Design Exception #5
Slopes at the MP 185 Cut Wall
Design Exception Statement

At MP 185 Cut Wall 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 TT recommendation was presented, the PLT reviewed the process used and agreed that the CSS guidance had been followed.

Documentation for the Design Exception #5
Design Exception ITF Meeting #5 Presentation
Design Exception ITF #5 Meeting Notes
Project Leadership Team Meeting #10 Presentation
Project Leadership Team Meeting #10 Notes

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 Exception Meeting

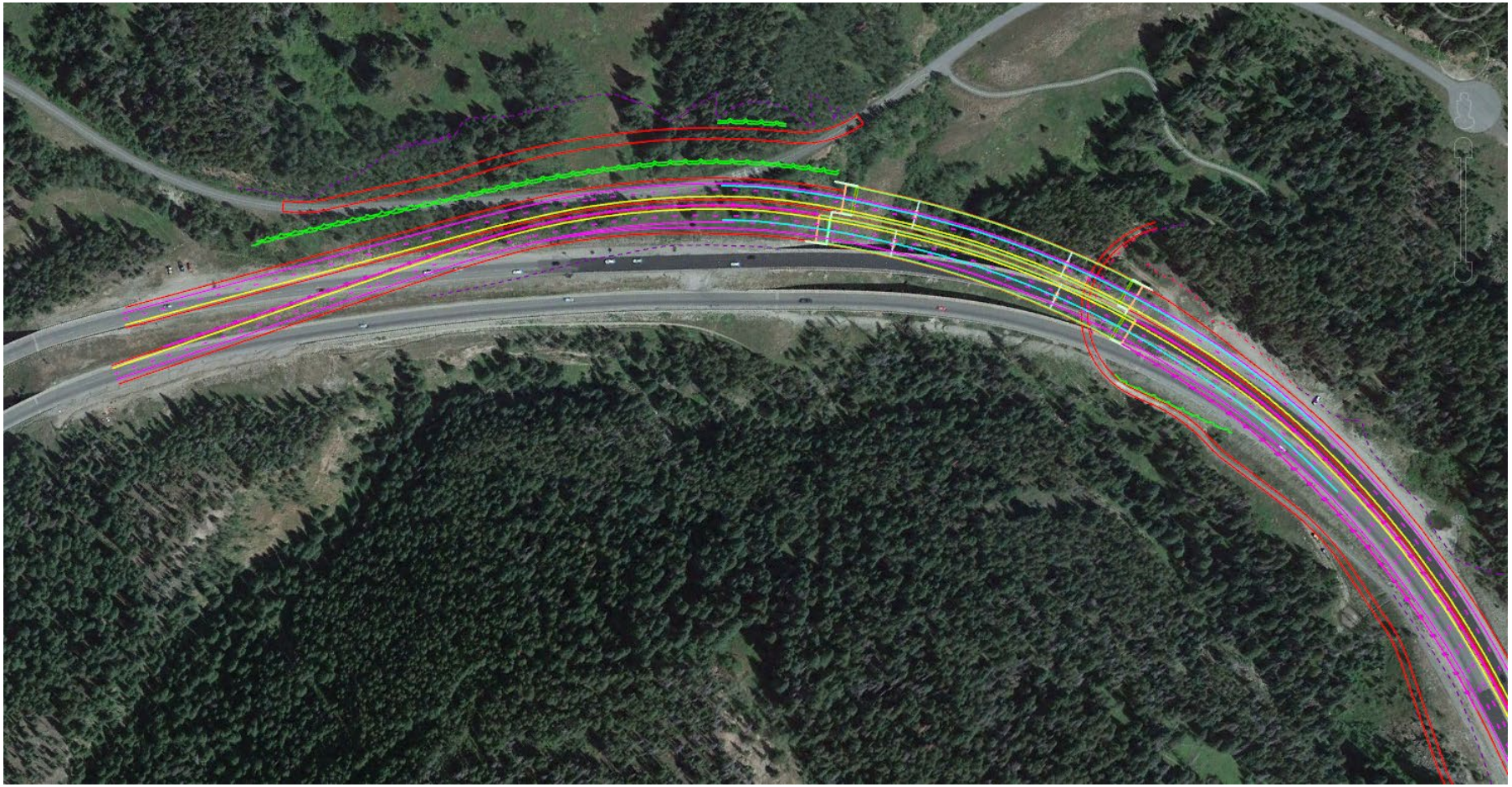
August 23, 2021

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

Cut walls at MP 185: Overview



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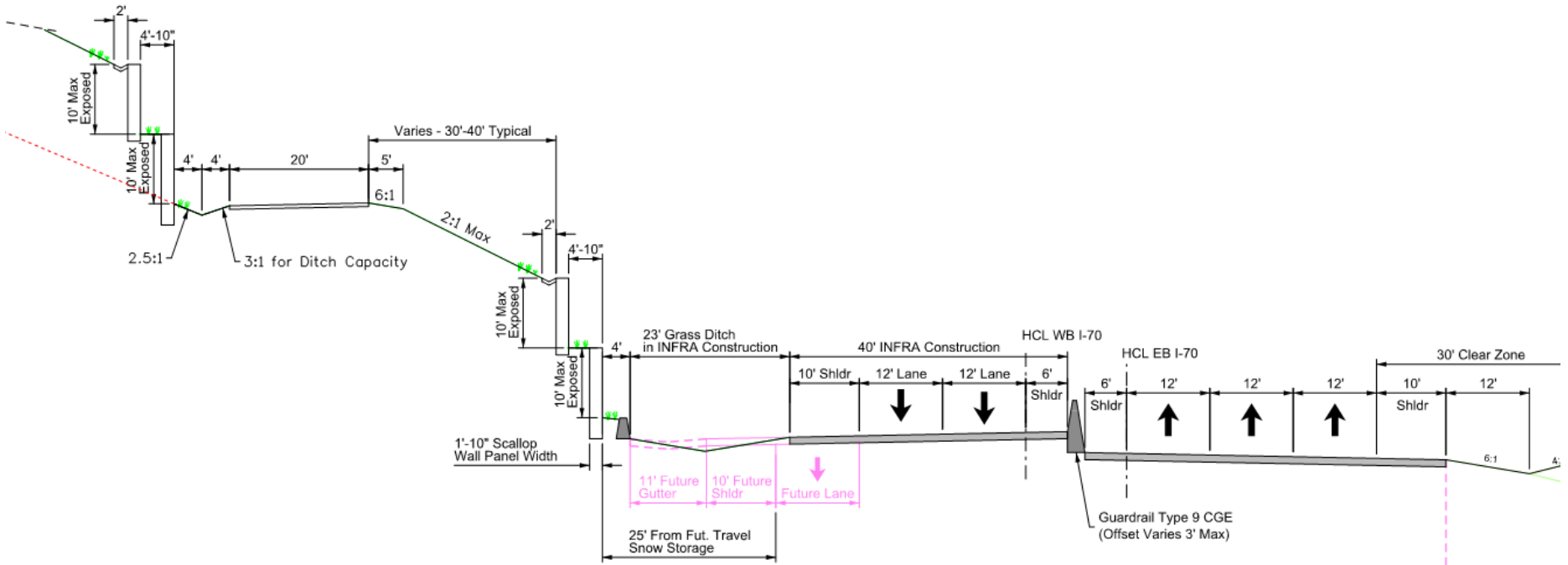

I-70 WB Cut Wall Typical Section ~ MP 187.5
Wall at 25' From Ultimate Travelway

Cut walls at MP 185 Design development

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

Cut Wall at MP 185
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:	Design Exception ITF Meeting
DATE HELD:	August 23, 2021
LOCATION:	Online Google Meet Meeting
ATTENDING:	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
COPIES:	Attendees

SUMMARY OF DISCUSSION:

1. **Introductions & Meeting Purpose**.
    a. Mary Jo explained that Design Exceptions are allowed to help balance a variety of issues. The Design Exceptions we will be talking about today are to protect the environment. We are trying to lessen the footprint to avoid existing vegetation at the MP 185 wall We will review the Design Exception with you and then we'd like to hear back you're your recommendation as to whether we move forward with these exceptions.
2. **Cut Wall at MP 185**
    a. Brian said just west of the bridge reconstructions we are pushing into the existing hill towards the old US 6 trail. We have a cut wall on the westbound side that is pushed off the edge of pavement and then above that we have the old US 6 trail relocation. What we're trying to do is use a 2:1 slope to minimize the grading impacts and heights of those walls. You can see on the graphic the wall as you come down the westbound lanes turning the corner on the bridge so what we're trying to do is to keep that limited to a two-tiered cut wall and then limit the length of the cut wall along the US 6 trail.

i. By utilizing the 2:1 slopes we gain a lot of benefit by tightening up the limits of those old US 6 relocations and again limiting how far back we chase our cut slopes.

ii. By doing the 2:1 slope, US 6 just has a two-tiered short wall, somewhere around 150' long. This area is probably going to be pretty sensitive to the final survey when we look at the topo versus what is in our existing high-level survey now.

