

## Urban Reserve Multi-Use Trail Design and Construction Plan Burlington, VT

## Introduction

Once constructed, the Urban Reserve Multi-Use Trail System will become a magnet for multi-use recreation. The character of the trails will boast a consistent and gentle grade, curvilinear design, and appropriate structures to manage hydrology while providing a safe tread for use by all appropriate modes of travel.

The Urban Reserve will play host to seasoned bikers, young children learning to ride, runners, pedestrians, and wheelchair users. This variety of users, combined with the trail's location within a densely populated area, drives the trail's design and construction guidelines. Ultimately, the goal is to construct a trail that is safe, sustainable, and blends within the natural landscape.

This document outlines the design and construction of the Urban Reserve Multi-Use Trail. All sections of this document work in unison to provide detailed information on the layout of the trail and the construction guidelines for each linear foot of tread.

## Section 1: Trail Tread

## 1.A - Tread Width and Corridor

The Urban Reserve Multi-Use Trail is a multi-use trail that is open to a wide range of users. At any one point, the trail can play host to bikes, wheelchairs, walking families with strollers, or joggers. This variety of use defines the trail's width and the extent of corridor clearing that is appropriate.

## 1.B - Tread Width

A trail's tread is the surface on which the users walk or bike. Whereas a trail encompasses all of the physical attributes of the entire experience, the tread is the specific surface that users recreate on. To accommodate the wide range of users and to ensure that the trail is both safe and comfortable, it is important for the Urban Reserve Multi-Use Trail to maintain an 8 foot width whenever possible. This specification is derived due to the following conditions<sup>i</sup>:



- The trail will be located within a densely populated area where there is potential for a high volume of use.
- > Bikers will be passing each other and traveling in both directions.
- > Walkers may be either in groups or pushing strollers or with children on bikes.
- The trail will be Accessible. This allows for the possibility of wheelchairs and bikers being on the same trail.
- > The trail will be a destination for groups of people looking to walk side by side.

In addition to these factors, high use bike trails require a site line distance of 120-150'. This is to ensure safe passing of bikes and adequate room for avoiding other users. A wider trail allows the trail to maintain sufficient site line distance and provide gradual turns instead of abrupt turns that can malaffect user experience<sup>ii</sup>.

#### 1.C - Trail Corridor

A trail's corridor is the zone that surrounds the trail tread. It entails the environmental buffer through which the user walks, bikes, or runs on the trail tread.

The Urban Reserve Multi-Use Trail travels through a variety of environmental zones. As such, some sections of the trail are located in wide open areas where Trail Corridor Clearing will never be an issue. In other areas, the Corridor will need to be maintained to prevent encroachment of branches and bushes.

The corridor of the Trail should be maintained to be 10-12 feet wide and 8-10 feet high. This is achieved by selectively removing branches or sections of branches that grow into the corridor zone. The task of clearing a corridor, typically done as the first step in trail construction, should be accomplished with a purposeful and careful hand. The clearing of the corridor should take into account the following:

- > All limbs should be cut close to the trunk, but not beyond the bark ridge or the branch collar.
- > Select branches should be left to allow an overhead canopy for the trail.
- The clearing of the corridor should frame the experience for users and is to be done specifically and not liberally.



Refer to **Figure 1** for a representation of a sample trail corridor and tread.



#### Figure 1:

The tread and corridor are integral components of a trail. The Urban Reserve Multi-Use Trail maintains a 8' wide tread wherever possible and a corridor that is 10-12' wide and 8-10' high. Note the importance of the trees alongside the trail that add structure and character to the trail experience. Not all trees need to be removed in order to maintain an adequate trail corridor.



## Section 2: Geotextile Fabric

## 2.A - Use of Geotextile Fabric

Geotextile Fabric is a synthetic material that is highly effective as a barrier between trail surfacing material and existing soils and moisture. These fabrics are used in trail construction to prevent the surfacing from migrating into the subsurface. They also spread out the impact and weight of a trail, and prevent trails from succumbing to wet areas.<sup>iii</sup>

## 2.B - Geotextile Type

The following specifications should be followed when selecting Geotextile Fabric for the Urban Reserve Multi-Use Trail.

