



OFF THE BEATEN PATH

Trail Work and Training ✿ Low Impact Backcountry Construction

14 April 2015

Members of the Cape Elizabeth Land Trust,

Thank you for the opportunity to offer a second bid proposal for stone step construction along the Great Pond Trail. I visited the site again last month after a conversation with Suzanne McGinn helped to clarify some of the project parameters as well as CELT's expectations.

I believe that this project can be accomplished without any machinery touching CELT property if there is an established agreement to use the neighboring property. If CELT is able to get the materials donated and transported to the end of Davis Point Road, the cost of the project on my end will include only labor and equipment. I will strive to match the final product with the aesthetic preferences of your organization.

I am confident that Off the Beaten Path is well equipped to construct a sustainable and naturalistic structure that will compliment the quality of the adjacent boardwalk, mitigate erosion and safety issues while enhancing the natural beauty of the Great Pond Trail. This project is consistent with the type of niche work that my company specializes in. We pride ourselves on building stone structures that are detail oriented and will endure for decades, if not centuries to come.

I have made a sincere effort to include all the necessary information for a comprehensive proposal in the following pages. If I have excluded anything, or if any clarifications are needed, please do not hesitate to contact me. My information is listed at the bottom of this page.

Thank you again for your consideration.

Sincerely,

Jedediah Talbot
Owner, *Off the Beaten Path*

Site Analysis:

- There is 185” of vertical rise on the slope where the existing stone steps are located
- There is approximately 50 feet of horizontal run from the boardwalk to the top of the slope
- The average grade of the slope is just over 30%.
- The existing stone steps are failing due to their small size and the lack of cribbing on either side of them. Evidence of water and human based erosion was present on both side of the steps (see photo #1).
- The current railing located on the downhill side of the trail is rotted and presents a significant liability. If a hiker were to lean on the rotted and it broke, they could potentially fall over 20 feet downhill.
- Approximately 20 lineal feet of downhill cribbing at an average height of 12-16”. will be needed to retain the trail tread edge above and below the steps.

Specifications of Work:

It is recommended that granite blocks be used for all step treads and granite boulders for cribbing (also known as “gargoyle” or “pinner” rocks). Please refer to construction drawings and photos below for additional details. Recommended specifications include:

- All step stones will be a minimum of 150 pounds.
- Risers will be 6-9” in height.
- The tread or stepping surface will be a minimum of 12” long.
- The tread width will be 12-24”.
- Steps will have close to a 90 degree relationships between the tread and the riser.
- Tread surfaces will be gently pitched 1-5% to drain water and prevent ice buildup.
- Steps and cribbing will be set in compacted mineral soil or crushed rock
- Cribbing will be placed above and below all steps and be set deeply in the ground.
- Downhill cribbing will have high top contact on the step and extend slightly higher than the tread level when possible for added safety.
- Existing steps will be removed and repurposed as cribbing on the downhill side of the steps.
- The existing rotted railing will be removed.
- A reinforced grade dip will be installed to shed water off the trail above the steps.

Narrative of Construction Techniques:

The stone step construction project on the Great Pond Trail is not particularly technical; however, it involves certain logistical concerns due to the location of and access to the work site.

The only viable option for moving materials to the site without mechanized equipment touching CELT property is to utilize the privately owned field off the end of Davis Point Road. Although efforts were made to secure permission for access from this direction, definitive permission was not granted. This bid is contingent on landowner agreement to use their property as a staging area for materials.

From the end of Davis Road, materials could be driven close to the work site at the field edge with tracked equipment, then lifted into place via 2 separate hand powered skyline systems, each 100-150 feet long (see Figure #1 and photos #2 and 3). These systems keep the loads (i.e. rocks) suspended in the air on pulleys that run along a wire rope. The loads are belayed down in a controlled fashion without any physical impact to the ground or the surrounding trees that are used as anchors. During my last site visit I was able to locate good anchors, loading and unloading zones, and clear paths of travel from the field to the work site.

