

Appendix C Avoidance, Minimization, and/or Mitigation Measures Summary

| Resource Area | Measure Reference | Avoidance, Minimization, and/or Mitigation Measure |
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| Aesthetics | AMM AES-1: Avoid or minimize glare through the selection of materials and finishes | Implement paint finishes that are matte, satin, or non-glare producing only. Concrete colors/finishes be selected to reduce their potential to become a source of glare. |
| Aesthetics | AMM AES-2: Minimize high contrast rock slope protection | Colors and/or stains which match or complement the predominant immediately adjacent landscape color will be used where stormwater energy dissipation and/or slope stabilization devices are used. |
| Aesthetics | AMM AES-3: Account for the loss of plantings and vegetation by providing replacement highway plantings and vegetation | Plans will be prepared which maintain and repair corridor landscaping and vegetation where proper setbacks exist and where feasible. Plans will ensure work within any existing classified landscape freeway maintains the status of the landscaped freeway. Appropriate replacement planting will be provided when existing planting (including oleander) is removed to a level considered roughly proportionate, with a target of 100%/1:1 and not less than 60%. Plantings would occur as will to the original impacts as possible. When native, naturally occurring or specimen trees are removed, replacement plantings will reflect the visual importance of the plantings lost. |
| Aesthetics | AMM AES-4: Reduce views of new overhead signage and read points from visually sensitive locations | Where new overhead signage and/or read points are proposed, consider refinements to its final location to avoid or screen direct views from sensitive viewsheds such as those of homeowners and recreationalists. Integrate read points into existing and proposed overhead structures where feasible. |
| Aesthetics | AMM AES-5: Minimize I-80 connector structure design profile | The I-80 connector structure design refinements will be prioritized to minimize its prominence, scale, and mass and avoid the need to raise/relocate adjacent powerline towers. |
| Biological Resources | AMM BIO-1: USACE and RWQCB Permitting | Before any discharge of dredge or fill material into waters of the United States or waters of the State, the required permits/authorizations will be obtained from the USACE and the RWQCB. All terms and conditions of the required permits/authorizations will be implemented. |
| Biological Resources | AMM BIO-2: CDFW Permitting | Before any activities that will obstruct the flow of, or alter the bed, channel, or bank of any feature subject to Fish and Game Code Section 1600, notification of streambed alteration will be submitted to CDFW. If required, a streambed alteration agreement will be obtained from CDFW and all conditions of the agreement will be implemented. |
| Biological Resources | AMM BIO-3: Restoration of Aquatic Resources | Aquatic resources subject to agency jurisdiction that are temporarily affected by Project construction will be restored as close as practicable to their original contour and conditions within 10 days of the completion of construction activities. |

