Kiewit Infrastructure West Co. Klamath River Renewal Project Technical Specifications

32 50 00 ROADS, BRIDGES AND CULVERTS

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REVISION INDEX

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PART 1 - GENERAL

1.1 SUMMARY

- A. This Section covers the general requirements applicable to the roads, bridges, and culverts construction of the Klamath River Renewal Project and as shown on the Project Drawings.
- B. Nothing in the specifications voids the Contractor's public safety responsibilities.
- C. Reference information for the Work identified in the Contract is made available for the Contractor to use for its own purpose. The Contractor shall be solely responsible for any interpretation placed thereon and for all impacts resulting from such interpretation.

1.2 DEFINITION

- A. Road Improvements Repairs or modifications to the existing public Project road network which are required to facilitate Project activities prior to and during the Project duration. This also includes repairs or modifications following Project completion to address any degradation or damage to Project Roads due to Project Activities. All repairs and modifications made to the public roads shall be reviewed and approved in agreement with the Memorandum of Understanding (MOU), with Siskiyou Co. in California and Klamath County in Oregon, and will be in kind with current conditions.
- B. **Temporary Roads and Bridges** All new roads and bridges required for Project activities which will be removed, following completion of the Project. The temporary Road and Bridge sites include:
 - 1. Dry Creek Bridge at Copco Road Temporary Support.
 - 2. Fall Creek Bridge at Copco Road Temporary Support.
 - 3. Temporary intersection improvements.
 - 4. Temporary shoofly detour roads required for construction of new structures.
 - 5. Copco No.1 Construction Access Road.
 - 6. Iron Gate Construction Access Road.
- C. **Permanent Roads and Culverts** All new roads and culverts required as permanent infrastructure which will remain in place following completion of the Project. The permanent crossings include:
 - 1. Scotch Creek Culvert.
 - 2. Camp Creek Culvert.
 - 3. Fall Creek Culvert at Daggett Road.



1.3 RELATED SECTIONS

- A. Section 02 41 00 Demolition and Facility Removal
- B. Section 03 30 00 Cast-in-Place Concrete
- C. Section 03 10 00 Concrete Forming and Accessories
- D. Section 03 20 00 Concrete Reinforcement
- E. Section 03 60 00 Grouting
- F. Section 05 12 00 Structural Steel
- G. Section 31 05 00 Materials for Earthwork
- H. Section 31 10 00 Clearing, Grubbing and Stripping
- I. Section 31 25 00 Erosion and Sedimentation Controls
- J. Section 31 60 00 Foundation Preparation

1.4 REFERENCE STANDARDS

- A. The work outlined in the following sections shall be completed in accordance with the relevant construction practices and specifications.
- B. California Department of Transportation (CalTrans):
 - 1. Standard Specifications, 2018.
 - 2. Manual of Traffic Controls (2014, Revision 4, effective March 20, 2019).
 - 3. Maintenance Manual (2014, Revision 16, effective August 23, 2017).
- C. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. LRFD Bridge Design Specifications (8th Edition, 2017).
 - 2. LRFD Bridge Construction Specifications (4th Edition, 2017).



- D. Oregon Department of Transport:
 - 1. Standard Specifications (2018).
- E. Federal Highway Administration (FHWA):
 - 1. Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-14.
 - 2. Gravel Roads Construction and Maintenance Guide.

1.5 GENERAL REQUIREMENTS

- A. The Contractor shall give all requisite notices in connection with the Work to the proper authorities and shall procure at the Contractor's expense all permits, licences, etc., of every description necessary for the construction and completion of the Work. The Contractor shall deliver or make available all original certificates to the Project Company for all or any part of the Work for which such certificates/permits/authorizations may be required in connection with performing the Work. Jurisdictional agencies include:
 - 1. Siskiyou County.
 - 2. Klamath County.
 - 3. Oregon Department of Transport.
 - 4. Regional Water Quality Control Board (RWQCB).
 - 5. California Department Fish and Wildlife.
 - 6. U.S. Army Corps of Engineers.
 - 7. Oregon Department of Fish and Wildlife.
 - 8. Oregon Department of Environmental Quality (DEQ).
- B. Construction in and around existing waterways shall comply with the relevant rules and regulations. The Contractor shall provide a work plan for any in-water work, to be reviewed and approved by the Engineer and governing agencies.
- C. Implement Erosion Control Plan and storm water management program as specified in the approved Storm Water Pollution Prevention Plan (SWPPP) as per Section 31 25 00 Erosion and Sedimentation Control,).
- D. Protect items to remain in place from damage (e.g., existing bridge structures, culverts, private driveways, fencing etc.). In the event of damage to items indicated to remain in place, immediately notify the Owner.
- E. Obtain encroachment permit and approval from Siskiyou County for the Traffic management plan prior to any construction within the Siskiyou County road right-of-way.



