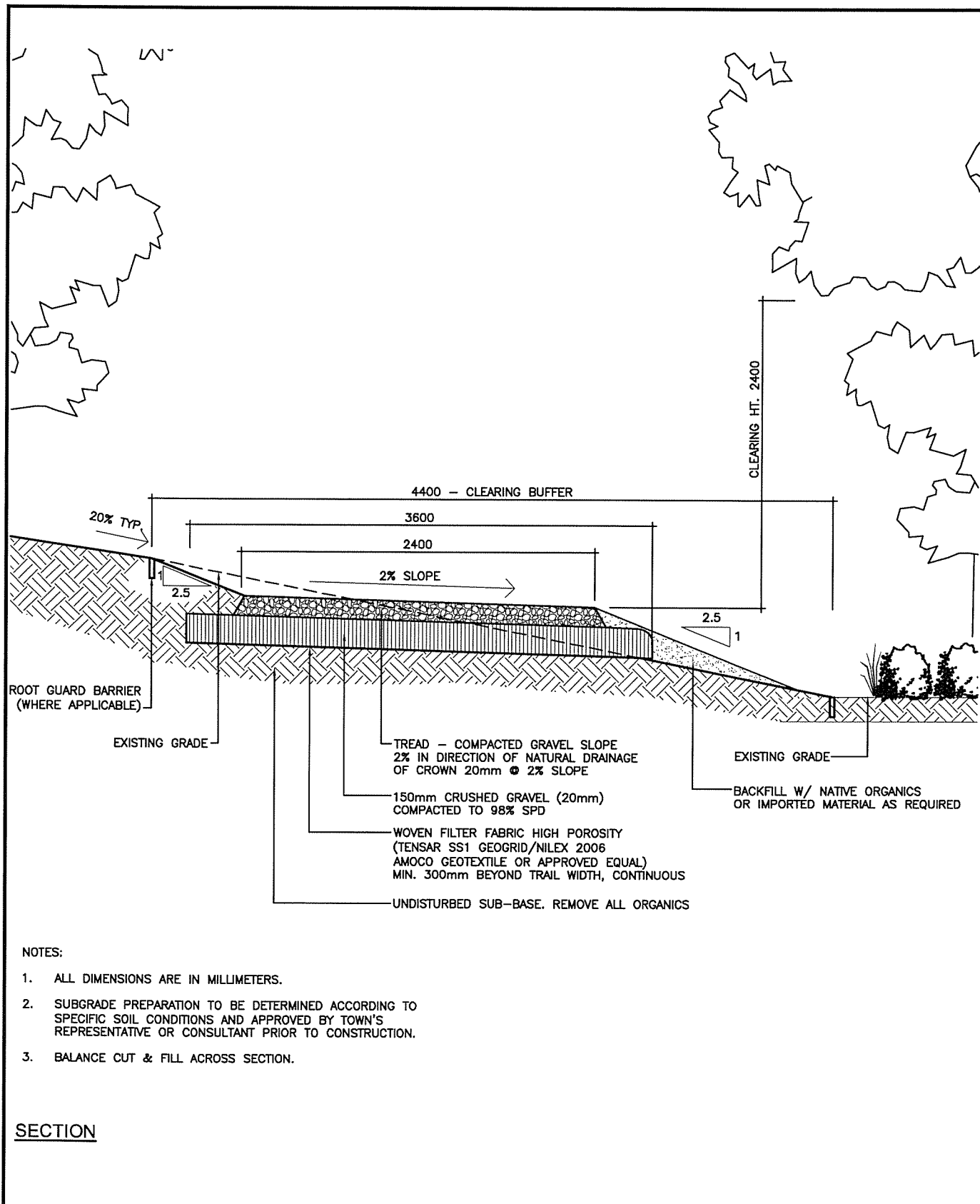
408 Tla Boulevard, 990 - 101 Avenue
Edmonton, Alberta Canada T5C 2A6
Tel: 780-435-0020
Fax: 780-435-0021
Email: gibbs@gb.ca
Web: www.gibbs.ca





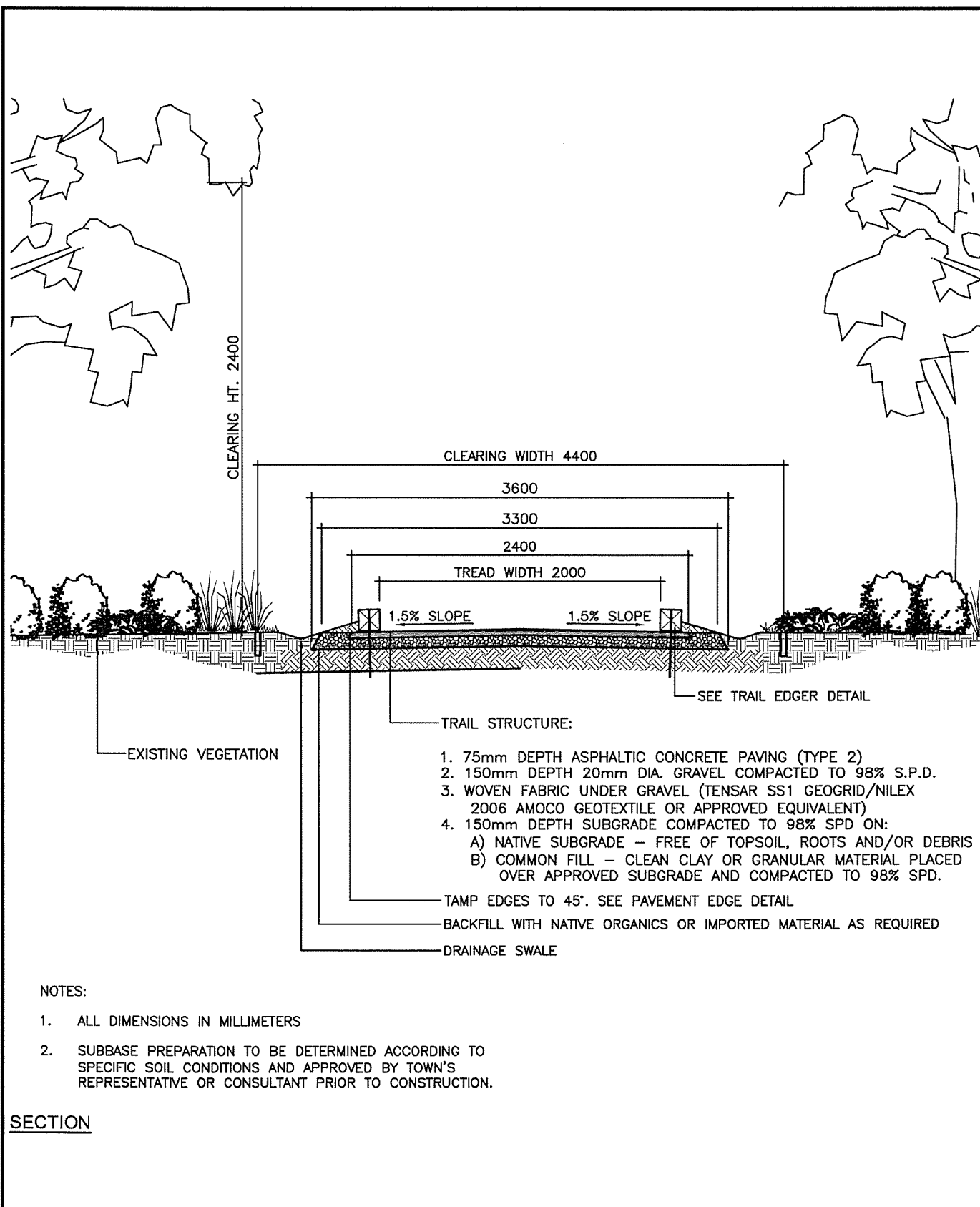
TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



GRAVEL TRAIL - 2400mm WIDE (CROWN)



PROJECT No. 04-1928	 <p>GIBBS & BROWN LANDSCAPE ARCHITECTS LTD 404 The Bow Neck, #100 - 107 Avenue Edmonton, Alberta, Canada, T1J 1J6 Tel: (780) 443-1111 Fax: (780) 443-1112 Email: info@gibbsbrown.com Web: www.gibbsbrown.com</p>	TOWN OF STONY PLAIN 2005 TRAIL MASTER PLAN DETAILS	 <p>Town of Stony Plain The Town with the Darkest Past</p>
DATE: FEBRUARY 2005		GRAVEL TRAIL - 2400mm WIDE (CROSS SLOPE)	
APPROVED: APPROVED			
SCALE: N.T.S.			
DWG. No. TS - 03			



PROJECT No. **04-1928**

DATE: **FEBRUARY 2005**

APPROVED: **APPROVED**

SCALE: **N.T.S.**

DWG. No. **TS - 04**

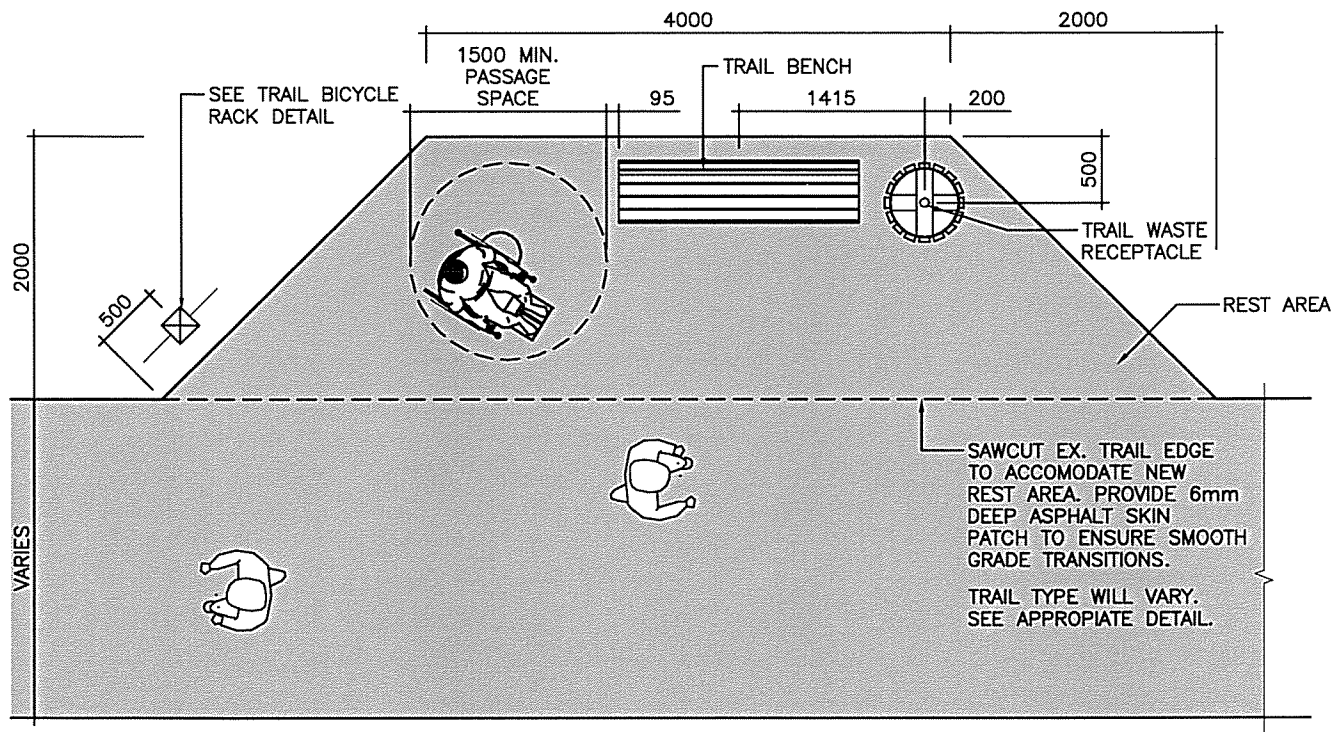
GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.
400 The Bow Road, Suite 100, 1000
Edmonton, Alberta, Canada T5C 2G6
Tel: 780-425-5022
Fax: 780-425-5026
Email: gbs@gbbrown.com
Web: www.gbbsbrown.com



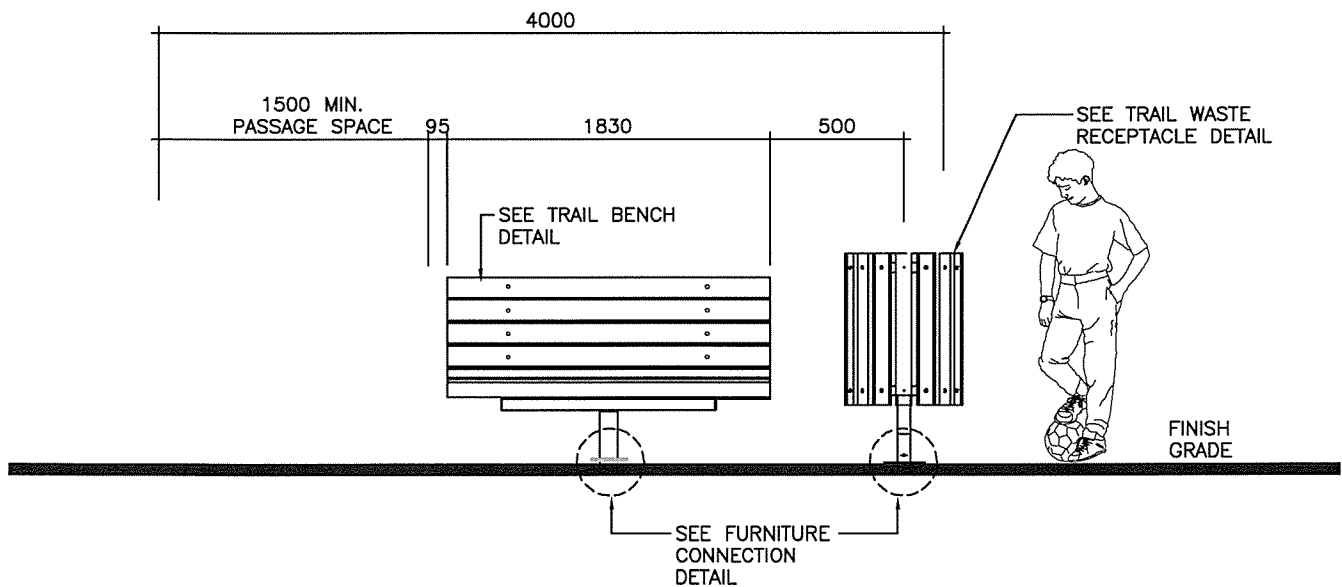
TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



WHEELCHAIR ACCESSIBLE TRAIL -
2400mm WIDE (CROWN)



PLAN



ELEVATION

PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 05

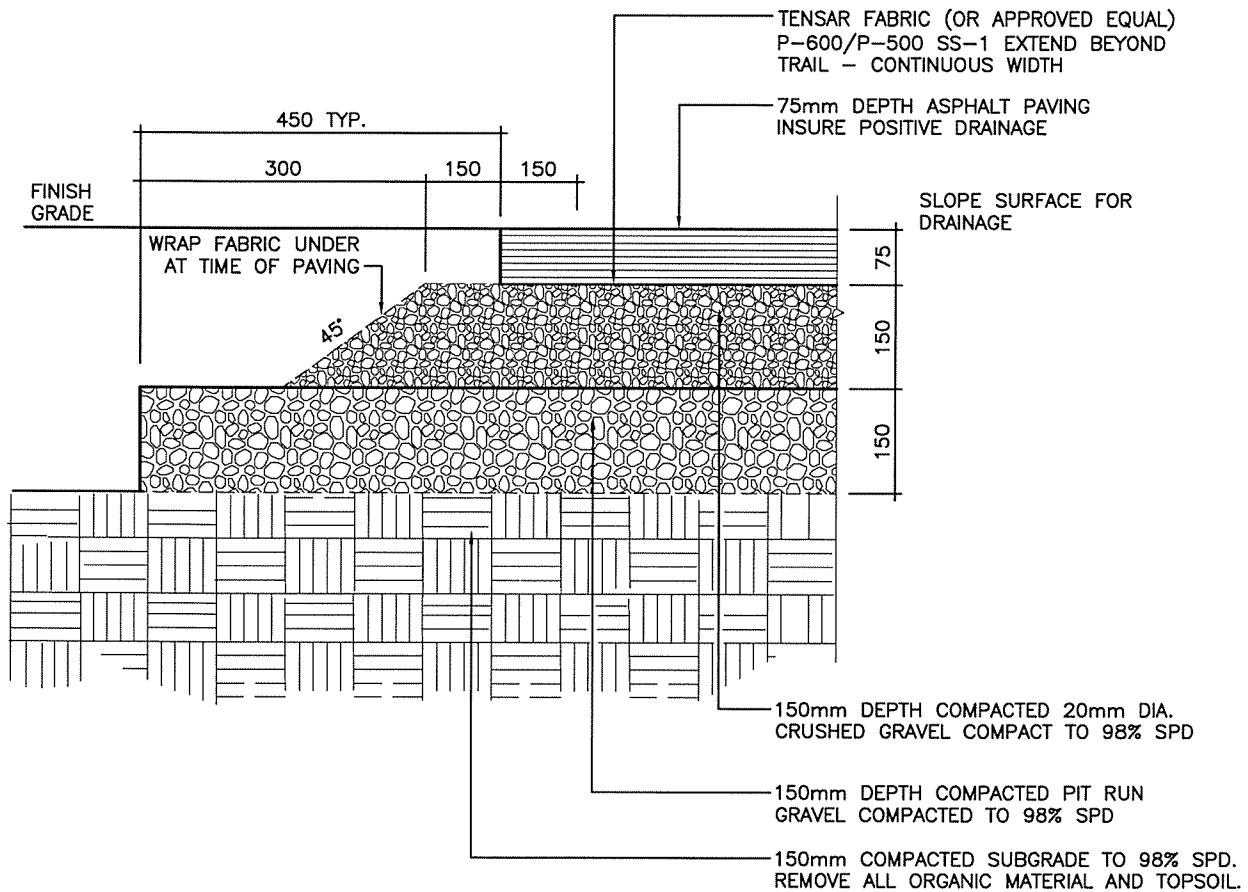
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 100 The Avenue, Suite 100, 175 Avenue
 London, Ontario, Canada, N7S 2S5
 Tel: (519) 851-1000
 Fax: (519) 851-1001
 Email: info@gibbsbrown.com
 Website: www.gibbsbrown.com



TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



TRAIL REST AREA



SECTION

PROJECT No. 04-1928
DATE: FEBRUARY 2005
APPROVED: APPROVED
SCALE: N.T.S.
DWG. No. TS - 06

GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.

