DOCKETED	
Docket Number:	24-OPT-02
Project Title:	Compass Energy Storage Project
TN #:	267930
Document Title:	Part 2 Supplemental Submittal_Attachment H_Lake and Streambed Alteration Agreement Application
Description:	N/A
Filer:	Erin Phillips
Organization:	Dudek
Submitter Role:	Applicant Consultant
Submission Date:	12/15/2025 1:52:59 PM
Docketed Date:	12/15/2025

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December 10, 2025, 12755.47

California Department of Fish and Wildlife
Region 5 – Lake and Streambed Alteration Program
3883 Ruffin Road
San Diego, CA 92123

Subject: Application for a Streambed Alteration Agreement for the Compass Energy Storage Project, Orange County, California

Region 5 – Lake and Streambed Alteration Program:

On behalf of Compass Energy Storage LLC (Applicant), Dudek submits the enclosed application for a Streambed Alteration Agreement for the Compass Energy Storage Project (project) located in Orange County, California.

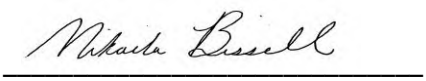
Supplemental Information Attachments

The following attachments are provided in the supplemental information Attachments

- Attachment A: Figures
  - Figure 1: Project Location
  - Figure 2: Impacts to Jurisdictional Aquatic Resources – CDFW
- Attachment B –Aquatic Resources Delineation Report (2021)
  - Attachment B.1 - Jurisdictional Delineation and Bat Memo (2025)
- Attachment C – Project Description
  - Attachment C.1 – SAA Project Description
- Attachment D – Diversion Plan Concept
  - Attachment D.1 Spec Pipe Plan
- Attachment E – Southwestern Pond Turtle Memorandum (2025)
- Attachment F- CEC Opt-In Application- Biological Resources Section
- Attachment G- Site Plans Exhibit
  - Attachment G.1 – BESS Site Plan
  - Attachment G.2 – Oso Creek Civils Plan
  - Attachment G.3 – Preliminary Planting Palette
- Attachment H – Hydraulic Study

Please let me know if you have any comments or questions at mbissell@dudek.com or 530 328 9515

Sincerely,



Mikaela Bissell
Biologist

cc: Michael Cady; Erin Phillips, Tommy Moolio, Morgan Kennedy; Dudek
cc: Renee Robins; ENGIE

Attribute	Answer
General Information	
Applicant	Renee Robin
Additional Contacts	N/A
Project Name	Compass Energy Storage Project
Organization	Compass Energy Storage LLC
Designated Representative	Erin Phillips
Project Location and Category	
Project Location	
Project Name	Compass Energy Storage Project
Does the project site have a physical address? (select one)	☐ Yes | ☒ No
GPS Coordinates	33.5332, -117.6776
County	Orange County, CA
Property APN	APN 637-082-71 See Attachment A for figures showing the Project location.
Project Category	
Project Category (select one)	☒ New Construction | ☐ Replace/Remove Existing Structure | ☒ Repair/Maintain/Operate Existing Structure
Work Type (select one)	☒ Bank stabilization – bioengineering/recontouring | ☒ Bank stabilization – rip-rap/retaining wall/gabion | ☐ Boat dock/pier | ☐ Boat ramp | ☐ Bridge | ☐ Channel clearing/vegetation management | ☐ Culvert | ☐ Dam | ☐ Debris basin | ☐ Diversion structure: weir or pump intake (obsolete) | ☒ Filling of wetland, river, stream, or lake | ☐ Geotechnical survey | ☒ Grading | ☐ Habitat enhancement – revegetation/mitigation | ☐ Levee | ☐ Low water crossing | ☐ Road/trail | ☐ Sand & gravel operations | ☐ Sediment removal – pond, stream, or marina | ☐ Sediment removal: flood control | ☒ Storm drain outfall structure | ☒ Temporary stream crossing | ☐ Utility crossing: horizontal directional drilling | ☐ Utility crossing: jack/bore | ☐ Utility crossing: open trench | ☐ Water diversion with facility | ☐ Water diversion without facility | ☐ Other (Describe other work type)
Does this project address any of the following: hazardous fuels reduction, fuel breaks, wildfire prevention, vegetation treatment or	☒ Yes | ☐ No

Attribute	Answer
vegetation management for fire management? (select one)	
Affected Body of Water	
River, Stream, or Lake Affected	Oso Creek – See Attachment B, Aquatic Resources Delineation Report
Waterbody tributary	
Will water be present during the proposed work period in the river, stream, or lake: (select one)	☒ Yes | ☐ No The project will require work in the wetted portion of the channel; however, the applicant plans to start work during the dry season to try and avoid working in the wet season as much as possible. The creek work will take approximately 9 months, which will go into the rainy season.
If "Yes", will the proposed project require work in the wetted portion of the channel?	☒ Yes | ☐ No
Wild and Scenic Rivers Act (WSRA)	
Is the river or stream segment affected by the project listed in the state or federal Wild and Scenic Rivers Acts?	☐ Yes | ☒ No | ☐ Unknown
Project Description, Term, and Impacts	
Project Description and Details	
Is the 'Property Owner' the same person as the 'Applicant Proposing Project?	☐ Yes | ☒ No
If “No”, outline the following contact information for the ‘Property Owner’: Name Business Agency Mailing Address Phone Number	Saddleback Church San Juan Capistrano 29251 Camino Capistrano San Juan Capistrano, CA 92675-1013 Phone: (949) 609-8700 Email: ranchocapistrano@saddleback.com

Attribute	Answer
Email	
Describe the Project in Detail	The project proposes to construct, own, and operate an approximately 250-megawatt (MW) battery energy storage system (BESS) Compass Energy Storage Project (project) located on up to approximately 12 acres in incorporated Orange County, California in the City of San Juan Capistrano. The proposed site is located on a stream terrace adjacent to Oso Creek on the east. A steep embankment of over 400 feet lies to the west and a creek stabilization project will occur to promote restoration in Oso Creek. See Attachment C, Supplemental Information-Project Description, for additional information
Describe Equipment and Machinery	Land-leveling equipment, trenchers, backhoes, excavators, haul vehicles, compaction equipment, water trucks, dozer, loaders, offroad haul trucks, pumps, generators, graders, tractors/loaders/backhoes/rubber-tired loaders/paving machine-roller, skid steer loads, plate compactors, rough terrain forklifts, air compressors, cranes, generator sets, rollers, aerial lifts, bore/drill rigs, pumps, and welders. See Attachment C, Supplemental Information- Project Description, for additional information
Will part or all of this project be funded with one of the following CDFW-managed grants? (select one)	☐ Fish Restoration Grant Program (FRGP) | ☐ Cannabis Restoration Grant Program | ☐ Prop 1 Grant | ☐ Prop 68 Grant | ☐ Greenhouse Gas Grant (GHG) | ☐ Wildlife Conservation Board (WCB) Grant | ☒ N/A
Water Rights(s), Water Diversion(s) & Reservoir(s)	
Does the project have an associated water right(s)? (select one) ▪ If "Yes", how many project water rights are included in the project?	☐ Yes | ☒ No
Does the project include any water diversion(s)? (select one) ▪ If "Yes", how many water diversions will be included in the project?	☒ Yes | ☐ No Flow from Oso Creek will be diverted by pumping baseflow immediately downstream of the (OC Flood) channelized portion of the creek into a temporary 18-inch HDPE pipe on the western side of the creek on the Compass property. This pipe can accommodate up to approximately 10 cfs to deliver the baseflow immediately downstream of the channel restoration project. The temporary pipe will be placed within the existing project construction area and will re-enter into the creek at the southern end of the restoration project on the Compass property and will integrate into the new stormwater management system.

Attribute	Answer
	Reference the following attachments for additional information: Attachment D, Diversion Plan Concept & Attachment D.1 Spec Pipe Plan.
Does the project include a reservoir(s)? (select one) ▪ If "Yes", how many reservoir(s) will be included in the project?	☐ Yes | ☒ No
Commercial Cannabis Cultivation	
Does any part of the project include remediation at a cannabis cultivation site? (select one)	☐ Yes | ☒ No
Are you seeking documentation to submit to the Department of Cannabis Control (DCC) for the purpose of commercial cannabis cultivation licensing? (select one)	☐ Yes | ☒ No
Agreement Term	
Agreement Term Requested	☒ Regular Term (5 years or less) | ☐ Long Term (Greater than 5 years)
Project Term	
Specify both the year the project activities will begin and the year the project activities will end. Be advised CDFW may restrict work within a stream or lake to the dry season of the year. Consequently, you may want to include more than one season of possible operation in your project proposal.	BESS Development: Beginning Year: 2026 Ending Year: 2027 Oso Creek Stabilization and Rehabilitation, approximately 195 days estimated Proposed Start Date: 09/01/2026 Proposed Ending Date: 06/17/2027
Seasonal Work Period	
Specify the time period you intend to work on the project (e.g., August 1 to October 15). If the work period	Construction Start Date: See Supplemental Information– Table 2.2 Proposed Construction Phasing Construction End Date: See Supplemental Information– Table 2.2 Proposed Construction Phasing

Attribute	Answer
will exceed one year, specify the work period for each year of the project (e.g., Work Period 1, February 10 to March 31; Work Period 2, August 1 to October 15; Work Period 3, February 10 to March 31; etc.). CDFW may restrict project work to certain periods depending on rainfall, fish migration, wildlife breeding or nesting season, or other resource concerns. Specify the estimated number of days of actual work days for each seasonal work period.	Oso Creek Stabilization and Rehabilitation, approximately 195 days estimated Proposed Start Date: 09/01/2026 Proposed Ending Date: 06/17/2027 BESS Development, approximately 511 working days estimated Proposed Start Date: 09/15/2026 (BESS/Substation Site Preparation) Proposed Ending Date: 10/25/2027 (Landscape Installation) Proposed Commissioning: 10/26/2027
Impacts to River, Stream, or Lake	
Describe Impacts	**0.267- acres (576 linear feet)** of Oso Creek would be permanently impacted **0.996-acres (2,069 linear feet)** of Oso Creek would be temporarily impacted **6.035 acres (2,109 linear feet)** of Riparian habitat would be temporarily impacted **1.108 acres (524 linear feet)** of Riparian habitat would be permanently impacted <u>Stormwater Trench Limits</u> • **Bank Habitat Acreage:** 0.011 acres (27 linear feet) of Oso Creek will temporarily impacted along the bank habitat as part of the stormwater trench limits. • **Riparian Habitat:** 0.004 acres (17 linear feet) of riparian habitat will be temporarily impacted as a result of the stormwater trench limits. *Total Temporary Impacts from Stormwater Trench Limits: 0.015 acres* <u>Creek Stabilization and Rehabilitation Work Area</u> • **Bank Habitat Acreage:** 0.38 -acres (2,042 linear feet) of Oso Creek will be temporarily impacted along the bank habitat as part of the Creek Stabilization and Rehabilitation Project. • **Ordinary High-Water Mark:** 0.605 acres (2,042 linear feet) of Oso Creek will be temporarily impacted along the ordinary high water mark as part of the Creek Stabilization and Rehabilitation Project. • **Riparian Habitat:** 6.03 acres (2,002 linear feet) of riparian habitat will be temporarily impacted as part of the Creek Stabilization and Rehabilitation Project. *Total Temporary Impact from Oso Creek Stabilization and Rehabilitation Work: 7.015 acres*

Attribute	Answer
	<u>Rock Drop Structure</u> • **Ordinary High-Water Mark:** 0.169 acres of Oso Creek will be permanently impacted along the ordinary high water mark as part of the rock drop structure • **Bank Habitat:** 0.098 acres of Oso Creek will be permanently impacted along the bank as part of the rock drop structure development. • **Riparian Habitat:** 0.722 acres of riparian habitat will be permanently impacted as a result of development of rock drop structure. *Total Permanent Impact from Rock Drop Structures: 0.99 acres* <u>Battery Energy Storage System (BESS) Site:</u> • **Riparian Habitat:** 0.001 acres of riparian habitat will be permanently impacted as a result of development of the battery energy storage system and substation portion of the Project. *Total Permanent Impact from BESS Development: 0.001 acres* <u>*See Supplemental Information for additional information related to temporary and permanent impacts. See Attachment A (Figure 2, Impacts to Jurisdictional Aquatic Resources – CDFW) for imagery of site plan related to impacts.*</u>
Impacts to Special-Status Species	
Will there be any foreseeable impacts to any special status animal or plant species, or habitat that could support such species, known to be present on or near the project site? (select one)	☒ Yes | ☐ No
If "Yes", list each species and describe the habitat	Southwestern pond turtle within Oso Creek (See Attachment E)
Source(s) Identify the source(s) of information (e.g., biological surveys, environmental documents, etc.) that support a "Yes" or "No" answer for the previous question.	The Biological Resources section of the Project's CEC "Opt-In" application (see Attachment F) contains the results of the biological studies conducted for the Project.
Impacts to Trees and Vegetation	
Will the project affect any trees or vegetation?	☒ Yes | ☐ No

Attribute	Answer
Describe Identify the type(s) of tree(s) or vegetation that will be affected by the project.	Mulefat Thickets (*Baccharis salicifolia*), Freemont Cottonwood-Arroyo Willow (*Populus fremontii-Salix lasiolepis*) Association and Upland Mustards.
Environmental Review	
California Environmental Quality Act	
Has a CEQA lead agency been determined? (select one)	☒ Yes | ☐ No
CEQA Lead Agency	California Energy Commission (CEC)
Agency Contact Person	Renee Longman
Phone Number	916-937-3538
Email	renee.longman@energy.ca.gov
Has a draft or final document been prepared for the project pursuant to CEQA? (select one)	☐ Yes | ☒ No The project is filing through the CEC "Opt-In" certification process (Assembly Bill 205). CEC will serve as lead agency and initiate CEQA once the application is deemed complete.
If "Yes", outline the type of environmental document. Include a copy of the CEQA document and all notices in the Documents and Map section.	☐ Notice of Exemption (NOE) | ☐ Negative Declaration (ND) | ☐ Mitigated Negative Declaration (MND) | ☐ Environmental Impact Report (EIR) | ☐ Timber Harvest Plan (THP)/Non-Industrial Timber Management Plan (NTMP)
State Clearinghouse Number (if applicable)	
Has a CEQA Notice of Determination (NOD) been completed for the project? (select one) If "Yes", attach the NOD in the Documents and Map section. If "No", explain why the NOD has not been completed.	☐ Yes | ☒ No The project is filing through the CEC "Opt-In" certification process (Assembly Bill 205). CEC will serve as lead agency and initiate CEQA once the application is deemed complete. CEQA NOD is anticipated in Q2 of 2027.
Has a CEQA Mitigation, Monitoring, Reporting Plan (MMRP) been	☐ Yes | ☒ No

Attribute	Answer
completed for the project? (select one) If “Yes”, attach the MMRP in the Documents and Map section. If “No”, explain why the MMRP has not been completed.	The project is filing through the CEC "Opt-In" certification process (Assembly Bill 205). CEC will serve as lead agency and initiate CEQA once the application is deemed complete. Minimization Measures (MMs) for the Mitigation, Monitoring Reporting Plan (MMRP) will be drafted by CEC in late 2026. Dudek has prepared proposed Avoidance and Minimization Measures (AMMs) and are viewable in this permit application under Supplemental Information.
Has a CEQA filing fee been paid pursuant to Fish and Game Code section 711.4? (select one) If “Yes”, attach a copy of the CEQA filing fee receipt in the Documents and Map section. If “No”, explain why the CEQA filing fee hasn’t been paid.	☐ Yes | ☒ No The Project is filing through the CEC. The Project anticipates this fee will be paid in 2027, under the Environmental Document pursuant to a Certified Regulatory Program (CRP).
If the project described in this notification is not the “whole project", or action pursuant to CEQA, briefly describe the entire project. If the project described in the notification is the entire project, insert the following statement in this box: “The project described in the notification is the entire project.”	The complete project description has been provided in the Supplemental Information. The portion of the Project that applies to the LSAA includes the Oso Creek Stabilization and Rehabilitation Work Area, the development of rock drop structures, the development of the battery energy storage system (BESS) site, and the stormwater trench limits.
National Environmental Policy Act (NEPA)	
Has a draft or final document been prepared for the project pursuant to the National Environmental Policy Act (NEPA)? (select one)	☐ Yes | ☒ No
If “Yes”, outline the type of environmental document. Include a copy of the document in the Documents and Map section.	☐ Categorical Exclusion | ☐ Environmental Assessment (EA) | ☐ Finding of No Significant Impact (FONSI) | ☐ Environmental Impact Statement (EIS)

Attribute	Answer
Measures to Protect Fish, Wildlife, and Plant Resources	
Sediment/Erosion Control	The Project's grading plans include details on the location and type of BMPs necessary to reduce the potential for Project-induced erosion and scour, including temporary BMPs to be implemented during construction (per the statewide Construction General Permit), and permanent BMPs to be installed and maintained (per the County BMP Design Manual). The exact location and type of temporary BMPs to be installed during construction depend on site-specific conditions, construction schedule, and proposed activities, all of which are outlined in the construction SWPPP that will be prepared for the Project. Typical temporary BMPs used for similar projects include energy dissipaters, silt fences, fiber rolls, gravel/sandbags, construction road stabilization, and stabilized construction entrances. Beginning work on the Project site will involve preparing the land for the installation of the Battery Energy Storage System (BESS) – related infrastructure, access, driveways, and temporary construction staging areas. The construction contractor will be required to incorporate BMPs consistent with the City zoning ordinance and with guidelines provided in the California Stormwater Quality Association's Construction BMP Handbook, as well as a soil erosion and sedimentation control plan to reduce potential impacts related to construction of the proposed Project. Prior to initial construction mobilization, pre-construction surveys will be performed, and sediment and erosion controls will be installed in accordance to state and City guidelines. Stabilized construction entrances and exits will be installed at driveways to reduce tracking of sediment on adjacent driveways. (As noted in the Supplemental Information), To summarize, the following plans will be prepared and implemented for the Project: SWPP, Dust Control Plan, and Erosion and Sedimentation Control Plan.
Avoidance/Minimization Measures	For AMMs specific to wildlife, plants, and aquatics see Attachment F. **AMM 1 _Spills and Contamination Prevention**: Construction-related indirect impacts may include inadvertent spillover impacts outside of the construction footprint, dust accumulation on adjacent native habitats, chemical spills, storm water erosion and sedimentation, and increased wildfire risk. To reduce fugitive dust resulting from Project construction and to minimize adverse air quality impacts, the Project would employ dust control measures in accordance with the Air Quality Management District's Rules 401 and 403.2, which would limit the amount of fugitive dust generated during construction. A Stormwater Pollution Prevention Plan (SWPPP) would also be prepared and implemented to prevent all construction pollutants from contacting stormwater during construction activities, with the intent of keeping sediment and any other pollutants from moving off site and into receiving waters to limit any potential indirect impacts to potentially jurisdictional waters. Best management practices (BMP) categories employed would include erosion control, sediment control, and good non-stormwater housekeeping. Preparation and implementation of a Stormwater Pollution Prevention Plan would help to avoid and minimize the potential effects of stormwater erosion during construction. To limit indirect impacts from construction related dust, soil erosion, water runoff decreasing, the Project will comply with National Pollutant Discharge Elimination System (NPDES) requirements.

Attribute	Answer
	During Operation: The BESS and all associated equipment will be remotely monitored and controlled. Qualified technicians would visit the site approximately 1-2 times per month to conduct routine inspections and maintenance as well as semiannual and annual services. Periodically, batteries and various components may be replaced or renewed to ensure optimal performance. During operation, the project will produce water discharge, noise, and light. Following construction, the proposed use would not create emissions to air, would not require sanitary facilities, and would not require water. Operational water will be limited to water necessary for landscape irrigation and to supply on-site fire hydrants.
Mitigation/Compensation Measures	**Applicant proposed mitigation:** The applicant proposes to provide mitigation through restoration of Oso Creek through the Oso Creek Rehabilitation and Restoration. The proposed Project includes repair and rehabilitation of approximately 2,600 linear feet of the degraded erosive portion of Oso Creek, which lies adjacent to the eastern boundary of the BESS facility. The creek currently exhibits high instability due to higher storm flow volumes, durations, and velocities, extensive and unmanaged invasive vegetation, and highly erodible soils. Stabilizing and rehabilitating the creek is therefore a critical component of the Project necessary to prevent future bank failure, reduce channel migration, enhance native vegetation, and improve water quality. All temporary impacts will be restored to pre-construction conditions within 30 days following project completion. For permanent impacts, any impact associated with the restoration and stabilization of Oso Creek will be restored. The total permanent impacts are estimated to be 1,115 linear feet to Oso Creek. The rehabilitation project will restore the creek by 2,600 linear feet. The applicant has partnered with a restoration consultant; through restoration, the area impact will be preserved and remain in improved functionality. The restoration design includes a series of instream stabilization structures composed of natural rock and native vegetation. Key features will include low hear drop/stabilization structures, including rock weirs and ramps, followed by pools or stilling basins. The rock features will be spaced approximately every 300 to 400 feet between flatter channel sections and bottom width of the creek channel will be 80 feet to reduce flow velocities. The western bank will be graded at a 3:1 side slope to a height of 10 feet. The slope will then be graded at a 2:1 slope until it meets the existing top of bank elevation. Native vegetation will be planted along the 2:1 side slope. The design also entails elevating the eroded Oso Creek channel to allow reestablishment of a hyporheic zone in the creek channel bed. Collectively, these channel rehabilitation measures will stabilize the creek, protect the adjacent BESS facility, and provide long-term habitat water quality benefits. Preliminary design drawings, a hydraulic report, and a planting plan and palette are provided under Attachment G, Site Plan Exhibits, and Attachment H, Hydraulic Study.
Prior Notifications, Orders, and Permits	
Prior Notifications and/or Agreements	
Identify any notification previously submitted to, or Lake or Streambed	Not Applicable

Attribute	Answer
Alteration Agreement previously issued by, CDFW for the project described in this notification. Include a copy of the previously submitted notification and/or agreement in the Documents and Maps form. If applicable, list the following: Name of Applicant: Notification Number: Date:	
Prior Orders, Notice, and/or Violations	
If this notification is being submitted in response to a court or administrative order or notice, or a notice of violation issued by CDFW, complete this section for each order, notice, or violation. Include a copy of each order, notice, or violation in the Document and Maps form. If applicable, list the following: Person who Directed you to Submit: Agency that Directed you to Submit: Describe Circumstances:	Not Applicable
Local, State, and/or Federal Permits	
List any local, state, and/or federal permits required for the project and mark whether applied or issued. Include a copy of each permit that has been issued in the Documents and Maps form. You are responsible for obtaining all necessary permits	CEC Opt-In Certification (**application in process of being deemed complete**) Regional Water Quality Control Board Water Quality Certification / Waste Discharge Requirements (**in process of application**) USACE Pre-Construction Notification for Nationwide Permit (NWP) (**in process of application**) NPDES (**in process of application)**