- F. The Contractor shall stay within the work limits shown on the Project Drawings unless approved by the Owner.
- G. Following Project completion, all temporary structures shall be removed unless otherwise noted or approved by Siskiyou County.
- H. Following Project completion, all Project sites shall be restored to original site conditions.

1.6 CO-ORDINATION WITH RESTORATION CONTRACTOR

- A. The Contractor shall construct the roughened channels at the Camp Creek Culvert at Copco Road, Scotch Creek Culvert at Copco Road, and the Fall Creek Culvert at Daggett Road as shown on the Project Drawings. The downstream and upstream tie-in point marks the limit of work between construction zone for the road/bridge/culvert site (which includes the roughened channel) and the limits of the Project Restoration efforts. The Contractor shall co-ordinate the tie-in points, as shown on the Project Drawings.
- B. The Camp Creek and Scotch Creek culvert crossings are on a "design hold" given that the channels may be affected by drawdown of Iron Gate Reservoir. The culvert sites shall be reviewed by the Engineer following drawdown to determine if design changes are warranted.
- C. Special consideration shall be made to avoid potential downstream ponding or drainage issues resulting from new culvert invert elevations. This will involve removal of the existing delta deposits downstream of new roughened channels. Removal of the deposits is required prior to structure installation to avoid any adverse impact from backwater and ponding.
- D. Seed mix design for riparian zones shown on the Final Erosion and Sediment Control Drawings shall be as per Section 31 25 00 Erosion and Sedimentation Controls.

1.7 SUBMITTALS

Items listed in this section are to be submitted to the Engineer for information prior to the start of any Works, unless noted otherwise.

- A. Photograph and Video documentation of pre-construction and post-construction conditions of all access routes and road and culvert improvements as per contract requirements.
- B. Contractor to complete a pre-construction condition assessment at each site which shall include:



- 1. Photo/video documentation of general conditions of any existing structures, on public or private roads, that may be impacted during construction as a baseline for post-Project review with Siskiyou County MOU and private entities (i.e., guardrails, connections, approaches, barriers, abutments, erosion protection/riprap, road surfaces, deck surface, utilities, vegetation, signage).
- 2. Documentation of any damage/deficiencies observed at existing structures.
- C. Clear water diversion system details necessary for new culvert construction at Camp Creek, Scotch Creek and Fall Creek at Daggett Road.
- D. Shop Drawings for all prefabricated structures for review and approval.
- E. Quality Control (QC) Plans for review and approval as specified in the relevant Sections (Cast-In Place Concrete, Foundation Preparation, Steel Reinforcement, Excavation/Fill Placement).
- F. Quality Control Plans for Roads, Bridges and Culverts components shall meet the requirements of:
 - 1. California Building Code 2019, Chapter 17 Special Inspections and Tests.
 - 2. Federal Highways Agency, F14, Section 105 Control of Materials, Section 106 Acceptance of Work.
 - 3. International Building Code (for sites in Oregon), as required.
- G. Erection and dismantling procedures and plans for falsework, assembly sequencing, crane operations and formwork details in accordance with Section 02 41 00 Demolition and Facility Removal.
- H. QC survey results for site layout (i.e., grade staking (per Section 152 of FHWA, Standard Specifications FP-14), key structural elevations, profiles, and geometry prior to construction).
- I. Post construction QC survey results for final grades and as-built dimensions for new structures).
- J. Lane Closure and Full Road Closure Plans and Schedules, in accordance with the Siskiyou County MOU and in compliance with the Oregon Department of Transportation.
- K. Any changes to the Traffic Management Plans shown on the Project Drawings.
- L. Construction material data sheets (material properties) as per QC plan.
- M. Materials Certificates of Compliance shall be submitted for:
 - 1. Asphalt materials.