The stone steps will be constructed according to the above specifications of work and the attached construction documents. Although it may be tempting from an aesthetic standpoint to build steps in the backcountry that do not have gargoyles or crib stones on either side, that type of construction has been proven over and over to fail over time. When possible, humans, dogs, and water find their way around the step stones, causing compaction, displacement, and erosion of the soils that are keeping the step in place (see photo #1). This results in resource damage and structure failure. The installation of well set gargoyles and crib stone can mitigate both the damage and the failure. In terms of the overall aesthetics- is possible to set the gargoyles and crib stones deeper in the ground and “hide” them more by adding a layer of soil over the top. I am happy to work with CELT to try and match the overall look of the staircase with what is viewed as the most naturalistic yet enduring solution.

The existing rotted railing will be removed and not replaced. The steps will provide safe passage in and of themselves. Railings located on the downhill side of a trail on a steep slope present the temptation for users to lean heavily on the rail instead of staying balanced.

Project Schedule and Timeline:

This project is expected to start in the spring or summer of 2015 after the ground has dried out enough sufficiently to minimize the impacts of material transportation. The project should take two weeks, including mobilization, site restoration, and demobilization.

Company Background and Qualifications:

From spring through fall, the scope of work for Off the Beaten Path (OBP) encompasses many aspects of trail design, maintenance, and construction, with a focus on education and training. Technical stone work, naturalistic accessible trails and backcountry rigging systems are strengths of the company. Typical projects include pedestrian trail layout and design, new trail construction (hand built and machine built), intensive trail reconstruction (such as large rock staircases and retaining walls), trail infrastructure improvements (such as bridges, boardwalks, kiosks, benches, trailheads etc.), and trail skills instruction. Over the last 15+ years, company owner Jed Talbot has built or supervised the installation of well over 1000 stone steps in backcountry settings across the country.

Jed Talbot is the co-author of the upcoming United States Forest Service Trail Manual titled “Principles of Backcountry Trail Rigging” This manual will be the first published resource on how to safely move materials through the air using hand powered equipment for backcountry

construction projects. Jed is considered a nationwide leader in low impact material transportation for trail projects and travels across the country teaching such trail building techniques to volunteer, municipal, federal, private, public, and non-profit crews. During the winter, Off the Beaten Path focusses on low impact logging and timber stand improvement projects.

Off the Beaten Path is a member company in the Professional TrailBuilders Association and a Certified Logging Professional (CLP) company. Jed has taken the Maine Department of Conservation Non-Point Source Pollution Course and is a Certified Erosion Control Specialist.

Description of Services:

Off the Beaten Path (OBP) will serve as the prime contractor. OBP will be responsible for all project coordination, communication with staff from the town of Cape Elizabeth, materials suppliers, and employees. The design and construction of the stone steps will involve specific duties including but not limited to: material transportation via low impact equipment, soil excavation, installation of stone steps and cribbing, site restoration and rehabilitation.

Equipment Used:

- 2004 ASV RC-60 rubber tracked skid steer loader
- Griphoist continuous feed wire rope winches, 2000# and 4000# capacities with wire rope, synthetic wire rope, blocks, slings and shackles and enough accompanying equipment to set up multiple hoisting systems to transport materials through the air without machinery
- All hand tools needed including generators and rock drills.

Cost Breakdown:

	Description	Number of Units	Unit of Measure	Cost per Unit	Subtotal	Transport	Total Cost
MATERIALS							
1.5" crushed stone		2	cu. yd.	\$0.00	\$0.00	\$0.00	\$0.00
Granite step stones	24"x12"x16", 500# avg. weight	30	total	\$0.00	\$0.00	\$0.00	\$0.00
Granite gargoyle/cribbing stones	Irregular, 200# avg. weight	50-60	total	\$0.00	\$0.00	\$0.00	\$0.00
EQUIPMENT							
Skid Steer Loader	Rubber Tracked	1	week	\$800.00	\$800.00	\$250.00	\$1,050.00
LABOR							
Supervisor/ Lead Mason		100	hour	\$45.00	\$4,500.00	\$0.00	\$4,500.00
Equipment/ Hoist Operator		60	hour	\$35.00	\$2,100.00	\$0.00	\$2,100.00
Mason Tender		80	hour	\$30.00	\$2,400.00	\$0.00	\$2,400.00
						TOTAL ESTIMATE	\$10,050.00


