



Work Plans Undercliff- 3.2

January 31, 2017

Prepared For
OPRHP, Hudson Highlands State Park

Prepared By
New York-New Jersey Trail Conference



Annual Project Work Plan - Trails Form

Submit to Park Manager for review and approval prior to commencing work: for ALL trail work beyond standard maintenance practices (blazing, clearing brush from treadway/tree pruning, maintenance of erosion control structures) on existing designated trails.

State Park Name: Hudson Highlands Year: 2017

Organization: The New York-New Jersey Trail Conference

Contact Name: Erik Mickelson

Contact Address: 600 Ramapo Valley Rd.

Contact Phone #: 760-893-9331

Contact Email Address: emickelson@nynjtc.org

Trail Name: Undercliff (part 2 pp 36-70 meeting the Breakneck Ridge trail)
Description of location of trail section to be worked on (if applicable): see map

GPS coordinates if available. Format: Decimal Degrees; Datum (circle one): NAD27, 83 or WGS84 (preferred)
(Lat/Long): ~41.44517 N, 73.97060 W to 41.44595 N, 73.97169 W

Type of work (check all that apply):

- Re-alignment/relocation of trail section
- New trail development (includes designating new trails)
- Tread upgrades including installation of water management structures
- Bridge construction/replacement
- Trail Closure/Restoration
- Other: _____

Scope of work included in Trails Plan: Yes No (If no, requires additional review of proposal)

Description of work: (be specific including rock moving, tree cutting, trail work within 100 ft. of a water body/wetland, bridge work (*may require DEC permit*), construction of switchbacks or retaining walls, culvert and turnpike installation, etc.): Repairs and slight realignments, including sidehilling, and step installation

Work Schedule: 4/17 until completed

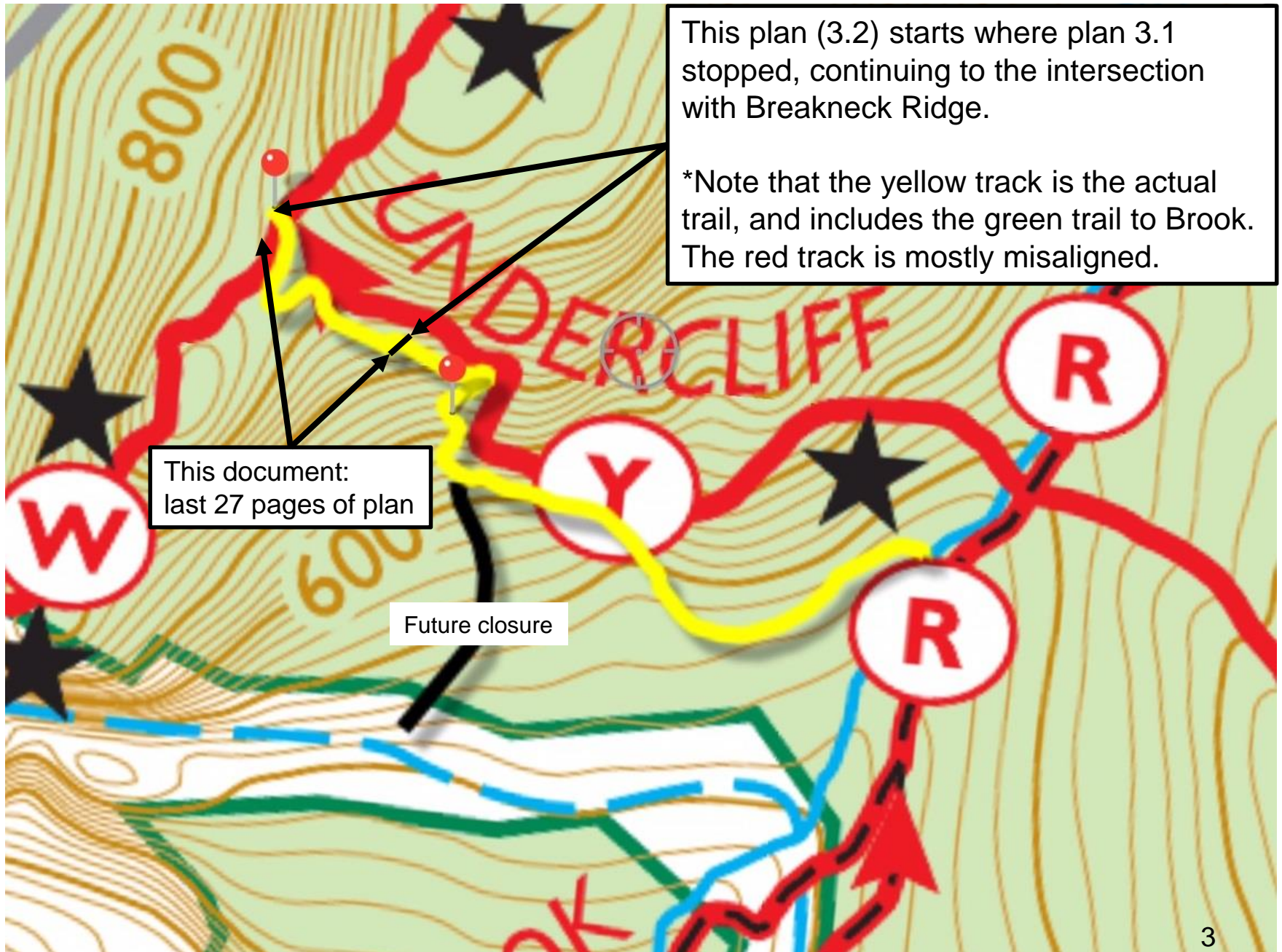
Attached map depicting area of work (required). Digital photo (before) Digital photo (after).

Submitted by (print): Erik Mickelson Signature: Erik Mickelson Date: 1/15/17

Approved by Park Manager (print): _____ Signature: _____ Date: _____

-Forward copy to Regional Natural Resource Steward and Capital Facilities Manager.

-Also forward copy to Trails Planning Unit if scope is not part of a Trails Plan.





Work Log Item Summary

The following table contains an approximate list of the major trail construction items which will be required for this section of trail. There are other minor items which are not listed here but described in the trail construction work log below.

Item	Unit	Quantity
Trail Length	In. ft.	430
Sidehill	In. ft.	148
Stone Steps	each	87-100
Stone Cribbing	sq. ft.	33 tbd
Stepping Stones	each	
Stone Paving	sq. ft.	50 tbd
Turnpike/Causeway	In. ft.	
Drainage Structures	each	3
Bridges	each	
Crush Fill	cu. ft.	
Surfacing	cu. ft.	

* Work Log Item Summary is for construction estimate purposes only. Actual project accomplishments may vary.

General Trail Construction Notes

1.NYNJTC Trail Development Level: 3 (<http://tinyurl.com/h8tv4dy>)

- Trail Use Type: **Foot Travel Only**
- Trail Tread Width Range: **18" - 36"**, tread should be natural surfacing where possible. **Where necessary, tread definition, filling, and removal of loose rock will be performed to keep hikers on trail and remove safety hazards.**
- Running Grade Range: **0-15%, Grades above 15% will have steps installed.**
- Corridor: **4'x8'**, all cuts should be flush to tree or ground. **Stumps within treadway should be removed.**
- **Deviations from Trail Development Level Standards:**

- 2.The trail layout/existing trail improvement follows the general principles of sustainable trail design with the added objective of creating an interesting, scenic, and low maintenance route.
- 3.All local stone harvesting/splitting/shaping must be done away from the trail as to not significantly alter the appearance of the surrounding area from the trail.
- 4.Safeguards should be made to protect trailside vegetation including the use of "tree bumpers."
- 5.All trailside impacted areas must be renovated with leaves, logs, and other on-site organic debris.
- 6.Visible drill holes on stone should be minimized to the extent possible with cut/split faces mixed in with natural faces.
- 7.Organic materials/duff must be removed from the ground surface before trail construction commences. These materials must be stockpiled for finishing work and trail closure purposes.
- 8.Backfill materials may be stone up to 3". To ensure proper drainage, mineral soil should not be used.
9. **Site Specific Notes: This trail borders a wetland area. All efforts should be made to not disturb wetland areas or vernal pools.**

Safety Notes

- 1.Each day will begin with a safety tailgate meeting outlining environmental, flora, fauna, work, communication, site, and tool related hazards and mitigation practices.
- 2.Proper personal protective equipment must be worn by all trail workers while on the worksite including long pants, closed-toe shoes, work gloves, eye protection, and hard hats. Ear protection must be worn around power equipment. Dust masks/respirators must be worn when drilling rock.