- 2. Class II Aggregate Base (E11).
- 3. Traffic Stripe, Pavement Marking, and Retroreflective Markers.
- 4. Storm Drain Boxes and Pipes.
- N. Engineering data and calculations as may be necessary and other engineering services required to facilitate construction.
- O. Contractor to provide as-built drawings for all permanent construction for submittal to the Owner, including.
 - 1. Camp Creek Culvert.
 - 2. Scotch Creek Culvert.
 - 3. Fall Creek at Daggett Road Arch Culvert.
- 1.8 QUALITY
 - A. Quality control for construction of the Temporary Roads and Bridges to comply with the Project Drawings and the related sections of this Specification.
 - B. Quality control for construction of the Permanent Roads and Culverts to comply with the Project Drawings and the related sections of this Specification and applicable Federal or State Department of Transportation Standard Specifications or as specified.
 - C. The Engineer is responsible for quality assurance, which refers to review and approval of third-party quality control inspection and test plans and the review/approval of quality control data, as required, for each site. Quality assurance may also involve direct visual inspection and/or observation of key construction activities.
 - D. The Engineer or designated representative will complete periodic observation of materials and completed work to determine general compliance with plans, specifications, and design and planning concepts.
 - E. The Contractor shall immediately notify the Engineer and any jurisdictional agencies or owners which may be permanently/temporarily impacted by a non-conformance during quality control testing for review prior to continuing work.
 - F. Quality assurance related to the manufacture and installation of prefabricated structures shall be provided by the suppliers and the Contractor.



PART 2 - PRODUCTS

2.1 GENERAL

A. The Contractor shall provide all materials and products required for the completion of the work as shown on the Project Drawings and in compliance with the applicable related sections noted in Section 1.3 and as noted on the Project Drawings and Design Reports. Any alternative equivalent materials/products proposed by the Contractor require review and approval from the Engineer before use. Review and approval of alternatives by the Engineer at Contractor's expense.

2.2 FOUNDATION PREPARATION FOR ROADS, BRIDGES AND CULVERTS

- A. Foundation preparation shall comply with Section 31 60 00 Foundation Preparation.
- B. After completing the stabilizing and compacting operations, ensure that the subgrade is firm and substantially unyielding to the extent that it will support construction equipment and will have the bearing value required by the Project Drawings and Design Reports. Remove all soft and yielding material, and any other portions of the subgrade which will not compact readily, and replace it with suitable material so that the whole subgrade is brought to line and grade, with proper allowance for subsequent compaction.
- C. At Copco No.1 Construction Access Road and Iron Gate Construction Access Road, the rock fill foundations must be clean of loose rock and debris and contoured to provide shear keys at the toe and mid points along the foundation section. The toe of the rock fill embankment shall be keyed into the channel bedrock, as shown on the Project Drawings. The Engineer or designated representative shall inspect and confirm adequate foundation conditions have been met prior to progressing with rock fill material placement.



D. At Iron Gate Construction Access Road, much of the proposed alignment is currently underwater in the Iron Gate Reservoir. In addition, no subsurface investigation data were available at the time of the preliminary design. As a result, the slope stability analysis and road design are preliminary and are subject to change. Foundation conditions shall be reviewed by the Engineer or designated representative during construction.

