

Design Exception #6

Slopes for the Recreational Trail

Design Exception Statement

Along the Recreational Trail use slopes ranging from 2.5:1 to 1.8:1 as directed by the project Landscape Architect to create a slope that fits into the adjacent landform, looks natural, sustains vegetation and is maintainable.

Process

A presentation was made to the Design Exception Issue Task Force at Meeting on August 23, 2021.

The Design Exception process was reviewed by the Project Leadership Team on November 12, 2021. Meeting notes document their agreement that the CSS process was followed.

Reasoning for this Design Exception included:

- Reduced aesthetic impact with reduced cut wall visible (less tiers and less length)
- Reduced trail relocation length
- Reduced impact to Miller Creek slide

The Design Exception Team agreed to forward their recommendation to the Project Leadership Team supporting steeper slopes at MP 185 Cut Wall.

At the Project Leadership Team #10 held on November 12, 2021, the Design Exception ITF recommendation was presented, the PLT reviewed the process used and agreed that the CSS guidance had been followed.

Documentation for this Design Exception

- Design Exception ITF Meeting #5 presentation August 23, 2021
- Design Exception ITF #6 Meeting Notes
- Project Leadership Team presentation November 12, 2021
- Project Leadership Team Meeting Notes November 12, 2021

Summary of Design Exception ITF Aesthetic Concern and the Design Team's Approach

Aesthetic Concern - Steep Slopes may not revegetate successfully.

Design Plan, Specifications, and Field Supervision to address the concern - As directed by the project Landscape Architect the contractor will construct a slope that fits into the adjacent landform, looks natural, sustains vegetation and is maintainable.



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**I-70 West Vail Pass Safety and
Operations Improvements**



Issue Task Force Design Exceptions Meeting #6

August 23, 2021

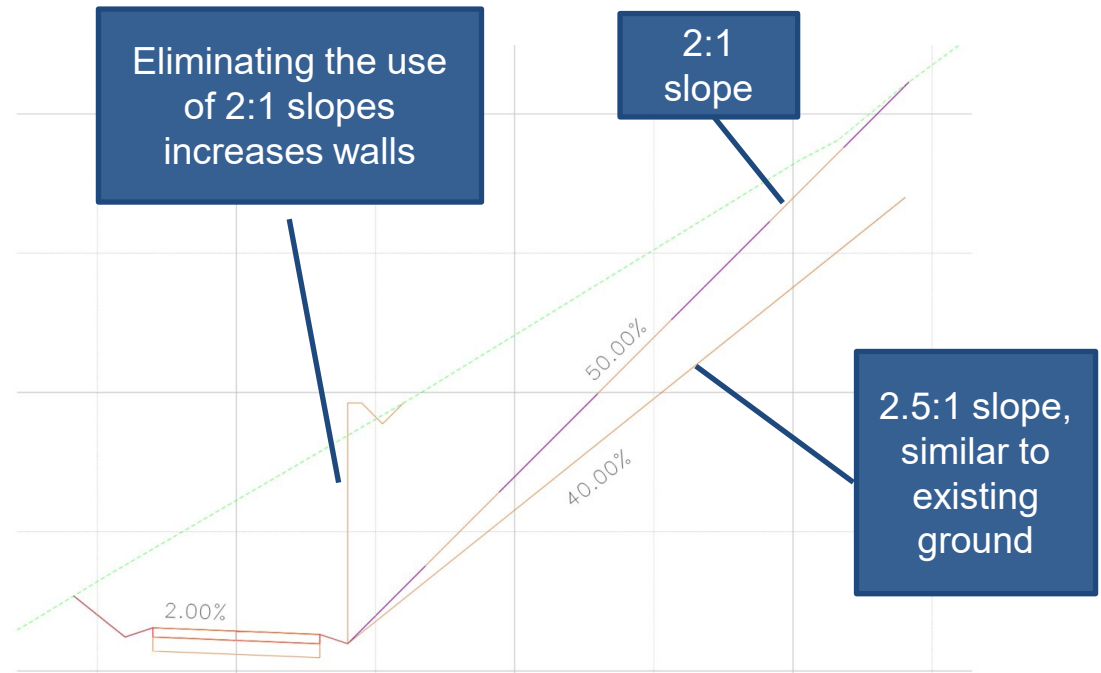
Design Exception

... Design exceptions may assist a designer in finding a transportation solution that balances impacts to scenic, historic, and culturally or environmentally sensitive area while still providing for safety and mobility...

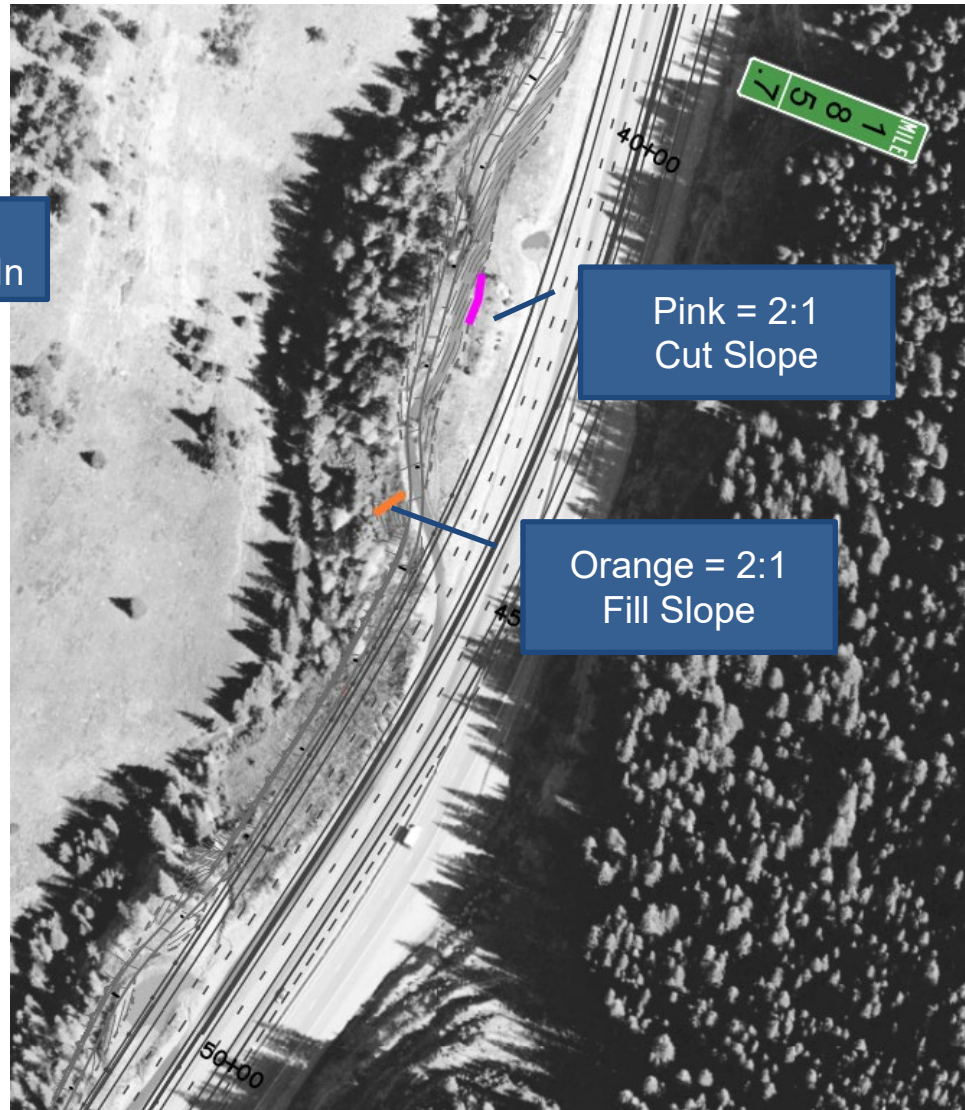
1. Complementing surrounding physical characteristics
2. Enhancing safety
3. Increasing capacity
4. Reducing costs
- 5. Protecting the environment**
6. Preserving historic and scenic elements
7. Interfacing with multiple modes of transportation
8. Utilizing new technology or innovative approaches
9. Doing the right thing