iii. This is going to be very similar to the cut wall typical section we have further down the project at MP 187 where proposed bottom of the wall is shifted and we were able to have a 23' ditch in the INFRA project and by the time we get our future shoulder built out we would have an 11' offset from the edge of pavement to the bottom of the barrier and another 4' to the bottom of the wall.

iv. The I-70 walls is going to be limited to two 10' tiers and we would like to chase that slope with a 2:1 slope instead a 2.5:1 slope. That saves us about 4' depending on where the alignment and the trail profile on US 6. The higher we can pull that trail profile up for US 6, the shorter the walls can be, and less impact on US 6.

v. From the old US 6 Trail we are keeping the same trail width that is out there today with a 20' width and keep a 5' shoulder down to the 2:1 slopes. There is a sizable existing ditch, so we'd go ahead and keep a little bit bigger of a ditch than we were showing for other cut wall situations. We are just trying to convey drainage in front of the trail.

vi. Most of the length of the trail we have just the 2:1 cut slope again coming back up and with the length of the cut slopes it really saved a significant amount of forest impacts and limited the amount of wall needed. To sum it up, we are trying to limit the wall heights and limit the forested impacts by using the 2:1 slopes. With the lengths and offsets, we have from the old US 6, the 2:1 provided a big benefit by reducing impacts to forested areas.

vii. By doing the 2:1 slopes we will reduce the aesthetic impacts and reduce the relocated trail length. Miller Creek Slide is a named slide, so we are trying to limit how far out into that we are cutting.

1. Dick said he went out to look at where the US 6 highway would be relocated. From a laymen's perspective, it looked like the trail at MP 185 is on a very steep hillside and it would be significant to cut that corner. Have you looked at that yet or have sufficient topos to do that at this point?

   Brian said we can't get the trail high enough to overcome all the grade. We are widening into an existing steep slope so pushing it out helps gain some of that grade and it's a pretty straight-line grade. I'm sure we didn't get over 10% in trying to optimize that profile.

   Brian said the alignment of the trail on the right side of the bridge swings out a little bit more and provides a consistent radius out to the pinch point at the existing wall to the south. And to limit the maximum grade we have

pulled away from the existing trail and down the hill just a little bit to help keep that profile grade under 10%. That wall also provides a greater separation from eastbound I-70.

2. Greg said I know when we were talking about the roadway design and the bridges, you said the bridges were about 10' apart or parallel and then there was a space when you go to your section, it does not look like we have any kind of median.

   Brian said it is shown incorrectly. On the westbound side we have the 6' inside shoulder and there will be a little bit more of an offset. We are working through the details of whether we need to have barrier on eastbound and westbound individually or whether we can have that CD barrier in the middle. There will be just a little bit of an open median through this section. This will be updated to show further separation as there is actually 8-9' feet in there.

3. Greg asked for clarification that the Design Exception is a grading exception, not a wall exception.

   Brian confirmed a grading exception is what we are requesting. To reduce the walls, we would like to use the 2:1 slopes grading design exception.

b. Mary Jo noted the range we chose is not exact. The slopes look better when they undulate. We are looking for a slope range that would give the designers flexibility. The design exception we are recommending is:

   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.

a. Mary Jo asked if anyone objects to this design exception 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 these design exceptions.

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I-70 West Vail Pass Safety and Operations Improvements

PROJECT LEADERSHIP TEAM MEETING #10

NOVEMBER 12, 2021

Design Exceptions Process

- Reviewed the Design Exception Criteria
- Reviewed each Design Exception with graphics, benefits, and mitigation
- Presented the Design Exception Statement
- Discussed and gained the TT endorsement