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| Biological Resources | AMM BIO-4: Western Pond Turtle | If western pond turtles are encountered within the BSA during construction, work activity in the immediate vicinity will cease until any turtles have left the work area on their own or a CDFW approved biologist move the individual out of harm's way. |
| Biological Resources | AMM BIO-5: Worker Training for Western Pond Turtle | Prior to initiation of construction activities, workers shall participate in environmental awareness training provided by a qualified biologist. The training shall instruct workers regarding: (1) how to identify the turtle; (2) the habitats used by the turtle; (3) the potential for turtle egg clutches (i.e., nest sites) to be discovered during vegetation clearing; and (4) what to do if a turtle or suspected egg clutch is encountered during construction activities. |
| Biological Resources | AMM BIO-6: Preconstruction Tricolored Blackbird and Yellow-Headed Blackbird Surveys | Pre-construction surveys for tricolored blackbird and yellow-headed blackbird should be conducted prior to any ground-disturbing activities within 500-feet of mapped Potentially Suitable Habitat. Pre-construction surveys should be conducted in mid-March, mid-April, mid-May, and mid-June given that the dates of nesting in northern California are not consistent from year to year and the species may nest twice in the same nesting season at the same or different locations. The recommendation of a survey every 30 days during the nesting season is based on the potential length of the nesting season in the Sacramento Valley (i.e., mid-March to mid-July) and total time required for incubation and fledging (i.e., 21 to 25 days). Note that the full complement of four survey visits can be reduced accordingly if work starts after mid-March and surveys can be avoided entirely if work starts between August 1 and March 1 (outside the nesting season). |
| Biological Resources | AMM BIO-7: Preconstruction Burrowing Owl Surveys | A minimum of one pre-construction survey for occupied burrowing owl burrows within 500 feet of the BSA in suitable habitat (e.g., grasslands) will be conducted by a qualified biologist within 15 days prior to the initiation of construction activities, regardless of the timing of construction. If any occupied burrows are identified, appropriate conservation measures (as determined by a qualified biologist) will be implemented. No disturbance will occur within 150 feet of occupied burrows during the non-breeding season (September 1–January 31) or within 250 feet during the breeding season (February 1–August 31). These measures may also include establishing a construction free buffer zone around the active nest site in coordination with the CDFW, biological monitoring of the active nest site, and delaying construction activities in the vicinity of the active nest site until the young have fledged. |
| Biological Resources | AMM BIO-8: Burrowing Owl Exclusion Plan | If burrowing owls are detected within the BSA during the non-breeding season and maintaining a 150-foot no-disturbance buffer is not practicable, a qualified biologist shall submit an exclusion plan to CDFW. The exclusion plan will generally follow the guidelines outlined in Appendix E of the <i>Staff Report on Burrowing Owl Mitigation</i> (CDFG 2012). The exclusion plan will consist of installing one-way doors in potential burrows, daily monitoring, and collapsing burrows once it is determined that the burrows are unoccupied. Exclusion may only take place during the non-breeding season (September 1 to January 31) and may be an ongoing effort during this time period. This will allow the owls to exit burrows if they are present, but not return. |

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| Biological Resources | AMM BIO-9: Burrowing Owl Direct Disturbance | If occupied burrows are detected during the breeding season and maintaining a 250-foot no-disturbance buffer is not practicable, CDFW will be consulted to determine alternative measures to minimize the potential for disturbance to occupied burrows and nesting activities. Measures may include but are not limited to continuous biological monitoring by a qualified biologist until it has been determined that the young have fledged and are no longer reliant on the nest for parental care or survival, or the construction is complete. No direct disturbance of burrows with eggs or young can be conducted without written authorization from the CDFW. |
| Biological Resources | AMM BIO-10: White-Tailed Kite Consultation | If a no-disturbance buffer around an active northern harrier or white-tailed kite nest is not practicable, CDFW will be consulted to determine alternative measures to minimize the potential for Project-related disturbance to the nest site that could result in nest abandonment or other forms of take. Measures may include but are not limited to continuous biological monitoring by a qualified biologist until it has been determined that the young have fledged and are no longer reliant on the nest or parental care for survival or the construction is complete. If the nesting pair shows signs of distress (i.e., adults leaving the nest when eggs or young chicks are present) as a result of Project-related activities, the monitoring biologist shall have authority to stop work until it is determined that the adults have returned and are no longer showing signs of distress. |
| Biological Resources | AMM BIO-11: White-Tailed Kite Avoidance | If consultation with CDFW results in a determination that take of a white-tailed kite nest may not be avoidable, then all activities that are likely to result in such take will be delayed until a qualified biologist has determined that the young have fledged and are no longer reliant on the nest or parental care for survival. White-tailed kites are a fully protected species, and CDFW is not able to provide an Incidental Take Permit for this species. |
| Biological Resources | AMM BIO-12: Tree Removal | To the extent practicable, removal of large trees with cavities shall occur before bat maternity colonies form (i.e., prior to March 1) or after young bats are volant (i.e., after August 31). To the greatest extent practicable, trees will be removed in pieces, rather than felling the entire tree. It is recommended that removal be done late in the day or in the evening to reduce the likelihood of evicted bats falling prey to diurnal predators and will take place during warm weather conditions conducive to bat activity. |
| Biological Resources | AMM BIO-13: Preconstruction Bat Surveys | If construction (including the removal of large trees) occurs during the non-volant season (March 1 through August 31), a qualified biologist shall conduct a pre-construction survey of the areas identified as high and moderate roosting potential in the Bat Habitat Assessment for maternity colonies. The pre-construction survey will be performed no more than 14 days prior to the implementation of construction activities (including staging and equipment access). If a lapse in construction activities for 14 days or longer occurs between those dates, another pre-construction survey will be performed. If any maternity colonies are detected, appropriate conservation measures (as determined by a qualified biologist) shall be implemented. These measures may include but are not limited to establishing a construction-free buffer zone around the maternity colony site, biological monitoring of the maternity colony, and delaying construction activities in the vicinity of the maternity site. |