Recreation Trail Slopes

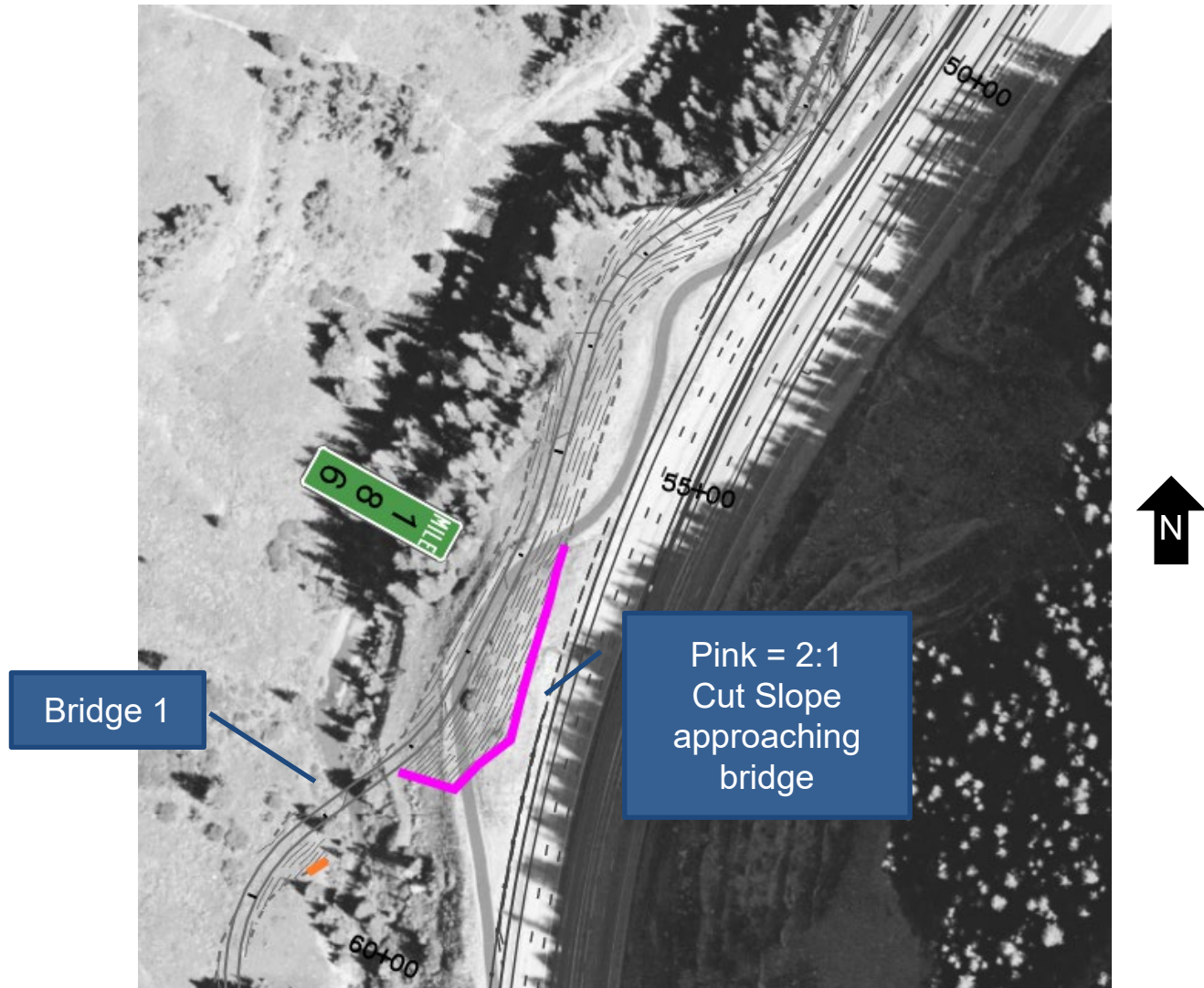
- Approximately 30% of the proposed slopes are 2:1
- Eliminating the 2:1 slopes creates more retaining walls, almost double
- Current 2:1 slopes are primarily approaching walls/ bridges or between the path and I-70