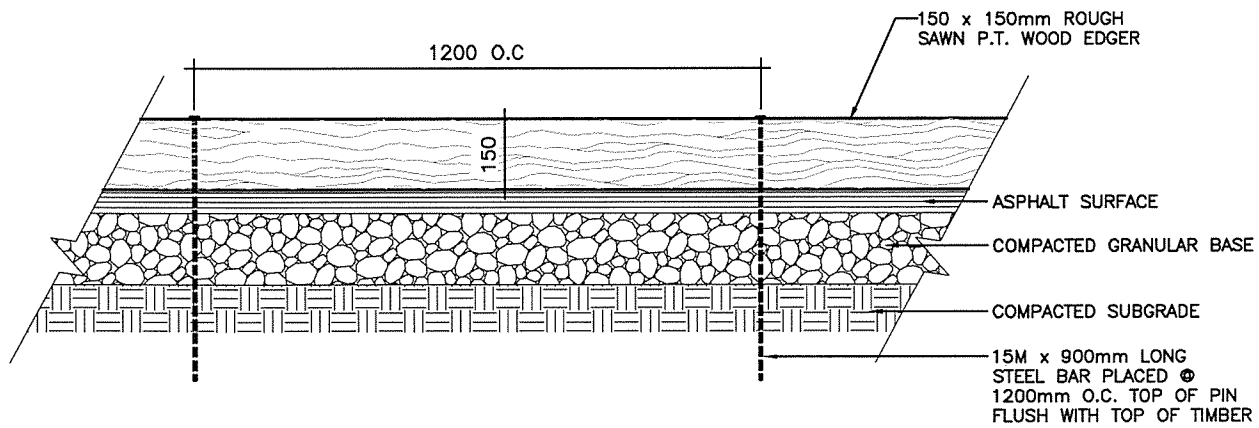
428 The Boulevard, 3000 - 30 Avenue
Edmonton, Alberta, Canada, T6E 2A6
Tel: 780-428-5200
Fax: 780-428-5078
Email: gbs@gibbsbrown.com
Web: www.gibbsbrown.com



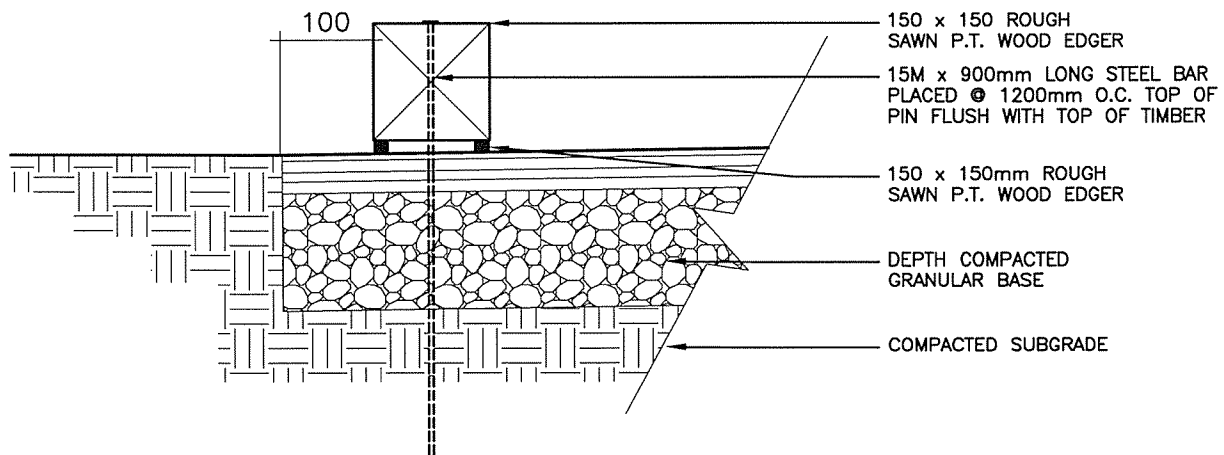
TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



ASPHALT TRAIL - 45° EDGE TREATMENT



TRAIL SECTION



EDGER OPTION B

PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 08

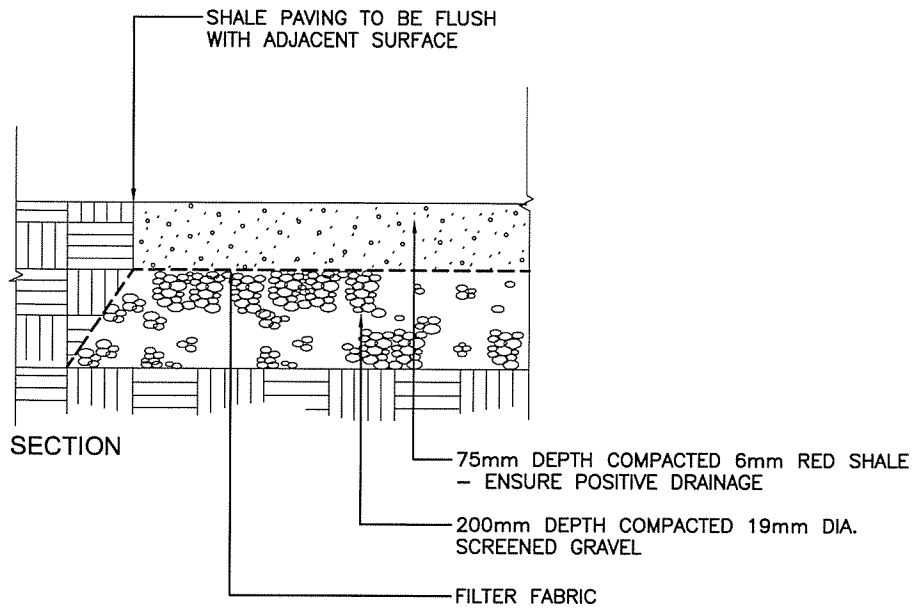
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 438 The Boulevard, Suite 100, 100 Avenue
 Glenora, Alberta, Canada T2G 2G6
 Tel: 780-485-1000
 Fax: 780-485-1001
 Web: www.gibbsbrown.com



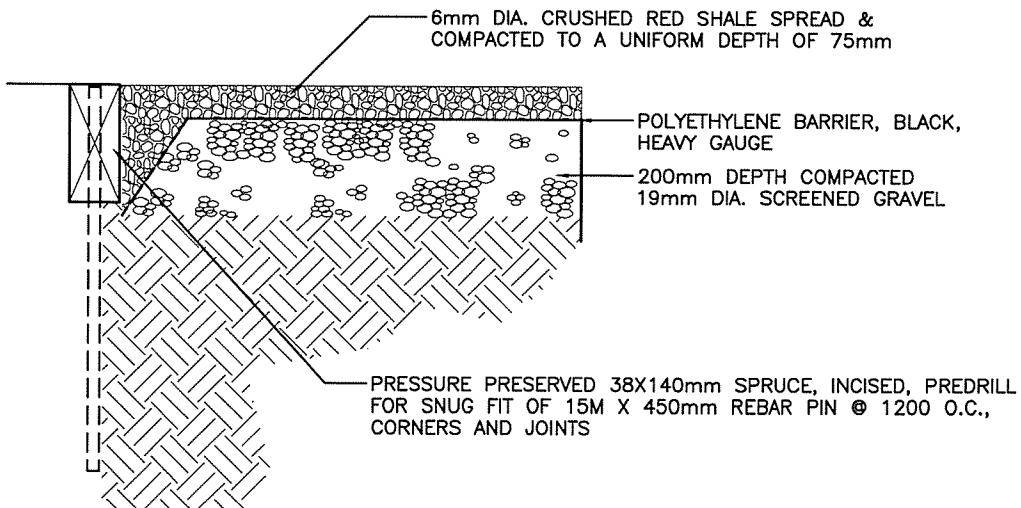
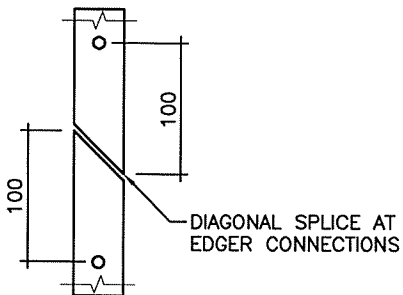
TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



TRAIL EDGER - WHEELCHAIR ADAPTED



SHALE STRIP - NO EDGER



SHALE STRIP WITH EDGER

PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 09

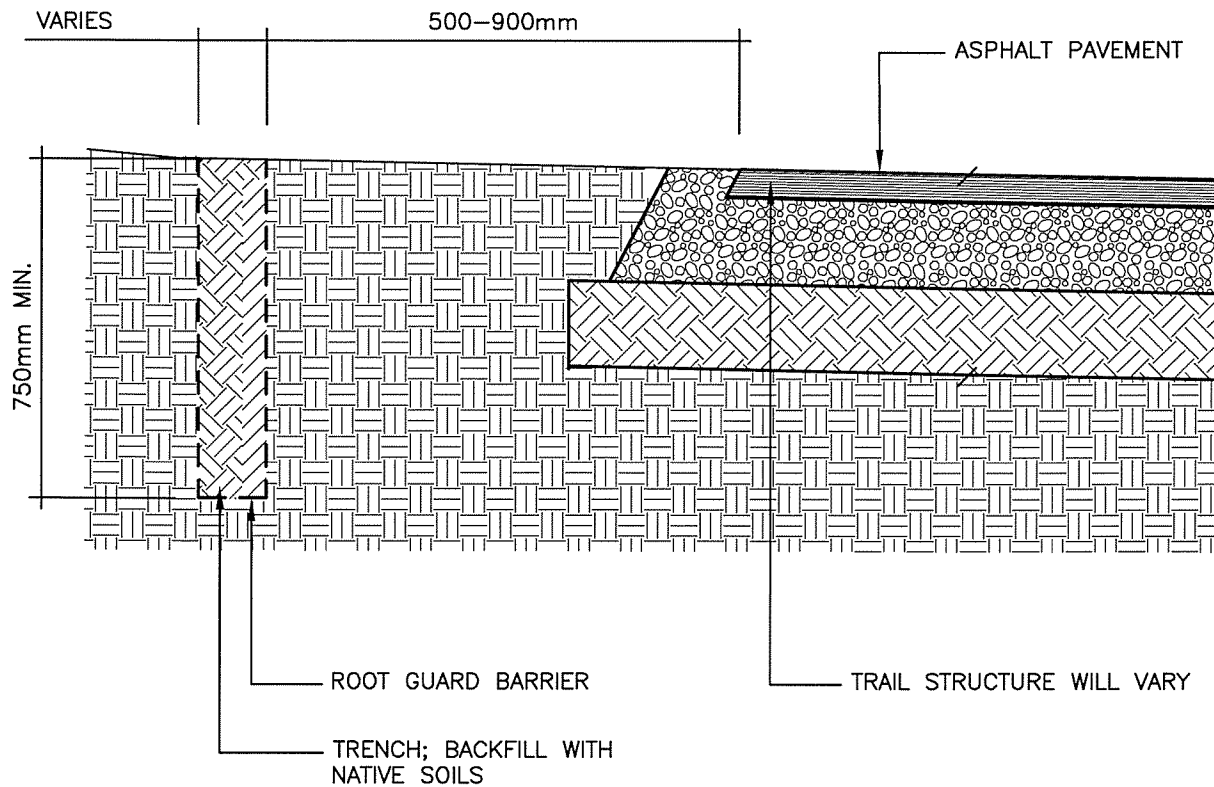
TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



SHALE TRAIL AND EDGER

NOTES:

1. AVOID GEOTEXTILE IF PRESENT.
2. CUT NARROW TRENCH, 500–900mm FROM ASPHALT TRAIL EDGE AFTER TRAIL INSTALLATION AND BEFORE FINAL LANDSCAPE RESTORATION.
3. CUT ROOTS FLUSH AGAINST THE WALL OF THE TRENCH.
4. INSERT CONTINUOUS ROOT BARRIER MESH Q899 NYLON FABRIC; BY JASON MILLS, INC (OR APPROVED EQUIVALENT) AGAINST TRENCH WALL AND BACKFILL. OVERLAP JOINTS BY 50mm.



PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 10

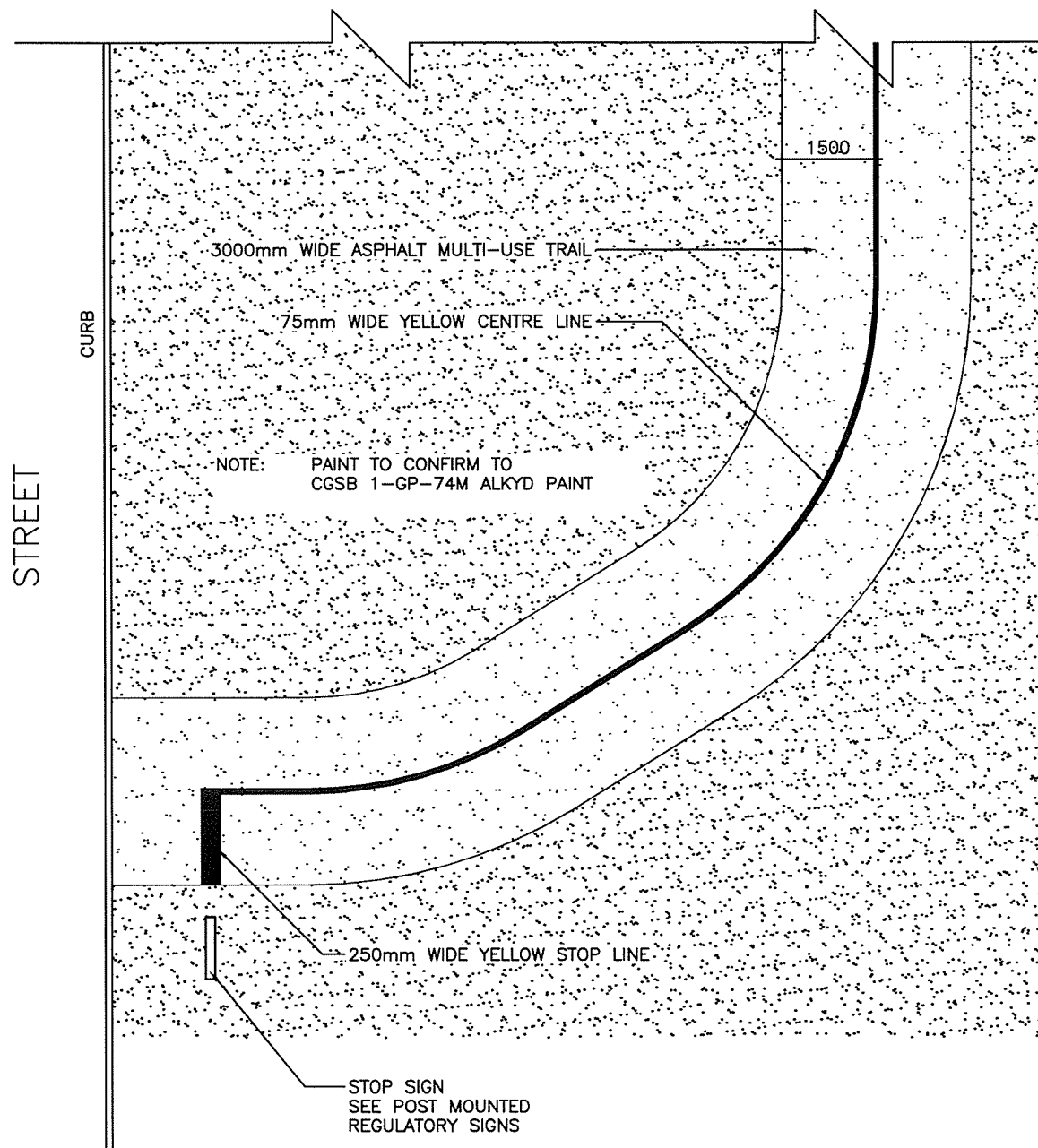
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 409-11111th Ave. Suite 1000, 101 Avenue
 Edmonton, Alberta, Canada, T5C 1A6
 Tel: 780-425-0500
 Fax: 780-425-1981
 Email: gibbs@brown.com
 Web: www.gibbsbrown.com



TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



ROOT GUARD BARRIER



PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 11

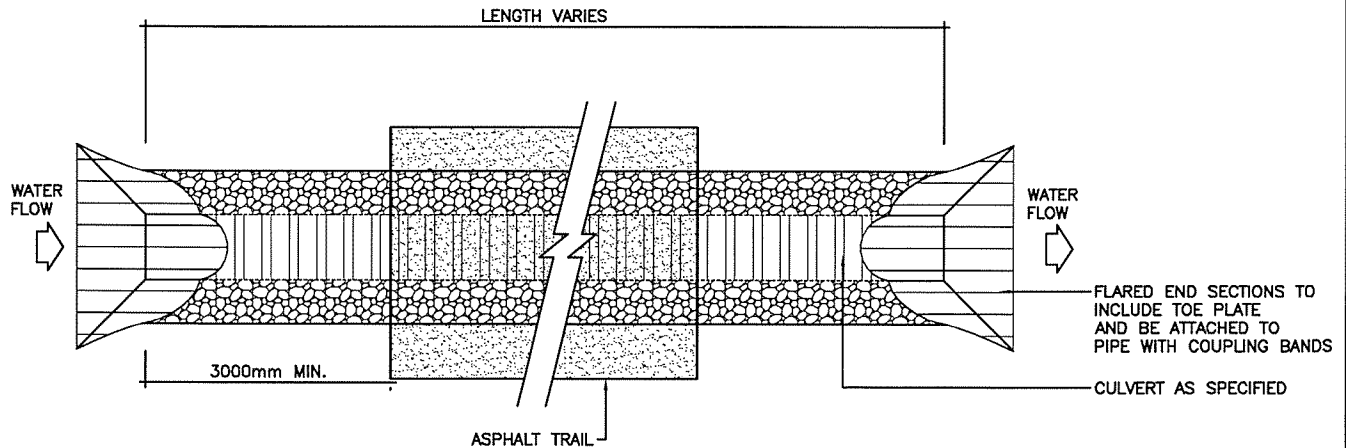
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 408-7th Street, P.O. Box 100
 Edmonton, Alberta, Canada T6B 1A4
 Tel: 780-425-0000
 Fax: 780-425-0001
 Web: www.gibbsbrown.com



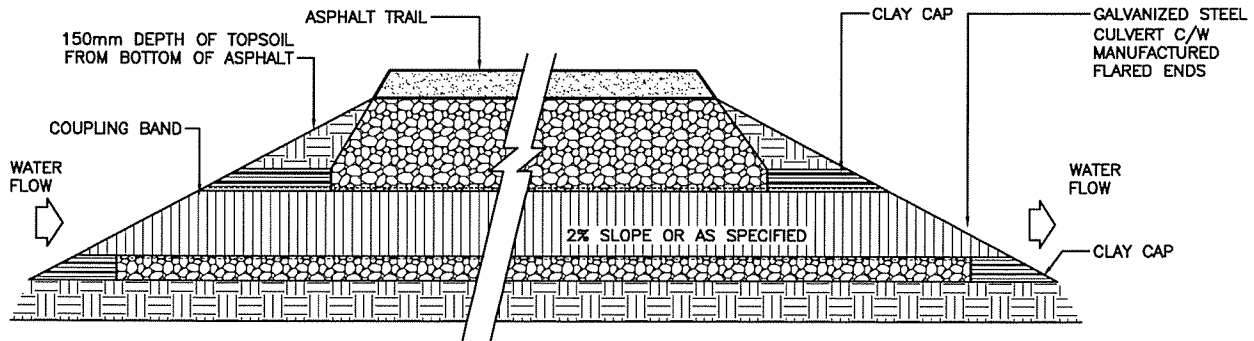
TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



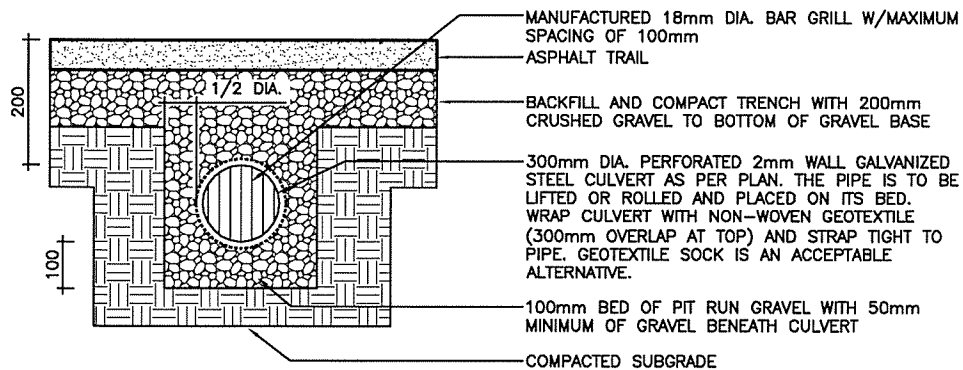
STOP LINE/ CENTRE LINE DETAIL



PLAN VIEW



SECTION



DETAIL

PROJECT No. 04-1928

DATE: FEBRUARY 2005

APPROVED: APPROVED

SCALE: N.T.S.

DWG. No. TS - 12

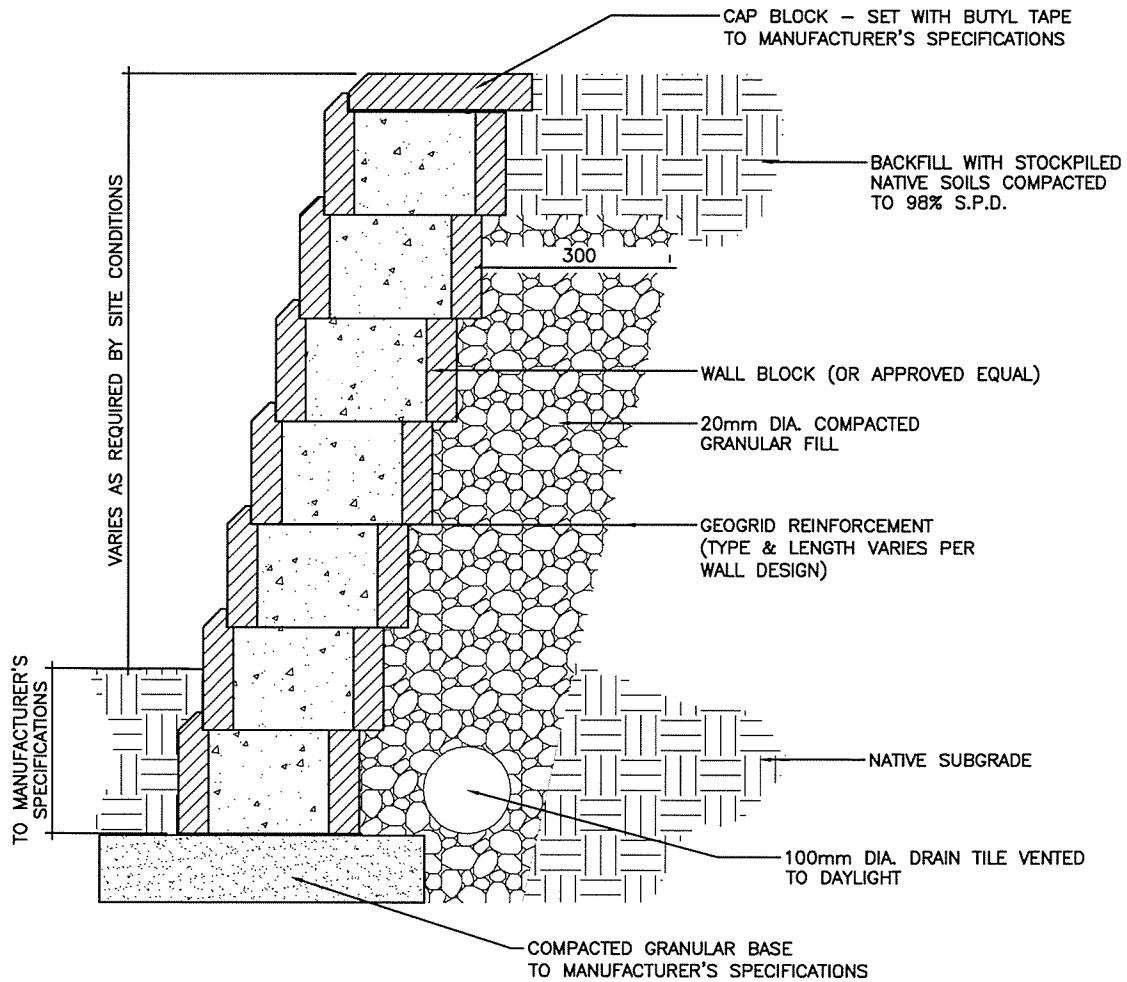
GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.
100 The Boulevard, Suite 102, Aurora, Ontario, Canada M1T 2Z4
Tel: (905) 709-1100
Fax: (905) 709-1101
Web: www.gibbsbrown.com



TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



CORRUGATED TRAIL CULVERT



GRAVITY WALL INSTALLATION NOTES:

1. FIRST COURSE OF BLOCKS TO BE FOUNDED ON 150mm (6") OF COMPACTED CRUSHED GRAVEL OR CONCRETE LEVELLING PAD WHERE WARRANTED, OVER FIRM UNDISTURBED ORIGINAL SOIL OR ENGINEERED SOIL.
2. WALL TO BE EMBEDDED AS PER MANUFACTURERS INSTRUCTIONS
3. WALL TO BE BACKFILLED WITH FREE DRAINING, NON FROST SUSCEPTABLE, GRANULAR MATERIAL, WITH LESS THAN 5% PASSING #200 SIEVE.
4. MINIMUM COMPACTION REQUIRED TO BE 95% STANDARD PROCTOR DENSITY.
5. BACKFILL TO BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 150mm (6") IN THICKNESS.
6. SLOPE ABOVE WALL NOT TO EXCEED THREE HORIZONTAL TO ONE VERTICAL (3:1).
7. POSITIVE DRAINAGE IS REQUIRED AND INSTALLATION OF FILTER FABRIC AND WEEPING TILE IS RECOMMENDED.
8. THE TOP COURSE OR COPING STONE IS TO BE SECURED TO THE WALL WITH TWO STRIPS OF BUTYL TAPE PLACED ON EITHER SIDE OF THE GROOVE.
9. ALLAN BLOCK CAPS, AND WALL BLOCKS (OR APPROVED EQUAL) AVAILABLE FROM:

CCI EDCON
16333-137 AVENUE
EDMONTON, ALBERTA
TEL: (780) 975-1709 FAX: (780) 447-1462
CONTACT: MIKE EWASKIW

PROJECT No. 04-1928
DATE: FEBRUARY 2005
APPROVED: APPROVED
SCALE: N.T.S.
DWG. No. TS - 13

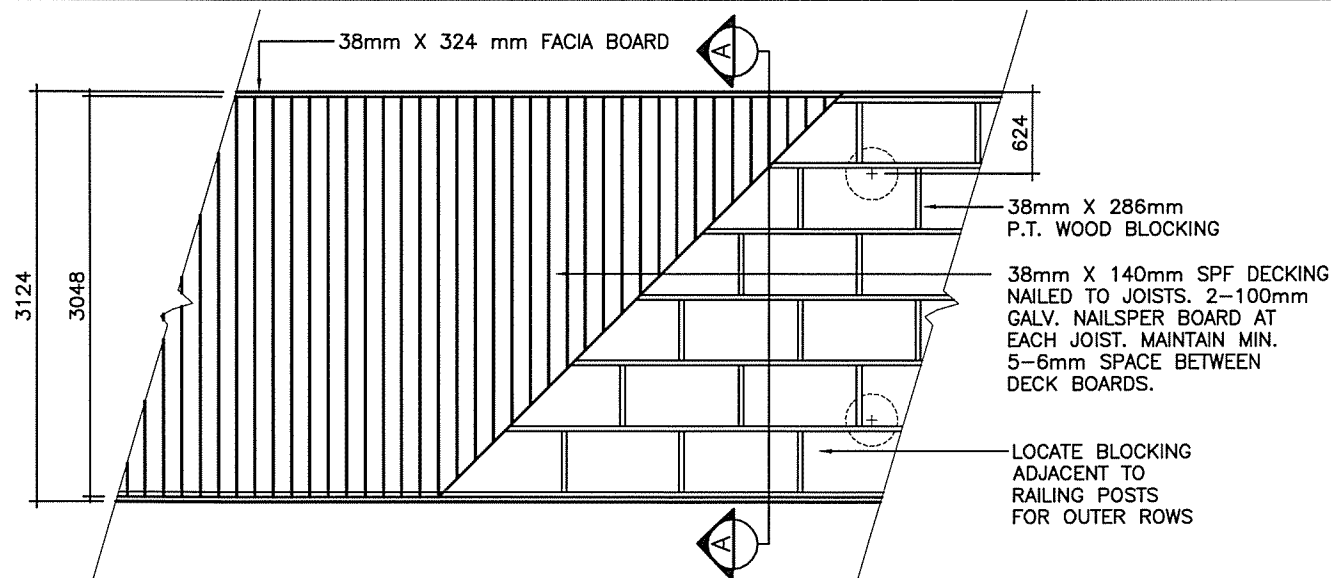
GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.
902-915 BROADVIEW, 1030-82 AVENUE
EDMONTON, ALBERTA T6C 1G4
TEL: (780) 447-1462
FAX: (780) 447-1462
WWW.GIBBSANDBROWN.COM



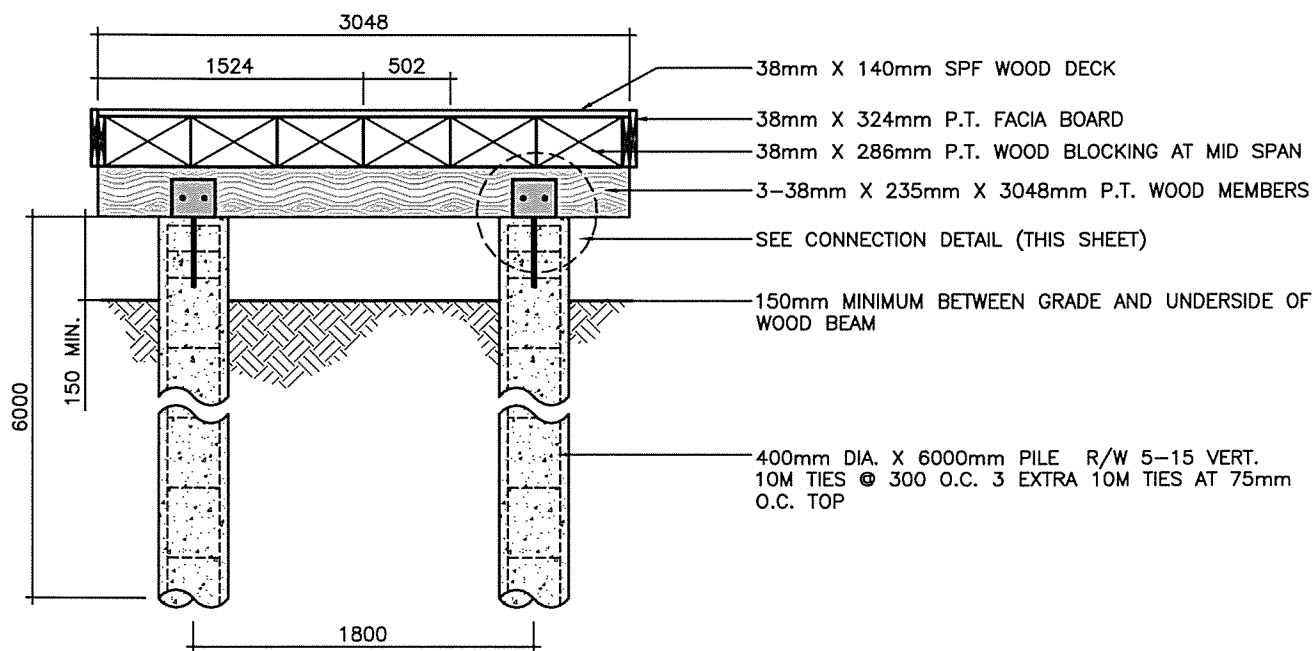
TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



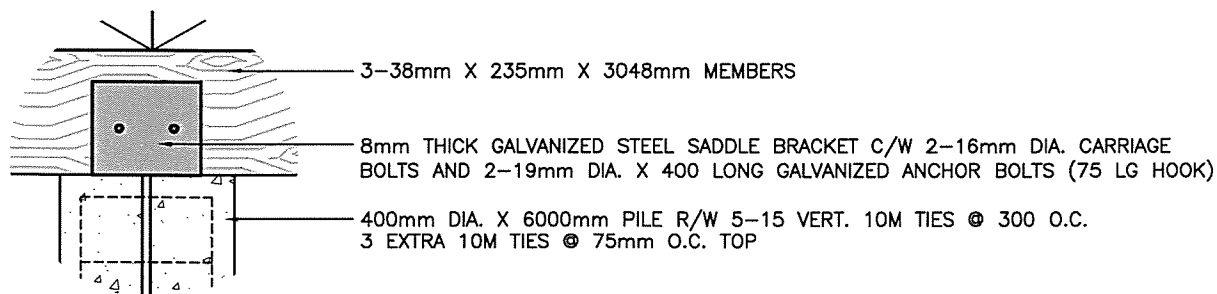
GRAVITY RETAINING WALL



PLAN



SECTION A-A



CONNECTION DETAIL

PROJECT No. 04-1928

DATE: FEBRUARY 2005

APPROVED: APPROVED

SCALE: N.T.S.

DWG. No. TS - 14

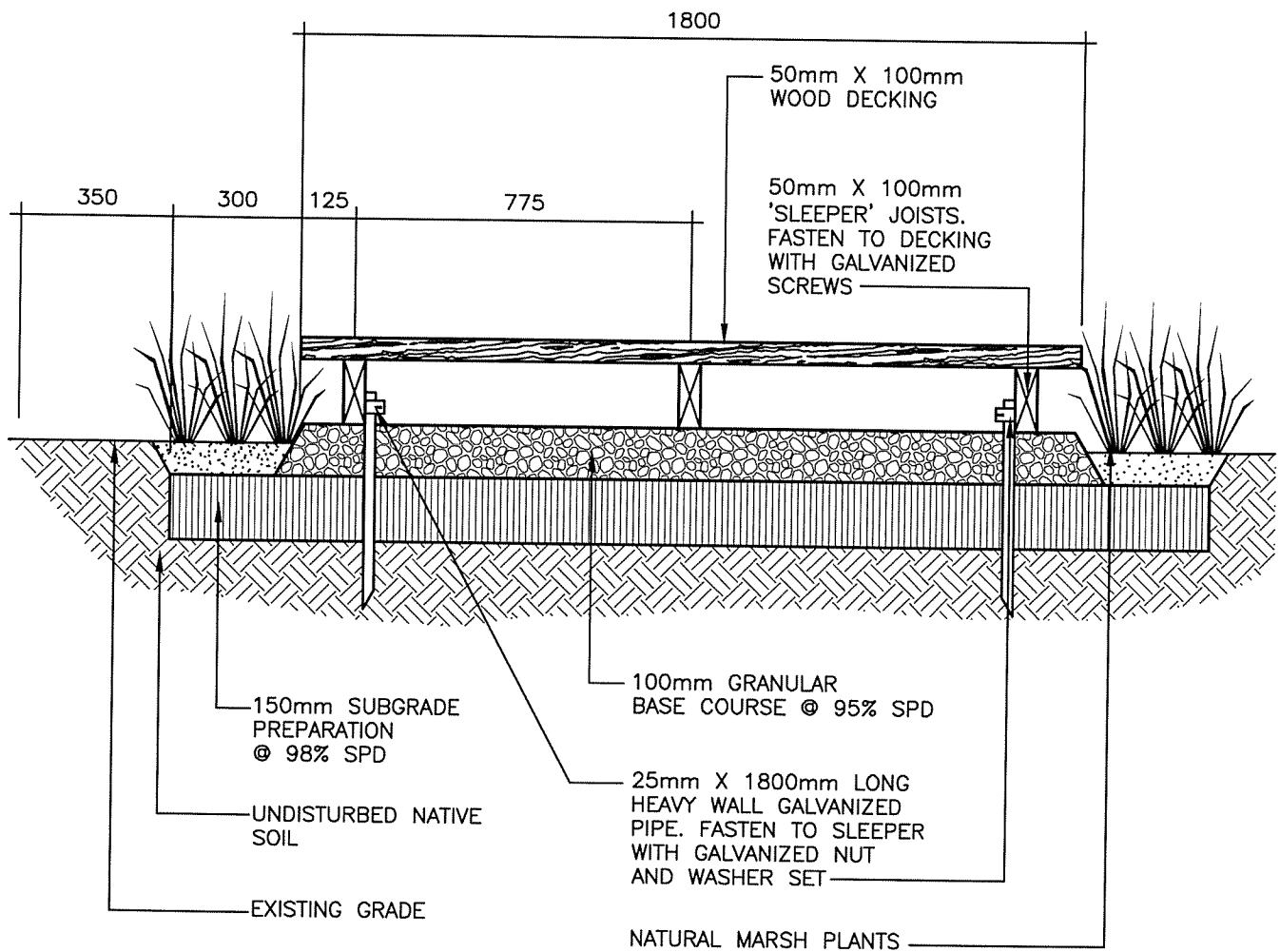
GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.
438 The Parkway, 2022 - 10 Avenue
Surrey, B.C. V4A 1A2
Tel: 604-551-5551
Fax: 604-551-5552
Web: www.gibbsbrown.com



TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



BOARDWALK WITH FOOTINGS



WOOD SLEEPER BOARDWALK

PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 14

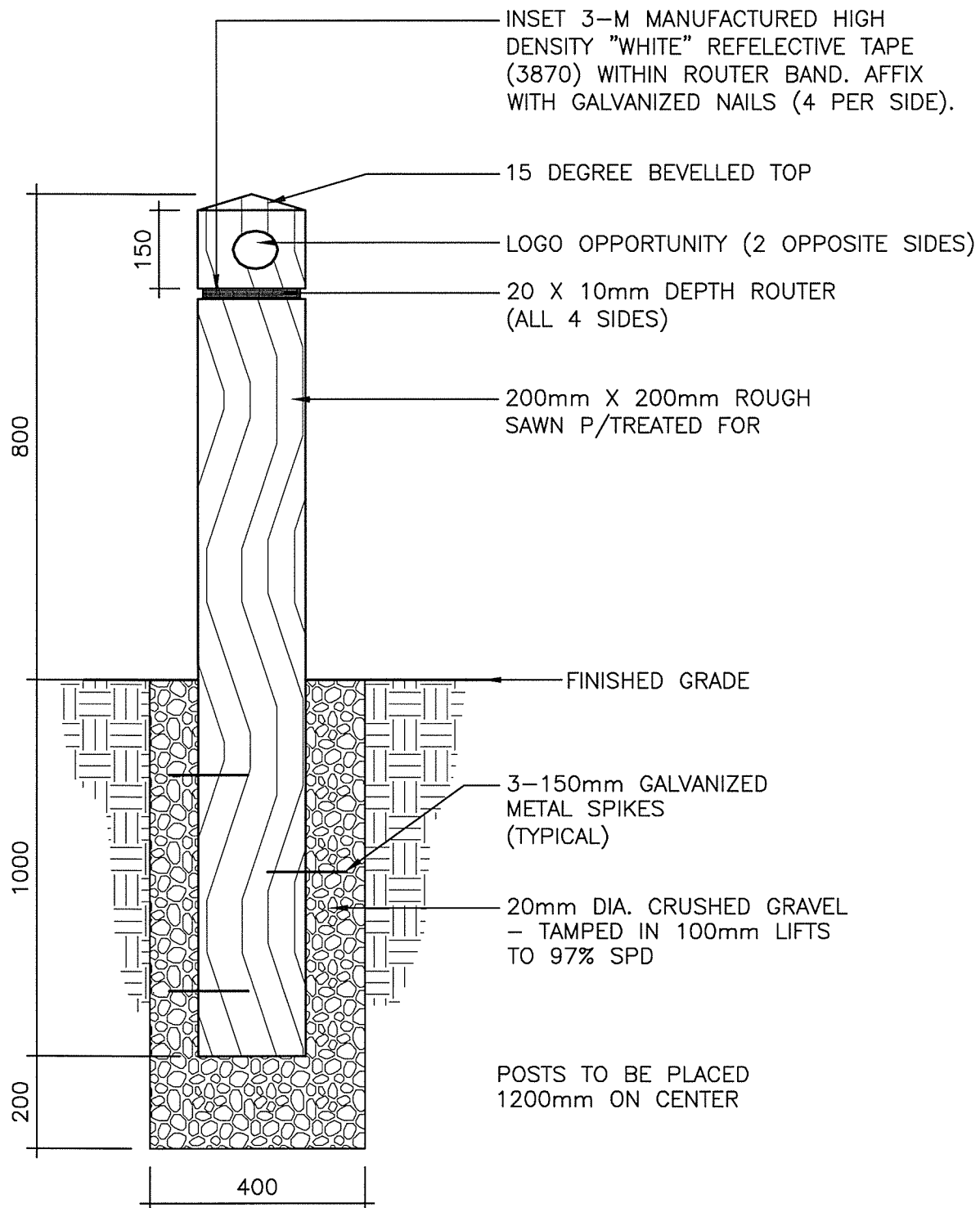
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 404 THE KENNEDY / 1700 170 Avenue
 Calgary, Alberta, Canada, T2T 0G5
 Tel: 403-243-5000
 Fax: 403-243-5001
 Email: info@gibbsbrown.com
 Web: www.gibbsbrown.com



TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



BOARDWALK WITHOUT FOOTINGS



PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 16

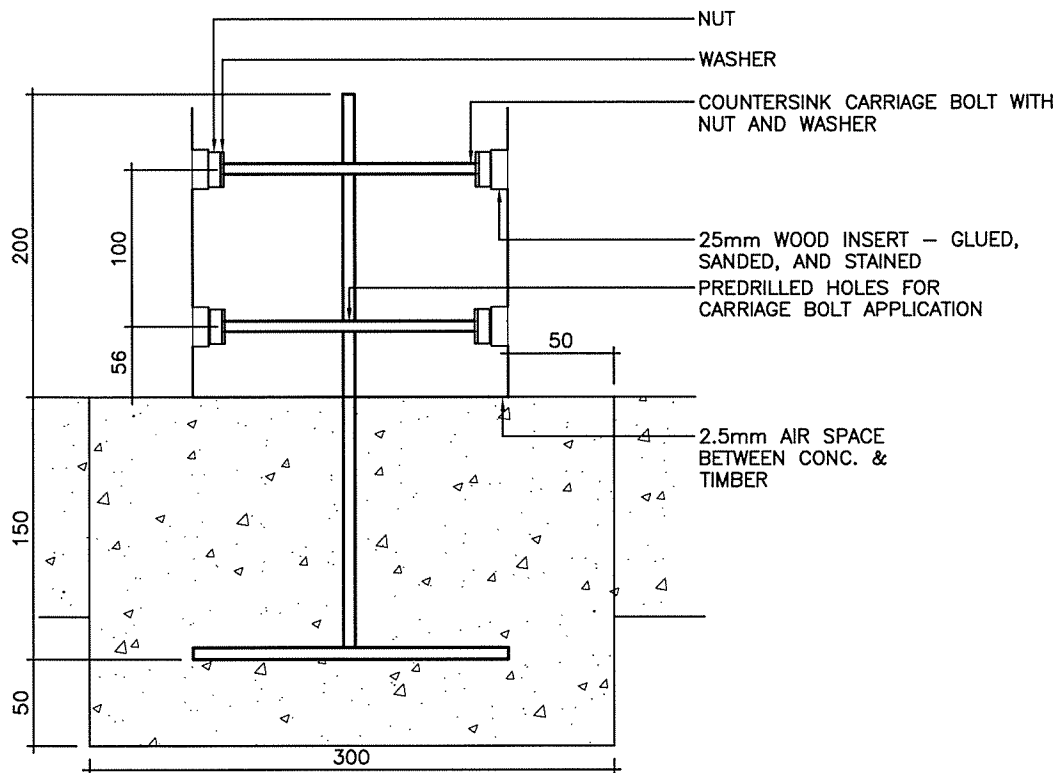
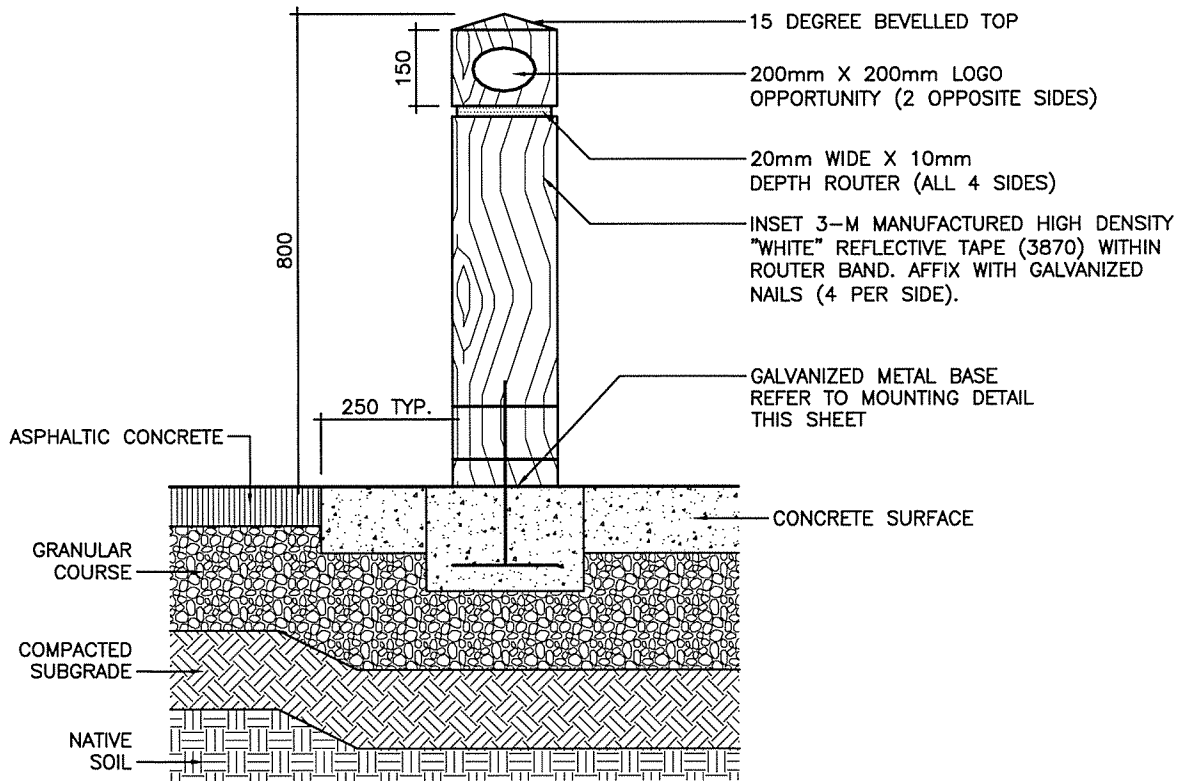
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 408 The West Street, Suite 102, 102 Avenue
 Richmond, British Columbia, V6V 1G6
 Tel: 779-33-0000
 Fax: 779-33-0000
 Email: gibs@brown.ca
 Web: www.gibbsbrown.ca



TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



BOLLARD IN GROUND



MOUNTING DETAIL

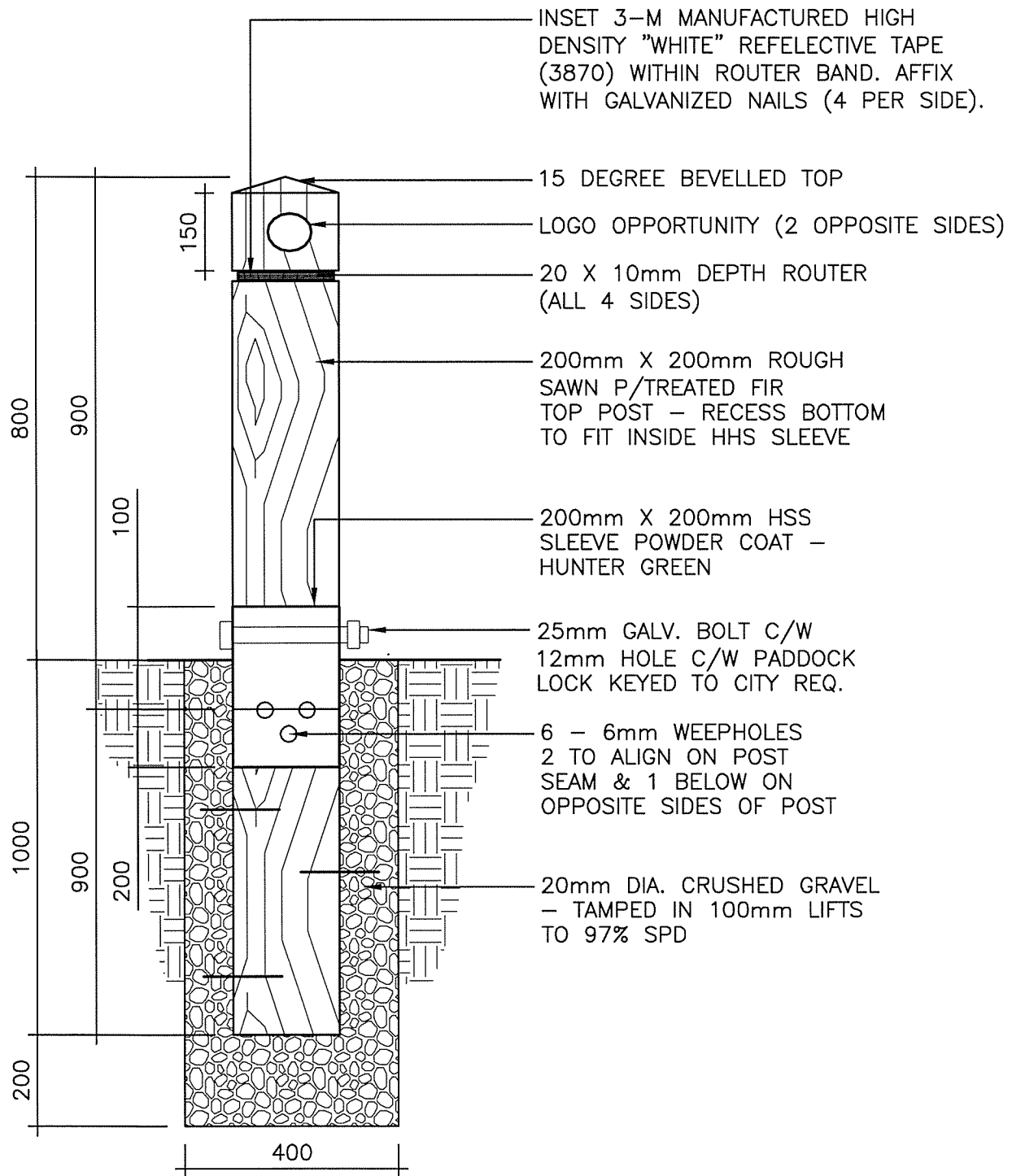
PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 17

GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 403 The Boulevard, 1020-102 Avenue
 Edmonton, Alberta, Canada T6E 1G3
 Tel: 781-421-5200
 Fax: 781-421-5205
 Email: info@gibbsbrown.com
 Web: www.gibbsbrown.com

TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



BOLLARD IN CONCRETE



POSTS TO BE PLACED
1200mm ON CENTER

PROJECT No. 04-1928
DATE: FEBRUARY 2005
APPROVED: APPROVED
SCALE: N.T.S.
DWG. No. TS - 18

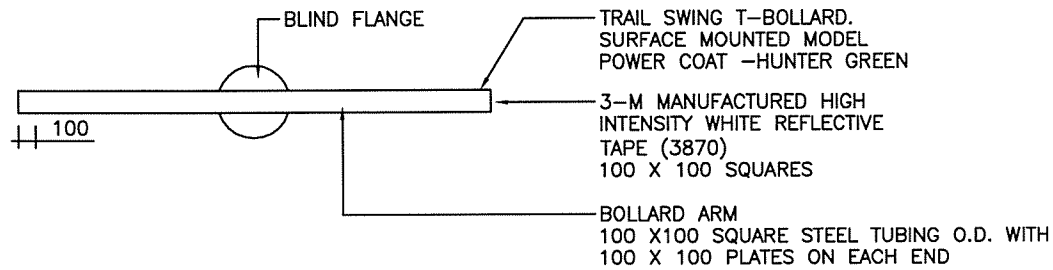
GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.
404 The Esplanade, 1000 - 102 Avenue
Edmonton, Alberta, Canada T6E 6P6
Tel: (780) 429-2000
Fax: (780) 429-2001
Email: gbs@gbrown.ca
Web: www.gbrown.ca



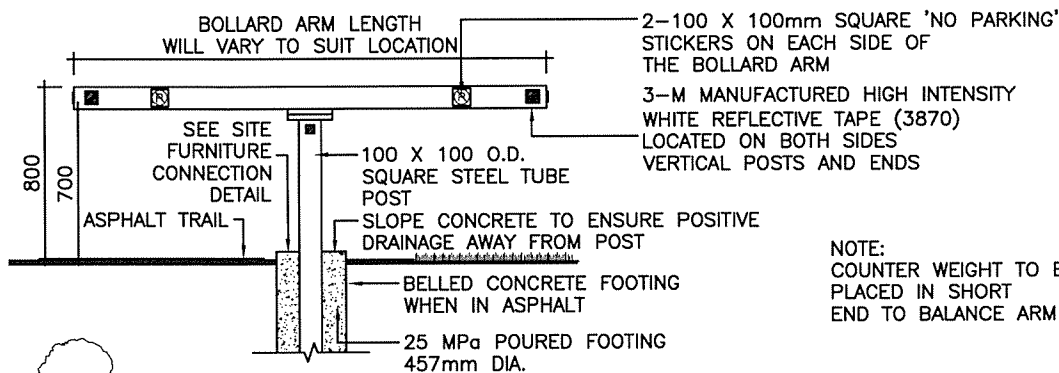
TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



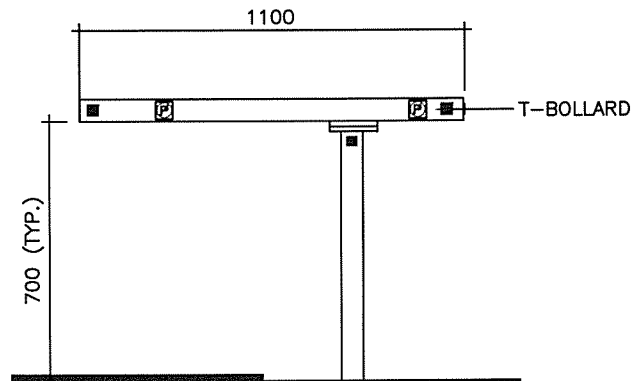
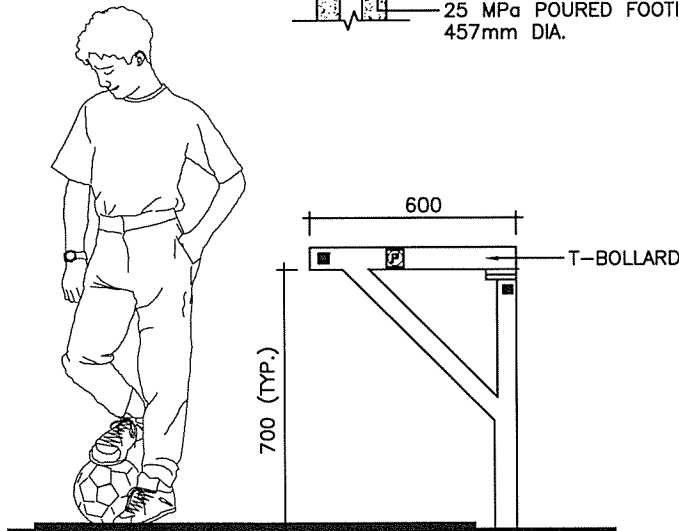
KNOCK-DOWN BOLLARD



PLAN



NOTE:
COUNTER WEIGHT TO BE
PLACED IN SHORT
END TO BALANCE ARM



NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS
- T-BOLLARDS AVAILABLE FROM (OR APPROVED EQUAL):
ROCKY MOUNTAIN RECREATION EQUIPMENT CANADA LTD.
16531 106 STREET.
EDMONTON, ALBERTA T5X 1W4
TEL: (780) 457-0988 FAX: (780) 476-3314
CONTACT: PAT ZELENAK

POWDERCOAT: HUNTER GREEN

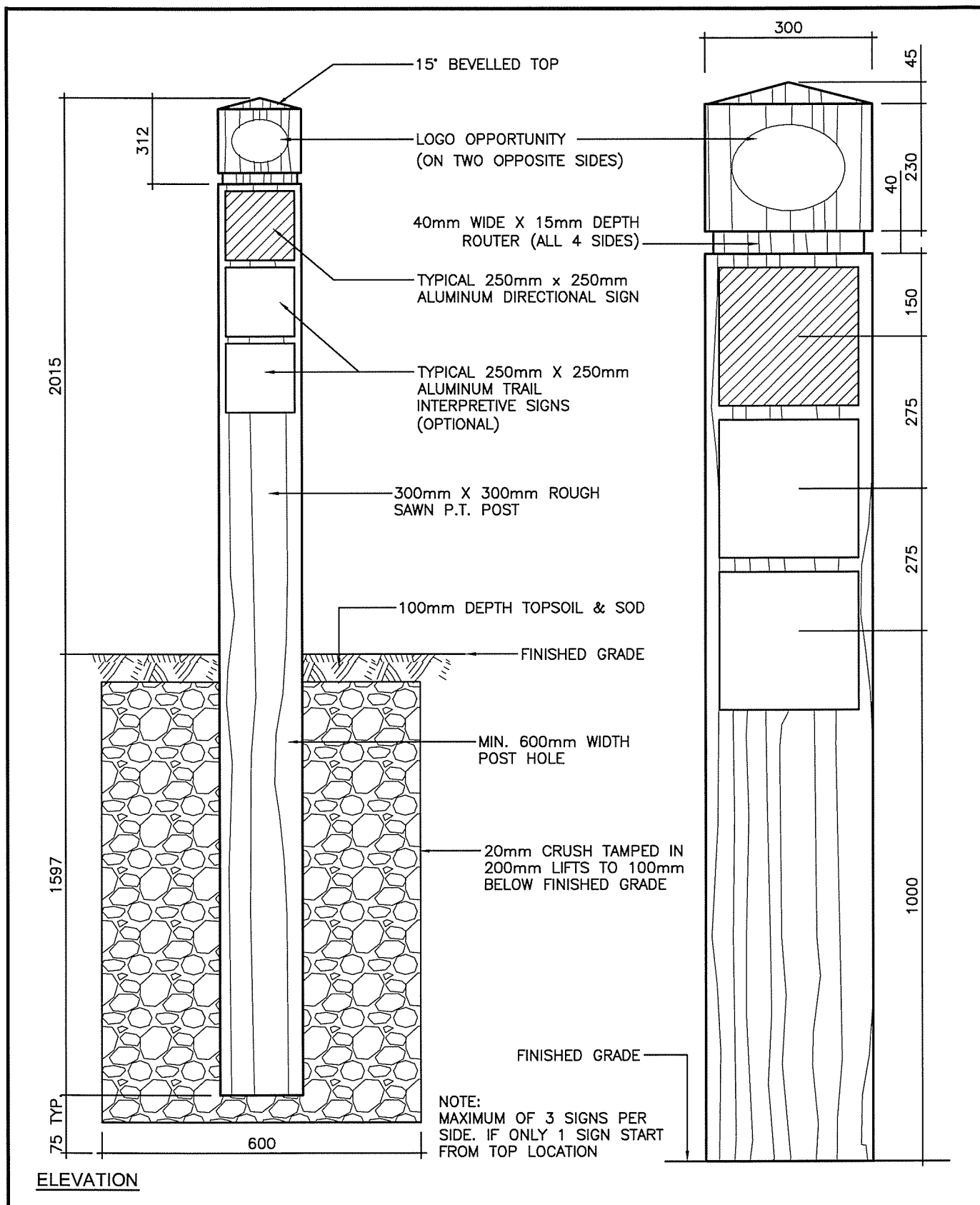
ELEVATION - T-BOLLARD MODELS

PROJECT No. 04-1928
DATE: FEBRUARY 2005
APPROVED: APPROVED
SCALE: N.T.S.
DWG. No. TS - 19

TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



SWING T-BOLLARD



PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 22

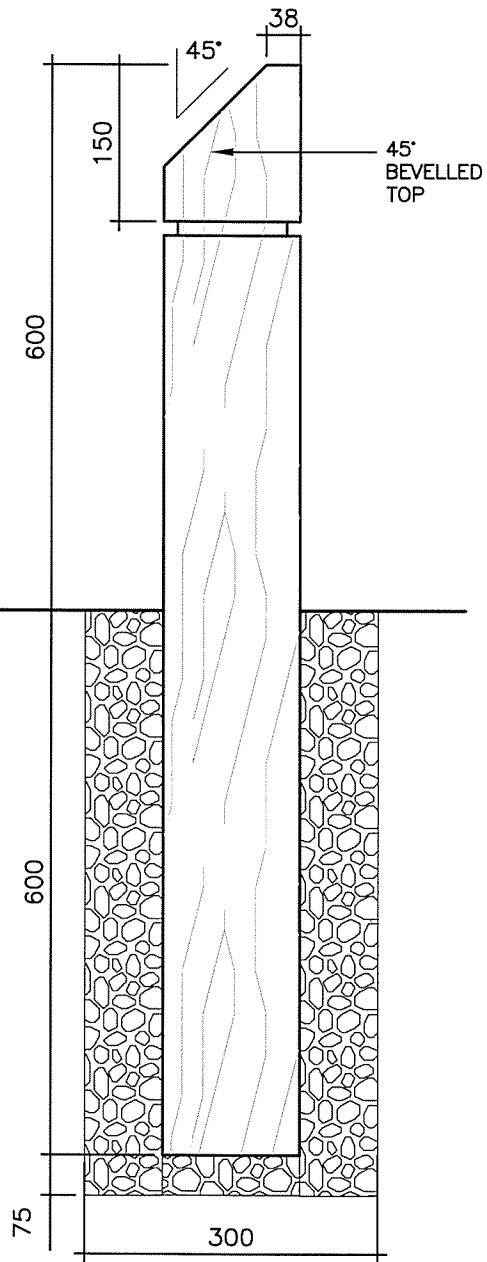
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 808-7th Street, Suite 100, St. John's
 St. John's, NL A1B 1X6
 Tel: (709) 754-2000
 Fax: (709) 754-2001
 Email: info@gibbsbrown.com
 Web: www.gibbsbrown.com



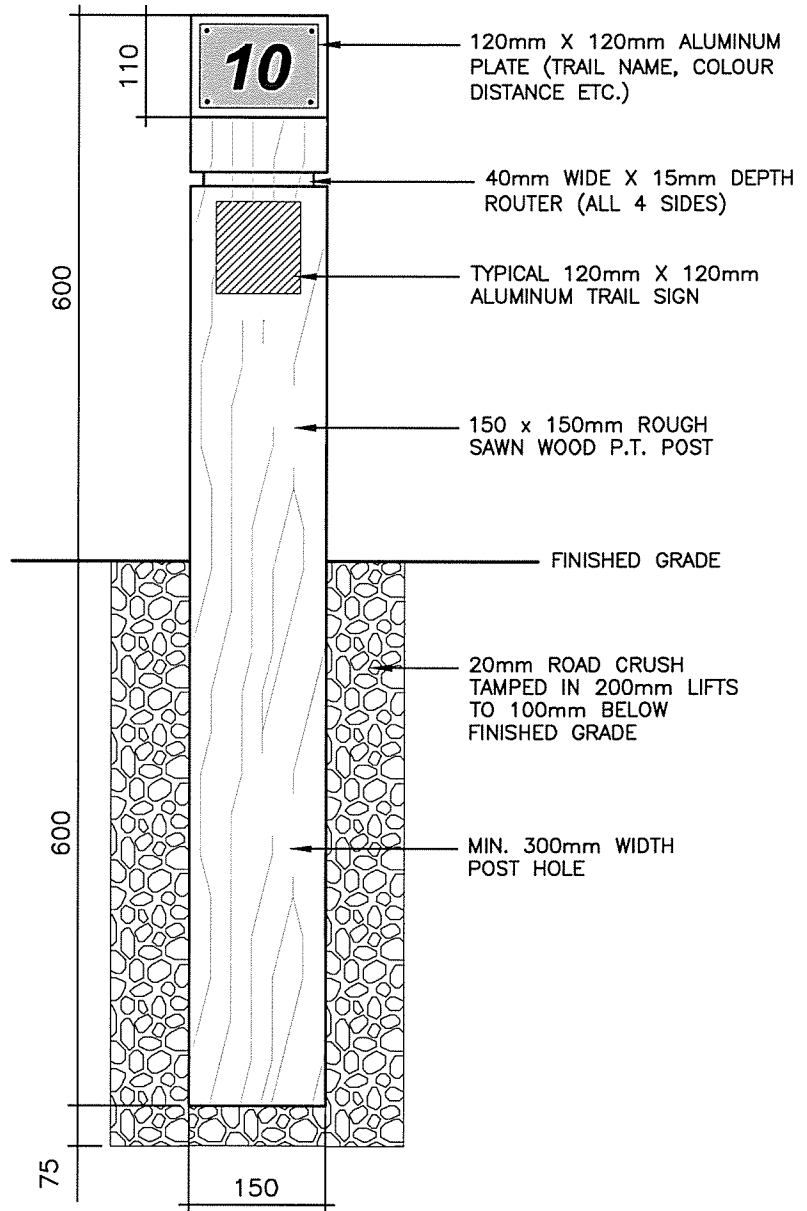
TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



PRIMARY TRAIL MARKER POST



SIDE ELEVATION



SECTION

PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 23

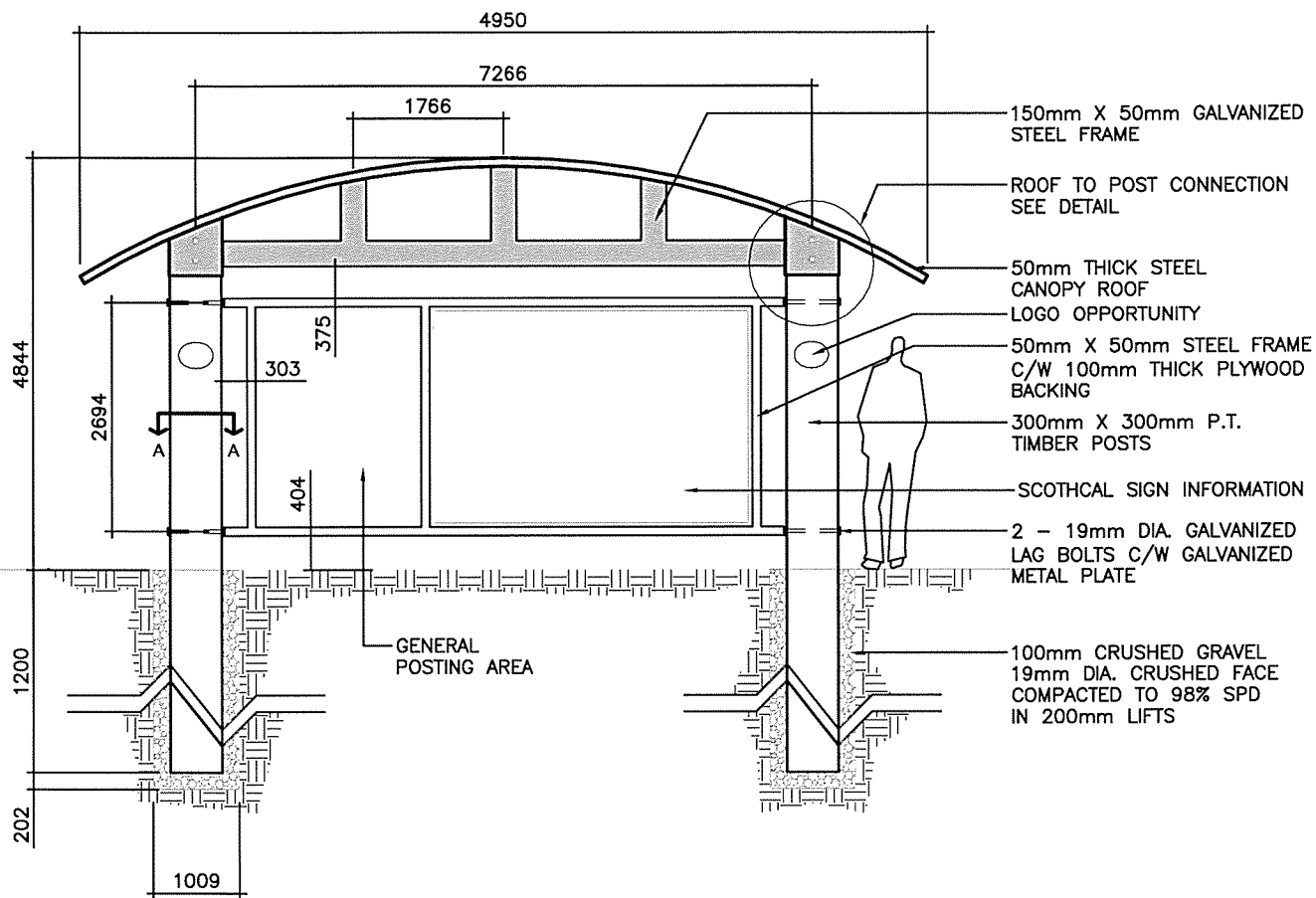
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 409 The Meadows, 5120 102 Avenue
 Edmonton, Alberta, Canada, T6J 2Z1
 Tel: 780-453-2100
 Fax: 780-453-0099
 Email: gbs@gblandscapes.com
 Web: www.gblandscapes.com



TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



TRAIL DISTANCE MARKER



ELEVATION

NOTES:

1. ALL DIMENSIONS IN MILLIMETERS
2. ALL SIGN INFORMATION PREPARED IN CONJUNCTION WITH DCI INC.
(CONTACT: RON PAZDER TEL: (780) 963-4238)
3. THE SIGN CAN EITHER BE PERMANENT (DURATECH) OR SEMI-PERMANENT (SCOTCHCAL).
4. ALL POST HOLES ARE TO BE PRE-DRILLED.
5. USE GASKETS (WHERE REQUIRED) AND CORROSION PROOF HINGE (COLOUR BRONZE).

PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 24

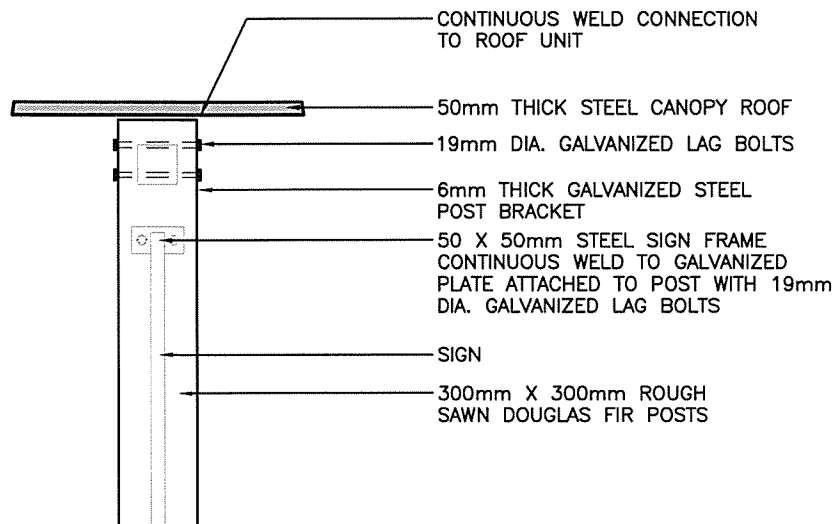
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 409 The Gardens, #101 - 101 Avenue
 Edmonton, Alberta, Canada T6C 1A2
 Tel: 780-425-5025
 Fax: 780-425-5086
 Email: gibs@brownarchitects.com
 Web: www.gibbsbrown.com



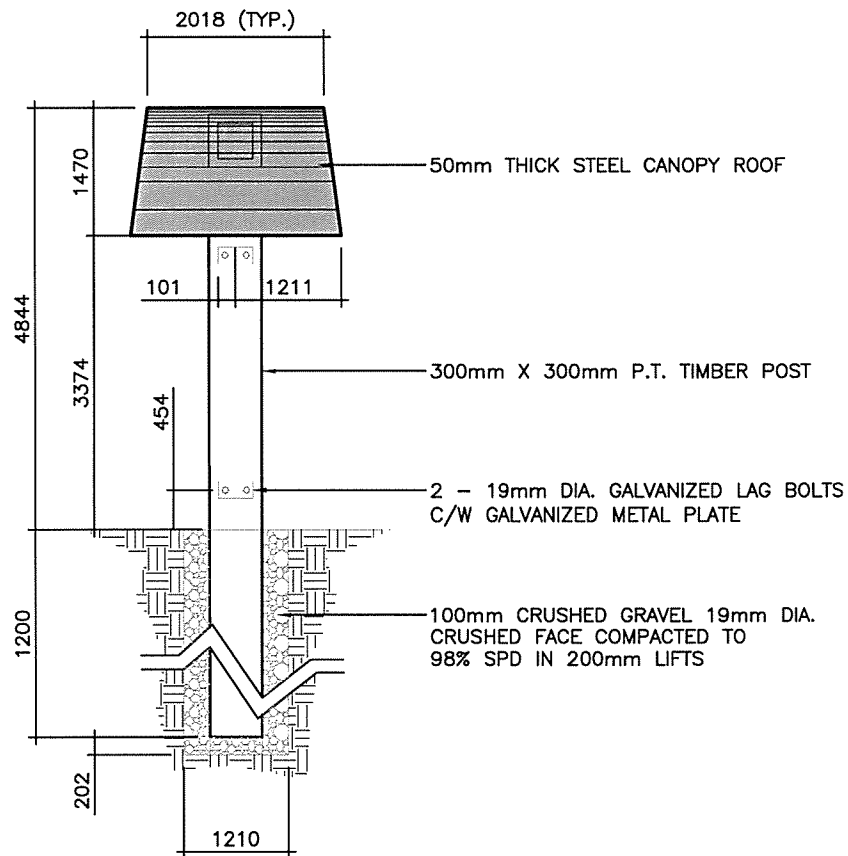
TOWN OF STONY PLAIN



TRAIL HEAD SIGN - TYPE I



ROOF TO POST CONNECTION DETAIL



SECTION A-A

PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 24

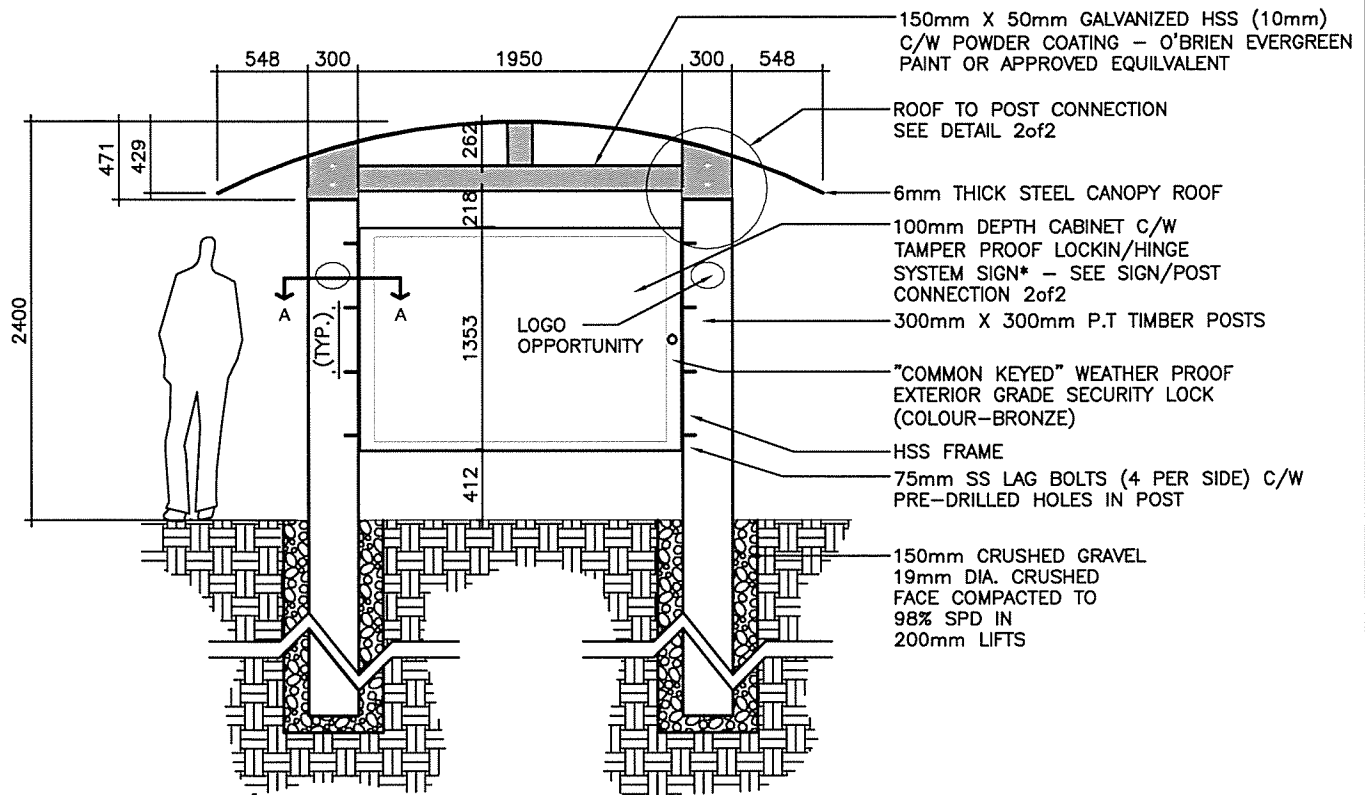
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 103 The Esplanade, #250 - 103 Avenue
 Edmonton, Alberta Canada T6E 2E8
 Tel: (780) 428-2525
 Fax: (780) 428-2526
 Email: info@gibbsandbrown.com
 Web: www.gibbsandbrown.com



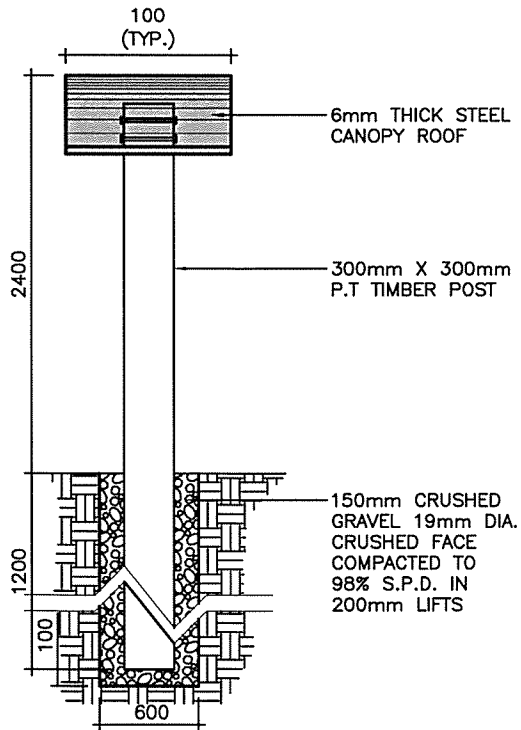
TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



TRAIL HEAD SIGN - TYPE 1



ELEVATION



SECTION A-A

NOTES:

1. ALL DIMENSIONS IN MILLIMETERS
2. ALL SIGN INFORMATION PREPARED IN CONJUNCTION WITH DCI INC. (CONTACT: RON PAZDER TEL: (780) 963-4238)
3. THE SIGN CAN EITHER BE PERMANENT (DURATECH) OR SEMI-PERMANENT (SCOTCHCAL).
4. ALL POST HOLES ARE TO BE PRE-DRILLED.
5. USE GASKETS (WHERE REQUIRED) AND CORROSION PROOF HINGE (COLOUR BRONZE).

PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 25

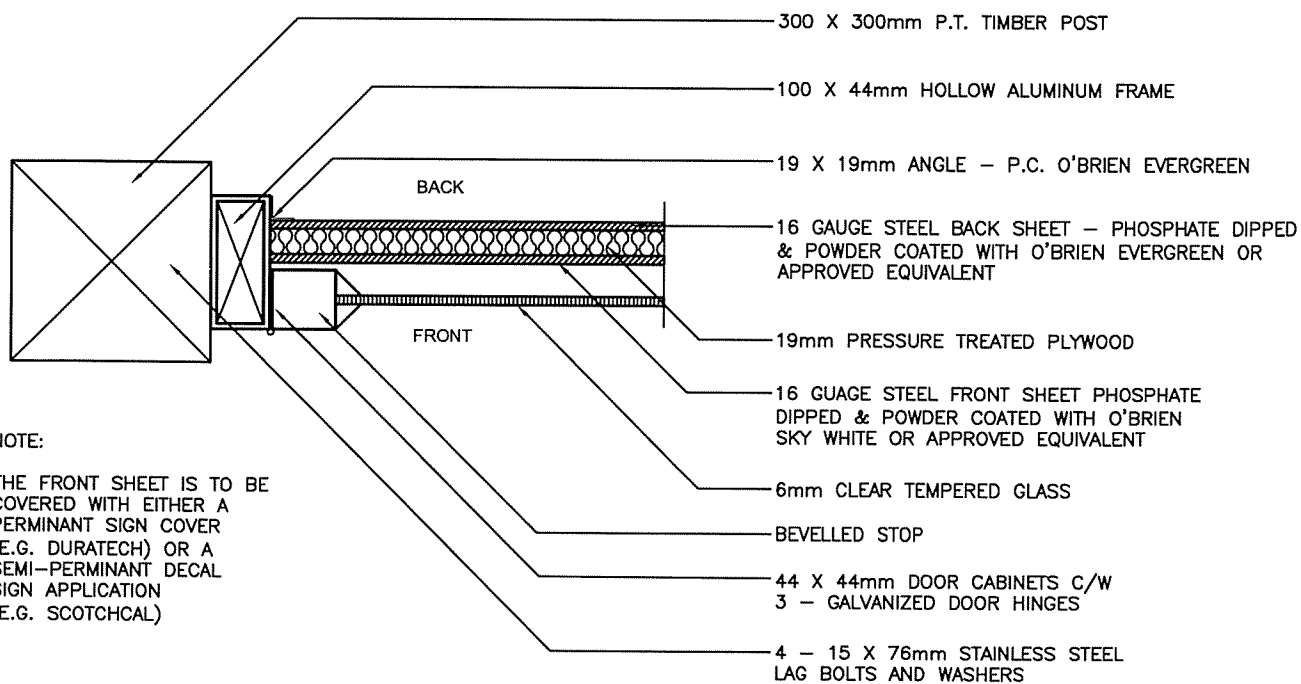
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD
 404 The Boulevard, 1200 - 122 Avenue
 River Valley, Calgary, T2C 2T6
 Tel: (403) 243-2020
 Fax: (403) 243-2020
 Email: gbs@gibbsbrown.com
 Web: www.gibbsbrown.com



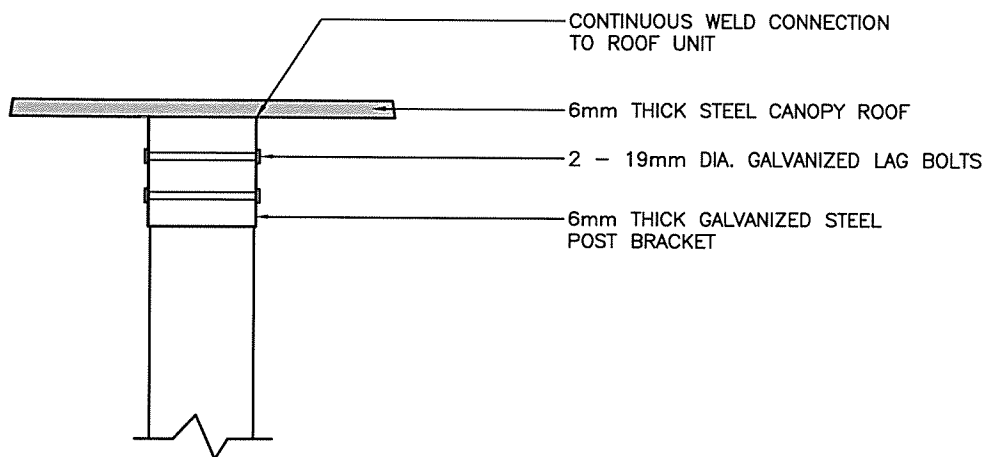
TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



TRAIL HEAD SIGN - TYPE II



SIGN/POST CONNECTION DETAIL



ROOF TO POST CONNECTION DETAIL

PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 25

TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



TRAIL HEAD SIGN - TYPE II



1. ALL DIMENSIONS IN MILLIMETERS
2. ALL SIGN INFORMATION PREPARED IN CONJUNCTION WITH DCI INC.
(CONTACT: RON PAZDER TEL: (780) 963-4238)
3. THE SIGN CAN EITHER BE PERMANENT (DURATECH) OR SEMI-PERMANENT (SCOTCHCAL).
4. ALL POST HOLES ARE TO BE PRE-DRILLED.
5. USE GASKETS (WHERE REQUIRED) AND CORROSION PROOF HINGE (COLOUR BRONZE).

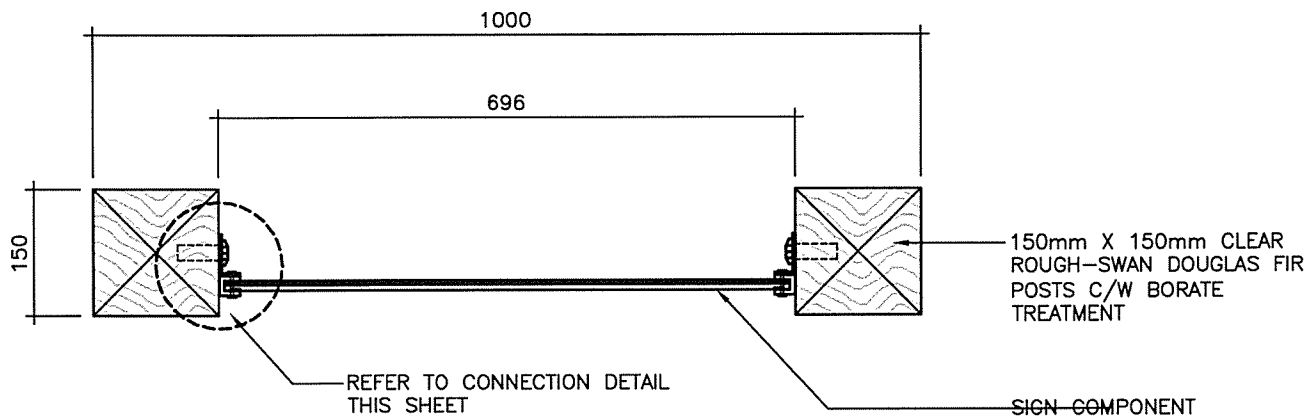
PROJECT No. 04-1928
DATE: FEBRUARY 2005
APPROVED: APPROVED
SCALE: N.T.S.
DWG. No. TS - 26



Town of
Stony Plain

The Town with the Diamond Road

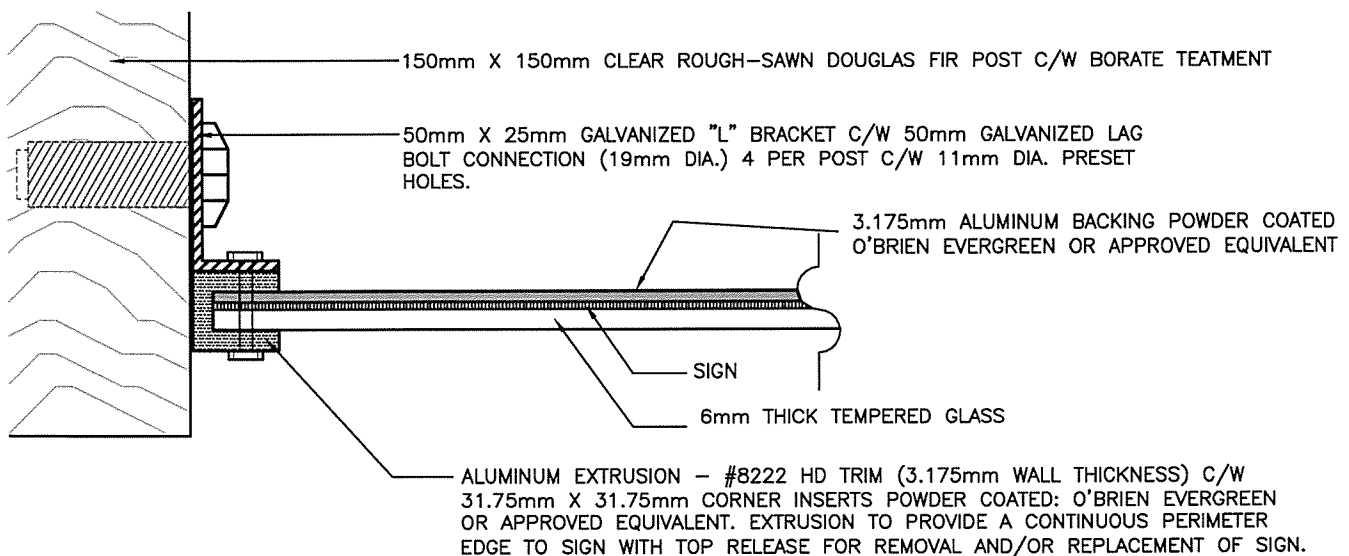
1 OF 2



NOTES:

1. ALL DIMENSIONS IN MILLIMETERS
2. ALL SIGN INFORMATION PREPARED IN CONJUNCTION WITH DCI INC.
(CONTACT: RON PAZDER TEL: (780) 963-4238)
3. THE SIGN CAN EITHER BE PERMANENT (DURATECH) OR SEMI-PERMANENT (SCOTCHCAL).
4. ALL POST HOLES ARE TO BE PRE-DRILLED.
5. USE GASKETS (WHERE REQUIRED) AND CORROSION PROOF HINGE (COLOUR BRONZE).
7. ALL FRAME/SIGN CONNECTIONS TO BE PLUG WELDED.