## Table 1<sup>iv</sup>

- Material Structure: Nonwoven
- Polymer composition: Polypropylene
- > Apparent opening by ASTM D4751-87: Less than .297 mm
- > Permittivity by ASTM D4491-92: More than 4,060 liters per minute per square meter
- > Puncture strength by ASTM D4833-88: More than .110 kilonewton
- Mullen burst by ASTM D3786-87: More than 900 kilopascals
- > Trapezoid tear strength by ASTM D4533-91: More than .110 kilonewton
- ➤ Grab tensile at 50% elongation by ASTM D4632-91: More than .355 kilonewton
- > Ultraviolet degradation: More than 70 percent retained strength at 150 hours



## Section 3: Trail Grades

## 3.A - Grade

The grade of a trail can be calculated by determining the total rise and run of a section of terrain. The formula for calculating % grade is:

% Grade = (Rise/Run) X 100

For example, if a section has a total run of 500 feet and a total rise of 10 feet the grade would be 2% and is calculated as:

% Grade = (10/500) X 100 = 2%

## 3.B – Outslope and Cross Grade

To ensure proper drainage of the Urban Reserve Multi-Use Trail, the trail should be consistently outsloped. The outslope refers to the subtle outward slope that is perpendicular to the trail. This allows water to travel across the trail in a sheetflow pattern. The potential for erosion is highly reduced by outsloping the trail. If the trail is left flat, the water will find a way to develop a channel which will lead to erosion issues.

The % grade of the outslope, known as cross grade, should strive to be 2%.<sup>v</sup> When installed, the outslope can be between 3-5%. Over time the trail will compact and develop into a consistent 2%. Refer to **Figure 2** for a representation of outslope.

## 3.C - Running Grade

The running grade of a trail refers to the percent grade of the trail in the direction of travel. This is an essential detail to pay attention to while constructing trails. The acceptable range of running grade relates to the trail type.

The Urban Reserve Multi-Use Trail is a multi-use bike trail that also complies with Accessible Trail Guidelines. Running grades should be kept to a minimum to match the abilities of the intended user, prevent surficial erosion, and maintain a consistent character. During the layout of the trail, all sections attained a running grade of 0-8%. This was achieved by using a clinometer to measure grades during layout and construction. A clinometer is a surveying instrument that is easily used in the field.





#### Figure 2:

Outslope is an essential component of sustainable trail construction. This figure outlines the cross section of a naturally surfaced trail. After the initial excavation and installation of 6-10" of crushed stone as needed, non-woven geotextile fabric is installed. This prevents the migration of surfacing into the crushed stone.

The 3/8" minus crushed stone surfacing is installed to a 4-6" depth. The surfacing is then graded using a 4' wide landscape rake to attain a 3-5% outslope. Compaction of the surfacing with a vibratory roller will reduce the outslope to an acceptable 2%.

As seen in the figure, the running grade and outslope is checked using a smartlevel. A smartlevel is a digital instrument that automatically measures percent grade.



## **3.D** – Accessible Grades

The Urban Reserve Multi-Use Trail System will have running grades that are compliant with the Americans with Disabilities Act (ADA.) **Table 2**<sup>vi</sup> can be referred to when determining the layout and construction of a section of trail that is to be Accessible.

#### Table 2<sup>vii</sup>

Running Grade of Trail	Trail Length
5%	Trail can travel over any distance.
8.3%	Resting intervals required every 200 feet.
10%	Resting intervals required every 30 feet.
12%	Resting intervals required every 10 feet.

## **Section 4: Stone Construction**

## 4.A - Retaining Walls

A retaining wall, also known as a crib wall, is built to support trails that are either elevated out of wet areas or to maintain appropriate running grades. Although retaining walls can be made of timber, it is highly recommended to build all retaining walls along the Urban Reserve Multi-Use Trail out of stone. In short, a stone retaining wall is more sustainable, and will last far longer than timber.

All retaining walls should be planned out during the design phase. By pinpointing the location of the walls, a consistent running grade is maintained and strategic use of local stone can be achieved.

## 4.B - Stone Causeway

A stone causeway is composed of two parallel retaining walls that elevate the trail tread out of wet areas or allows the trail to maintain specific grades.<sup>viii</sup> Stone causeways will need to be built along the trail leading out to the Jetty.



The dimension of the causeway is relevant to the finished tread width. All causeways should be built so that the finished stone height is outside the trail's width. This allows for the trail tread to be installed inside that dimension. Stones used for constructing causeways should be at least 1-2 feet tall and 1-2 feet wide. This size ensures stability of placement.



