



# I-70 Floyd Hill

## Floyd Hill CMGC Technical Team

### Meeting Summary

March 29, 2024, 10:30am to 12:00 PM

Kraemer Floyd Hill Office: 35715 US-40 Building B, Ste 220, Evergreen, CO 90439

## 1. Introductions, Meeting Purpose and Project Updates

CDR Associates opened the meeting and reviewed the agenda.

### TT Agenda 3-29-24

1. *Introductions & Agenda Review*
2. *Project Updates*
3. *Central Section Walls Update*
4. *Techniques for Slope Restoration*
5. *Revegetation of Saddle Cut*
6. *Wrap Up & Next Steps*

TT members confirmed the meeting agenda with no changes.

## 2. Project Updates

### Main Projects

- *East Section Construction* - Wall and drainage work continues. The Team is also re-striping and fixing some of the pavement. The traffic shift occurred last night and will remain in its current configuration until the fall when work will push into the median.
- *West Section Design* - West Section construction is just beginning. There are signs up and the Team will be adding barriers and addressing pavement concerns first.

### Early Projects

- *Genesee Wildlife Crossing* - The Team is paving and moving traffic to the final alignment. Completion is expected in April/May and there will be a ribbon cutting ceremony.



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- **Roundabouts** - Work is progressing on both of the roundabouts with traffic moving into the roundabouts and lighting starting to be installed. On US 65, there is currently a steep incline as you go through the roundabout. This is not a permanent alignment, but is an interim phase as the Team works to tie in the WB I-70 off ramp into the roundabout. Closures will tentatively take place during the second half of April to complete this work. The Team will work to limit closures and will give proper notice to first responders and Clear Creek School District.
  - **Question** (Lisa Wolff, Floyd Hill POA): What at the roundabout is slated for lighting? Residents would prefer to maintain the dark sky and to not add a significant amount of lighting.
    - **Response:** Kurt shared the diagram and lighting key below.

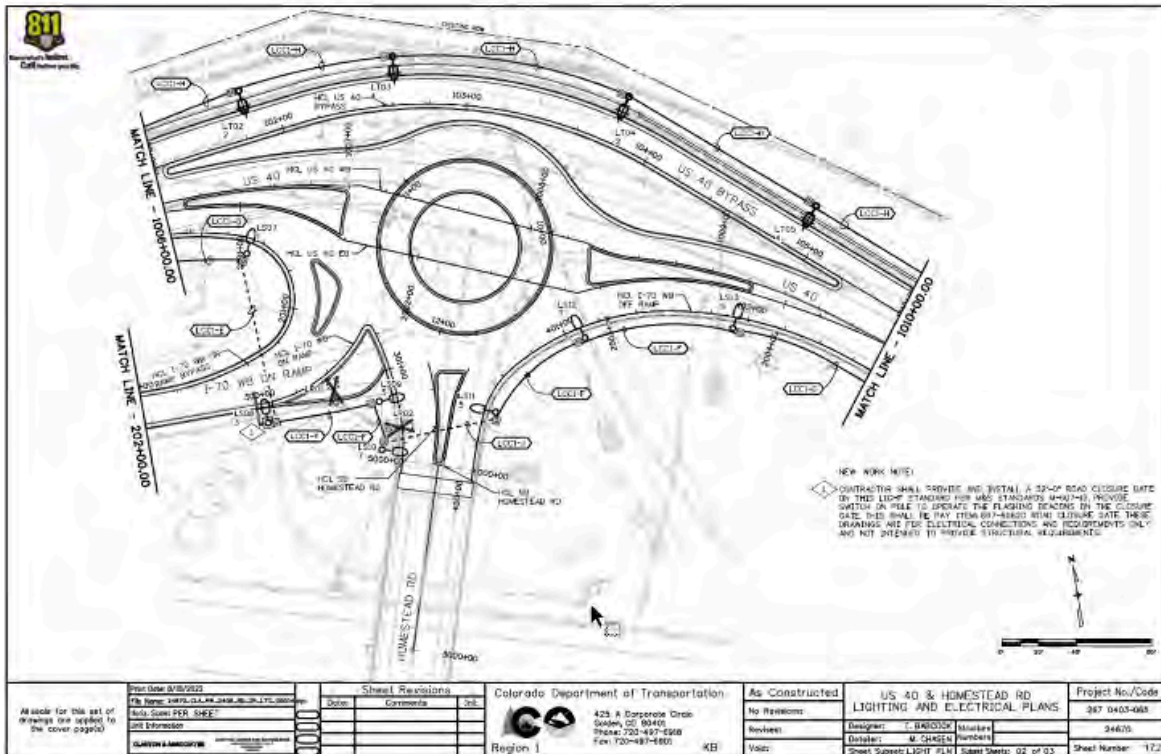


Diagram showcasing lighting specs for the roundabout.