PLAN



SIGN TO POST CONNECTION DETAIL

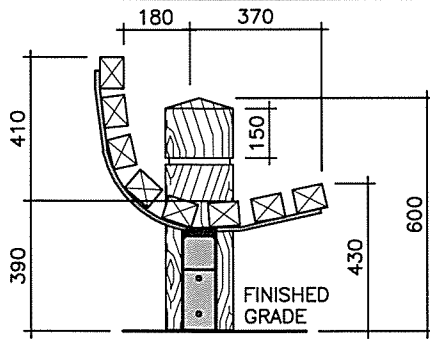
PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 27

GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 408 The Meadows, 1220-122 Avenue
 Prince George, British Columbia V1N 1Y4
 Tel: (250) 561-5100
 Fax: (250) 561-5101
 Email: gibs@brown.ca
 Web: www.gibbsbrown.ca

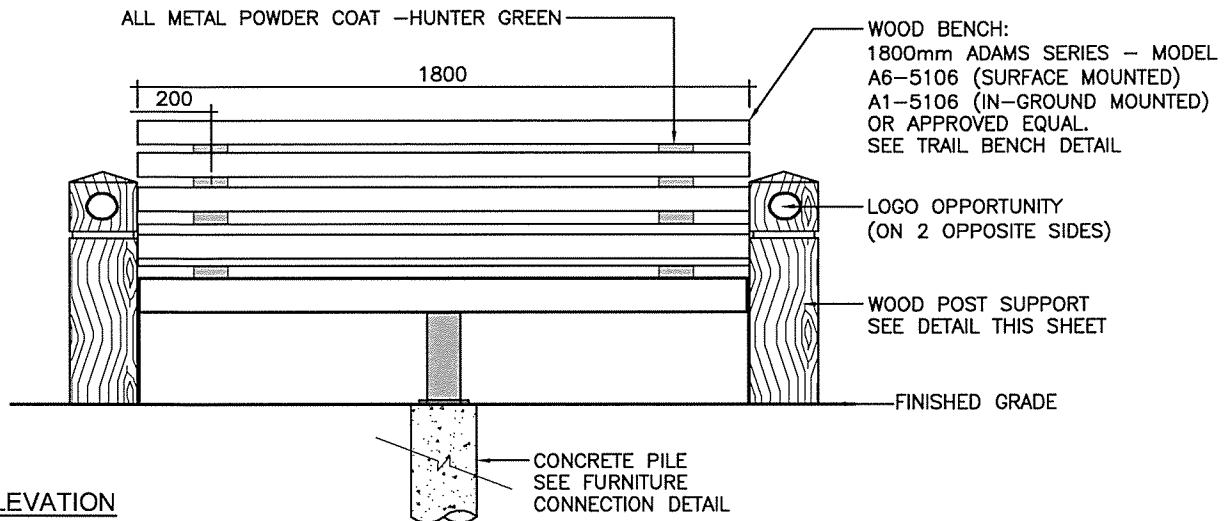


TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS

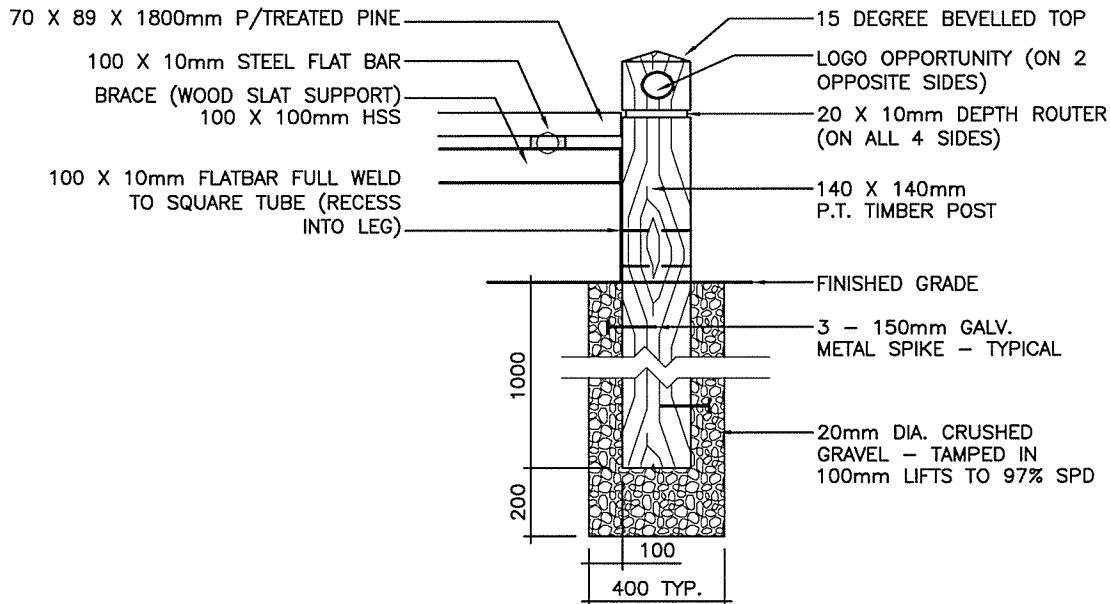
INTERPRETATIVE TRAIL SIGN



SECTION



ELEVATION



WOOD POST SUPPORT

PROJECT No. **04-1928**
 DATE: **FEBRUARY 2005**
 APPROVED: **APPROVED**
 SCALE: **N.T.S.**
 DWG. No. **TS - 28**

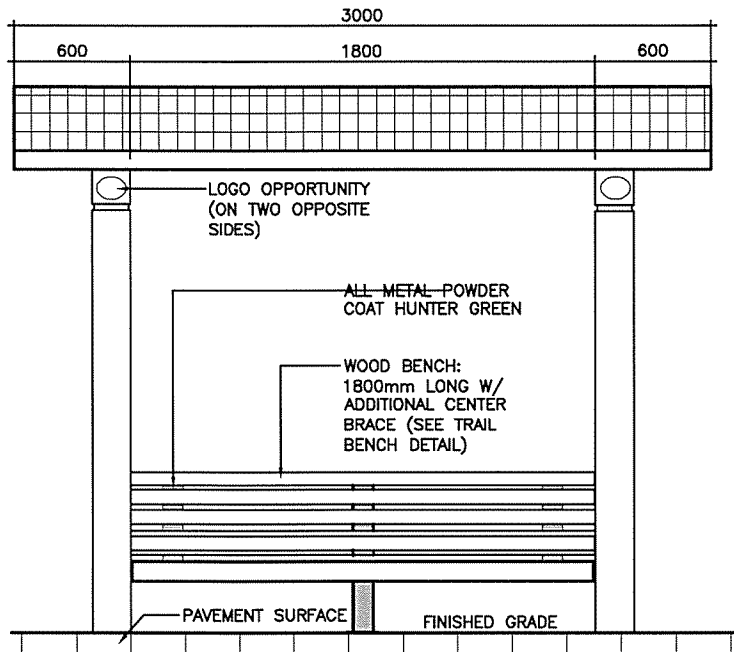
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 104-1111 Highway 100, Suite 100
 Edmonton, Alberta, Canada T5P 1C6
 Tel: 780-480-0000
 Fax: 780-480-0001
 Email: gibs@brownbrown.com
 Web: www.brownbrown.com



TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



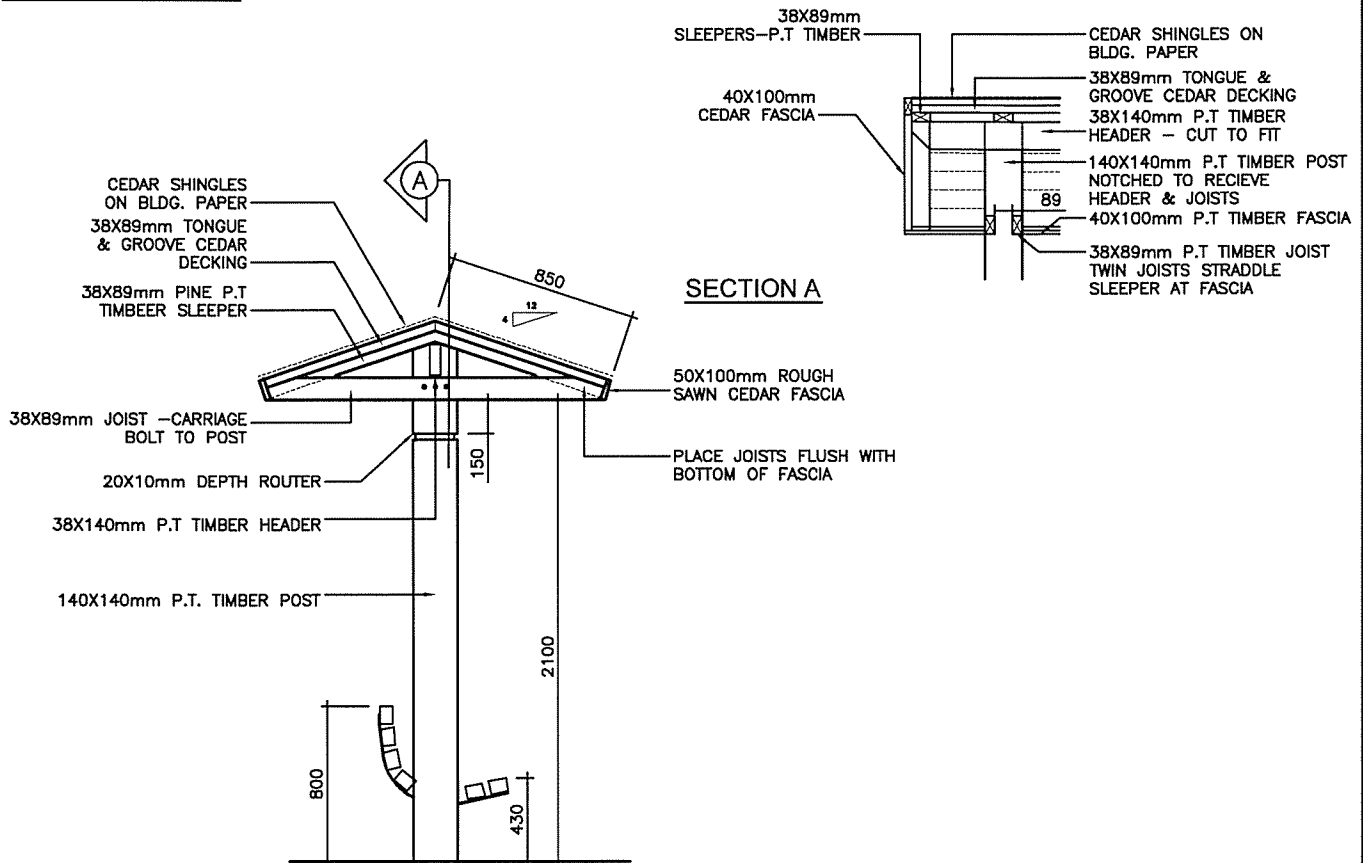
BENCH W/ WOOD POST SUPPORTS



FRONT ELEVATION

NOTES:

1. ALL DIMENSIONS IN MILLIMETERS
2. BEVELLING'S, ROUTING, OF TIMBERS TO BE DONE PRIOR TO INSTALLATION IN THE SHOP.
3. ALL VISIBLE METAL TO BE POWDER COATED - HUNTER GREEN



SIDE ELEVATION

PROJECT No. 04-1928

DATE: FEBRUARY 2005

APPROVED: APPROVED

SCALE: N.T.S.

DWG. No. TS - 29

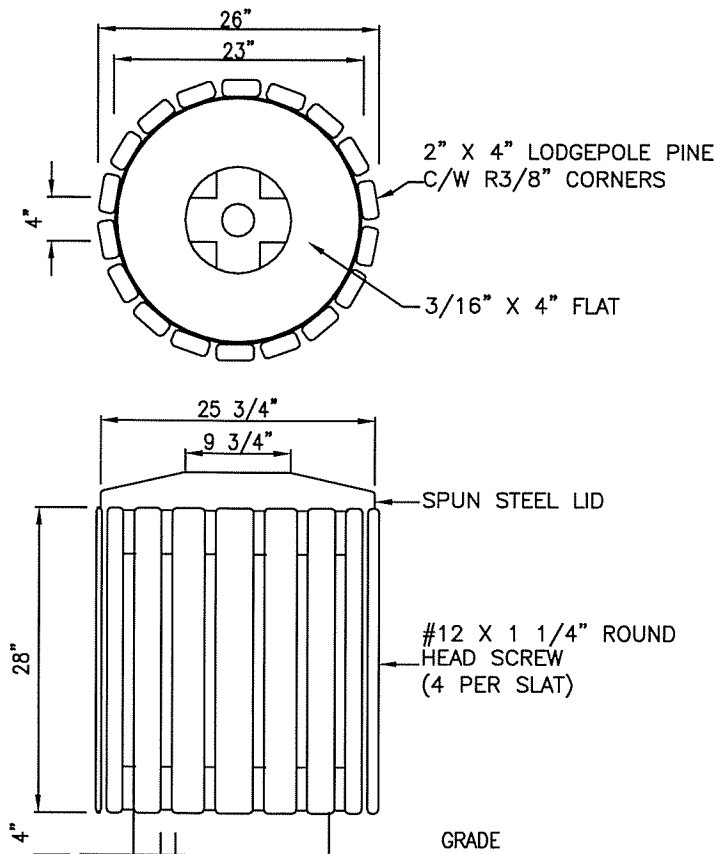
GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.
130 The Woodlands Road, 102 Avenue
Birmingham, Alberta Canada T3J 2A4
Tel: (403) 462-5000
Fax: (403) 462-5001
Web: www.gibbsbrown.com



TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



COVERED TRAIL BENCH



ADAMS STYLE LITTER CONTAINER W/ RAIN LID:
MODEL # ALC-4 (SURFACE MOUNT) — OR APPROVED EQUAL

SPECIFICATIONS

WOOD:

LOGEPOLE PINE — PRESSURE TREATED WITH CCA SALTS TO CSA 080

METAL:

4" FLAT STEEL FRAME. THE SPUN STEEL RAIN LID IS ATTACHED BY A SHORT CHAIN. THE LITTER CONTAINER IS SUPPLIED WITH A STANDARD 75 LITRE (20 US GALLONS) GALVANIZED CAN.

FINISH:

AFTER SANDBLASTING THE STEEL, IT IS COATED WITH A PROFESSIONALLY APPLIED BAKED-ON POLYESTER POWDER FOR EXTREME DURABILITY. STANDARD BLACK POWDERCOAT

HARDWARE:

VANDAL RESISTANT SOCKET DRIVE ELECTROPLATED WOOD SCREWS.

NOTE:

PICNIC TABLE AVAILABLE FROM (OR APPROVED EQUAL):

ROCKY MOUNTAIN RECREATION EQUIPMENT CANADA LTD.
16531 106 STREET.
EDMONTON, ALBERTA
T5X 1W4
TEL: (780) 457-0988
FAX: (780) 476-3314
CONTACT: PAT ZELENAK

PROJECT No. 04-1928

DATE: FEBRUARY 2005

APPROVED: APPROVED

SCALE: N.T.S.

DWG. No. TS - 30

GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.

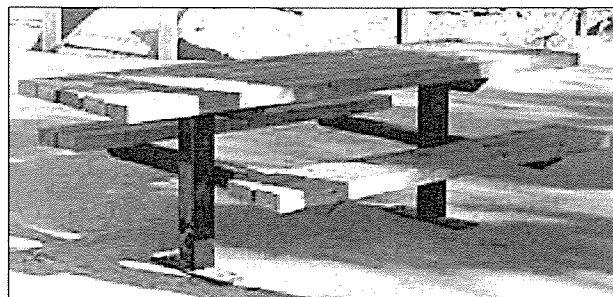
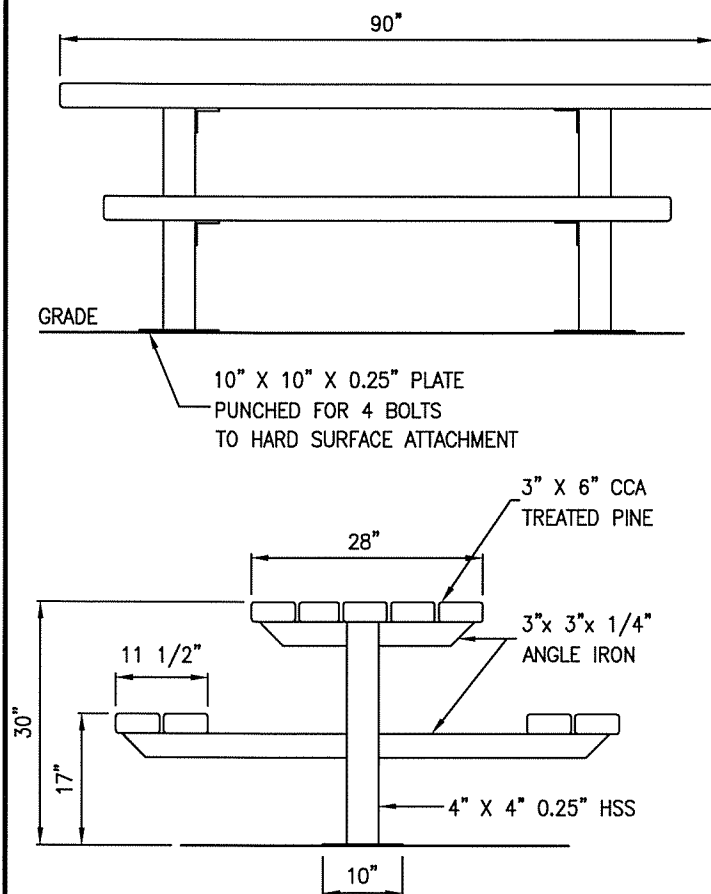
408 The Bowhall, Suite 100, 401 Avenue
Edmonton, Alberta, Canada T5E 0A6
Tel: (780) 462-5020
Fax: (780) 462-5021
Email: gibs@brown.ca
Web: www.gibbsbrown.ca



TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



WASTE RECEPTACLE



THETIS PICNIC TABLE
MODEL # T4 (SURFACE MOUNT) – OR APPROVED EQUAL

SPECIFICATIONS

WOOD:

THESE NOMINAL 6' TABLES HAVE 3 X 6 (NOMINAL) RAILS WITH ALL EDGES EASED 3/8" RADIUS. THE "S" TABLES ARE SQUARE WITH 3 X 4 (NOMINAL) TIMBERS. THE WOOD IS LODGEPOLE PINE PRESSURE TREATED WITH CCA SALTS TO CSA 080.

METAL:

THE EXTREMELY HEAVY STRUCTURAL STEEL FRAMES ARE CONTINUOUSLY WELDED TOGETHER PRIOR TO POWDER COATING.

FINISH:

AFTER SANDBLASTING THE STEEL, IT IS COATED WITH A PROFESSIONALLY APPLIED BAKED-ON POLYESTER POWDER FOR EXTREME DURABILITY. STANDARD BLACK POWDERCOAT.

HARDWARE:

ZINC PLATED CARRIAGE BOLTS WITH VANDAL RESISTANT NYLON INSERT LOCKING NUTS.

NOTE:

PICNIC TABLE AVAILABLE FROM (OR APPROVED EQUAL):

ROCKY MOUNTAIN RECREATION
EQUIPMENT CANADA LTD.
16531 106 STREET.
EDMONTON, ALBERTA
T5X 1W4
TEL: (780) 457-0988
FAX: (780) 476-3314
CONTACT: PAT ZELENAK

PROJECT No. 04-1928

DATE: FEBRUARY 2005

APPROVED: APPROVED

SCALE: N.T.S.