A stone retaining wall is constructed to elevate a trail. This is done to maintain running grades or elevate the trail out of wet areas. This figure highlights the 3:1 batter of the stone cribbing and the 2% outslope.

## 4.C - Coping Stones

Coping stones provide visual and physical edging to a trail. They naturally blend into the landscape while performing an essential task: to safely guide users away from steep trail edges.

Coping stones should be installed wherever a wall rises above the ground more than 30 inches. This height can result in injury if a user was to migrate off the edge due to speed or not paying attention to their travel. The installation of coping stones should occur during the construction of crib walls or previous to the installation of surfacing. They should protrude above the trail a minimum of 6 inches and be buried into the ground a minimum of 1/4 the total height of the stone. These factors work together to assure their stability and visibility.



Spacing between coping stones should remain between 30-60 inches. This provides a clear edge to the trail and allows for the stones to look natural in the environment. To blend the coping stones within the trail's structure, they should be selected of a similar parent stone as that of the crib wall and surfacing.

Refer to **Figure 4** for a representation of coping stones.



#### Figure 4:

This figure represents the installation of coping stones along the Urban Reserve Multi-Use Trail. The stones should rise above the trail tread 6-12 inches and be spaced apart 30-60". As seen in the figure, the stones can be incorporated such that they attain height within the wall as well as providing visual edge.



## **Section 7: The Use of This Document**

This document is exceptionally field focused. The field work was conducted with an eye towards providing the reader with an ability to walk the trail and visualize what structures are needed and what they will look like. To use this document efficiently, please consider the following guidelines:

## 1. Use a Rolatape:

• This measuring wheel serves as a vital link to the trail log that documents each linear foot of the trail sytem. The rolatape guides the user of this document around the trail system. Please visit: http://www.rolatape.com/ to learn more about this tool.

## 2. Trail Log Accuracy

- The Trail Log begins at set points along the trail system. Be sure to start the wheel at 00 while standing at the correct point described on the document.
- Each beginning and end point of the trail log is expected to change, depending on who is using the rolatape. Be prepared for the points to have a variance of 5-10 feet.
- The Trail Log cites reference points to help indicate where certain Design Directives are located. These reference points could change slightly over time due to the expected change of a forest's composition.

## 3. Analysis Sequence

- a) Identify a Site: Arrive at a proposed work site using the rolatape wheel.
- **b) Reference the Map:** The Trail Layout Map gives a sense as to the trail's shape and location of intersections.
- c) Check the Existing Condition: Look at the Existing Condition to find points of reference that highlight your exact location.
- **d**) **Realize the Design Directive:** The directive will identify the proposed solution to the work site.
- e) Check the Sitework Photopage: Cross reference the photo number with the correct photo page for more detailed information on the work site.
- **f**) **Review the Construction Specification:** Most work sites have an associated Construction Specification Letter. This letter (ie: A, B) relates to the attached documents that outline how to construct a crib wall or causeway.



## Conclusion

The Urban Reserve Multi-Use Trail will provide unmatched recreational opportunities to the City of Burlington and to the surrounding communities. By constructing the trail as outlined in this document, the trail will endure the use and remain intact. Most importantly, the users will enjoy the trail with little knowledge of the work that lies underfoot.

Respectfully Submitted,

Joshua D. Ryan Manager Timber & Stone, LLC



#### Works Cited:

<sup>i</sup> Parker, Troy S. 1993. Open Space and Trails Program, Pitkin County, Colorado: Trails Design and Management Handbook. Boulder, CO: Natureshape. (pg 2-1 thru 2-7)

State of Minnesota, Department of Natural Resources, 2007. Trail Planning, Design, and Development Guidelines. Trails and Waterways Division, 500 Lafayette Road, St. Paul, MN. (pg 5.1 thru 5.7) Rails to Trails Conservancy, 2001. Trails for the Twenty First Century, 2<sup>nd</sup> Edition. Washington, D.C.: Island Press. (pg 51 thru 68)

http://www.access-board.gov/outdoor/draft-final.htm#3

<sup>ii</sup> Parker, Troy S. 1993. Open Space and Trails Program, Pitkin County, Colorado: Trails Design and Management Handbook. Boulder, CO: Natureshape. (pg 2-2)