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## LIGHTING AND ELECTRICAL LEGEND

	NEW LED STREETLIGHT INSTALLED BEHIND RETAINING WALL, COOT DARNED AND MAINTAINED, ON NEW CONCRETE FOUNDATION, RE-LAMPING SCHEDULE ON LIGHT OIL SHEET 05.
LS#	LIGHT STANDARD IDENTIFICATION NUMBER
E#	ELECTRICAL CIRCUIT IDENTIFICATION NUMBER
	NEW LED STREETLIGHT, COOT DARNED AND MAINTAINED, ON NEW CONCRETE FOUNDATION, RE-LAMPING SCHEDULE ON LIGHT OIL SHEET 05.
LS#	LIGHT STANDARD IDENTIFICATION NUMBER
E#	ELECTRICAL CIRCUIT IDENTIFICATION NUMBER
	NEW LED STREETLIGHT WITH ROAD CLOSED, COOT DARNED AND MAINTAINED, ON NEW CONCRETE FOUNDATION, RE-LAMPING SCHEDULE ON LIGHT OIL SHEET 05. LAMPING TO MATCH OTHER FIXTURES FOR PROJECT.
LS#	LIGHT STANDARD IDENTIFICATION NUMBER
E#	ELECTRICAL CIRCUIT IDENTIFICATION NUMBER
	EXISTING LIGHT STANDARD TO REMAIN, PROTECT IN PLACE (CONTRACTOR SHALL MAINTAIN ELECTRICAL NOTES TO EXISTING LIGHT STANDARDS, UNLESS OTHERWISE NOTED).
	EXISTING LIGHT STANDARD TO BE REMOVED (CONTRACTOR TO REMOVE EXISTING FOUNDATION, CIRCUIT, WIRING, AND SIGNPOST MARKS).
LS#	LIGHT STANDARD REMOVAL IDENTIFICATION NUMBER
	NEW HEAVY-DUTY FLUSH-IN-GRADE POLYMER CONCRETE BOTTOMLESS SPLICE BOX WITH PER 25 INCIDENTALS TRAFFIC MARKS, SEE L&E NOTES. REFER TO CDOT STANDARD DETAILS S-423 FOR SPLICE BOX DETAIL.
	EXISTING POLE MOUNTED TRANSFORMER
	UNDERGROUND BURIED RACEWAY IN SCHEDULE BY PVC CONDUIT REFER TO ELECTRICAL FEEDER SCHEDULE FOR CONDUIT AND CONDUCTOR SIZE (REFER TO CDOT STANDARD DETAILS S-423 FOR CONDUIT BURIAL DETAIL).
	3" HEAVY BURIED SLEEVE TERMINATING IN SPLICE BOXES ON EACH END (REFER TO FEEDER SCHEDULE FOR CONDUCTOR SIZES).
	NEW LIGHTING CONTROL CENTER LOCK
	FEEDER TAG (REFER TO FEEDER SCHEDULE FOR CONDUCTOR AND CONDUIT SIZE)
	EXISTING METER AND PANEL TO BE REMOVED AND REFER FROM NEW LOCK

- **Comment** (Cindy Neely, Clear Creek County): Cindy agreed with Lisa regarding the addition of lighting on the roundabouts. She suggested shielding the lights similar to chain station lights in the corridor.
- **Question** (Mike Raber, Clear Creek Bikeway User Group): Is the lighting on the roundabouts an FHWA requirement?
  - **Response:** There are lighting standards for the roundabouts and there will be some lighting along the exit ramps as well. Any lights that are put in will be certified dark sky. Some lighting infrastructure is already in place which limits what changes can be made at this point.
  - **ACTION:** The Team will determine what lighting adjustments might be possible based on current progress, and will bring more information back to the TT at a future meeting.
- **Question** (Jessica North, Clear Creek County School District/Board): There are some high school parents interested in assisting with a display/planting for the center of the roundabouts. What options are there for something like this?
  - **ACTION:** Kurt and Jessica will connect regarding the potential for planting flowers/plants in the roundabouts.
  - **Comment** (Mike Raber): It will be important to have shorter plants, or something that does not obscure the sight of traffic in the roundabout.