2.3 FILL MATERIALS AND MATERIALS FOR EARTHWORKS

- A. The materials listed on the Project Drawings comply with specifications listed in Section 31 05 00 Fill Materials and Materials for Earthworks. Material that does not meet the specifications needs to be approved and exempted by the Engineer.
- B. All Fill Materials and Materials for Earthworks for both temporary and permanent applications shall be placed and compacted as per the Project Drawings.
- C. The following fill materials for Road, Bridge and Culvert components shall undergo a test lift to establish compaction and placement requirements for QA/QC during construction, per ASTM D698:
 - 1. E3
 - 2. E5
 - 3. E7a
- D. All temporary construction access roads open to public or non-Project Company traffic shall be surfaced with E11 material.
- E. Construction of the rock fill embankment at Copco No.1 Construction Access Road, and Iron Gate Construction Access Road shall comply with the following:
 - 1. Rock fill embankment subgrade shall be free of loose boulders and debris. Contractor shall remove silt/sediment and loose material as much as practical prior to constructing rock fill embankment to ensure a clean interface between subgrade and rock fill.
 - 2. Excavate rock fill embankment toe shear key as per the Project Drawings.
 - 3. Select rocks so that angular interlocking shapes provide a stable structure for the required section.
 - 4. Rocks shall be angular.
 - 5. Rock fill prism fill slopes shall be sloped no steeper than 1.5H:1V.
 - 6. Erosion Protection material, and large roughness elements (individual boulders) shall be dense, sound, and free from cracks, seams, and other defects.
 - 7. Erosion Protection material will be sourced from a SAMRA approved rock quarry or when sourced on-site will need to be tested to confirm compliance with Section 31 05 00 Materials for Earthwork.



- 8. Do not place Erosion Protection material by dumping. Erosion Protection material to be placed using an excavator bucket or equivalent. Erosion Protection material to be placed to be well interlocked, rolled into place, and tamped down.
- F. Placement of foundation material at Dry Creek and Fall Creek temporary strengthening structures comprises of E3 or E7a and shall conform to the following requirements:
 - 1. Material shall be placed and compacted as noted in the Project Drawings.
 - 2. Material shall be removed from the river channel following removal of the temporary bridge structures. This includes removal of any material placed within the steel confinement structure for the foundation at Fall Creek and any material encased within the geotextile for the foundation at Dry Creek.
- G. Backfill material for permanent road embankments shall be as per the Project drawings in addition to meeting the following placement requirements.
 - 1. Comply with Sections 31 05 00 Materials for Earthworks and 31 23 00 Excavation Fill Placement.
 - 2. Minimum compaction of materials shall not be lower than 95% of the bulk relative density, to be achieved by the specified compaction methods or, if the specified compaction is not applicable, with the following observed method specification.
 - 3. Minimum of 4 passes with a 20,000 lb vibratory drum roller and proof rolled with a loaded dump truck having a single axel loaded with at least 10 ton with a tire ground pressure of 90 psi for visible deflection, as measured every other lift.
 - 4. Material placed in permanent road embankments shall be free of any rocks larger than 4 inch and organic debris and shall have a plasticity index of less than 12. Material shall be moisture conditioned, as approved by the Engineer during placement.
 - 5. Fill material placed in permanent road embankments shall have a fines content of less than 35% passing the No.200 sieve.
 - 6. Material shall be placed in maximum -foot lifts and moisture conditioned to optimum levels, as approved by the Engineer during placement.
- H. Backfill material for temporary road embankments shall be as per the Project drawings in addition to meeting the following placement requirements.
 - 1. Comply with Section 31 05 00 Materials for Earthworks and 31 23 00 Excavation Fill Placement.
 - 2. Minimum compaction of materials in temporary road embankments for the Road, Bridge and Culvert sites shall not be lower than 90% bulk relative density, to be achieved by the specified compaction methods or, if the specified compaction is not applicable, through the following observed method specification.



