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 MP185 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 Design Exception #6:

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

COLORADO
Department of Transportation

I-70 West Vail Pass Safety and Operations Improvements

Design Exceptions Meeting

August 23, 2021

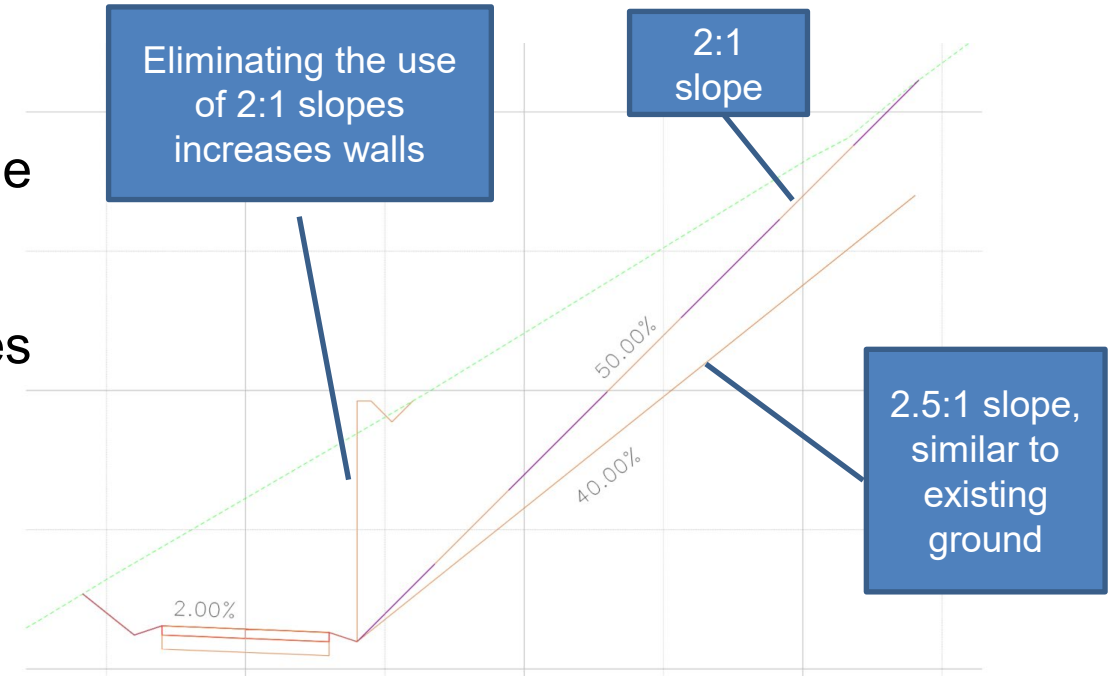
Design Exception

… 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…

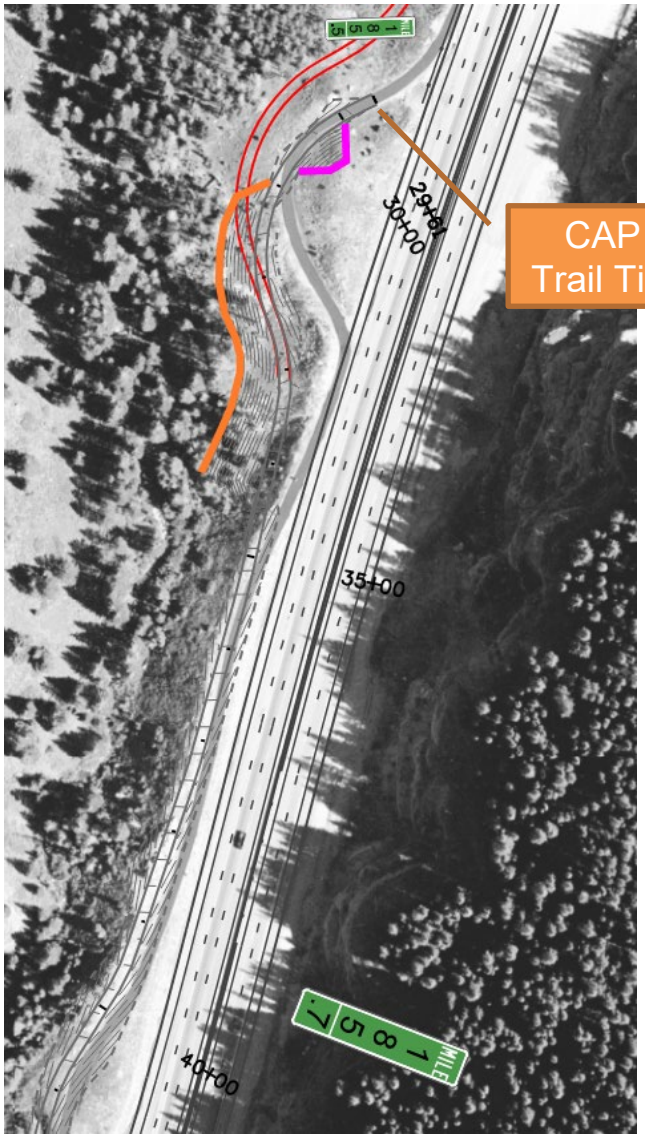
1. Complementing surrounding physical characteristics
2. Enhancing safety
3. Increasing capacity
4. Reducing costs
5. **Protecting the environment**
6. Preserving historic and scenic elements
7. Interfacing with multiple modes of transportation
8. Utilizing new technology or innovative approaches
9.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