References:

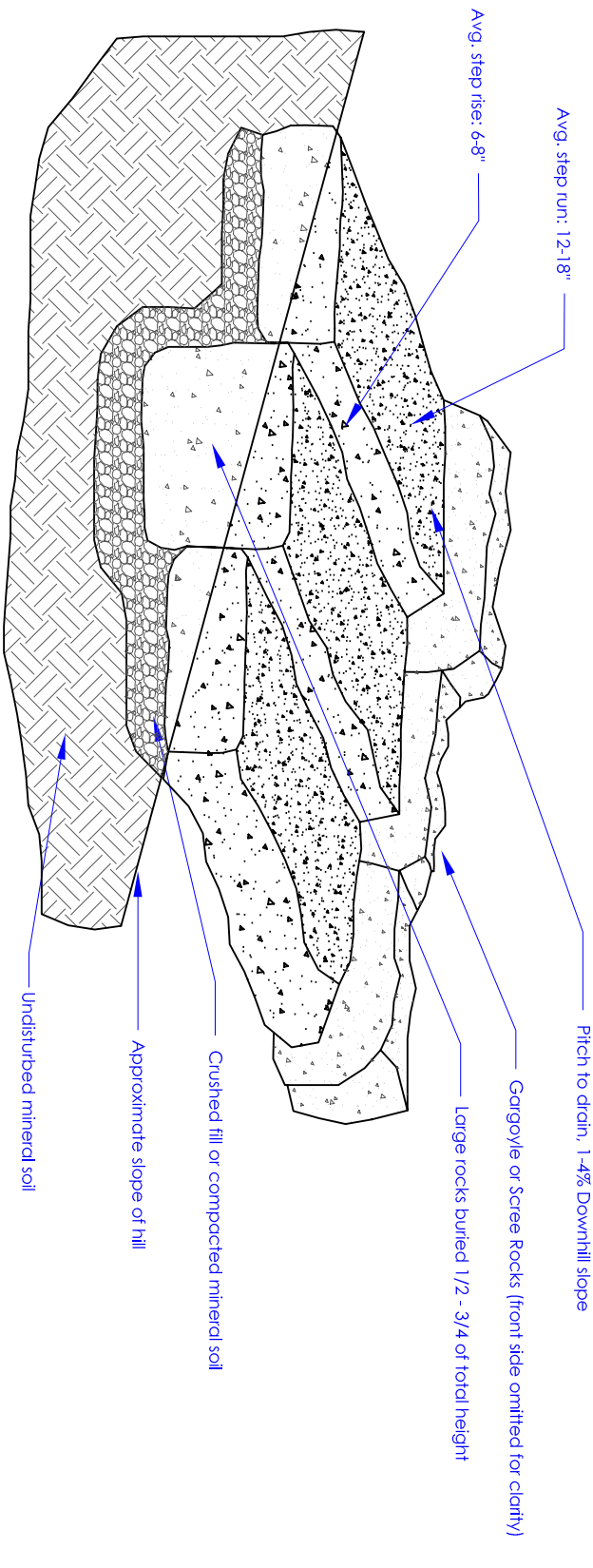
- Fred Lavigne, Member of Wonalancet Out Door Club; phone: 603.284.6919
- Rick Young, Eaton Conservation Commission, email: farmer4hire@gmail.com
- Daniel Newton, President of Waterville Valley Athletic and Improvement Association; email Danpnewton@gmail.com; phone: 603.726.1232
- Cristin Bailey, Trails Manager and Volunteer Coordinator for the US Forest Service, Saco Ranger District; email: cristinbailey@fs.fed.us; phone: 603.447.5448 x112; 603.986.2645
- Lew Shelley, Director of Training for the SCA; email: lshelley@thesca.org; phone 603.543.1700 x174
- Walter Opuszynski, Trail Director of Northern Forest Canoe Trail, email: walter@northernforestcanoetrail.org; phone: 802.496.2286 x2
- Chuck Simpson, Maine Department of Conservation Regional Land Manager, Bureau of Parks and Public Lands, email: chuck.simpson@maine.gov; phone: 207.941.4413

Contingencies of Bid:

- It is highly recommended that the trail section must be closed during construction.
- This bid is based on moving materials to the site by way of the privately owned field off the end of Davis Point Road. Materials could be driven close to the work site with tracked equipment, then lifted into place via the aforementioned skyline system.
- Costs listed are for labor and equipment only. The purchase and transportation of materials remain the responsibility of CELT.