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## Design

- *Package 3* - Will include earth work on the Saddle Cut between US 6 and 40 downslope of I-70, and is about a month away from CAP. It will take a few additional months for the final package to be complete. The Team anticipates Package 3 construction to commence around August.
- *Package 4* - Slated for 60% design this summer.

## Environmental

- The air quality remains good through the project area. The Team is meeting monthly regarding the Water Quality sampling plan and hope to have a plan developed by the summer to present at the next Deicer ITF.
- PEAK has been meeting with the bio team working on SB40.
- The archeological excavation reporting is ongoing. They are still waiting on some radiocarbon dating to be able to finish the report, and estimate a full report by June. Once the report is complete, there will be a presentation to the TT on the findings.

## Utilities

- Utilities are tracking well. Excel de-energized the line in the hill section which allowed for drilling work to take place this week. Work continues on the joint trench for ITS. There was a helicopter in the area a couple of weeks ago that was installing an inclinometer 250 feet into the ground of the landslide area across from Two Bears. This will monitor any movement in the ground and provide the team with real time data.

## ROW

- Clear Creek County is taking the ROW proposal to the Board of County Commissioners for approval on April 4. Central City is taking the ROW proposal to Council for a second reading next Tuesday.

## Other Updates

- *Rafting Coordination* - Kraemer will provide additional information at the next TT meeting.
- *Greenway Shuttle* - Kraemer has acquired a pickup truck with a crew cab as well as a bike rack to serve as the Greenway Shuttle. The rack will fit 4 bikes and accommodate the majority of 2-wheeled vehicles with no frame contact. The Team is coordinating the final pieces for the shuttle launch.



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- **ACTION:** The Team will notify the TT once the schedule for the shuttle launch is confirmed.
- *Emergency Services Coordination* - The Team will meet with emergency services on April 4th. Cindy Neely, Clear Creek County, noted that the primary concern for that meeting is related to the communication challenges during the recent major snowstorm that closed the highway for multiple hours. There was confusion with who was in charge and what roads were being closed. This was not a result of the Floyd Hill project, but the project area was in the middle of the closure. Sam Hoover, Central City, is working with another group at CDOT to showcase the impacts that occur when 119 and US 6 are both closed.
  - **ACTION:** Kurt will reach out to Jessica, CDOT, to set something up with Clear Creek County to help address the recent snowstorm incident.

### 3. Central Section Walls Update

Daniel Estes, CDR Associates, confirmed the agreement from the last TT [meeting on 3/1/24](#) and the TT provided input on next steps.

**TT Agreement:** The Team will move forward with a 5x10 panel wall design, and will present other aesthetic wall treatment options outside of CO Random Reveal to the TT that may be more compatible with the horizontal joints of the 5x10 panels.

THK and Kraemer are coordinating on possible wall treatment options. There are some examples of standard form liners including on buildings and parking structures. The Team is working to compile examples and considering potential field trip options.

- **Comment** (Cindy Neely): Cindy reiterated that pictures of actual walls and/or providing locations of where TT members can go and see examples in person would be more effective than just presenting renderings.
- **ACTION:** The Team will compile photos of different wall treatment options and present these to the TT at a future meeting.

### 4. Techniques for Slope Restoration and Revegetation

Kevin Shanks, THK, presented on proposed slope restoration and revegetation techniques, drawing on some that have been used in the corridor already. Kevin emphasized that the techniques presented serve as a “toolbox of potential options” to showcase various options to the TT. They are not necessarily all techniques that will be



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used on the project. The following diagrams (also shared with the TT as a PDF) represent these various techniques.

Some of the slopes will be very steep (i.e. 2:1) and the Team will look at slope rounding and undulating.

