



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

# Memorandum

Subject: **PROJECT NUMBER and NAME**

Date: **XX/XX/XXXX**

## **PROJECT ENGINEER MEMO**

From: **Designer Name**  
Highway Design Engineer  
Lakewood, CO

In Reply Refer To:  
HFHD-16

To: **Project Engineer Name or Project Number (if PE  
unknown)**  
Project Engineer

### **General Project Description and Critical Project Information**

Schedule A Bonnie Clare Road - The goal of this project is to repair the road damaged in the 2015 Flood Event and make the road resilient to future storm events and clean up the roadside flood material and existing debris left from the flood.

Option X Waterline Relocation – The goal of this option is to install a waterline under the roadway. The waterline is part of a larger system being installed by NPS contractors from the pump house to an intake near Scotty’s Castle.

Option Y Historic Fence Repair – The goal of this option is to replace and repair the existing historic fence in the historic district. Replace the fence posts and fencing as close to the historic alignment and elevations relative to the road as practical.

Option Z Scotty’s Castle Bridge Scour Repair – The goal of this option is to repair the foundation of the bridge and armor the channel to prevent additional up stream and downstream scour and channel cutting.

- The NPS would like to add a cross walk with landings/ramps at Cliff Palace parking area sta 3089+50, from the comfort station to the south sidewalk. My mapping shows the cross slopes are too steep to accommodate the request. NPS personnel questioned our map & would like us to verify. The PM promised that if the actual conditions meet

requirements, then we would add the cross walk. Same note for a desired crosswalk at Balcony House parking area station 3178+69 over to comfort station at 3179+00 (the mapping shows grade is too steep).

**Project Cross Functional Team:**

	<b>Name</b>	<b>Phone</b>	<b>Email</b>
<b>Project Manager</b>			
<b>Design</b>			
<b>Environment</b>			
<b>Survey</b>			
<b>Bridge</b>			
<b>ROW/Utilities</b>			
<b>Safety</b>			
<b>Permits</b>			
<b>Geotechnical</b>			
<b>Pavements/Materials</b>			
<b>Hydraulics</b>			
<b>Construction</b>			

**Project Stakeholders:**

	<b>Name/Position</b>	<b>Phone</b>	<b>Email</b>
<b>La Plata County (Invite to weekly meeting)</b>	Jake Jacobson County Engineer		
<b>San Juan National Forest (Invite to weekly meeting)</b>	Sally Suthers Forest Engineer		
<b>North State Power Utility (Coordinate electric relocation as needed)</b>	Tina Black Construction Coordinator		
<b>Friends of the Forest Group (Include on public info distribution)</b>	Xavier Balding Group Spokesperson		

**Geometry:**

- Minor horizontal alignment shifts were made to Mesa Top road, in the 2-way section, to reduce impacts to arch sites in coordination with the NPS.
- There is a station equation at Station  $195+16.26 = 196+86.36$  this shortens the project by 170.10 feet. The stationing does not match the 2012 plans because the alignment is different from 1+00 to 195+16.26
- The Centerline alignments and curves were based off aerial images prior to getting survey. On Desert View Drive the centerline shown in the plans does not always match the surveyed centerline. For example, at Pipe Creek Vista the centerline alignment shown in the plans appears to be off by about 2 to 3 feet. The intent of the project is to match the existing alignment and roadway bench.
- The 3D model provided to the contractor does not reflect the transition zones from a V ditch to the full flat bottom ditch at pipe locations. The model does reflect the full width flat bottom ditch at the planned culvert inlet locations. Only the 40' transition in, and 20' transition out is not captured in the 3D model.

### **Survey and Staking:**

- The following information will be provided prior to award:
  - Alignments, superelevation, and staking notes
- The following information was provided with the physical data at the time of bid:
  - 3D surface model in .xml format.
    - Refer to the disclaimer for limitations.
    - The model was based on XX ft template intervals. The design between the intervals is interpolated and therefore not necessarily representative of actual site conditions. Notify design of discrepancies.
- Pedestrian and multi-modal paths and trails are described in the project plans. These facilities are to be staked in the field and reviewed by the CO prior to any ground disturbing activities to ensure they best align with the topography, drainage, and the desires of the Park.
- No formal survey control points or monuments have been established. Base information and data obtained for development of this project includes aerial imagery, spot field measurements (differential level information and horizontal measurements) and mapping grade GPS measurements. Spot field measurements were obtained for pullouts, obliterations, riprap installations and parking areas.

### **Environment:**

- NEPA Commitments-
  - A Pacific gilia plant population is located at the top of left cut at Sta. 2041+90. The contractor is responsible for providing a qualified biologist to place construction fence around the plant and avoiding any disturbance (See sheet C10,

EA Section 3.20.4, SCR 107.02). Approximate location of fence is shown in the plans since we have had a hard time locating the plant since the initial survey.