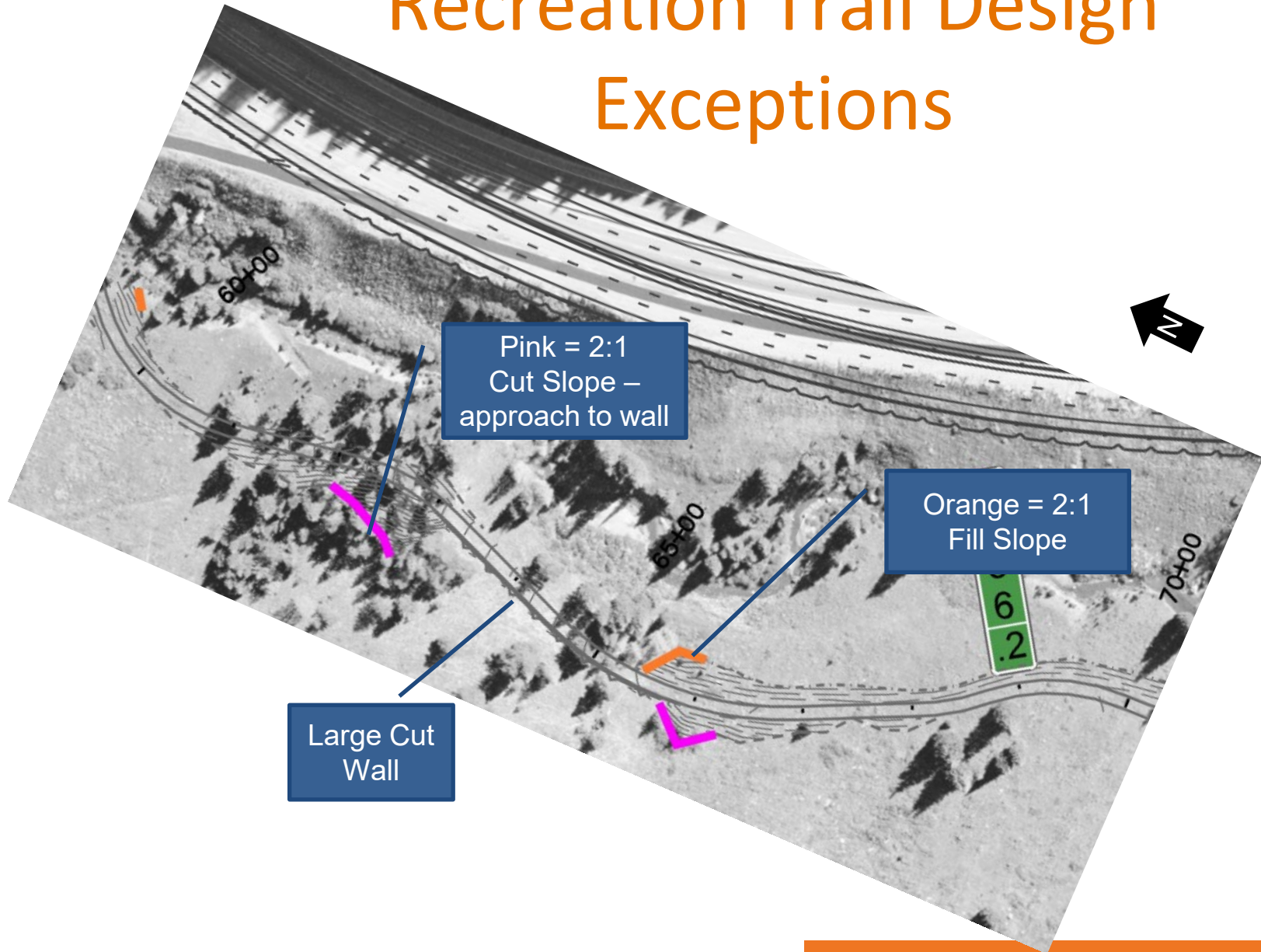
Recreation Trail Design Exceptions



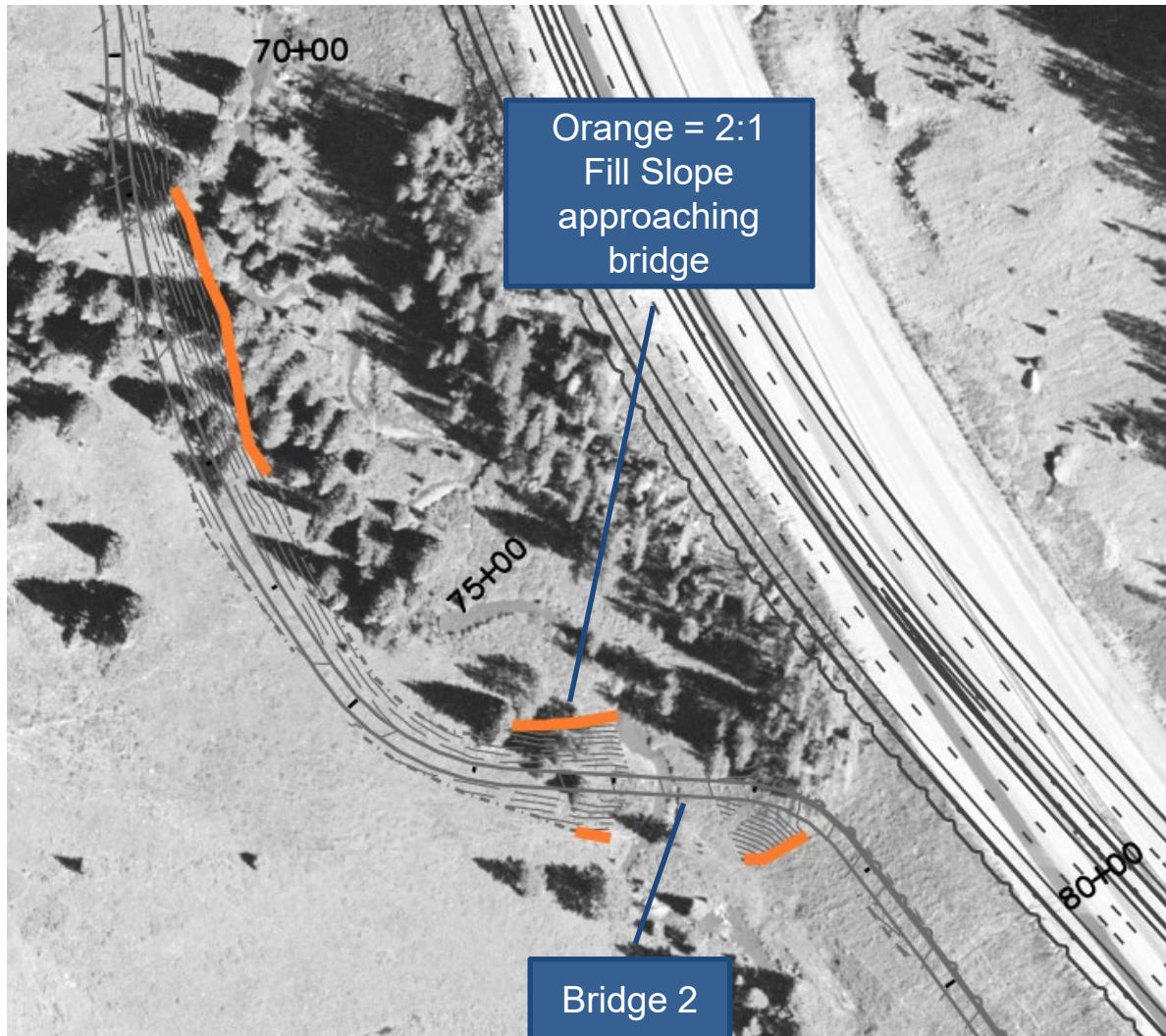
Recreation Trail Design Exceptions



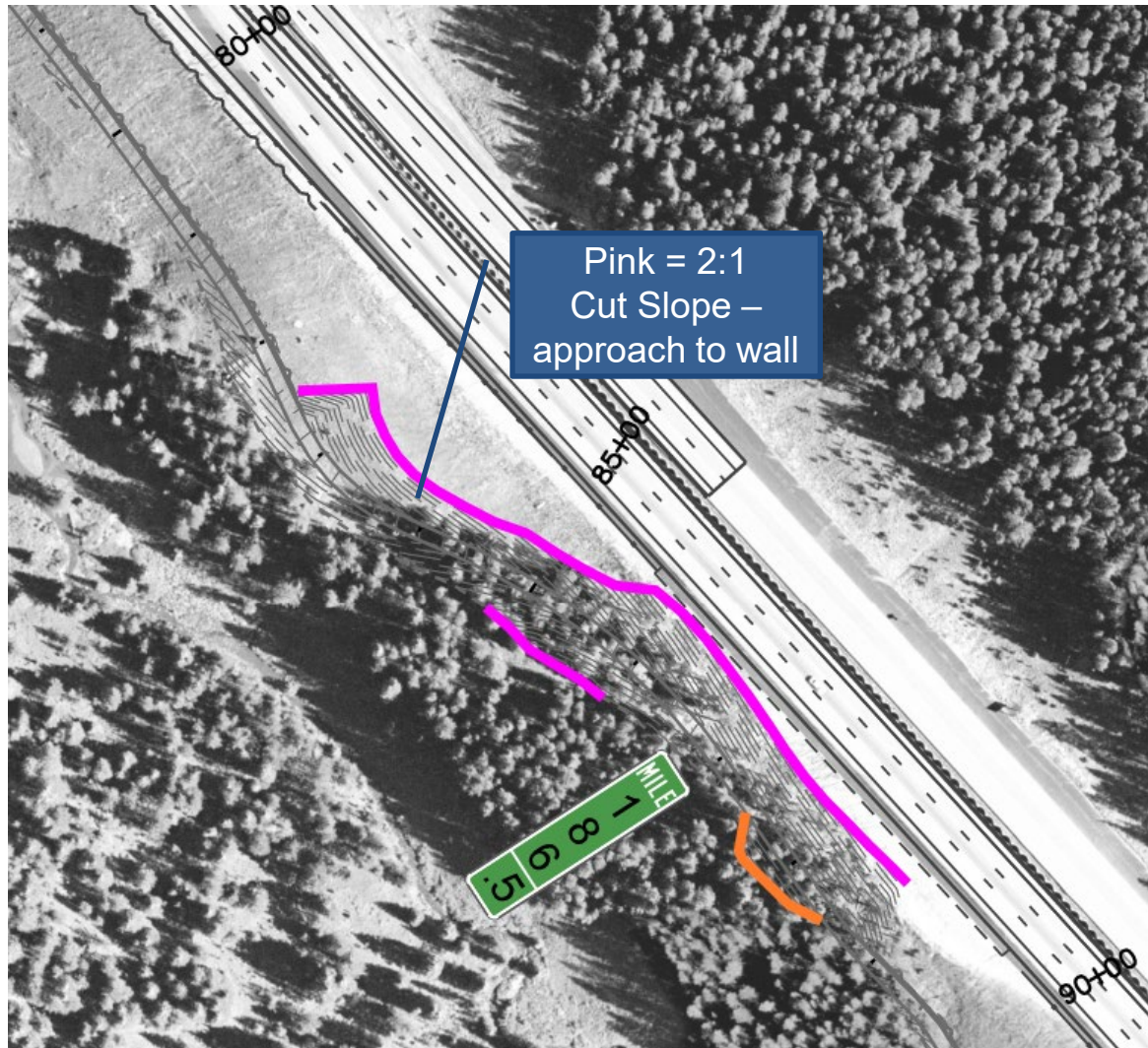
Recreation Trail Design Exceptions



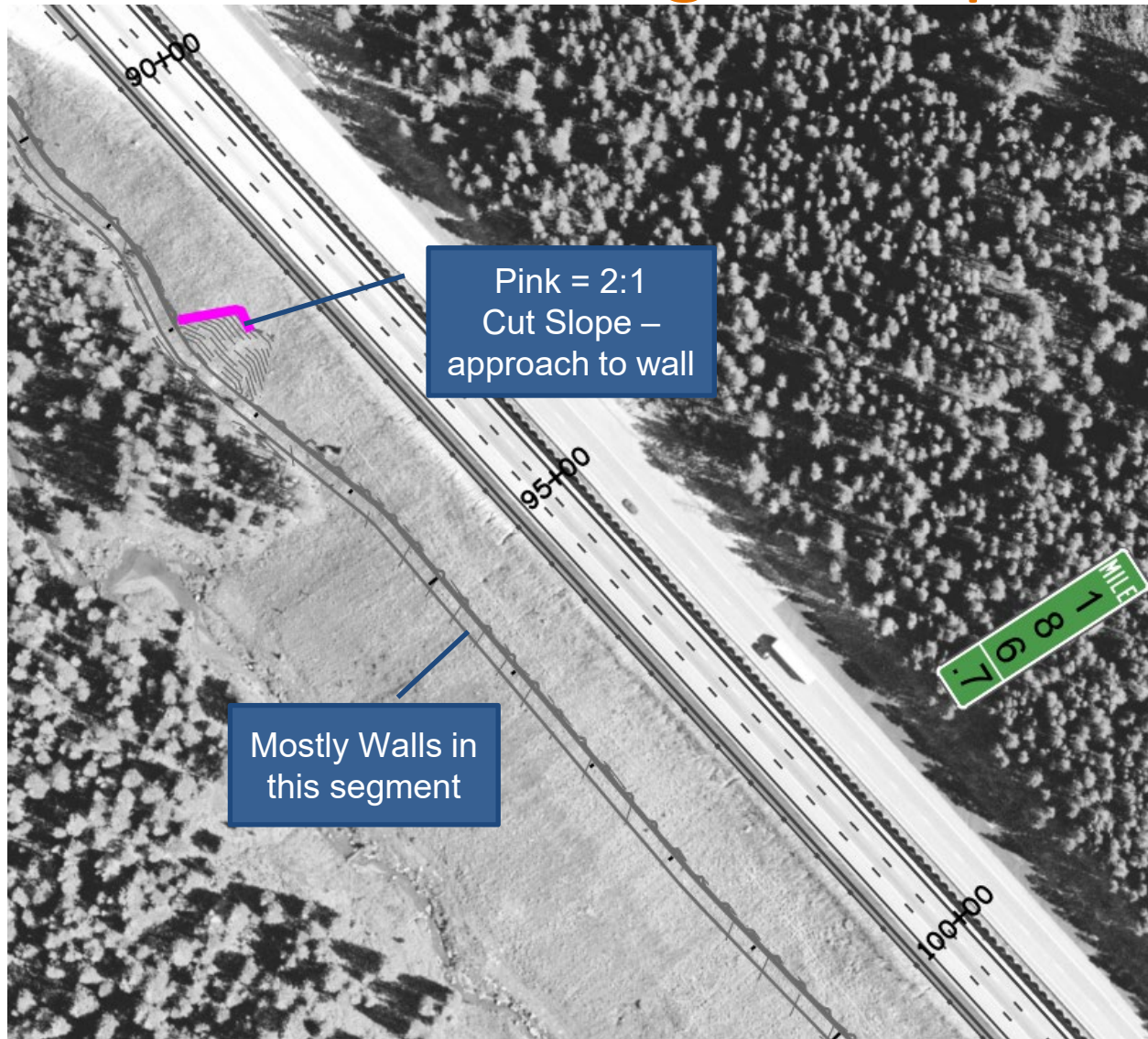
Recreation Trail Design Exceptions



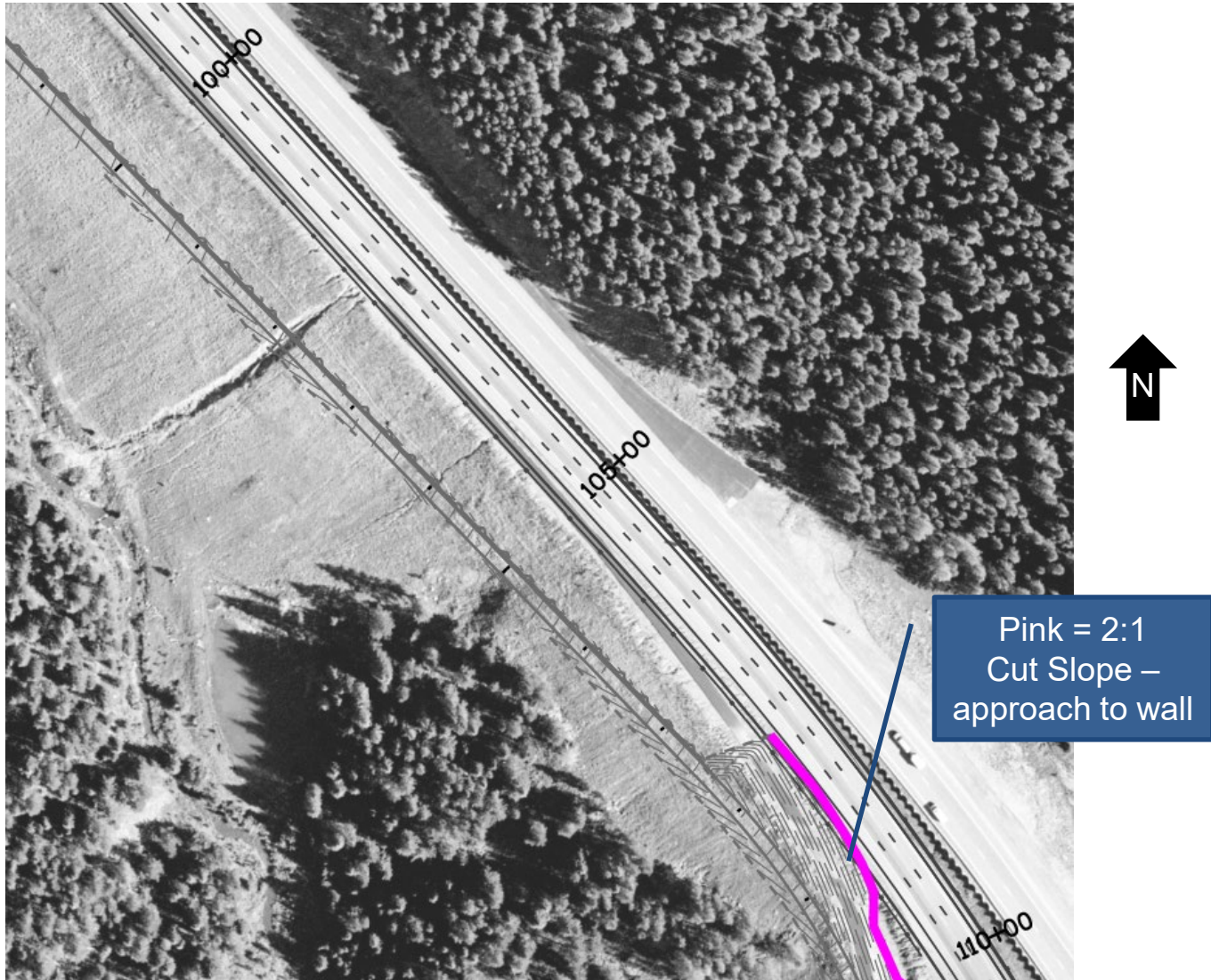
Recreation Trail Design Exceptions



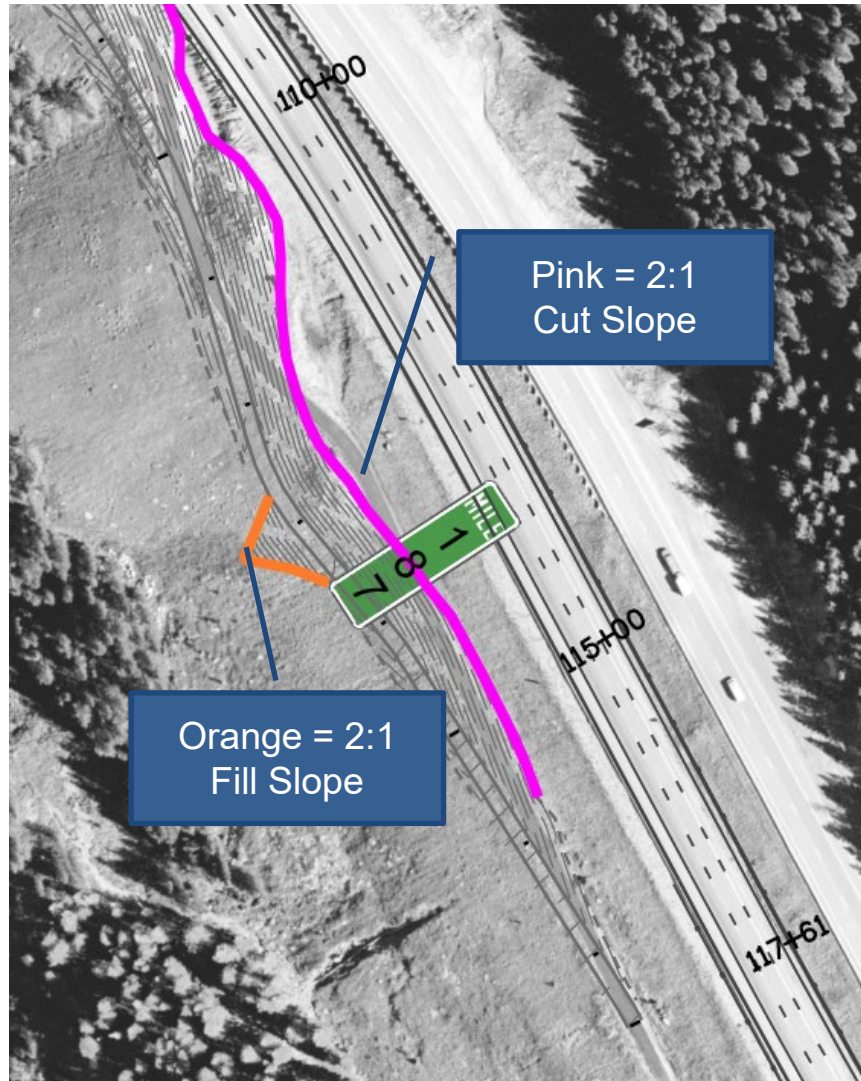
Recreation Trail Design Exceptions



Recreation Trail Design Exceptions



Recreation Trail Design Exceptions



Recreation Trail Slope Mitigations

- Boulders
 - Break up slope with random placement
- Logs and Stumps
 - Reflect natural conditions
- Trees
 - Plant mixture of diverse sizes
- Landscaping
 - Use native ecosystem species and mat groundcovers
 - Spray on blankets, bonded fiber matrix





Recreation Trail Design Exception Recommendation

Use slopes ranging from 2.5:1 to 1.8:1 as directed by the project Landscape Architect to create a slope that fits into the adjacent landform, looks natural, sustains vegetation and is maintainable.



23982-23929 I-70 West Vail Pass Safety and Operations Improvements Meeting Notes

Date: August 23, 2021

Purpose:

Issue Task Force (ITF) Design Exception Meeting #6

Location:

Online Google Meet Meeting

Attending:

Attendance list:

- John Kronholm, Project Manager, CDOT Region 3
- Karen Berdoulay, Resident Engineer, CDOT Region 3
- Matt Figgs, Project Manager, CDOT Region 3
- James Proctor, CDOT Bridge Enterprise
- Lisa Schoch, CDOT Historian