<sup>iii</sup> Missoula Technology and Development Center, 2008. Geosynthetics for Trails in Wet Areas, 2008 Edition. Missoula, MT: U.S. Department of Agriculture Forest Service. (pg 2)

<sup>iv</sup> Missoula Technology and Development Center, 2008. Geosynthetics for Trails in Wet Areas, 2008 Edition. Missoula, MT: U.S. Department of Agriculture Forest Service. (pg 16)

<sup>v</sup> State of Minnesota, Department of Natural Resources, 2007. Trail Planning, Design, and Development Guidelines. Trails and Waterways Division, 500 Lafayette Road, St. Paul, MN. (pg 6.11)

vi http://www.access-board.gov/outdoor/draft-final.htm#3

vii http://www.access-board.gov/outdoor/draft-final.htm#3

<sup>viii</sup> Student Conservation Association, 2005. Lightly on the Land, The SCA Trail Building and Maintenance Manual, 2<sup>nd</sup> Edition. Mountaineer Books, Seattle, WA. (pg 170 thru 172)













![](_page_18_Picture_1.jpeg)

![](_page_19_Picture_1.jpeg)

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# Project: Urban ReserveLocation: Burlington, VTSponsor: Burlington Parks and Recreation Department

# Urban Reserve Trail Log

Begin	End	Length	Photo #	Existing Condition	Design Directive	Spec #
0	0	0	1	Trail begins and stays to the right of Telephone Pole 02769		
0	101	101	2	Trail located to the right of Railroad Tracks. Leave tracks exposed for historical significance.	Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam. Reseed and mulch.	A
101	101	0		Concrete pad on right	Either remove all of the pad or excavate enough room to fit trail to right of the Railroad Tracks	
101	167	66		Grassy crossslope, minimal running grades	Locate trail along crossslope to maximize drainage. Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam.	A
167	380	213	3	Trail located in center of Phytoremediation Site. View of Adirondacks on left of trail.	Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam. Reseed and mulch.	A
380	605	225	4	Deep water transfer site on left. Locate trail on edge of site, leaving enough room for loading activity.	Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam. Reseed and mulch.	A

Begin	End	Length	Photo #	Existing Condition	Design Directive	Spec #
605	605	0	5	Trail enters woods		
605	746	141		Trail continues through woods with steel piling on left.	Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam. Reseed and mulch.	A
746	855	109	6	Trail rises up and is located on center of existing berm.	Clear corridor and flatten berm 6-8" to prepare for 8' wide trail. Install trail at center of berm by importing edging and installing surfacing on geotextile fabric.	A
855	885	30	7	Southern end of 40'x40' viewing platform between trail and steel piling.	Install trail on berm and connect to boardwalk structure that is supported by steel piling tie backs and directly to the steel piling.	A
885	1085	200	8	Trail located on center of berm	Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam. Reseed and mulch.	A
1085	1,190	105	9	Berm ends, trail emerges onto field within site of dog park.	Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam. Reseed and mulch.	A
1,190	1,190	0	10	Accessible picnic and viewing area	Create a naturally surfaced pad that is 25 square feet and install 2 picnic tables and coping stones along edge of water access.	А, В
1,190	1,320	130	11	Continue path across grass field and towards concrete field	Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam. Reseed and mulch.	A

Begin	End	Length	Photo #	Existing Condition	Design Directive	Spec #
1320	1330	10		Trail alignment over existing concrete pad	Cut and remove concrete to allow 8' wide trail to be flush with concrete on either side	A
1330	1485	155	12	Trail alignment over existing concrete pad	Cut and remove concrete to allow 8' wide trail to be flush with concrete on either side	A
1485	1700	215	13	Trail aligned over existing concrete pad and foundations, pipe access to Lake on left	Cut and remove concrete to allow 8' wide trail to be flush with concrete on either side	A
1700	1700	0	14	Junction with trail to Jetty		
1700	2,045	345	15	Trail alignment leaves the concrete pad and continues toward Hub	Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam. Reseed and mulch.	A
2,045	2,211	166	16	Trail enters wooded area with Poplars overhead	Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam. Reseed and mulch.	A
2,211	2,397	186	17	Trail alignment nears the Hub with greenscape on right	Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam. Reseed and mulch.	A
2,397	2,505	108	18	Trail enters the Hub Area and intersects with Bike Trail	Clear vegetation, mow grass short, and install trail directly on sod. Build up sides with imported compost and loam. Reseed and mulch.	A

#### Trail Spec A: Trail Surfacing

**Rationale:** When native soils are not suitable for trail surfacing or when the trail's intended use requires a hardened surface, it is necessary to import and install surfacing. Often this is the case when the trail will be deemed to be ADA compliant or when there will be extensive bike use. Typically, the cost per ton of crushed stone surfacing is reasonable. The cost for transporting the material is much higher. It is worth paying more to have the correct material transported from a longer distance than to use local material that is not sustainable.