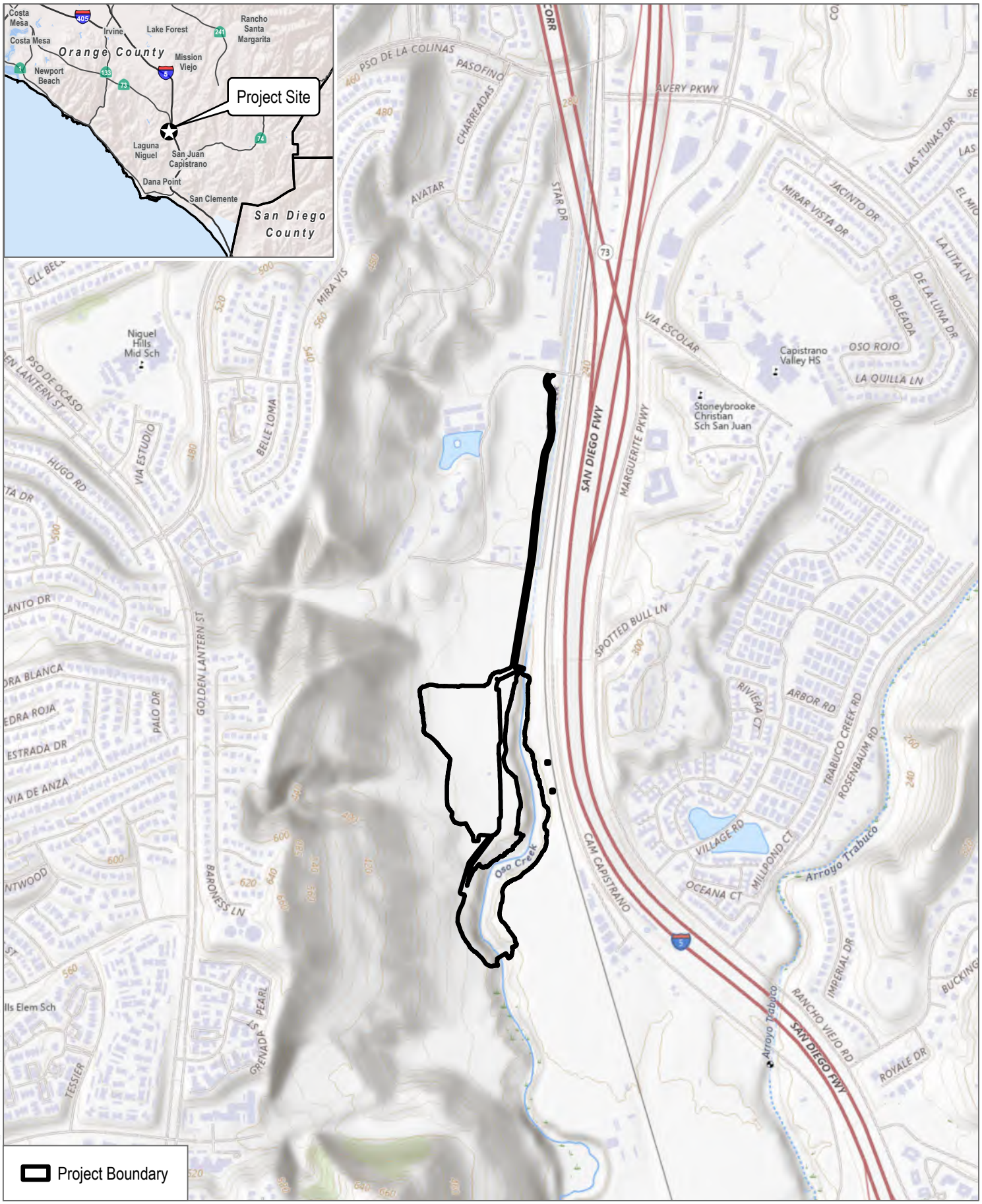
Attribute	Answer
and authorizations from CDFW and other agencies before beginning any project described in the notification. If applicable, list the following: Permit Name: Permit Type: If the permit was applied for or issued: Date issued/applied:	
Documents and Maps	
Maps/Photos	
Project Site Map	See Attachment A, Figure 1
Project Aerial View Map	See Attachment A, Figure 1
Project Site Photo(s)	See Attachment B, Aquatic Resources Delineation Report. Within the Aquatic Resources Delineation Report, refer to Attachment C within the document, site photographs.
Studies and Mapping	
Has a biological study been completed for the project site? (select one) If "Yes", include a copy of the document in the Documents and Map section.	☒ Yes | ☐ No The Biological Resources section of the Project's CEC "Opt-In" application (see Attachment E) contains the results of the biological studies conducted for the Project. Avoidance and Minimization Measures (AMMs) have been drafted as part of the Project's CEC "Opt-In" application, which can be viewed in Supplemental Information.
Has one or more technical studies (e.g., engineering, hydrologic, geologic, or geomorphological) been completed for the project for project site? (select one) If "Yes", include a copy of the documents in the Documents and Map section.	☒ Yes | ☐ No The appendices of the Project's CEC "Opt-In" application contains engineering and hydrologic studies.
Have fish or wildlife resources or waters of the state been mapped or	☒ Yes | ☐ No

Attribute	Answer
delineated on the project site? (select one) If "Yes", include a copy of the document in the Documents and Map section.	See Attachment B, Aquatic Resources Delineation
Additional Documents and Maps	
Upload Attachments, Documents, Maps, etc.	**Attachment A – Figures** ○ Figure 1 Project Location ○ Figure 2 – Impacts to Jurisdictional Aquatic Resources – CDFW **Attachment B – Aquatic Resources Delineation Report (2021)** ○ Attachment B.1 – Jurisdictional Delineation and Bat Memo (2025) **Attachment C – SAA Project Description** **Attachment D Diversion Plan Concept** ○ Attachment D.1 Spec Pipe Plan **Attachment E – Southwestern Pond Turtle Memorandum (2025)** **Attachment F – CEC Opt-In Application-Biological Resources Section** **Attachment G – Site Plans Exhibit** ○ Attachment G.1 – BESS Site Plan ○ Attachment G.2 – Oso Creek Civils Plan ○ Attachment G.3 – Preliminary Planting Palette **Attachment H - Hydraulic Study**
Fees Schedule	
Notification Fees	
Project Name	
Project Cost Range	Regular Term: ☐ < $5,000 | ☐ $5,000 to less than $10,000 | ☐ $10,000 to less than $25,000 | ☐ $25,000 to less than $100,000 | ☐ $100,000 to less than $200,000 | ☐ $200,000 to less than $350,000 | ☐ $350,000 or more Long Term: ☐ Base Fee | ☐ < $5,000 | ☐ $5,000 to less than $10,000 | ☐ $10,000 to less than $25,000 | ☐ $25,000 to less than $100,000 | ☐ $100,000 to less than $200,000 | ☐ $200,000 to less than $350,000 | ☐ $350,000 to less than $500,000 | ☐ $500,000 or more
Actual Project Cost	TBD

Attribute	Answer
Payment Information	
Payment Method	☐ Check/Money Order | ☐ Credit Card If check/money order, outline the following information: Name of the Bank/Institution: Check/Money Order #: If credit card, CDFW's online internet sales system will provide a document number after completing the transaction. Outline the document number:
Acknowledgment and Signature	
Site Inspection	
First Contact this Person to Schedule Site Visit Outline method of contact, contact name and information	Renee Robin Director, Permitting and Planning Engie North America Flexible Generation Renee.robin@engie.com (510) 525-0062
Electronic Signature	
Application to be electronically signed by the Applicant or Designated Representative.	

ss

Attachment A
Figures



SOURCE: USGS National Map 2025

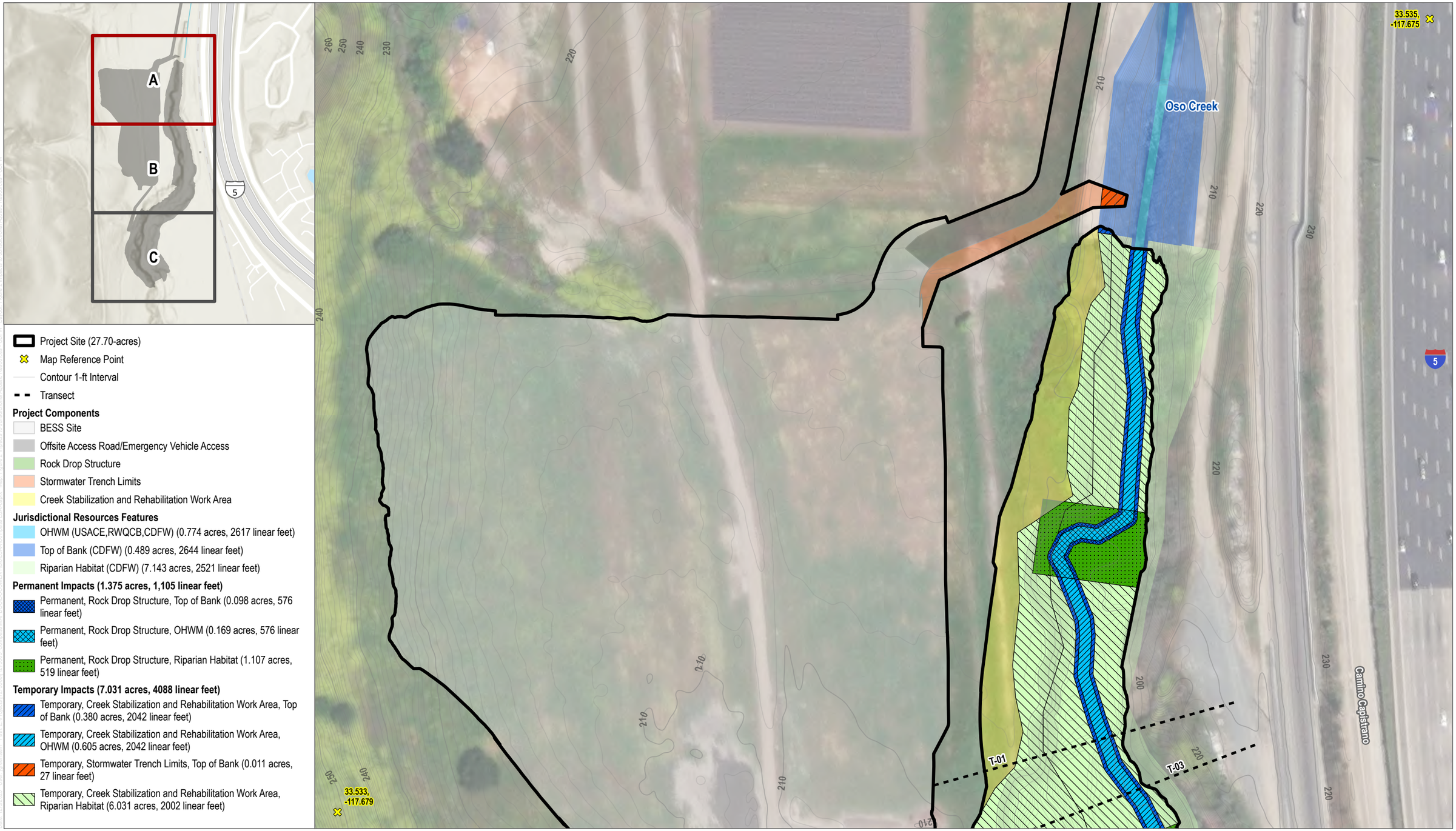
DUDEK

0 500 1,000 Feet

FIGURE 1

Project Location

Compass Energy Storage Project



SOURCE: Maxar 2023

DUDEK

0 50 100 Feet

FIGURE 2A

Impacts to Jurisdictional Aquatic Resources - CDFW

Compass Energy Storage Project

SOURCE: Maxar 2023

DUDEK

0 50 100 Feet

FIGURE 2B

Impacts to Jurisdictional Aquatic Resources - CDFW

Compass Energy Storage Project

Project Site (27.70-acres)

Map Reference Point

Contour 1-ft Interval

Project Components

- Rock Drop Structure
- Stormwater Trench Limits
- Creek Stabilization and Rehabilitation Work Area

Jurisdictional Resources Features

- OHWM (USACE,RWQCB,CDFW) (0.774 acres, 2617 linear feet)
- Top of Bank (CDFW) (0.489 acres, 2644 linear feet)
- Riparian Habitat (CDFW) (7.143 acres, 2521 linear feet)

Permanent Impacts (1.375 acres, 1,105 linear feet)

- Permanent, Rock Drop Structure, Top of Bank (0.098 acres, 576 linear feet)
- Permanent, Rock Drop Structure, OHWM (0.169 acres, 576 linear feet)
- Permanent, Rock Drop Structure, Riparian Habitat (1.107 acres, 519 linear feet)

Temporary Impacts (7.031 acres, 4088 linear feet)

- Temporary, Creek Stabilization and Rehabilitation Work Area, Top of Bank (0.380 acres, 2042 linear feet)
- Temporary, Creek Stabilization and Rehabilitation Work Area, OHWM (0.605 acres, 2042 linear feet)
- Temporary, Stormwater Trench Limits, Riparian Habitat (0.004 acres, 17 linear feet)
- Temporary, Creek Stabilization and Rehabilitation Work Area, Riparian Habitat (6.031 acres, 2002 linear feet)

SOURCE: Maxar 2023

DUDEK

N

0 50 100 Feet

FIGURE 2C

Impacts to Jurisdictional Aquatic Resources - CDFW

Compass Energy Storage Project

Attachment B

Aquatic Resources Delineation Report (2021)

27372 CALLE ARROYO
SAN JUAN CAPISTRANO, CALIFORNIA 92675
T 949.450.2525 F 949.450.2626

July 7, 2021 12755

Mr. Justin Amirault
Broad Reach Power, LLC
5444 Westheimer Road, Suite 1000
Houston, Texas 77056

Subject: *Aquatic Resources Delineation Report for Compass Battery Energy Storage Project, San Juan Capistrano, California*

Dear Mr. Amirault:

This letter report documents the existing aquatic resources at the proposed Compass Battery Energy Storage Project site (Project) located in the City of San Juan Capistrano, Orange County, California. The Project proposes the installation of a battery energy storage facility. This letter report is intended to (1) evaluate the presence and extent of aquatic resources that may be subject to the jurisdiction of the United Stated Army Corps of Engineers (USACE), the Regional Water Quality Control Board (RWQCB), and the California Department of Fish and Wildlife (CDFW), (2) quantify impacts to aquatic resources that would result from implementation of repairs at the project site, and (3) provide a discussion of potential water resource permits required for construction of the project.

1 Project Location

The Project will be constructed on approximately 13 acres in the north-western portion of the City of San Juan Capistrano (Project Boundary) (Attachment A: Figure 1). The 13-acre Project Boundary occurs located west of Interstate 5 and State Route 73, and east of Golden Lantern Street. The Project Boundary occurs within an undeveloped area located to the south of an existing church facility.

The Project Boundary and a 100-foot buffer were assessed for this report (Survey Area). The Survey Area is surrounded by the Saddleback Church Rancho Capistrano to the north, open space and scattered residences to the south, Oso Creek to the south and east, Burlington Northern Santa Fe (BNSF) railroad tracks and Interstate-5 to the east, and Oso Rancho Capistrano Trail to the west. The SDG&E Trabuco to Capistrano 138 kV transmission line is located approximately 250 feet to the east and runs alongside the BNSF tracks.

2 Project Description

The proposed Project will be composed of lithium-ion batteries installed in racks, inverters, medium-voltage (MV) transformers, a switchyard, a collector substation, and other associated equipment to interconnect into the SDG&E Trabuco to Capistrano 138 kV transmission line (point of interconnection). The batteries will be installed either in containers or in purpose-built enclosures designed for aesthetic compatibility with the surrounding area. The containers or enclosures will have battery storage racks, with relay and communications systems for automated monitoring and managing of the batteries to ensure design performance. A battery management system will be provided to control the charging/discharging of the batteries, along with temperature monitoring and control of the individual battery cell temperature with an integrated cooling system. Batteries operate with direct current (DC)

electricity, which must be converted to alternating current (AC) for compatibility with the existing electric grid. Power inverters to convert between AC and DC, along with transformers to step up the voltage, will be included.

The proposed facility will provide a service to the regional electric grid by looping into the SDG&E electric transmission system, storing energy on site, and then later delivering energy (discharging) back to the point of interconnection. Following construction, the proposed use will not create emissions to air, will not require sanitary facilities, and will not require water for operation.

3 Regulatory Background

3.1 Federal Statutes and Regulations – U.S. Army Corps of Engineers

Pursuant to Section 404 of the Clean Water Act (CWA), any person or public agency proposing to discharge dredged or fill material into "waters of the United States", including jurisdictional wetlands, must obtain a permit from the ACOE. On January 23, 2020, the Environmental Protection Agency and ACOE published a final rule (33 CFR, Part 328) defining the scope of waters protected under the CWA in an effort to undo the broad interpretation of federal jurisdiction established in the 2015 "Clean Water Rule" (80 Federal Regulation 37053). The new rule, referred to as the "Navigable Waters Protection Rule," issued new regulations to redefine the types of waterbodies covered by the federal CWA, which dramatically narrowed the scope of the federal administration's regulatory authority compared to previous CWA regulations. As a result of the final rule, the Environmental Protection Agency and ACOE define "waters of the United States" to include the following four categories: (1) the territorial seas and traditional navigable waters; (2) tributaries of such waters; (3) certain lakes, ponds, and impoundments of jurisdictional waters; and (4) wetlands adjacent to other jurisdictional waters (other than waters that are themselves wetlands).

For non-tidal waters of the United States, the lateral limits of ACOE jurisdiction extend to the ordinary high-water mark (OHWM) when no adjacent wetlands are present. As defined in 33 Code of Federal Regulations 328.3(c)(6), the OHWM is "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as [a] clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." If adjacent wetlands are present, the jurisdiction extends to the limit of the wetlands.

Wetlands are "those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3). Wetlands are jurisdictional if they meet this definition as well as the definition of waters of the United States. Three criteria must be satisfied to classify an area as a wetland under ACOE jurisdiction: (1) a predominance of plant life that is adapted to life in wet conditions (hydrophytic vegetation); (2) soils that saturate, flood, or pond long enough during the growing season to develop anaerobic conditions in the upper part (hydric soils); and (3) permanent or periodic inundation or soils saturation, at least seasonally (wetland hydrology). The ACOE uses the methodology in the Regional Supplements to the Corps of Engineers Wetland Delineation Manual to determine whether an area meets these three criteria. In the Survey Area, the supplement for the Arid West Region (ACOE 2008a) is used.

ACOE-Regulated Activities

Under Section 404 of the CWA, the ACOE regulates activities that involve a discharge of dredged or fill material, including but not limited to grading, placing riprap for erosion control, pouring concrete, laying sod, and stockpiling excavated material into waters of the United States. Activities that generally do not involve a regulated discharge (if performed specifically in a manner to avoid discharges) include driving pilings, providing some drainage channel maintenance activities, and excavating without stockpiling.

3.2 State Statutes and Regulations – Regional Water Quality Control Board

The State of California has concurrent jurisdiction with the federal government under Section 401 of the CWA for jurisdictional wetlands and waters of the United States. Where isolated waters and wetlands (not subject to federal jurisdiction) are involved, the state will exert independent jurisdiction via the Porter-Cologne Water Quality Control Act.

Section 401 of the Clean Water Act

Section 401 of the CWA requires that any applicant for a federal permit for activities that involve a discharge to waters of the United States shall provide the federal permitting agency a certification from the state in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the federal CWA. Therefore, in California, before the ACOE will issue a Section 404 permit, applicants must apply for and receive a Section 401 Water Quality Certification or waiver from the RWQCB.

Under Section 401 of the CWA, the RWQCB regulates at the state level all activities that are regulated at the federal level by ACOE.

Porter-Cologne Water Quality Control Act

The RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state" (California Water Code, Section 13260(a)), pursuant to provisions of the state Porter-Cologne Water Quality Control Act. "Waters of the state" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code, Section 13050(e)).

Under the Porter-Cologne Water Quality Control Act, the RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into waters of the state, that are not regulated by the ACOE due to a lack of connectivity with a navigable water body.

3.3 State Statutes and Regulations – California Department of Fish and Wildlife

The California Fish and Game Code, Sections 1600–1616, mandates that "it is unlawful for any person to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds, without first notifying the department of such activity."

The CDFW's jurisdiction includes ephemeral, intermittent, and perennial watercourses (including dry washes) and lakes characterized by the presence of (1) definable bed and banks and (2) existing fish or wildlife resources. Furthermore, CDFW jurisdiction extends to riparian habitat and may include oak woodlands in canyon bottoms. Historical court cases have further extended CDFW jurisdiction to include watercourses that seemingly disappear but reemerge elsewhere. Under the CDFW definition, a watercourse need not exhibit evidence of an OHWM to be claimed as jurisdictional. CDFW does not have jurisdiction over ocean or shoreline resources.

Under the California Fish and Game Code, Sections 1600–1616, CDFW has the authority to regulate work that will substantially divert or obstruct the natural flow of, or substantially change or use any material from, the bed, channel, or bank of any river, stream, or lake. CDFW also has the authority to regulate work that will deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. This regulation takes the form of a requirement for a Lake or Streambed Alteration Agreement and is applicable to all projects.

4 Methods

4.1 Literature Review

The following available resources were reviewed to assess the potential for jurisdictional aquatic resources within the Survey Area: aerial photographs (Google Earth 2021; Historic Aerials 2021); the U.S. Geological Survey 7.5-minute topographic quadrangle (USGS 2021); a Natural Resources Conservation Service soil map (USDA 2021a); U.S. Environmental Protection Agency Watershed Assessment, Tracking & Environmental Results System (EPA 2020), which includes the National Hydrography Dataset; and the National Wetland Inventory (NWI; USFWS 2021).

4.2 Jurisdictional Delineation

On March 11, 2021, Dudek biologist Dylan Ayers conducted a formal aquatic resources delineation of potentially jurisdictional waters and wetlands within the Survey Area, where access was available. The Survey Area, which encompasses the Project Boundary, was surveyed on foot. The following types of features were surveyed for:

- Waters of the United States, including wetlands, under the jurisdiction of the ACOE, pursuant to Section 404 of the federal CWA
- Waters of the state under the jurisdiction of the RWQCB, pursuant to Section 401 of the federal CWA and the Porter-Cologne Water Quality Control Act as wetlands or drainages
- Streambeds under the jurisdiction of the CDFW, pursuant to Section 1602 of the California Fish and Game Code

Non-wetland waters of the United States were delineated based on the presence of an OHWM as determined using the methodology in A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (ACOE 2008b). Wetland waters of the United States were delineated based on methodology described in the 1987 Corps of Engineers Wetland Delineation Manual (ACOE 1987) and the ACOE Regional Supplement (ACOE 2008a). Pursuant to the federal CWA, ACOE and RWQCB jurisdictional areas include those supporting all three wetlands criteria described in the ACOE manual: hydric soils, hydrology, and hydrophytic vegetation. Areas regulated by the RWQCB are generally coincident with the ACOE, but can also include isolated

features that have evidence of surface water inundation pursuant to the state Porter-Cologne Water Quality Control Act. Isolated features are delineated at the OHWM, at the outer limits of hydrophytic vegetation, or at the outer rim of depressional features if relevant.

Streambeds are typically delineated from top of bank to top of bank or the extent of the overhanging canopy of associated riparian vegetation beyond the top of bank. For shallow drainages and washes that do not support riparian vegetation, the top-of-bank measurement may be the same as the OHWM measurement.

To aid in the delineation, data forms were used to collect information at representative locations. Information obtained at each sample point location was recorded on the appropriate data form to determine the OHWM, as provided in Appendix B of the ACOE's OHWM guidance (ACOE 2008b), and presence of jurisdictional wetlands, as provided in Appendix C of the ACOE's Regional Supplement (ACOE 2008a). Hydrology, vegetation, and soils were assessed, and data were collected on an approved ACOE Arid West Wetland Determination Data form. These datasheets and forms are provided in Attachment B of this report. Representative photographs of the jurisdictional features were taken in accordance with ACOE guidelines and are provided in Attachment C.

5 Environmental Setting

5.1 Land Uses

The Survey Area occurs adjacent to Oso Creek and consists of a mix of undeveloped and developed lands. Open space is located on the northern side of the Project Boundary, associated with the Saddleback Church Rancho Capistrano, that contains dirt roads and light, non-commercial agricultural activity. Besides a few small dirt trails and roads, the southern portion of the Project Boundary is undeveloped and showed no sign of recent agricultural activity. The entire eastern edge of the Project Boundary is adjacent to Oso Creek which lies at the bottom of steep slopes which cut through large areas of the site (Attachment A: Figure 2). Outside of these steep areas, the Survey Area is flat to gently sloping. Elevation on the Survey Area ranges from approximately 165 to 270 feet above mean sea level. Representative photographs of the Survey Area are included in Attachment C.

5.2 Climate

The climate of southern Orange County consists of a generally dry yet coastal climate typical of the arid southwest, characterized by hot, dry summers with mild winters. Average yearly temperatures near San Juan Capistrano range from approximately 43°F to 78°F, with the lowest average temperature of 51°F in January to the highest average temperature of 71°F in August. The regional area generally receives an average rainfall of approximately 12.52 inches per year, with precipitation concentrated in the winter to spring months of November through March (WRCC 2021). Rainfall had occurred in the region approximately two weeks before or after the March 11 site visit (Weather Underground 2021).

5.3 Soils

According to the NRCS Web Soil Survey (USDA 2021a), the Survey Area occurs within the Orange County and Part of Riverside County, California (CA678). Six soil types were found within the Survey Area (Attachment A: Figure 3). A brief description of each series is provided below:

- Alo soils consists of moderately deep, well drained soils. They formed in material weathered from shale or sandstone on mountains. Alo soils have slopes of 2 to 75 percent.
- Botella soils generally consist of very deep, well drained soils that formed in alluvial material from sedimentary rocks. Botella soils typically occur in valley bottoms and on alluvial fans with slopes of 0 to 15 percent.
- Corralitos soils consist of deep, somewhat excessively drained soils that formed in recent sandy alluvium derived from acid sandstone and related rocks. Corralitos soils are on alluvial fans and in small valleys and have slopes of 0 to 15 percent.
- Myford soils are generally deep, moderately well drained soils formed on terraces. They typically occur on nearly level to moderately steep terraces at elevations of less than 1,500 feet.
- Riverwash soils generally consist of coarse sands, gravel, and sandy loams. They are the result of stream flow and are often found on alluvial fans.
- Sorrento soils consist of very deep, well drained soils that formed in alluvium mostly from sedimentary rocks. Sorrento soils are on alluvial fans and stabilized floodplains and have slopes of 0 to 15 percent.

Soils in the northern half of the Survey Area are somewhat disturbed due to agricultural activity, while soils in the southern portion of the Survey Area are mostly undisturbed.

Riverwash is listed as a hydric soil by the Natural Resource Conservation Service for Orange County and Part of Riverside County, California (USDA 2021b). No other soil types mapped within the Survey Area are considered hydric.