- Carol Huey, US Forest Service
- Taylor Elm, DNR
- Greg Hall, Town of Vail
- Dick Cleveland, Town of Vail
- Chad Salli, Town of Vail
- Kevin Sharkey, ECO Trails
- Siri Roman, ERWSD
- Len Wright, PhD, ERWSD
- Larissa Read, ERWSD
- Tracy Sakaguchi, Colorado Motor Carriers
- Shannon Anderson, Bicycle Colorado
- Brian Hearn, R S & H
- Jeb Sloan, R S & H
- Mary Jo Vobejda, Jacobs
- Jim Clarke, Jacobs
- Candice De, Jacobs
- Loretta LaRiviere, Jacobs



Summary of Discussion:

The following is a summary of the subjects discussed during the meeting.

1) Introductions & Meeting Purpose.

Mary Jo explained that Design Exceptions are allowed to help balance a variety of issues. The Design Exception we will be talking about today are to protect the environment. We are trying to lessen the footprint to avoid existing vegetation at the recreation trail. We will review with you and then we'd like to hear back you're your recommendation as to whether we move forward with this exception.

2) Recreation Trail Design Exception

- a) Candice said one of the challenges with the recreation trail is the existing slopes are steep at 2:1. What we found in a quick analyses is that almost 30% of our proposed slopes are 2:1 instead of the preferred 2.5:1. If we don't use a 2:1 slope in the design, our retaining walls almost double. Using 2:1 slopes help keep the cost down quite a bit for the retaining walls. Obviously the walls have the least environmental footprint, but they cost more.
