Design Exception #7
Height Exception for Sculpted Shotcrete Walls at MP 185 and MP 187

Design Exception Statement

Facing the walls at MP185 and MP187 with a sculpted shotcrete treatment is recommended. This wall treatment will complement the historic Vail Pass aesthetics and is consistent with the site-specific construction methods and geotechnical conditions at these locations.

The height of the individual tiers varies, and some locations exceed 12' based on the location specific topography. Wall height, color, and texture of the shotcrete will reflect the surrounding rock formations. The top of the wall will undulate, and planting areas will be included in the wall layout.

Process

A presentation was made to the Technical Team on January 21, 2022. It was agreed that a **memo** would be distributed presenting the details of the wall heights and after reading the memo the TT would provide their concurrence through email.

A memo was written and emailed to the Technical Team on February 1, 2022. Email concurrence from TT members was recorded in an excel spreadsheet.

Two TT members had comments on the memo, the comments were addressed, and the actual Design Exception statement was revised based on the comments.

The revised Design Exception was presented at the Technical Team on February 14, 2022. Meeting notes document aesthetic concerns regarding the appearance of the sculpted shotcrete. No concerns were expressed regarding design exception for the height of the walls.

The Design Exception process was reviewed by the Project Leadership Team on February 11, 2022. Meeting notes document their agreement that the CSS process was followed.

Documentation for this Design Exception

- Technical Team presentation January 21, 2022, slides 22 through 33; and February 14, 2022, slides 5 through 10.
- Draft Memo
- Record of email concurrence
- Comments and responses

- Final Memo
- Project Leadership Team presentation February 11, 2022 – slides 20 through 31

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

Technical Team Aesthetic Concern – Sculpted Shotcrete will not appear natural.

Design Plan, Specifications, and Field Supervision to address the concern – As directed in the Aesthetic Guidelines, the plans and specifications will indicate undulations on the top of the wall, vertical and horizontal striations will be incorporated into the shotcrete, a variety of colors will be used, and a planting area with varying widths will constructed between the tiers.

A pre-qualified subcontractor experienced in high quality sculpted shotcrete walls will be engaged. A sample of the shotcrete showing the various colors and textures will be built. The landscape architect will review it and give approval.

COLORADO
Department of Transportation

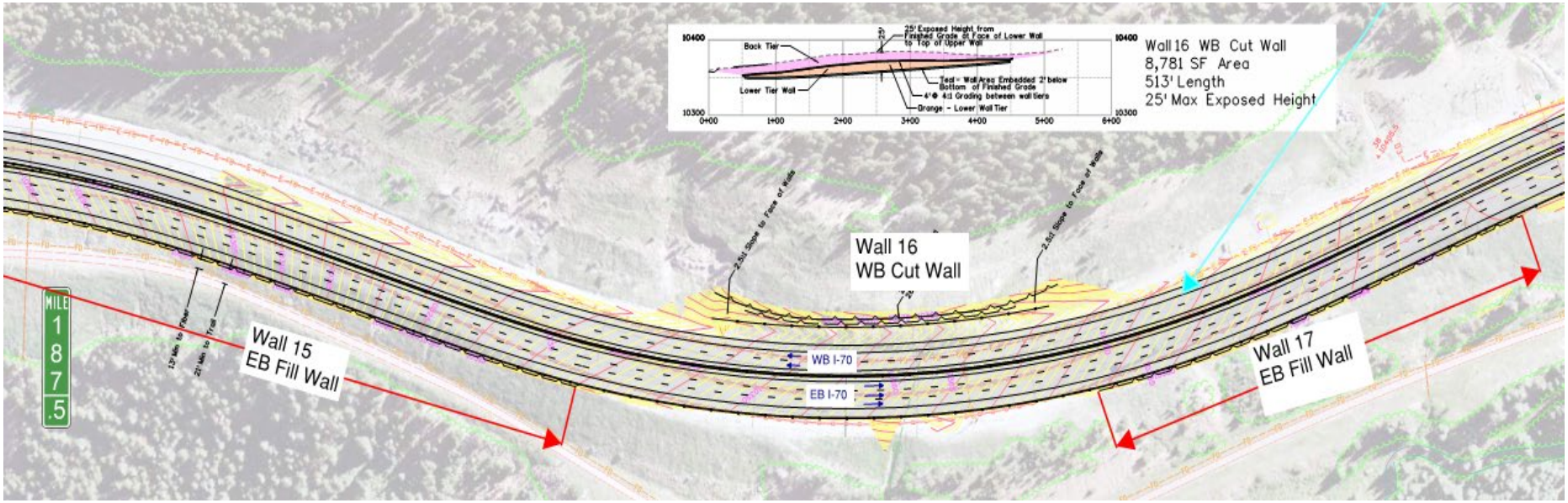
I-70 West Vail Pass Safety and Operations Improvements

TECHNICAL TEAM MEETING # 23

JANUARY 24, 2022

Westbound Walls - MP 187.7

- Studied realigning the roadway to minimize visible walls
- Laid out 3 alternatives with different wall systems
- Analyzed the alternatives using the Core Values

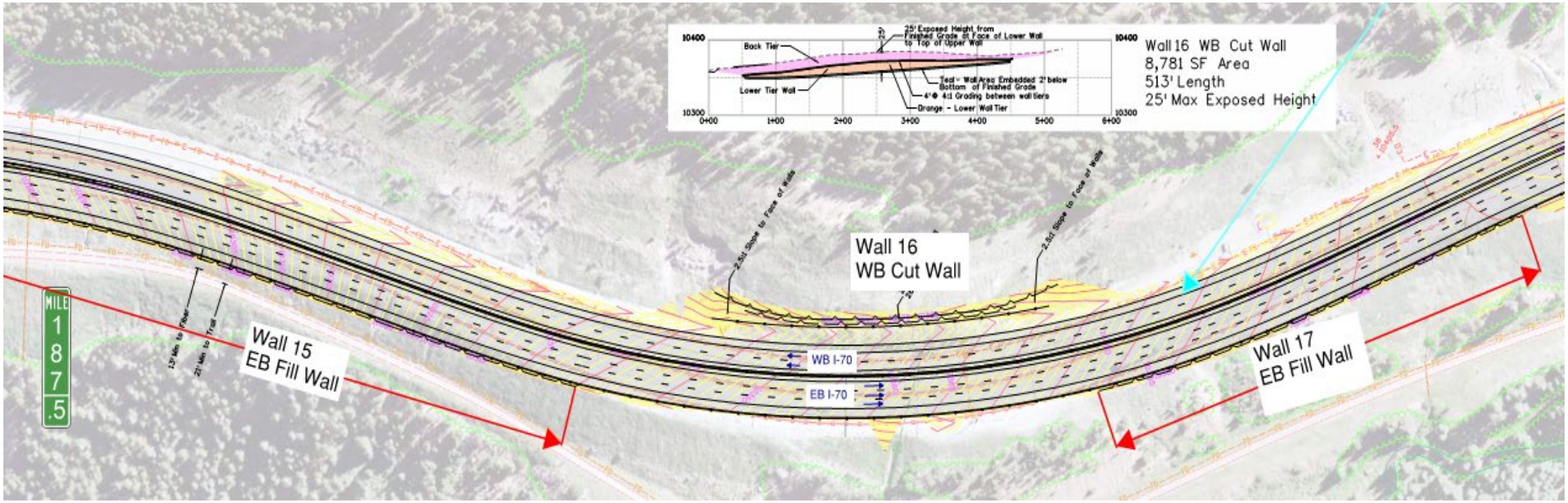


Matrix Analysis - Wall at MP 187.7

Category/Core Value	Critical Issue	Criteria
Safety	Improve safety and reduce crashes	• Roadway curve geometry • Crash reduction factor
Operations	Not applicable	Anticipated traffic operations impacts
Corridor Character & Aesthetics	Maintain the context-sensitive design of the road while modernizing the facility and impacts to the high-quality views in the corridor	• Does the option introduce any CSS aesthetic design exceptions? • Aesthetic considerations
Enhanced Environment	Wildlife corridors and habitat, threatened and endangered habitat	• Total forested area impacted • Total wetlands area impacted
Recreation	Minimal closure of recreational facilities	Anticipated trail user impacts during construction
Collaborative Decision Making	Not applicable	Not applicable
Implementability	Impacts to the traveling public	• Construction duration and phasing • Traffic control impacts to the traveling public • Throw-away costs
Sustainability	Project meets the needs now and into the future	Ease of access to the items that need to be maintained
Sustainability	Maintenance and operational financial feasibility	Level of effort for CDOT to maintain

Alternatives Considered - MP 187.7

- Alternative 1 - base case from the EA
- Alternative 2 - move the alignment 20’ north
- Alternative 3 - move the alignment 30’ north