- a. Minimum of 4 passes with a 20,000 lb vibratory roller or proof rolled with a loaded truck having a single axel loaded with at least 10 ton, producing a tire bearing pressure of 90 psi, observed for visible deflection, as measured every other lift.
- I. Backfill material within 3 ft. of new culvert structures shall be placed and compacted per supplier specifications.
- J. Roughened Channel Installation.
 - 1. The Engineer or designated representative shall observe construction of the roughened channel.
 - 2. Contractor shall begin construction of the roughened channel from the downstream end, constructing the downstream apron prior to constructing the roughened channel. The sequence of work shall include:
 - a. downstream boulder buttress construction.
 - b. engineered streambed material and roughness element construction.
 - c. upstream boulder buttress construction.
 - 3. Boulder buttresses will be spaced as per project drawings.
 - Intermediate roughness elements (i.e., random boulders and boulder clusters, 2 ft -3.5 ft in size, located between buttresses) shall be placed to create a complex flow field, which will require field fitting roughness elements to create a network of bifurcating and confluencing low flow paths.
 - Roughness elements (i.e., boulders and boulder clusters 2 ft 3.5 ft in size) shall be placed, as directed by the Engineer (or designated representative) to project upwards (1 ft - 1.5 ft min) into the field of flow and remain in position following compaction of the surrounding material, per Project Drawings.
 - 6. Place engineered streambed material between roughness elements, vibratory compaction (vibratory plate) is required following every 1 ft lift of E12 material between protruding roughness elements.
 - 7. Once firmly compacted, final surface shall undergo high pressure hose treatment to direct fines into the interstitial spaces to improve compaction and achieve increased impermeability.
 - 8. Final channel grade will have an average longitudinal slope between boulder buttresses as shown on the plans. Roughened channel surface will have localized high points and low points due to roughness elements. Roughness elements will not be included in the calculation of the roughened channel slope.



- 9. The Engineer or designated representative shall direct field survey of the roughened channel slope and confirm slopes match Project Drawings.
- 10. The Engineer or designated representative shall direct and approve compaction testing for the roughened channel.
- 11. Compaction testing will require a percolation test every 30 ft along the roughened channel. Sandbags may be used to isolate a zone for testing (2 ft² area minimum, embedded 6" minimum testing zone). If percolation rate exceeds greater than 120 min/in (over a 4-hour minimum measurement period), further compaction and/or filling of interstitial spaces with high pressure fines/water is required. In the event of a failed percolation test, the testing zone may be reduced to 15 ft length and retested prior to vibratory/high pressure treatment.

2.4 TRENCHES AND CUT-SLOPES

- A. Trenches and cut-slopes shall be constructed following the Project Drawings and Design Reports.
- B. There are excavation sites that will have deep trenches. Given the measured soil conditions (see Appendix F4.1 Roads, Bridges, And Culverts Geotechnical Design Report), it is likely that the excavations can be sloped at 1.5H:1V with 4 ft benches to 20 ft below grade assuming that the Type C soil is homogeneous. At sites where the excavation is greater than 20 ft deep, other shoring methods will be needed due to depth of excavation. In addition, presence of saturated, medium dense, non-cohesive gravel excavations will need to be dewatered if water is present. Other shoring methods may be needed depending on the actual excavation depth and type of soil encountered during construction (OSHA 29 CFR 1926.650, 29 CFR 1926.651, and 29 CFR 1926.652). Shoring below 20 ft needs to be designed by a registered Professional Engineer. During construction, unusual changes in rock or soil strata should be evaluated by the Engineer or designated representative.
- C. For cut-slopes in soil or weathered rock, the slope angle should be no steeper than 2H:1V, and erosion control measures shall be implemented to help ensure long-term slope stability. For cut-slopes in hard rock, the slope angle should be no steeper than 1H:1V unless noted otherwise on the Project Drawings. Final cut-slope angles may vary depending on the rock and soil conditions encountered. Variations in cut-slope angle can be field fit during construction as approved by the Engineer.



- D. At Copco No.1 Construction Access Road, station specific cut-slope angles are specified for hard rock cut road prisms and soft and hard rock cut road prisms. Final cut-slope angles may vary depending on the rock conditions encountered. Variations in cut-slope angle can be field fit during construction as approved by the Engineer.
- E. At Iron Gate Construction Access Road, much of the proposed alignment is currently underwater in the Iron Gate Reservoir. In addition, no subsurface investigation data were available at the time of the preliminary design. As a result, the cut-slope stability analysis and road design are preliminary and are subject to change. Cut-slopes conditions shall be reviewed by the Engineer or designated representative during construction.

2.5 CAST-IN-PLACE CONCRETE

- A. Temporary cast-in-place concrete to comply with Section 03 30 00 Cast-in-Place Concrete, and as noted on the plans.
- B. Permanent cast-in-place concrete to comply with Section 8 of the AASHTO LRFD Bridge Construction Specifications (4th Edition).
- C. The Engineer or designated representative shall confirm that cast-in-place concrete components are placed as per the Project Drawings to within ³/₄ in., per the Quality Control Plan.