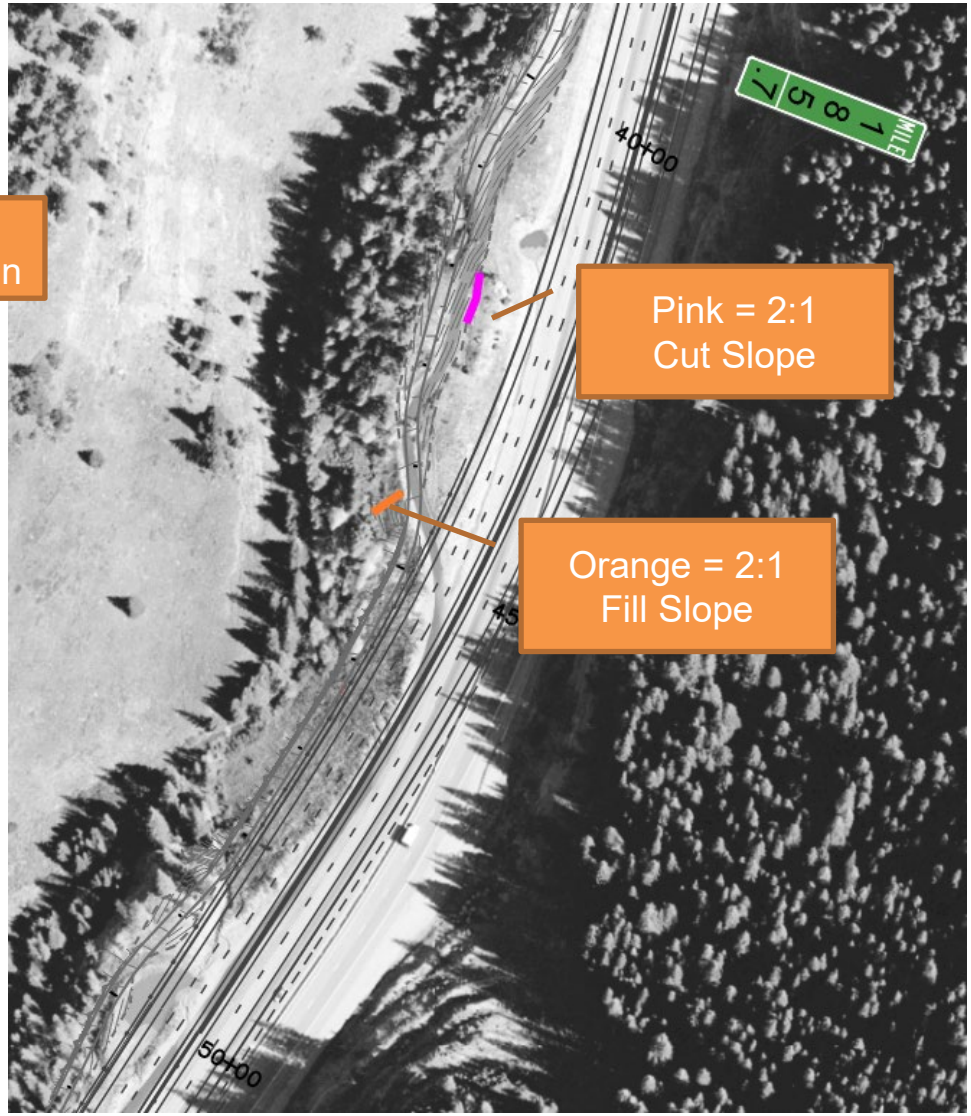
Recreation Trail Slopes

- 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

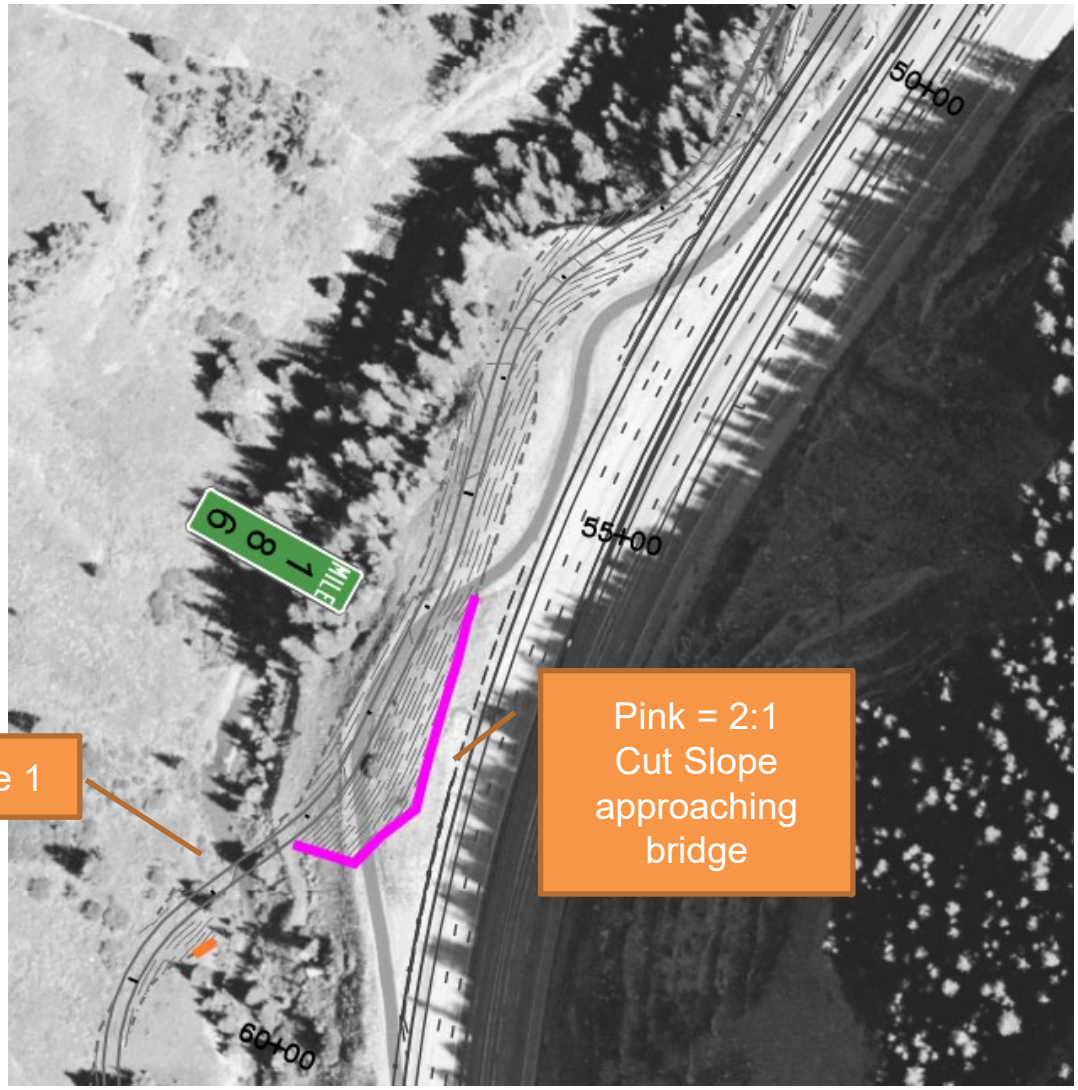


Recreation Trail Design Exceptions