- i) Candice said you might be thinking, why don't you just bring the profile up to eliminate that? We've thought a lot about it ourselves but because of the overall elevation gain from the starting point to the ending point we have some very steep profile grades. We are trying to navigate the existing steep slopes with proposed slopes with retaining walls. Generally, those 2:1 slopes are approaching the retaining walls or bridges. That is where we are proposing to use the 2:1 slopes.
- ii) During our field visit we learned a lot and we will continue to evolve the alignment. In the area approaching Bridge 1 we looked at shifting the alignment a little further down the slope and that allowed some of these 2:1 slopes to be eliminated.
- iii) We've got some cut walls going down towards the creek and others approaching the bridge. Some of the bridge grading will be refined once we get the bridge abutment set and know what the grading all around the abutment and wing walls look like.
- iv) There are also some cut walls between the rec path and I-70 and the 2:1 slope Design Exception allows a slope instead of a retaining wall with some cut instead of walls the entire length. This is another area we looked at in the field that we might be adjusting based on the existing topography.

Jim said we were out on the wetland field visit updating the EA boundaries and they are changing a bit so there will probably be some minor refinements in the design to account for this.

- v) Candice said there is a long cut wall where we won't have 2:1 slopes. We're just trying to tie into existing hillside and minimize the height of the cut wall.
 - vi) 2:1 slopes will be used to stay further away from the highway in some locations. We will use an offset barrier in some locations to make sure we tie in at the barrier locations. The proposed slopes will be used to try to catch the tie in points where we have steep grades.
- b) Mary Jo reviewed the mitigations measures that we have talked about with the truck ramps, and these are all things the landscape architect and designers will consider as ways to break up the slopes:
- Boulder could be used to break up slope with random placement
 - Logs and Stumps to reflect natural conditions
 - Trees will be a plant mixture of diverse sizes
 - Landscaping will use native ecosystem species with mat groundcovers and spray on blankets, bonded fiber matrix

Mary Jo acknowledged these don't lessen the steepness of the slopes being proposed to you right now. But there are ways to mitigate so the slopes have a different appearance and that helps with the type of vegetation that can survive. The main reason the Design Exception is recommended for 2.5:1 slopes versus 2:1 slopes is that 2.5:1 slopes are easier to revegetate.

- c) Mary Jo noted the Recreation Trail Design Exception is the same Design Exception for the cut walls:

Use slopes ranging from 2.5:1 to 1.8:1 as directed by the project Landscape Architect to create a slope that fits into the adjacent landform, looks natural, sustains vegetation and is maintainable.