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| Biological Resources | AMM BIO-14: Bat Protection Plan | A bat species protection survey plan will be developed. The plan will include items such as having a qualified biologist present on-site to conduct monitoring during construction in/near bat roosting habitat. |
| Biological Resources | AMM BIO-15: Structural Changes to Bat Roosting Habitat | To the greatest extent practicable, structural changes may be made to any known roost proposed for removal (determined by pre-construction surveys), to create conditions in the roost that are undesirable to roosting bats and encourage the bats to leave on their own (e.g., open additional portals so that temperature, wind, light, and precipitation regime in the roost change). Structural changes to the roost will be performed during the appropriate exclusion timing (listed above) to avoid harming bats. |
| Biological Resources | AMM BIO-16: VELB Avoidance Area | Activities that may damage or kill an elderberry shrub (e.g., trenching, paving, etc.) may need an avoidance area of at least 6 meters (20 feet) from the drip-line, depending on the type of activity. |
| Biological Resources | AMM BIO-17: Worker Education for VELB | A qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for noncompliance. |
| Biological Resources | AMM BIO-18: VELB Timing | As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, will be conducted outside of the flight season of the VELB (March - July). |
| Biological Resources | AMM BIO-19: Erosion Control and Re-Vegetation | Erosion control will be implemented, and the affected area will be re-vegetated with appropriate native plants. |
| Biological Resources | AMM BIO-20: Elderberry Shrub Transplanting | <p>If the elderberry shrub cannot be avoided, or if indirect effects will result in the death of stems or the entire shrub, then it should be relocated following the transplanting guidelines:</p> <ul style="list-style-type: none"> • Monitor. A qualified biologist will be on-site for the duration of transplanting activities to assure compliance with avoidance and minimization measures and other conservation measures. • Exit Holes. Exit-hole surveys will be completed immediately before transplanting. The number of exit holes found, GPS location of the plant to be relocated, and the GPS location of where the plant is transplanted will be reported to the Service and to the CNDDDB. • Timing. Elderberry shrubs will be transplanted when the shrubs are dormant (November through the first two weeks in February) and after they have lost their leaves. Transplanting during the non-growing season will reduce shock to the shrub and increase transplantation success. Transplanting Procedure. Transplanting will follow the most current version of the ANSI A300 (Part 6) guidelines for transplanting (http://www.tcia.org/). • Trimming Procedure. Trimming will occur between November and February and should minimize the removal of branches or stems that exceed 1 inch in diameter. |
| Biological Resources | AMM BIO-21: Compensation for Loss of VELB Habitat | To mitigate for the removal of elderberry shrubs, Caltrans will purchase credits at a 1:1 ratio at a USFWS-approved conservation bank |