2.6 CONCRETE REINFORCEMENT

- A. Temporary concrete reinforcement shall comply with Section 03 20 00 Concrete Reinforcing.
- B. Permanent concrete reinforcement shall comply with Section 9 of the AASHTO LRFD Bridge Construction Specifications (4th Edition).
- C. The Engineer or designated representative shall confirm bar placement prior to concrete placement at Fall Creek at Daggett Road Arch Culvert strip footings (if footings are cast-in-place).

2.7 PRECAST CONCRETE COMPONENTS

- A. For all Permanent Roads and Culverts, precast concrete components shall comply with AASHTO and as per supplier specifications or as approved by the Engineer.
- B. Interlocking concrete blocks shall be 4,000 psi concrete, LockBlock, UltraBlock, or equal.



C. The Engineer or designated representative shall confirm that pre-cast components are placed as per the Project Drawings to within ³/₄ in., per the Quality Control Plan.

2.8 ASPHALT

- A. Permanent asphalt construction to comply with Section 400 of the Standard Specifications for Construction of Roads and Bridges on Federal Highways Projects (FP-14).
- B. For asphalt repairs along Copco Road in Siskiyou County, repair details shall be implemented as per the Siskiyou County Memorandum of Understanding (September 30, 2020).
- C. Shall be performed by a licensed paving contractor. Asphalt concrete shall be Type A, ³/₄" inch maximum size aggregate, medium grading. Asphalt binder shall be PG 64-22. Asphalt shall conform to Federal Highways Specifications.
- D. Asphalt pavement shall be placed and compacted as per the Federal Highways Agency, Standard Construction Specifications, Section 403 for asphalt concrete.
- E. At connections to existing pavements and previously placed asphalt lifts, the contractor shall ensure the transverse joints are vertical. Transverse joints shall be formed by cutting back the previous lift to expose the full-depth of pavement. Roughen the joint surface and apply an asphalt tack coat to the joint edge.

2.9 EROSION PROTECTION FOR BRIDGE AND CULVERT STRUCTURES

- A. Placement of Erosion Protection material shall comply with Section 31 05 00 Materials for Earthworks in addition to the following requirements.
- B. Erosion Protection Material (E7a, E7b, E7c) shall be installed as per the Project Drawings.
- C. Do not place Erosion Protection material by dumping. Erosion Protection material to be placed using an excavator bucket or equivalent. Erosion Protection material to be placed to be well interlocked, rolled into place, and tamped down.
- D. Erosion Protection Material will be sourced from either approved on-site sources or from a SMARA approved quarry.
- E. In addition to the material gradations specified in Section 31 05 00 Materials for Earthworks, Erosion Protection material shall meet the following requirements:



Table 1 – Erosion Protection Material (E7a, E7b, E7c) Material Property Requirements

Property	California Test Method ¹	Required Value
Apparent Specific Gravity	206	2.35 min.
Absorption	206	4.2% max.
Durability Index	206	52 min

NOTES:

1. CALIFORNA TEST METHOD 206, (METHOD OF TEST FOR SPECIFIC GRAVITY AND ABSORPTION OF COARSE AGGREGATE, 2011).

2.10 PREFABRICATED CROSSING STRUCTURES

- A. Temporary Prefabricated Bridge Structures, by bridge supplier shall be designed for single lane HL-93 Design Vehicle only. Design shall include shop drawings and calculation package, both stamped by a California registered Professional Engineer (civil or structural). Bridge suppliers shall be responsible for providing final bridge bearing reactions for applicable design load combinations applicable during construction and service. This information shall be reviewed for acceptance by the Engineer to finalize foundation design.
- B. Permanent Prefabricated Culvert Structure, by culvert supplier shall be designed for HL-93 Design Vehicle and P-13 Permit loads (as per AASHTO) by appropriate suppliers. Design shall include shop drawings and calculation package, both stamped by a California registered Professional Engineer (civil or structural). Culvert supplier shall be responsible for providing final foundation bearing pressures for anticipated design loads. This information shall be reviewed for acceptance by the Engineer to finalize foundation design.
- C. Construct crossing structures, guard rails, signage, and road markings according to the Project Drawings and as indicated on supplier shop drawings, which may contain additional technical specifications.
- D. The Contractor shall refer to the prefabricated bridge and culvert supplier specifications for installation of the prefabricated crossing structures.