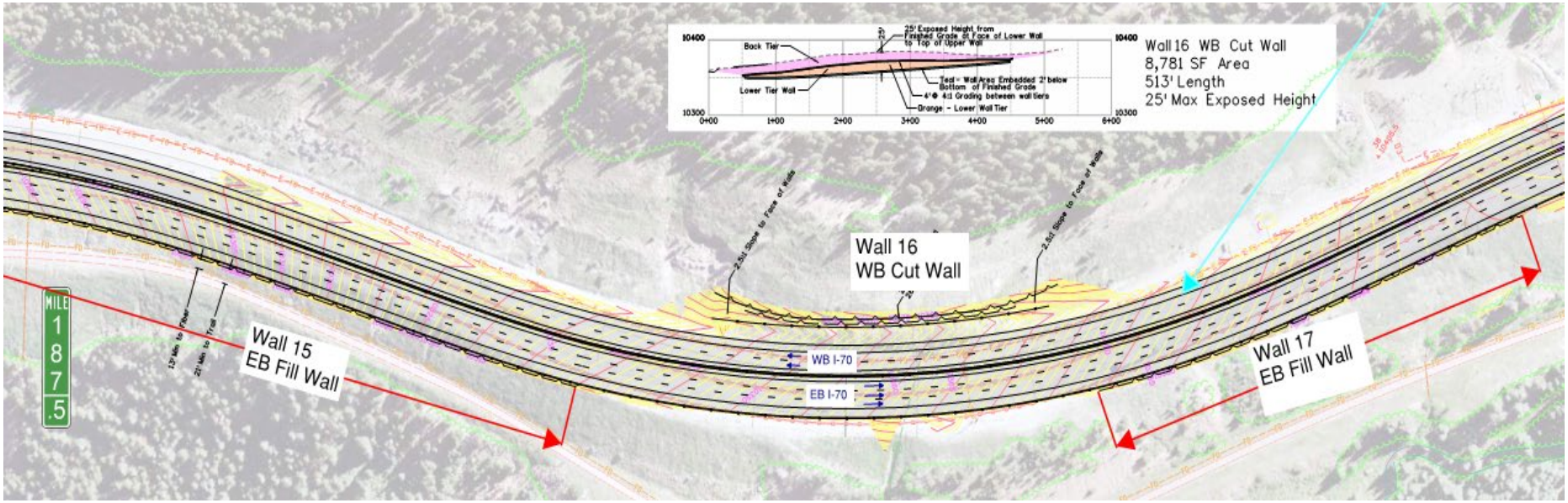


Summary of Alternatives at MP 187.7

- Alternative 1 - base case
  - Highest eastbound fill wall
- Alternative 2 - move the alignment by 20’
  - Walls are not as high but are longer
- Alternative 3 - move the alignment by 30’
  - Shortest walls for INFRA construction
  - Same wall height as Alt 2 in the ultimate buildout

Chose Alternative 3 - MP 187.7

- Optimizes the westbound cut wall (Wall 16) to a 25' max exposed wall with 2-tiers
- Balances eastbound fill walls (Wall 15 and 17) with westbound cut wall



Analysis of Wall Type for MP 187

Goal - light touch on the land, a natural look


Sculpted Shotcrete Wall at Truck Escape Ramp

Considered:

- Surrounding area, topography, geology

Types reviewed

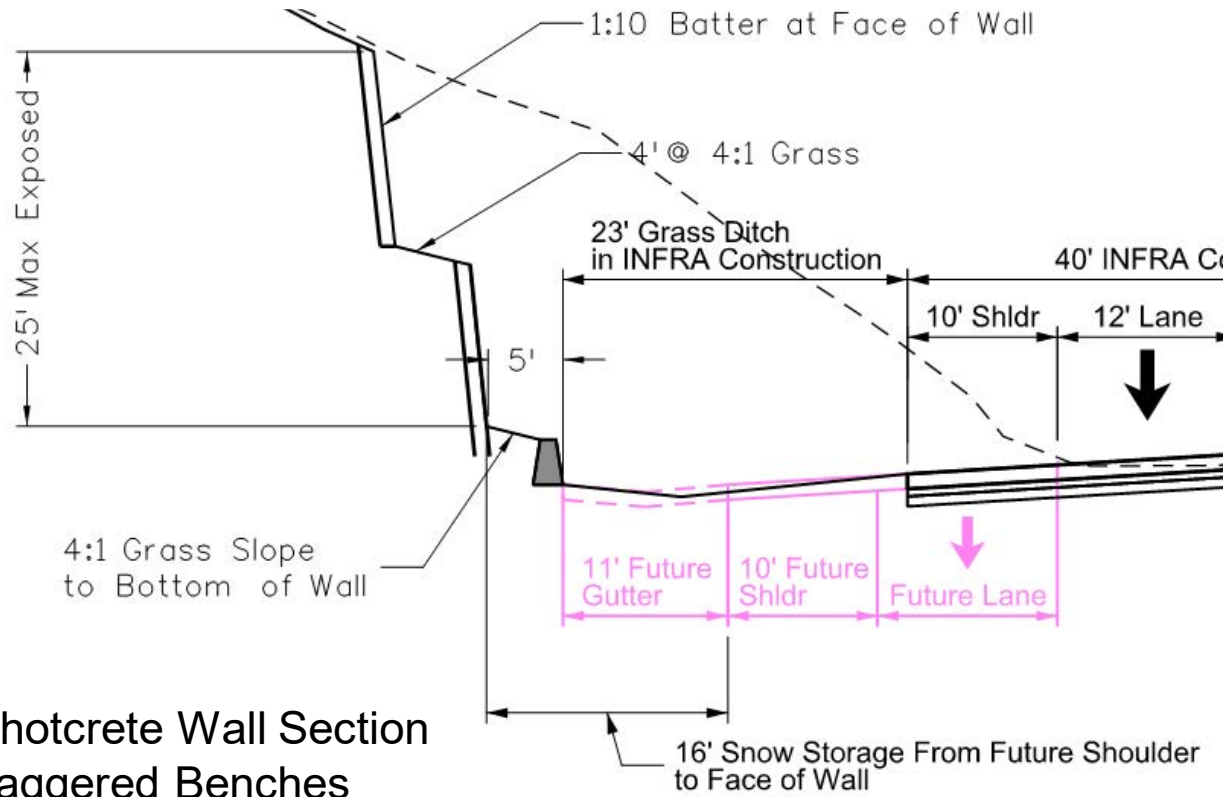
- Rock sculpting the existing rock
- Shotcrete
- Scalloped

Factors in the decision

- Existing rock not stable enough
- Shotcrete gives ability to vary the wall top
- Shotcrete gives ability to pull the walls back into the terrain
- Shotcrete and Scalloped provide planting areas
- Economy of construction time