- i) Greg said the existing slopes from the interstate down, irrigation could be put in to really establish revegetation on the steeper slopes. He has a project that is putting in a lot of temporary irrigation. It seems with summers getting warmer, we can get vegetation to re-establish better on steep slopes with irrigation.

Candice said the slopes vary. Some are 3:1, some are 2:1 and some are steeper than 2:1.

Karen said we haven't gotten that far in the landscaping design yet. Traditionally if it is 2:1 or steeper we put a blanket down on top of seeding.



There is no water source so it will have to be completely portable and could be quite challenging.

Matt said we are a little far out to be having detailed discussions on this, but we have talked about it quite a bit. Getting the seed to establish is really important in holding the slopes.

- ii) Greg said that's the hard part when you go to 2:1. You're kind of in a catch 22 situation. You use a steeper slope and put the protection on there but if your seeding doesn't take, it's really hard to reseed it a second time to get it to take. That would be my concern about these design exceptions.

John said he has seen some great results in the valley seeding and grass growing with the cold air blankets on steeper slopes. We put the onus on the contractor, but the state holds the SWMP Permit and is responsible to get the vegetation to come back so one way or another vegetation gets re-established.

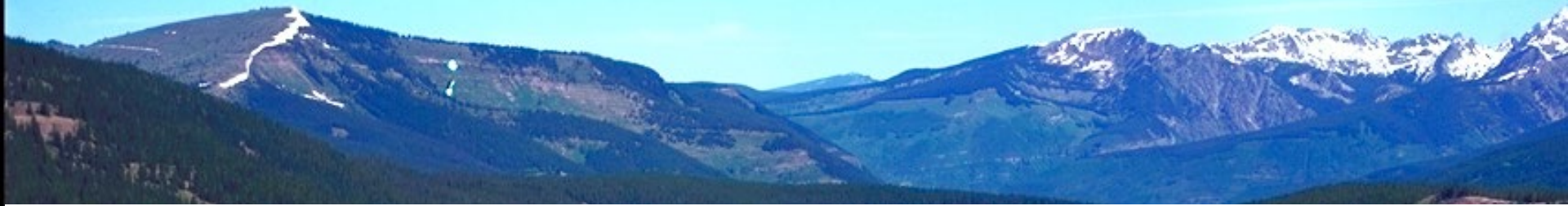
Karen said a lot of the trail will be built in 2022 but we will be constructing through 2024 and will have a landscape period after that. It's usually a year to make sure everything is established so this is a little different than a typical project.

We can't close our SWMP permit until we get 80% of the disturbance area has established vegetation. We then transfer that permit to maintenance. They have the ability to contract to pay additional funds for additional seeding which we've had to do on other projects. There is a way to do it regardless of who pays for it. We'll be up there for a while so we'll definitely have time, and we will have a landscape warranty period like we had on Vail Underpass.

- d) Mary Jo asked if anyone objects to these design exceptions or if there was anything you would like us to change in the text to better address any of the concerns that have been brought up.

Hearing no objections or language change suggestions, Mary Jo said we will move forward with the assumption that everyone is comfortable with these slope design exceptions and with the PLT approval, our designers will move forward using this design exception.





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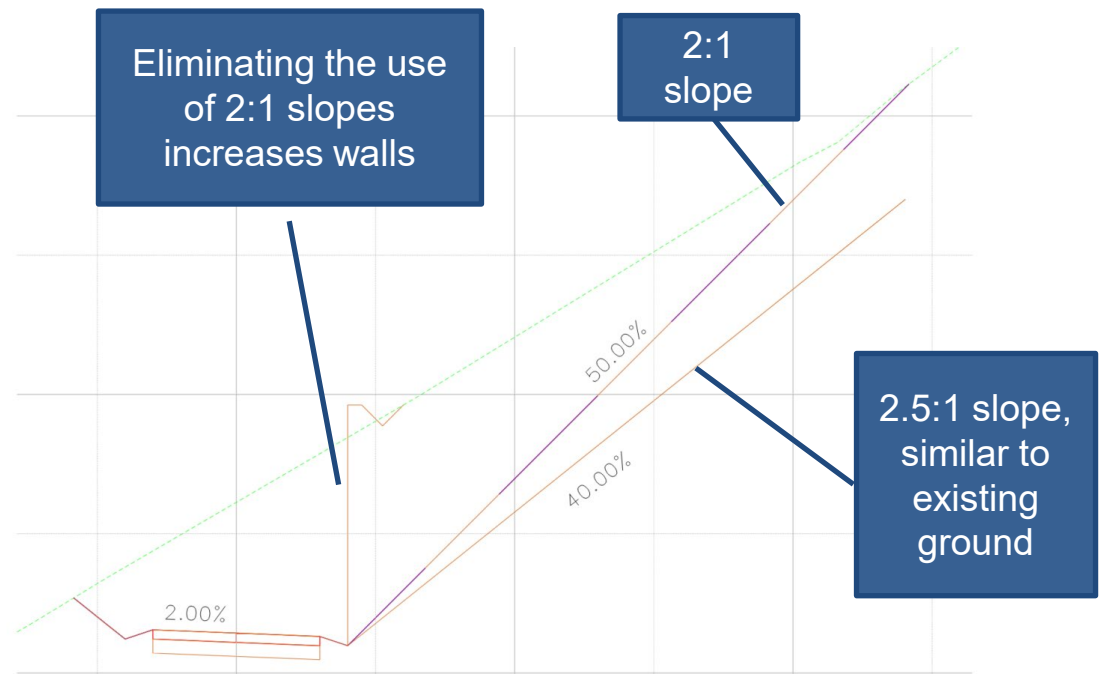
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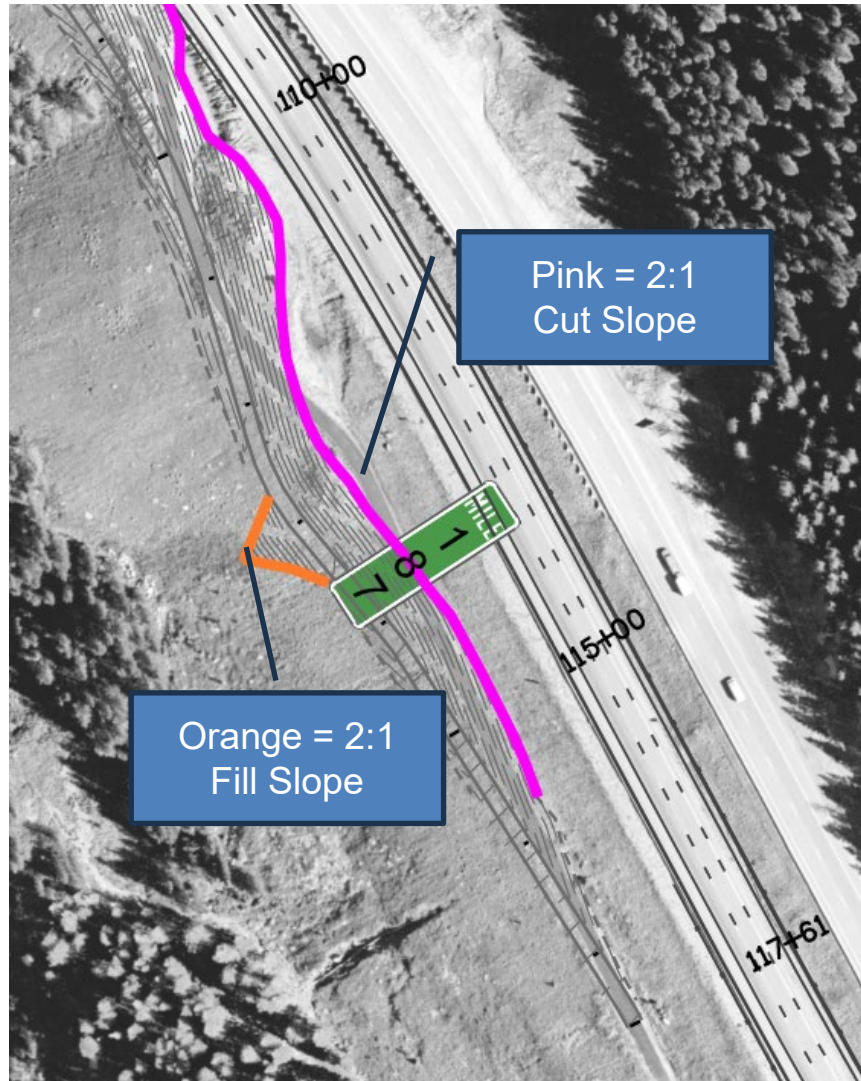
Project Leadership Team Meeting #10
November 12, 2021

