



MEETING NOTES

PROJECT:	23982-23929 I-70 West Vail Pass Safety and Operations Improvements
PURPOSE:	Technical Team (TT) Meeting #21
DATE HELD:	October 25, 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 Patrick Chavez, CDOT I-70 Corridor Operations Jeff Bellen, FHWA Devin Duval, DNR Michelle Cowardin, DNR Greg Hall, 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 Randal Lapsley, R S & H Jeb Sloan, R S & H Mark Gutknecht, Kiewit Mary Jo Vobejda, Jacobs Jim Clarke, Jacobs Loretta LaRiviere, Jacobs
COPIES:	Attendees

SUMMARY OF DISCUSSION:

1. Introductions & Meeting Purpose

- a. Karen introduced the attendees at today's meeting.
- b. Mary Jo said we will be discussing what has been done, and adjustments made to some items in the construction packages. Major elements aren't changing a lot but as we move forward with the design, it becomes apparent some items fit better in different packages or at different times during construction. We will also spend some time talking about how stakeholder feedback from the ITF's is being used on the project.

2. Review of Work Completed Since the Last Technical Team (TT) Meeting

- Groundbreaking – August 25th and construction package 1 is now under construction.
- ALIVE ITF Meeting #5 – September 13th. This was their last meeting, their work has been completed and they have given their direction to the designers.
- SWEEP ITF Meeting #5 – September 16th. They will meet again in a few months.
- TT Field Trip – September 27th
- SWEEP Field Trip – September 27th



- Revising Aesthetic Guidelines
- FIR Design meeting for INFRA project – September 28th

3. Updates to the Construction Packages

- a. Mary Jo said that updates to construction packages result from new survey information with much more detail of the topography and existing conditions, some new design techniques, new types of construction, and input from the contractor. All of these cause the construction packages to be dynamic.
- b. Karen noted the original INFRA scope included an anti-icing system. This was not part of the original EA, it was identified while we were writing the grant. The anti-icing system looked great on paper. It had a good cost/benefit ratio and sounded like it might be good for our project, so we put it into the grant. We started looking into it afterwards, we discovered there is now only one manufacturer in the country and their product hasn't been performing well. We found this system has maintenance challenges and there is not much flexibility to change the system to make it more easily maintainable. The company charges for the install and then charges a monthly fee because it is so hard and costly to maintain. In an area like Vail Pass where we have quite a few plows, and we are put down deicing fluids, this wasn't the best solution for the project, so we are moving ahead with the paperwork to remove it from the grant.

John said Karen provided a great summary of the reasons to remove the anti-icing system from the bridges. As substitutes, we also looked at a pavement system that will absorb mag chloride and release it when moisture gets on the bridge, but that company didn't recommend it for our location because we have so many chains up on the Pass that it would destroy their product.

We looked at installing another weather station which provides feedback and information to Eisenhower Tunnel which dispatches plows for the Pass. It can help get plows up there at the right time, however there are two weather systems up on the Pass now and we may need to install another one for the Variable Speed Limit (VSL) system that we are proposing to install.

We met with our Executive Oversight and Director Lewto proposed a substitute for the anti-icing system of adding the westbound bridge. The current westbound bridge has a substandard radius of about 300' and it also has a steeper super elevation. In this case, that bridge has an 8% super. When you have a steep super, it can actually induce or contribute to crashes in inclement weather and smoothing out that radius will reduce this. CDOT no longer does designs with existing the super elevation and has set the maximum super elevation allowable as 6%.

Karen said the other news is we have continued to evaluate the design of the concrete curved panel wall. Several months ago, we concluded that we would be going with the modern interpretation of the scallop wall because it had a smaller footprint with a scallop that wasn't as deep existing because it was more cost effective. We worked very closely with Greg Hall who knows the scallop walls very well on the Pass and one of the things he pointed out to us was the width between the existing tiered scalloped walls varies. In some areas, the tiers are as close as 8" from the back of the scallop to the nose



of the wall, but where we had taken measurement on other walls they were further apart. When we started to condense the full scallop version of the design, it was actually able to match the same footprint as the modern interpretation. The environmental impact was the same so then the biggest differentiator was cost. The full scallop does cost more to construct because you have to form it vertically, but it is not magnitudes of difference.

We are spending around \$140 million for the entire INFRA project, and the difference in cost is around \$900K. It is a big number and money we could use on other improvements but, because there is not a large magnitude of difference we have decided to move back to the design of the full scallop to honor the historic character of the Pass. We are updating the aesthetic guidance and updating the scallop wall selection memo. We will be submitting these to SHPO and the consulting parties with our FIR design.