5.4 Vegetation Communities and Land Covers

The Survey Area consists of mostly undeveloped lands (Attachment A: Figure 4). Most of the Survey Area is dominated by non-native annual grasses, with trees and shrubs occurring intermittently around the Survey Area. Dense riparian vegetation is found around the aquatic resources on the Survey Area and non-native vegetation occurs sporadically throughout. The entire eastern edge of the Survey Area contains steep slopes that are associated with Oso Creek. Significant erosion is occurring on these steep slopes, leaving some areas as barren soils with no established vegetative cover. Communities observed throughout the Survey Area include Agriculture (AGR), Artemisia Californica Association (Artcal), Urban/Developed (DEV), Disturbed Habitat (DH), Non-Vegetated Channel (NVC), Ornamental (ORN), Populus fremontii – Salix lasiolepis Association (Popfre-Sallas), and Upland Mustards (UM). These vegetation communities and land covers are described in further detail below. The complete list of plant species observed at the Survey Area is included in Attachment D.

5.4.1 Native Vegetation Communities

Agriculture (AGR) The AGR mapping unit is not recognized by the Natural Communities List (CDFG 2010) but is described by Oberbauer (2008). The AGR mapping unit refers to areas that support an active agricultural operation.

Agricultural activity occurring on-site consisted of row crops and raised container gardens that are part of a non-commercial operation. Some herbaceous ruderal species were observed growing in the disturbed soils associated with these areas. AGR habitat is mapped throughout the northern half of Project site and accounts for approximately 27.42 acres of the Survey Area.

Artemisia Californica Association (Artcal) The Artcal vegetation community occurs nears the southern tip of the Project and is mapped adjacent to the Oso Creek Trail. Characteristic species of this community incudes California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), purple sage (*Salvia leucophylla*), and sugar bush (*Rhus ovata*). Other mixed herbs observed in this community include artichoke thistle (*Cynara cardunculus*), fiddleneck (*Amsinckia menziesii*), and California wood sorrel (*Oxalis californica*). This vegetation community occurs outside of the project site and Survey Area boundaries but is found on adjacent hillsides to the west.

Mulefat Thickets (Bascal) The Bascal mapping unit occurs along the edges of the Popfre-Sallas vegetation community, on the steep slopes associated with Oso Creek. Charaterictic species of this community includes mule fat (*Baccharis salicifolia*), elderberry (*Sambucus nigra*), and tamarisk (*Tamarix ramoissima*). Other mixed herbs observed in this community include poison hemlock, black mustard (*Brassica nigra*), and horseweed (*Erigeron* sp.). This community is relatively low and occupies 4.86 acres within the Survey Area.

Urban/Developed (DEV) The DEV unit is not recognized by the Natural Communities List (CDFG 2010) but is described by Oberbauer (2008). Developed land typically includes areas that have been constructed upon and do not contain any naturally occurring vegetation. These areas are generally characterized as graded land with asphalt and concrete placed upon it. DEV areas mapped for the Survey Area include approximately 2.86 acres of the existing paved parking lots and roadway on the northern side of the site. No vegetation was observed within DEV areas on the Survey Area.

Disturbed Habitat (DH) The DH mapping unit is not recognized by the Natural Communities List (CDFG 2010) but is described by Oberbauer (2008). The DH mapping unit refers to areas that lack vegetation but still retain a pervious surface, or that are dominated by a sparse cover of non-native grasses and ruderal species such as wild oat (*Avena fatua)*, black mustard, red brome (*Bromus madritensis*), and prickly lettuce (*Lactuca serriola*). DH is mapped in the northern areas of the site near some barren parking areas that are compacted with predominantly bare ground. It is also mapped along the dirt roads that extend across the entire site. It accounts for approximately 6.12 acres of the Survey Area.

Non-Vegetated Channel (NVC) The NVC mapping unit is not recognized be the Natural Communities List (CDFG (2010) but is described by Oberauer (2008). The NVC mapping unit refers to sandy, gravelly, or rocky fringe of waterways or flood channels. These areas are generally unvegetated due to variable water lines although some weedy species of grasses may grow along the outer edges. NVC is mapped near the northeastern corner of the site, associated with the artificial channels that convey Oso Creek. It accounts for 0.42-acre within the Survey Area.

Ornamental (ORN) The ORN mapping unit is not recognized be the Natural Communities List (CDFG (2010) but is described by Oberauer (2008). The ORN mapping unit refers to areas that are consistently managed and planted with decorative tree, shrub, and herbaceous species. ORN is mapped near the northwestern corner of the site, associated with the DEV areas also located near that side of the site. It accounts for 0.47-acre within the Survey Area.

Populus fremontii – Salix lasiolepis Association (Popfre-Sallas) The Popfre-Sallas vegetation community occurs along Oso Creek and Stream 1, found on both flat land and steep slopes. Characteristic species of this community includes Fremont's cottonwood (*Populus fremontii*), arroyo willow (*Salix lasiolepis*), mule fat (*Baccharis salicifolia*), and California sycamore (*Platanus racemosa*). Other mixed herbs observed in this community include poison hemlock (*Conium maculatum*) and California wood sorrel. This community is relatively high quality and occupies 4.88 acres within the Survey Area.

Upland Mustards (UM) The UM vegetation community occurs across all portions of the site, on both sloped areas and flat lands. The community is mapped for approximately 12.55 acres of the Survey Area. Characteristic species of this community includes black mustard, red brome, ripgut brome (*Bromus diandrus*), wild oat, soft chess (B*romus hordeaceus*), and Johnsongrass (*Sorghum halepense*). Other mixed herbs observed in this community include artichoke thistle (*Cynara cardunculus*), pampas grass (*Cortaderia selloana*), red stemmed filaree (*Erodium cicutarium*), and London rocket (*Sisymbrium irio*). This community is relatively low quality as many of the observed species are non-native and associated with prior disturbance.

5.5 Topography

The Survey Area is located in southeastern Orange County and occurs within in lightly developed area as depicted on the Orange, CA 7.5-minute USGS topographic quadrangle map. The Survey Area is flat to very steep with an elevation range of approximately 165 feet above mean sea level (AMSL) to 270 feet AMSL. The surrounding topography is generally similar. The most significant change in topography within the Survey Area is associated with Oso Creek and its steep slopes.

5.6 Hydrology

The Survey Area is located within the Aliso-San Onofre watershed (HUC 8), and specifically within the San Juan Creek Subwatershed (HUC 10) (Attachment A, Figure 5). The Aliso-San Onofre watershed covers approximately 176 square miles of mountainous, urban, and costal lands and its drainage area includes portions or Orange, Riverside, and San Diego counties.

The Nation Hydrography Dataset (NHD) maps Oso Creek as a perennial stream feature which flows north to south along the eastern edge of the Project (Attachment A, Figure 6). An ephemeral drainage feature is mapped flowing across the southern portion of the Project, originating from a concrete lined channel at the southwestern corner of the site. This ephemeral feature flows northeast, eventually flowing into Oso Creek. One additional ephemeral stream feature is mapped on the western side of the Project, but it was not observed in the field. A review of the National Wetland Inventory (NWI) dataset revealed one wetland type, Riverine, occurs within the Survey Area. Oso Creek (R4SBC) habitat is classified as riverine, intermittent, streambed, and seasonally flooded. The ephemeral streams mentioned above are not shown in the NWI dataset.

Oso Creek flows south, away from the Project, into Arroyo Trabuco. Arroyo Trabuco joins with San Juan Creek, a relatively permanent water (RPW) downstream, which flows into the Pacific Ocean, a traditional navigable water (TNW) near Dana Point.

6 Results

Based on the results of the literature and database review, and the jurisdictional delineation conducted in the field, one perennial stream, Oso Creek, one unnamed ephemeral stream, Stream 1, and one upland swale, Swale 1, were identified and evaluated within the Survey Area. Oso Creek drains the local watershed, including Stream 1 and Swale 1, and exhibits direct downstream connectivity with the Pacific Ocean. All features are potentially subject to the regulatory agency jurisdiction under Section 404 and 401 of the CWA, and Section 1600 et seq. of CFG Code, which is described in more detail below for each jurisdiction. All data collected in the field is provided in Attachment B. As required by the ACOE's Los Angeles District, a summary of aquatic resources investigated is provided in Attachment E, Aquatic Resources Upload Sheet. Attachment A, Figures 7a & 7b, provide a complete geographic overview of the features discussed.

6.1 Waters of the United States

The Survey Area contains portions of Oso Creek, Stream 1, and Swale 1. All features exhibit downstream connectivity with the Pacific Ocean, a traditional navigable water, but only Oso Creek and Stream 1 display an OHWM (Attachment A, Figures 7a & 7b).

The following descriptions are detailed accounts of the potentially jurisdictional features investigated within the Survey Area. For potential wetland areas, the wetland indicator status wfiguras assigned to each species using the National Wetland Plant List (California) (Lichvar et al. 2016), as shown in Table 1.

Table 1. Summary of Wetland Indicator Status

Category	Probability
Obligate Wetland (OBL)	Almost always occur in wetlands (estimated probability of >99%)
Facultative Wetland (FACW)	Usually occur in wetlands (estimated probability of 67% to 99%)
Facultative (FAC)	Equally likely to occur in wetlands/non-wetlands (estimated probability of 34% to 66%)
Facultative Upland (FACU)	Usually occur in non-wetlands (estimated probability 67% to 99%)
Obligate Upland (UPL)	Almost always occur in non-wetlands (estimated probability >99%)
No Indicator (NI)	—

Oso Creek

Oso Creek flows onto the site via a concrete lined culvert near the northeast corner of the Survey Area. The Cowardin classification for Oso Creek is R4SBC (Riverine Intermittent Streambed Seasonally Flooded Wetlands), which supports the observed conditions of the creek during the aquatic delineation in the field. Besides the concrete lined portions, the creek is heavily vegetated with riparian species and large trees that shade out much of the creek. Vegetation around the creek was dominated by native species with some non-native populations found throughout the observable portions of the Survey Area.

Two data stations were collected at Oso Creek, one on the muddy bank of the creek (DP-03), and one in an adjacent upland area (DP-04). Data Point 3 (DP-03) contains a dominance of arroyo willow (FACW) and mule fat (FAC). The

presence of hydrophytic plant species represents a dominance of hydrophytes, and therefore hydrophytic vegetation is present. A 5-inch soil sample was taken at DP-03. A restrictive layer of cobbles and roots was found at the bottom of the sample. The soil within the entire 5-inches had a sandy clay loam texture and displayed a color of 10YR 4/2 in 100% of the matrix. No redoximorphic concentrations were found. Due to the lack of hydric soil indicators, hydric soils are absent from DP-03. However, soils within the sample were saturated which is a primary wetland hydrology indicator, as well as the presence of secondary wetland hydrology indicators such as water marks, sediment deposits, and drift deposits within a riverine feature. Therefore, wetland hydrology is present within DP-03. Since DP-03 only contains 2 of the 3 ACOE wetland parameters, it does not pass the "three parameter test" and is not considered a wetland feature.

Data Point 4 (DP-04) contains a dominance of black mustard (NI), red stemmed filaree (NI), and fiddleneck (NI). The presence of these upland species does not represent a dominance or prevalence of hydrophytes, and therefore no hydrophytic vegetation is present. A 3-inch soil sample was taken at DP-04. A restrictive layer of hard soils was found immediately below the surface. The soil within the entire 3-inches had a clay loam texture and displayed a color of 10YR 5/3 in 100% of the matrix. No redoximorphic concentrations were found. Due to the lack of hydric soil indicators, hydric soils are absent from DP-04. Finally, no wetland hydrology indicators were observed and there was a lack of a surface water, a high-water table, and saturated soils. Therefore, DP-04 does not occur within a wetland as all three wetland parameters are absent.

Stream 1

Stream 1 flows into the Survey Area via a concrete lined channel at the southwestern corner of the site. Stream 1 is described as an ephemeral stream and has no Cowardian classification. This feature, after flowing on-site beneath a pedestrian bridge, widens out as it flows under a thick riparian canopy before becoming channelized and moving towards a dirt road. The creek has a separate branch the dead ends at this dirt road. After crossing the road, the riparian canopy thins out as Stream 1 reaches the edge of the steep slopes associated with Oso Creek. Before reaching the creek, water in Stream 1 falls over a 15+ foot vertical drop.

Three data stations were collected at Stream 1, one within the thick riparian canopy near the southwestern corner of the Survey Area (DP-05), one in an upland area adjacent to a branch of Stream 1 (DP-01), and one in a vegetated area on the southern bank of the stream (DP-02).

Data Point 1 (DP-01) contains a dominance of poison hemlock (FACW) and California wood sorrel (NI). The presence of these species does not represent a dominance or prevalence of hydrophytes, and therefore no hydrophytic vegetation is present. A 9-inch soil sample was taken at DP-01. A restrictive layer of hard clay soils was found below the surface. The soil within the entire 9-inches had a clay loam texture and displayed a color of 10YR 3/2 in 100% of the matrix. No redoximorphic concentrations were found. Due to the lack of hydric soil indicators, hydric soils are absent from DP-01. However, soils within the sample were saturated which is a primary wetland hydrology indicator. Therefore, wetland hydrology is present within DP-01. Since DP-01 only contains 1 of the 3 ACOE wetland parameters, it does not pass the "three parameter test" and is not considered a wetland feature.

Data Point 2 (DP-02) contains a dominance of arroyo willow (FACW) and poison hemlock (FACW). The presence of hydrophytic plant species represents a dominance of hydrophytes, and therefore hydrophytic vegetation is present. A 10-inch soil sample was taken at DP-02. A restrictive layer of hard clay soils was found below the surface. The

soil within the entire 10-inches had a clay loam texture and displayed a color of 10YR 3/3 in 100% of the matrix. No redoximorphic concentrations were found. Due to the lack of hydric soil indicators, hydric soils are absent from DP-02. However, soils within the sample were saturated which is a primary wetland hydrology indicator. Therefore, wetland hydrology is present within DP-02. Since DP-02 only contains 2 of the 3 ACOE wetland parameters, it does not pass the "three parameter test" and is not considered a wetland feature.

Data Point 5 (DP-05) contains a dominance of arroyo willow (FACW), poison hemlock (NI), Brazilian pepper (*Schinus terebinthifolius*) (FAC), and California wood sorrel (NI). The presence of hydrophytic plant species represents a dominance of hydrophytes, and therefore hydrophytic vegetation is present. A 10-inch soil sample was taken at DP-05. A restrictive layer of hard clay soils was found below the surface. The soils within inches 0 to 4 had silty clay texture and displayed a color of 10YR 5/2 in 100% of the matrix. Inches 4 to 10 had sandy clay loam texture and displayed a color of 10YR 5/3 in 90% of the matrix. No redoximorphic concentrations were found. Due to the lack of hydric soil indicators, hydric soils are absent from DP-05. However, soils within the sample were saturated which is a primary wetland hydrology indicator. Therefore, wetland hydrology is present within DP-05. Since DP-05 only contains 2 of the 3 ACOE wetland parameters, it does not pass the "three parameter test" and is not considered a wetland feature.

Swale 1

Swale 1 is a small erosional feature that acts as an upland swale, draining areas associated with adjacent agricultural areas. This feature was deep and V-shaped and did not exhibit an OHWM. Water than enters Swale 1 moves towards the steep slope that leads down to Oso Creek. Significant erosion can be seen below Swale 1 along the slope. No hydrophytic vegetation was observed in this feature.

A summary of the data collected at each data station is provided below in Table 2.

Table 2. Data Station Results Summary

Data Station	Wetland Field Indicators			Vegetation Community	ACOE Jurisdictional Status	ACOE Jurisdiction Type
	Vegetation	Hydric Soils	Hydrology			
DP-01	None	None	✓	Popfre-Sallas	Jurisdictional	Non-Wetland
DP-02	✓	None	✓	Popfre-Sallas	Jurisdictional	Non-Wetland
DP-03	✓	None	✓	Popfre-Sallas	Jurisdictional	Non-Wetland
DP-04	None	None	None	Upland Mustards	Jurisdictional	Non-Wetland
DP-05	✓	None	✓	Popfre-Sallas	Jurisdictional	Non-Wetland

6.2 Waters of the State

RWQCB Jurisdiction

The features described above as subject to ACOE's jurisdiction as Waters of the U.S. also potentially fall under the authority of the Santa Ana RWQCB in accordance with Section 401 of the CWA.

6.3 CDFW Jurisdiction

Areas under CDFW jurisdiction mapped on the Survey Area include the portions of Oso Creek, Stream 1, and Swale 1 that encompass all non-wetland waters of the U.S./State, and the top of channel banks and associated riparian habitats (Attachment A, Figures 7a & 7b).

6.4 Summary of Jurisdictional Aquatic Resources

The Survey Area supports three features that would be considered non-wetland waters of the United States under the jurisdiction of the ACOE, non-wetland waters of the State under the jurisdiction of RWQCB, and CDFW jurisdictional non-wetland waters. Table 3 summarizes the extent of each regulatory agency's jurisdiction within the Survey Area.

Table 3. Summary of Jurisdictional Aquatic Resources within the Survey Area

Jurisdiction	Habitat Type	Total (acres/linear feet)
Waters of the United States and State (ACOE/RWQCB)		
Non-Wetland Waters		
Oso Creek	OHWM	0.23/1,865
Stream 1	OHWM	0.37/3,233
Waters of the United States and State (ACOE/RWQCB) Total*		**0.60/5,098**
CDFW Waters		
Non-Wetland Waters		
Oso Creek	OHWM and Bank	0.40
Stream 1	Concrete Bank and Channel	1.39
Swale 1	Swale Bank and Channel	0.01
CDFW Jurisdiction Total*		**1.89**

Notes:
* Acreage may not total due to rounding.
RWQCB = Regional Water Quality Control Board; CDFW = California Department of Fish and Wildlife.

7 Conclusions

The delineation determined that the Survey Area contains non-wetland waters of the U.S. and State within the reach of Oso Creek that occurs along the Survey Area boundary. As currently designed the project will be constructed within upland habitats on site, and no design features are proposed to encroach within potential jurisdictional limits. However, in the event project impacts do occur, permitting and subsequent mitigation would be required from the regulatory agencies. Should you have any questions regarding this report or require additional information, please do not hesitate to contact me at tmolioo@dudek.com or 949.373.8308.

Sincerely,

Dylan Ogers Tommy Molioo

Dylan Ayers
Biologist

Tommy Molioo
Sr. Biologist

Att.: A – Figures
1. Project Location
2. Local Topographic Map
3. Soils Map
4. Biological Resources
5. Watershed Map
6. Hydrology Map
7. Aquatic Resources Delineation
B – Datasheets
C – Site Photographs
D – Species Compendium
E – Aquatic Resources Upload Sheet

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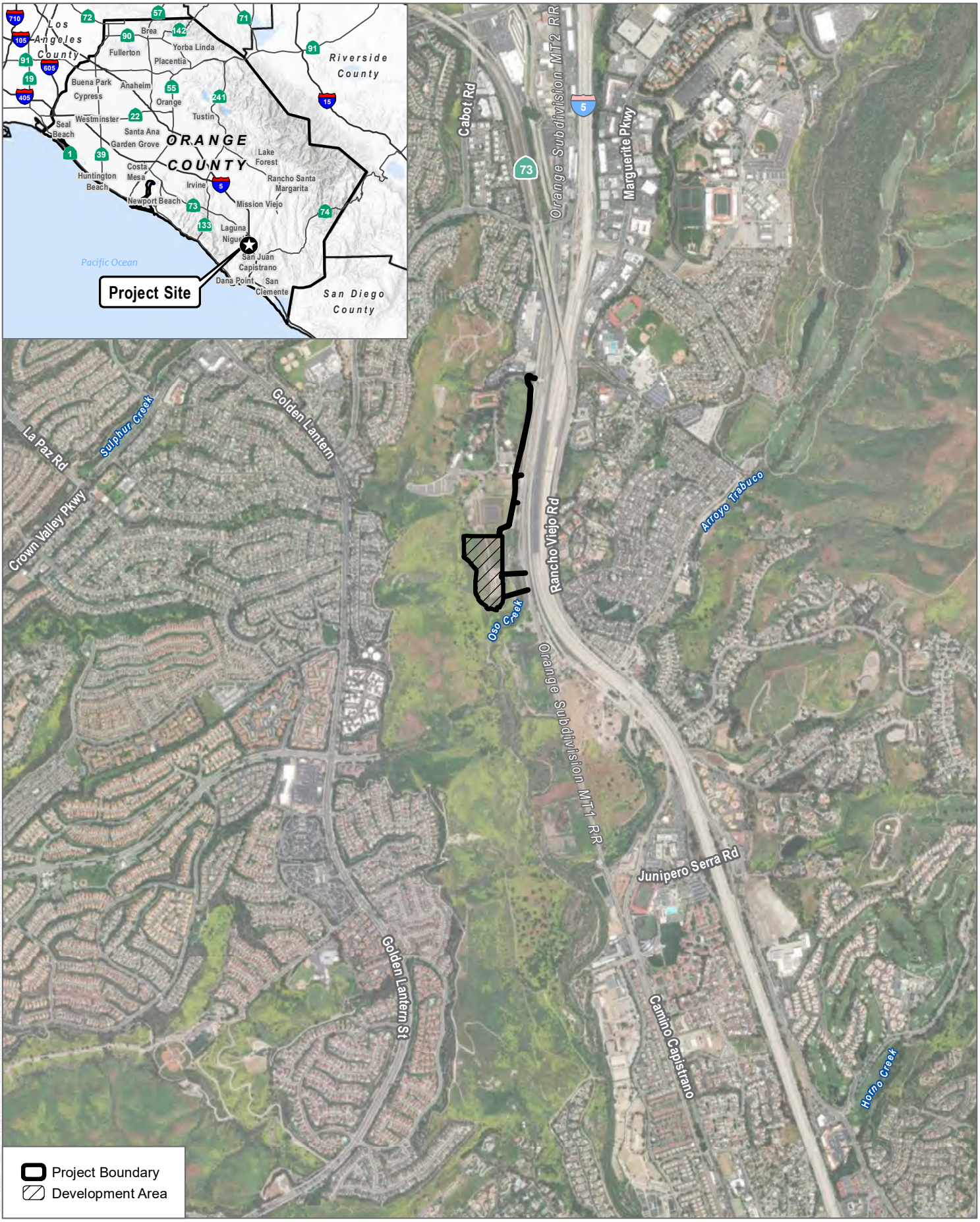
Attachment A

Figures



SOURCE: Esri World Imagery 2020

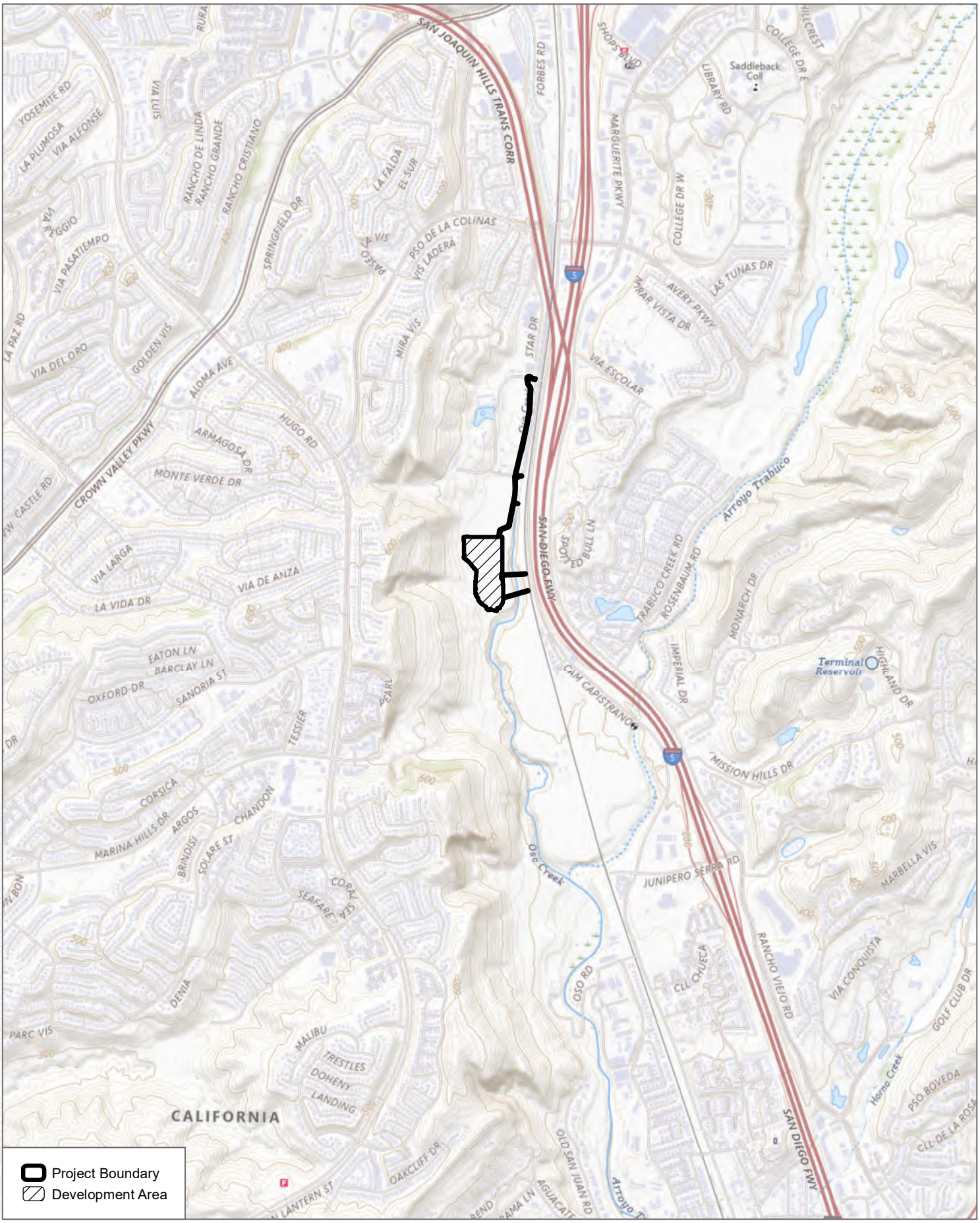
DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Compass Energy Storage Project