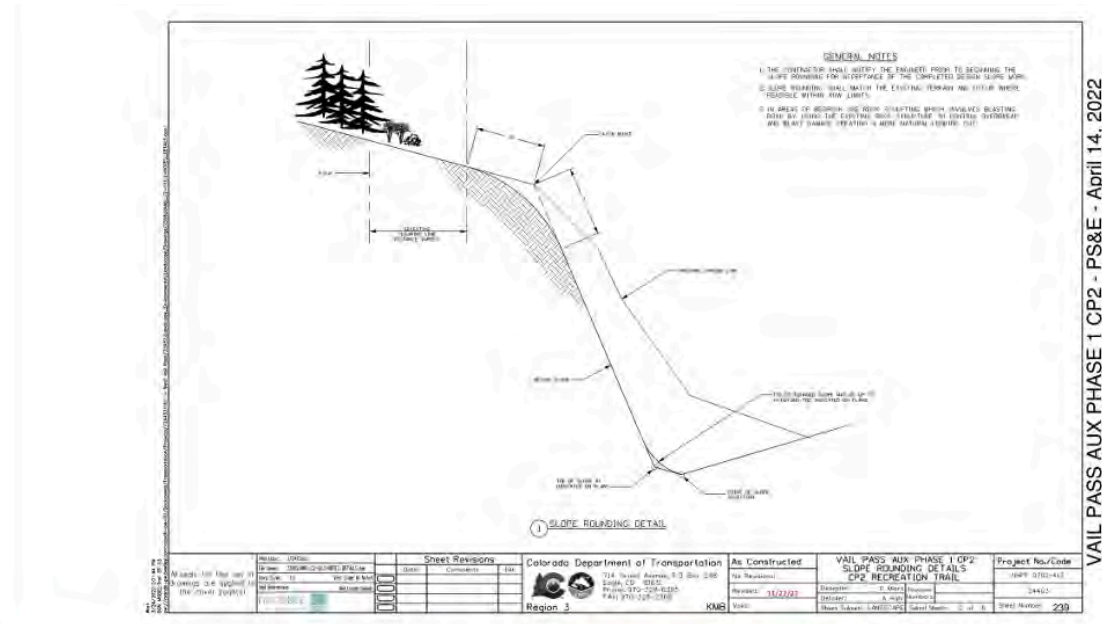


Diagram showcasing slope rounding techniques at the top and bottom that were used on the Vail Pass project.

THK is considering potential options to minimize the impact and an appearance of a “clear cut” of the trees (i.e. an obvious cut line). On Vail Pass (seen below), there was selective pruning and thinning of trees in the transition areas to be more visually appealing. THK would like to discuss the opportunity of a similar technique on the Floyd Hill project with Clear Creek County, as there is potential that this option would cross the ROW line. The area of impact will go within 10ft of the ROW line.

- **ACTION:** Kevin to connect with Cindy and Amy to further discuss replanting opportunities that may affect Clear Creek County ROW.



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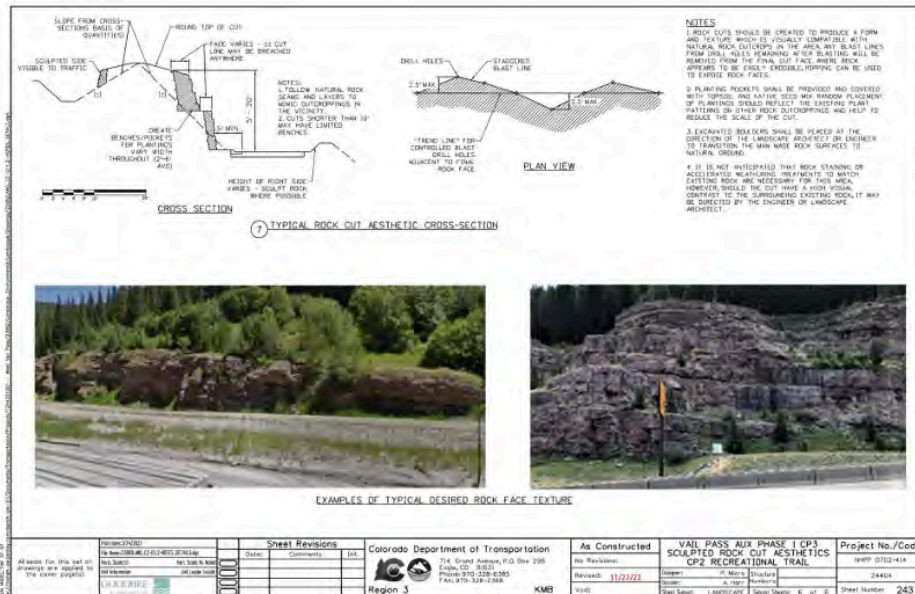


D) Uniform clearing lines create an unnatural edge.



E) Staggered clearing lines provide a natural appearance.

There is still uncertainty on the Floyd Hill project of what underlying textures will be found when the rock cuts are made.



VAIL PASS AUX PHASE 1 CP2 - PS&E - April 14, 2022

Diagram and images showcasing examples from Vail pass of rock cut cross sections and desired rock face texture.

There are some locations in the Floyd Hill project area where the engineered slopes will be at about a 2:1 scale (i.e. a 45 degree angle). In order to minimize an obviously engineered appearance, the Team will attempt to vary the slope and recreate some talus slopes.