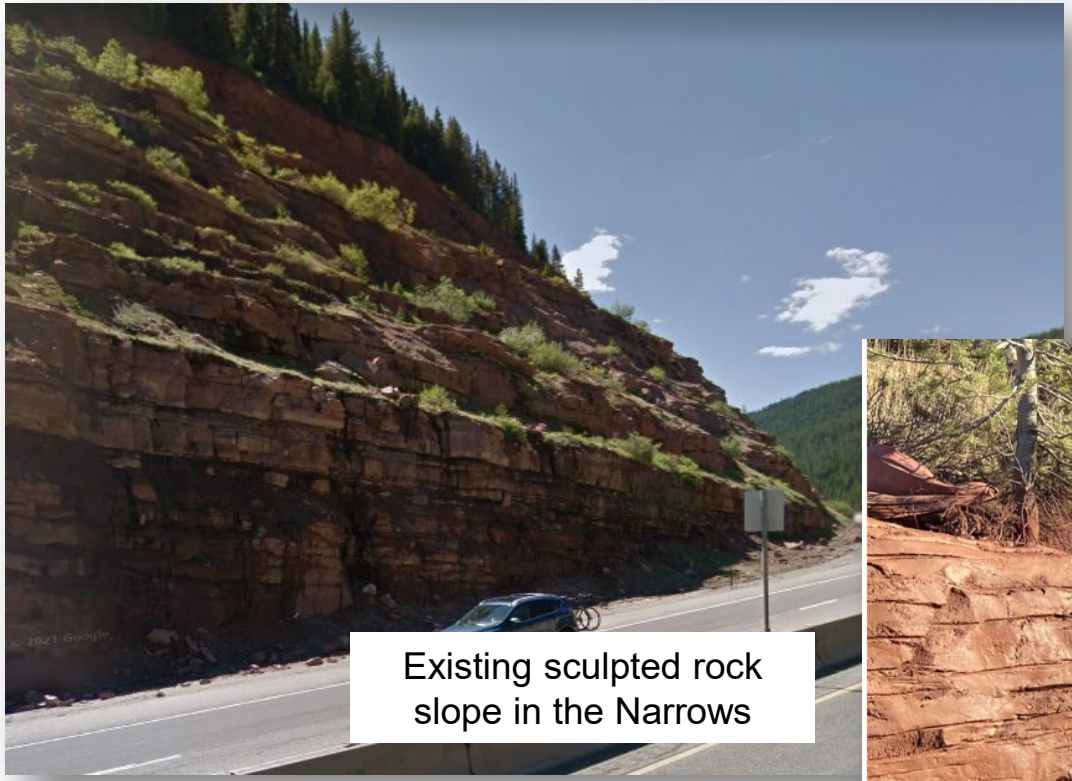
Analysis of Wall Type for MP 187

Recommended Wall Type: Sculpted Shotcrete



Sculpted Shotcrete Wall Section with Staggered Benches

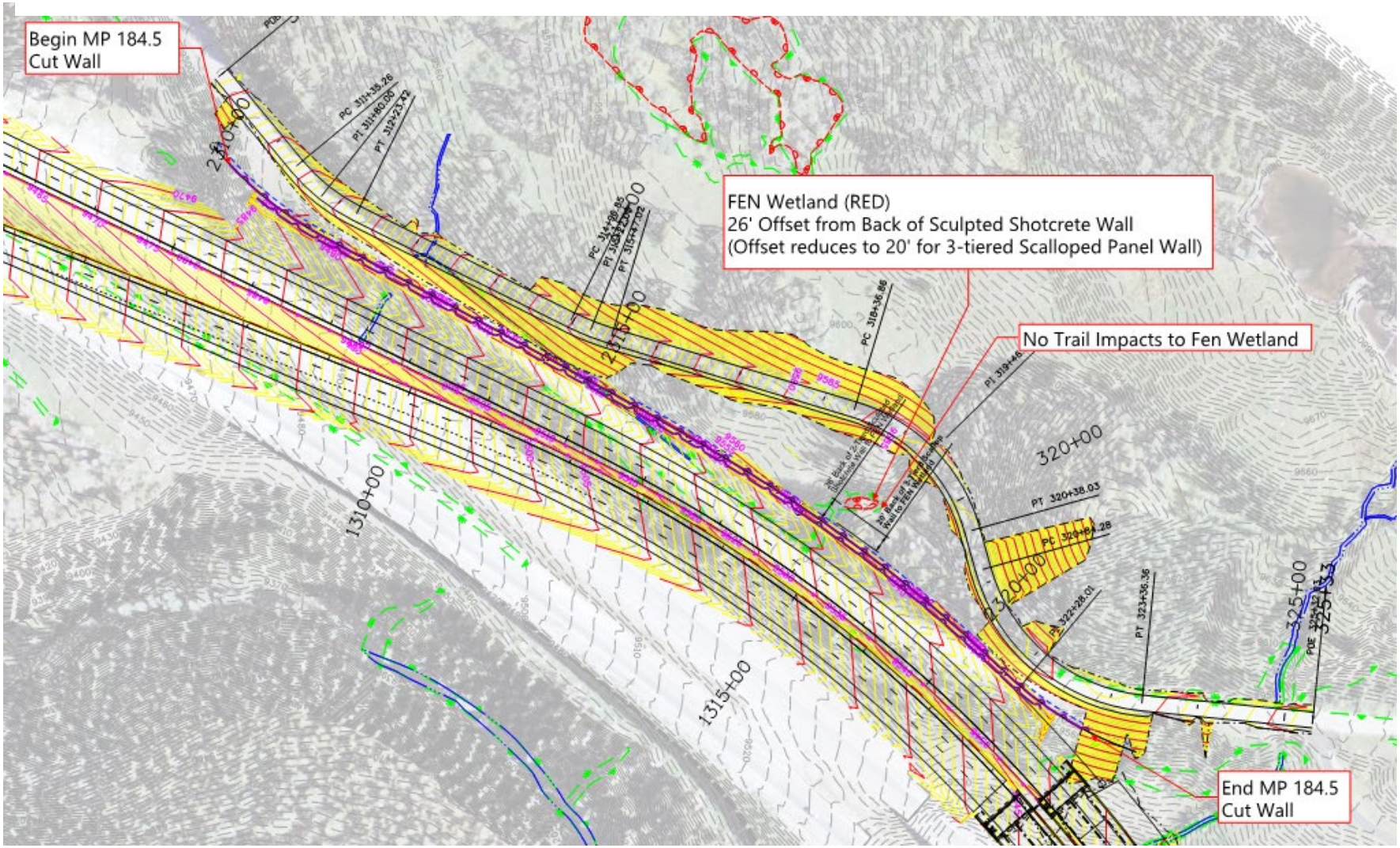
Analysis of Wall Type for MP 187



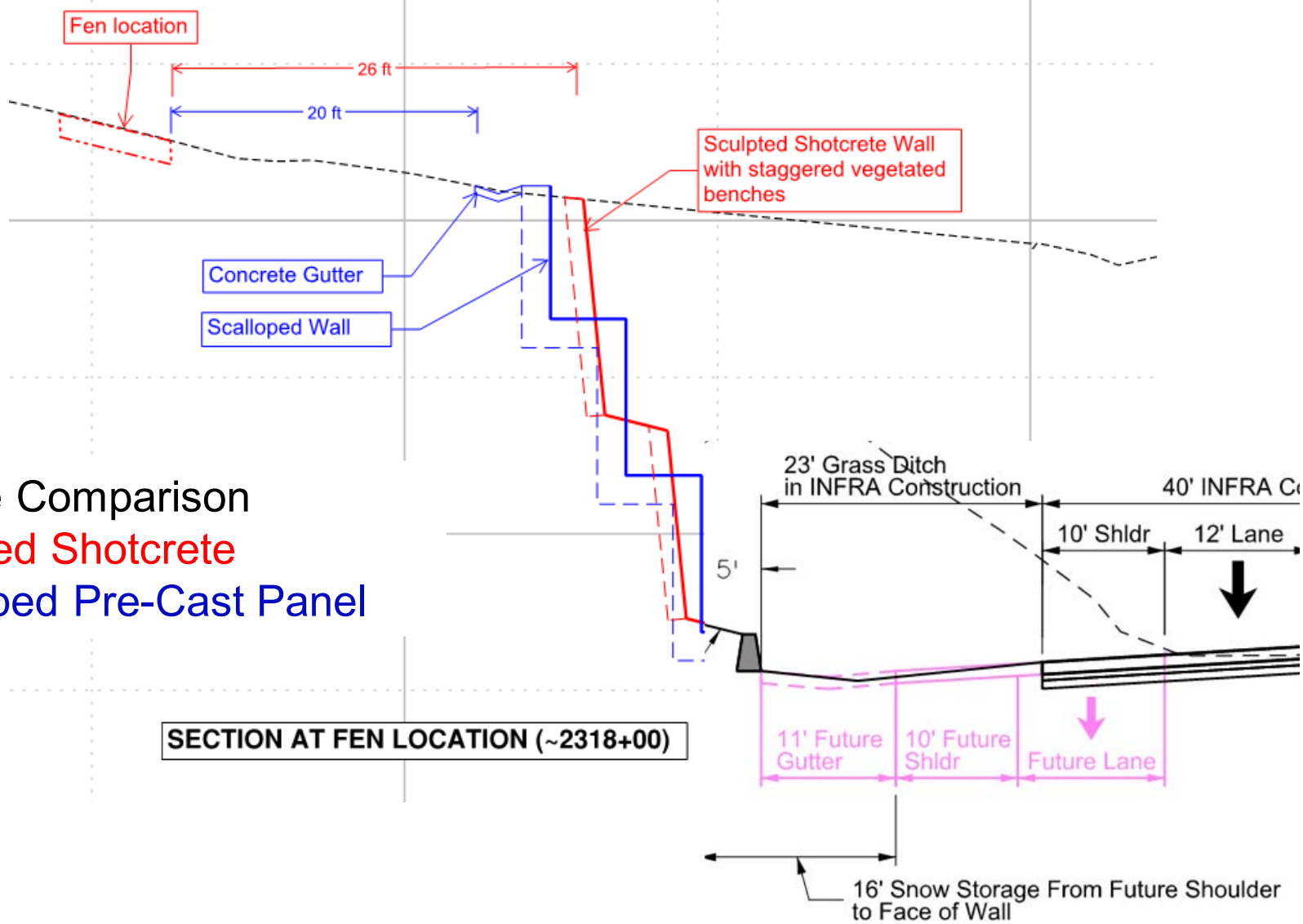
Existing sculpted rock slope in the Narrows

Sculpted Shotcrete Wall at Truck Escape Ramp

Trail realignment to avoid Fen - MP 184.5



Trail and Cut Wall at Fen - MP 184.5



Wall Type Comparison

- Sculpted Shotcrete
- Scalloped Pre-Cast Panel

Trail and Cut Wall at Fen - MP 184.5

Goal - light touch on the land, a natural look

Considered:

- Surrounding area, topography, geology

Types reviewed

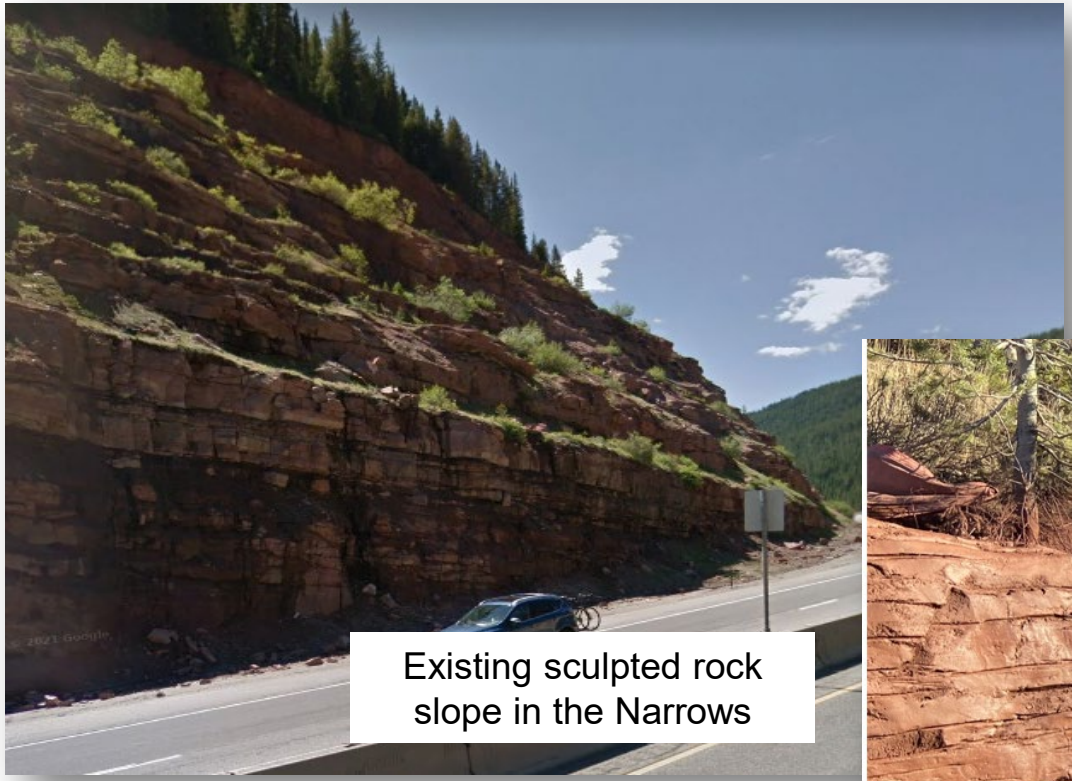
- Sculpted Shotcrete
- Scalloped

Recommended Wall Type: Sculpted Shotcrete

Factors in the decision:

- Reduces footprint and proximity to Fen vs. scalloped wall
- Accommodates maintaining natural drainage patterns
- Provides ability to vary the wall top
- Provides ability to taper/pull the walls back into the terrain
- Shotcrete and Scalloped provide planting areas
- Economy of construction time

Trail and Cut Wall at Fen - MP 184.5



Existing sculpted rock slope in the Narrows

Sculpted Shotcrete Wall at Truck Escape Ramp

COLORADO
Department of Transportation

I-70 West Vail Pass Safety and Operations Improvements

TECHNICAL TEAM MEETING #24

FEBRUARY 14, 2022

Design Exception

Comments and Responses

Comments included:

How will drainage be handled?

What is the actual height of the walls?

What is the length of walls over 12’?

Confusing statement “rock sculpting was considered on the existing rock.”

Edits

Design Exception

Comments and Responses

Text in red has been added to the memo.