SOURCE: USGS Topo Series San Juan Capistrano Quadrangle

DUDEK

0 1,000 2,000 Feet

FIGURE 2

Local Topographic Map

Compass Energy Storage Project

SOURCE: Esri World Imagery 2023; USDA 2023; Open Street Map 2023

DUDEK

0 295 590 Feet

FIGURE 3

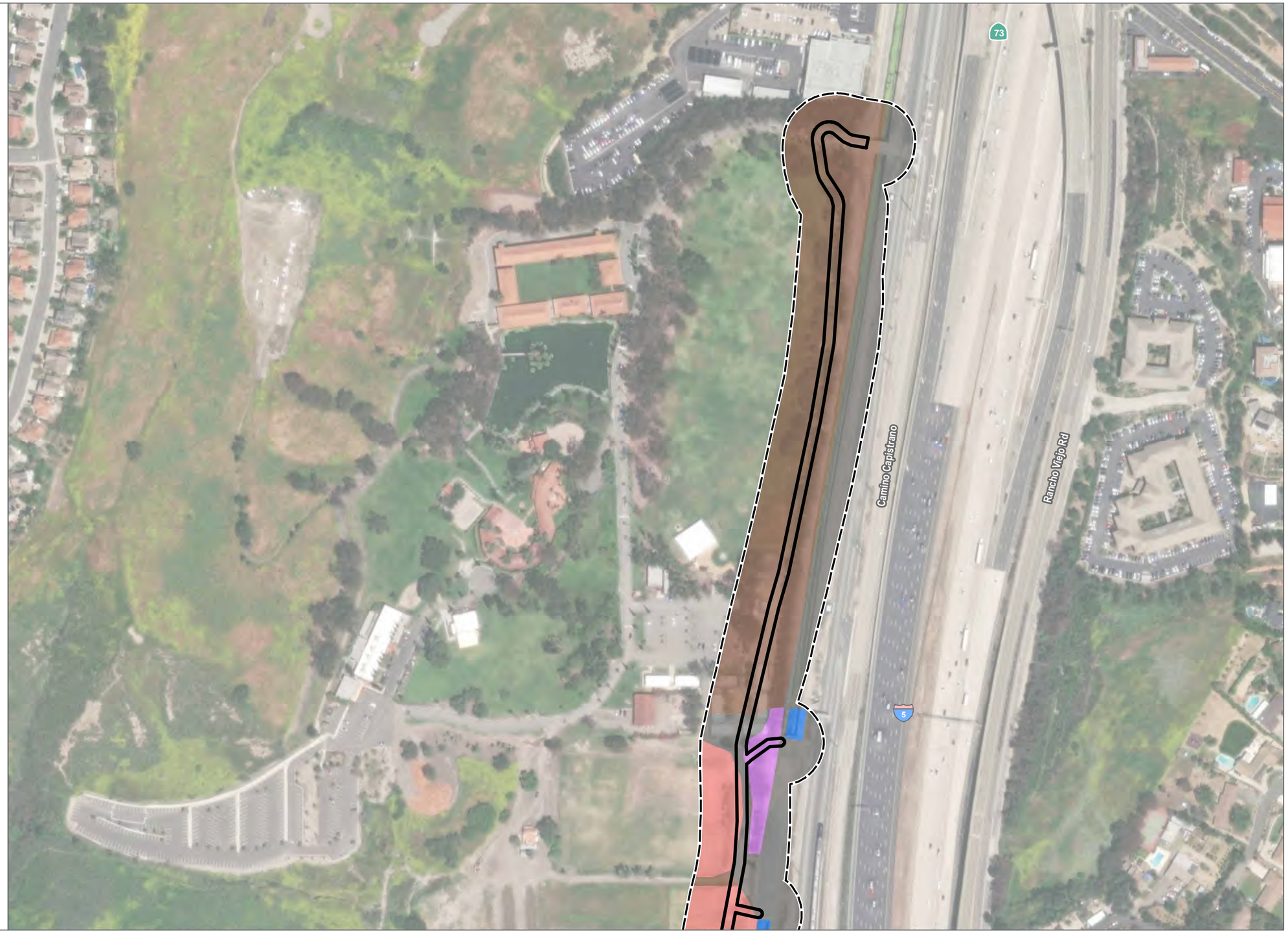
Soils

Compass Energy Storage Project

Project Boundary
Survey Area

Vegetation Communities and Land Covers

- Upland Mustards
- Disturbed Habitat
- General Agriculture
- Non-Vegetated Channel
- Ornamental
- Urban/Developed



SOURCE: Esri World Imagery 2023; Open Street Map 2023

DUDEK

0 125 250 Feet

FIGURE 4A

Biological Resources

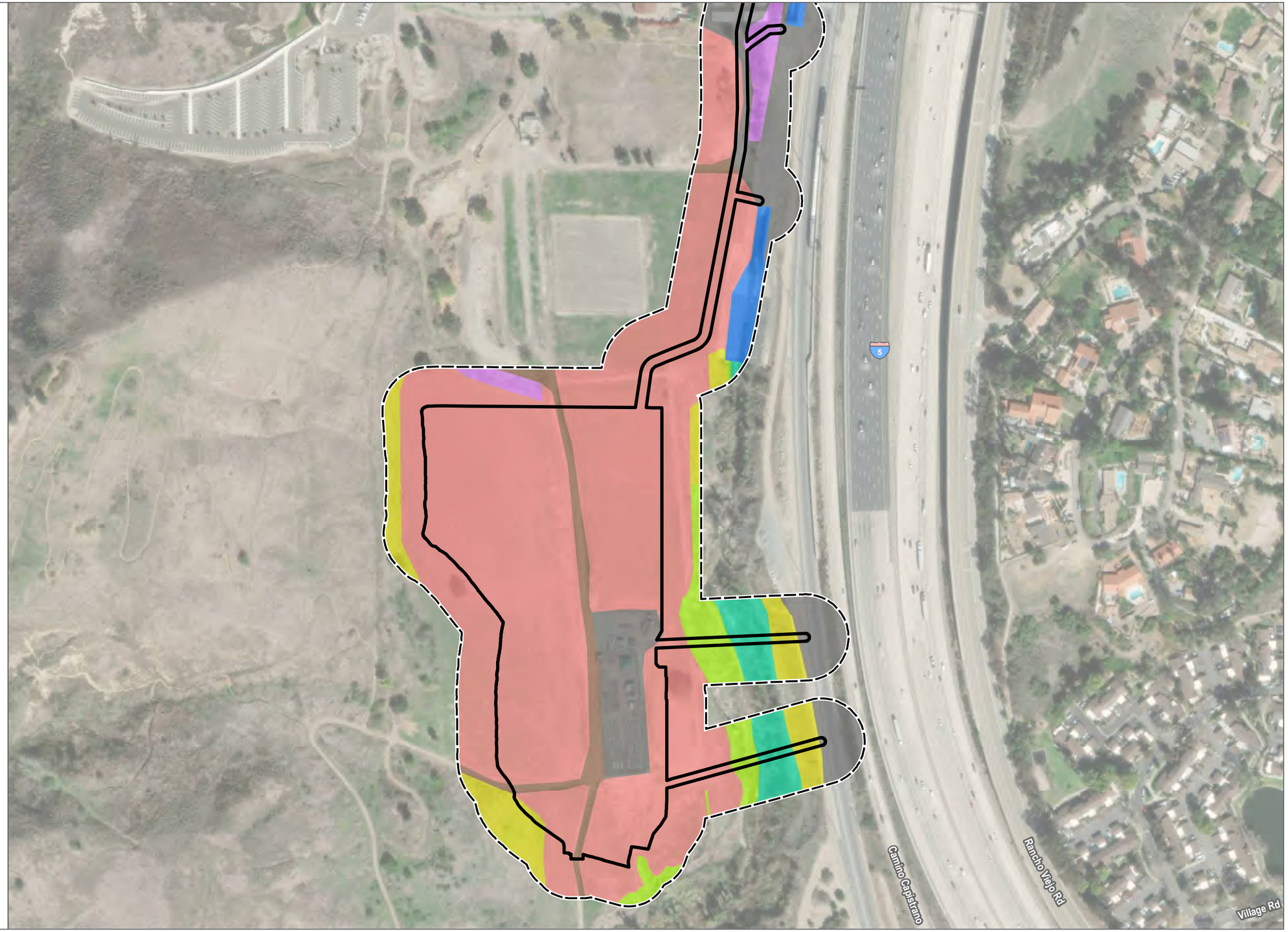
Compass Energy Storage Project

Project Boundary

Survey Area

Vegetation Communities and Land Covers

- Mulefat thickets
- Populus fremontii - Salix lasiolepis Association
- Upland Mustards
- Disturbed Habitat
- General Agriculture
- Non-Vegetated Channel
- Ornamental
- Urban/Developed



SOURCE: Esri World Imagery 2023; Open Street Map 2023

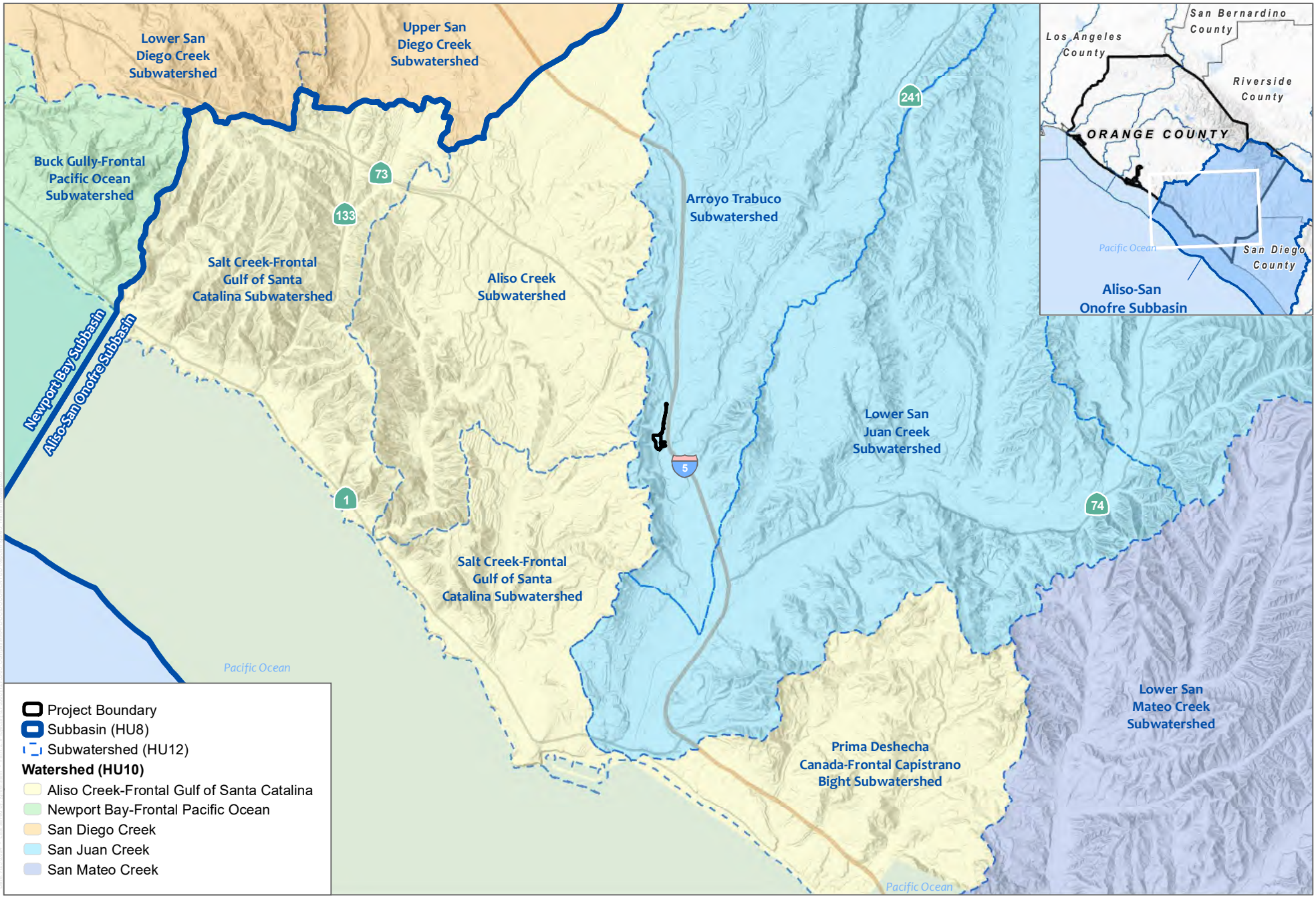
DUDEK

0 125 250 Feet

FIGURE 4B

Biological Resources

Compass Energy Storage Project



SOURCE: Esri Shaded Relief 2023; USGS 2023

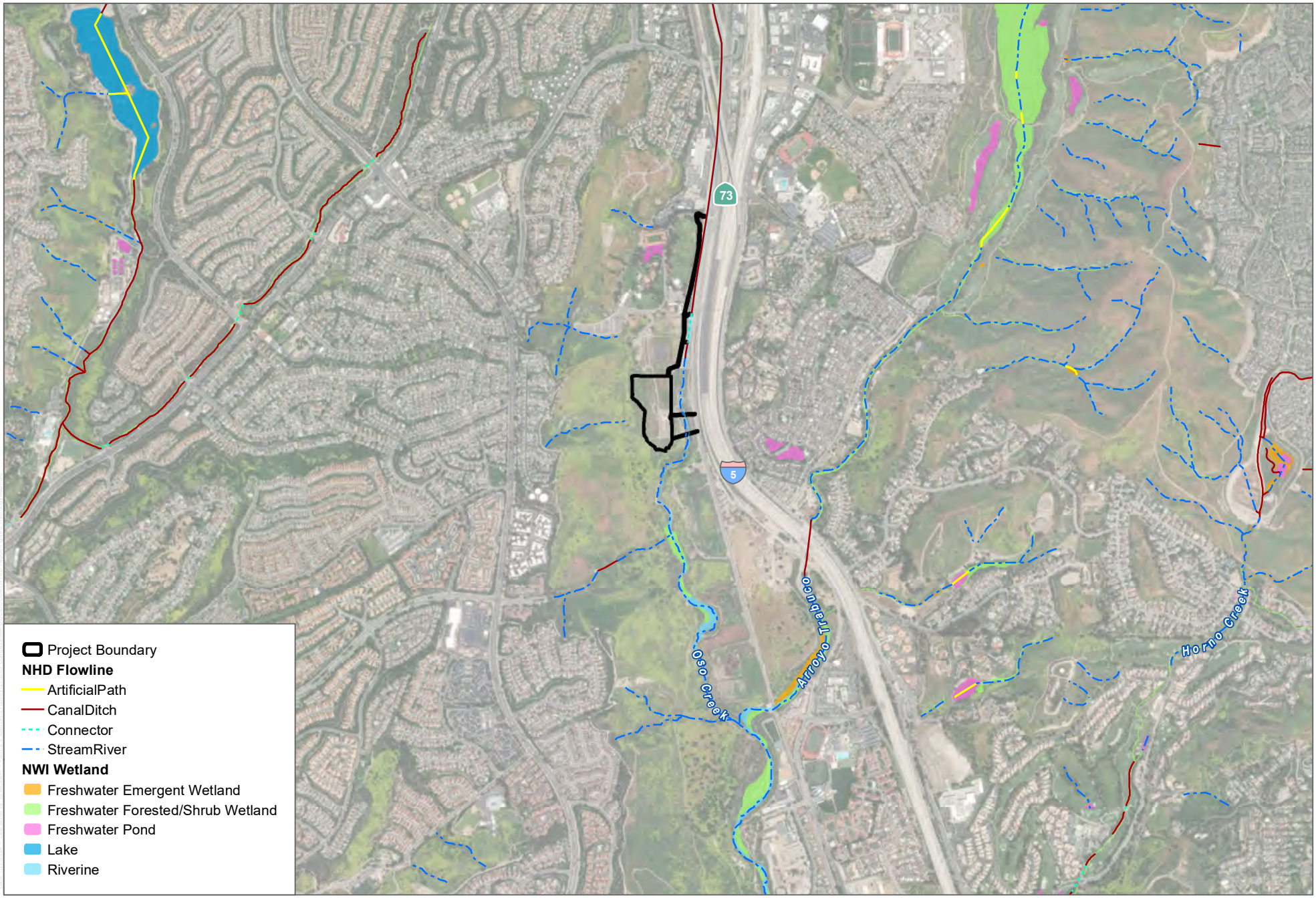
DUDEK

0 5,000 10,000 Feet

FIGURE 5

Watershed Map

Compass Energy Storage Project



SOURCE: Esri World Imagery 2023; USFWS NWI 2023; USGS NHD 2023

DUDEK

0 1,000 2,000 Feet

FIGURE 6

Hydrology Map

Compass Energy Storage Project

Project Boundary (14.54 acres)
Survey Area (39.17 acres)
Map Reference Point

Jurisdictional Features

Bank/Swale (CDFW) (0.93 acres)
OHWM (USACE, RWQCB, CDFW) (1.40 acres)
Bank Habitat

Vegetation Communities and Land Covers

AGR, General
DEV, Urban/Developed
DH, Disturbed Habitat
NVC, Non-Vegetated Channel
ORN, Ornamental

Created on Thursday, July 25, 2024
Made in accordance with the *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program*, as amended on February 10, 2016 by:
Jason Deters, Project Manager
Enforcement and Special Projects Unit
U.S. Army Corps of Engineers
South Pacific Division
Sacramento District, Regulatory Division
1325 J Street, Room 1350
Sacramento, California 95814-2922

Coordinate System: NAD 1983 State Plane Zone 5
Projection: Transverse Mercator
Datum: North American 1983
Vertical Datum: NAVD88, U.S. Feet
1 inch = 100 feet

SOURCE: Esri World Imagery 2023

DUDEK 0 125 250 Feet

FIGURE 7A
Aquatic Resources Delineation
Compass Energy Storage Project

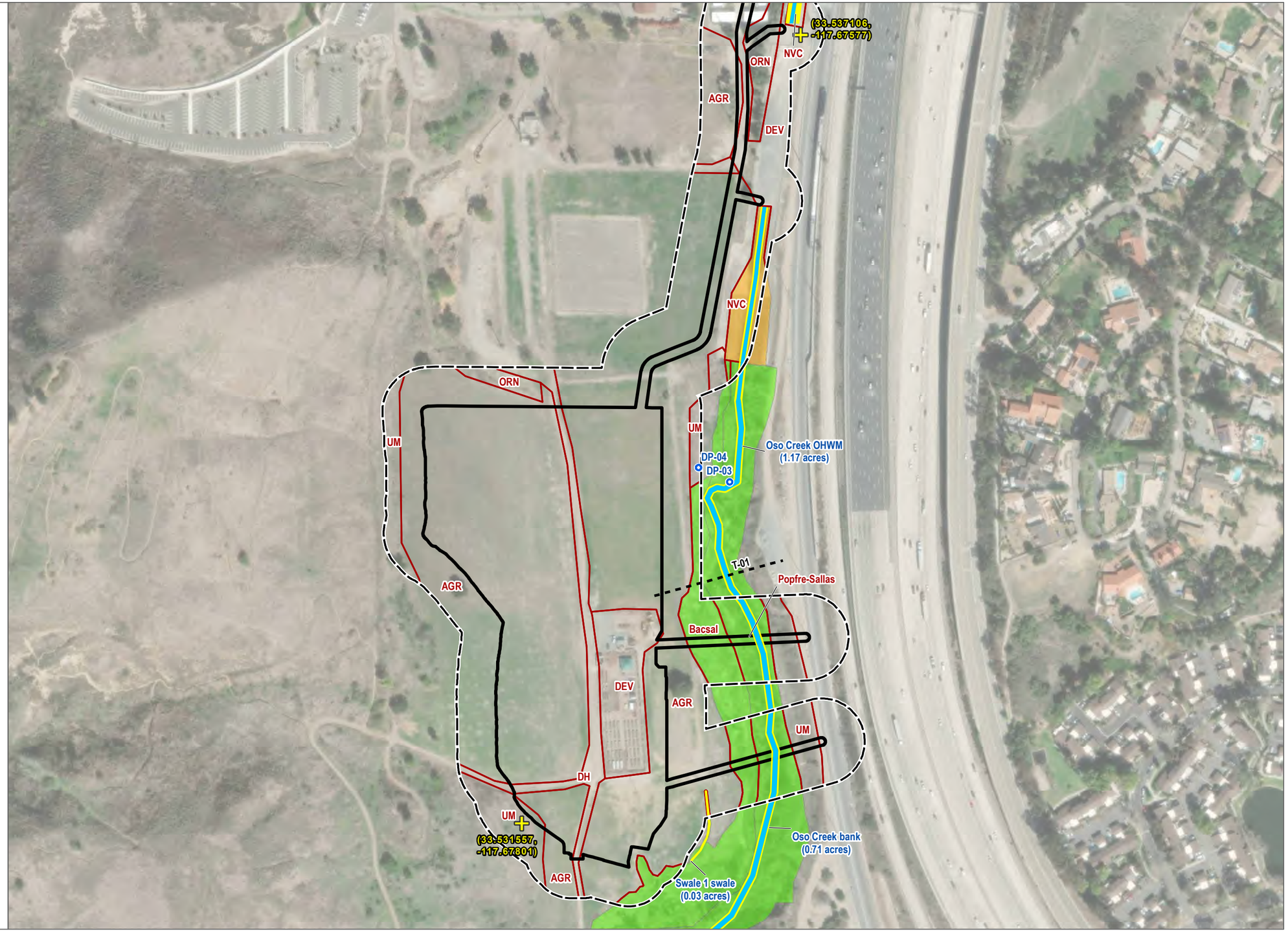
Project Boundary (14.54 acres)
Survey Area (39.17 acres)
Map Reference Point
Data Point
Transect

Jurisdictional Features

Bank/Swale (CDFW) (0.93 acres)
OHWM (USACE, RWQCB, CDFW) (1.40 acres)
Bank Habitat
CDFW Riparian Oso Creek (15.36 acres)

Vegetation Communities and Land Covers

AGR, General
Bacsal, Mulefat thickets
DEV, Urban/Developed
DH, Disturbed Habitat
NVC, Non-Vegetated Channel
ORN, Ornamental
Popfre-Sallas, Populus fremontii - Salix lasiolepis Association
UM, Upland Mustards



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Coordinate System: NAD 1983 State Plane Zone 5
Projection: Transverse Mercator
Datum: North American 1983
Vertical Datum: NAVD88, U.S. Feet
1 inch = 100 feet

SOURCE: Esri World Imagery 2023

DUDEK

0 125 250 Feet

FIGURE 7B
Aquatic Resources Delineation
Compass Energy Storage Project

Attachment B

Datasheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Captiva BESS City/County: San juan capistrano Sampling Date: 2021-03-11

Applicant/Owner: State: California Sampling Point: CPTV-DMA-DP-01

Investigator(s): DMA Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland, Depression Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): C 19 Lat: 33.5348206 Long: -117.6741809 Datum: WGS 84

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✔	**Is the Sampled Area within a Wetland?** Yes ____ No ✔
Hydric Soil Present?	Yes ____	No ✔	
Wetland Hydrology Present?	Yes ✔	No ____	

Remarks:

Some old Ag trees in area, area mostly dominated by shrub and herb species, sub dominant species include palm, mule fat, pampas grass, and oxalis understory. Besides a dirt road nearby, area is mostly unimpacted.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10x10 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus agrifolia	5	✔	NI
2.			
3.			
4.			
	5%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10x10 ft r)			
1. Conium maculatum	80	✔	FACW
2. Cortaderia jubata	5		FACU
3.			
4.			
5.			
	85%	= Total Cover	
Herb Stratum (Plot size: 10x10 ft r)			
1. Oxalis californica	70	✔	NI
2. Conium maculatum	25	✔	FACW
3. Silybum marianum	5		NI
4.			
5.			
6.			
7.			
8.			
	100%	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	105	x 2 =	210
FAC species	0	x 3 =	0
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	110 (A)		230 (B)

Prevalence Index = B/A = 2.1

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✔

Remarks:

Hydro veg in this area is dominated mostly by sub tree species.