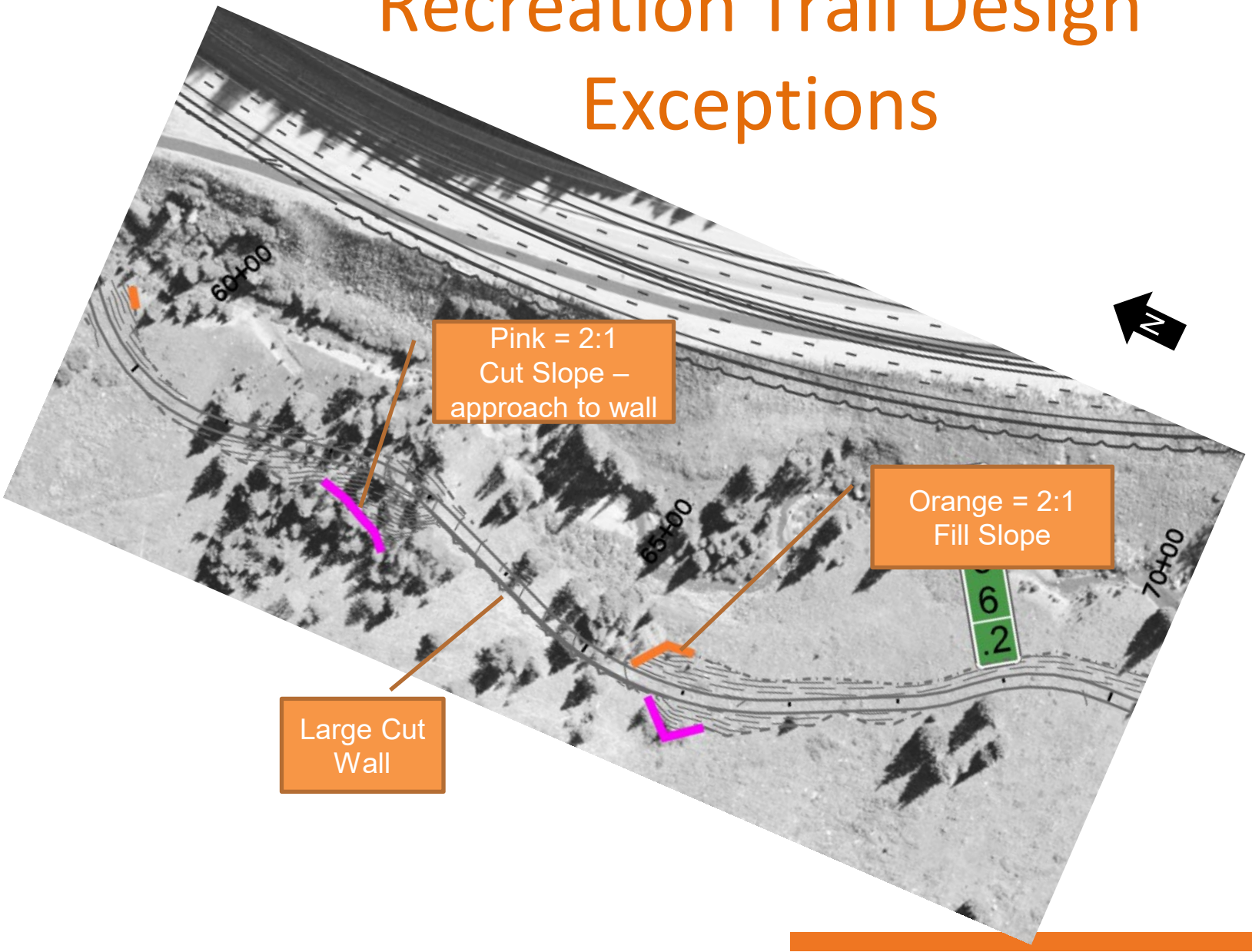




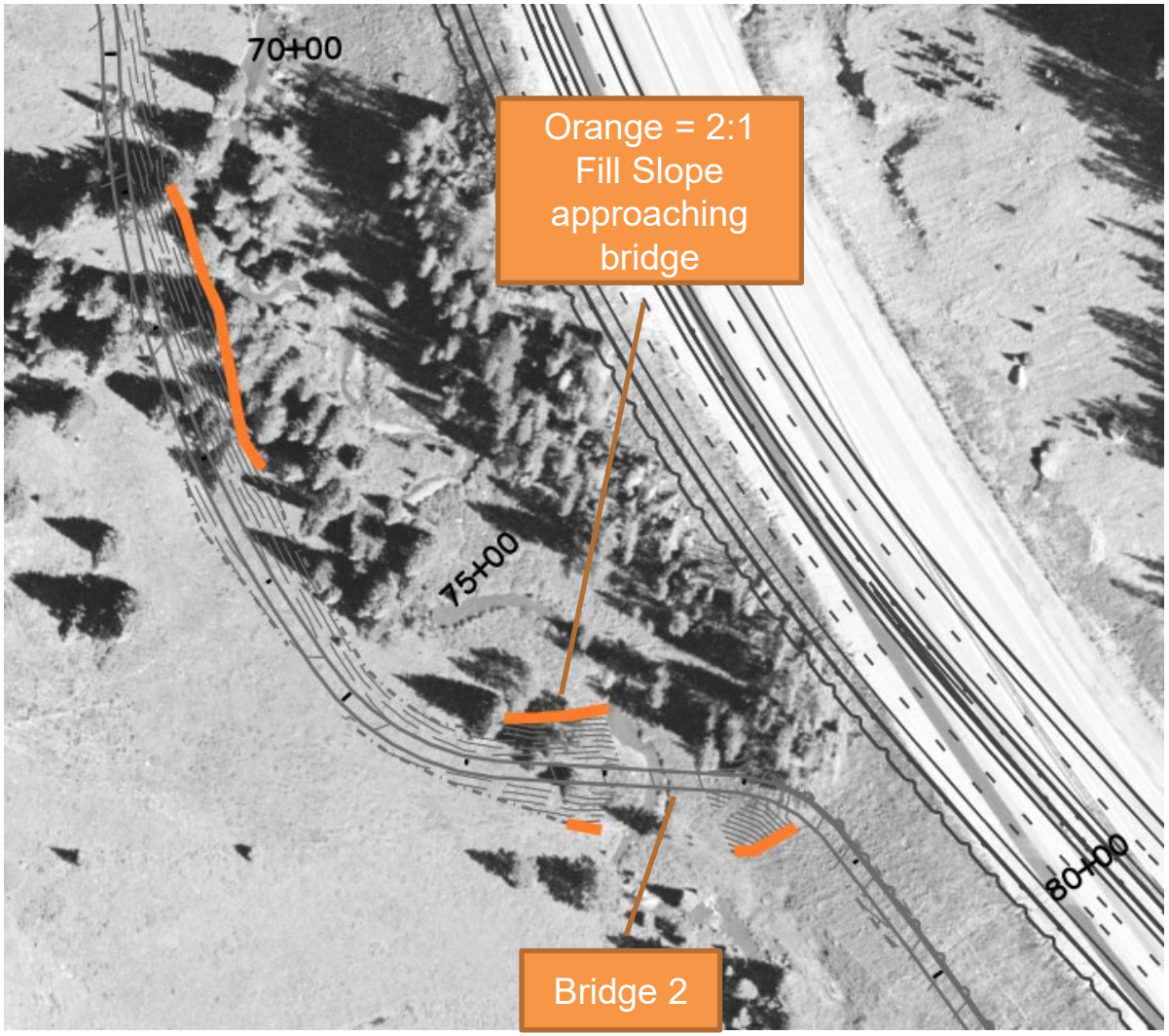
Recreation Trail Design Exceptions



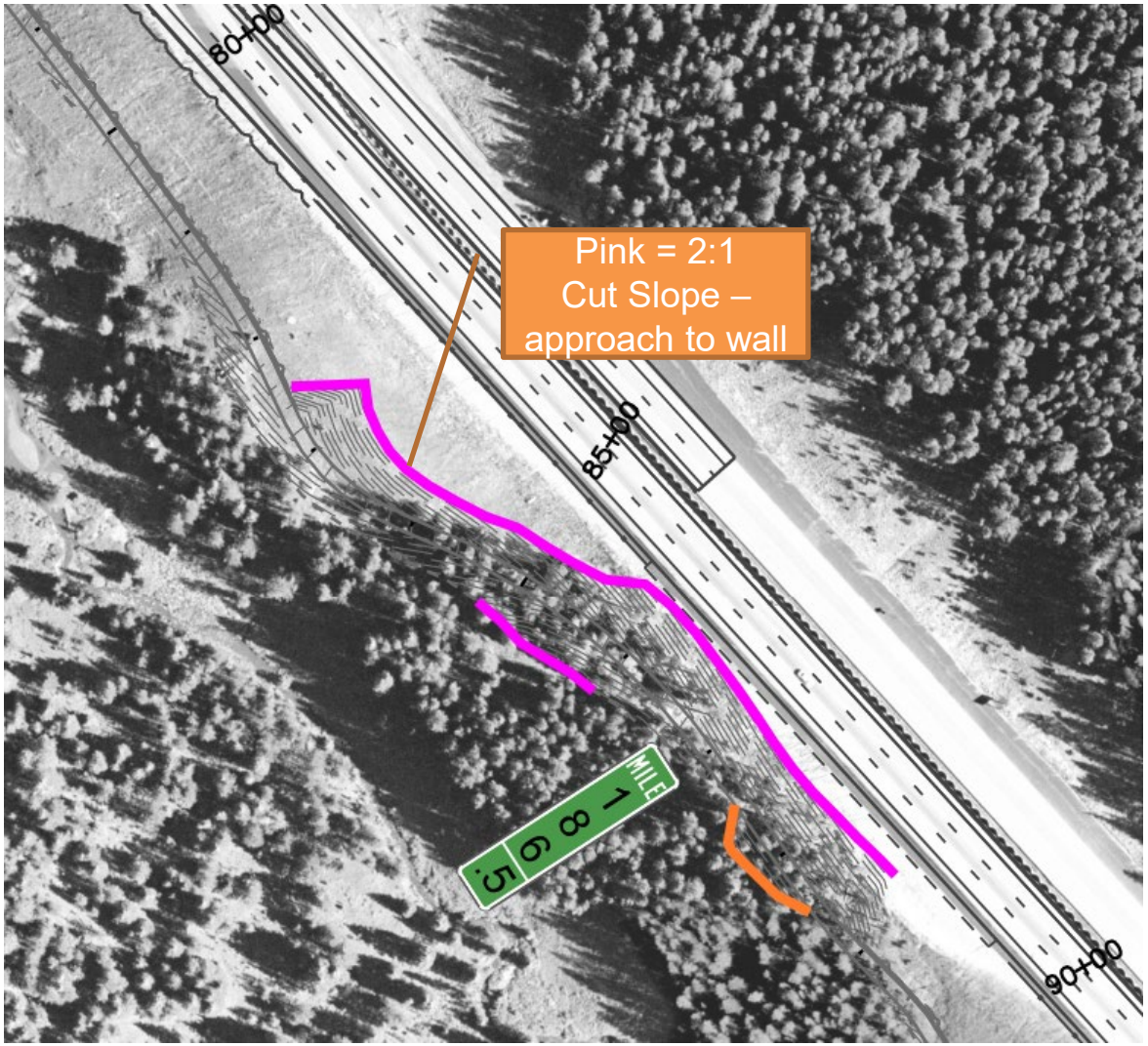
Recreation Trail Design Exceptions



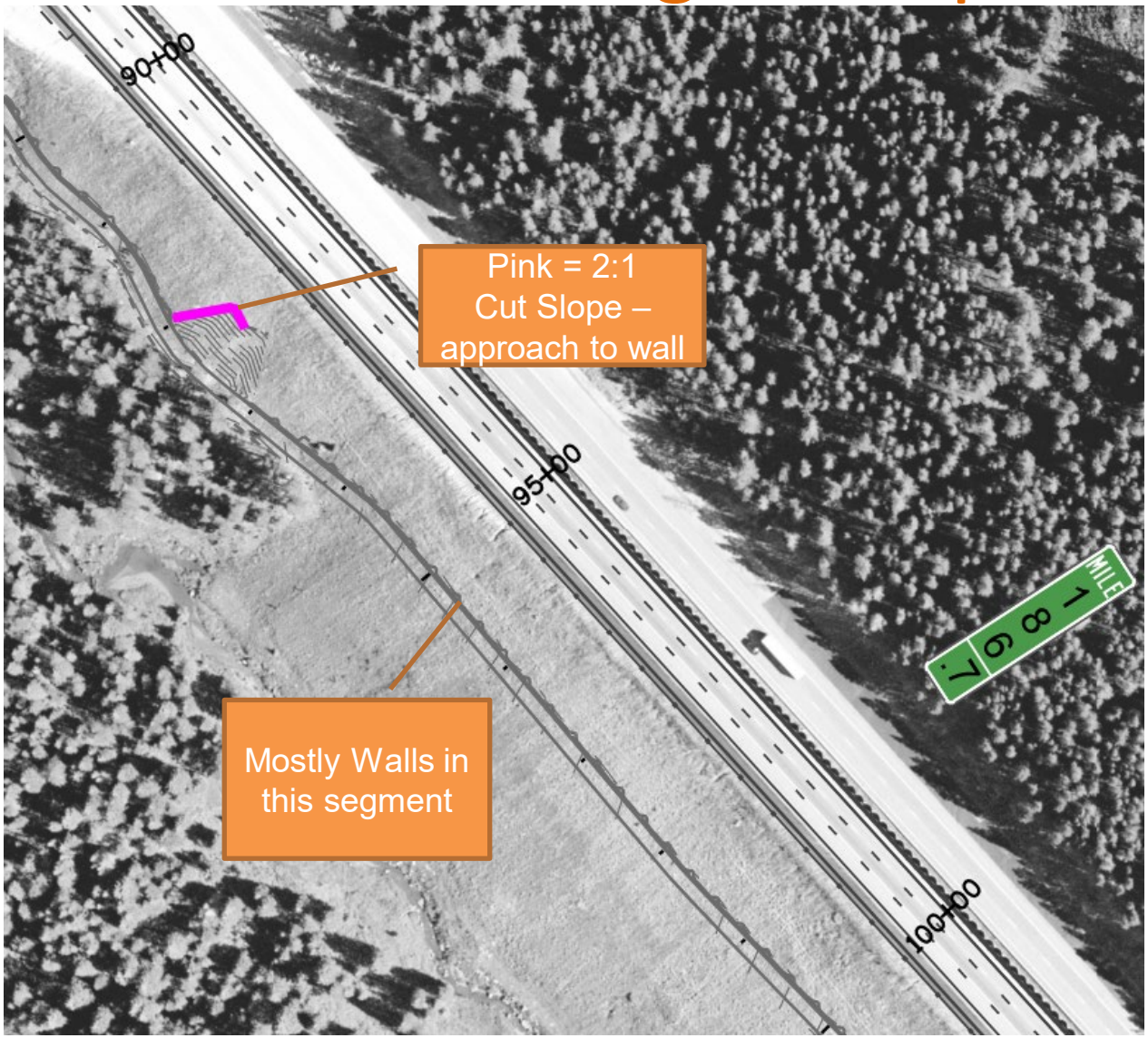