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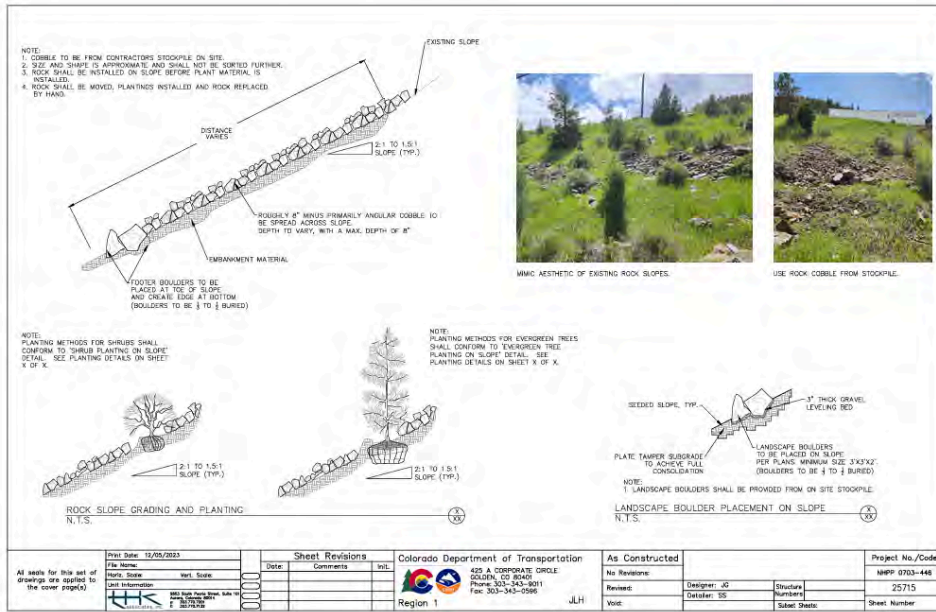


Diagram showing varied slope techniques from the Veterans Memorial Project.

Another technique the team is looking at is placing downed trees and boulders on the slopes and replanting tree stumps. Kevin noted that on Vail Pass, most of the east slope has been replanted.