#### **Construction Specification:**

**Material:** Trail surfacing typically conforms to a specific sieve analysis. Quarries produce crushed stone that conforms to a variety of sizes ranging from stone dust to small aggregates that are 3/8" in size. It is important to monitor the material as it is delivered from the quarry to ensure it complies with the intended sieve analysis. FW Whitcomb Quarry produces a Monkton Brown Crushed Stone that can be crushed to adhere to a specific sieve set.

**Dimension:** The size of the surfacing is often dependent on the quality of the parent stone that is crushed. The best material to use is a hard stone such as Monkton Brown. The material is crushed to conform to a specific sieve analysis, or sizing chart. Please refer to Figure 1 for a suggested sieve analysis for this project.

#### Installation:

Step 1: Before the surfacing is installed, the trail tread is to be mowe and cleared of any vegetative material. All roots are to be clipped flush with the ground.

Step 2: The trail is then monitored for running grade. A naturally surfaced trail is most sustainable at grades that remain between 5-8%. This will prevent migration and erosion of surfacing. To maintain a sustainable running grade, 1 ½" washed crushed stone trail base may need to be installed to raise sections of the trail. This material should be installed and compacted to ensure the trails remains flat.

Step 3: To ensure that the trail surfacing will be supported on either side, and to acknowledge that the site will not be excavated, trail edging will need to be imported and installed. Trail edging will be comprised of compost, loam, and stone no larger than 1 ½" in size. This material is side dumped along the trail and will be smoothed out after the installation of surfacing. Edging will not rise above the surfacing, as this will impede sheetflow drainage of the crowned trail tread.

Step 4: A non-woven geotextile fabric should be installed on top of the excavated soil, as needed, and wherever 1 ½" crushed stone is installed. The fabric allows the trail to float on top of the mineral soil, spreads out the weight of the surfacing, and prevents the surfacing from mixing with the mineral soil and crushed stone.

Step 5: Trail surfacing is typically installed at a depth of 6-8". The surfacing is smoothed out using either hand tools or machinery. The surfacing's depth will vary on the terrain, but it should be no less than 6" in depth. While smoothing out the surfacing, it is important to maintain an outslope of 2%.

*Step 6:* After the surfacing has been installed, it is compacted with a vibratory roller. It is most effective to compact the surfacing after a rainfall. At minimum, the surfacing should be moist. Outslope and crowning can be monitored using a smartlevel. Please refer to Figure 2 for a detailed cross section of a naturally surfaced trail.

![](_page_33_Picture_13.jpeg)

## City of Burlington, VT – Urban Reserve Trail Construction Specifications

#### Figure 1: Crushed Stone Sieve Analysis for Naturally Surfaced Trail

## 3/8" Minus Crushed Stone

Sieve Designation	Percent Passing
3/8"	99%
No. 4	65-85%
No. 8	40-70%
No. 30	25-50%
No. 50	10-20%
No. 100	10-20%
No. 200	5-10%

#### Sources Include:

http://www.americantrails.org/resources/trailbuilding/BuildCrushFinesOne.html

Parker, Troy S. 1993. Open Space and Trails Program, Pitkin County, Colorado: Trails Design and Management Handbook. Boulder, CO: Natureshape.

#### Figure 2: Trail Tread Analysis

![](_page_34_Picture_8.jpeg)

![](_page_34_Picture_9.jpeg)

## City of Burlington, VT – Urban Reserve Trail Construction Specifications

#### Trail Spec B: Coping Stone Installation

**Rationale:** Coping stones are cap stones on a crib wall that purposefully rise above the trail tread. Their purpose is to provide a visual edge to the trail and to provide another aesthetic character to the trail. Coping stones can be installed during trail construction or afterwards. If a crib wall rises higher than 30" or if there is an unusually sharp turn in a trail, coping stones should be installed along the Urban Reserve Trail System.