- c. Karen said the new survey information really helped with refining the recreation path design and trying to match the terrain. We are continuing to look for constructability improvements.

John said getting additional field survey really paid off for the recreations trail design. We are further refining the general alignment from the EA and since the FIR package which is about a 30% design level, the recreation trail has come a long way and looks great.

4. Work in Progress

- Environmental compliance tracking is a FONSI requirement for all the construction packages and is currently being tracked for Construction Package #1.
- Emergency Management coordination continues. We do have another ITF meeting planned for early 2022.
- The website continues to be updated for Construction Package #1. I hope you are also on the email system to receive regular updates on what is going on with construction and where you might see work being done.
- The SWEEP ITF is reviewing major sections of the SCAP and Maintenance Manual.

5. ITF Guidance Review

- a. Mary Jo said we really want to focus today on how the ITF's guidance has made a difference. As you may recall, the FONSI directs the formation of Issue Task Forces. There are several mitigation statements in the FONSI directing CDOT to form and hold these ITF's, which they did.

Each ITF laid out their methodology and deliverables. They said from the beginning what they were going to do and on what schedule they were going to deliver their products. The ITFs include:

- Aesthetic Guidelines
- ALIVE Memo
- SCAP and Maintenance Manual



In the meantime, additional surveys were completed. For example, an updated wetlands survey from the one used during the EA and it has made a difference to some of the design.

The designers are using these inputs for:

- Aesthetic Guidelines for wall locations and designs
- Location and sizing of wildlife crossings was optimized based on length of crossing recommendations and habitat at crossing openings. This was a combination of aesthetics, sediment control as well as the directive to minimize impacts to the surrounding habitat.
- The location of bridge and the recreation trail were optimized to meet the goals of the ITFs.

b. Aesthetic Guidance in Construction Package #1

Mary Jo said the Aesthetic Guidance has made a difference on this project. Karen mentioned the scalloped walls, but another example is at the truck ramp which is currently under construction. The Aesthetic Guidance was taken into consideration and impacted the design of the sculptured shotcrete wall. The Aesthetic Guidance laid out what the rock wall would look like and how to utilize the natural grading to either minimize or blend the wall into the natural surroundings.

Karen said the team is doing the wall right now. They are working on a sample area so we can understand what the sculpting will look like. They are also doing up to four iterations of coloring to work through different color options to try to find the right balance to make sure it blends in, this testing is directed by the Aesthetic Guidance

c. Aesthetic Guidance for the Wall at MP 187

Mary Jo said a lot of the aesthetic guidance and the design guidelines talk about balancing cut and fill walls and optimizing the cut walls which are above the road to limit the height.

Jeb said our original alignment had three tiers in this location at the cut wall and we were looking for ways to optimize that. By reducing it to two 10' tiers, it did add a little to eastbound fill wall, but it was an attempt to try to balance that and look at the aesthetics of what was above the wall.

Mary Jo said that one of the biggest goals of the design criteria for the Mountain Corridor is to consider the very basics which is the actual location of the road and not put the road in and then move forward with, putting in a wall. We are optimizing those as we design the road alignment itself.

d. ALIVE ITF Affecting Locations and Types

Mary Jo noted the ALIVE ITF had a large effect on the location and types of wildlife crossings. The locations for the medium and small crossings were maximized for access for all the different habitats



John said we have the two large crossings and they have basically stayed in their same general locations to optimize their contact with the topography.

We have one smaller crossing for the lynx just past the peak of the hill, a little closer to the winter recreation area and the other three smaller ones are located towards the top of the Pass. They have shifted around a little bit to get the approach and departure grades optimized with the slope in the pipe.

Randal said we worked closely with the ALIVE ITF to understand what things were important from the wildlife perspective and worked to minimize the length of the culverts and to provide good visualization. We optimized the grading coming into the crossings to make it look natural while still providing the necessary passage for large and small animals and to divert any kind of nuisance flows. We also worked with Kiewit to understand what things would be important for constructability. We looked at what is the shape of the crossing, how does it function with the roadway, and how to avoid more accidents. If we put another bridge in there, we would have the potential for more icing on the roadway, so we looked at how to best optimize the crossing locations and minimized the safety impacts with arch shaped crossings because they create more fill above the pipe which reduces the potential for freezing.

e. SWEEP Approaches in FIR Design

Jeb said the SWEEP ITF gave us input on sediment control measures and those have been incorporated into the designs. We worked with the SWEEP ITF and maintenance personnel to come up with some different options for some of these control measures so they can get in and clean out control measures more easily than some of the existing ones.