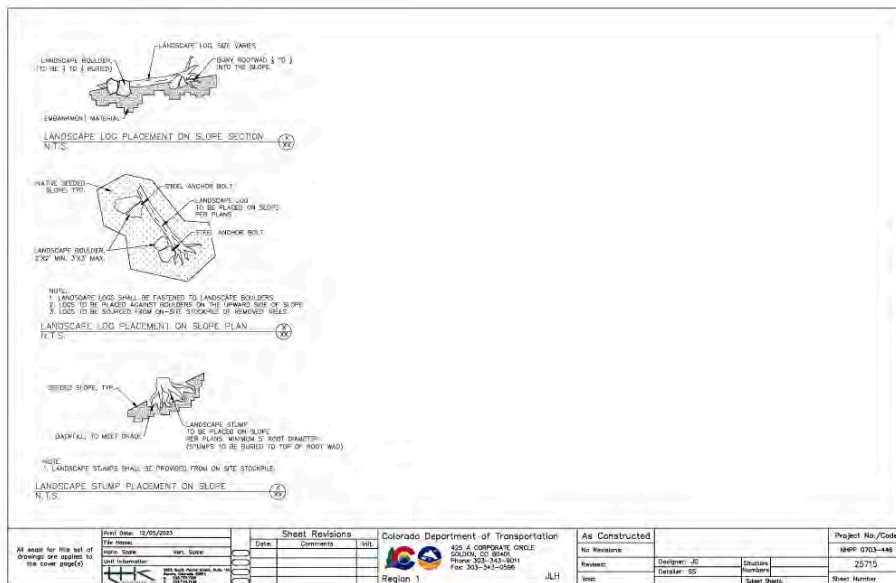


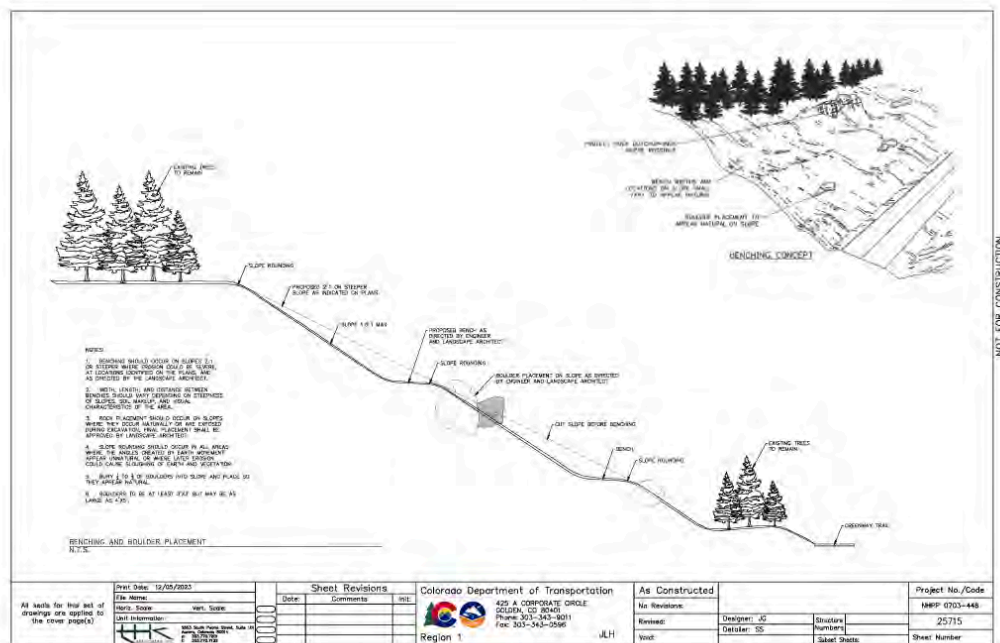
Diagram showcasing details for placing downed trees and stumps.





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The detail below was originally from Vail Pass but has been modified to be more accurate for Floyd Hill. The Greenway Trail is on the far right end of the slope. The Team intends to leave some trees on the south side of the trail and THK and Atkins have designed many safety measures on the trail. Moving into the fill slope beneath Bridge M, the Team will undulate the slope to move between a 2:1 and 1.5:1 scale. Tyler Brady, CDOT, noted that in some of the 60% design plan documents, the slope will appear as a straight line, but the landscaping plan details will show the undulation. As the restoration is occurring, the Team landscape architects will be in the field with Kraemer to help make this look as natural as possible.



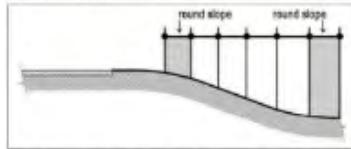
Kevin emphasized that the Team may not know if some of these techniques will be feasible until the work begins, as it remains unknown what types of landforms will be present. If there are landforms present, it may be possible to create variable slopes that mimic the natural landform or to leave consolidated rock in place. Some examples of this can be seen in the images below.



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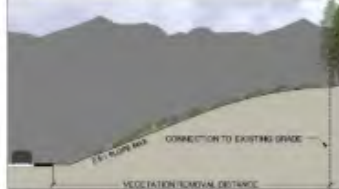
A) Rounding the top and toe of the slope blends embankments into the existing landscape and facilitates revegetation of constructed slopes.



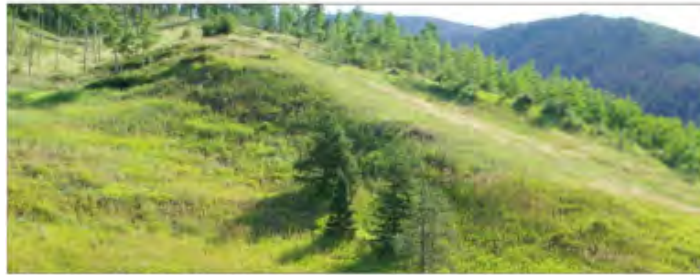
B) To transition into existing grade, round the slope over the last one sixth of the top and toe of the embankment.



Typical methods deliver an engineered slope poorly integrated into existing grade.

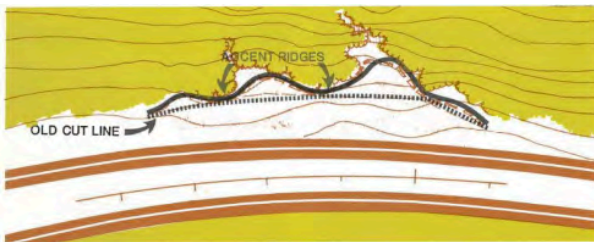


C) The preferred method requires additional clearing to round grading properly, yet creates a more natural slope and vegetation condition.



D) Utilizing variable slopes through the length of an embankment mimics the natural patterns.

Kevin then shared some images that came from a Colorado Department of Highways book detailing the reconstruction work that took place on Vail Pass.



Old ridges and draws poorly accentuated



Rounded ridge with rock outcrop and revegetating area

3. Created Landform Diversity  
 On some large slopes it was impossible to modify slope characteristics by just laying back draws and accenting ridges. On these slopes, diversity was created by modifying slope ratios and developing false draws and ridges along the slope. Large slopes were rarely left at their 2:1 ratio but often flattened and rolled to reflect existing landscape characteristics. Often rock outcrops were used as backdrop for benches and planting platforms.