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| Biological Resources | AMM BIO-22: GGS Timing | Ground disturbing activity will be conducted between May 1 and October 1, which is the active season for GGS, in order to minimize impacts to the species. |
| Biological Resources | AMM BIO-23: GGS Exclusionary Fencing | Where practicable, snake exclusion fencing will be placed around the BSA (fenced area) before construction during the active period for GGS (May 1–October 1) and be maintained through the construction period until the Project has been completed. |
| Biological Resources | AMM BIO-24: Agency Notification for GGS | Caltrans will notify CDFW and the USFWS one week prior to when construction is scheduled to commence. |
| Biological Resources | AMM BIO-25: Worker Education for GGS | A Worker Environmental Awareness Training Program for construction personnel will be conducted by a USFWS/CDFW-approved biologist for all construction workers including contractors, prior to the start of construction activities. This training will instruct workers to recognize GGS and their habitats. |
| Biological Resources | AMM BIO-26: Preconstruction Survey for GGS | Twenty-four hours prior to construction activities, BSA shall be surveyed for GGS by USFWS/CDFW-approved biologist. Surveys of the BSA should be repeated if a 2-week or greater lapse in construction activity occurs. If GGS is encountered during construction, activities will cease until appropriate corrective measures have been completed or it has been determined that the GGS will not be harmed. Any sightings and any incidental take will be reported to the USFWS and CDFW immediately by telephone at (916) 414-6600 or (916) 358-2900, respectively, and e-mail or written letter addressed to the Chief, Sacramento Division (USFWS) or North Central Region (CDFW), within 1 working day of the incident. |
| Biological Resources | AMM BIO-27: GGS Environmentally Sensitive Area | The canals and rice fields adjacent to the BSA will be flagged and designated as an Environmentally Sensitive Area during the construction period. |
| Biological Resources | AMM BIO-28: GGS Post Construction Report | Upon completion of the Project, all disturbed areas within the BSA will be revegetated using native plant species, and post-monitoring work and pictures will be reported to USFWS and CDFW showing that temporary impacts have been restored to pre-construction conditions. |
| Biological Resources | AMM BIO-29: GGS Escape Ramp | At the end of each workday, permittee shall place an escape ramp at each end of any open trenches. This will allow any animals that may have been entrapped in the trench overnight to climb out. The escape ramp may be constructed of dirt fill, wood planking, or other suitable material and placed at an angle no greater than 30 degrees. |
| Biological Resources | AMM BIO-30: Compensation for Loss of GGS Habitat | Caltrans will mitigate for the permanent loss of GGS habitat through the purchase of GGS mitigation bank credits. These mitigation credits will be purchased from a USFWS- and CDFW-approved GGS mitigation bank possessing a conservation easement in perpetuity with available credits located in the Sacramento County service area prior to impacts to the species. Caltrans shall purchase these credits and provide a bill of sale acceptable and approved by CDFW/USFWS before construction begins. To compensate for the permanent loss of approximately 4.299 acres of GGS habitat, Caltrans will purchase 12.897 acres (a 3:1 ratio) of GGS credits. |