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**
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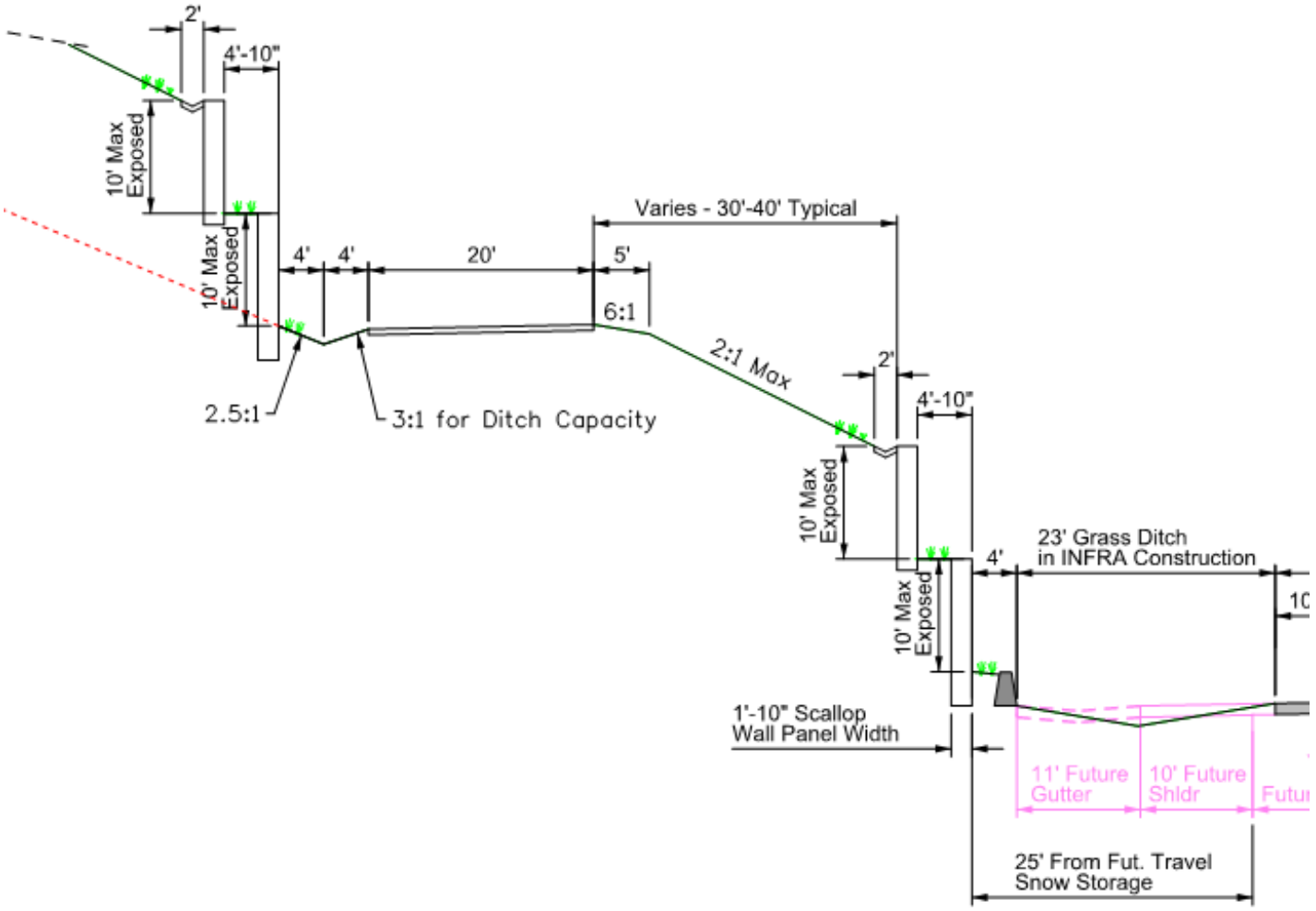

Cut Wall at MP 185
Exception Recommendation

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

2. **Using ITF Guidance and Design Exceptions**

    Mary Jo noted the TT has recommended two Design Exceptions.

    The Design Exception process is:

    - Review the Design Exception Criteria with the Technical Team
    - Review each Design Exception with graphics, benefits, and possible mitigation
    - Present the Design Exception Statement
    - Discussed and gain the TT endorsement

    The two Criteria we have been using for all of the Design Exceptions are complementing surrounding physical characteristics and protecting the environment. It is easy to imagine what is happening here, the slopes are steeper than the design criteria recommendation. You can chase those slopes forever, you can create little sliver slopes when you try to meet the standard and all those things in one way or another are likely to impact the environment. Either we go farther and disturb more land, or we end up with slopes that don't really stabilize themselves.

    a. Cut Wall Slopes at MP 185 Design Exception

    Randal said the tiered walls that we are looking at in these areas and if we went to a flatter slope, we would actually increase the wall height in a number of areas. There

is a 2.1 max slope in this area. Part of the reason we asked for this exception is to minimize the wall heights in these areas. Again, we have tiered walls in here as part of the CSS guidance for these locations. We're looking at how we can get vegetation to grow and maintain on these slopes. The design allows us to create snow storage areas in the sediment removal area on the bottom while minimizing the disturbance of the footprint.

Mary Jo reviewed the recommendation endorsed by the Technical Team:

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

1. Dick asked if the PLT needs to make a recommendation to approve this Design Exception?

   Mary Jo said the TT makes the recommendation, your job is to confirm that we followed the process. The design is going forward using this, we just want to make sure you see what we are doing and that it fits into your expectations of how CSS works and is being implemented. It is more of a check on process than the design at this point.

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