Recreation Trail Design Exceptions



Recreation Trail Design Exceptions

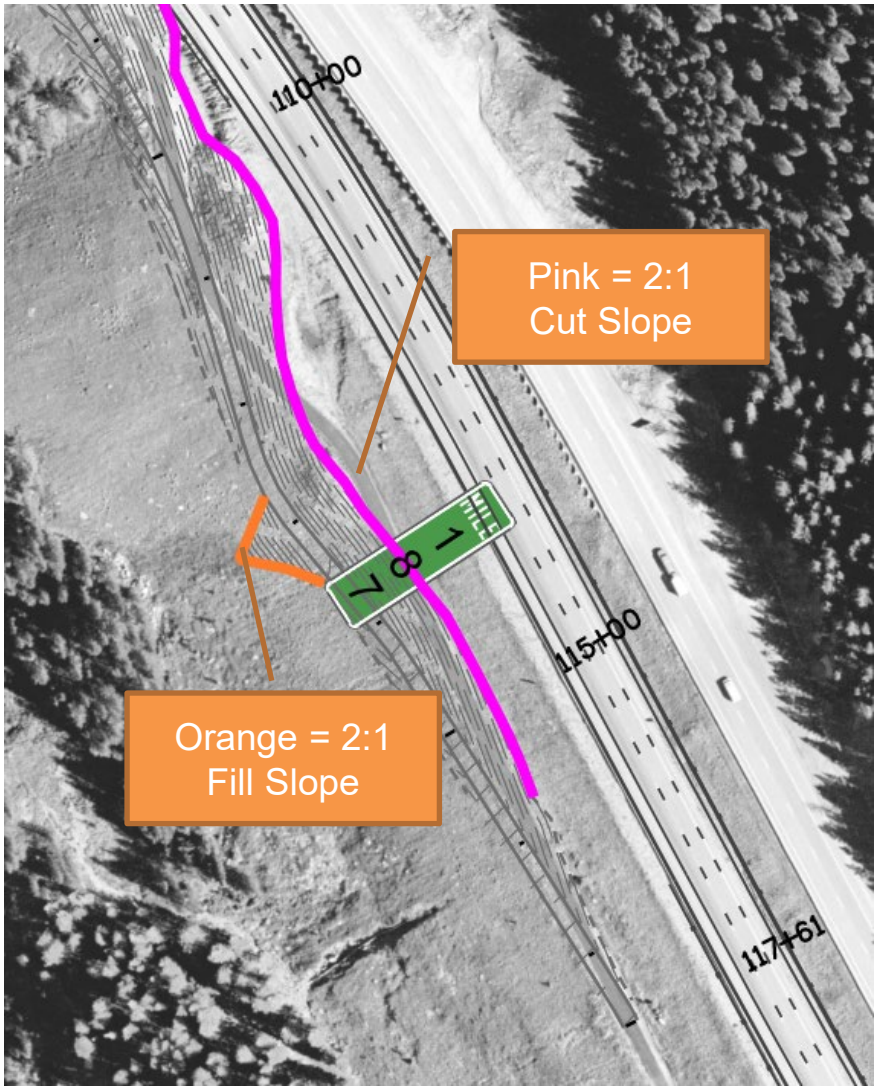


Recreation Trail Design Exceptions



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.