PART 3 - EXECUTION

- 3.1 GENERAL
 - A. The Contractor shall complete the work at each site as shown on the Project Drawings.



B. The Contractor shall correct promptly any unacceptable work to the satisfaction of the Engineer.

3.2 EQUIPMENT

- A. The Contractor shall ensure that all construction access vehicles and haul vehicles adjust loads according to the posted load limits of the Project bridges.
- B. The Contractor shall ensure that the maximum allowable haul loads do not exceed standard AASHTO highway vehicle loading (i.e., HL-93 Design Truck).

3.3 WATER POLLUTION CONTROL AND DRAINAGE FACILITIES

- A. For both Temporary and Permanent Roads, Bridges, and Culverts, management of storm water and surface water to comply with the Project BMPs, as per Section 31 35 00 - Erosion and Sedimentation Control. Contractor shall install culverts and/or drainage components as shown on the Project Drawings. If site conditions vary from the Project Drawings, the Contractor shall contact the Engineer to approve a modified drainage plan, as needed.
- B. Walls shall be drained as shown on the Project Drawings. The drainage collection pipe, drain pipe, shall be a 6 in. perforated or slotted PVC/HDPE (Schedule 40) pipe or as approved by the Engineer. The drain pipe should be located at the back of the drain rock behind the wall, and as close to the bottom of the wall as allowed while still maintaining a positive gradient for drainage to daylight.
- C. As an alternative to drain rock, walls may be vertically drained by a suitable prefabricated retaining wall drainage product for approval by the Engineer. The drainage collection pipe shall be installed per supplier recommendations.

3.4 SHOP DRAWINGS

A. The Contractor shall verify shop drawings for any Project materials/products which are shipped to site and used during construction.



3.5 TRAFFIC MANAGEMENT

- A. The Contractor shall cause as little inconvenience as possible to the travelling public during the Contractor's operations and shall erect and maintain proper and adequate barricades, traffic signs, lights and other traffic control devices as may be considered necessary, in the opinion of the Engineer, for the safety of both workers and public traffic. All road barriers, traffic signs, lights and other control devices shall be provided at the Contractor's expense, and shall be erected in accordance with, and otherwise conform to the standards as set out in the County MOU's.
- B. The Contractor shall be responsible for obtaining the relevant haul permits and overload permits for any overweight or oversize vehicles for public roads. The Contractor shall provide adequate traffic control during transport of overweight or oversize vehicles along Project Roads to ensure the safety of public traffic. Overweight or Oversize vehicles shall not be permitted to cross any bridge structures identified with insufficient load carrying capacity without prior review and approval, as per the County MOU's and any required permits.
- C. The Contractor shall provide and install temporary support structures at Dry Creek at Copco Road and Fall Creek at Copco Road, which shall service public traffic, as shown on the Project Drawings.
- D. The Contractor shall submit a traffic control management plan (by a California registered Professional Engineer) for each temporary and permanent crossing site on public roads for review and approval by the jurisdictional agency, as per the County MOU's, prior to construction.

3.6 ROAD AND CULVERT REMOVAL

- A. Comply with the requirements of Section 02 41 00 Demolition and Facility Removal.
- B. Demolished materials to be wasted or disposed of off-site and on-site shall be in accordance with state and federal regulations.

3.7 ROAD AND CULVERT IMPROVEMENTS/REPAIRS

- A. Remove all waste materials and spoil as per Section 31 10 00 Clearing, Grubbing and Stripping.
- B. Install all traffic controls per the traffic plans submitted by the Contractor and as per the County MOU's. (This section will be co-ordinated with the Project Traffic Control Plan).



- C. Road Repairs shall be reviewed and approved by the Engineer and the County in accordance with the MOU between the Contractor and the County.
- D. Culvert repairs and replacements will be determined using guidance from the Caltrans Maintenance Manual (Chapter C5, 2014) as well as the pre-construction baseline studies. Existing culverts requiring replacement due to construction related damage will be replaced with equal or greater capacity culverts. Plans will be communicated to Siskiyou and Klamath County. Sequencing of construction shall minimize disruption to local traffic and any effected intersections.