Construction Document #1: Independently Set Rock Steps

	<h1>OFF THE BEATEN PATH</h1> <h2>TRAIL WORK AND TRAINING</h2>		<p>TITLE: Rock Steps, Independently Set</p> <p>NOT TO SCALE</p> <p>DATE: 22 September 2014</p>
<p>110 Poplar Hill Road, Turner, Maine 04282</p>	<p>Cell: 207.312.1340</p>	<p>Website: www.obptrailwork.com</p>	



Pitch to drain, 1-4% Downhill slope

Avg. step run: 12-18"

Avg. step rise: 6-8"

Gargoyle or Scree Rocks (front side omitted for clarity)

Large rocks buried 1/2 - 3/4 of total height

Crushed fill or compacted mineral soil

Approximate slope of hill

Undisturbed mineral soil

Construction Document #2: Overlapping and Rock Riser Stairs

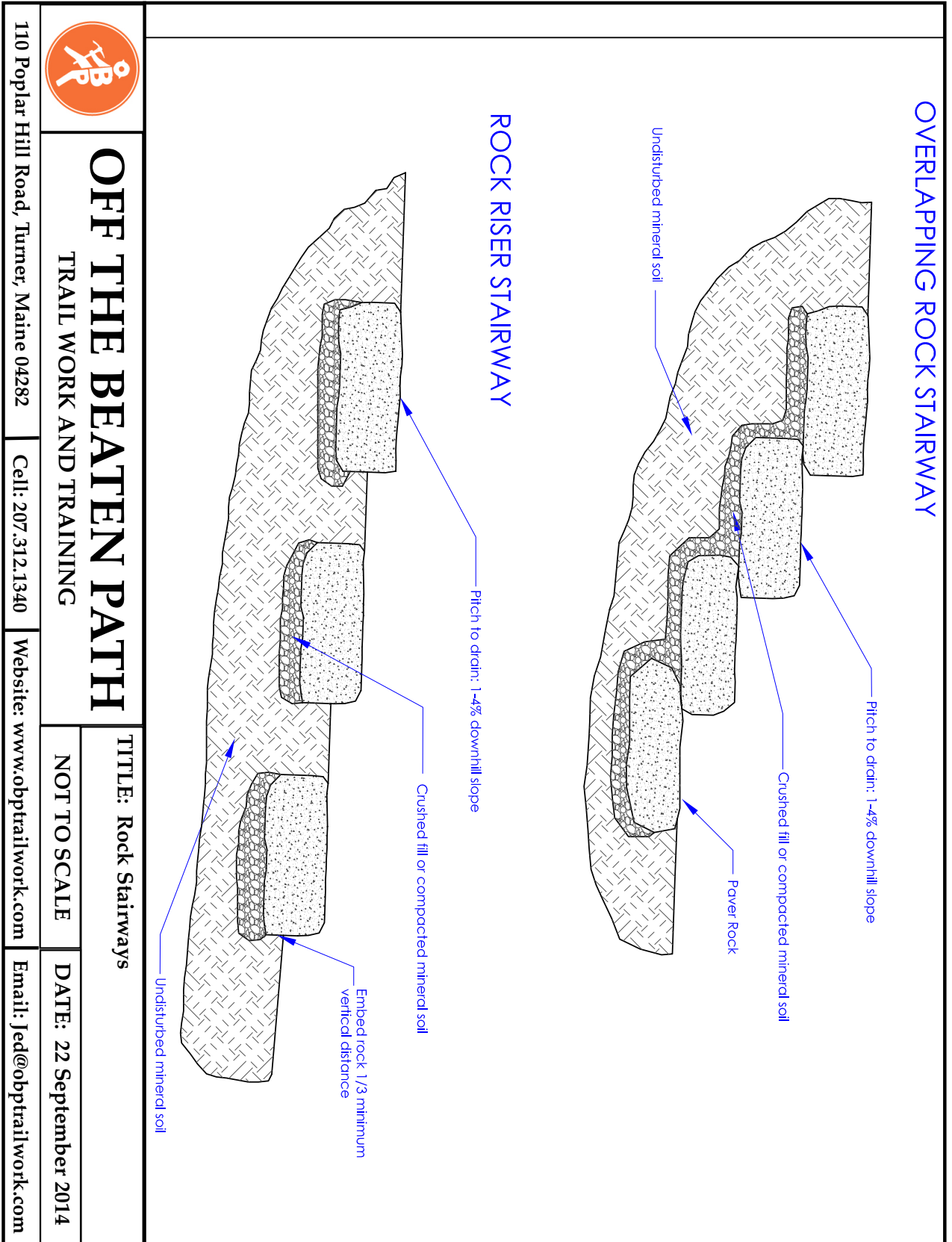
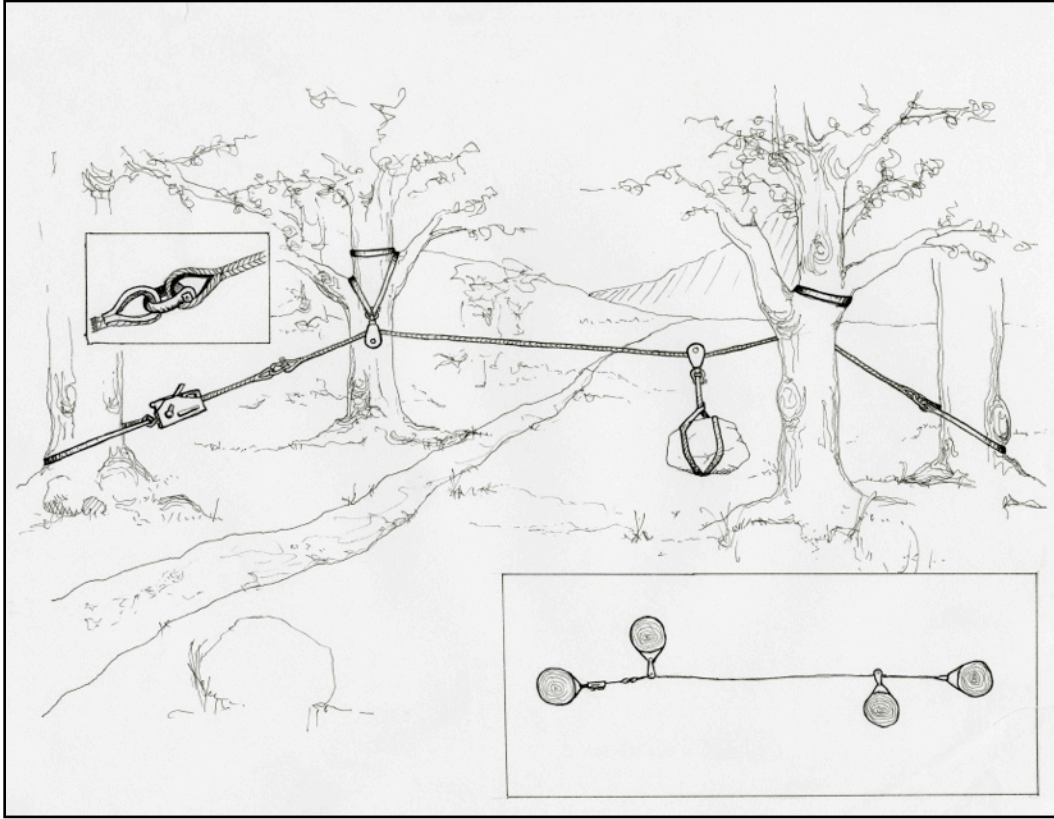


Photo #1: Erosion Around Existing Steps due to Absence of Gargoyle and Crib Stones



Figure #1 and 2: Skyline System Illustrations



Photos 2 and 3: Step Stones Set off a Skyline



Photos 4 and 5: Typical Stone Staircases