Context for the Design Exceptions

Walls are needed at I-70 MP185 and MP187, both of which are located above the I-70 roadway and, therefore, visible from I-70. The walls will be constructed as soil nailed walls. The I-70 Mountain Corridor Engineering Design Criteria includes design criteria that all roadway retaining walls over 12' in height will be installed below the elevation of the roadway. A design exception is proposed because the walls at MP185 and MP187 vary in height from 10' to 16'. ~~A design exception is proposed to exceed this height when the~~ These walls are proposed to be faced with sculpted shotcrete ~~that~~ in order to better blend with the natural environment. The facing of these walls was carefully considered using the I-70 Mountain Corridor Design Criteria and the West Vail Pass Aesthetic Guidelines.

Process for the Design Exceptions - NO CHANGES TO THIS SECTION

The Aesthetic Guidelines Section 03 Transportation Support Structures state the following for wall designs. ***Each wall design will complement the historic Vail Pass wall aesthetics in a cohesive way but will be designed to meet site specific construction methods, safety improvements, and geotechnical conditions.***

To best blend the wall into the surrounding environment and to reduce the scale of the wall, planting areas and varied heights will be included to break up the length including connections to existing natural drainage. Other methods to break up the smooth face of the wall will be included such as deep relief in the sculpted pattern, larger sculpted features in the wall, and placing large, excavated boulders in front of the wall.

Design Exception

Comments and Responses

Text in red has been added to the memo.

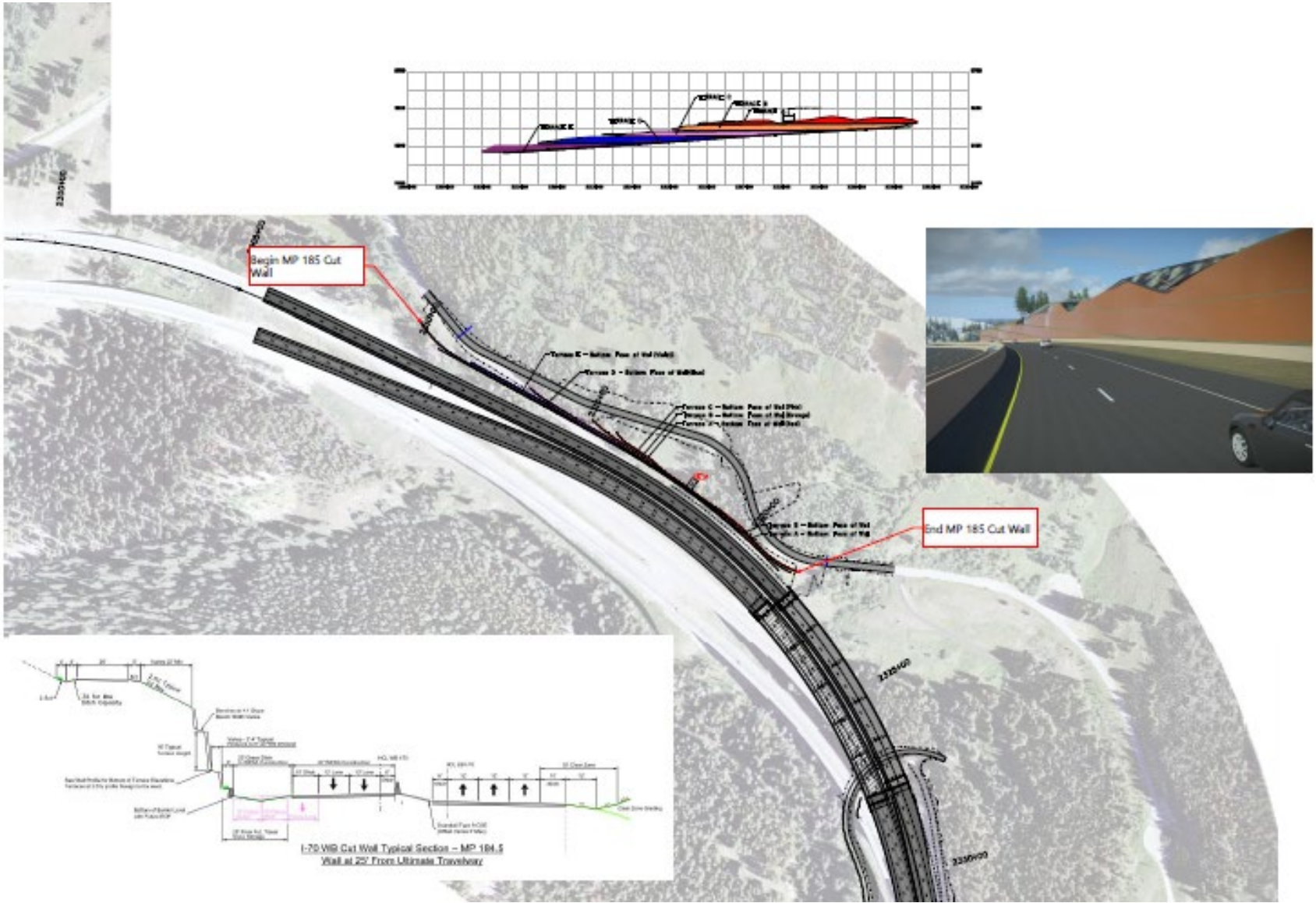
Specific Design Exceptions

Wall at MP 185 Analysis

Walls at MP 185 were refined to minimize the total area and height of walls and avoid impact to a nearby FEN wetland. The alignment chosen reduced the overall wall height from the EA conceptual wall layout and minimizes the height of the wall above I-70 for the INFRA project. The design accommodates the future widening. With the new alignment, the walls vary from 10’ to 16’ in height. Approximately 52% of the wall length is over 12’ in height.

Existing drainage patterns will generally be maintained at this wall location. The relocated US 6 Trail will intercept and channelize some offsite flows and convey them beyond the end of the wall to the west to drainage features under I-70. The existing drainage at the FEN location will be perpetuated under the Trail; flows from the FEN area will spill over the wall face and into the drainage swale/snow storage area adjacent to WB I-70.

Wall at MP185



Design Exception

Comments and Responses

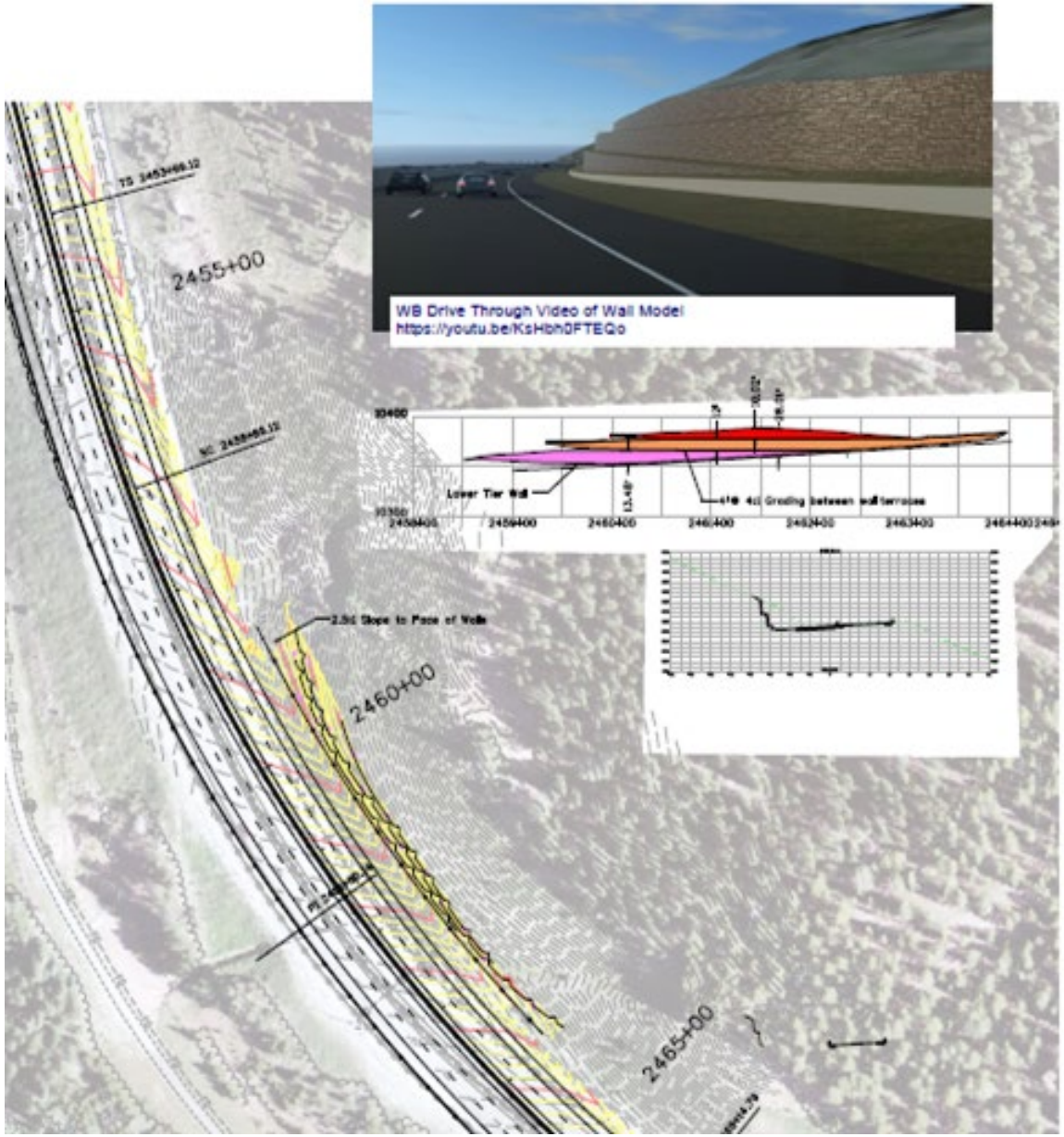
Text in red has been added to the memo.