3.8 TEMPORARY ROADS AND BRIDGES

- A. Temporary Roads and Bridges to be constructed as shown on the Project Drawings and in compliance with the related clauses of this specification. For any work not described by the referenced clauses of this specification, the Contractor shall comply with CalTrans, Standard Specifications and AASHTO LRFD Bridge Construction Specifications (4th Edition). The Contractor may propose alternative means, methods, and/or products which will require review and approval from the Engineer. Review and approval from the Engineer at Contractor's expense for alternative methods proposed.
- B. Following Project completion, roads which featured temporary Project components during Project activities will be restored to their original alignment and condition. Repair any damages from construction usage of roadways. Siskiyou and Klamath County shall review and approve repairs with the Project Company. Temporary bridges and abutments shall be fully removed, and stream channel widths shall be restored to their pre-construction condition.
- C. The Contractor shall locate and protect any existing sub-surface, surface, and overhead utilities at each of the Road and Bridge sites to avoid accidental damage during Project activities.
- D. The Contractor shall protect existing structures as required to avoid accidental impact or damage to the existing structures (e.g., bridge abutments, bridge deck, culverts, services, walls, fences, and private property boundaries).
- E. Existing in-water structures shall be protected from potential damage due to construction activities.
- F. Temporary bridge foundations shall be installed as per the Project Drawings.
- G. Temporary Bridge approaches shall be constructed as per the Project Drawings.



- H. The Contractor shall protect and avoid damaging any existing structures/property/utilities due to Project activities. In the event of accidental damage, the Contractor shall provide a full incident report including photographs and a detailed description to the Engineer for corrective action.
- I. The Contractor shall conduct in-situ load tests on the temporary strengthening structures at Dry Creek and Fall Creek following installation. Any post-installation settlement resulting from the load test shall be addressed through installation of shims to increase temporary support height and shall be approved by the Engineer. The temporary strengthening systems shall be visually inspected and checked for relative settlement. periodically during the Project, quarterly and following any substantial events which include:
 - 1. Heavy haul periods.
 - 2. Major rain events (i.e., 50% Probable Annual Flood or greater).
 - 3. Seismic events.
 - 4. Collision or impact or impact events.

3.9 PERMANENT ROADS AND CULVERTS

- A. Permanent road and culvert construction to comply with the latest version of AASHTO LRFD Bridge Construction Specifications (4th Edition).
- B. Permanent culverts shall be constructed as per the Project Drawings and in compliance with the AASHTO LRFD Bridge Construction Specifications (4th Edition). Any variances proposed by the Contractor to the construction standards must be reviewed and approved by the Engineer prior to construction.
- C. Following completion of the permanent culvert at Fall Creek at Daggett Road, the Contractor shall re-route traffic permanently along the new road alignment. The temporary bypass roads shall be decommissioned after the permanent roads are completed as shown on the Project Drawings.
- D. The Contractor shall co-ordinate scheduling and timing of construction activities as needed with the Project Restoration team to ensure new crossing installations can function as free-flowing crossings. This will require prior removal of downstream sediment deposits as required to avoid any adverse effects due to ponding or backwater at new crossing locations.



- E. Decommissioning of the temporary bypass roads includes:
 - 1. The Contractor shall remove all fill from the stream crossings and slope embankments back to stable angles of 3H:1V or less, and they shall prevent reasonable access by public vehicles and pedestrians to the temporary road sections through installation of permanent berm/embankments/fences/gates or a proposed alternative method of access prevention, to be reviewed and approved by Siskiyou and Klamath County.
- F. The Contractor shall implement Project BMPs as shown on the Project Drawings and specifications Section 31 25 00 Erosion and Sedimentation Controls.
- 3.10 CLEAN-UP
 - A. At completion and during progress of the Work maintain premises in a neat and orderly manner. Dispose of rubbish, construction debris and surplus materials at least on a weekly basis.
 - B. Cover and protect the work from damage by Work of other sections or other contractors.
 - C. Protect the Work of other sections from damage resulting from the work of this section.

END OF SECTION 32 50 00