SOIL

Sampling Point: CPTV-DMA-DP-01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 9	10YR 3/2	100					Clay Loam	Soils are saturated, likely from recent rain, no water table found, sample is one uniform layer
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Hard clay soils

Depth (inches): 9

Hydric Soil Present? Yes ____ No ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✔ Depth (inches): ____

Water Table Present? Yes ____ No ✔ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ✔ No ____ Depth (inches): 1

Wetland Hydrology Present? Yes ✔ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Point taken between two stream features in the riparian area they support, recent rains the previous night, ground is moist.

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Captiva BESS City/County: San juan capistrano Sampling Date: 2021-03-11

Applicant/Owner: State: California Sampling Point: CPTV-DMA-DP-02

Investigator(s): DMA Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland, Depression Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): Lat: 33.527097 Long: -117.678112 Datum: WGS 84

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✔ No ____ Hydric Soil Present? Yes ____ No ✔ Wetland Hydrology Present? Yes ✔ No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✔

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10x10 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	25	✔	FACW
2.			
3.			
4.			
	25%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10x10 ft r)			
1. Conium maculatum	70	✔	FACW
2.			
3.			FACU
4.			
5.			
	70%	= Total Cover	
Herb Stratum (Plot size: 10x10 ft r)			
1. Oxalis californica	70	✔	NI
2. Conium maculatum	25	✔	FACW
3. Silybum marianum	5		NI
4.			
5.			
6.			
7.			
8.			
	100%	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	120	x 2 =	240
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	120 (A)		240 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

✔ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No ____

Remarks:

Hydro veg in this area is dominated mostly by sub tree species, few willow in area, some new growth occuring

SOIL

Sampling Point: CPTV-DMA-DP-02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 10	10YR 3/3	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Hard soils

Depth (inches): 10

Hydric Soil Present? Yes ____ No ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ✔ Sediment Deposits (B2) (**Riverine**)
- ✔ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✔ Depth (inches): ____

Water Table Present? Yes ____ No ✔ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ✔ No ____ Depth (inches): 1

Wetland Hydrology Present? Yes ✔ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Point taken near stream feature, rain has occurred recently,

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Captiva BESS City/County: San juan capistrano Sampling Date: 2021-03-11

Applicant/Owner: State: California Sampling Point: CPTV-DMA-DP-03

Investigator(s): DMA Section, Township, Range:

Landform (hillslope, terrace, etc.): Riverine Local relief (concave, convex, none): Concave Slope (%): 25

Subregion (LRR): Lat: 33.533971 Long: -117.676311 Datum: WGS 84

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✔
Hydric Soil Present?	Yes ____	No ✔	
Wetland Hydrology Present?	Yes ✔	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10x10 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Baccharis salicifolia	40	✔	FAC
2. Salix lasiolepis	25	✔	FACW
3. Washingtonia robusta	15		FACW
4.			
	80%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10x10 ft r)			
1. Baccharis salicifolia	50	✔	FAC
2.			
3.			
4.			FACU
5.			
	50%	= Total Cover	
Herb Stratum (Plot size: 10x10 ft r)			
1. Rumex crispus	25	✔	FAC
2.			
3.			FACW
4.			
5.			
6.			
7.			
8.			
	25%	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 75.0 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	115	x 3 =	345
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	155 (A)		425 (B)

Prevalence Index = B/A = 2.7

Hydrophytic Vegetation Indicators:

✔ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No ____

Remarks:

Adventitious rooting in this area, point taken near edge of water

SOIL

Sampling Point: CPTV-DMA-DP-03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 5	10YR 4/2	100					Sandy Clay Loam	Soils are saturated, likely from recent rain, lots of organics in sample,
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Cobbles

Depth (inches): 6

Hydric Soil Present? Yes ____ No ✔

Remarks:

Despite proximity to creek, no hydric indicators were found. Difficult to dig given presence of cobbles and roots from surrounding veg

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ✔ Water Marks (B1) (**Riverine**)
- ✔ Sediment Deposits (B2) (**Riverine**)
- ✔ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✔ Depth (inches): ____

Water Table Present? Yes ____ No ✔ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ✔ No ____ Depth (inches): 1

Wetland Hydrology Present? Yes ✔ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Point taken adjacent to oso creek where water is flowing at or just below ordinary high levels.

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Captiva BESS City/County: San juan capistrano Sampling Date: 2021-03-11

Applicant/Owner: State: California Sampling Point: CPTV-DMA-DP-04

Investigator(s): DMA Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): Lat: 33.534067 Long: -117.676572 Datum: WGS 84

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✔	**Is the Sampled Area within a Wetland?** Yes ____ No ✔
Hydric Soil Present?	Yes ____	No ✔	
Wetland Hydrology Present?	Yes ____	No ✔	

Remarks:

Veg maintenance occurs near this area, ag areas are nearby but this location doesn't seem to support any actual ag activity. Despite this, mowing and other management likely occurs here. Very slight grade which lead to slope which becomes steeper in riparian areas

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10x10 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.	15	✔	FACW
2.			
3.			FAC
4.			
	15%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10x10 ft r)			
1. Baccharis salicifolia	15	✔	FAC
2.			
3.			
4.			
5.			
	15%	= Total Cover	
Herb Stratum (Plot size: 10x10 ft r)			
1. Brassica nigra	25	✔	NI
2. Erodium cicutarium	25	✔	NI
3. Amsinckia menziesii	15	✔	NI
4. Lactuca serriola	10		FACU
5.			
6.			
7.			
8.			
	75%	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 25.0 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	15	x 3 =	45
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	40 (A)		115 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✔

Remarks:

Upland area

SOIL

Sampling Point: CPTV-DMA-DP-04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 5/3	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Hard soils

Depth (inches): 4

Hydric Soil Present? Yes _____ No ✔

Remarks:

Upland area

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Upland, no evidence of flow in this area

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Captiva BESS City/County: San juan capistrano Sampling Date: 2021-04-08

Applicant/Owner: State: California Sampling Point: CPTV-DMA-DP-05

Investigator(s): DMA Section, Township, Range:

Landform (hillslope, terrace, etc.): Riverine Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): C 19 Lat: 33.526707 Long: -117.679008 Datum: WGS 84

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✔
Hydric Soil Present?	Yes ____	No ✔	
Wetland Hydrology Present?	Yes ✔	No ____	

Remarks:

Point taken in forested riparian habitat

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10x10 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	60	✔	FACW
2.			
3.			
4.			
	60%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10x10 ft r)			
1. Schinus terebinthifolia	25	✔	FAC
2. Persea palustris	15	✔	NI
3. Conium maculatum	5		FACW
4.			
5.			
	45%	= Total Cover	
Herb Stratum (Plot size: 10x10 ft r)			
1. Oxalis californica	65	✔	NI
2. Cyperus eragrostis	15		FACW
3. Conium maculatum	10		FACW
4.			
5.			
6.			
7.			
8.			
	90%	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 10.0 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		255 (B)

Prevalence Index = B/A = 2.2

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No ____

Remarks:

Multiple hydrophytic species found in this riparian area, ground is moist from recent rains, no OBL species found

SOIL

Sampling Point: CPTV-DMA-DP-05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 4	10YR 5/2	100					Silty Clay	
4 - 10	10YR 5/3	90					Sandy Clay Loam	Some mineral material felt in sample, some gravel and organic materials
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Roots and cobbles

Depth (inches): 10

Hydric Soil Present? Yes _____ No ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ✔ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ✔ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✔ No _____ Depth (inches): 1

Wetland Hydrology Present? Yes ✔ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Point taken near branching area of stream, rain has occurred recently, water is not flowing in some places, some standing water visible in streambed

Remarks:

Attachment C

Site Photographs

<table>
<tr>
<td> 
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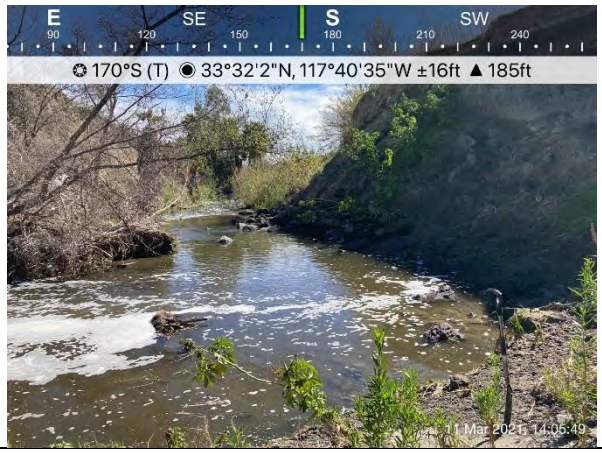
<tr>
<td>Photo 1: View of Oso Creek flowing out of culvert into non-vegetated channel at northeast corner of site.</td>
<td>Photo 2: View looking upstream Oso Creek towards non-vegetated channel.</td>
</tr>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>Photo 3: Another view of Oso Creek channel, looking upstream from western bank.</td>
<td>Photo 4: View of Oso Creek taken from western bank, looking downstream.</td>
</tr>
</table>

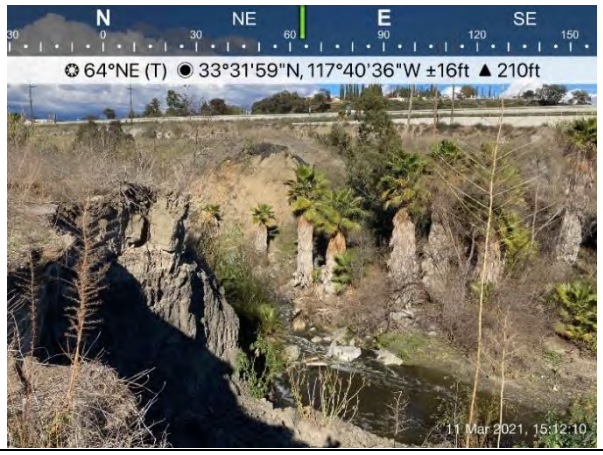


Photo 5: View of Oso Creek, taken from top of steep bank, riparian area in view.

Photo 6: View of area around DP-03.

Photo 7: View of area around DP-04.

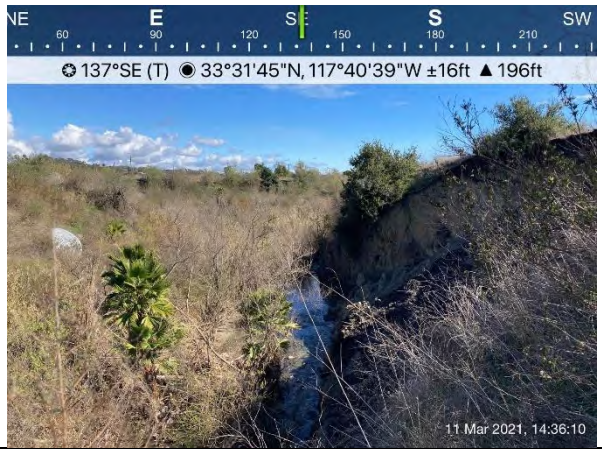


Photo 8: View of riparian area and steep walls that characterize Oso Creek.

Photo 9: Additional view of riparian area and steep walls around Oso Creek.

Photo 10: View of Stream 1 coming down onto site from adjacent slope. Concrete Streambed shown.

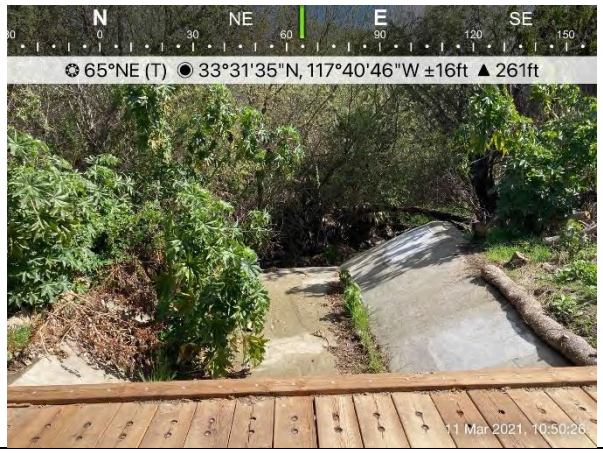


Photo 11: View of Stream 1 passing beneath pedestrian and flowing onto site.

Photo 12: View of thick riparian vegetation around Stream 1.

	
Photo 13: View of incised area of Stream 1 channel as it flows through riparian area.	**Photo 14:** View of heavily incised area where Stream 1 falls over vertical drop before flowing towards Oso Creek.
	
Photo 15: View of branch of Stream 1 that dead ends at dirt road.	**Photo 16:** View of poison hemlock occupying portion of riparian area near Stream 1.

	
Photo 17: View of area around DP-01.	**Photo 18:** View of area around DP-02.
	
Photo 19: View of area around DP-02.	

Attachment D

Species Compendium

Plants

Eudicots

Vascular Species

ANACARDIACEAE—SUMAC FAMILY

* *Rhus integrifolia*—lemonade berry
* *Schinus mole*—Peruvian pepper tree
* *Schinus terebinthifolius*—Brazilian pepper tree

APIACEAE—CARROT FAMILY

* *Conium maculatum*—poison hemlock

ASTERACEAE—SUNFLOWER FAMILY

* *Artemisia californica*—California sagebrush
* *Baccharis salicifolia*—mulefat
* *Baccharis pilularis*—coyote brush
* *Centaurea melitensis*—Tocalote
* *Cynara cardunculus*—artichoke thistle
* *Erigeron* sp.—horseweed
* *Helianthus annuus*—common sunflower
* *Heterotheca grandiflora*—telegraphweed
* *Isocoma menziesii—Menzies'* goldenbush
* *Lactuca serriola*—prickly lettuce
* *Xanthium strumarium*—cocklebur

BORAGINACEAE-FORGET ME NOT FAMILY

* *Brassica nigra*—black mustard
* *Amsinckia menziesii* — fiddleneck

BRASSICACEAE—MUSTARD FAMILY

* *Brassica nigra*— black mustard
* *Sisybrium irio*—London rocket

EUPHORBIACEAE—SPURGE FAMILY

* *Croton setiger*—turkey mullein
* *Ricinus communis*—castorbean

FABACEAE—LEGUME FAMILY

* *Trifolium repens*—white clover
* *Melitlotus indicus*—sweetclover

GERANIACEAE—GERANIUM FAMILY

* *Erodium cicutarium*—red stemmed filaree

OXALIDACEAE—WOOD SORREL FAMILY

* *Oxalis californica*—California wood sorrel

POLYGONACEAE—BUCKWHEAT FAMILY

* *Eriogonum fasciculatum*—California buckwheat

ROSACEAE—ROSE FAMILY

* *Rosa californica*—California wild rose
* *Rubus ursinus*—California blackberry

RUBIACEAE—COFFEE FAMILY

* *Gallium* sp.—cleavers

SALICACEAE—WILLOW FAMILY

* *Populus fremontii*—Fremont's cottonwood
* *Salix lasiolepis*—arroyo willow
* *Salix lucida*—Pacific willow

SOLANACEAE—NIGHTSHADE FAMILY

* *Nicotiana glauca*—tree tobacco

TAMARICACEAE—TAMARISK FAMILY

* *Tamarix ramosissima*—French tamarisk

Monocots

ARECACEAE—PALM FAMILY

* *Washingtonia robusta*—Washington fan palm

CYPERACEAE—GRAMINOID FAMILY

* *Cyperus eragrostis*—Washington fan palm

POACEAE—GRASS FAMILY

* *Arundo donax*—giant reed
* *Avena fatua*—wildoats
* *Cortaderia selloana*—pampas grass

* *Bromus diandrus*—ripgut brome
* *Bromus hordeaceus*—soft chess
* *Bromus madritensis*—red brome
* *Echinochloa crus galli*—barnyard grass
* *Festuca perennis*—Italian rye grass
* *Polypogon monspeliensis*—Annual beard grass
* *Sorghum halpense*—Johnson grass

Wildlife

Bird

Crow and Ravens

CORVIDAE—CROW, RAVENS, AND ALLIES

Corvux corax—common raven

Finches

FRINGILLIDAE—FRINGILLINE AND CARDUELINE FINCHES AND ALLIES

Haemorhous mexicanus—house finch
Spinus psaltria—lesser goldfinch

Flycatchers

TYRANNIDAE—TYRANT FLYCATCHERS

Sayornis nigricans—black phoebe
Tyrannus vociferans—Cassin's kingbird

Hawks

ACCIPITRIDAE—HAWKS, KITES, EAGLES, AND ALLIES

Buteo jamaicensis—red-tailed hawk
Buteo lineatus—red-shouldered hawk

Hummingbirds

TROCHILIDAE—HUMMINGBIRDS

Calypte anna—Anna's hummingbird

New World Vultures

CATHARTIDAE—NEW WORLD VULTURES

Cathartes aura—turkey vulture

New World Warblers

PARULIDAE—NEW WORLD WARBLER

Setophaga palmarum—palm warbler

Pigeons and Doves

COLUMBIDAE—PIGEONS AND DOVES

Columba livia—rock pigeon

Zenaida macroura—mourning dove

Sparrows

PASSERIDAE—SPARROWS

Passer dosmesticus—house sparrow

Zenaida macroura—mourning dove

Mammals

Rabbits

LEPORDIAE—RABBITS

Sylvilagus bachmani—brush rabbit

Squirrels

SCIURIDAE—SQUIRRELS

Spermophilus (Otospermophilus) *beecheyi*—California ground squirrel

* signifies introduced (non-native) species

Attachment E

Aquatic Resources Upload Sheet
(files submitted separately)

Attachment B.1

Jurisdictional Delineation and Bat Memo (2025)

DUDEK
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MISSION VIEJO, CALIFORNIA 92691
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MEMORANDUM

To:	Renee Robin, Compass Energy Storage LLC
From:	Tommy Molioo, Senior Biologist, Dudek
Subject:	Compass BESS Project – Updated Jurisdictional Delineation and Focused Bat Survey Results
Date:	September 26, 2025
cc:	Erin Phillips, Project Manager, Dudek
Attachments:	A – Figures 1 and 2 B – Photo Log

This memorandum documents the methods and results of an updated jurisdictional delineation and focused bat survey at the Compass Battery Energy Storage System Project (project). The updated jurisdictional delineation and bat survey was conducted at the request of the California Energy Commission (CEC) due to the increased project footprint within Oso Creek for slope stabilization, and the addition of a proposed access road along the northeastern project boundary.

1 Site Description

The project is located on the grounds of the Saddleback Church in San Juan Capistrano, within a valley between the Santa Ana Mountains to the northeast and the Laguna Woods to the west, at an elevation of approximately 185 to 210 feet above mean sea level. The project site contains existing development associated with the church grounds, including agricultural land and a pollinator garden, and undeveloped lands including non-native grassland and upland coastal sage scrub. The eastern boundary of the project is bordered by Oso Creek, which supports mature riparian woodland and flowing water. Vegetation communities and land covers on the project include Fremont cottonwood (*Populus fremontii)*–arroyo willow *(Salix lasiolepis)* riparian woodland, mulefat thickets, ornamental vegetation, upland mustards, urban/developed, and agricultural lands.

2 Bat Habitat Requirements

Bat species in Southern California are insectivores that roost in a variety of habitats that contain crevices or foliage for cover, and forage for insects on the wing or by gleaning off trees or water surfaces. Suitable roosting habitat typically contains adequate cover and temperature to support multiple individuals of bats that either occur in anthropogenic (e.g. buildings, bridges, mines, etc.) or natural features (e.g. trees, caves, cliff faces), within close proximity to a fresh water source. Adjacent water sources and any other areas that provide habitat for flying insects are required for bat foraging. Bats will also use additional night roosts that provide cover for resting during nightly foraging activities. Additionally, areas with night lighting may also provide foraging opportunities for bats as they attract flying insects like moths.

3 Methods

Jurisdictional Delineation Update

Prior to the field delineation update, Dudek's biologists reviewed the existing Aquatic Resources Delineation Report prepared by Dudek in 2021. The updated delineation survey was recommended to account for any potential changes to the jurisdictional limits of Oso Creek due to significant erosion observed on the western bank and/or changes to the definition of Waters of the U.S. under Section 404 of the Clean Water Act. Two Dudek biologists conducted an updated delineation survey to determine if Oso Creek displays any changes in regulatory boundaries for the United States Army Corps of Engineers (USACE) and California Department of Fish and Wildlife (CDFW). Dudek's biologists walked the previously mapped limits of USACE and CDFW jurisdiction searching for signs of changes in the Ordinary High Water Mark (OHWM), or outer channel bank width, as well as any potential new wetland areas. Besides physical changes to Oso Creek, Dudek's biologists also analyzed if potential regulatory definition changes have an effect on the determination of regulatory waters boundaries on the site. Any changes observed were mapped in the field using a handheld GPS antenna with sub-meter accuracy and a mobile field GIS application on an iPhone. Field mapping was digitized offsite using GIS software to identify and quantify any changes to Oso Creek regulatory limits (Attachment A: Figure 1) .

Bat Survey

The bat survey was conducted by Senior Bat Biologist Tommy Molioo on the evening of September 1, 2025, from the hours of 6:00pm to 10:00pm. The survey consisted of a roost assessment, emergence survey, and acoustic echolocation detection. The survey focused on suitable habitat within the project site which primarily includes the riparian habitat within Oso Creek, the eucalyptus and palm trees located along the northeastern project boundary, and the various buildings associated with the church. The roost assessment included a daytime visual survey of all suitable roosting habitat to determine if any sign of active roosting is present, due to the presence of staining and guano piles. Additionally, any areas that provide ingress/egress for roosting bat emergence were closely examined. The locations of any potential roost locations were noted for further examination during the emergence survey and acoustic monitoring.

The emergence survey was conducted at dusk and consisted of visually observing potential roosts for the emergence of bats for foraging. Bats such as Brazilian free-tailed bat (*Tadarida brasiliensis*) will emerge from roosts up to 30 minutes before sunset and are observable silhouetted against the evening sky. Other bats such as California myotis (*Myotis californicus*) will emerge later into the evening and therefore, emergence observation was conducted throughout the survey period.

To aid in emergence detection and species determination, active and passive echolocation monitoring was conducted. A Pettersen M500 microphone attached to a laptop running Sonobat Live software was deployed throughout the night during the emergence survey to actively detect bats emerging and foraging on the project site. Additionally, five Wildlife Acoustics SM4 full-spectrum bat detectors were deployed throughout the eastern portion of the project site to passively detect and record bats flying along Oso Creek and the rows of trees along the northeastern project boundary. The passive acoustic detectors were deployed for 4 consecutive nights and recorded echolocation calls from 30 minutes prior to sunset to 30 minutes after sunrise in order to detect bats when they are most active throughout the night. The detectors were placed in small plastic lockable bins with an ultrasonic

microphone attached to the top of a 10-foot pole, deployed on the first night of surveys and retrieved the morning after the fourth night (Attachment B: Photo Log). The detector deployment locations are depicted on Attachment A: Figure 2. The recorded calls were then analyzed off site using Sonobat 4 software with automated call classification. Any questionable, ambiguous or incomplete calls were manually vetted by Dudek's senior bat biologist.

3 Results

Jurisdictional Delineation Update

The updated delineation survey determined the potentially jurisdictional limits of Oso Creek for USACE and the Regional Water Quality Control Board (RWQCB), for non-wetland waters of the U.S., are the same as previously mapped in 2021. The width of the OHWM is the same as previously measured, taking into account the new OHWM datasheet to define the observable boundaries of potential USACE jurisdiction. Additionally, Oso Creek continues to flow relatively permanently through the project site and survey area and continues to connect downstream with the Pacific Ocean. Therefore, USACE and RWQCB jurisdiction within Oso Creek has not changed from previous mapping.

However, the potential limits of CDFW jurisdiction have changed due to a significant amount of erosion on the upper west bank of Oso Creek. Approximately 0.50 acre (850 linear feet) of erosion has occurred on the bank which has resulted in a near vertical cliff face and an approximate 20-foot drop to the channel bottom (Attachment A: Figure 1. Based on observations and mapping from 2021, this equates to an erosion rate of approximately 11.75 feet per year. Which has resulted in a current total of 16.59 acres of potential CDFW jurisdiction mapped within the study area.

Lastly, no new or additional wetlands were found on the study area during the delineation update, and the artificial pond to the northwest of the study area remains intact.

Focused Bat Survey

The roost assessment determined there is suitable roosting habitat for foliage roosting species within the riparian habitat associated with Oso Creek, and the Eucalyptus and fan palm trees located along the northeastern project boundary. Additionally, some suitable roosting habitat occurs within the various buildings on site, however the potential for these buildings to support an active roost is low due to the amount of active use. While the site contains suitable roosting habitat, no sign of previous or active roosting was observed on site. There were no crevices with staining (i.e. bodily secretions) or guano piles observed on the ground beneath a roost. Therefore, there is no active bat roosting on site.

The active acoustic monitoring and passive acoustic monitoring passes support the determination there is a lack of active bat roosting and only foraging activity was observed. The active acoustic monitoring during the roost assessment and emergence survey resulted in 36 files recorded. Of those 36 files, only 14 were attributed to and identified as a bat echolocation call; which is a relatively low number, indicative of foraging as opposed to bats emerging from a roost. The only bat detected during active monitoring include the common Brazilian free-tailed bat (14 passes). Passive acoustic monitoring consisted of deploying five full-spectrum detectors recording for approximately 10 hours each night, for a total of approximately 40 hours of detection time per detector. The passive acoustic detection resulted in 3,443 recorded files, of which 1,514 files were attributed to and identified as bat

calls to the species level. The recording of just over 1,500 bat calls from five detectors over a four-night period indicates a bat roost is not present within the project site, as an active bat roost can produce several thousand recorded calls in one night. Additionally, the number of calls recorded does not correspond to the number of individual bats present as one bat can record several calls during one pass.