Some of the other modification we've looked at and continue to refine are areas where the snow is going to be thrown over the barrier. This snow will have sediment in it and considered how we can capture it more effectively. This is the case on a portion of the trail where we moved the wall a little bit closer to the roadway so any thrown snow could be captured in the trail ditch and eliminate having a dead spot there that would be difficult to get in to maintain. Any thrown snow will be captured in the trail ditch and when they go in to clean off the trail in the spring, that sediment can be captured rather than letting it go down the hill and into the creek.

John said in this area there is currently there is no sediment collection other than the state has erosion control logs to slow down the sediment. This feels like a big improvement for capturing the sediment over what is there existing, and this placement offers something to truly catch the sediment and allow us to manage it in this area.

f. SWEEP Approaches to Reduce Sediment Introduced into the Creek

The EA had the eastbound bridge really close to Black Gore Creek. Being so close to the creek, that would allow the sediment to be thrown directly into the creek. So, we were looking at ways to modify that and ended up adding the westbound bridge. It allows us to pull the eastbound bridge away from the existing creek and it allows us to phase the



bridges so we can minimize the amount of sediment that is thrown directly into the creek. This is a big water quality improvement from the original EA alignment.

Jeb said this also gives us the opportunity to create some sediment control in between the road and the trail and anything thrown off can be treated before it hits the creek. Another benefit is that it gets rid of one of the worst curves on the recreation trail now coming under the bridge. It will soften the curve and creates a safer trail alignment in this area.

John said we are also providing access roads to get underneath the bridges so that in the future we can clean up the sediment. Right now, the giant rows of sand are too difficult to clean out.

1. Greg asked with this new design will there be added sediment control with the trail drainage.

Jeb said where we are draining back into the hillside with this ditch and have a combined ditch with this overflow or what is being thrown over the barrier, yes we will have sediment control to address both. It won't be designed for any sand being put on the trail, but it will be designed for the roadway sediment. This ditch will typically end in a control measure and then pipe down or ditch down depending on the situation. Where the trail is further away from I-70 and we can super elevate towards the creek, those locations will not have additional sediment control for the trail because we will be treating the roadway separately.

Karen said the trail will not have any traction sand. The only areas we are trying to collect traction sand on the recreational trail is right next to I-70 in the splash zone essentially but otherwise the trail will not have sediment control features next to it. The only other spot there may be some sediment control features below the highway is near Black Lakes because we know it gets thrown over the barrier up there.

Greg said you he's just trying to understand how the traction sand will be collected. I know you aren't going to put traction sand on the path but typically you are going to plow right up to the barrier and that sand mixed with snow goes up and over the barrier and ends up down on the trail.

2. Greg noted quite a few of the culverts are being relined and reused and it looks like you have quite a few sediment basins. Does every culvert come out after a sediment basin or are there some culverts that aren't going through the sediment basin before they drain? It looks like some extend all the way down to the creek past the Recreation Trail and I just want to make sure they are treated before release into the creek.

Jeb said you're probably looking at the FIR plans and we are continuing to tweak that a little bit and where we are doing construction on the westbound lanes we will have something uphill of the culvert crossing to treat it. We are still looking at where we need to reline those and if any need



to be replaced, we are working on getting all that information into the plans, but for the time being we are assuming we are relining all of them just to have a quantity for the FIR plans.

John said there aren't too many opportunities for a clean water pipe bypass in this area. There could be a few where there are springs, and the water runs off the uphill side of I-70. If we can collect it in a pipe before it gets too close to the road, then we wouldn't have to treat it. The water would just bypass I-70 altogether and discharge down near Black Gore Creek. Otherwise, we are doing our best to have some sort of sediment collection measure at every pipe.

3. Greg said Berthoud Pass was laid out as the best practices when it was constructed and after 10 years, is that still considered state of the art or is there something better now? They have a lot of hard shoulders and collection areas and I notice on our project we have a lot of gravel or dirt ditches.

John said there was a similar project around ten years ago on Vail Pass where we wound up paving a lot of shoulders and they are easier to clean than an unlined ditch. For this phase of the project, a lot of those shoulders can simply remain.