- All earth disturbing activities require monitoring by Park archeologist, park needs a 2 week notice prior to beginning earth disturbing activities
- There is an environmentally sensitive rock at the Sun Point View parking area, along the path to the Sun Point. Protect the rock with plastic fence. NPS will have to locate exact location.
- Permits-
  - FHWA-CFLHD and the contractor must apply separately for an EPA National Pollution Discharge Elimination System (NPDES) Construction Stormwater Permit. The permit must be issued to both parties before work commences on site.
- Mitigation-
  - There are three areas of onsite mitigation for impacts to Waters of the US at Sta. 1917+25, 1932+50, and 1935+35 to 1936+05 (See plan sheet W3, 401, and 404 permits). The first two are at sites where a culvert will be removed and a natural channel will be reestablished and the third site is to connect existing drainages to provide a continuous channel.
  - The proposed graded ditches shown in the plans throughout the project are also considered mitigation and therefore important to construct as designed.
  - There is one section of channel realignment at Sta. 2011+50 where the proposed fill is in the mapped channel. See plan sheet W2 and 401/404 permits for requirements to realign the channel around the fill.

### **Staging Areas:**

- There are two material stockpiles located at Scotty's Castle that need to be removed and used on the project. Volumes calculated in the earthwork tab are based on survey contours compared with an elevation at the base of the stockpile.

### **Schedule/Phasing/Closures:**

- SCR 108.04 Project construction schedule has an interim completion date October 19, 2018 to complete the subbase from station 245+00 to 399+70 ( Scotty's Castle to east end of the project at intersection at Ubehebe Crater Road). This requirement was put in to encourage the contractor complete this part of the road first so the NPS contractors working at Scotty's Castle have an accessible road to drive on.
- Prior to closing the road at Yaki Point or South Kaibab notify the concessionaires who

have bus tours going to those locations.

- The USFS Ranger Station will remain open to FS personnel, but will not be accessed from Cottonwood pass road. A back route will provide access to the Ranger station. The Ranger station will be closed to the public.

### **Relocations & Salvage Items:**

- Existing mailboxes are within the proposed cut and fill slopes and will need to be relocated during construction. See a summary in the plans. Contact Janet from USPS with a list of the mailboxes that are going to be moved and the plan of how people are going to access their mail during construction. Her email address is [janet.d.powell@usps.gov](mailto:janet.d.powell@usps.gov).
- Contact Grand Canyon Vegetation Staff to determine if any vegetation can be salvaged.

### **Clearing and Tree Removal:**

- Existing vegetation is planned to be used as vertical mulch in the obliteration areas. Stake the material to the ground or secure it with other methods to prevent the wind from blowing it away.
- There is a pay item for clearing and grubbing, sqyd. There are small areas of clearing where there is some embankment construction – Yaki Point and South Kaibab.
- Cleared timber may be used for landscaping in obliteration areas and wetland mitigation areas or as mulch. Timber not used will remain USFS property. Deck logs in lengths that are no greater than we feet long. Coordinate locations with the USFS. They indicated that the staging area at station 179+00 Rt would be a good location.

### **Earthwork:**

- It is anticipated that a large proportion of the excavated material will not be suitable for embankments. Braden Peters (CFL geotech) estimated which areas would produce unsuitable material as shown in the grading spreadsheet. With the values assumed, this material will not be needed for embankment construction but was assumed to be used for roadway obliteration to reduce project waste.
- The grading summary column “Additional Material Estimated for Roadway Obliteration” assumes a quantity of material that can be wasted on the old roadway. These areas are not represented in the cross-sections but the proposed contours can be seen in the erosion control sheets of the plans.
- **Excavation for barrier.** The excavation material removed in cuts for the barrier is included in the excavation quantity. The material for the area occupied by the barrier in

fills is not included in embankment construction ( the quantity is removed from the embankment material calculated for earthwork)

- In locations where the road crosses the channel or there are cross drainages grade the channels to drain across the road, tie this in with the obliteration areas. The concept is to have the road flush with the surrounding area so the water flows across the road and is not dammed up by the road.

### **Utilities & Right-of-Way:**

- All ROW has been obtained for the project. See the ROW contracts for all terms of the agreements (they have been incorporated into the plans and SCRs as applicable).
- Multiple property owners have requested the downed trees from their acquired property as part of their ROW contracts. See the tree clearing details in the plans, Section 201.06, and the ROW contracts for additional details.
- PG&E and AT&T have above and below ground utilities present throughout the project. Both have conflicts with the project and will be relocated during construction. Coordination with utility companies during construction will be necessary. See Section 107.02 of the SCRs for contact info.
- The bottom of the proposed box at Sta. 145+69 is near the top of the conduits housing CenturyLink fiber optic line and Xcel electric line. The contractor will need to coordinate with CenturyLink and Xcel at least 30 days before excavation of the box and hand excavation may be necessary.