Wall at MP 187 Analysis

Walls at MP 187 were refined to minimize the total area and height of the walls. Using the existing rock was considered at MP 187. The existing rock is not stable enough to ensure a long-term face without rock falls. This wall has a 13.5’ maximum height and is 550’ long, with approximately 9% of the wall over 12’ in height.

The wall is following the falling topography from east to west. Water will be directed along the top and bottom of the wall and channeled into drainage features. If the natural drainage currently flows directly toward the road, the wall may be sculpted to allow water to fall over and down the face.

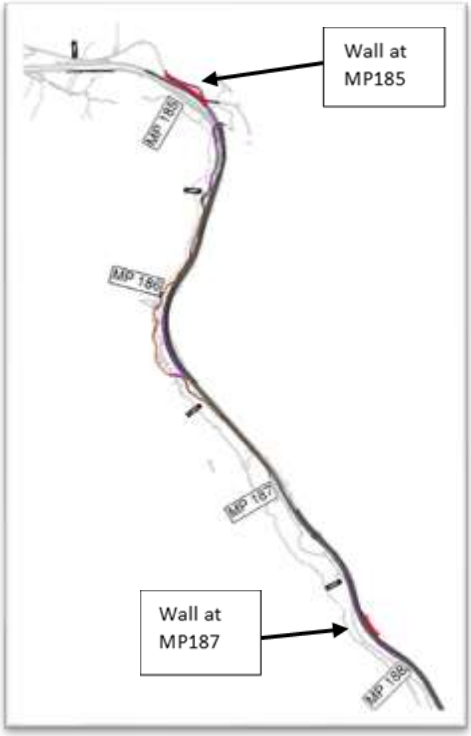
Wall at MP187



Design Exception Recommendations for Sculpted Shotcrete Walls at MP185 and MP187

Context for the Design Exceptions

Walls are needed at I-70 MP185 and MP187, both of which are located above the I-70 roadway and, therefore, visible from I-70. The walls will be constructed as soil nailed walls. The I-70 Mountain Corridor Engineering Design Criteria includes design criteria that all roadway retaining walls over 12' in height will be installed below the elevation of the roadway. A design exception is proposed to exceed this height when the walls are faced with sculpted shotcrete that blends with the natural environment. The facing of these walls was carefully considered using the I-70 Mountain Corridor Design Criteria and the West Vail Pass Aesthetic Guidelines.



Process for the Design Exceptions

The design exception process is prescribed in the I-70 Mountain Corridor CSS Guidance and allows for design exceptions that may assist a designer in finding a solution that balances impacts to scenic, historic, and cultural or environmentally sensitive areas 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

These design exceptions are being requested because they complement the surround physical characteristics, reduce costs, protect the environment, and utilize a new technology.

The Aesthetic Guidelines Section 03 Transportation Support Structures state the following for wall designs. ***Each wall design will complement the historic Vail Pass wall aesthetics in a cohesive way but will be designed to meet site specific construction methods, safety improvements, and geotechnical conditions.***

The following site specific and geotechnical conditions were considered in making the following Design Exception recommendations.

1) The stability of the existing rock. The existing rock will travel and degrade without at a wall.
2) The ability to match the existing rock strike (orientation of horizontal lines of rock).
3) Color and texture of the existing rock
4) Suitability of rock for the type of wall system (soil nail) proposed

Specific Design Exceptions

Wall at MP 185 Analysis

Walls at MP 185 were refined to minimize the total area and height of walls and avoid impact to a nearby FEN wetland. The alignment chosen reduced the overall wall height from the EA conceptual wall layout and minimizes the height of the wall above I-70 for the INFRA project. The design accommodates the future widening.

Sculpted shotcrete wall facing is recommended for the walls at MP 185 because:

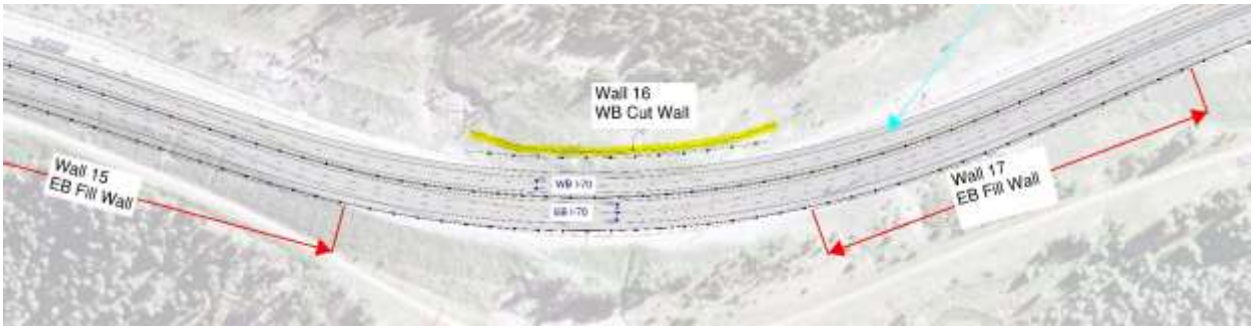
- These construction materials and methods **complement the surrounding physical characteristics** by simulating the surrounding rock formations. Specifically, sculpted shotcrete wall facing provides ability to vary the wall top and to taper the walls back into the terrain.
- The sculpted shotcrete walls **reduce the construction time** for the walls providing an economy through time savings.
- The sculpted shotcrete walls **protect the environment** by reducing the wall footprint and its proximity to FEN. The sculpted shotcrete walls also maintaining natural drainage patterns and provide planting areas.
- Sculpted shotcrete walls are a **technology** that has advanced over the years and can now simulate a natural rock face, match the surrounding rock color, and provide planting areas.

Wall at MP 187 Analysis

Walls at MP 187 were refined to minimize the total area and height of the walls. Rock sculpting was considered for the wall at MP 187. However, the existing rock is not stable enough to ensure a long-term wall face without rock falls.

Sculpted shotcrete wall facing is recommended for the walls at MP 187 because:

- These construction materials and methods **complement the surrounding physical characteristics** by simulating the surrounding rock formations. Specifically, sculpted shotcrete wall facing provides ability to vary the wall top and to taper the walls back into the terrain.
- The sculpted shotcrete walls **reduce the construction time** for the walls providing an economy through time savings.
- The sculpted shotcrete walls **protect the environment** by reducing the wall footprint and minimizing the wall height for the INFRA project. The sculpted shotcrete walls also maintaining natural drainage patterns and provide planting areas.
- Sculpted shotcrete walls are a **technology** that has advanced over the years and can now simulate a natural rock face, match the surrounding rock color, and provide planting areas.



Design Exception

Facing the walls at MP185 and MP187 with a sculpted shotcrete treatment is recommended. This wall treatment will complement the historic Vail Pass aesthetics and is consistent the site-specific construction methods and geotechnical conditions at these locations.

The height of the walls may exceed 12’ and will be designed based on the location specific topography. Wall height, color, and texture of the shotcrete will reflect the surrounding rock formations. The top of the wall will undulate, and planting areas will be included in the wall layout.

Commentor	Page	Comment	Response
Rob Beck	1	Bullet #1 at bottom of page: Delete "at"	Done
Rob Beck	3	1st paragraph, 2nd sentence: This syntax is confusing "sculpting was considered" So what became of that consideration? "However" is used to show contrast or contradiction. Its use here suggests that the rock sculpting won't work.	Text was changed to: Using the existing rock was considered at MP187. The existing rock is not stable enough to ensure a long-term face without rock falls.
Marcus Dreux	1	What is the height range of excepted walls?	Wall heights less than 12' do not require design exceptions. Wall heights over 12' that are also above the roadway surface require a design exception.
Marcus Dreux	1	To best blend the wall into the surrounding environment and to reduce the scale of the wall, I am in favor of planting areas/terraces to break up the tallest parts of the wall and varied heights to break up the length including connections to existing natural drainage. Any other way of breaking up the smooth face of the wall would be encouraged such as deep relief in the sculpted pattern, larger sculpted features in the wall, or place large excavated boulders in front of the wall, etc	Details directing the planting areas, varied heights, including natural drainage, breaking up a smooth face with sculpted relief, and landscaping features such as boulders will all be included in the project specifications.
Marcus Dreux	2	The main visual concern with the wall at MP 185 is that it could be out of scale with other natural rock cuts or smaller shotcrete walls. The map shows it being approximately ¼ mile long. It will be more difficult to sculpt a pattern that is similar to the surrounding natural rock cuts if the wall is very long and/or very tall. The pattern begins to look fake the larger and straighter the wall is. Add the excepted wall length and height range.	The height of individual tiers varies between 10 and 16 feet. Approximately 52% of the wall is over 12' in height.
Marcus Dreux	2	how will drainage patterns be maintained?	For Wall 185, the existing drainage patterns will generally be maintained at this wall location. The relocated US 6 Trail will intercept and channelize some offsite flows and convey them beyond the end of the wall to the west to drainage features under I-70. The existing drainage at the FEN location will be perpetuated under the Trail; flows from the FEN area will spill over the wall face and into the drainage swale/snow storage area adjacent to WB I-70. For Wall 187, it is following the falling topography from east to west. Water will be directed along the top and bottom of the wall and channeled into drainage features. If the natural drainage currently flows directly toward the road, the wall may be sculpted to allow water to fall over and down the face

Design Exception Recommendations for Sculpted Shotcrete Walls at MP185 and MP187

Context for the Design Exceptions

Walls are needed at I-70 MP185 and MP187, both of which are located above the I-70 roadway and, therefore, visible from I-70. The walls will be constructed as soil nailed walls. The I-70 Mountain Corridor Engineering Design Criteria includes design criteria that all roadway retaining walls over 12' in height will be installed below the elevation of the roadway. A design exception is proposed because the walls at MP185 and MP187 vary in height from 10' to 16'. These walls are proposed to be faced with sculpted shotcrete in order to better blend with the natural environment. The facing of these walls was carefully considered using the I-70 Mountain Corridor Design Criteria and the West Vail Pass Aesthetic Guidelines.