As depicted in Table 1 below, the acoustic monitoring effort detected four bat species: Brazilian free-tailed bat, Yuma myotis (*Myotis yumanensis*), California myotis (*Myotis californicus*), and western red bat (*Lasiurus blossevillii*). Western red bat is listed as a California Species of Special Concern and is present on site in low numbers (8 bat calls). This species is known to roost within under the exfoliating bark of gum (*Eucalyptus* sp.) trees alms, typical of those that occur on the project site (i.e. *Eucalyptus globulus*).

Table 1. Bat Survey Results

Scientific Name	Common Name	Listing Status	Number of Bat Calls Identified
Tadarida brasiliensis	Brazilian free-tailed bat	-	1,289
Myotis yumanensis	Yuma myotis	-	213
Lasiurus blossevillii	Western red bat	SSC	8
Myotis californicus	California myotis	-	4

4 Conclusion

The results of the updated jurisdictional delineation determined that jurisdictional limits for USACE and RWQCB are the same as previously mapped, however, an additional approximately 0.50 acre of CDFW jurisdiction has been created due to significant erosion on the western bank of Oso Creek. Project activities that occur within the jurisdictional limits of Oso Creek will require regulatory agency permitting. Since the project is being processed by the California Energy Commission (CEC) through the AB 205 process, the Lake and Streambed Alteration Agreement required for impacts would be processed in the project's AB 205 application as opposed through CDFW under Section 1600 et seq. of California Fish and Game Code.

The focused bat survey determined that while suitable roosting and foraging habitat exists on the project site for bats, there is currently no active roosting on site. The bats observed and detected on site are foraging nightly through the site but are likely roosting in off site areas. The majority of bats detected on site are common species, however, the western red bat is a California SSC and impacts to maternity roosting habitat would be considered significant under CEQA. Therefore, the project should avoid impacts to suitable foliage roosting habitat during the maternity roosting season of March through August. If impacts to suitable roosting habitat must be impacted during the roosting season, a pre-construction clearance survey should be conducted prior to the impact. If roosting bats are found, the roost must first be excluded outside of the maternity roosting season to ensure roosting bats are evicted from the site and will not be impacted.

Attachment A

Figures

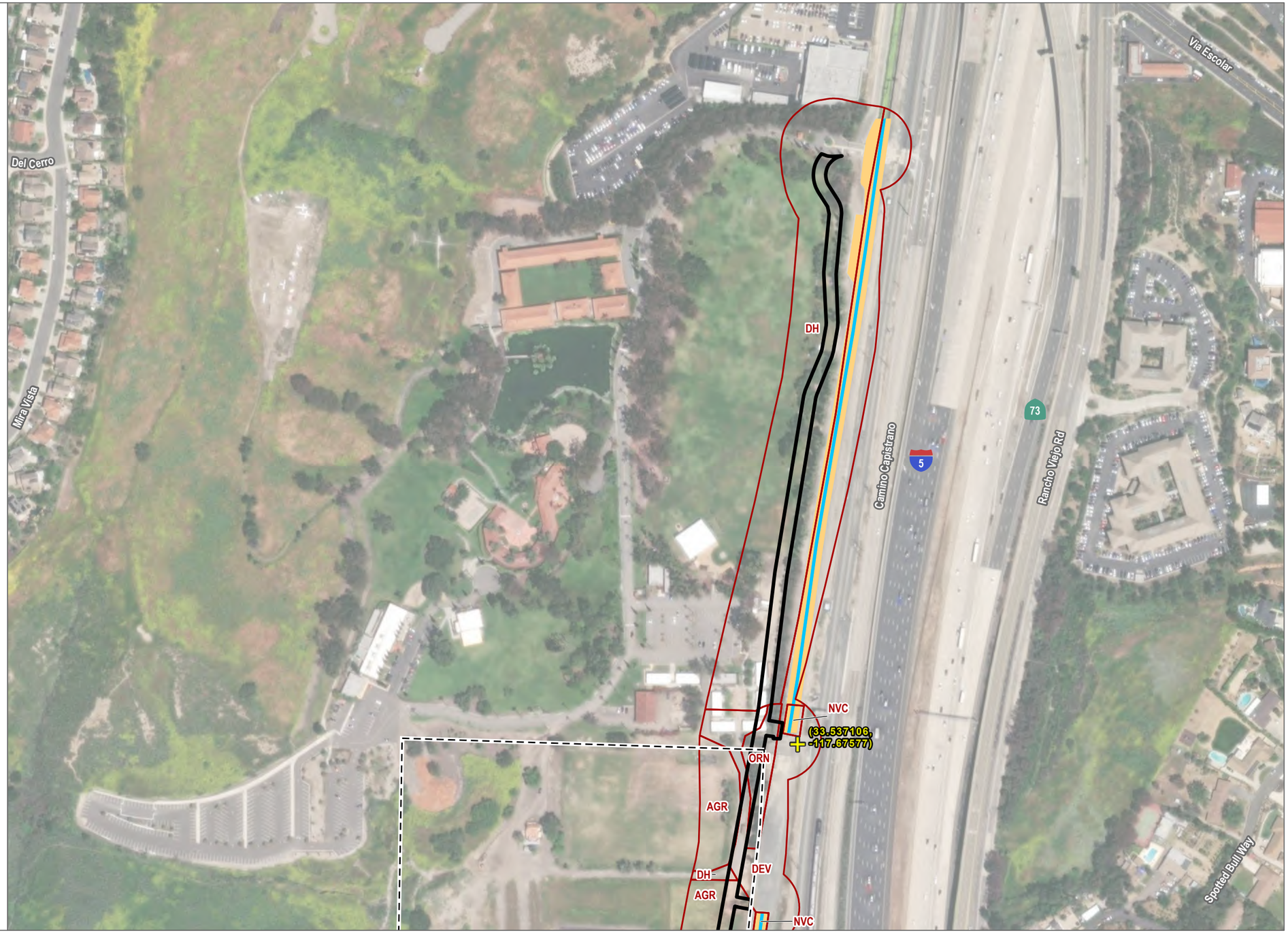
Project Boundary (13.28 acres)
Parcel B1
Map Reference Point

Potentially Jurisdictional Features

OHWM (USACE,RWQCB,CDFW) (1.77-acres)
Bank Habitat (CDFW) (2.47-acres)

Vegetation Communities and Land Covers

AGR, General Agriculture
DEV, Urban/Developed
DH, Disturbed Habitat
NVC, Non-Vegetated Channel
ORN, Ornamental



Created on Tuesday, September 30, 2025
Made in accordance with the *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program*, as amended on February 10, 2016 by:
Jason Deters, Project Manager
Enforcement and Special Projects Unit
U.S. Army Corps of Engineers
South Pacific Division
Sacramento District, Regulatory Division
1325 J Street, Room 1350
Sacramento, California 95814-2922

Coordinate System: NAD 1983 State Plane Zone 5
Projection: Transverse Mercator
Datum: North American 1983
Vertical Datum: NAVD88, U.S. Feet
1 inch = 100 feet

SOURCE: Maxar 2023

DUDEK

0 130 260 Feet

FIGURE 1A
Updated Jurisdictional Delineation
Compass Energy Storage Project

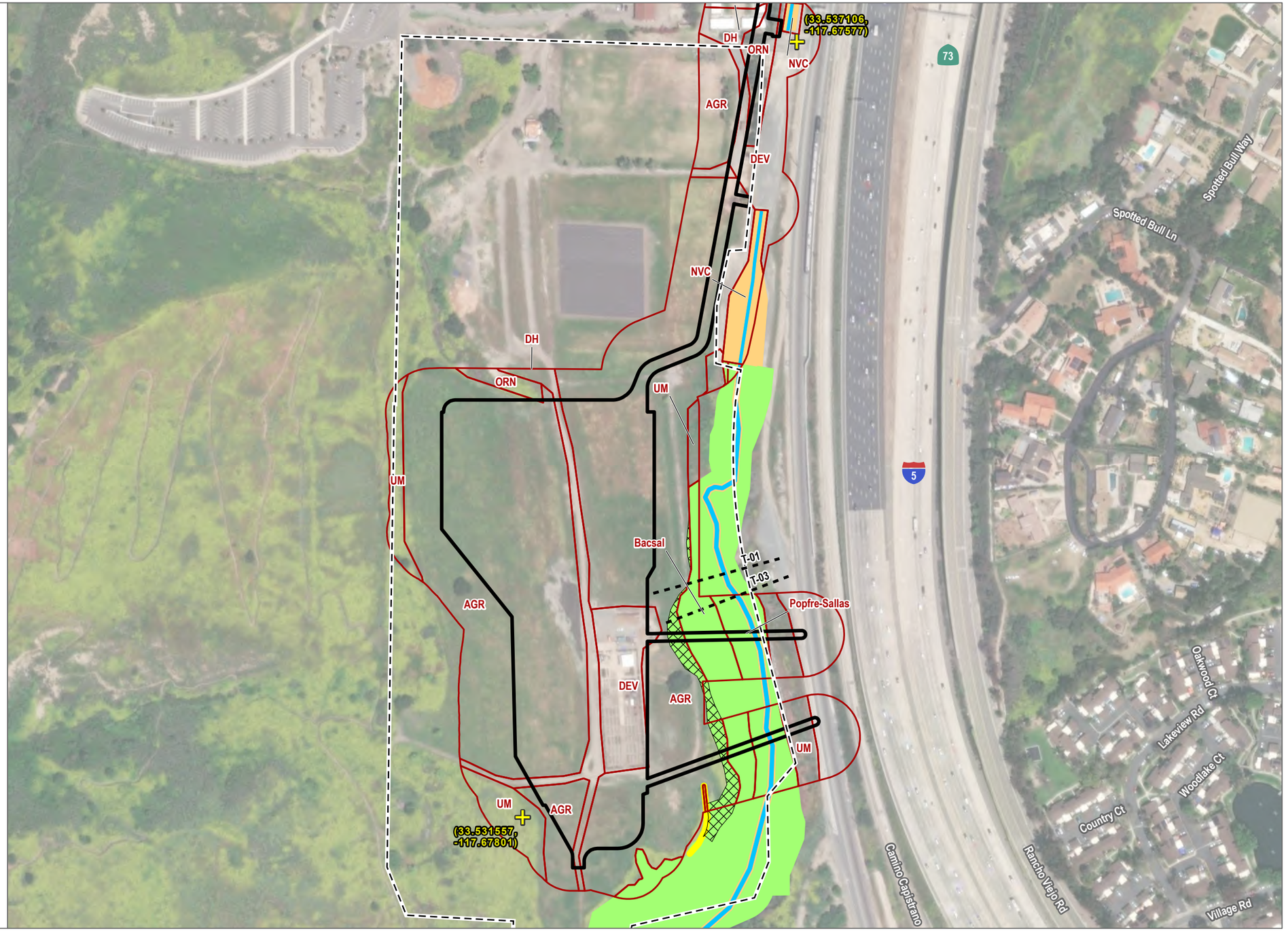
- Project Boundary (13.28 acres)
- Parcel B1
- Map Reference Point
- Transect
- Erosion Area (0.50 acres, 850 linear feet)

Potentially Jurisdictional Features

- OHWM (USACE,RWQCB,CDFW) (1.77-acres)
- Bank Habitat (CDFW) (2.47-acres)
- Riparian Habitat (CDFW) (16.59-acres)
- Swale (0.03-acres)

Vegetation Communities and Land Covers

- AGR, General Agriculture
- Bacsal, Mulefat thickets
- DEV, Urban/Developed
- DH, Disturbed Habitat
- NVC, Non-Vegetated Channel
- ORN, Ornamental
- Popfre-Sallas, Populus fremontii - Salix lasiolepis Association
- UM, Upland Mustards



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Vertical Datum: NAVD88, U.S. Feet
1 inch = 100 feet

SOURCE: Maxar 2023

DUDEK

0 130 260 Feet

FIGURE 1B

Updated Jurisdictional Delineation

Compass Energy Storage Project

- Project Boundary (13.28 acres)
- Parcel B1
- Map Reference Point
- Transect
- Erosion Area (0.50 acres, 850 linear feet)

Potentially Jurisdictional Features

- OHWM (USACE,RWQCB,CDFW) (1.77-acres)
- Bank Habitat (CDFW) (2.47-acres)
- Riparian Habitat (CDFW) (16.59-acres)
- Swale (0.03-acres)

Vegetation Communities and Land Covers

- AGR, General Agriculture
- Bacsal, Mulefat thickets
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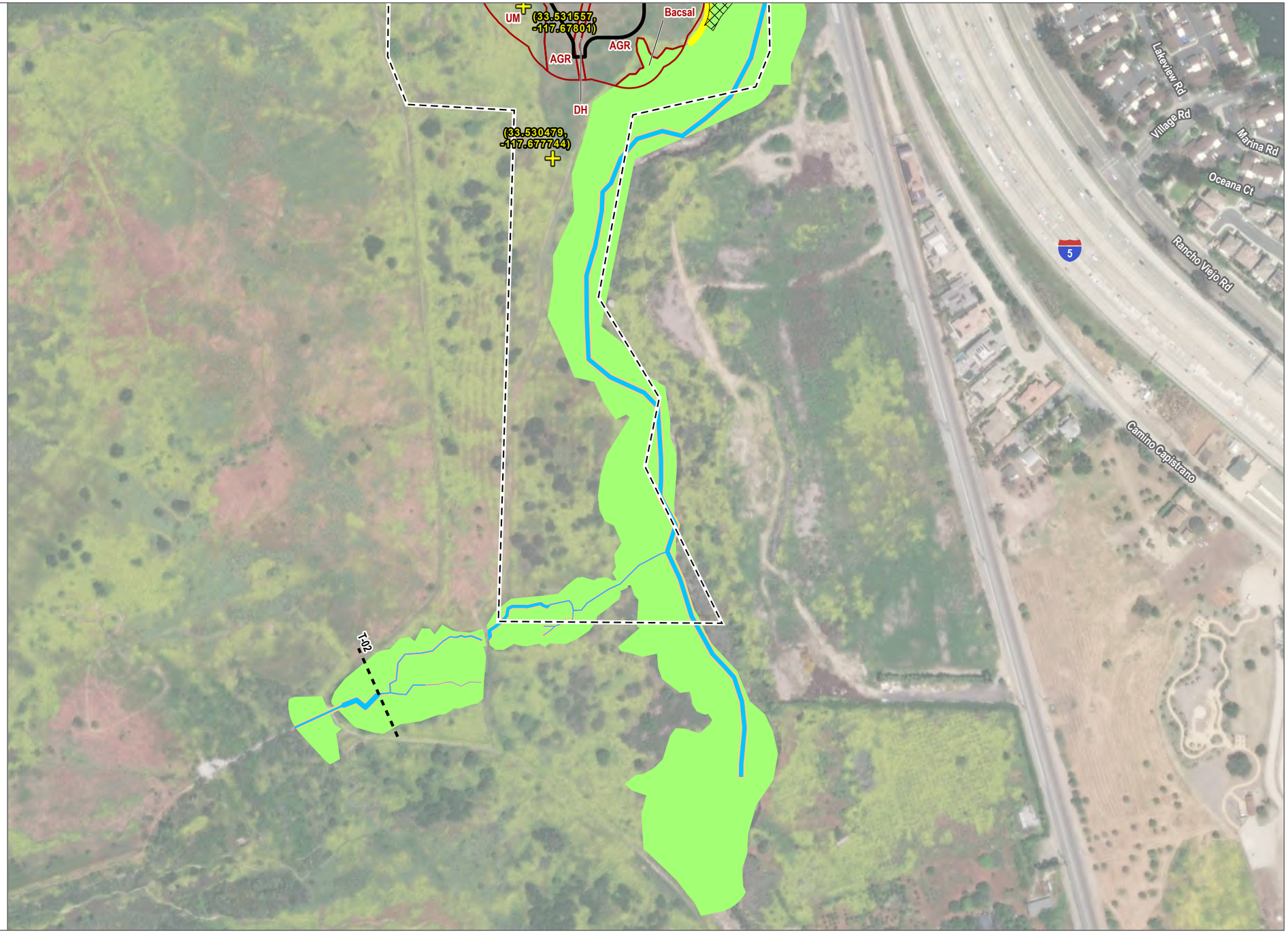
- UM, Upland Mustards



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1 inch = 100 feet

SOURCE: Maxar 2023

DUDEK

0 130 260 Feet

FIGURE 1C

Updated Jurisdictional Delineation

Compass Energy Storage Project

SOURCE: Maxar 2023

DUDEK

0 215 430 Feet

FIGURE 2

Bat Survey Results

Compass Energy Storage Project

Attachment B

Photo Log

Photo 1. Facing southeast towards Bat Detector 1. Note Oso Creek in background.

Photo 2. Facing southeast towards Bat Detector 2.

Photo 3. Facing east towards Bat Detector 3.

Photo 4. Facing north towards Bat Detector 4. Note fan palms and eucalyptus trees in background.

Photo 5. Facing south towards Bat Detector 5. Note fan palms to the left of photograph.

Attachment C

Project Description

2 Project Description

2.1 Overview and Location

The battery energy storage (BESS) project (Project) proposed by Compass Energy Storage LLC is a 250 MW, up to 1000 MWh facility composed of lithium-iron phosphate, or similar technology batteries (LFP), inverters, medium-voltage (MV) transformers, a switchyard, a collector substation, and other associated equipment to interconnect into the San Diego Gas and Electric (SDG&E) Trabuco to Capistrano 138 kilovolt (kV) transmission line (Point of Interconnection). The Project includes a switchyard to be owned and operated by SDG&E. The batteries will be installed in non-habitable steel cabinet-enclosures. The enclosures will have battery storage racks, with relay and communications systems for remote, automated monitoring and managing of the batteries. The BESS will also include a battery management system to control the charging/discharging of the batteries, along with temperature monitoring and control of individual battery cell temperature with an integrated cooling system. Batteries operate with direct current (DC) electricity, which must be converted to alternating current (AC) for compatibility with the existing electric grid. Power inverters to convert between AC and DC, along with transformers to step up the voltage, will be included as part of the Project. Electric energy will be transferred from the existing power grid to the Project batteries for storage and from the Project batteries to the power grid when additional electricity is needed.

Following construction, the Project will not create air emissions, will not require sanitary facilities, will generate minimal vehicle trips, and will only require water for landscape irrigation and to supply on-site fire hydrants.

The proposed BESS facility consists of approximately 12.2 acres of an approximately 40.8-acre parcel in the City of San Juan Capistrano, California (City). The Project also includes approximately 2.47 acres of offsite components (access road). The Project site is located within the northern portion of the City, adjacent to Camino Capistrano with Interstate-5 located to the east. The Project site is utilized by the current owner, Saddleback Church, for ancillary activities and is adjacent to the Saddleback Church Rancho Capistrano to the north, mostly open space to the south, Oso Creek to the south and east, Metrolink Railroad and Interstate-5 to the east, and open space and residences outside of the City limits to the west. Stabilization and rehabilitation of Oso Creek will occur along approximately 2,600 linear feet area of the non-channelized portion of the creek (12.49 acres) to ensure long term site integrity, support project infrastructure, protect sensitive resources and improve water quality. The SDG&E Trabuco to Capistrano 138 kV transmission line is located approximately 500 feet to the east and runs alongside the Metrolink Railroad tracks.

Upon commencement of construction, Compass Energy Storage LLC will be the owner of the battery project site and upon completion of construction, the SDG&E switchyard site will be deeded to SDG&E.

The Project site was selected given it is in an area of high energy demand near SDG&E facilities. The Project site is one of the few remaining suitable and available sites in Orange County with minimal topography and associated grading/civil improvements in immediate proximity to transmission with full capacity and deliverability --and where extensive off-site transmission upgrades are not required. The Project location requires minimal new facilities to interconnect into the SDG&E grid with only 500 feet of transmission improvements. The Project site is also located immediately adjacent to existing roadways that provide readily available access for construction and operations. The site is also located outside of sensitive biological habitat as the site has been mostly previously disturbed.

2.2 Project Components

The Project will include the development of an approximately 250 MW BESS and associated infrastructure, including stabilization and restoration of the adjacent Oso Creek. A BESS is comprised of stationary equipment that receives electrical energy and then utilizes batteries to store that energy to then supply electrical energy at a future time. Power released or captured by the proposed Project will be transferred to and from the SDG&E Trabuco to Capistrano 138kV transmission line via a loop-in generation transmission line that will interconnect to an SDG&E switchyard that will be constructed within the Project site. The Project will consist of LFP or similar technology batteries installed in racks and contained inside non-habitable enclosures; inverters; MV transformers; an SDG&E switchyard; a Project substation; and other associated equipment. The Project will include the following components:

- Battery Energy Storage System
- Power Inverters and Transformers
- Project Substation
- SDG&E Switchyard
- Telecommunication Facilities
- Perimeter Visual Screening and Security Walls
- Stormwater Detention Facilities
- Oso Creek Stabilization and Rehabilitation
- Landscaping and Fuel Modification
- Access Road Improvements
- Site Access and Security
- Loop-In Transmission Line
- Fire Protection System
- Operations and Maintenance Area

The BESS facilities will be remotely operated year-round and be available to receive or deliver electrical energy to the grid 24 hours a day and 365 days a year. After commissioning and during the operational life of the Project, qualified technicians would routinely inspect the battery energy storage system and conduct necessary maintenance to ensure safe operational readiness. If an issue arises, the system can remotely shut down and de-energize.

Project components are also described in the following subsections. Figure 2-1, Site Plan, shows the Project layout. Appendix 2A contains scale plan and elevation drawings depicting the relative size and location of all facilities.

2.2.1 Battery Energy Storage System

The LFP batteries will be housed in racks similar to common computer server racks. The racks are typically made of aluminum but sometimes may be composed of steel. The LFP battery technology is considered one of the safest, best understood, and most efficient methods of energy storage on the market. The proposed facility will use an LFP battery technology that has a long lifespan and boasts superior safety and stability characteristics. The battery racks will be designed and installed in accordance with the local seismic design requirements.

The battery racks will be housed in non-habitable enclosures. The BESS will be designed and installed in conformance with the nationally recognized National Fire Protection Association (NFPA) 855 Standard for the Installation of Stationary Energy Storage Systems, along with all applicable state and local fire protection requirements. The BESS development area will be connected with an improved access road that will meet OCFA requirements. Future augmentation area will be located within the BESS yard.

A Battery Management System (BMS) is used in conjunction with the energy storage system, which can monitor the battery voltage, current, temperature, managing energy absorption and release, thermal management, low voltage power supply, high voltage security monitoring, fault diagnosis and management, external communication with PCS and Emergency Management System (EMS), and ensure the stable operation of the energy storage system.

The Project will use battery storage systems that are compliant with National Fire Protection Association (NFPA) 855, that are Underwriters Laboratories (UL) certified, and that include built-in failsafe and cooling systems designed to prevent thermal runaway and the spread of fire. A fire protection system is installed to automatically shut down any affected battery storage components and prevent the spread of the fire to the other battery storage modules. A detailed hazard mitigation analysis, air dispersion models and emergency response plan have been prepared for the project and coordinated with the Orange County Fire Authority.

In addition, the site will include infra-red sensors and visual monitoring by the operations team as part of its Hazard Mitigation and Emergency Response program.

2.2.2 Power Inverters and Transformers

Compass Energy Storage LLC uses only industry-standard, nationally (and internationally) recognized equipment. The inverters are unattended, stand-alone units that operate in all conditions. They operate in both a charge mode and a discharge mode. They are UL listed for bi-directional use and are monitored and controlled remotely. There will be on-site disconnects in the event of an emergency or unscheduled maintenance. They are robust in their design and are designed to last more than 30 years with proper preventive maintenance, scheduled maintenance, and occasional major overhauls.

MV transformers and additional electrical equipment will be installed outside the BESS enclosure. From the MV transformer, cabling will be run to the Project substation. All outside electrical equipment will be housed in the appropriate National Electrical Manufacturers Association (NEMA) rated enclosures and screened from view to the extent possible, on all sides.

2.2.3 Project Substation

A Project substation will be installed that will include open rack, air insulated switch gear and the main power transformer to step up from 34.5 kV to 138 kV, as well as a pole to connect the Project substation to the SDG&E switchyard.

2.2.4 SDG&E Switchyard

An SDG&E switchyard will be installed adjacent to the Project substation that will include open rack, air insulated switch gear to deliver power to the nearby Trabuco to Capistrano 138kV transmission line. There will also be a Transmission Control Center within the switchyard area.

2.2.5 Telecommunication Facilities

The Project will include telecommunication facilities for communication with the SDG&E/CAISO facilities and to support remote Project operations monitoring. To provide for communication with SDG&E facilities, a fiber-optic cable will be used to connect the Project site switchyard with the SDG&E point of interconnection. Utility interconnection regulations require the installation of a second, separate, redundant fiber-optic cable. The redundant fiber-optic cable will also be installed within the Project footprint. For remote monitoring and operations communication, the Project will use local exchange carrier services, connecting to existing telecommunication fiber-optic lines owned and managed by local telecommunication providers.