Recreation Trail Slopes

- Approximately 30% of the proposed slopes are 2:1
- Eliminating the 2:1 slopes creates more retaining walls, almost double
- Current 2:1 slopes are primarily approaching walls/ bridges or between the path and I-70



Recreation Trail Design Exceptions



Recreation Trail Slope Mitigations

- Boulders
 - Break up slope with random placement
- Logs and Stumps
 - Reflect natural conditions
- Trees
 - Plant mixture of diverse sizes
- Landscaping
 - Use native ecosystem species and mat groundcovers
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Recreation Trail Design Exception Recommendation

Use slopes ranging from 2.5:1 to 1.8:1 as directed by the project Landscape Architect to create a slope that fits into the adjacent landform, looks natural, sustains vegetation and is maintainable.



23982-23929 I-70 West Vail Pass Safety and Operations Improvements Meeting Notes

Date: November 12, 2021

Purpose:

Project Leadership Team (PLT) Meeting #10

Location:

Online Google Meet Meeting

Attending:

Attendance list:

- John Kronholm, Project Manager, CDOT Region 3
- Karen Berdoulay, Resident Engineer, CDOT Region 3
- Rob Beck, CDOT Region 3 Program Engineer
- Kane Schneider, CDOT Region 3 Maintenance
- Zane Znamenacek, CDOT Region 3 Traffic Program Engineer
- Matt Figgs, CDOT Region 3
- Pete Wadden, Town of Vail
- Dick Cleveland, Town of Vail
- Tracy Sakaguchi, Colorado Motor Carriers
- Randal Lapsley, R S & H
- Jim Clarke, Jacobs
- Mary Jo Vobejda, Jacobs
- Loretta LaRiviere, Jacobs

Summary of Discussion:

The following is a summary of the subjects discussed during the meeting.

1) Introductions & Meeting Purpose

- a) Karen began the meeting by introducing the PLT attendees' names and organizations.
- b) Mary Jo said the purpose of today's meeting is to present the Technical Team's recommendation for the recreation trail Design Exception.



2) Recreation Trail Design Exception

The recreation trail currently has about 12 locations where they don't meet the slope requirements. The number could increase as the trail design continues to have fewer conflicts with wetlands and trees. About 30% of the slopes being proposed will be at 2.1 along the recreation trail. If we go to 2.5:1, we are going to create almost twice as many walls. We are primarily doing these at approaches to bridges or between the trail and I-70. You can imagine as we get closer to I-70, it is harder and harder to keep a more shallow slope of 2.5:1.

If you had the slope at 2.5:1, it comes further and further out just to meet the existing grade, so you create more and more disturbance area. Not only does it come out further, but it also goes further along the trail.

Mary Jo said we are not doing this because it is the cheaper and easier way to do it. We are doing this because we really believe we are going to get a better product. Where we can, we will use the standard of 2.5:1 slopes. Where it is onerous or causes greater damage or disturbance, we are going to use this Design Exception.

- a) Dick asked in the areas where we have the steeper slopes, do you have to do additional sediment control or debris control or additional gutters along the trail to prevent debris on the trail.

John said on the previous slide it showed spray on mulch which we wouldn't use. We would use biodegradable erosion control blankets so we would have that extra measure to help the grass grow on the steeper slopes and we have had great success in getting the grass to grow there.

In this case, where we have the 2.1 there are little rills that form on the steep slopes just because of the runoff from I-70. Here we are making an effort with the new lane to capture that water and are going to manage the water from the road which then has an influence on the bike path. The bike path, in these areas with the steeper grades, is going to see less water that gets to the path now. We have some drainage features on the recreation trail so in areas where we are closer to I-70, we have taken steps to manage it much better than it is managed now

Randal said there is a ditch at the bottom and that will help avoid any sediment getting directly on the path and then we are looking at all the ways we can take the water that is running in those ditches and put it through some sediment containment pieces or run it through natural vegetation to diminish the sediment load.

Mitigation measures proposed and shown to the TT are:

- Boulders to break up slope with random placement and act as stabilizing forces

- Use logs and stumps to reflect natural conditions
- Plant a tree mixture of diverse sizes
- Landscaping using native ecosystem species, mat groundcovers and spray on blankets, bonded fiber matrix to insure at the steeper 2.1 slopes to revegetate the slopes

The recommendation endorsed by the TT is the same as the Cut Wall Slope Design Exception:

Use slopes ranging from 2.5:1 to 1.8:1 as directed by the project Landscape Architect to create a slope that fits into the adjacent landform, looks natural, sustains vegetation and is maintainable.

The PLT had no objections to the process and approve the recommendation.