MEETING NOTES

PROJECT:	23982-23929 I-70 West Vail Pass Safety and Operations Improvements
PURPOSE:	Project Leadership Team (PLT) Meeting #10
DATE HELD:	November 12, 2021
LOCATION:	Online Google Meet Meeting
ATTENDING:	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
COPIES:	Attendees

SUMMARY OF DISCUSSION:

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.

1. 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 Slop 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.

COLORADO
Department of Transportation

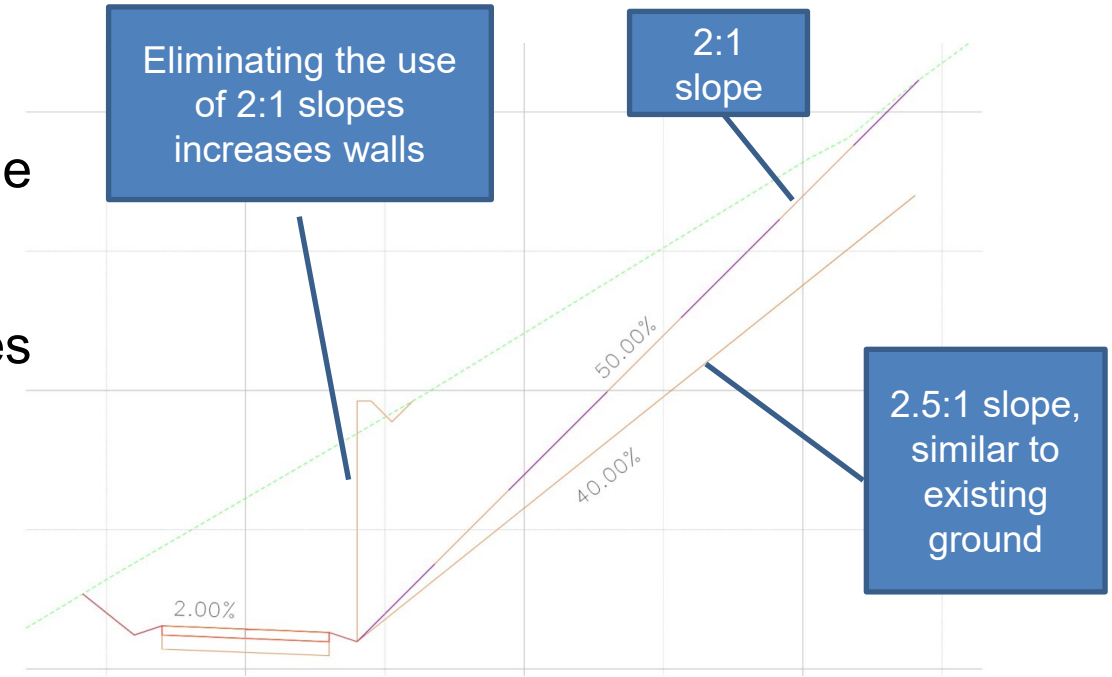
I-70 West Vail Pass Safety and Operations Improvements