2.2.6 Stormwater Detention Structures

As discussed above, the proposed Project layout consists of access roads, substation area, and battery storage area. The batteries and other equipment will sit on top of concrete foundations and the remaining operational areas will have aggregate surfacing. The Project has been designed to meet regulatory standards and reduce potential for stormwater to be discharged off site in exceedance of existing conditions. Stormwater runoff from the Project site currently outflows to an un-channelized section of Oso Creek. Currently, storm runoff from the hills west of Oso Creek drain across the property as mostly unconcentrated sheet flow, with high infiltration of runoff occurring on the property during the more frequent low intensity storms. During less frequent high intensity storms, runoff cascades over the west bank of the channel, which contributes to the instability of the channel bank. It is thus prudent to manage the offsite (and onsite) storm runoff by capturing and controlling it in an engineered conveyance system that discharges the runoff to the creek channel at a point where erosion will not occur.

Onsite Flows

The onsite stormwater runoff from the Project will be detained in an underground storage chamber system located under and adjacent to the internal access roads and is sized for the 100-year storm event. From here, the water will be routed to the north through a storm drain where it will meet with the northerly offsite flow location at the proposed culvert location. From here the onsite and offsite flows will discharge together into the creek as described in more detail below.

Offsite Flows

Stormwater runoff from the offsite area will be re-routed through a series of drainage ditches, culverts, and storm drain facilities sized for the 100-year storm event. The offsite flows are split into two areas, northerly and southerly. The northerly offsite flows will be collected at a low point on the west side of the proposed access road, just north of the proposed BESS yard. The northerly runoff will be routed into box culverts to cross under the proposed access road. The northerly runoff will then be routed through a storm drain system northeasterly to outfall within the existing rip rap just south of the existing concrete channel. The northerly runoff will exit the storm drain system through a proposed headwall above the channel limits. The runoff velocity will be decreased by proposed rip rap immediately below the proposed headwall that extends to the bottom of the channel. The southerly offsite flows will be collected in a drainage ditch along the westerly and southerly portions of the proposed BESS yard. The southerly runoff will enter a series of culverts to bypass the two proposed access roads that exit the southerly portion of the yard. The southerly runoff will then be routed into a storm drain system and directed southeasterly to an outfall above the stabilized channel limits. The runoff velocity will be decreased by internal energy dissipaters and be integrated into the proposed creek restoration rip rap immediately below the proposed headwall that extends to the bottom of the channel. This design will reduce erosion from the current site conditions as it will ensure that the flow will no longer

discharge over the channel cliff and will also reduce the tributary area by the 12.2-acre site area. The updated off-site storm drain system is depicted in Appendix 2A.

2.2.7 Oso Creek Stabilization and Rehabilitation

The proposed Project includes the repair and rehabilitation of approximately 2,600 linear feet of the degraded, erosive portion of Oso Creek, which lies adjacent to the eastern boundary of the BESS facility site. The creek currently exhibits high instability due to higher storm flow volumes, durations and velocities, unmanaged vegetation, and highly erodible soils. Stabilizing and rehabilitating the creek is therefore a critical component of the Project necessary to prevent future bank failure, reduce channel migration, enhance native vegetation, and improve water quality.

The restoration design includes a series of instream stabilization structures composed of natural rock and native vegetation. Key features will include low head drop/stabilization structures, including rock weirs and ramps, followed by pools or stilling basins. The rock features will be spaced approximately every 300 to 400 feet between flatter channel sections and the bottom width of the creek channel will be 80 feet to reduce flow velocities. The western bank will be graded at a 3:1 side slope to a height of 10 feet. The slope will then be graded at a 2:1 slope until it meets the existing top of bank elevation. Native vegetation will be planted along the 2:1 side slopes. The design also entails elevating the eroded Oso Creek channel to allow reestablishment of a hyporheic zone[1] in the creek channel bed. Collectively, these channel rehabilitation measures will stabilize the creek, protect the adjacent BESS facility, and provide long-term habitat and water quality benefits.

The proposed rehabilitated creek channel has been designed to comply with the ecological requirements of the U.S. Army Corps of Engineers Nationwide Permit 27 (Aquatic Habitat Restoration, Enhancement, and Establishment) including, using only native plant species, designing restoration to resemble a natural reference habitat, and ensuring net ecological benefits with no conversions between habitat types.

Preliminary design drawings, a hydraulic report, and a planting plan and palette are provided in Appendix 2D.

2.2.8 Perimeter Wall, Landscaping, Aesthetics, and Fuel Modification Zones

A 10-foot-tall perimeter wall around the site will be constructed that consists of a prefabricated masonry material for both visual enhancement, security and fire protection. This wall will be combined with perimeter landscaping and a 20-foot-tall visual screening fence along the northeastern perimeter to minimize or eliminate visual impacts from public views. A detailed Landscape Plan is provided in Appendix 2B.

The Project will incorporate an approximate 20-foot landscape buffer around the perimeter for screening and aesthetic enhancement. The landscape buffer will consist of a mixture of trees, shrubs, groundcover, and vines to create a varied, aesthetically pleasing visual buffer. Trees within the landscape buffer will include species native to southern California, 24-inch box size, with heights of 20 to 60 feet and widths of 15 to 40 feet, depending on the

[1] The hyporheic zone is defined as the subsurface area where stream water flows through segments of its adjacent bed and lower banks, characterized by the mixing of stream water and groundwater, crucial for aquatic ecosystems, providing habitat and performing vital functions like filtering pollutants and regulating water temperature

tree type. Additional information related to planting sizes, spacing, quantities, and representative tree photographs are included in Appendix 2B. All plantings will require minimal supplemental irrigation until established.

The applicant has provided visual simulations of the Project with landscaping from several public vantage points. Pursuant to CEC Application Requirements and Appendix G of the CEQA Guidelines, if the Project is located in an urbanized area the Project should not conflict with applicable zoning and other regulations governing scenic quality. As the City of San Juan Capistrano qualifies as an "urbanized area" under CEQA, the urbanized area threshold requiring an assessment of scenic quality policy and regulation consistency is the appropriate threshold to apply (and is referenced below). While visual simulations are not required to make this assessment, the applicant has offered these figures to further clarify the Project's conformity with policies and standards governing scenic quality (See Section 4.13 herein, and See also Figures 4.13-2 and 2a and 4.13-3 and 3a).

The Project has prepared a draft fuel modification plan for the areas surrounding the BESS facility outside of the 10-foot-tall perimeter wall to incorporate OCFA fire safety policies and to promote wildfire prevention and safety as recommended by the OCFA in their Community Wildfire Prevention Plan. The draft fuel modification plan has been submitted to the OCFA for its review and approval. Proposed fuel modification consists of the following three zones:

- Zone "A". 10- to 85-foot variable width on the outside of the 10-foot walls, flat level terrain, automatic irrigation system, fire resistant plants selected from Fuel Modification Zone Plant List.
- Zone "B". 40- to 170-foot variable width, flat level terrain, non-irrigated, mowing of annual grass and forbs (or more frequently as needed).
- Zone "C". 25- to 170-foot variable width, gently sloping terrain (up to 20%), non-irrigated, 50% thinning of native shrubs annually (or more frequently as needed).

2.2.9 Site Access and Security

Interstate-5 is the largest highway in the area and provides regional access to the Project site from the north and south. Access to the Project site will be provided via an existing access road off of Camino Capistrano approximately 0.6 miles northeast of the Project site. A new access road will be improved from the entry access road off Camino Capistrano along the east side of the property to the Project site. Road improvements shall consist of converting existing dirt roads into gravel roads and widening the roads to meet OCFA and SDG&E standards (30-feet wide). There will be three separate entrances/driveways into the BESS facility in accordance with OCFA standards. The three entrances/driveways will be located along the northern border of the BESS yard.

As noted above, perimeter walls will be installed around the Project site for fire safety and security purposes, as well as for visual screening. Access will only be available to authorized personnel. A Knox box will be provided at all access gates to allow for emergency access.

Permanent motion-sensitive, directional security lights will be installed to provide adequate illumination around the substation area and points of ingress/egress. All lighting will be shielded and directed downward to minimize the potential for glare or spillover onto adjacent properties. Security cameras will be placed on site and monitored 7 days a week and 24 hours per day.

2.2.10 Loop-In Transmission Line

A loop-in transmission line will be constructed that will transfer power to and from the proposed Project and the SDG&E Trabuco to Capistrano 138kV transmission line approximately 500 feet to the east of the Project site, which runs north-south adjacent to the railroad. The loop-in transmission line will be supported by up to 5 pole structures which will be sited to fully avoid Oso Creek. These poles consist of two poles on the Project site within the SDG&E switchyard, west of Oso Creek, and three poles on the east side of Oso Creek (two of which will be replacing existing poles); only one pole on the east side of Oso Creek will be new).

2.2.11 Fire Protection System

Compass Energy Storage LLC will use battery storage systems that are both NFPA 855 Code compliant and UL certified, and that include built-in failsafe and cooling systems designed to prevent thermal runaway and the spread of fire. A fire protection system will be installed to automatically shut down any affected battery storage components and, in the event of a thermal runaway event, to prevent the spread of the fire to the other battery storage modules.

The perimeter wall discussed above will also provide fire protection – both to prevent wildfire from impacting the site, as well to reduce the chance of an on-site fire from escaping beyond the property. The fire wall will be consistent with both the NFPA 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire – 2008 Edition, Section 5.1.3.3 and A.5.1.3.3, and the International Urban Wildland Interface Code (ICC 2012). The fire wall shall also serve as a decorative wall for the Project site. In addition, fire hydrants will be installed in accordance with OCFA standards.

In coordination County fire and public safety officials, the Project prepared a detailed Hazard Mitigation Analysis and Emergency Response Plan that has been approved by the OCFA as part of their approved Fire Management Plan. See Section 4.17, Wildfire and Fire Prevention).

2.2.12 Operations and Maintenance Area

The Project would include up to six conex containers to house equipment and materials necessary to complete operations and maintenance activities. Additionally, there would be a prefabricated mobile office trailer with self-contained water and sanitary for technicians to utilize while on-site for routine inspections and maintenance of the Project.

2.3 Construction

2.3.1 Schedule and Workforce

The physical construction/site activities of the proposed Project are expected to last approximately 17 months, including 3 months of testing and commissioning. Table 2-2 includes proposed construction phasing.

Table 2-2. Proposed Construction Phasing

Phase Name	Start Date	End Date	Days per Week	Workdays per Phase
Oso Creek Stabilization and Rehabilitation	9/1/2026	6/17/2027	5	195
Access Road Site Preparation, Grading, and Paving	9/1/2026	9/30/2026	5	22
BESS/Substation Site Preparation	9/15/2026	9/30/2026	5	12
Switchyard Site Preparation	9/15/2026	9/30/2026	5	12
BESS/Substation Site Grading and Stormwater Detention Structures	2/16/2027	4/29/2027	5	50
Switchyard Grading	2/16/2027	3/27/2027	5	30
Battery/Container and Substation Installation	4/19/2027	12/17/2027	5	175
Switchyard Installation	3/30/2027	10/25/2027	5	150
Loop-In Transmission Line Foundation and Tower Erection	8/31/2027	9/27/2027	5	20
Loop-In Transmission Stringing and Pulling	9/28/2027	10/25/2027	5	20
Landscaping Installation	9/28/2027	10/25/2027	5	20
Commissioning	10/26/2027	1/17/2028	5	60
Decommissioning	1/1/2058	8/7/2058	5	157

The proposed Project will be constructed by several specialized construction contractors. Construction will primarily occur during daylight hours, Monday through Saturday between 7:00 a.m. and 6:00 p.m., as required to meet the construction schedule. Any construction work performed outside the normal work schedule will be coordinated with the appropriate agencies and will conform to City regulations.

2.3.2 Site Grading and Earthwork

Construction activities will include excavation and grading of the Project site. Site preparation and construction will occur in accordance with all federal, state, and local code and requirements. Stabilization of Oso Creek will commence during the dry summer season. Noise-generating construction activities will be limited to Monday through Saturday between 7:00 a.m. and 6:00 p.m. All stationary equipment and machines with the potential to generate a significant increase in noise or vibration levels will be located away from noise receptors to the extent feasible. The contractor will conduct construction activities in such a manner that the maximum noise levels at the affected buildings will not exceed established noise levels.

The BESS facility grading is anticipated to generate approximately 582 cy of export and approximately 48,028 cy of import. The stabilization and rehabilitation of Oso Creek is anticipated to generate approximately 141,720 cy of cut and 38,140 cy of fill for a net export of 103,580 cy. A portion of the import necessary for the BESS facility grading (approximately 38,024 cy) can be met by using available net export of the creek (103,580 cy) which will result in a remaining 65,556 cy net export of the creek. This will result in a total Project export of 76,142 cy (65,556 cy plus 10,586 cy). Export will occur over the duration of the BESS grading phase, which is assumed to be 50 workdays.

All applicable federal, state, and local requirements and best management practices (BMPs) will be incorporated into the construction activities for the Project site. Beginning work on the Project site will involve preparing the land for installation of the BESS-related infrastructure, access driveways, and temporary construction staging areas. The construction contractor will be required to incorporate BMPs consistent with the City zoning ordinance and with guidelines provided in the California Stormwater Quality Association's Construction BMP Handbook (CASQA 2019), as well as a soil erosion and sedimentation control plan to reduce potential impacts related to construction of the proposed Project. Prior to initial construction mobilization, pre-construction surveys will be performed, and sediment and erosion controls will be installed in accordance with state and City guidelines. Stabilized construction entrances and exits will be installed at driveways to reduce tracking of sediment onto adjacent public roadways.

Site preparation will be consistent with City BMPs and the South Coast Air Quality Management District Rule 403: Fugitive Dust (SCAQMD 2005). Site preparation will involve the removal and proper disposal of existing debris that would unduly interfere with Project construction or the health and safety of on-site personnel. Dust-minimizing techniques will be employed, such as placement of wind control fencing, application of water, and application of dust suppressants. Conventional grading will be performed throughout the Project site but minimized to the maximum extent possible to reduce unnecessary soil movement that may result in dust. Earthworks scrapers, excavators, dozers, water trucks, paddlewheels, haul vehicles, and graders may all be used to perform grading. Land-leveling equipment, such as a smooth steel drum roller, will be used to even the ground surface and compact the upper layer of soil to a value recommended by a geotechnical engineer for structural support. Soil movement from grading will be balanced on the site. However, Class II road base will be imported to create necessary compaction under the equipment, as determined by geotechnical testing and Project specifications.

Trenching will be required for placement of underground electrical and communication lines as well as stormwater facilities, and may include the use of trenchers, backhoes, excavators, haul vehicles, compaction equipment, and water trucks. After preparation of the site, concrete pads, equipment enclosures, and equipment vaults will be installed per geotechnical engineer recommendations. The SDG&E switchyard and Project substation area will have a grounding grid installed and will be covered with aggregate surfacing for safe operation.

During this work, multiple crews will be working on the site with various equipment and vehicles, including vehicles for transporting the batteries and other equipment. As the BESS enclosures are constructed, the electrical collection and communication systems will be installed. The wiring will connect to the appropriate electrical and communication terminations, and the circuits will be checked and commissioned prior to operation. The total number of construction workers (consisting of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel) will consist of approximately 100 to 120 workers (average). It is estimated that construction will require the vehicle trips and equipment listed in Table 2-3.

Table 2-3. Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Average Daily Haul Truck Trips	Equipment Type	Quantity	Usage Hours
Oso Creek Stabilization and Rehabilitation	20	4	0	Dozer	1	8
				Excavators	2	8
				Loader	1	8
				Offroad Haul Trucks	2	8
				Pump	1	8
				Generator	1	8
Access Road Site Preparation, Grading, and Paving	40	4	20	Graders	1	8
				Tractors/loaders/ backhoes	1	8
				Rubber-tired loaders/	1	8
				Paving machine	1	8
				Roller	1	8
				Skid steer loaders	1	8
BESS/Substation Site Preparation	40	4	20	Graders	2	8
				Tractors/loaders/ backhoes	2	8
				Rubber-tired loaders	2	8
				Skid steer loaders	2	8
Switchyard Site Preparation	40	4	2	Tractors/loaders/ backhoes	2	8
				Rubber-tired dozers	2	8
BESS/Substation Grading and Stormwater Detention Structures	40	4	190	Graders	2	8
				Rubber-tired loaders	2	8
				Tractors/loaders/ backhoes	2	8
				Plate compactors	2	8
				Rollers	2	8
				Skid steer loaders	2	8
Switchyard Grading	40	4	0	Rollers	2	8
				Rubber-tired dozers	2	8
				Tractors/loaders/ backhoes	2	8
Battery/Container and Substation Installation	40	20	8	Air compressors	2	8
				Cranes	2	8
				Excavators	2	8
				Generator sets	4	8
				Plate compactors	2	8

Table 2-3. Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Average Daily Haul Truck Trips	Equipment Type	Quantity	Usage Hours
				Rollers	2	8
				Rough terrain forklifts	2	8
				Skid steer loaders	4	8
				Tractors/loaders/ backhoes	2	8
Switchyard Installation	40	20	0	Aerial lifts	4	8
				Air compressors	2	8
				Bore/drill rigs	2	8
				Cranes	1	8
				Excavators	1	8
				Generator sets	2	8
				Rollers	2	8
				Rough terrain forklifts	2	8
				Rubber-tired dozers	2	8
				Skid steer loaders	2	8
				Tractors/loaders/ backhoes	4	8
				Trenchers	4	8
Loop-In Transmission Foundation and Tower Erection	10	4	0	Air compressors	2	8
				Crane	1	8
				Forklifts	1	8
				Generator sets	2	8
				Pumps	2	8
				Drill rig	1	8
				Welders	2	8
Loop-In Transmission Stringing and Pulling	8	4	0	Forklifts	1	8
				Bucket truck	3	8
				Tractors/loaders/ backhoes	2	8
				Puller	1	8
				Generator sets	2	8
Landscaping Installation	40	4	8	Excavators	2	8
				Trenchers	2	8
				Tractors/loaders/ backhoes	2	8
Commissioning	160	0	0	NA	NA	NA

Table 2-3. Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Average Daily Haul Truck Trips	Equipment Type	Quantity	Usage Hours
Decommissioning	40	4	0	Cranes	2	8
				Tractors/loaders/ backhoes	2	8
				Concrete/industrial saws	2	8
				Rubber-tired dozers	2	8

2.3.3 Construction Water Use

During construction of the proposed Project, water will be required for common construction-related purposes, including but not limited to dust suppression, soil compaction, and grading. Dust-control water may be used during ingress and egress of on-site construction vehicle equipment traffic and during the construction of the energy storage equipment. A sanitary water supply will not be required during construction because restroom facilities will be provided by portable units serviced by licensed providers.

The water used is anticipated to be supplied by purchase from the local water purveyor,

2.3.4 Solid and Nonhazardous Waste

The Project will produce a small amount of solid waste from construction activities. This may include paper, wood, glass, plastics from packing material, waste lumber, insulation, scrap metal and concrete, empty nonhazardous containers, and vegetation waste. These wastes will be segregated, where practical, for recycling. Non-recyclable waste will be placed in covered dumpsters and removed on a regular basis by a certified waste-handling contractor for disposal at a Class III (nonhazardous waste) landfill.

2.3.5 Hazardous Materials

The hazardous materials used for construction will be typical of most construction projects of this type. Materials will include small quantities of gasoline, diesel fuel, oils, lubricants, solvents, detergents, degreasers, paints, ethylene glycol, dust palliatives, herbicides, and welding materials/supplies. A hazardous materials business plan will be provided. The hazardous materials business plan will include a complete list of all materials used on site and information regarding how the materials will be transported and in what form they will be used. This information will be recorded to maintain safety and prevent possible environmental contamination or worker exposure. During Project construction, material safety data sheets for all applicable materials present at the site will be made readily available to on-site personnel.

2.3.6 Hazardous Waste

Small quantities of hazardous waste will most likely be generated over the course of construction. These wastes may include waste paint, spent construction solvents, waste cleaners, waste oil, oily rags, waste batteries, and spent welding materials. Workers will be trained to properly identify and handle all hazardous materials. Hazardous waste will be either recycled or disposed of at a permitted and licensed treatment and/or disposal facility. All hazardous waste shipped off site for recycling or disposal will be transported by a licensed and permitted hazardous waste hauler.

2.4 Operations

The BESS and all associated equipment will be remotely monitored and controlled. Qualified technicians would visit the site approximately 1-2 times per month to conduct routine inspections and maintenance as well as semiannual and annual services. Periodically, batteries and various components may be replaced or renewed to ensure optimal performance.

Operational water will be limited to water necessary for landscape irrigation and to supply on-site fire hydrants.

2.4.1 Solid and Nonhazardous Waste

The Project will produce a small amount of waste associated with maintenance activities, which could include broken and rusted metal, defective or malfunctioning electrical materials, empty containers, and other miscellaneous solid waste, including typical refuse generated by workers. Most of these materials will be collected and delivered back to the manufacturer or to recyclers. Non-recyclable waste will be placed in covered dumpsters and removed on a regular basis by a certified waste-handling contractor for disposal at a Class III landfill.

2.4.2 Hazardous Materials

Limited amounts of hazardous materials will be stored or used on the site during operations, including diesel fuel, gasoline, and motor oil for vehicles; mineral oil to be sealed within the transformers; and lead-acid-based batteries for emergency backup. Appropriate spill containment and cleanup kits will be maintained during operation of the Project. A spill prevention control and countermeasures plan will be developed for site operations.

2.4.3 Hazardous Waste

Fuels and lubricants used in operations will be subject to the spill prevention control and countermeasures plan to be prepared for the proposed Project. Solid waste, if generated during operations, will be subject to the material disposal and solid waste management plan to be prepared for the proposed Project.

2.5 Decommissioning

Decommissioning of the Project at the end of its useful life would include the removal of BESS equipment from the foundations, disconnection of wiring, and removal of site infrastructure. A Decommissioning Plan has been prepared and included as part of this application (see Appendix 2C). The facilities would be decommissioned and dismantled, and the site would be restored. The vast majority of the Project components are recyclable, and the

batteries and other equipment and materials will be recycled to the extent feasible to minimize disposal in landfills. The switchyard area will be deeded to SDG&E upon completion of construction and is anticipated to remain in place for ongoing use and operation.

Decommissioning activities will require a workforce of approximately 20 workers and would take approximately 7 months to complete. In general, activities would include the following:

- Dismantling and removal of all aboveground equipment (battery enclosure units, Excavation and removal of all underground cabling less than 3 feet below ground
- Removal of fencing
- Break up and removal of concrete pads and foundations
- Scarification of compacted areas
- Seeding of disturbed areas with a native seed mix

Project Site
Parcel B1

Project Components

- Battery Storage Yard
- SDG&E 138kV Interconnection Switchyard
- Internal Access Roads
- Drainage Ditch
- Maintenance Area
- Rock Drop Structure
- Offsite Access Road/Emergency Vehicle Access
- Landscaping
- Creek Stabilization and Rehabilitation Work Area
- Transmission Pole (replacement)
- Transmission Pole (new)
- Transmission Line
- 20' Tall Visual Screening Fence
- 10' Tall Perimeter Wall
- Internal Security Fence
- Gate
- Stormwater Discharge Line
- Relocated Portion of Unnamed Trail (Preliminary Alignment)
- 2:1 Slope Limit
- 3:1 Slope Limit
- Existing San Diego Gas and Electric (SDG&E) Trabuco to Capistrano 138 kilovolt (kV) transmission line

SOURCE: Maxar 2024; ECI 2025

DUDEK

0 150 300 Feet

FIGURE 2-1

Site Plan

Compass Energy Storage Project

Attachment C.1

LSAA Project Description

DUDEK
853 LINCOLN WAY, SUITE 105
AUBURN, CALIFORNIA 95603
T 530.887.8500 F 530.887.1250

Compass Energy Storage Project, Project Description for the Streambed Alteration Agreement

The battery energy storage (BESS) project (Project) proposed by Compass Energy Storage LLC is a 250 MW, up to 1000 MWh facility composed of lithium-iron phosphate, or similar technology batteries (LFP), inverters, medium voltage (MV) transformers, a switchyard, a collector substation, and other associated equipment to interconnect into the San Diego Gas and Electric (SDG&E) Trabuco to Capistrano 138 kilovolt (kV) transmission line (Point of Interconnection). The Project includes a switchyard to be owned and operated by SDG&E. The batteries will be installed in non-habitable steel cabinet-enclosures. The enclosures will have battery storage racks, with relay and communications systems for remote, automated monitoring and managing of the batteries. The BESS will also include a battery management system to control the charging/discharging of the batteries, along with temperature monitoring and control of individual battery cell temperature with an integrated cooling system. Batteries operate with direct current (DC) electricity, which must be converted to alternating current (AC) for compatibility with the existing electric grid. Power inverters to convert between AC and DC, along with transformers to step up the voltage, will be included as part of the Project. Electric energy will be transferred from the existing power grid to the Project batteries for storage and from the Project batteries to the power grid when additional electricity is needed.

