Lakeland Park Trail Staircase: Locust Log Ladder

Alexis Weiss, Andra Morrison, Daniel Lee, James Knox, Umang Mittal, and Rachel Herring Sangree (Faculty)

Baltimore City Recreation and Parks (BCRP), Trails Division

Baltimore City Recreation and Parks (BCRP), Natural Areas Unit

Challenge

This project aimed to build a stairacase that would link two trails together in Lakeland Park on behalf of Baltimore City Parks and Recs. The staircase is part of a renovation project to make a forested section accessible for residents.

Objectives / Constraints

Objectives

- Connect the trail and pathway
- Establish safe access up and down slope
- Limit erosion & flooding
- Attain community approval
- Maintain natural aesthetic

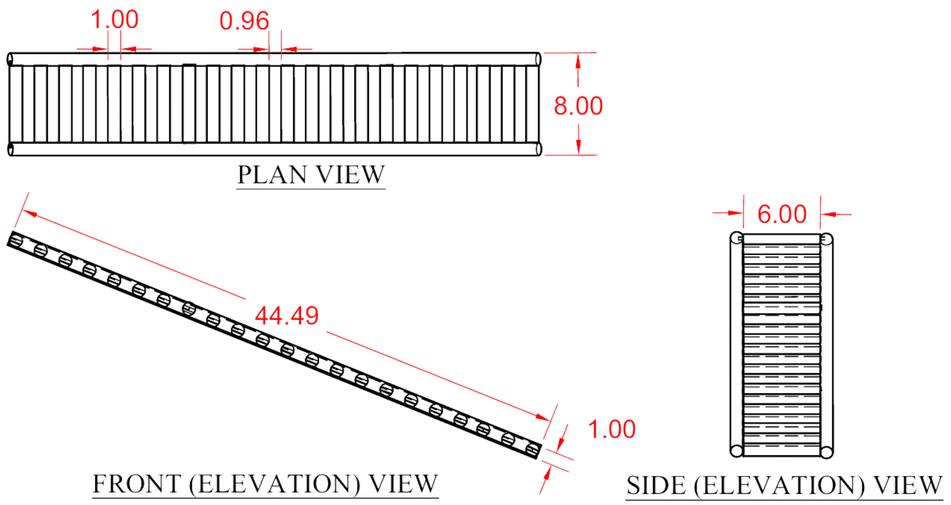
Constraints

- Use durable, natural materials
- Keep construction low-cost and feasible
- Source materials from Camp Small

Cost Estimate

Item	Unit Cost	Number of Units	Total Cost	Notes
Log lumber (log seconds)	$0.30/linear ft	244 linear ft	$73.20	26 6ft "rungs" 88 lin ft side logs
3/8" x 12" galvanized spikes	~$0.67	150	$100.00	Pack of 150
Gravel	$40.00/ton	1.34 tons	$54.40	See Notes
Labor			$0.00	Volunteer
Tools			$0.00	BCRP-owned
Gravel Delivery			$100	Estimate
Log Truck Delivery			$100	
BCRP Non-Gravel Cash Expense			$100	
Total Estimated Project Cost			**$427.60**	
BCRP Total Cash Contribution			$254.40	
Remaining Amount Owed to Camp Small			$173.20	

Proposed Solution



Overview

A locust log ladder that effectively resists soil erosion for non-gullied steep slopes in dense growth.

Materials

- Log lumber (log seconds) - 244 linear feet
- 3/8" x 12" Galvanized Spikes - 150 units
- Gravel - 1.34 tons

Volunteer Information

Approximately 5-10 volunteers will be needed each work day.

Equipment

- Chainsaw (and sharpening file)
- Chainsaw PPE
- Ear, Eye, and Head Protection
- Draw knives (for bark)
- 3/8 " auger drill bit
- Sledge hammers
- Level(s)
- Tape measure(s)
- Basic tread tools (handsaw, pick-mattock, mcloeds)
- Buckets and rock sled

Selecting a Trail Structure

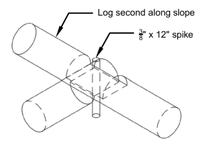
Fig. 1: Original BCRP Proposal: Check Steps

Fig. 2: Joint 1: Log Supports

Fig. 3: Joint 2: Locust Ladder Locks

Considerations

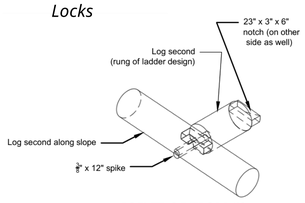
- Check steps are only stable on gullied routes, not our clear slope (notice the backslope in *Fig. 1*)
- Limited by tools – Joint 2 requires more advanced chainsaw work
- Limited by time/labor – Joint 1 is simpler, but less stable



JOINT OPTION #1

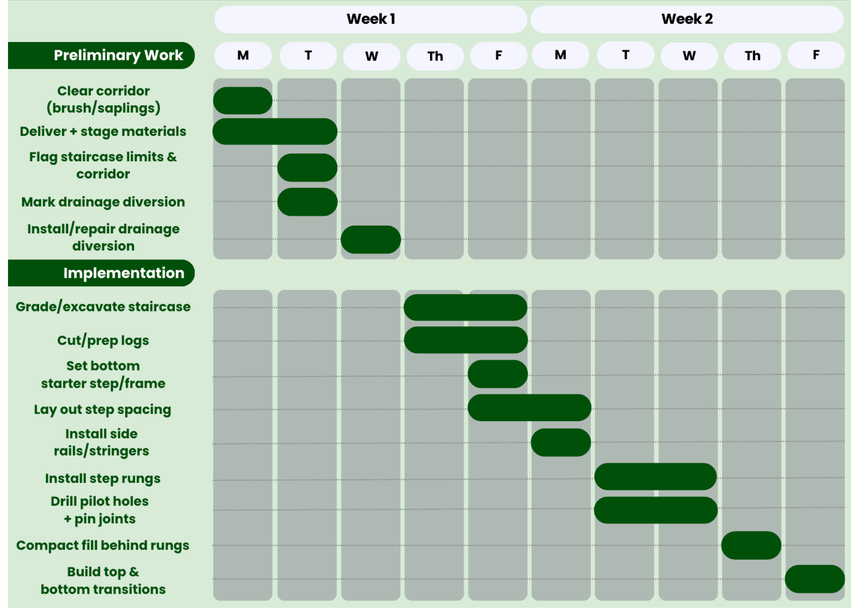
Partially removed logs intersecting perpendicularly, secured with a spike.

Fig. 4: Joint 1 CAD Drawing



JOINT OPTION #2

Horizontal log with a notch and a perpendicular log with the notch missing connected like a "lock and key", secured with a spike.

Fig. 5: Jint 2 CAD Drawing

Implementation Plan