### **Hydraulics:**

- The existing culvert at Sta 1265+00 did not have enough cover and was hit by a plow. This culvert is being replaced with a 24-inch pipe culvert and end sections left and right. There is not a well-defined channel so the culvert should be placed in a reasonable location, additional excavation at the inlet and outlet will be necessary to provide the minimum cover over the pipe.
- There is a culvert with stone headwalls at station 421+32 that is at the edge of the existing top of bench which creates a narrow pinch point for the road. Extending the culvert and resetting the headwalls was considered but dismissed due to historical and environmental impacts.

### **Structures:**

- **Structural Timber and Lumber submittal (557).** Timber for the boardwalk structure and the pedestrian approach railing is accepted by production certification. Note all timber is treated S4S members of the species and grade noted on the plans. Unless noted otherwise, lumber nominal sizes are called out in the plans – actual sizes will be smaller. Field cutting or hole boring of any treated lumber shall be field treated with preservative.

All lag bolts, screws, nails, joist hangers, and hardware shall be galvanized. Manufacturer literature/specifications should be provided verifying joist hanger capacities for the required loadings shown in the plans.

- **Prefabricated Bridge Submittal (104/555).** Design calculations and fabrication drawings for the weathering steel prefabricated pony truss bridge is required. Requirements for prefabricated bridge are in 555 SCR and plans. This submittal should be submitted as early as possible to provide as much lead time as possible for review/approval of the design and drawings and fabrication of the bridge while meeting overall construction schedule. Erection drawings must be provided, which will be particularly important as the shutdown of the highway will be necessary for erection of the bridge modules. See Section 156 for requirements. A staging area for storing the bridge prior to erection is available adjacent to the proposed bridge site. Fabrication plant and steel erector are required to provide certification to the proper AISC standard specified in the plans.
- Structure excavation and backfill quantity limits are shown on RG3118-E. Contractor may excavate beyond those limits depending on their means and methods, but the quantities are based on the plan details and the FP-14.

#### **Geotechnical:**

- Rockery – Call Laura Girard for rock salvaging areas and rock size and placement for the rockeries.

#### **Pavements/Materials:**

- All routes. There is not a quantity for additional Roadway Aggregate for supplementing the roadway base pulverized material. In locations with adjustments to the vertical it is assumed the pulverized material will be salvaged and placed back over any embankment, or excess material from other locations can be used to elevate the roadway.
- There is a quantity of 403 Asphalt for constructing temporary vertical tie-ins since the concrete is proposed to be constructed first.

#### **Temporary Traffic Control:**

- Caltrans District 1 requires an additional advance flagger at the end of traffic queues during flagging operations.
- See Section 156.03 of the SCRs for traffic requirements during construction including developing a construction management plan, notifying Caltrans of delays, entering closures into Caltrans Lane Closure System, notifying emergency services, providing access for school buses and USPS, and accommodating bicycle traffic. See the table below for a contact list of those whom should be notified of upcoming traffic delays.

- The advisory speed throughout the project is 25 mph (see sheet V4) and has been approved by Caltrans. No regulatory speed limit signs should be posted during construction. Under special conditions including if traffic is going to be on gravel, if there is a bump, or other condition requiring an advance warning sign a W13-1P with 15 MPH can then be used (see sheet V7). The exact location and quantity of the warning and 15 MPH signs will be based on the contractor's operations.
- Minimal traffic control will be needed for this project. The trail will be closed on either end during construction. SH 91 will need to be closed for one night to place the pedestrian bridge over the highway. This closure will be coordinated with CDOT and follow any of their traffic control requirements.

### **Permanent Traffic Control:**

- In the canyon area it is going to be difficult to install the signs since the walls are right next to the road. The locations may need to be adjusted to locations where the signs will fit and not hang over the road.
- The intent of the permanent pavement markings in Schedule A and Option X is to match the existing permanent pavement markings.
- The Proposed Pavement Marking Plan on Sheet V1 within the plan set is intended only as a basic representation of the adjusted pavement markings. A drawing with greater detail should be submitted by the contractor and included as an 'as-built' plan. Do not approve Sheet V1 as the contractors proposed layout for the left turn lane between station 64+00 and station 70+00.
- CDOT has previously used PreMark® Skid, Bike Lane Green manufactured by Ennis Flint ([www.ennisflint.com](http://www.ennisflint.com); (800)331-8118; [qpladmin@ennisflint.com](mailto:qpladmin@ennisflint.com)) for item 63403-1300 Pavement Markings, Type Bike Lane Surface.

### **Turf Establishment:**

- The Park is providing the seed for the revegetation.
- The seed mix included in the SCRs is from Caltrans Landscape Architect, Laura Lazzarotto (707-445-7878). She also included a second seed mix that can be used in shadier or moister locations as needed. This was not included in the SCRs for simplicity but may be used on the project as needed.

### **Miscellaneous:**

- Use equipment hours to pay for the berm behind the guardrail from Station 715+00 to 717+50. There is an existing berm in place. The material should be pulled back and used to replace the berm intact.



If you have any questions, please contact **designer name**, at **(XXX)XXX-XXXX** or [designer.name@dot.gov](mailto:designer.name@dot.gov).