page	rise	run	run	step #	step #	s-hill	s-hill	other
#	in	in	ft	low	high	in	ft	
36	44	150						crib? and/or realign
37	60	200		3				crib? and/or realign
38	70	200						crib? and/or realign
39	35	150		2	4			
40	27	150						
41			21				21	
42	66	200				200		ramps
43	64	250				250		ramps
44	45	200				200		ramps
45	42	150	0.27125	2	2	150		or ramp
46	99	250		10	12			
47	127	200		12	16			
48	77	150		8	10			
49			21				21	
50	31	200		3	4	100		
51	14	150				150		
52	17	50	18	2	2		18	drain
53	54	200		4	6			
54	25	150						drain
55	56	150		7	7			
56	79	200		8	10			
57	95	200		12	12			
58	71	200		2	2			
59	104	250						
60	70	200						
61	41	100		5	5			
62	61	150		7	8			
total			431	87	100		148	



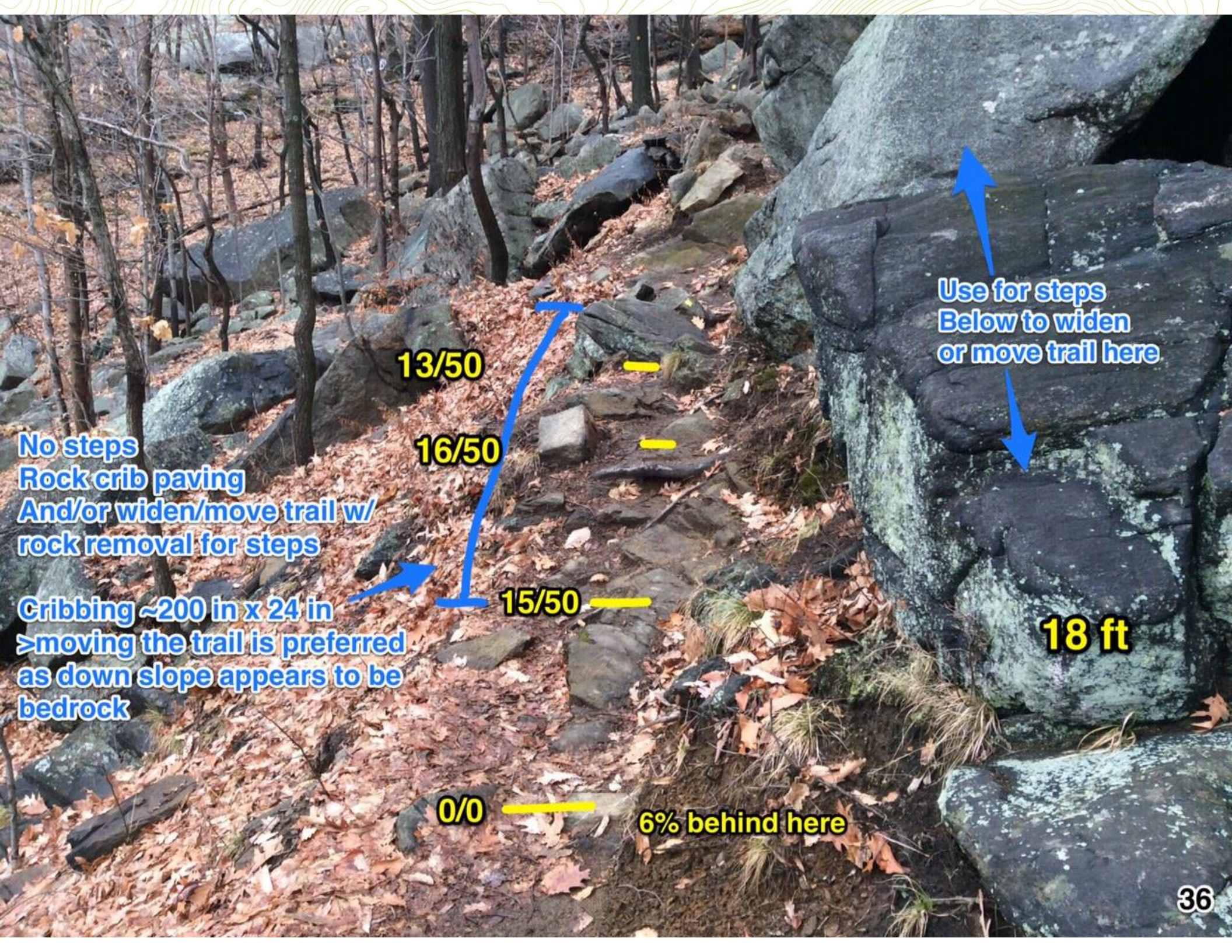
These photo references indicate the location of major work items as well as the trail centerline indicated by a solid yellow line shown in each photo.

To effectively use this trail construction work log, place yourself approximately where the photographer stood, note the trees, boulders, or other features in the photo and that will help you reference where the trail is to built/improved. Remember you are looking at photos which are in two dimensions and the field situation is in three dimensions. In addition, expect the view to change over time given more vegetation, downed trees, etc.

Arrows point to the approximate location of the work needed, or the location of a singular structure, such as a drainage structure. Two arrows or lines show the approximate start and finish of on-going structures or types of work, such as stone cribbing, stairs, and sidehill.

Each section to be built will be field staked or pin-flagged where needed by the trail designer prior to construction.

Note: Trail routing assumes a 50 foot corridor on either side of the centerline in which to move or realign the trail. For example, a trail might need to be realigned around a seep, large boulder, or bedrock. If the trail needs to be moved outside of the 50ft corridor due to unforeseen construction constraints, it will be brought to the land manager's attention for approval. A new work log photo with proper proof of approvals will be inserted into this document (at the end as an addendum to the slide/s in question).



Use for steps
Below to widen
or move trail here

13/50

16/50

15/50

18 ft

No steps
Rock crib paving
And/or widen/move trail w/
rock removal for steps

Cribbing ~200 in x 24 in
>moving the trail is preferred
as down slope appears to be
bedrock

6% behind here

0/0

Steps pending geo safety review
And possible realignment

27/50

Two steps to meet
this rock as the 3rd
Pending movement
and/or cribbing

15/50

?Reroute low
starting back @slide 32
>high route preferred at
this time

18/50

Check this
megalith for
safety, and
remove for
steps below
to move trail
to its location