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| Biological Resources | AMM BIO-31: Preconstruction SWHA Survey | If construction is to occur between February 1 and August 31, a qualified biologist will conduct preconstruction surveys for nesting Swainson's hawk, white-tailed kite, and northern harrier. The preconstruction surveys will include the project footprint and a 0.5-mile buffer for Swainson's hawk. The survey will be conducted no more than 15 days prior to the initiation of construction to ensure no active nests will be disturbed. |
| Biological Resources | AMM BIO-32: SWHA Agency Consultation | If a no-disturbance buffer around an active Swainson's hawk nest is not practicable, CDFW will be consulted to determine alternative measures to minimize the potential for Project-related disturbance to the nest site that could result in nest abandonment or other forms of take. Measures may include but are not limited to continuous biological monitoring by a qualified biologist until it has been determined that the young have fledged and are no longer reliant on the nest or parental care for survival or the construction is complete. If the nesting pair shows signs of distress (i.e., adults leaving the nest when eggs or young chicks are present) as a result of Project-related activities, the monitoring biologist shall have authority to stop work until it is determined that the adults have returned and are no longer showing signs of distress. |
| Energy | AMM ENERGY-1: Construction Energy Efficiency Plan. | As part of the Plans, Specifications, and Estimates (PS&E), the Resident Engineer will prepare a Construction Energy Efficiency Plan, which may include the following: <ul style="list-style-type: none"> • Reuse of existing rail, steel, and lumber, wherever possible, such as for falsework, shoring, and other applications during the construction process • Recycling of asphalt taken up from roadways, if practicable and cost-effective • Use of newer, more energy-efficient equipment, where feasible, and maintenance of older construction equipment to keep in good working order • Promoting of scheduling of construction operations to efficiently use construction equipment (i.e., only haul waste when haul trucks are full and combine smaller dozer operations into a single comprehensive operation, where possible) • Promotion of construction employee carpooling. |
| Environmental Justice | AMM EJ-1 (3a, 3b, 4a, 4b, 5a, and 5b) | Caltrans will establish a variable pricing for express lanes or provide discounted per-mile tolls, credits, rebates and/or exemptions based on income levels and cost of living. |
| Environmental Justice | AMM EJ-2 (Build Alternatives (3a, 3b, 4a, 4b, 5a, and 5b) | Caltrans will offset the financial burden of enrolling in electronic tolling program. The toll authority will consider improving methods for environmental justice communities and other users to obtain toll tags/transponders. For example, the toll authority will ensure that drivers without a credit card or bank accounts can receive toll tags and waive or redefine the monthly minimum balance requirements for low-income users and provide translation services to community travelers with Limited English Proficiency (LEP). |
| Environmental Justice | AMM EJ-3 (Build Alternatives 3a, 3b, 4a, 4b, 5a, and 5b): | Caltrans will use no less than 50 percent of excess toll revenue to improve multi-modal transit, expand transportation choice, and other transportation improvements that will distribute benefits to environmental justice communities identified in this report. |

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| Geology/Soils/Seismic/Topography | AMM GEO-1: Culvert Replacement Best Management Practices and Construction Monitoring | During construction, Caltrans or its contractor will be responsible for evaluating potential damage to existing facilities, implementing necessary preventative measures, and monitoring effects on facilities during construction. |
| Geology/Soils/Seismic/Topography | AMM GEO-2 | With respect to worker safety during construction, Caltrans' Standard Specifications and California Division of Occupational Safety and Health Administration (Cal OSHA) requires employers to comply with hazard-specific safety and health standards. Pursuant to Section 5(a) (1) of OSHA, employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm. |
| Geology/Soils/Seismic/Topography | AMM GEO-3 | As part of the final design phase, Caltrans requires preparation of the geotechnical design reports that incorporate the results of additional subsurface field work and laboratory testing. Site specific subsurface soil conditions, slope stabilities, and groundwater conditions within the Build Alternative area will be verified during the preparation of these geotechnical design reports. The identification of the site-specific soil conditions within the project limits will be used to determine the appropriate final design for the foundations and footings that will support the proposed Build Alternative improvements. Caltrans' standard design and construction guidelines incorporate engineering standards that address seismic risks. Proposed structures constructed within the geologic study area will consider seismically induced liquefaction and settlement during the final design phase. |
| Hazardous Waste and Materials | AMM HAZ-1 Asbestos and Lead-Based Paint Survey. | During the design phase, existing bridge or structures that will be disturbed by the project will be tested for asbestos and lead-based paint by a qualified and licensed inspector prior to construction. All asbestos-containing material or lead-based paint, if found, will be removed by a certified contractor in accordance with local, state, and federal requirements. |
| Hazardous Waste and Materials | AMM HAZ-2 National Emission Standards for Hazardous Air Pollutants Notification. | Prior to construction, the contractor will prepare a demolition/renovation/rehabilitation notification/permit form and attachments to be submitted to the Air Pollution Control District (APCD) or Air Quality Management District (AQMD) as required by the National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40 CFR Part 61, Subpart M, and California Health and Safety Code section 39658(b)(1). |
| Hazardous Waste and Materials | AMM HAZ-3 Aerially Deposited Lead Preliminary Site Investigation. | Prior to construction, Caltrans will conduct a preliminary site investigation for aerially deposited lead. Soil samples collected to evaluate aerially deposited lead will be analyzed for total lead and soluble lead in accordance with Department of Toxic Substances Control's requirements to determine appropriate actions that will ensure the protection of construction workers, future site users, and the environment. |
| Hazardous Waste and Materials | AMM HAZ-4 Hazardous Materials Incident Contingency Plan. | Prior to construction, the contractor will prepare a hazardous materials incident contingency plan to report, contain, and mitigate roadway spills. The plan will designate a chain of command for notification, evacuation, response, and cleanup of roadway spills. This plan is to be prepared by the contractor. |