Process for the Design Exceptions

The design exception process is prescribed in the I-70 Mountain Corridor CSS Guidance and allows for design exceptions that may assist a designer in finding a solution that balances impacts to scenic, historic, and cultural or environmentally sensitive areas 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

These design exceptions are being requested because they complement the surround physical characteristics, reduce costs, protect the environment, and utilize a new technology.

The following site specific and geotechnical conditions were considered in making the following Design Exception recommendations.

1) The stability of the existing rock. The existing rock will ravel and degrade without a wall.
2) The ability to match the existing rock strike (orientation of horizontal lines of rock).
3) Color and texture of the existing rock
4) Suitability of rock for the type of wall system (soil nail) proposed

The Aesthetic Guidelines Section 03 Transportation Support Structures state the following for wall designs. ***Each wall design will complement the historic Vail Pass wall aesthetics in a cohesive way but will be designed to meet site specific construction methods, safety improvements, and geotechnical conditions.***

To best blend the wall into the surrounding environment and to reduce the scale of the wall, planting areas and varied heights will be included to break up the length including connections to existing natural drainage. Other methods to break up the smooth face of the wall will be considered such as relief in the sculpted pattern, larger sculpted features in the wall, and placing excavated boulders in front of the wall.

Specific Design Exceptions

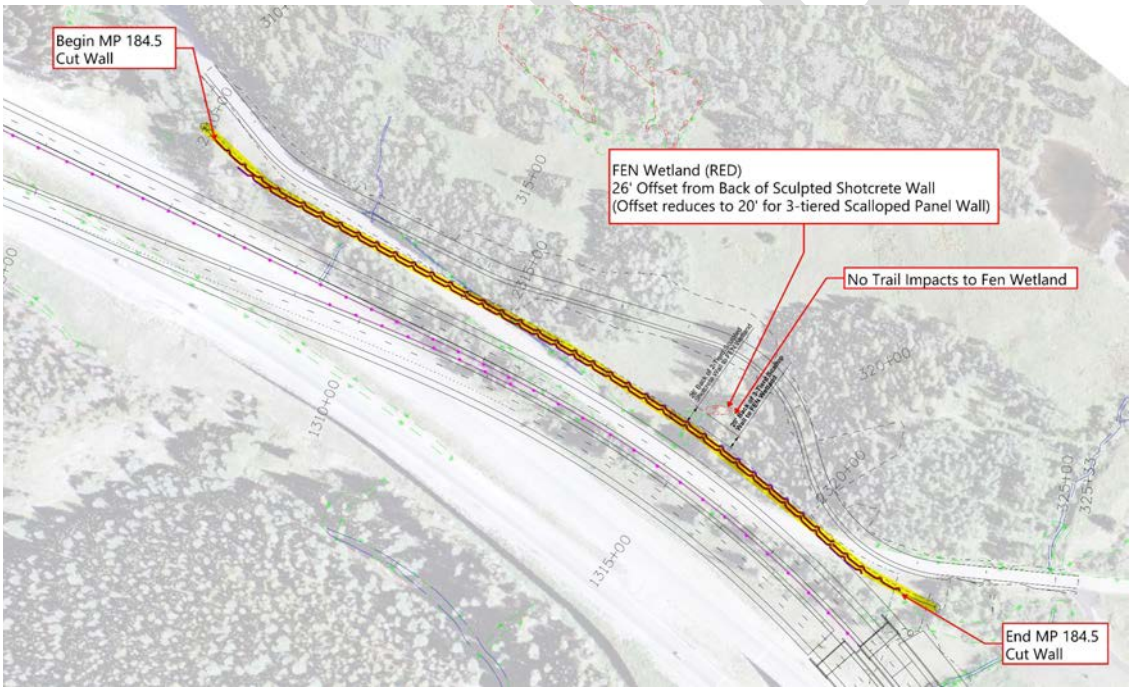
Wall at MP 185 Analysis

Walls at MP 185 were refined to minimize the total area and height of walls and avoid impact to a nearby FEN wetland. The alignment chosen reduced the overall wall height from the EA conceptual wall layout and minimizes the height of the wall above I-70 for the INFRA project. The design accommodates the future widening. With the new alignment, the tiers vary from 10' to 16' in height. Approximately 52% of the total wall length is over 12' in height.

Existing drainage patterns will generally be maintained at this wall location. The relocated US 6 Trail will intercept and channelize some offsite flows and convey them beyond the end of the wall to the west to drainage features under I-70. The existing drainage at the FEN location will be perpetuated under the Trail; flows from the FEN area will spill over the wall face and into the drainage swale/snow storage area adjacent to WB I-70.

Sculpted shotcrete wall facing is recommended for the walls at MP 185 because:

- These construction materials and methods **complement the surrounding physical characteristics** by simulating the surrounding rock formations. Specifically, sculpted shotcrete wall facing provides ability to vary the wall top and to taper the walls back into the terrain.
- The sculpted shotcrete walls **reduce the construction time** for the walls providing an economy through time savings.
- The sculpted shotcrete walls **protect the environment** by reducing the wall footprint and its proximity to FEN. The sculpted shotcrete walls also maintaining natural drainage patterns and provide planting areas.
- Sculpted shotcrete walls are a **technology** that has advanced over the years and can now simulate a natural rock face, match the surrounding rock color, and provide planting areas.



Wall at MP 187 Analysis

Walls at MP 187 were refined to minimize the total area and height of the walls. Using the existing rock was considered at MP 187. The existing rock is not stable enough to ensure a long-term face without rock falls. The tiers in this wall have a 13.5' maximum height. The overall wall is 545' long and approximately 9% of the wall is over 12'.

The wall is following the falling topography from east to west. Water will be directed along the top and bottom of the wall and channeled into drainage features. If the natural drainage currently flows directly toward the road, the wall may be sculpted to allow water to fall over and down the face.

Sculpted shotcrete wall facing is recommended for the walls at MP 187 because:

- These construction materials and methods **complement the surrounding physical characteristics** by simulating the surrounding rock formations. Specifically, sculpted shotcrete wall facing provides ability to vary the wall top and to taper the walls back into the terrain.
- The sculpted shotcrete walls **reduce the construction time** for the walls providing an economy through time savings.
- The sculpted shotcrete walls **protect the environment** by reducing the wall footprint and minimizing the wall height for the INFRA project. The sculpted shotcrete walls also maintaining natural drainage patterns and provide planting areas.
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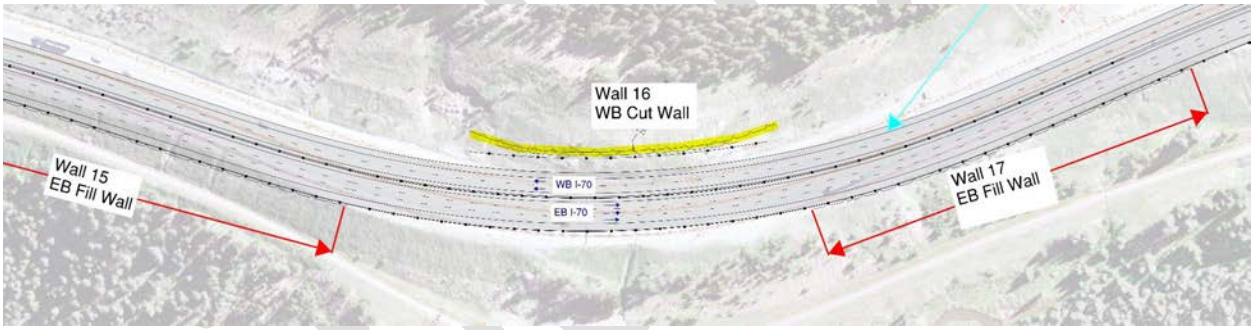


Design Exception

Facing the walls at MP185 and MP187 with a sculpted shotcrete treatment is recommended. This wall treatment will complement the historic Vail Pass aesthetics and is consistent the site-specific construction methods and geotechnical conditions at these locations.

The height of the individual tiers varies and in locations exceeds 12' based on the location specific topography. Wall height, color, and texture of the shotcrete will reflect the surrounding rock formations. The top of the wall will undulate, and planting areas will be included in the wall layout.

COLORADO
Department of Transportation

I-70 West Vail Pass Safety and Operations Improvements

PROJECT LEADERSHIP MEETING #11

FEBRUARY 11, 2022

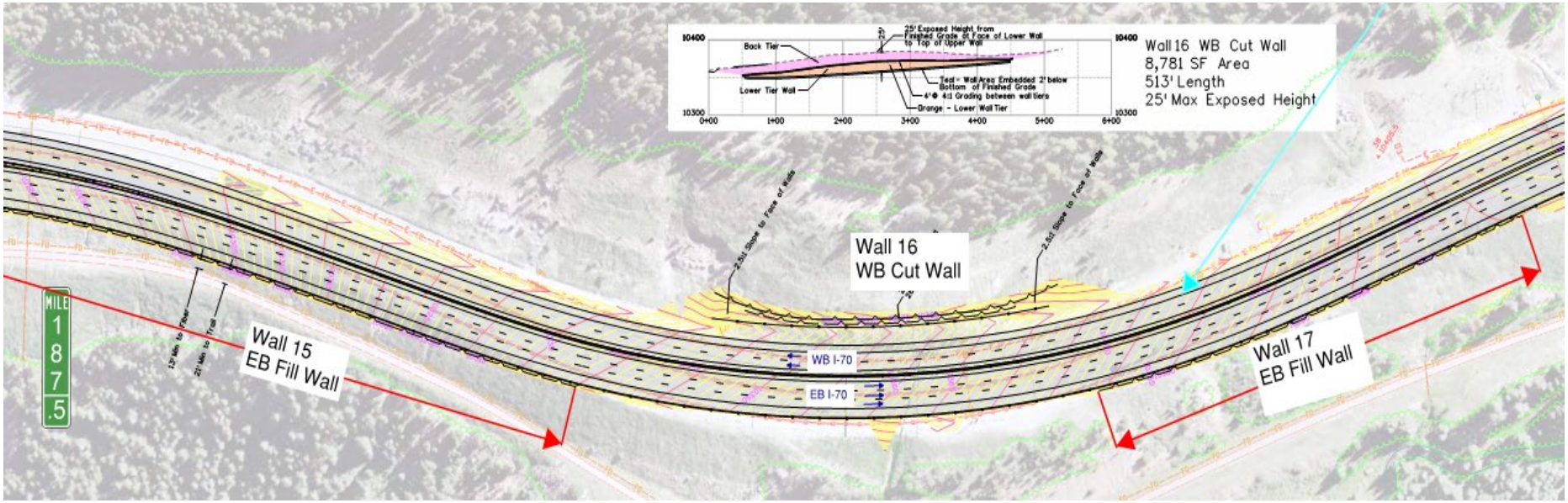
Wall Analysis and Design Exceptions

Walls at MP185 were refined to minimize the total area of walls. The alignment chosen reduced the overall wall height from the EA conceptual wall layout and minimizes the height of the wall above I-70 for the INFRA project. The design accommodates the future widening.