Cribbing?
Looks like
bedrock slope

13/150

27/50

3 steps pending movements below

11/50

Steps pending geo safety review
And possible realignment

21/50

11/50

27/50



110 in

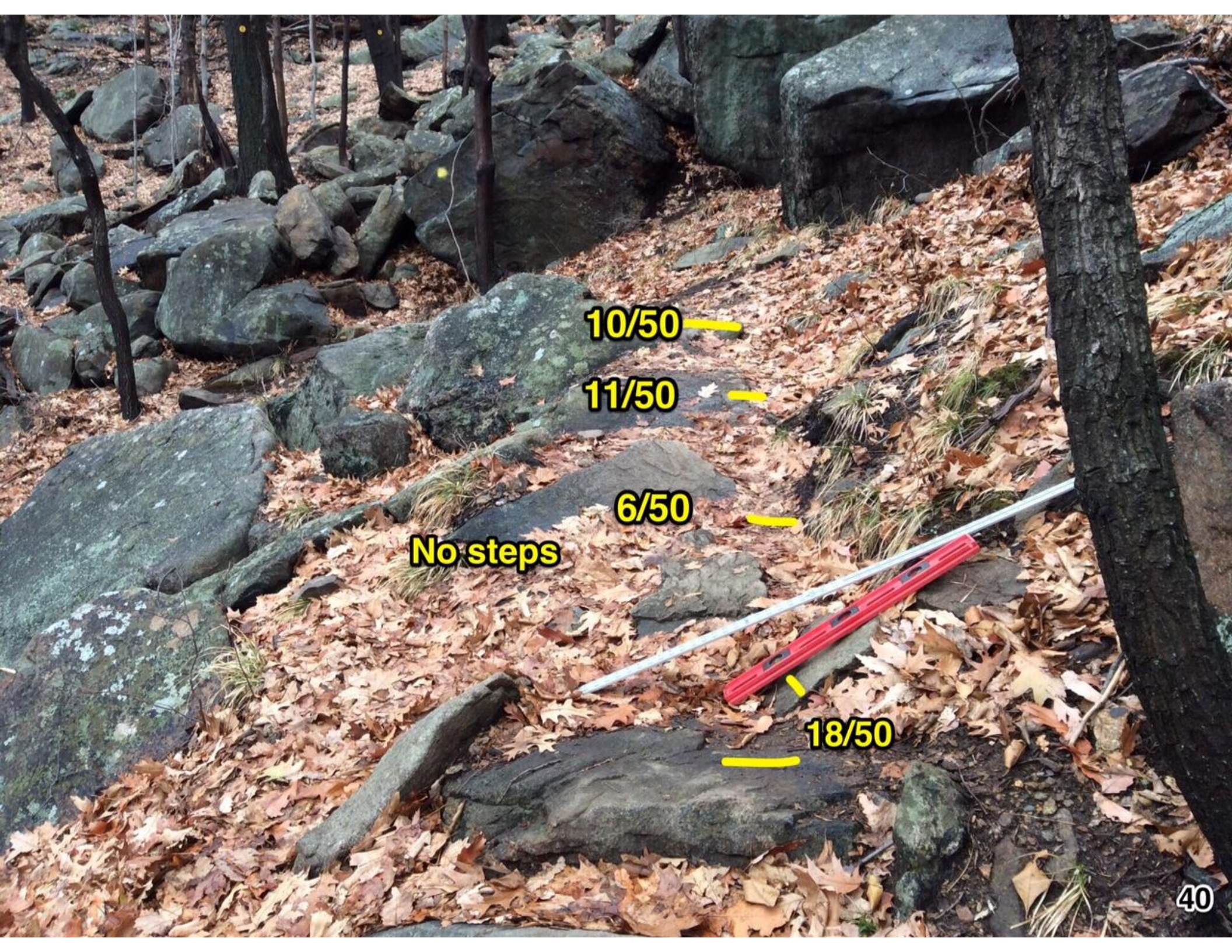
18/50, 35/150

2-4 steps pending movements below

13/50

No steps

4/50



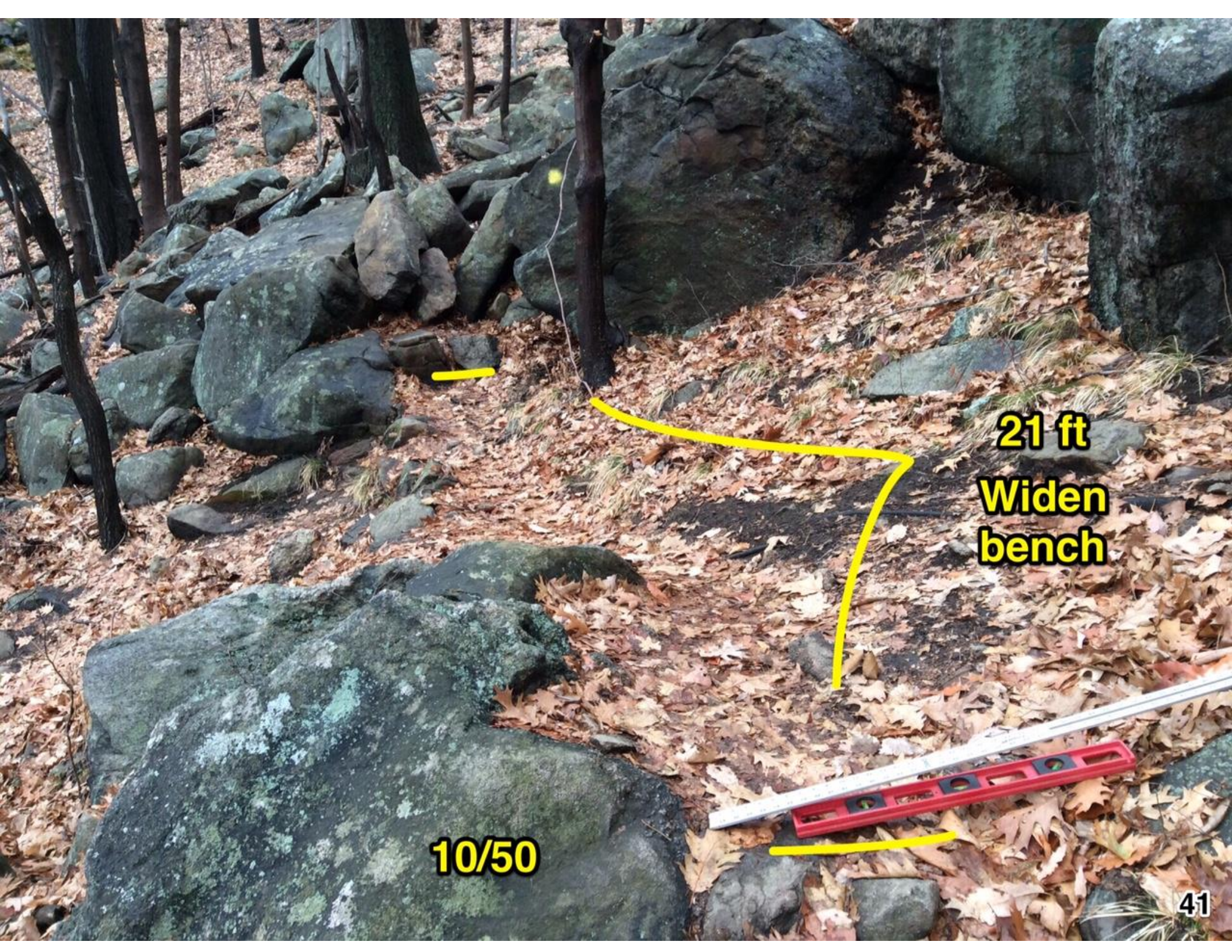
10/50

11/50

6/50

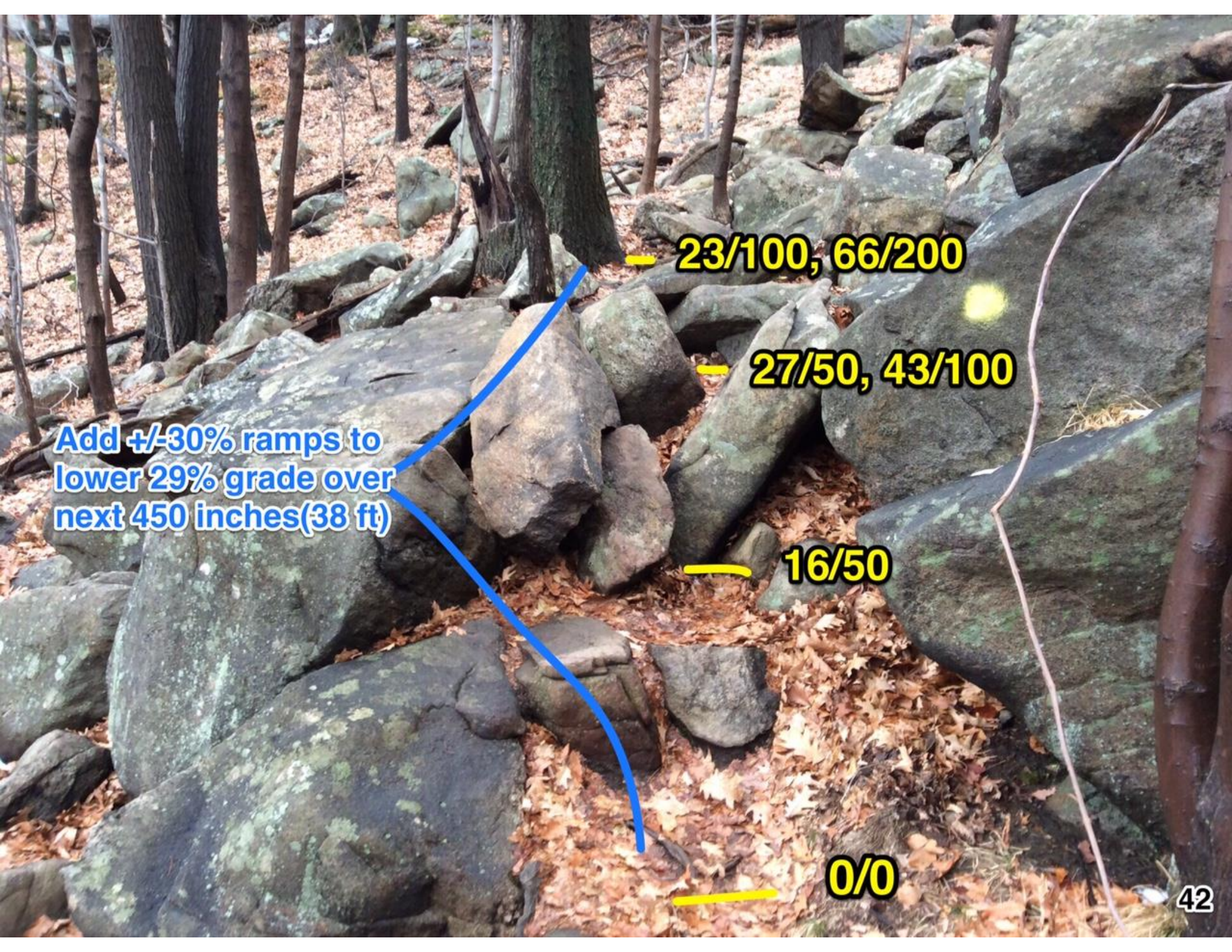
No steps

18/50



**21 ft
Widen
bench**

10/50



— 23/100, 66/200

— 27/50, 43/100

— 16/50

— 0/0

Add +/-30% ramps to lower 29% grade over next 450 inches(38 ft)