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| Hydrology and Floodplain | AMM HF-1 (Build Alternatives 2a and 2b) | Increased peak flows will be moderated by the use of detention basin risers in existing infrastructure. Caltrans will install detention basin risers to tie into existing storm drains on the upstream side at two locations in the city of Davis—one detention basin rise inlet is proposed at the storm drain crossing on Mace Boulevard south of I-80 and the other will be at the WB I-80 off-ramp to Chiles Road. |
| Noise | AMM NOI-1 | Noise-generating construction activities shall be restricted to between 7:00 a.m. and 7:00 p.m. on weekdays, with no construction occurring on weekends or holidays. If work is necessary outside of these hours, Caltrans shall require the contractor to implement a construction noise monitoring program and provide additional noise controls where practical and feasible. Pile driving activities shall be limited to daytime hours only. |
| Paleontological Resources | AMM PALEO-1: Paleontological Evaluation Report | During the design phase, a qualified paleontologist must prepare a PER. If the PER results in an evaluation that the project does not risk encountering paleontological resources, no further measures are required. |
| Paleontological Resources | AMM PALEO-2: Paleontological Resources Management Plan | During the design phase, a qualified paleontologist will prepare a PMP. The PMP will incorporate the results of the PER along with design details to develop a plan for where and when construction activities are at risk of encountering fossils and construction monitoring will occur. The PMP will also include procedures for worker training, and actions for construction staff to follow if fossils are encountered. It will also include a curation agreement for the housing and identification of any fossils found. |
| Paleontological Resources | AMM PALEO-3: Paleontological Resources Monitoring | During construction, areas of high paleontological sensitivity identified during the PER and PMP will be monitored by a qualified paleontological monitor. The monitor will spot-check locations where foundation, utility, and/or culvert work extends deeper than 4 feet below ground surface into native soils (not fill material). |
| Wildfire | AMM WF-1: Implement Fire Prevention Practices | <p>During the construction, Caltrans will implement the following fire prevention practices to reduce the potential for wildfire.</p> <ul style="list-style-type: none"> • Prepare names and emergency telephone numbers of the nearest fire suppression agencies before the start of job site activities and post at a prominent place at the job site. • Prepare a fire prevention plan required by the California Division of Occupational Safety and Health before the start of job site activities. • Cooperate with fire prevention authorities in performance of the work. • Immediately report fires occurring within and near the project limits by dialing 911 and to the nearest fire suppression agency by using the emergency phone numbers retained at the job site. • Prevent Project personnel from setting open fires that are not part of the work. • Prevent the escape of and extinguish fires caused directly or indirectly by job site activities. |

Key:

APCD=Air Pollution Control District

AQMD=Air Quality Management District

NESHAP=National Emission Standards for Hazardous Air Pollutants
PS&E=Plans, Specifications, and Estimates
BSA=Biological Study Area
CDFW=California Department of Fish and Wildlife
GGS=giant garter snake
OSHA=Occupational Safety and Health Act
PER= Paleontological Evaluation Report
PMP= Paleontological Resources Management Plan
RWQCB=Regional Water Quality Control Board
SWHA= Swainson's hawk
USACE=U.S. Army Corps of Engineers
USFWS=U.S. Fish and Wildlife Service
VELB=Valley elderberry longhorn beetle