Karen said there are some paved shoulders and we do have hard-bottomed sediment control collection systems, but the aesthetics and nature of the Pass would be affected if we were to pave everything out to the roadside ditches everywhere. We have a couple spots especially in the area where we are trying to minimize the height of the scalloped walls near MP 187, where we paved almost to the base of the wall and put a ditch in the pavement because we wanted to optimize our snow storage and it didn't make sense to have a dirt patch in between. But we do have more of the hard bottomed sediment control systems that are easier to clean for our maintenance forces and they know where the bottom is. So, I think it's a balance.

4. Greg said when we talked about improving Vail Pass we were going to improve the sediment control not considering the aesthetics. Is what has been proposed state of the art and what has CDOT learned over the years with the different plans put in place for Berthoud, Straight Creek, and some of the other projects. This is our opportunity here and we only get one shot so we need to do it as well as we can.

John said there is a lessons learned section in the SCAP that takes into account Straight Creek and Berthoud Pass and they were passed on to the designers. One lesson learned from Berthoud Pass is making sure that the sediment collection features are actually the right size for the desired type of equipment that maintenance wants to use to clean them out.

6. Wetlands Update



Jim said the field work started in the summer once you could actually see the ground and we finished our work in September. It took a while to process all that data and get it to the designers. Before we were able to do that we were leaning on the preliminary EA wetlands survey information which was notably and admittedly conservative. As the name suggests, it is preliminary and subject to change. During the EA, the subconsultant took a conservative approach to identifying wetlands and he didn't have time to look at the soils information but based it on vegetation mostly. Our wetland boundaries have been reduced from what is shown in the EA. We did have a good site visit last week with the EPA rep (our CORPS rep couldn't attend) where we showed him how the EA boundaries had changed with the more accurate mapping and he was comfortable with the changes that were made.

Karen said one thing we didn't include in this presentation is the latest information on wetlands. We have some challenging news for our team that we have discovered a fen on the project, and it is located around MP 185 in the area of the existing recreation trail that is north of the highway.

Fens are high quality wetlands, and they are something that we try very hard not to impact and we certainly don't want to do that now. Jim said the fen is very small, about 500 sf. There is a larger fen system located upslope quite a ways. That is another one we discovered, that also wasn't identified in the EA preliminary mapping. We are potentially going to impact the smaller fen. Right now we are looking at alignment changes for the trail to try to avoid that fen. We looked at this area pretty closely when we were in the field with the EPA last week.

Karen said the area that is impacting the fen right now is where we had planned to relocate the recreation trail in that area which is the wider portion. We have identified and are evaluating alternatives. The challenge is the fen location is still pretty close to that westbound cut wall where the road is proposed to go. But we are defining some pretty good options and we may be able to avoid impacting the fen.

We're still early in the process but I thought I'd bring it up because it is a new challenge we are working through taking our core values and all the normal ways we do our business anytime we impact wetlands we have to go through certain processes, especially with fens it's ten times more intensive. We will know a lot more by the next TT meeting as we are evaluating these wetlands and the fen.

Karen said another interesting thing is we have identified an area for a potential fen mitigation up near the CDOT Maintenance Yard on the north side of the highway around MP 190. This is a really rare opportunity and something we might be using for other wetland mitigation on site is improvements to this fen. Jim will check to confirm the area meets the criteria for a fen. The hydrology has been really affected by lack of moisture and that has changed the vegetation that you see there, it's not a typical fen vegetation.

The concept we discussed with the EPA is to restore the hydrology by doing modifications to some of the drainage above the maintenance shed. We are optimistic about it. We are taking what is called an adaptive management approach and what that

means is we might make some adjustments to the hydrology and monitor it to see how that is working. We will also have a Plan B and make further adjustments and monitor that in turn.

John said if we enhance the fen above, there could be an opportunity onsite for wetland mitigation. We are looking into some of the legal logistics as well to mitigating on Forest Service property for a federal highway project. It is an area where the fix seems straight forward, so I think it's a great opportunity.

1. Shannon asked for the definition of a fen.

Jim a fen is a rare, high quality wetland in high alpine environments that is characterized by organic peaty subsurface material and it has to be of sufficient depth, maybe 1 1/2'. Part of the reason they are to be avoided and restored where possible is that it takes a long time to create that organic material, we are talking in terms of geologic times so it's millions of years. There just aren't that many left and that's why they are prioritized when it comes to wetlands work and permitting.