— 24/50, 130/450

— 4/50, 106/400

— 17/100, 102/350

— 19/50, 85/250

— 0/0, 66/200

Add +/-30% ramps to lower 29% grade over previous 450 inches(38 ft)

Continue w/ramps
And tread definition
at 3 ft wide

18/50, 175/650

5/50, 157/600

~22%

13/50, 152/550

9/50, 139/500

24/50, 130/450

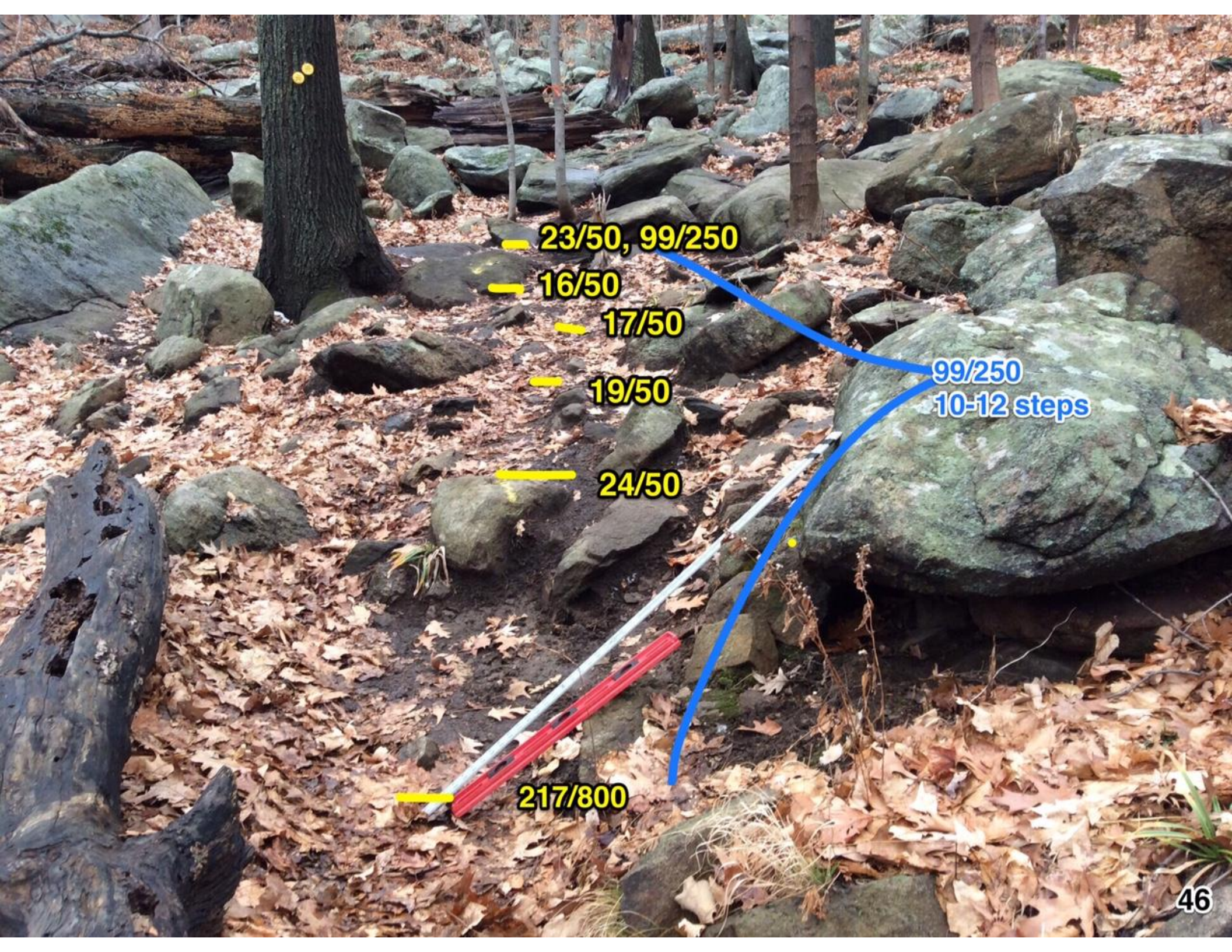
7/50, 217/800 →

17/50, 210/750 →

18/50, 193/700 →

175/650 →

Continue ramps or
add 2 steps



23/50, 99/250

16/50

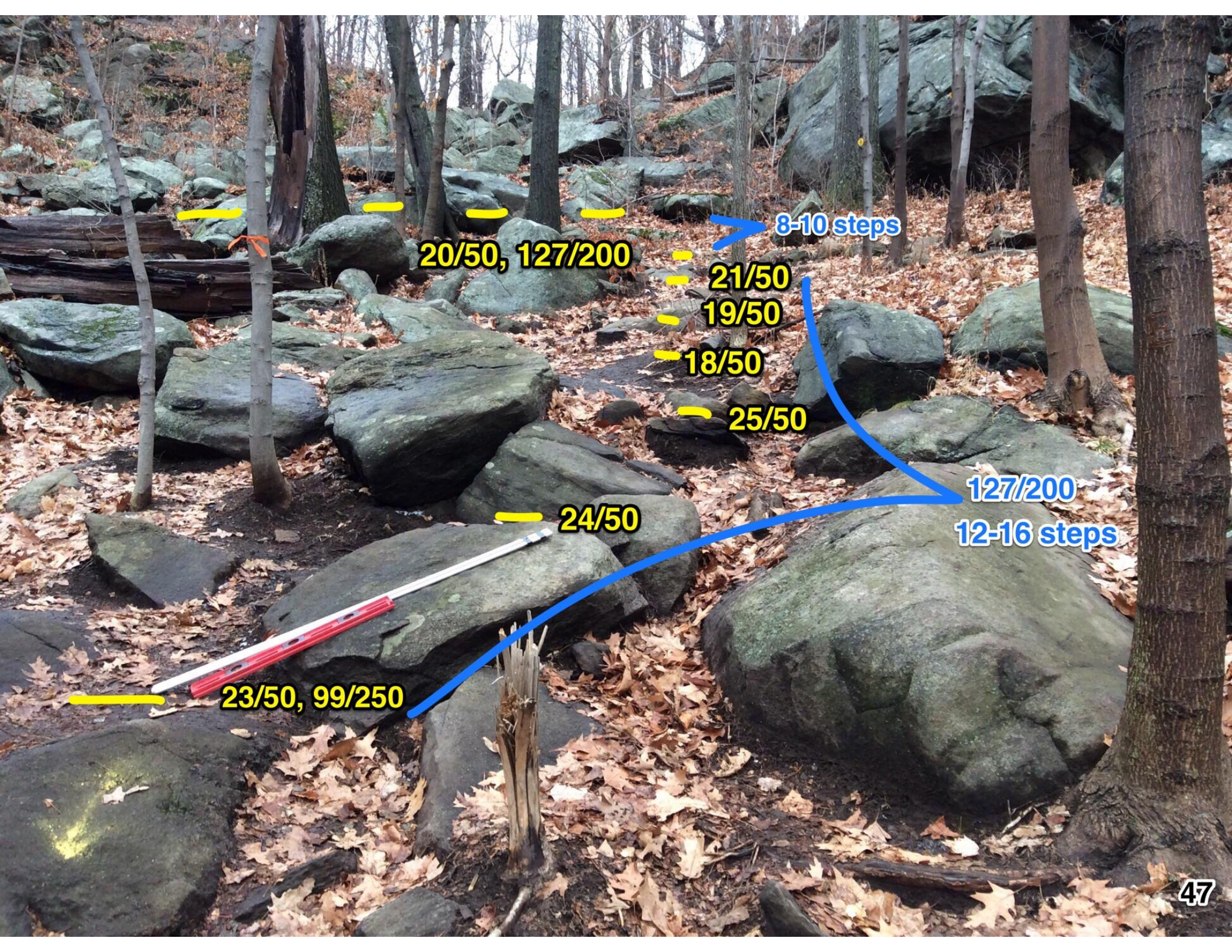
17/50

19/50

24/50

217/800

99/250
10-12 steps



20/50, 127/200

8-10 steps

21/50

19/50

18/50

25/50

24/50

127/200

12-16 steps

23/50, 99/250