Both of these images show the undulating slope and cut line on Vail Pass.



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*The image on the left shows the slope reconstruction. The image on the right shows the replanted stumps.*



*The image on the left shows the undulating slope and placed boulders. The image on the right shows a fully reconstructed feature.*



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*The image on the left shows the Vail Pass slope. The Floyd Hill slope will be a bit steeper. The image on the right shows a reconstructed talus field at the Veterans Memorial Tunnels.*

The TT expressed support for these techniques and how convincing they look when done well. Members noted that the comparison to Vail Pass was apt and emphasized how important it will be to make the Floyd Hill slopes look as natural as possible given the reconstruction area is very large.

Kevin then introduced the 3D model that THK has created of the Saddle Cut. In order to create the model, THK used a photogrammetry model as the base that was captured by Chinook Landscape Architecture. The photogrammetry model was created by flying a drone back and forth from multiple directions and taking thousands of pictures of the hillside to recreate the real life conditions seen in the Saddle Cut area. The image below shows the area of impact. THK then removed the trees, added in the Saddle Cut, Bridge X, and Bridge M and inserted the Team's roadway model to create the images that the TT will see today. The one caveat is that the Team does not yet know what the rock cut will look like in detail. It will likely be more unconsolidated rock, but the Team will not know for certain until the work begins. The model will be updated as further geotechnical information is available.



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*Rendering showing the area of impact in current conditions.*



*Rendering showing the area with the future Saddle Cut, roadway, and the fill area.*

The area will be revegetated with approximately 750 trees and 500 shrubs. The Team is still reviewing options for supplemental irrigation. The following images show various locations with revegetation in place.



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VIEW OF EB-I70 FROM GREENWAY TRAIL



VIEW FROM EB-I70



# I-70 Floyd Hill



VIEW FROM WB-I70



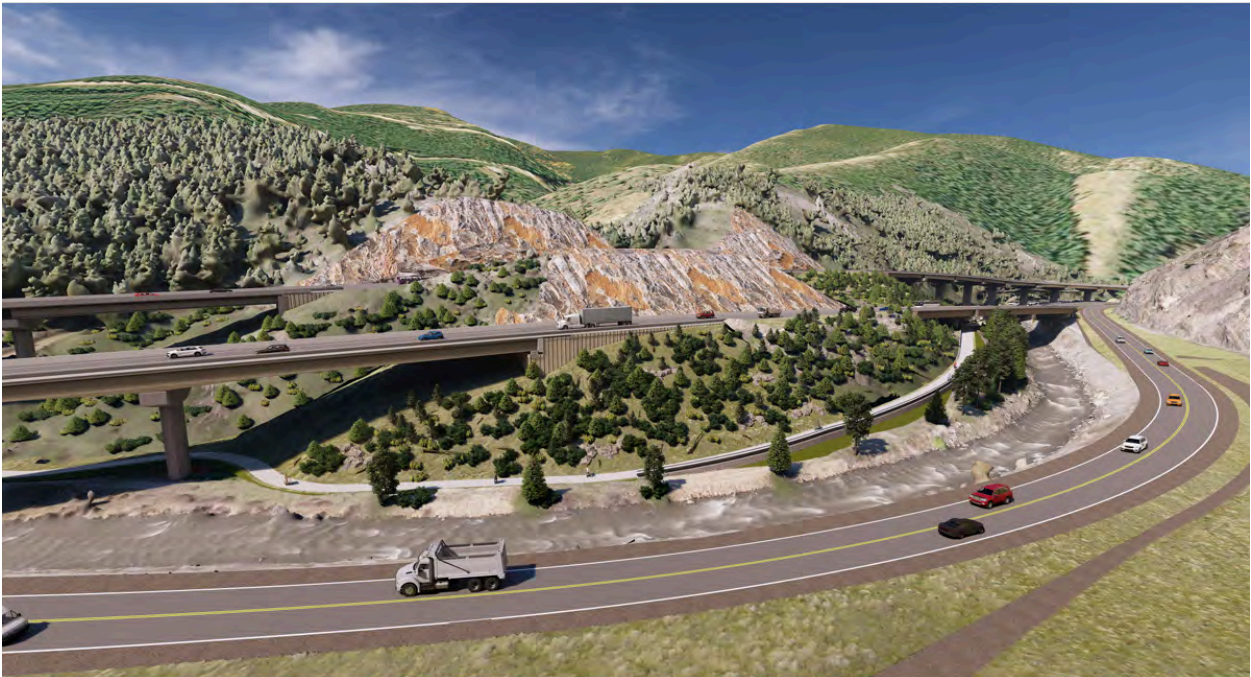
VIEW LOOKING EAST FROM US-6



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PERSPECTIVE VIEW OF SADDLE CUT LOOKING EAST



PERSPECTIVE VIEW LOOKING WEST





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I-70 AND SADDLE CUT LOOKING WEST