Mary Jo said she is making a note to make sure as this continues we present it to the TT on what the progress and ultimate conclusions are because this is an interesting opportunity.

7. New Survey Data

Jeb said we are tweaking the recreation trail based on the wetland survey and updated topographic survey trying to minimize the earthwork. We saw we had some impacts to a tree grove and some wetlands. As we as did our field walk with the trail folks we decided it would be worthwhile to shift the trail to the south to minimize our wetland impacts as well as the impacts to the existing trees. Some things, especially the earthwork has changed quite a bit since the FIR with the new survey and some of the shifts we have made to optimize the design.

Randal said the trail alignment shift allowed us to reduce the impacts to the wetlands. We had the new boundaries, we looked at those in relation to the trail and then we optimized it to further reduce the wetland impacts in this area.

Karen said this is just one example of what the recreational trail team is doing, they really went through everywhere we have impacts to see if there was a slight shift that would reduce wetland or tree impacts. In this case we are avoiding a very large tree, so I think that has been incorporated across the board.

Mary Jo said, as a teaser, our next TT meeting will be focusing on the recreational trail and where it is ending up with these changes. We want to highlight all that has changed on the trail.

8. Schedule

Karen said we added the second bridge at MP 185 so that has extended the construction date to 2025. The majority of the work will be done along the corridor as planned in 2024, it will just be that one bridge at MP 185 that will be built offline and shouldn't have much in

the way of traffic impacts other than getting materials to and from the site. We will be doing very minor landscape seeding throughout the project, but the major landscaping project will be starting in 2025. We will probably have one more package beyond CP #4 and that is where the second bridge will be. And we are still figuring out if the bridge design will finish up by the end of 2022 or extend a little bit into 2023. We're still refining what the design schedule looks like for that new bridge.

Mary Jo noted we are winding up our ITFs. Right now, we expect the TT to meet every month until design is finished. If you look at how the TT coordinates with the design, your job is to oversee how the design is being implemented consistent with the ITF recommendations. When design is completed it becomes the PLT's responsibility to make sure the rest of the construction is done following the principles of CSS.

We would like to give you the opportunity to talk to us about:

- What you find the most interesting, the best reason for you to come to these meetings
- Topics that you are most interested in
- The timing of the meetings set at monthly, we don't always think we will have interesting topics but want to get your input on that
- How long the meetings should be

Shannon said for her it mostly been about the recreation trail changes and improvements, which is such a welcome change and I'm so excited to be a part of this and learn so much. Every meeting I learn some new acronym. I thank you all very much, it's been fascinating, and I like the monthly meetings. It keeps me up to speed on what is going on.

Kevin said he agrees with Shannon.

Larissa said on behalf of the Water & Sanitation District, having the monthly meetings on the calendar is great. If occasionally you want to cancel or shorten one, that is fine. But I think especially as we get into implementation, as you showed us today some of the outcomes from the Aesthetic and SWEEP ITFs, seeing how those are actually playing out as you are up there doing the final surveys and designing the remaining construction packages has been very helpful for us.

Greg said he agrees that monthly meetings are great. The one topic of interest to me is the final location of the wildlife fence and whether we are blazing through trees and if it can be maintained. If we get it too close to the road, does it cause maintenance issues and things like that. I think there are a lot of people who are on the TT would want to have updates on construction. It would be worthwhile to bring the TT back together each season you're going to start construction to let us know what's we will be doing, what worked and didn't work in the last construction season. You have a lot of people who are dedicated to this project and have been meeting for a long time and would like to see it to the end.

9. Next Steps

- PLT Meeting on November 12th



- TT Meeting on November 15th which will focus on the recreational trail design and adjustments made based on the new surveys because of topography as well as the wetland mapping
- We have a TT meeting on December 20th. I think that one is getting close to the holiday, but we'll want to plan ahead to see what topic is to make sure it will be worthwhile for everyone.
- We plan to have one more SWEEP meeting this year and then we are thinking about and EMS ITF meeting early in 2022. That might speak to the construction that went on this year and what we learned and what we can improve.

The scallop wall memo is about ready to go out to SHPO and the consulting parties. Mary Jo said she feels it is her job to make sure that CSS is working and what happened with the scalloped walls is just a classic example of how well your input works and it can affect the outcome of these projects. So big kudos to everyone who participated in that and we may highlight this success story in an upcoming presentation.

Randal said it's been a good process to see our design team work together with the technical experts in all these areas to evolve the design to keep all of the different priorities and to strike the right balance between all of these areas.