29/50, 77/150

25/50

23/50

Block well
to force turn

8-10 steps

127/200



21 ft

17 ft

9 ft

Define tread
3 ft wide

Top step

0 ft

11/50, 31/100 —

20/50 —

3-4 steps

**100 inches
from 21 ft**

21 ft

**Slide down for cribbing
Open pinch**

17 ft



0/50



5/50

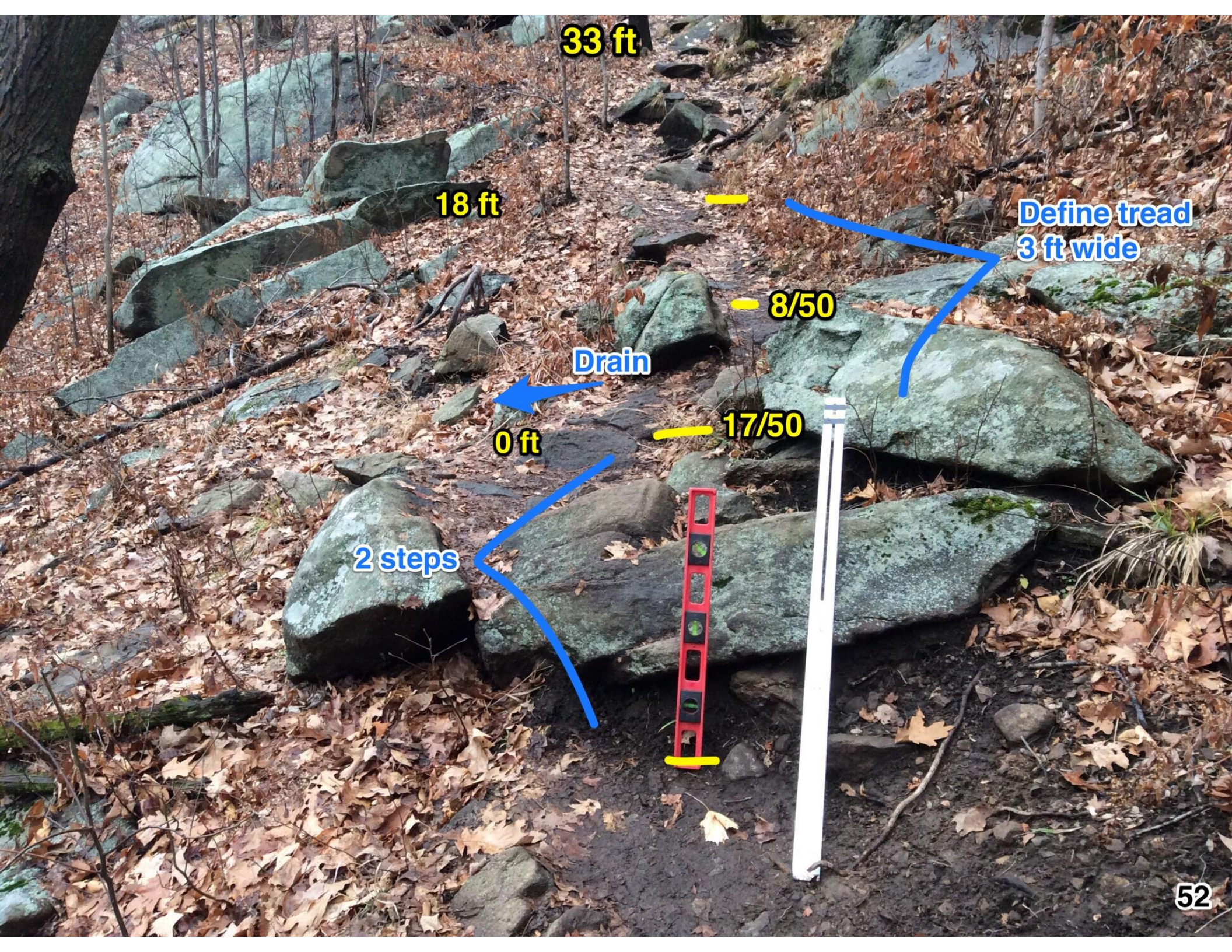
**Define tread
3 ft wide**



9/50



31/100 top step



33 ft

18 ft

Define tread
3 ft wide

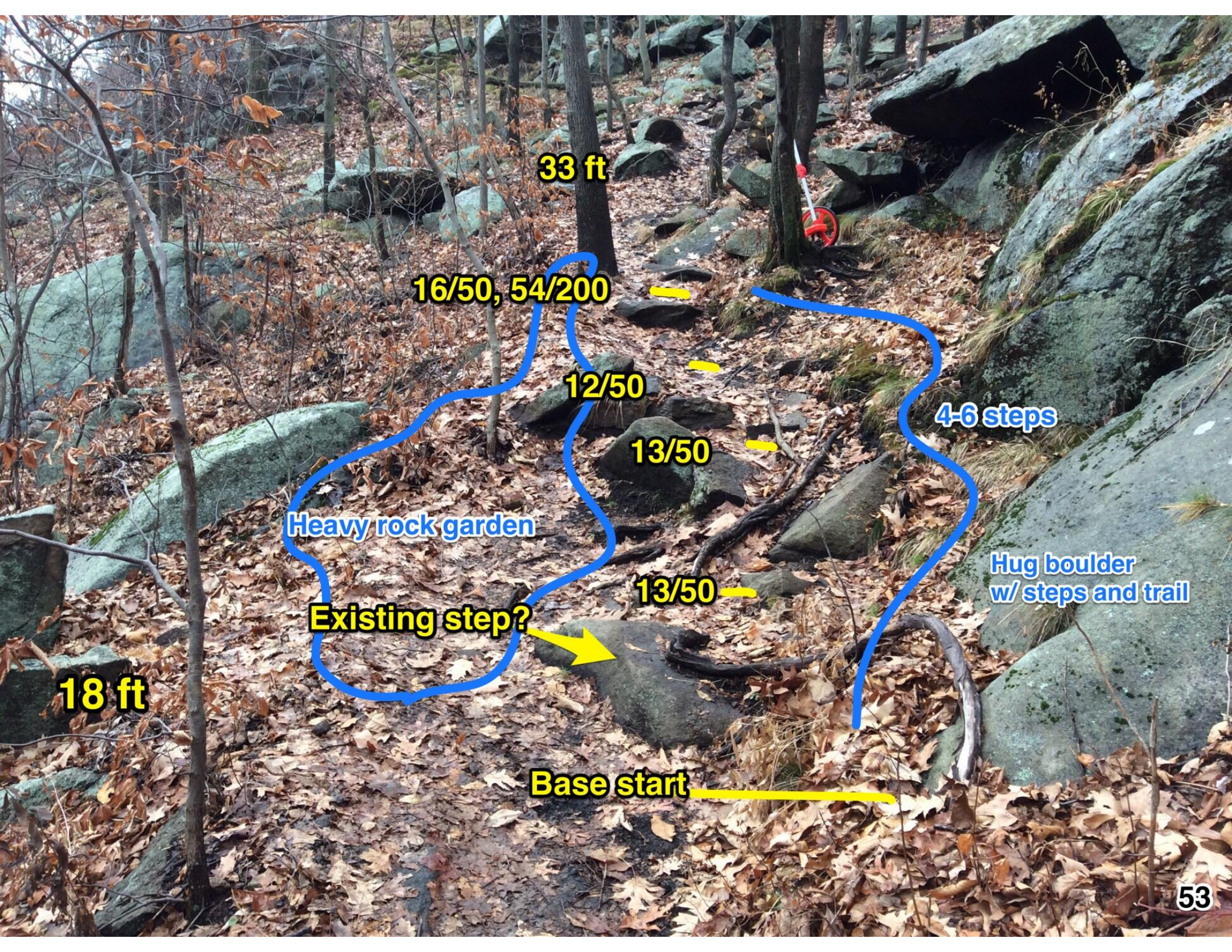
8/50

Drain

0 ft

17/50

2 steps



33 ft

16/50, 54/200

12/50

13/50

13/50

18 ft

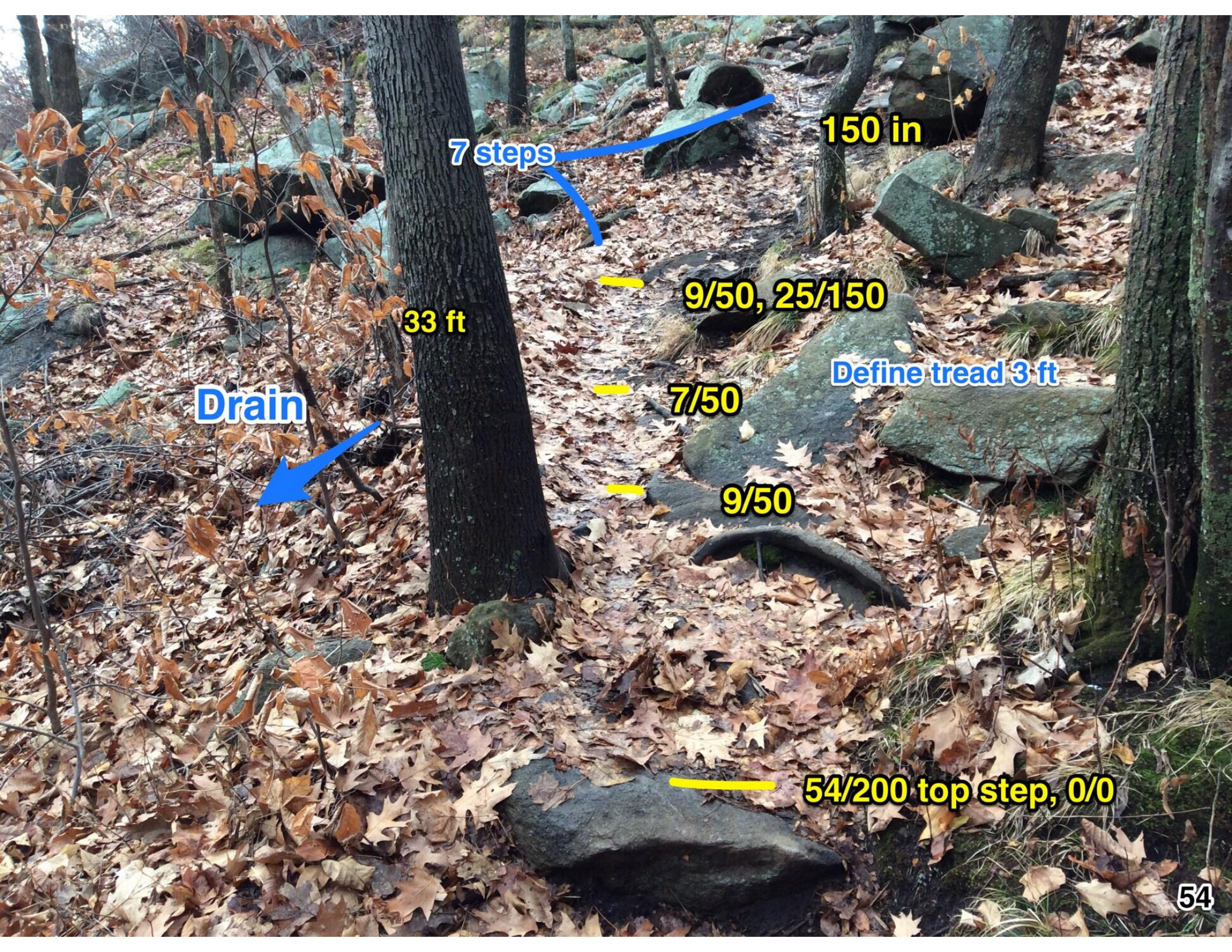
Base start

4-6 steps

Heavy rock garden

Existing step?