PROJECT LEADERSHIP TEAM MEETING #10

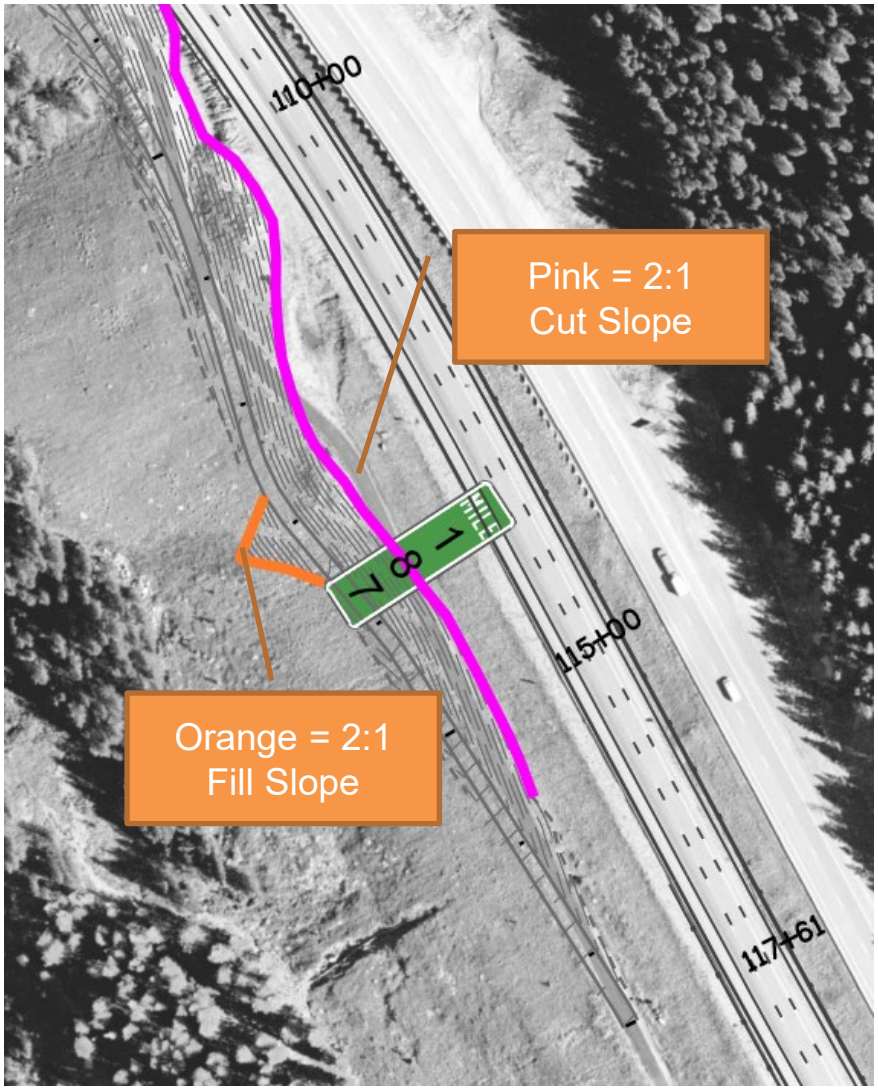
NOVEMBER 12, 2021

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 Mitigation

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.

MEETING NOTES

PROJECT:	23982-23929 I-70 West Vail Pass Safety and Operations Improvements
PURPOSE:	Project Leadership Team (PLT) Meeting #10
DATE HELD:	November 12, 2021
LOCATION:	Online Google Meet Meeting
ATTENDING:	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
COPIES:	Attendees

SUMMARY OF DISCUSSION:

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.

1. 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.