Rock sculpting was considered for the wall at MP187. However, the existing rock is not stable enough to ensure a long-term wall face without rock falls.

Westbound Walls - MP 187

- Studied realigning the roadway to minimize visible walls
- Laid out 3 alternatives with different wall systems
- Analyzed the alternatives using the Core Values



Matrix Analysis - Wall at MP 187.7

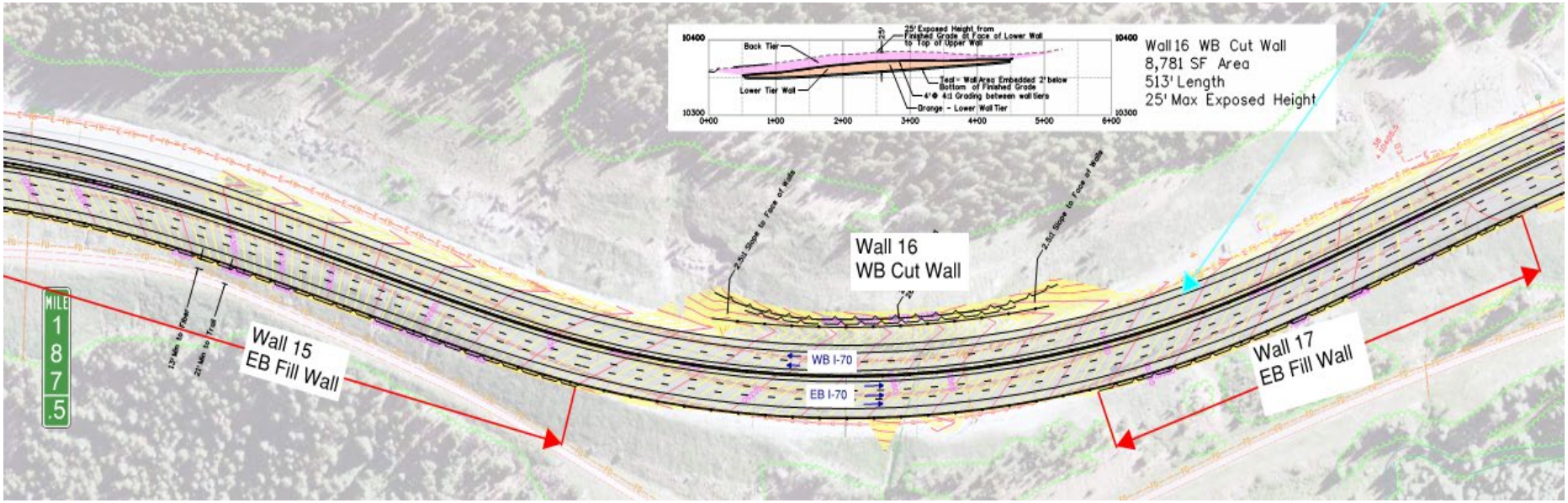
Category/Core Value	Critical Issue	Criteria
Safety	Improve safety and reduce crashes	• Roadway curve geometry • Crash reduction factor
Operations	Not applicable	Anticipated traffic operations impacts
Corridor Character & Aesthetics	Maintain the context-sensitive design of the road while modernizing the facility and impacts to the high-quality views in the corridor	• Does the option introduce any CSS aesthetic design exceptions? • Aesthetic considerations
Enhanced Environment	Wildlife corridors and habitat, threatened and endangered habitat	• Total forested area impacted • Total wetlands area impacted
Recreation	Minimal closure of recreational facilities	Anticipated trail user impacts during construction
Collaborative Decision Making	Not applicable	Not applicable
Implementability	Impacts to the traveling public	• Construction duration and phasing • Traffic control impacts to the traveling public • Throw-away costs
Sustainability	Project meets the needs now and into the future	Ease of access to the items that need to be maintained
Sustainability	Maintenance and operational financial feasibility	Level of effort for CDOT to maintain

Summary of Alternatives at MP 187

- Alternative 1 - base case
  - Highest eastbound fill wall
- Alternative 2 - move the alignment by 20’
  - Walls are not as high but are longer
- Alternative 3 - move the alignment by 30’
  - Shortest walls for INFRA construction
  - Same wall height as Alt 2 in the ultimate buildout

Chose Alternative 3 - MP 187

- Optimizes the westbound cut wall (Wall 16) to a 25' max exposed wall with 2-tiers
- Balances eastbound fill walls (Wall 15 and 17) with westbound cut wall



Analysis of Wall Type for MP 187

Goal - light touch on the land, a natural look


Sculpted Shotcrete Wall at Truck Escape Ramp

Considered:

- Surrounding area, topography, geology

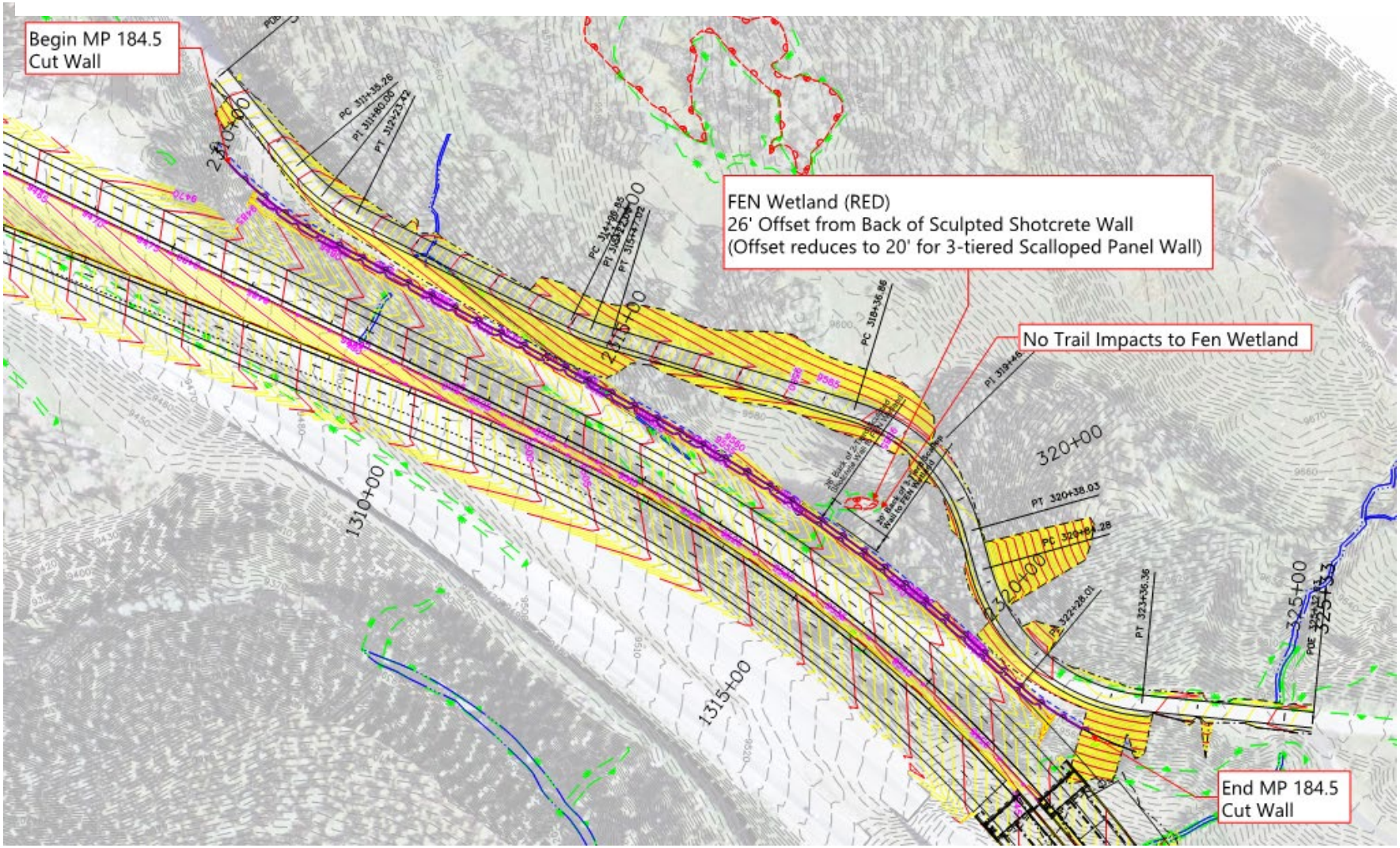
Types reviewed

- Rock sculpting the existing rock
- Shotcrete
- Scalloped

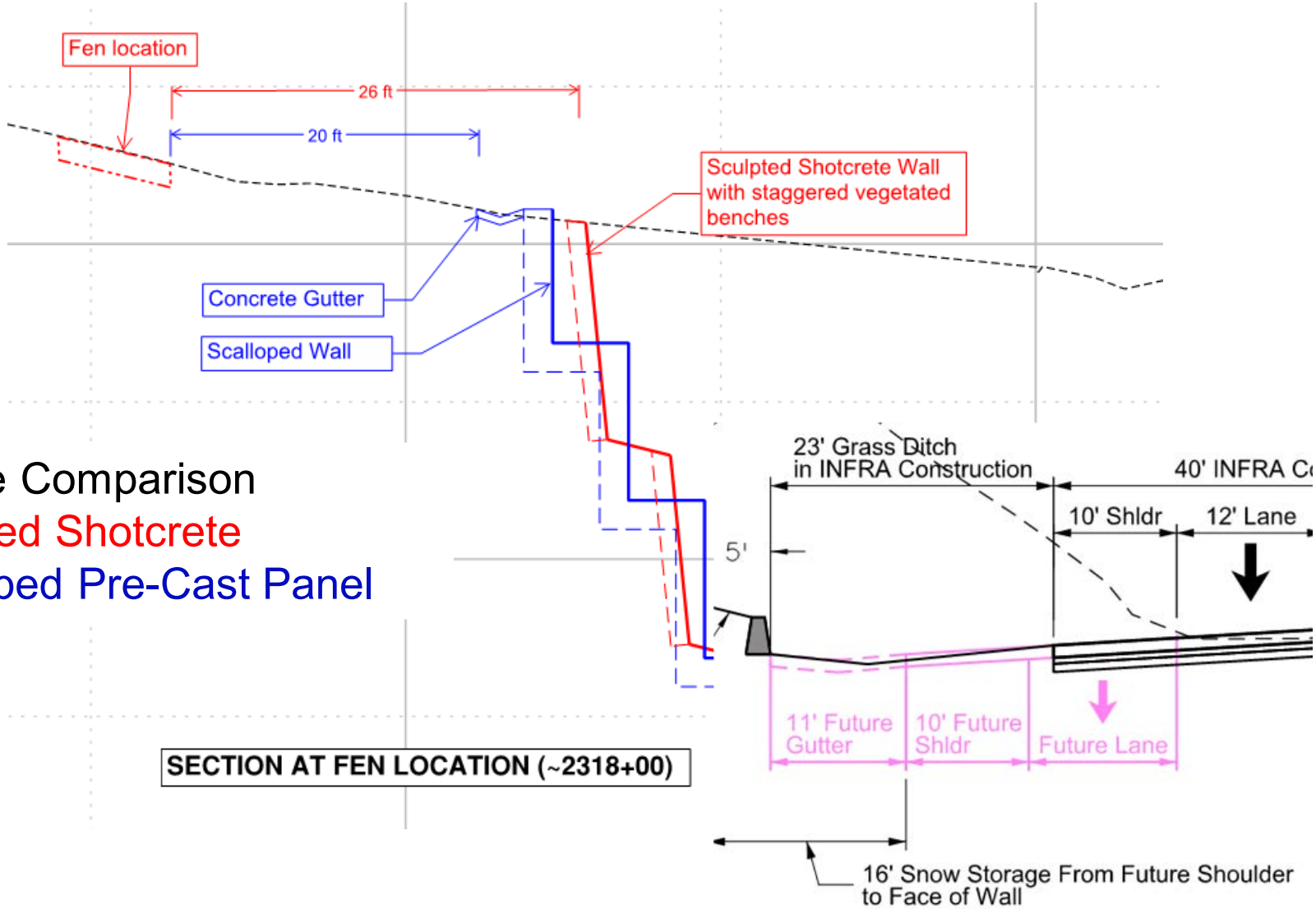
Factors in the decision

- Existing rock not stable enough
- Shotcrete gives ability to vary the wall top
- Shotcrete gives ability to pull the walls back into the terrain
- Shotcrete and Scalloped provide planting areas
- Economy of construction time

Trail realignment to avoid Fen - MP 185



Trail and Cut Wall at Fen - MP 185



Wall Type Comparison

- Sculpted Shotcrete
- Scalloped Pre-Cast Panel

Trail and Cut Wall at Fen - MP 185

Goal - light touch on the land, a natural look, avoid FEN

Considered:

- Surrounding area, topography, geology

Types reviewed

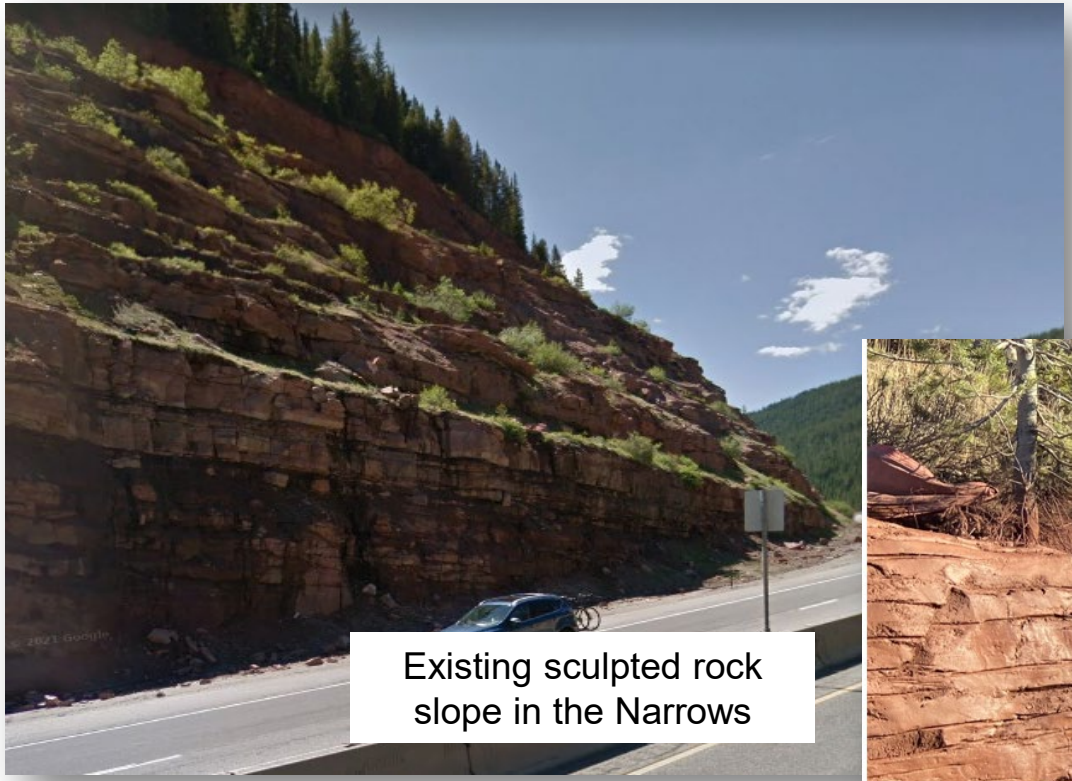
- Sculpted Shotcrete
- Scalloped

Recommended Wall Type: Sculpted Shotcrete

Factors in the decision:

- Reduces footprint and proximity to Fen vs. scalloped wall
- Accommodates maintaining natural drainage patterns
- Provides ability to vary the wall top
- Provides ability to taper/pull the walls back into the terrain
- Shotcrete and Scalloped provide planting areas
- Economy of construction time

Trail and Cut Wall at Fen - MP 185



Existing sculpted rock slope in the Narrows

Sculpted Shotcrete Wall at Truck Escape Ramp

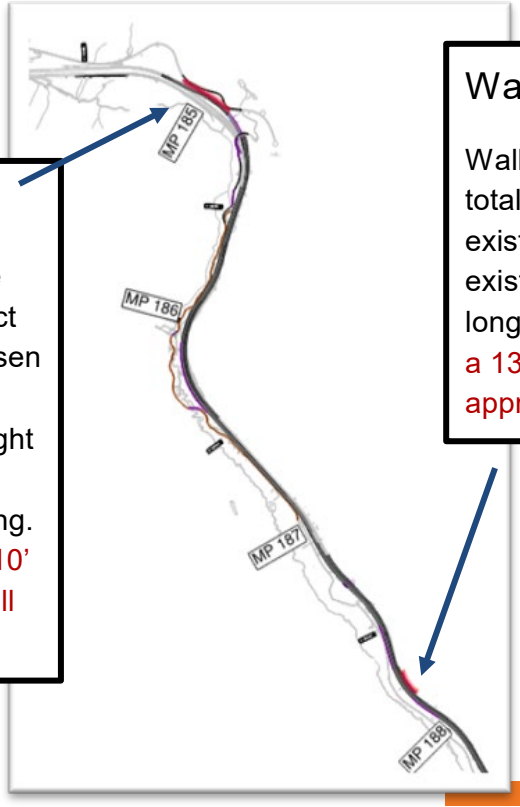
Design Exception Process

Design Exception followed the CSS process which allows for design exceptions that may assist a designer in finding a solution that balances impacts to scenic, historic, and cultural or environmentally sensitive areas while still providing for safety and mobility.

These design exceptions are being requested because they complement the surround physical characteristics, reduce costs, protect the environment, and utilize a new technology.

Wall at MP185

Walls at MP 185 were refined to minimize the total area and height of walls and avoid impact to a nearby FEN wetland. The alignment chosen reduced the overall wall height from the EA conceptual wall layout and minimizes the height of the wall above I-70 for the INFRA project. The design accommodates the future widening. With the new alignment, the walls vary from 10' to 16' in height. Approximately 52% of the wall length is over 12' in height.



Wall at MP187

Walls at MP 187 were refined to minimize the total area and height of the walls. Using the existing rock was considered at MP 187. The existing rock is not stable enough to ensure a long-term face without rock falls. This wall has a 13.5' maximum height and is 550' long, with approximately 9% of the wall over 12' in height.

Design Exception Recommendations

Design Exception

Facing the walls at MP185 and MP187 with a shotcrete treatment is recommended. This wall treatment will complement the historic Vail Pass aesthetics and is consistent the site-specific construction methods and geotechnical conditions at these locations.

The height of the individual walls varies exceeding 12' based on the location specific topography. Wall height, color, and texture of the shotcrete will reflect the surrounding rock formations. The top of the wall will undulate, and planting areas will be included in the wall layout.

Design Exception for walls MP185 and MP187

Technical Team reviewed the analysis and offered comments. We have responded to comments and will check back with the TT on Monday, Feb. 14th.