**Hug boulder
w/ steps and trail**



7 steps

150 in

33 ft

9/50, 25/150

Define tread 3 ft

Drain

7/50

9/50

54/200 top step, 0/0

8-10 steps

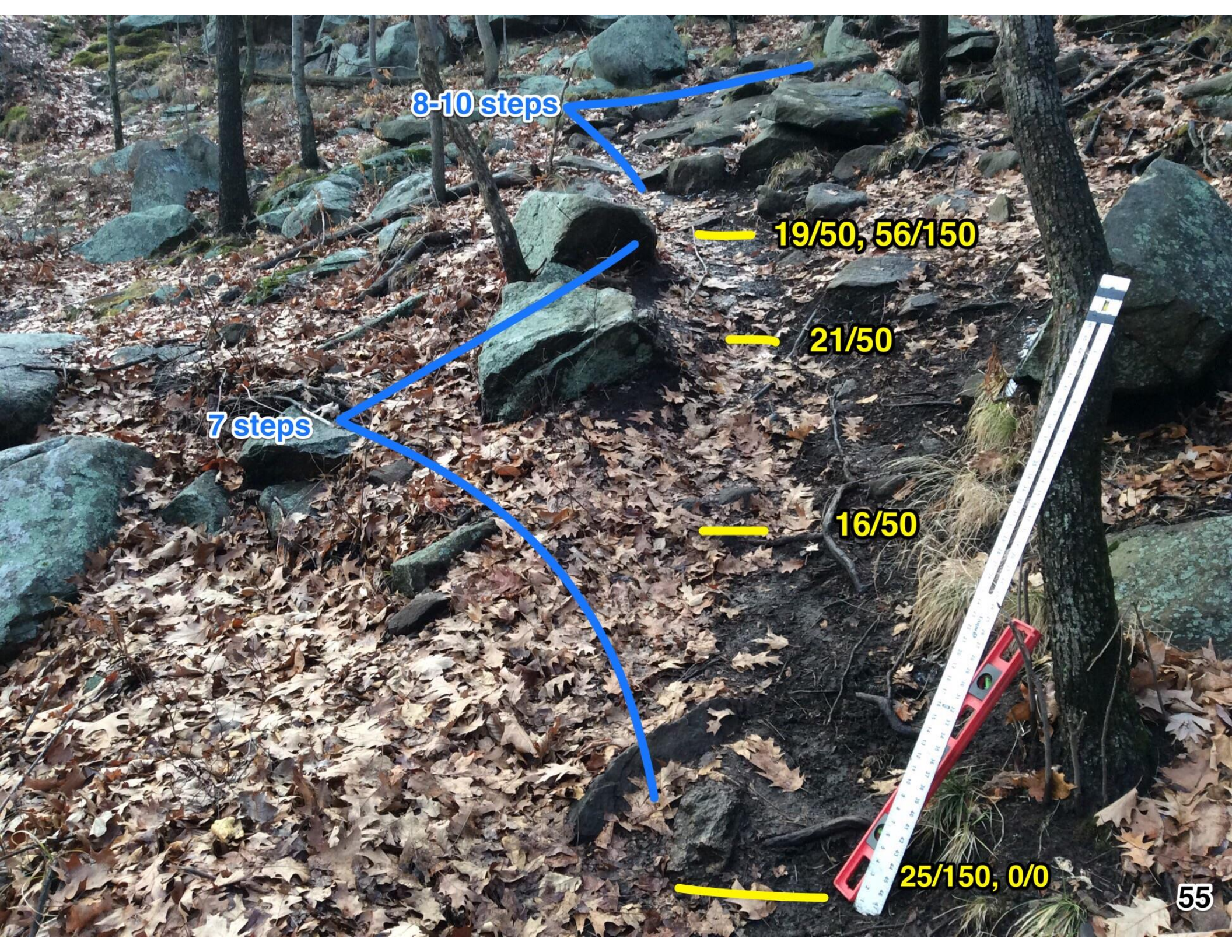
19/50, 56/150

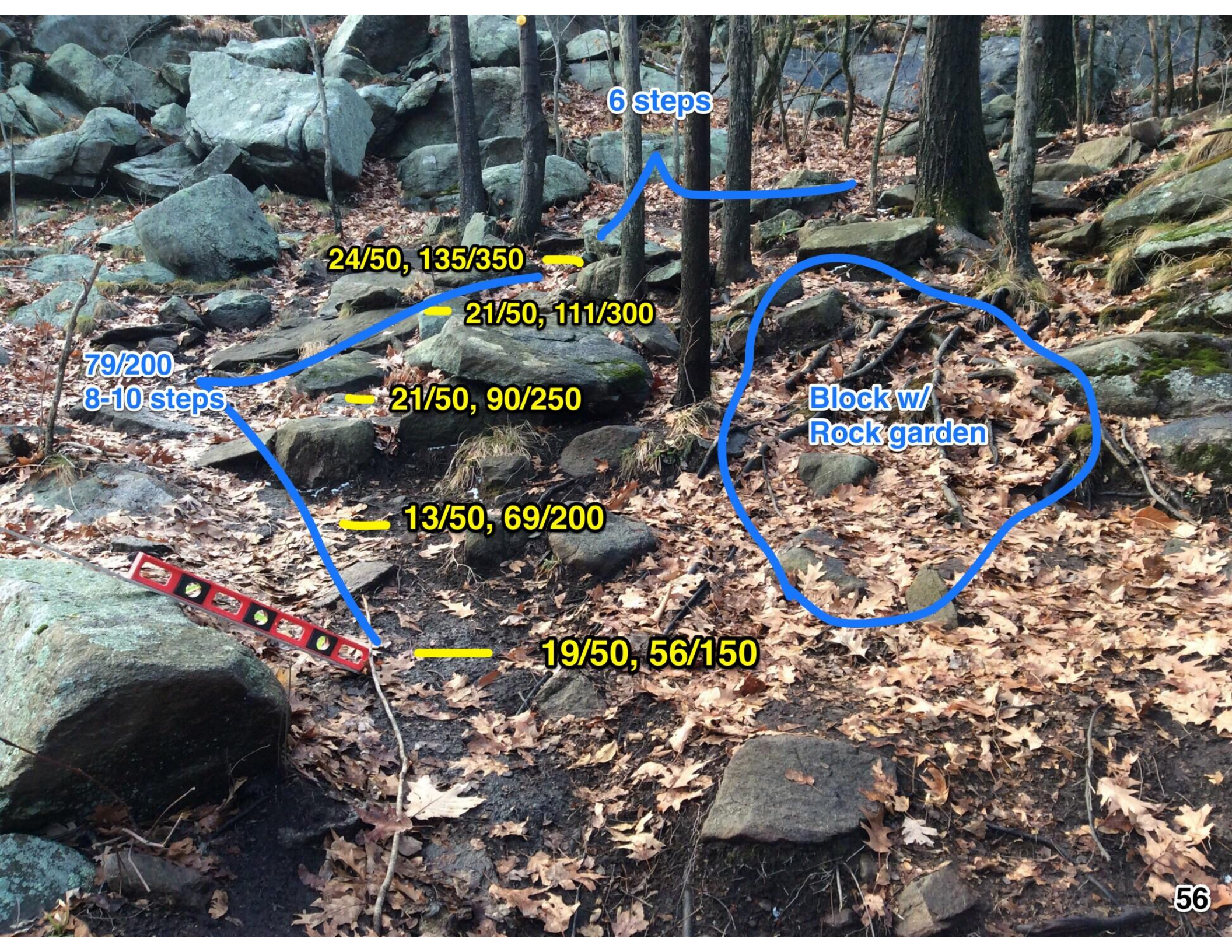
21/50

7 steps

16/50