*Aerial view rendering of the Saddle Cut and slopes.*



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The slope reconstruction and revegetation walk through ended with the Team discussing next steps and additional considerations. The Team is starting to analyze the probability of encountering rockfall in the area. The flatter slopes are more likely to be unconsolidated, whereas the steeper slopes will likely be more consolidated. Rockfall mitigation will be a topic at a future TT meeting. Kevin also reiterated that finding supplemental irrigation is important and poses the biggest risk at the moment related to revegetation. The Team is in the concept stage and have not developed construction documents yet. THK and Atkins will continue to work closely on these items and will bring topics and models back to the TT for further discussion.

## TT Comments/Questions

- **Question** (Cindy Neely): What will be the planted tree density compared to the original tree density in revegetated areas?
  - **Response** (Kevin Shanks): There are more trees in place now than will be put in during revegetation, however this has some benefits from a fire mitigation perspective.
- **Question** (Mike Raber): Will this be an evergreen tree mix?
  - **Response** (Kevin Shanks): We will use species that are native in the area and can do well on the specific slope orientation.
- **Question**: Will any aspens be planted?
  - **Response** (Kevin Shanks): There will be some impacts to the aspens currently in Sawmill Gulch. The Team is working on options to try and save some of these aspens.
- **Question** (Bill Coffin, Saddleback HOA): Is there any correlation between the amount of vegetation that will be put back to noise suppression or reduction?
  - **Response** (Kevin Shanks): Kevin noted that he is not a noise expert, but that what he has seen in the past is that if you are in line of sight of the road, there is more of a chance of hearing the roadway noise. The location of the road on the north facing slope is likely a better location for Saddleback residents as they will be above it.
  - **Response** (Anthony Pisano, AtkinsRéalisis): Anthony also clarified that the Team will not be cutting down any trees above the Saddle Cut.

**ACTION:** Team to send out PDF and model stills for the Saddle Cut after the meeting.



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## 6. Wrap Up & Next Steps

- Sam Hoover, Central City, noted that this was his last Floyd Hill TT meeting and expressed his gratitude for all of the work that has been done on the Technical Team thus far. He will be available through email until the end of April, and Jack Beard will fill in at the TT meetings moving forward.
- *Next TT Meeting* - April 26
- *Future Meeting Topics* - Roundabout lighting, Saddle Cut rockfall mitigation

### **ACTION ITEMS:**

- **ACTION:** The Team will determine what lighting adjustments might be possible based on current progress, and will bring more information back to the TT at a future meeting.
- **ACTION:** Kurt and Jessica will connect regarding the potential for planting flowers/plants in the roundabouts.
- **ACTION:** The Team will notify the TT once the schedule for the shuttle launch is confirmed.
- **ACTION:** Kurt will reach out to Jessica, CDOT, to set something up with Clear Creek County to help address the recent snowstorm incident.
- **ACTION:** The Team will compile photos of different wall treatment options and present these to the TT at a future meeting.
- **ACTION:** Kevin to connect with Cindy and Amy to further discuss replanting opportunities that may affect Clear Creek County ROW.
- **ACTION:** Team to send out PDF and model stills for the Saddle Cut after the meeting.

## 7. Attendees

Sam Hoover (Central City); Cindy Neely, Amy Saxton (Clear Creek County); Margaret Bowes (I-70 Coalition); Jessica North (Clear Creek Schools); Mike Raber (Clear Creek Bikeway User Group); Levi LaGuardia (Jeffco); Lisa Wolff (Floyd Hill POA); Bill Coffin (Saddleback POA); Julian Gonzalez, Bill Schiebel (FHWA); Tammy Heffron (HDR); Mandy Whorton, Ashley Bushey (PEAK Consulting); Tyler Weldon (Bridge Enterprise); Kevin Shanks, Sam Spicer (THK); Matt Aguirre, Anthony Pisano (AtkinsRéalisis); Tyler Brady, Kurt Kionka, Abbie Modafferi; Stacia Sellers, Ryan Sullivan, John Gregory (CDOT); Daniel Estes, Julia Oleksiak (CDR Associates)