DWG. No. TS - 31

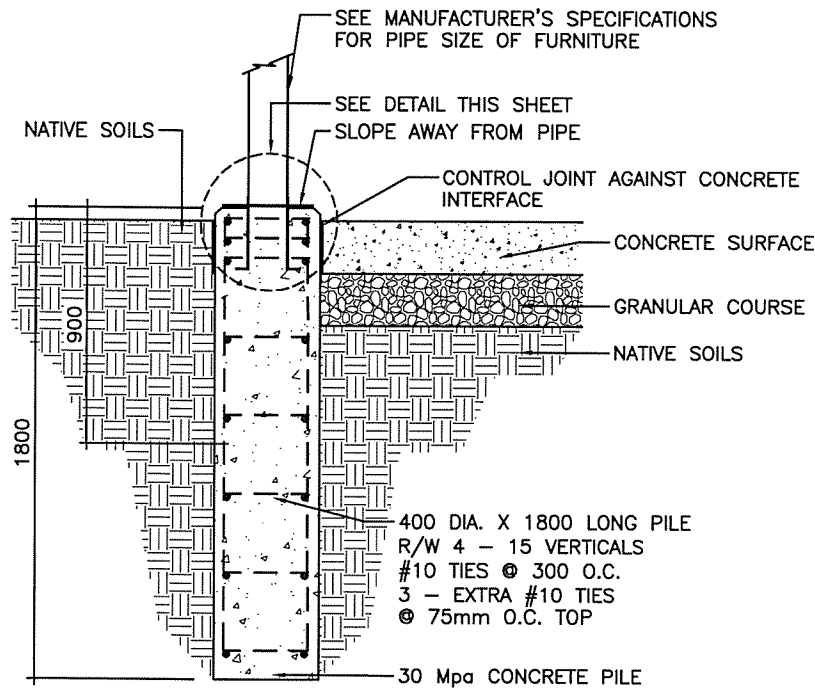
GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.
408 THE BARNYARD, 1000 - 100 AVENUE
EDMONTON, ALBERTA, CANADA T6A 2A4
TEL: (780) 457-0988
FAX: (780) 476-3314
EMAIL: gibs@brown.com
WEB: www.gibbs-brown.com



TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS

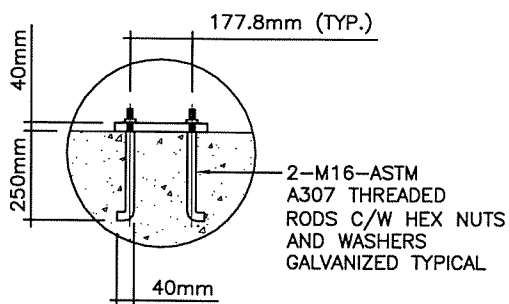


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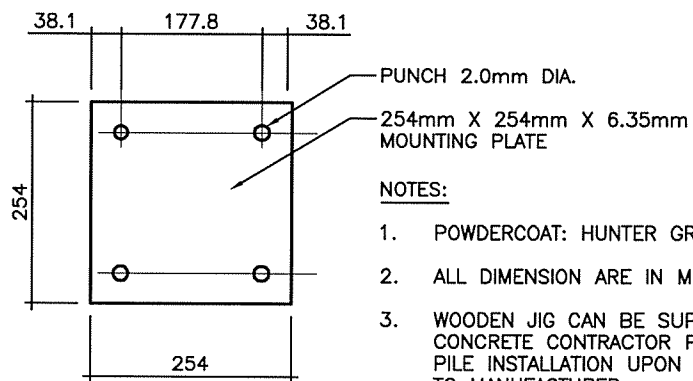


NOTES:

1. FURNITURE BASE PLATE CAN BE HILTI-HIT INTO CONCRETE SURFACE.
2. ALL UTILITIES TO BE STAKED BY ALBERTA ONE CALL PRIOR TO DIGGING.
3. LOCATIONS TO BE STAKED BY CONTRACTOR AND APPROVED BY TOWN REPRESENTATIVE OR CONSULTANT PRIOR TO INSTALLATION.



BASE CONNECTION



NOTES:

1. POWDERCOAT: HUNTER GREEN
2. ALL DIMENSION ARE IN MILLIMETERS
3. WOODEN JIG CAN BE SUPPLIED TO CONCRETE CONTRACTOR PRIOR TO PILE INSTALLATION UPON REQUEST TO MANUFACTURER.

BASE PLATE

PROJECT No. **04-1928**
 DATE: **FEBRUARY 2005**
 APPROVED: **APPROVED**
 SCALE: **N.T.S.**
 DWG. No. **TS - 32**

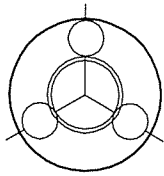
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 158 The Parkway, Suite 100, St. John's, NL A1B 1X6
 Tel: (709) 576-1111
 Fax: (709) 576-1112
 Web: www.gibbsbrown.com



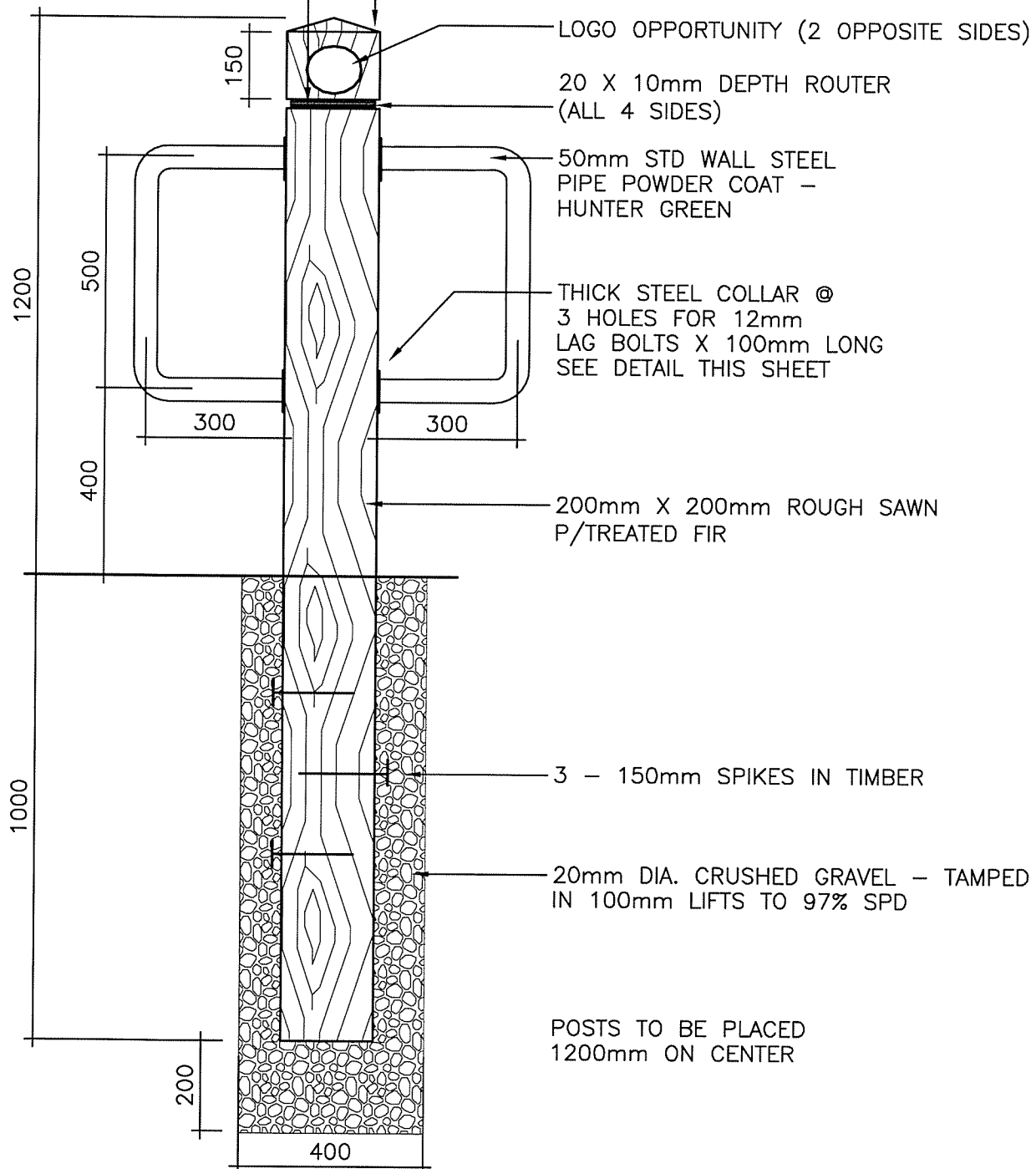
TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



FURNITURE CONNECTION -
 SURFACE MOUNTED



COLLAR CONNECTION



PROJECT No. **04-1928**

DATE: **FEBRUARY 2005**

APPROVED: **APPROVED**

SCALE: **N.T.S.**

DWG. No. **TS - 33**

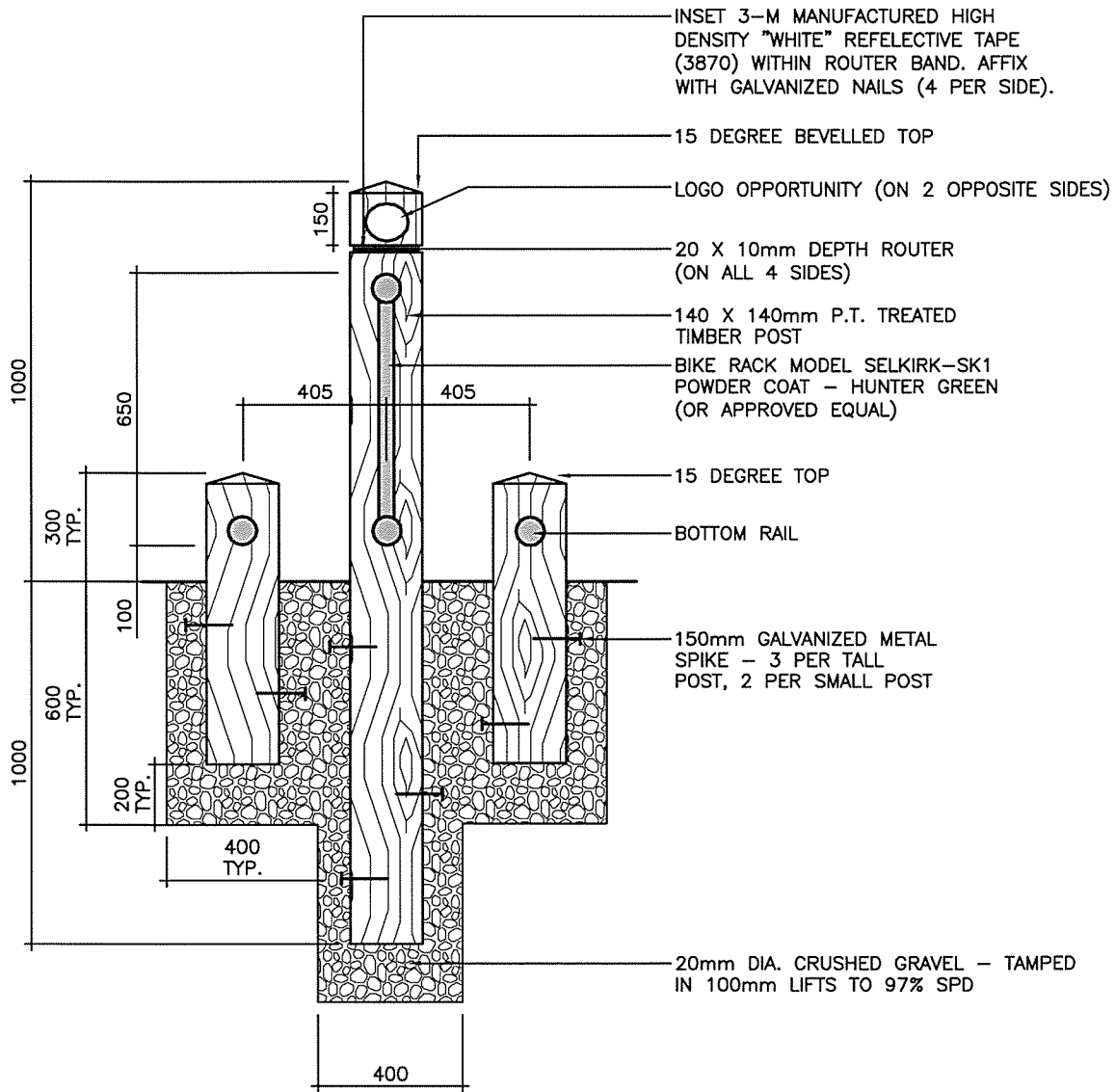
GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.
404 17th Avenue SW, Suite 100, 17th Ave SW, 17th Ave SW
Edmonton, Alberta T6C 1T7
Tel: 780-422-2222
Fax: 780-422-2222
www.gibbsandbrown.com



TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



BICYCLE RACK - SINGLE



NOTE:

BICYCLE RACK & RAILS AVAILABLE FROM (OR APPROVED EQUAL):

ROCKY MOUNTAIN RECREATION EQUIPMENT CANADA LTD.
16531 106 STREET.
EDMONTON, ALBERTA
T5X 1W4
TEL: (780) 457-0988
FAX: (780) 476-3314
CONTACT: PAT ZELENIAK

MODEL NO: SELKIRK - SK1
POWDER COAT: HUNTER GREEN

PROJECT No. 04-1928
DATE: FEBRUARY 2005
APPROVED: APPROVED
SCALE: N.T.S.
DWG. No. TS - 34

GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.
400 THE BARDNET AVENUE - 100 AVENUE
EDMONTON, ALBERTA T6C 1E4
TEL: (780) 450-0001
FAX: (780) 450-0001
E-MAIL: g.brown@gibbsbrown.com
WWW.GIBBSBROWN.COM



TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



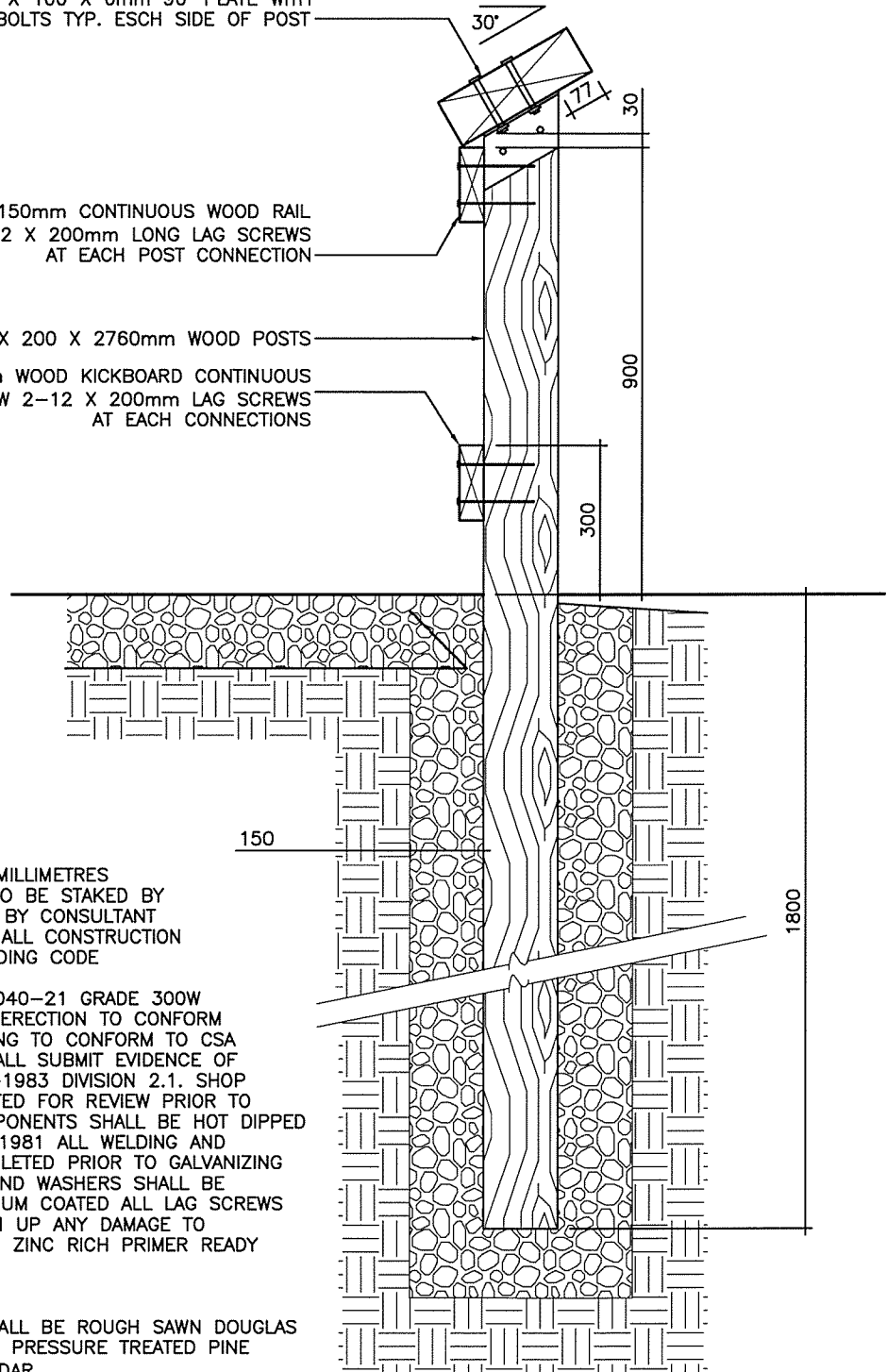
TRAIL BICYCLE RACK - GROUP

100 X 300mm WOOD HANDRAIL CONTINUOUS
C/W 100 X 100 X 6mm 90° PLATE WITH
4-12mm DIA. BOLTS TYP. ESCH SIDE OF POST

50 X 150mm CONTINUOUS WOOD RAIL
C/W 2-12 X 200mm LONG LAG SCREWS
AT EACH POST CONNECTION

200 X 200 X 2760mm WOOD POSTS

50 X 150mm WOOD KICKBOARD CONTINUOUS
C/W 2-12 X 200mm LAG SCREWS
AT EACH CONNECTIONS



NOTES:

1. ALL MEASUREMENTS ARE IN MILLIMETRES
2. LAYOUT OF HANDRAIL AREA TO BE STAKED BY CONTRACTOR AND APPROVED BY CONSULTANT
3. CONTRACTOR SHALL ENSURE ALL CONSTRUCTION CONFORMS TO ALBERTA BUILDING CODE
4. STRUCTURAL STEEL:
STRUCTURAL STEEL TO CSA 040-21 GRADE 300W DETAILING, FABRICATION AND ERECTION TO CONFORM TO CAN3-S16, I-M78 WELDING TO CONFORM TO CSA W59-1984 FABRICATIONS SHALL SUBMIT EVIDENCE OF CERTIFICATIONS CSA W47, 1-1983 DIVISION 2.1. SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW PRIOR TO FABRICATION ALL STEEL COMPONENTS SHALL BE HOT DIPPED GALVANIZED TO CSA G164-M1981 ALL WELDING AND FABRICATION SHALL BE COMPLETED PRIOR TO GALVANIZING ALL BOLTS, SCREWS, NUTS AND WASHERS SHALL BE CSA G164-M1981, OR CADMIUM COATED ALL LAG SCREWS SHALL BE GALVANIZED TOUCH-UP ANY DAMAGE TO GALVANIZING WITH TOUCH-UP ZINC RICH PRIMER READY MIXED TO CGSB 1-GP181M

STRUCTURAL SAWN TIMBER:
HANDRAILS, POSTS, DECK SHALL BE ROUGH SAWN DOUGLAS FIR OR CEDAR BEAMS TO BE PRESSURE TREATED PINE (APPEARANCE GRADE) OR CEDAR.
ALL WOOD TO BE PRESSURE TREATED TO CSA

PROJECT No. 04-1928

DATE: FEBRUARY 2005

APPROVED: APPROVED

SCALE: N.T.S.