25/150, 0/0





6 steps

24/50, 135/350

21/50, 111/300

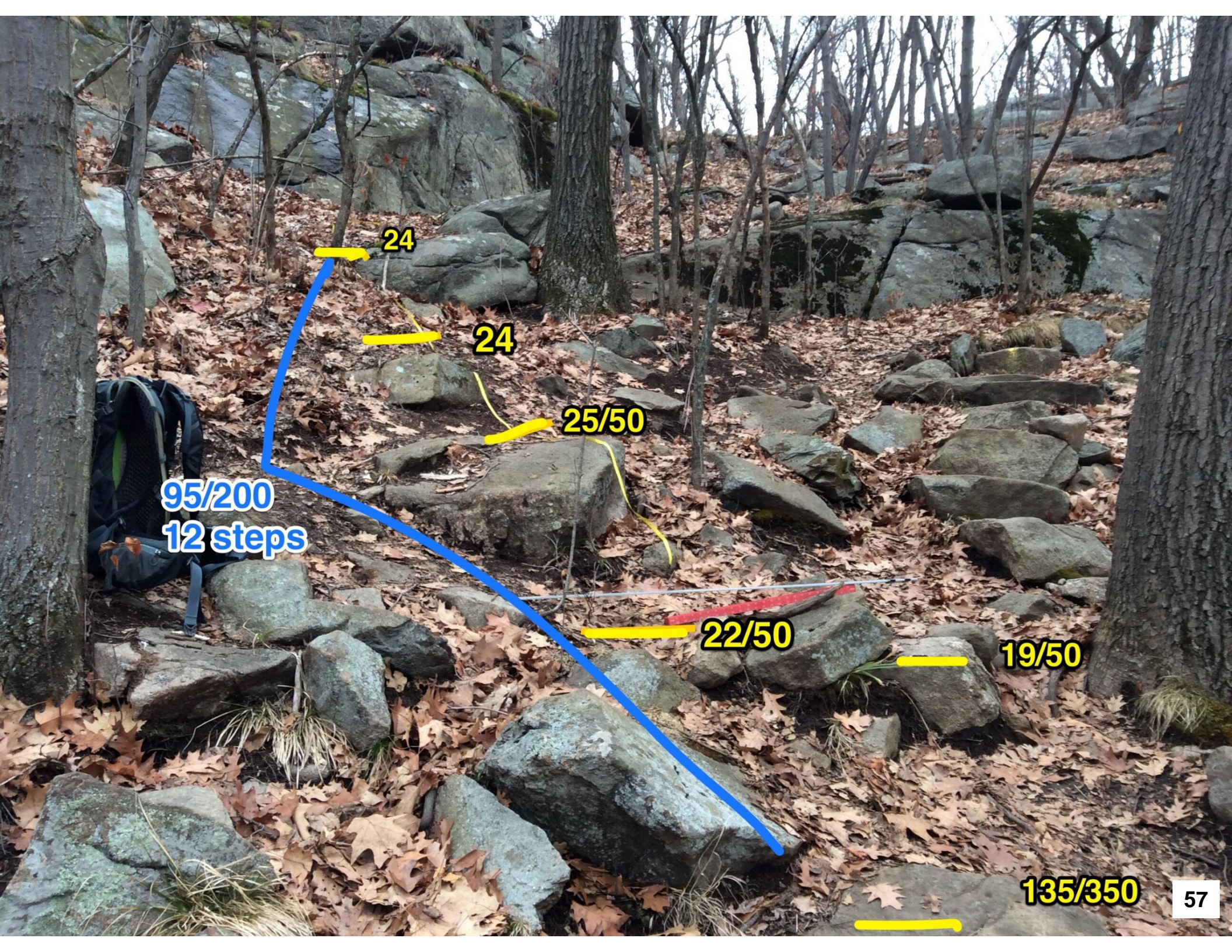
79/200
8-10 steps

21/50, 90/250

Block w/
Rock garden

13/50, 69/200

19/50, 56/150



24

24

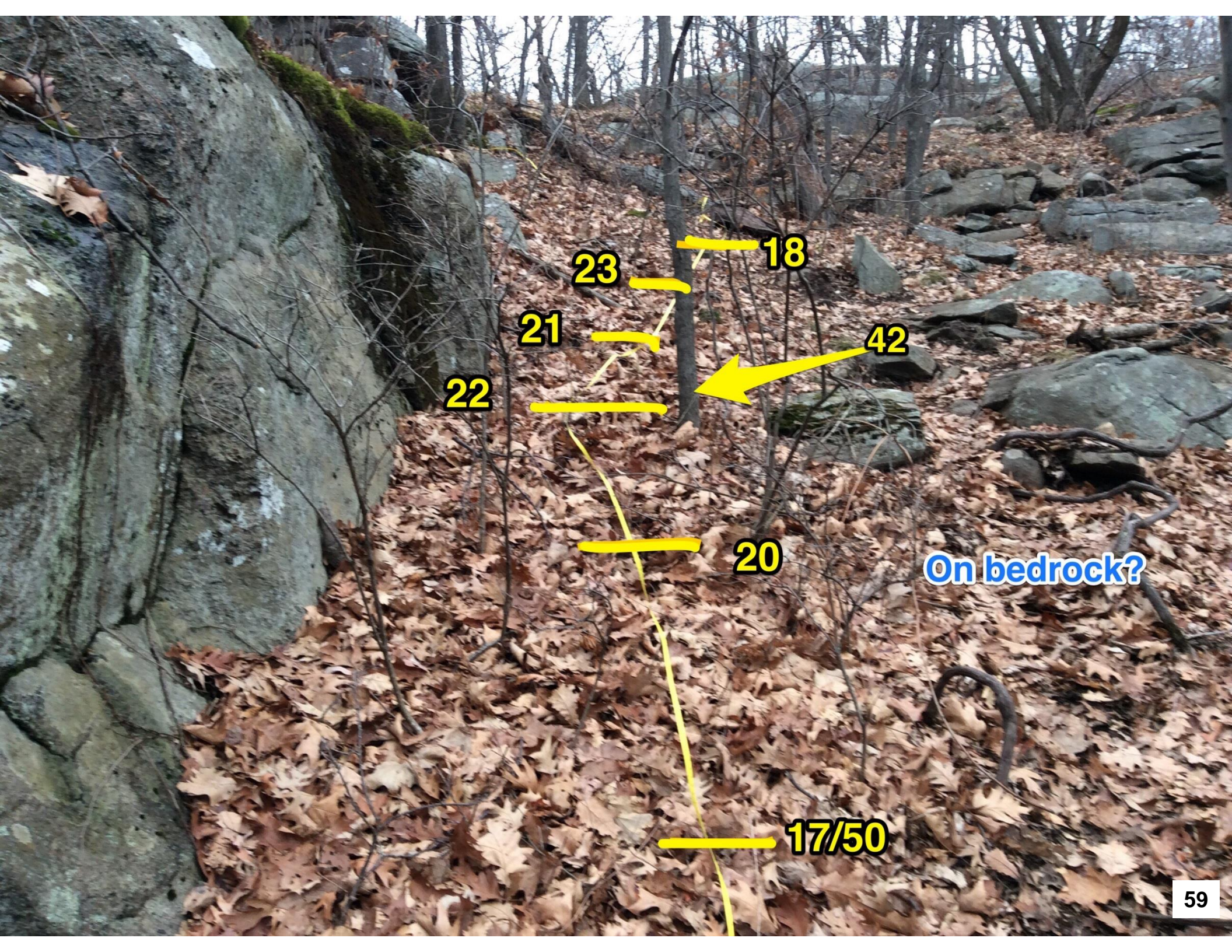
25/50

95/200
12 steps

22/50

19/50