#### **Construction Specification:**

**Material:** Coping stones are purposefully angular in shape and are selected to match the color and character of the trail system. It is ideal if the coping stones are made of the same parent material as the stone used in the crib wall.

**Dimension:** Coping stones are typically 1-2 cubic feet in size. They are installed to rise above the tread a minimum of 6" and a maximum of 1'.

#### Installation:

1. *Cap Stone Installation:* If the coping stones are installed as cap stones for a crib wall, follow the instructions for stone crib construction in order to build the wall to the intended height. The coping stones are incorporated into the wall so that their spacing is between 30-60" and their height remains between 6-12".

2. *Trail Tread Installation:* Coping stones can be added directly to the edge of a trail. If this method is used, the stones should be dug into the ground to avoid being disturbed.

3. *Stone wall Incorporation:* Coping stones can be installed to give both height and coping function to the stone wall. If this technique is used, the wall should be sturdily built around it while ensuring staggered joints and maximum contact.

#### Examples:

![](_page_35_Picture_11.jpeg)

This figure, whose vantage is from outside of the crib wall, depicts proper installation of Coping Stones.

![](_page_35_Picture_13.jpeg)

Timber & Stone, LLC Conservation Minded Construction

Joshua D. Ryan 1820 County Road East Calais, VT 05650

Project Estimate: October 14, 2013

To: Jen Francis Parks Planner Burlington Department of Parks and Recreation 645 Pine Street, Suite B Burlington, VT

## Urban Reserve Multi-Use Trail Burlington, VT

Work Description –	
2,505 of 8' Wide Multi-Use Bike Trail – Trailhead to Bike Path Hub	
Construction Materials	\$ 57,523.78
• 1/2" Minus Crushed Stone Surfacing (904 Tons)	
2" Washed Crushed Stone (200 Tons)	
• 2-3' Cubic Boulder Rip Rap (48 Yards)	
Non-Woven Geotextile Fabric (2,755 Feet)	
Trail Edging (275 Tons)	
Equipment Rental – Excavators, Material Haulers, Compactors, Loaders	\$ 17,820.00
Construction Labor – (Mobilization, Construction, Cleanup, and Demobilization)	\$ 46,337.50
Fuel Expenses	\$ 2,200.00
10% Administrative Overhead	\$ 12,388.13
Total =	\$136,269.41
Additional Trail Related Items	
Stone Bench Installation - (Cost per Pre-Built Bench Installed)	\$ 660.00
Split Rail Fence Installation - (Cost per Linear Foot)	\$ 37.00
6' Width Side Trail Installation - (Cost Per Linear Foot)	\$ 45.00

This quote is relevant to the 2013 Construction Season and includes the following: Professional Trail Construction Labor Timber & Stone, LLC Liability Insurance and Administrative Overhead Crew Mobilization, Specialty Tools, and Equipment Expenses

This Quote is Design/Build Based and is Subject to Change Based on the Following: Change in Trail Design Before Start of Construction Change Order of Trail Design After Start of Construction

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Joshua D. Ryan 1820 County Road East Calais, VT 05650

Project Estimate: October 14, 2013

To: Jen Francis Parks Planner Burlington Department of Parks and Recreation 645 Pine Street, Suite B Burlington, VT

## Urban Reserve Multi-Use Trail Burlington, VT

Work Description –	
1,400 Square Foot Observation Platform with Viewing Area	
Construction Materials	
Helical Anchor Foundation System	
Pressure Treated Framing	
Galvanized Framing Hardware	
Black locust Decking	
Black locust Railing Posts	
Stainless Steel Wire Rope Railing Infill	
Stainless Steel Decking Fasteners and Hardware	
Equipment Rental – Excavator, Material Hauler, Generator, Pier Driver	
Construction Labor – (Mobilization, Construction, Cleanup, and Demobilization)	
Fuel Expenses	
Engineering Expenses	
10% Administrative Overhead	
Total =	\$55,000.00
Cost Per Square Foot =	\$ 39.23

This quote is relevant to the 2013 Construction Season and includes the following: Professional Trail Construction Labor Timber & Stone, LLC Liability Insurance and Administrative Overhead Crew Mobilization, Specialty Tools, and Equipment Expenses

This Quote is Design/Build Based and is Subject to Change Based on the Following: Change in Trail Design Before Start of Construction Change Order of Trail Design After Start of Construction

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