DWG. No. TS - 35

GIBBS & BROWN
LANDSCAPE ARCHITECTS LTD.
400 McLeod Avenue, Suite 100
Edmonton, Alberta T6A 2A6
Tel: 780-443-1000
Fax: 780-443-1005
Email: gbs@brown.com
Web: www.gibbsbrown.com



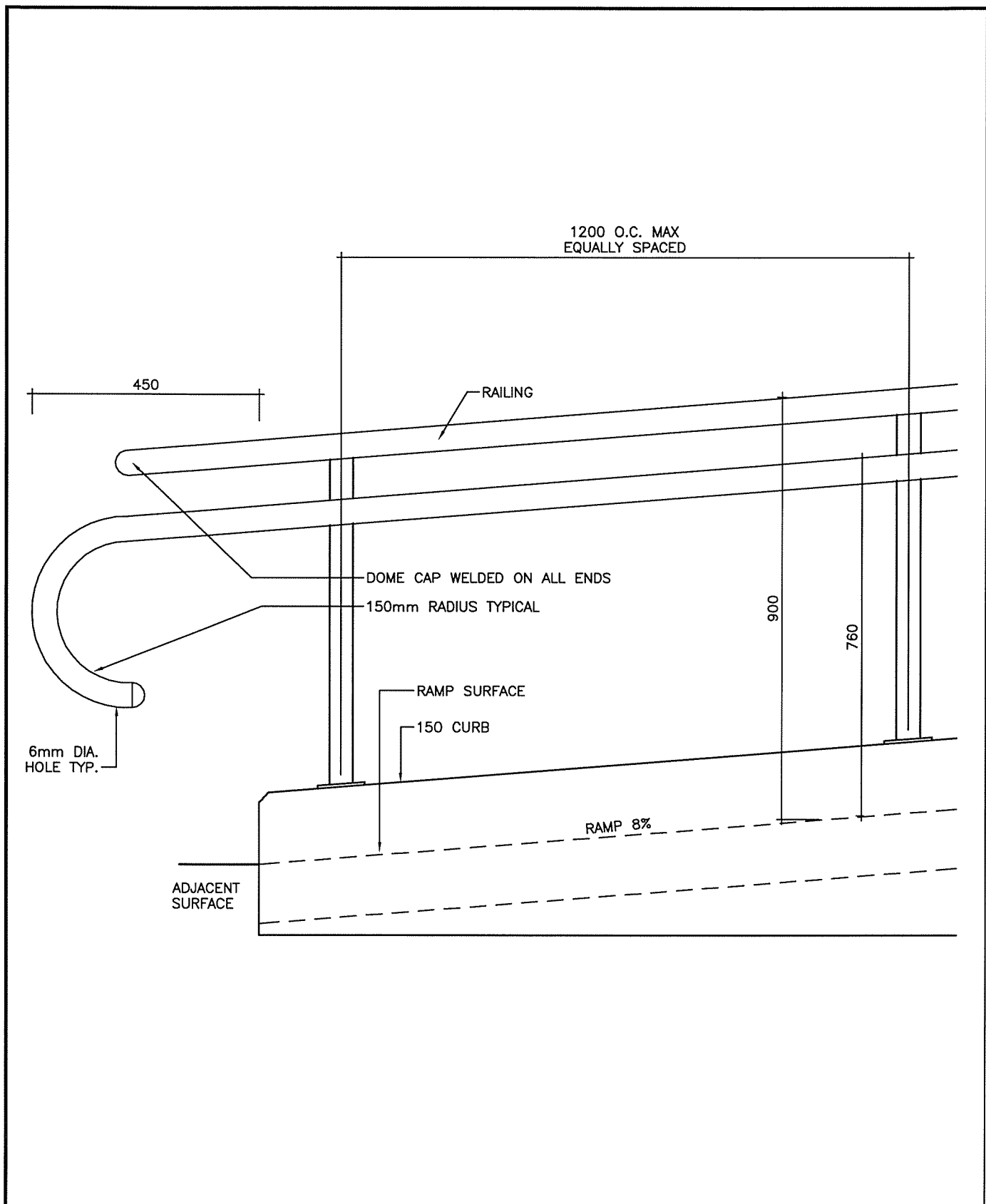
TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS





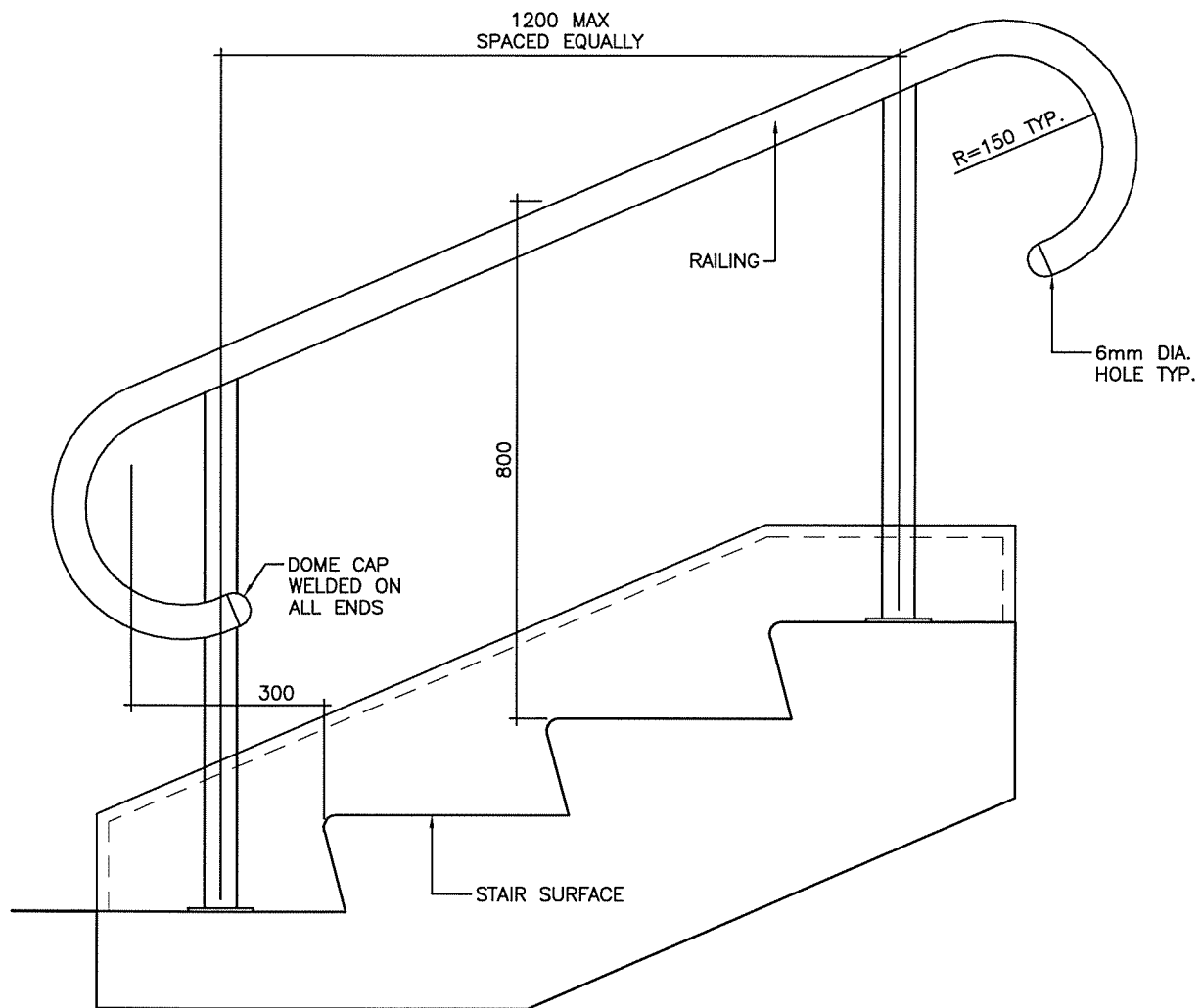
WOOD HANDRAIL



WOOD FENCE WITH 2 RAILS



<p>PROJECT No. <u>04-1928</u></p> <p>DATE: <u>FEBRUARY 2005</u></p> <p>APPROVED: <u>APPROVED</u></p> <p>SCALE: <u>N.T.S.</u></p> <p>DWG. No. <u>TS - 38</u></p>	<p>GIBBS & BROWN LANDSCAPE ARCHITECTS LTD.</p> <p>425-17th Avenue, Suite 100, 100-17th Avenue Edmonton, Alberta, Canada T6E 2K6 Tel: 780-442-0200 Fax: 780-442-0201 Web: www.gibbsbrown.com</p> 	<p>TOWN OF STONY PLAIN 2005 TRAIL MASTER PLAN DETAILS</p> <p> The Town with the Biggest Past</p> <p>METAL HAND RAILING FOR RAMPS</p> <p>1 OF 1</p>
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PROJECT No. 04-1928
 DATE: FEBRUARY 2005
 APPROVED: APPROVED
 SCALE: N.T.S.
 DWG. No. TS - 39

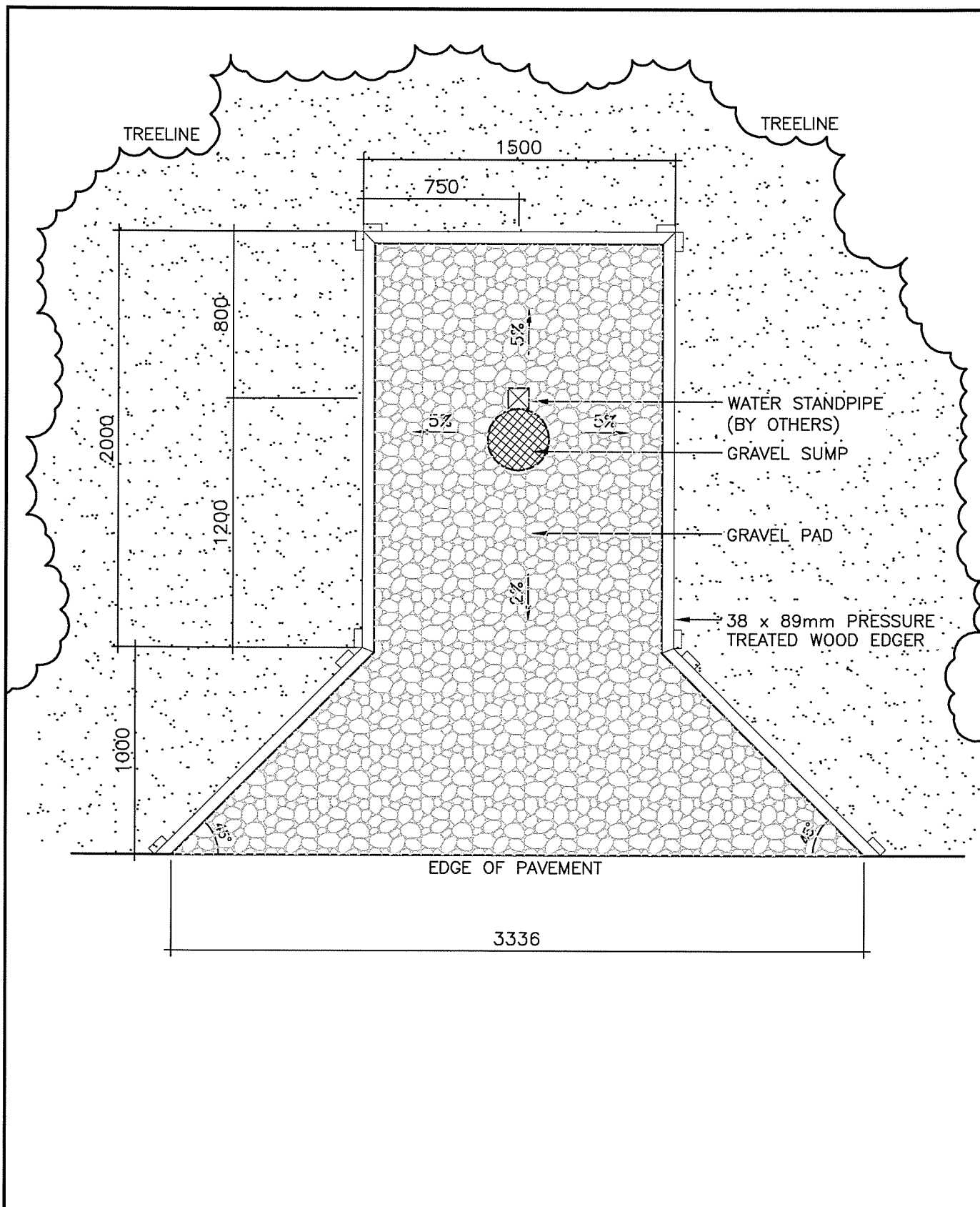
GIBBS & BROWN
 LANDSCAPE ARCHITECTS LTD.
 100 THE BAYVIEW, 1000 - 100, Avenue
 10000, 10000, 10000, 10000
 Tel: 100-1000000
 Email: gibbs@brown.com
 Web: www.gibbsbrown.com



TOWN OF STONY PLAIN
 2005 TRAIL MASTER PLAN DETAILS



METAL HAND RAILING
 FOR STAIRS



PROJECT No. 04-1928

DATE: FEBRUARY 2005

APPROVED: APPROVED

SCALE: N.T.S.

DWG. No. TS - 41

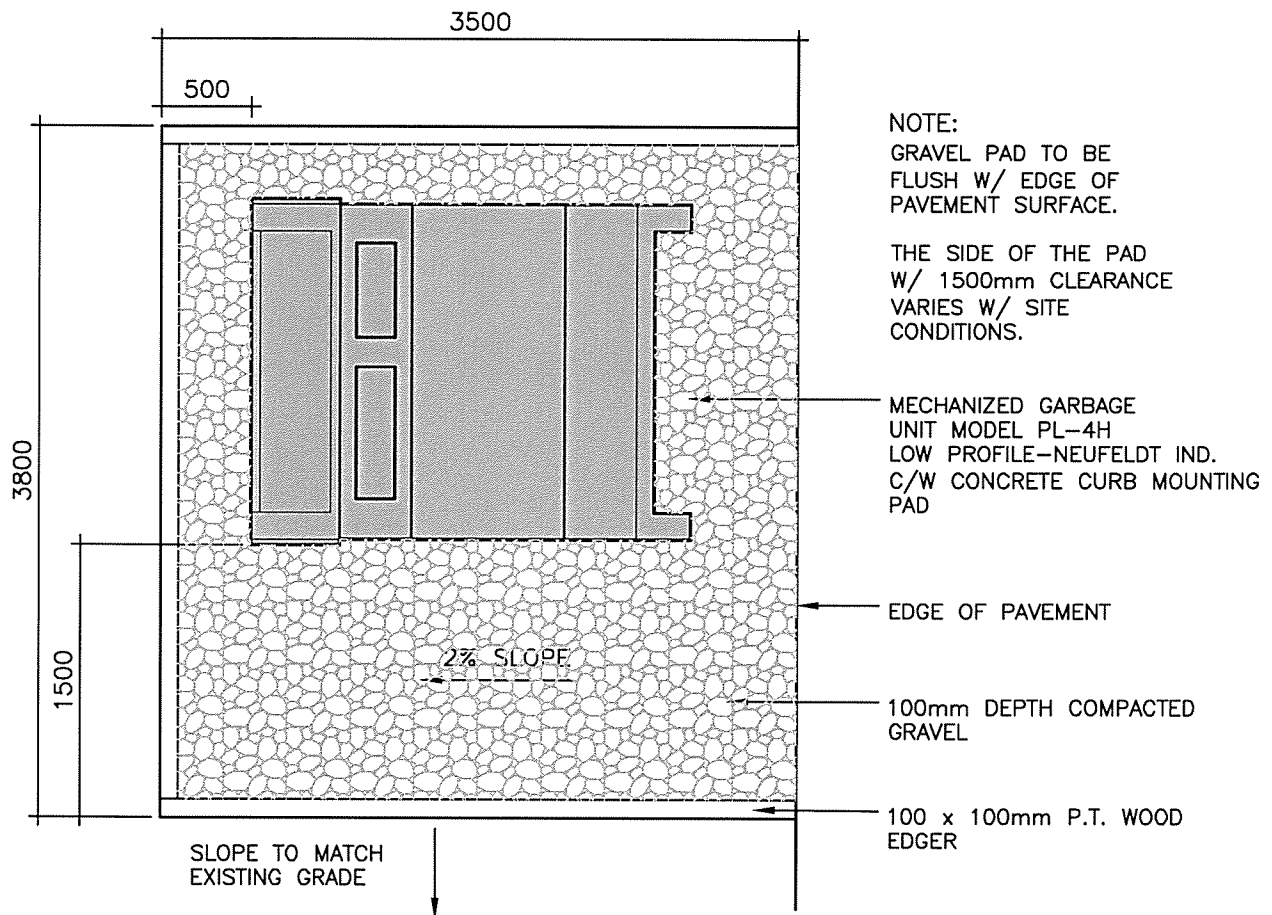
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LANDSCAPE ARCHITECTS LTD.
158 The Burnside, 1050 10th Avenue
Edmonton, Alberta, Canada T5J 2J8
Tel: (780) 464-5000
Fax: (780) 464-5000
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Web: www.gibbsbrown.com



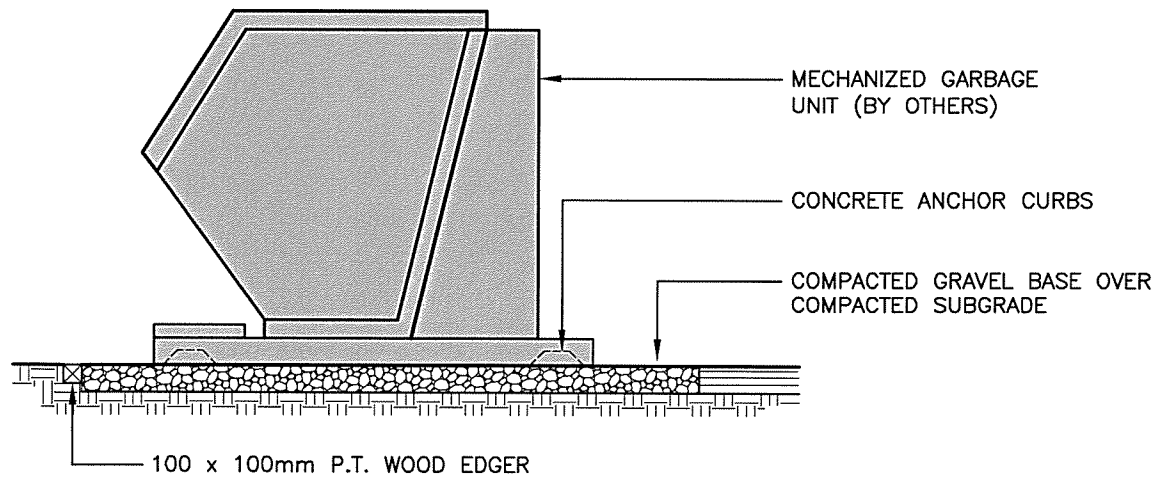
TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



WATER OUTLET - GRAVEL PAD



PLAN



SECTION

PROJECT No. 04-1928
DATE: FEBRUARY 2005
APPROVED: APPROVED
SCALE: N.T.S.
DWG. No. TS - 42

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LANDSCAPE ARCHITECTS LTD.
108 The Boulevard, 1000, St. John's
Superior, 1000, St. John's
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TOWN OF STONY PLAIN
2005 TRAIL MASTER PLAN DETAILS



MECHANIZED GARBAGE CONTAINER
AND GRAVEL PAD

8.0 GLOSSARY OF TERMS

Average grade	The average of many contiguous running grades.
Bike routes	Streets and roads which are shared equally by cyclists and motorists, and which are identified as such by traffic signs and <u>no</u> visible surface pavement markings.
Bike trails	Any path specifically designated as being open to bicycle travel, regardless of whether or not they are designated for the exclusive use of bicycles, or to be shared with other transportation modes not served by streets, railroads and highways.
Bikeway	Adjacent to the existing roadway, their pavement forming continuity with that of the roadway, but separate from the roadway by either a painted line or by a physical barrier; however, vehicular traffic can cross a bikeway to gain access (<i>or egress</i>) from private property.
Boardwalks	Used to provide safe and environmentally compatible trail access across ecologically sensitive landscapes.
Carrying capacity	The amount of use by man that the area can withstand without undue environmental degradation.
Changes in level	Vertical height transitions along the surface of a path.
Clear space	The passage space required for a wheelchair user.
Cross-slope	The slope measured perpendicular to the direction of travel.
Degree of confinement	Is dependant on the height of the 'walls' that surround the space. There can be a great variety of materials forming the 'walls' of spaces.
Design width	The width specification the trail was intended to meet.
Environmentally sensitive area	An area designated as environmentally sensitive.
Grade	The slope parallel to the direction of travel.
Greenways	Linear open spaces for human access and recreational use along either a natural corridor (<i>stream, ridgeline, etc.</i>) or overland along various easements, municipal reserves and rights-of-ways (<i>railroad, canal, etc.</i>) to enhance and protect remaining natural and cultural resources.

Interpretive foot trails	Provide the public with interpretive learning opportunities to enjoy and to gain an understanding of environments of natural or cultural interest along a foot trail.
Maximum grade	A limited section of trail that exceeds the typical running grade.
Minimum clearance width	The narrowest point on a trail.
Multi-Use Trails	A prepared hard-surfaced trail that serves as part of a transportation circulation system, supports multiple recreation opportunities (<i>such as pedestrians, walking, running, bicycling and in-line cycling, etc.</i>) and can accommodate a variety of non-motorized users and wheelchairs/scooters for assisted travel.
Multi-Use Trail Corridor	An open space right-of-way with a desirable minimum width of 10m through which a multi-use trail could be constructed.
Natural Corridors	A natural feature (<i>e.g. such as a creek, forest stand, etc.</i>).
Protruding objects	Anything that overhangs or protrudes into the trail tread, whether or not the object touches the surface.
Rate of change of grade	The change in grade over a given distance.
Rest Areas:	Level portions of a trail wide enough to provide wheelchair users and others a place to rest and gain relief from prevailing grade demands.
Rest Area interval	The distance between rest areas.
Running grade	Measured over the maximum distance afforded by sight lines when grades are continuous.
Scale of Space	The relationship between the sizes of spatial area relative to the viewer.
Sidewalk	A pedestrian facility, usually concrete, that is located within the road right-of-way.
Single-user Paths	Recreational trails with strict enforcement practices and barriers that effectively exclude other users.
Shared Paths	Recreational trails used by more than one type of user.
TAC	Transportation Association of Canada.
TAC Bikeway Guidelines	Guidelines prepared by the Transportation Association of Canada for bikeway development.

Town Sections	Specific geographic areas within the Town of Stony Plain, as defined by this study.
Trail	A constructed path for non-motorized travel.
Trail System	All trails within the Town of Stony Plain.
Trail Corridor Network	The system of multi-use trail corridors that will be developed through this study.
TUC	Transportation Utility Corridor
Utility/ Transportation	Land designated through ownership or easement for surface or underground utilities or pipelines; or for roadways.
Vertical clearance	Minimum unobstructed vertical passage space required along a trail.
Viewing position	The relationship of the observer to the surrounding area.
Walkway	A hard surfaced, off street trail that makes use of park areas and utility rights-of-way within residential neighbourhoods.

9.0 REFERENCES

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