135/350



22

21

23

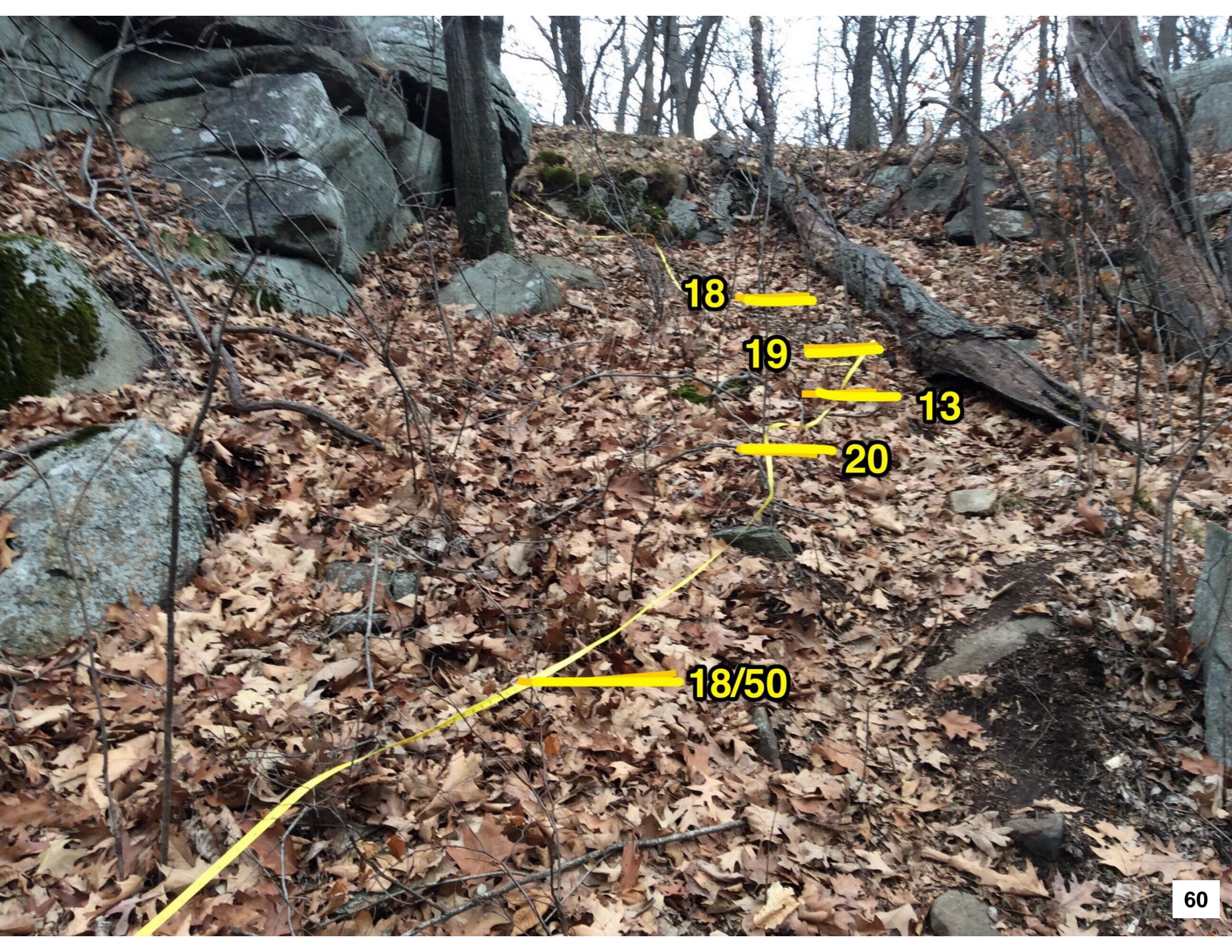
20

18

17/50

42

On bedrock?



18 —

19 —

13 —

20 —

18/50 —



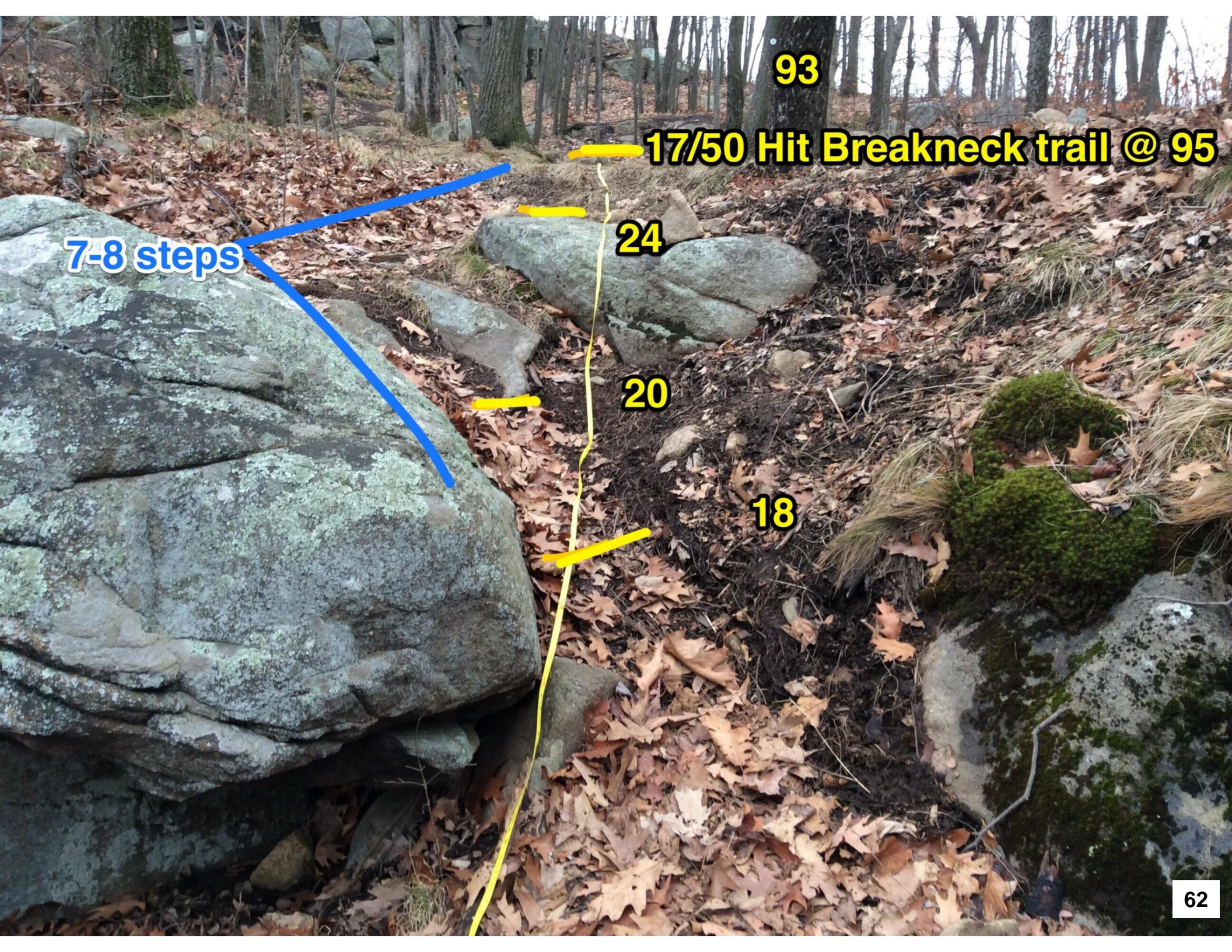
73

18

41/100
5 steps?

23

18



93

17/50 Hit Breakneck trail @ 95

24

20

18

7-8 steps