Following construction, the Project will not create air emissions, will not require sanitary facilities, will generate minimal vehicle trips, and will only require water for landscape irrigation and to supply on-site fire hydrants.

The proposed BESS facility consists of approximately 12.2 acres of an approximately 40.8-acre parcel in the City of San Juan Capistrano, California (City). The Project also includes approximately 2.47 acres of offsite components (access road). The Project site is located within the northern portion of the City, adjacent to Camino Capistrano with Interstate-5 located to the east. The Project site is utilized by the current owner, Saddleback Church, for ancillary activities and is adjacent to the Saddleback Church Rancho Capistrano to the north, mostly open space to the south, Oso Creek to the south and east, Metrolink Railroad and Interstate-5 to the east, and open space and residences outside of the City limits to the west. Stabilization and rehabilitation of Oso Creek will occur along approximately 2,600 linear feet area of the non-channelized portion of the creek (12.49 acres) to ensure long term site integrity, support project infrastructure, protect sensitive resources and improve water quality. The SDG&E Trabuco to Capistrano 138 kV transmission line is located approximately 500 feet to the east and runs alongside the Metrolink Railroad tracks.

Upon commencement of construction, Compass Energy Storage LLC will be the owner of the battery project site and upon completion of construction, the SDG&E switchyard site will be deeded to SDG&E.

The Project site was selected given it is in an area of high energy demand near SDG&E facilities. The Project site is one of the few remaining suitable and available sites in Orange County with minimal topography and associated grading/civil improvements in immediate proximity to transmission with full capacity and deliverability –and where extensive off-site transmission upgrades are not required. The Project location requires minimal new facilities to interconnect into the SDG&E grid with only 500 feet of transmission improvements. The Project site is also located immediately adjacent to existing roadways that provide readily available access for construction and

operations. The site is also located outside of sensitive biological habitat as the site has been mostly previously disturbed.

An Aquatic Resources Delineation was completed for the Project on March 11, 2021. A total of two (2) non-wetland waters (NWWs; Stream 01; Oso Creek) were delineated totaling 0.60 acres (5.038 linear feet). A total of one (1) other water (Swale 01) was delineated totaling at 0.01 acres. The Stream 01 and Swale 01 are not within the current Project boundary design and will not be impacted. Additional details are available in the Project's Aquatic Resources Delineation Report (Attachment D to the Application for the Streambed Alteration Agreement).

A follow up survey to account for an extension of the Project boundary was conducted in 2023. A total of 20.64 (16,900) of CDFW jurisdictional waters were updated for non-wetland waters. No additional features were added, however, existing features were extended from previous mapping that occurred in March 2021.

An additional follow up survey to account for updates in jurisdictional limits of Oso Creek from initial Aquatic Resources Delineation was completed for the Project on September 01, 2025. The updated delineation survey determined the potential jurisdictional limits for CDFW have changed due to significant amount of erosion on the upper west bank of Oso Creek. Approximately 0.50 acres (850 linear feet) of erosion has occurred on the bank which has resulted in a near vertical cliff face of approximate 20-foot drop to the channel bottom. Based on the observations and mapping from the initial Aquatic Resources Delineation, this equates to an erosion rate of approximately 11.75 feet per year for Oso Creek. Additional details are available in the Project's updated jurisdictional delineation and focused bat survey report (Attachment C.1 to the Application for the Streambed Alteration Agreement).

No direct impacts to jurisdictional aquatic resources will occur from construction or operation of the proposed project. However, stormwater runoff from the existing project development area currently sheet flows to Oso Creek. As part of the project, to meet regulatory standards and reduce potential for stormwater to be discharged off site in exceedance of existing conditions, offsite and onsite stormwater will flow to an underground stormwater detention basin located in the central portion of the Survey Area. A waterline will be constructed from the proposed onsite stormwater detention basin and pumped north to the existing 18-inch and/or 30-inch storm drainpipe/outfalls located north, which currently discharge into the unvegetated channelized portion of Oso Creek.

The aquatic resources within the project boundary are isolated to Oso Creek. Oso Creek totals 1.3 acres (2,644 linear feet) to top of bank. The total riparian habitat within the project boundary totals 7.14 acres (2,521 linear feet). Additional features were delineated as part of the 2021 and 2023 delineation efforts, however, these aquatic features do not fall under the current project boundary and are not counted to total acreages.

Regulated Streams and Impact Summary for the Project

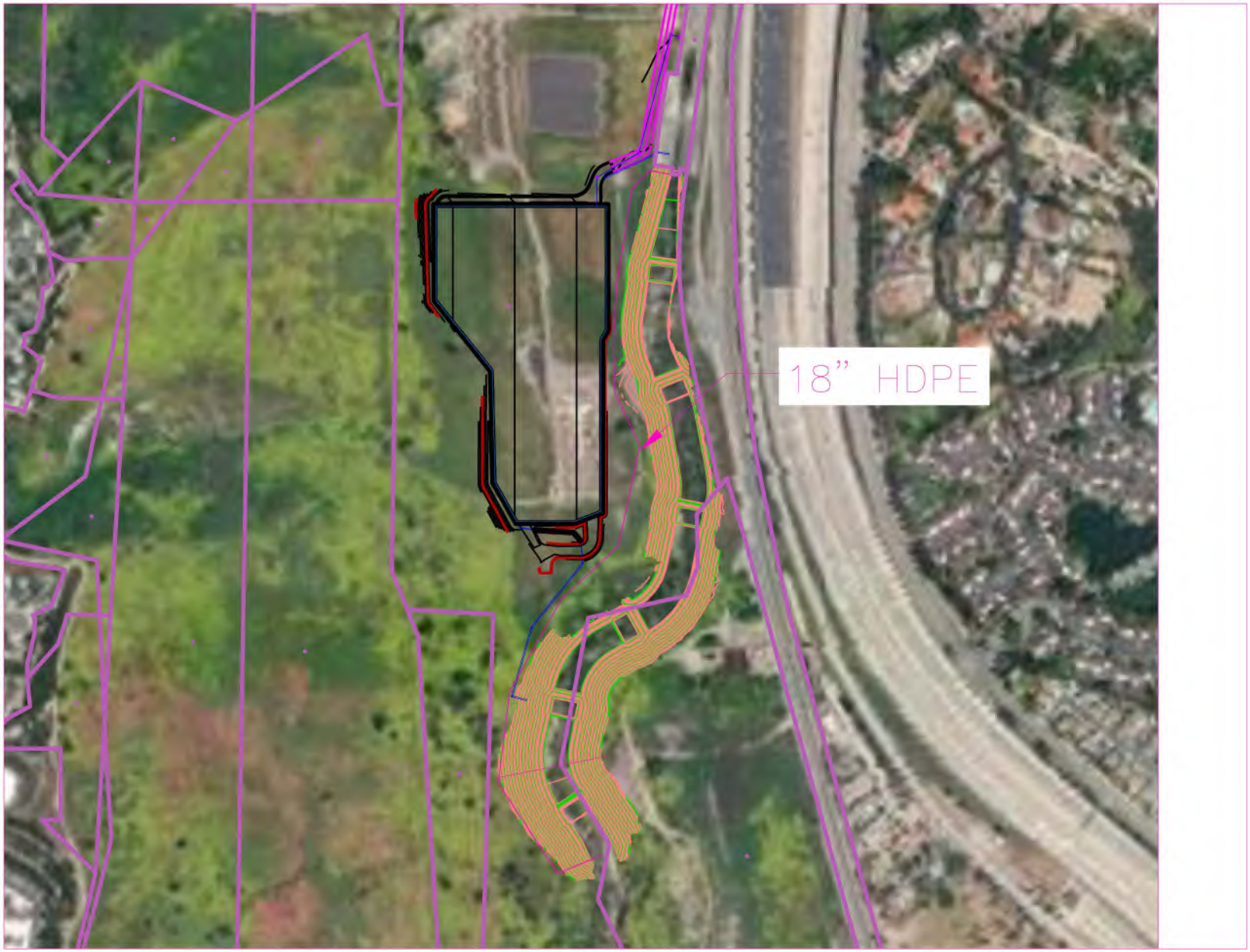
Type	Oso Creek (OHWM + TOB)	Riprian Habitat	Total
Permanent Impacts			
Rock Drop Structure	0.267/576	1.107/519	1.375/1,110
BESS Site	-	0.001/5	0.001./5
			Total: 1.38/1,115
Temporary Impacts			
Creek Stabilization and Rehabilitation Work Area	0.985/2042	6.031/2002	7.016/4044
Storm Trench Limits	0.011/27	0.004/17	0.005/44
			Total: 7.031/4088
		Grand Total	**8.411/5,203**

Table Notes: totals may not sum due to rounding; BESS = Battery Energy Storage System. All acreage is reported based on current project design

* Temporary impact areas will be restored once construction is complete.

Attachment D

Diversion Plan Concept


18" HDPE

Attachment D.1

Spec Pipe Plan

JMM HIGH DENSITY POLYETHYLENE (HDPE) PE4710 PRODUCT SPECIFICATION

Description:

JMM manufactures High Density Polyethylene (HDPE) water pressure pipes for municipal and industrial transmission systems. Our pressure pipe is used in many types of applications such as potable water, sewer, drain, mining, irrigation, slip lining, and reclaimed water.

Materials:

JMM HDPE pressure pipe is manufactured with premium, highly engineered PE4710 resin that provides maximum performance benefits to service today's municipal and industrial water needs. The PE4710 material conforms to ASTM D3350 with the cell classification of 445574C/E and is listed with the Plastic Pipe Institute's (PPI) TR4. It is formulated with carbon black and/or ultraviolet stabilizer for maximum protection against UV rays for added assurance.

Size	Type	DR	Standard (If Applicable)
4" – 63"	IPS / DIPS	7 – 41	ASTM F714

Quality Assurance:

JMM takes great pride in the quality and workmanship of all of our products. JMM quality control programs monitor three critical aspects of the manufacturing process: the raw material, pipe production, and the finished goods. Incoming raw material is inspected and tested to ensure the material meets all applicable requirements before its release for production. During production, the pipe will be examined and pipe samples will be collected for physical verification and testing for compliance. The finished product is subjected to further visual inspection to ensure it has met all the appropriate specifications and packaging requirements. Our pipes are continuously monitored throughout the entire manufacturing process to validate that they are in accordance with all applicable specifications. Certificates of Compliance are available upon request.

Lengths & Bending Radius:

Standard laying lengths of HDPE pressure water pipe is 40/50 foot lengths. Pipe sizes under 6" may be coiled at continuous longer lengths upon request.

Marking:

The standard markings printed on JMM pipes generally consist of the JMM logo, nominal size and OD base, material code, dimension ratio, pressure class, current AWWA C906 (if applicable), ASTM F714 (if applicable), and production date (day, month, & year).

Website:

Please visit our website at www.jmm.com for more information.

Note: Information provided here is a general guideline of JMM PE products. JMM reserves the right to modify any information as necessary. For more detailed information, please contact your JMM sales representative. Always follow project specifications and adhere to local rules, codes and regulations

HDPE IRON PIPE SIZE (IPS) PRESSURE PIPE PE4710

		DR 7 (333 psi)			DR 7.3 (318 psi)			DR 9 (250 psi)			DR 9.3 (241 psi)			DR 11 (200 psi)			DR 13.5 (160 psi)		
Pipe Size	Avg OD	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft
1/2	0.840	0.120	0.59	0.12	0.115	0.60	0.11	0.093	0.64	0.10	0.090	0.65	0.09	0.076	0.68	0.08	0.062	0.71	0.07
3/4	1.050	0.150	0.73	0.19	0.144	0.75	0.18	0.117	0.80	0.15	0.113	0.81	0.15	0.095	0.85	0.12	0.078	0.88	0.10
1	1.315	0.188	0.92	0.29	0.180	0.93	0.28	0.146	1.01	0.23	0.141	1.02	0.23	0.120	1.06	0.20	0.097	1.11	0.16
2	2.375	0.339	1.66	0.95	0.325	1.69	0.91	0.264	1.82	0.77	0.255	1.83	0.74	0.216	1.92	0.64	0.176	2.00	0.53
3	3.500	0.500	2.44	2.06	0.479	2.48	1.98	0.389	2.68	1.66	0.376	2.70	1.61	0.318	2.83	1.39	0.259	2.95	1.16
4	4.500	0.643	3.14	3.40	0.616	3.19	3.28	0.500	3.44	2.75	0.484	3.47	2.67	0.409	3.63	2.30	0.333	3.79	1.91
5 3/8	5.375	0.768	3.75	4.85	0.736	3.81	4.68	0.597	4.11	3.92	0.578	4.15	3.81	0.489	4.34	3.29	0.398	4.53	2.73
5	5.563	0.795	3.88	5.20	0.762	3.95	5.02	0.618	4.25	4.20	0.598	4.29	4.08	0.506	4.49	3.52	0.412	4.69	2.92
6	6.625	0.946	4.62	7.36	0.908	4.70	7.12	0.736	5.06	5.96	0.712	5.11	5.79	0.602	5.35	4.99	0.491	5.58	4.15
7	7.125	0.976	5.06	8.23	0.976	5.06	8.23	0.792	5.45	6.89	0.766	5.50	6.70	0.648	5.75	5.78	0.528	6.01	4.80
8	8.625	1.232	6.01	12.48	1.182	6.12	12.06	0.958	6.59	10.09	0.927	6.66	9.81	0.784	6.96	8.46	0.639	7.27	7.03
10	10.750	1.536	7.49	19.40	1.473	7.63	18.74	1.194	8.22	15.68	1.156	8.30	15.24	0.977	8.68	13.14	0.796	9.06	10.92
12	12.750	1.821	8.89	27.28	1.747	9.05	26.36	1.417	9.75	22.07	1.371	9.84	21.44	1.159	10.29	18.49	0.944	10.75	15.36
14	14.000	2.000	9.76	32.90	1.918	9.93	31.78	1.556	10.70	26.61	1.505	10.81	25.85	1.273	11.30	22.30	1.037	11.80	18.52
16	16.000	2.286	11.15	42.97	2.192	11.35	41.51	1.778	12.23	34.75	1.720	12.35	33.76	1.455	12.92	29.12	1.185	13.49	24.19
18	18.000	2.571	12.55	54.37	2.466	12.77	52.53	2.000	13.76	43.97	1.935	13.90	42.73	1.636	14.53	36.84	1.333	15.17	30.61
20	20.000	2.857	13.94	67.13	2.740	14.19	64.85	2.222	15.29	54.28	2.151	15.44	52.77	1.818	16.15	45.49	1.481	16.86	37.79
24	24.000	3.429	16.73	96.68	3.288	17.03	93.39	2.667	18.35	78.18	2.581	18.53	75.98	2.182	19.37	65.52	1.778	20.23	54.44
26	26.000							2.889	19.88	91.75	2.796	20.07	89.17	2.364	20.99	76.89	1.926	21.92	63.89
28	28.000							3.111	21.40	106.40	3.011	21.62	103.42	2.545	22.60	89.15	2.074	23.60	74.09
30	30.000							3.333	22.93	122.13	3.226	23.16	118.72	2.727	24.22	102.35	2.222	25.29	85.04
32	32.000													2.909	25.83	116.46	2.370	26.98	96.76
34	34.000													3.091	27.45	131.48	2.519	28.66	109.26
36	36.000													3.273	29.06	147.41	2.667	30.35	122.49

		DR 15.5 (138 psi)			DR 17 (125 psi)			DR 19 (111 psi)			DR 21 (100 psi)			DR 26 (80 psi)			DR 32.5 (64 psi)		
Pipe Size	Avg OD	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft
1/2	0.840	0.054	0.73	0.07	0.062	0.71	0.07	0.044	0.75	0.05	0.062	0.71	0.07	0.062	0.71	0.07	0.062	0.71	0.07
3/4	1.050	0.068	0.91	0.09	0.062	0.92	0.08	0.055	0.93	0.08	0.062	0.92	0.08	0.062	0.92	0.08	0.062	0.92	0.08
1	1.315	0.085	1.14	0.14	0.077	1.15	0.13	0.069	1.17	0.12	0.063	1.18	0.11	0.062	1.18	0.11	0.062	1.18	0.11
2	2.375	0.153	2.05	0.47	0.140	2.08	0.43	0.125	2.11	0.39	0.113	2.14	0.35	0.091	2.18	0.29	0.073	2.22	0.23
3	3.500	0.226	3.02	1.02	0.206	3.06	0.94	0.184	3.11	0.84	0.167	3.15	0.77	0.135	3.21	0.63	0.108	3.27	0.51
4	4.500	0.290	3.88	1.68	0.265	3.94	1.55	0.237	4.00	1.39	0.214	4.05	1.27	0.173	4.13	1.03	0.138	4.21	0.83
5 3/8	5.375	0.347	4.64	2.40	0.316	4.71	2.21	0.283	4.78	1.99	0.256	4.83	1.81	0.207	4.94	1.48	0.165	5.03	1.19
5	5.563	0.359	4.80	2.58	0.327	4.87	2.36	0.293	4.94	2.13	0.265	5.00	1.94	0.214	5.11	1.58	0.171	5.20	1.27
6	6.625	0.427	5.72	3.65	0.390	5.80	3.35	0.349	5.89	3.02	0.315	5.96	2.74	0.255	6.08	2.24	0.204	6.19	1.81
7	7.125	0.460	6.15	4.23	0.419	6.24	3.88	0.375	6.33	3.49	0.340	6.40	3.18	0.274	6.54	2.59	0.219	6.66	2.09
8	8.625	0.556	7.45	6.19	0.507	7.55	5.68	0.454	7.66	5.12	0.411	7.75	4.66	0.332	7.92	3.80	0.265	8.06	3.06
10	10.750	0.694	9.28	9.62	0.632	9.41	8.82	0.566	9.55	7.95	0.512	9.66	7.24	0.413	9.87	5.90	0.331	10.05	4.77
12	12.750	0.823	11.01	13.53	0.750	11.16	12.41	0.671	11.33	11.18	0.607	11.46	10.17	0.490	11.71	8.30	0.392	11.92	6.69
14	14.000	0.903	12.09	16.31	0.824	12.25	14.97	0.737	12.44	13.49	0.667	12.59	12.28	0.538	12.86	10.00	0.431	13.09	8.08
16	16.000	1.032	13.81	21.30	0.941	14.01	19.55	0.842	14.21	17.61	0.762	14.38	16.03	0.615	14.70	13.07	0.492	14.96	10.54
18	18.000	1.161	15.54	26.95	1.059	15.75	24.75	0.947	15.99	22.29	0.857	16.18	20.28	0.692	16.53	16.54	0.554	16.83	13.36
20	20.000	1.290	17.26	33.28	1.176	17.51	30.53	1.053	17.77	27.52	0.952	17.98	25.03	0.769	18.37	20.43	0.615	18.70	16.47
24	24.000	1.548	20.72	47.92	1.412	21.01	43.99	1.263	21.32	39.63	1.143	21.58	36.06	0.923	22.04	29.42	0.738	22.44	23.72
26	26.000	1.677	22.44	56.24	1.529	22.76	51.61	1.368	23.10	46.51	1.238	23.38	42.31	1.000	23.88	34.53	0.800	24.30	27.86
28	28.000	1.806	24.17	65.22	1.647	24.51	59.87	1.474	24.88	53.94	1.333	25.17	49.07	1.077	25.72	40.05	0.862	26.17	32.33
30	30.000	1.935	25.90	74.87	1.765	26.26	68.74	1.579	26.65	61.92	1.429	26.97	56.36	1.154	27.55	45.98	0.923	28.04	37.09
32	32.000	2.065	27.62	85.23	1.882	28.01	78.18	1.684	28.43	70.45	1.542	28.73	64.11	1.231	29.39	52.31	0.985	29.91	42.22
34	34.000	2.194	29.35	96.21	2.000	29.76	88.27	1.790	30.21	79.54	1.619	30.57	72.36	1.308	31.23	59.06	1.046	31.78	47.63
36	36.000	2.323	31.08	107.86	2.118	31.51	98.98	1.895	31.98	89.17	1.714	32.37	81.12	1.385	33.06	66.22	1.108	33.65	53.42

HDPE IRON PIPE SIZE (IPS) PRESSURE PIPE PE4710

		DR 17 (125 psi)			DR 19 (111 psi)			DR 21 (100 psi)			DR 26 (80 psi)			DR 32.5 (64 psi)			DR 41 (50 psi)		
Pipe Size	Avg OD	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft
36	36.000	2.118	31.510	98.98	1.895	31.983	89.17	1.714	32.366	81.12	1.385	33.064	66.22	1.108	33.651	53.42	0.878	34.139	42.63
42	42.000	2.471	36.761	134.72	2.211	37.314	121.37	2.000	37.760	110.43	1.615	38.576	90.08	1.292	39.261	72.68	1.024	39.830	58.03
48	48.000	2.824	42.013	175.97	2.526	42.644	158.52	2.286	43.154	144.25	1.846	44.086	117.68	1.477	44.869	94.95	1.171	45.517	75.79
54	54.000	3.177	42.265	222.64	2.842	47.975	200.63	2.571	48.549	182.51	2.077	49.597	148.95	1.622	50.477	120.20	1.317	51.208	95.92
63	63.000							3.000	56.640	248.46	2.423	57.863	202.72	1.938	58.891	163.53	1.537	59.742	130.56

HDPE DUCTILE IRON PIPE SIZE (DIPS) PRESSURE PIPE PE4710

		DR 7 (333 psi)			DR 9 (250 psi)			DR 11 (200 psi)			DR 13.5 (160 psi)			DR 17 (125 psi)		
Pipe Size	Avg OD	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft
4	4.800	0.686	3.346	3.87	0.533	3.670	3.13	0.436	3.876	2.62	0.356	4.045	2.18	0.282	4.202	1.76
6	6.900	0.946	4.894	7.99	0.767	5.274	6.46	0.627	5.571	5.41	0.511	5.817	4.50	0.406	6.039	3.64
8	9.050	1.293	6.309	13.75	1.006	6.917	11.12	0.823	7.305	9.32	0.670	7.630	7.74	0.532	7.922	6.25
10	11.100	1.586	7.738	20.68	1.233	8.486	16.72	1.009	8.961	14.01	0.822	9.357	11.64	0.653	9.716	9.41
12	13.200	1.886	9.202	29.24	1.467	10.090	23.65	1.200	10.656	19.82	0.978	11.127	16.47	0.776	11.555	13.30
14	15.300	2.186	10.666	39.29	1.700	11.696	31.77	1.391	12.351	26.63	1.133	12.898	22.12	0.900	13.392	17.88
16	17.400	2.486	12.130	50.81	1.933	13.302	41.09	1.582	14.046	34.44	1.289	14.667	28.61	1.024	15.229	23.13
18	19.500	2.786	13.594	63.82	2.167	14.906	51.61	1.773	15.741	43.25	1.444	16.439	35.92	1.147	17.068	29.04
20	21.600				2.400	16.512	63.32	1.964	17.436	53.07	1.600	18.208	44.09	1.271	18.905	35.64
24	25.800				2.867	19.722	90.34	2.345	20.829	75.69	1.911	21.749	62.90	1.518	22.582	50.84
30	32.000							2.909	25.833	116.46	2.370	26.976	96.76	1.880	28.014	78.18
36	38.300										2.837	32.286	138.62	2.253	33.524	112.02
42	44.500													2.618	38.950	151.24
48	50.800													2.988	44.465	197.05

		DR 19 (111 psi)			DR 21 (100 psi)			DR 26 (80 psi)			DR 32.5 (64 psi)		
Pipe Size	Avg OD	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft
4	4.800	0.253	4.264	1.59	0.229	4.315	1.44	0.185	4.408	1.18	0.148	4.486	0.95
6	6.900	0.363	6.130	3.28	0.329	6.203	2.98	0.265	6.338	2.43	0.212	6.451	1.96
8	9.050	0.476	8.041	5.64	0.431	8.136	5.13	0.348	8.312	4.18	0.278	8.461	3.37
10	11.100	0.584	9.862	8.48	0.529	9.979	7.72	0.427	10.195	6.29	0.342	10.375	5.08
12	13.200	0.695	11.727	11.99	0.629	11.867	10.91	0.508	12.123	8.91	0.406	12.339	7.18
14	15.300	0.805	13.593	16.11	0.729	13.755	14.66	0.588	14.053	11.95	0.471	14.301	9.65
16	17.400	0.916	15.458	20.83	0.829	15.643	18.96	0.669	15.982	15.46	0.536	16.264	12.49
18	19.500	1.026	17.325	26.16	0.929	17.531	23.81	0.750	17.910	19.42	0.600	18.228	15.67
20	21.600	1.137	19.190	32.10	1.029	19.419	29.22	0.831	19.838	23.84	0.665	20.190	19.24
24	25.800	1.358	22.921	45.80	1.229	23.195	41.68	0.992	23.697	33.99	0.794	24.117	27.44
30	32.000	1.684	28.430	70.45	1.524	28.769	64.11	1.231	29.390	52.31	0.985	29.912	42.22
36	38.300	2.016	34.026	100.93	1.824	34.433	91.84	1.473	35.177	74.92	1.179	35.801	60.43
42	44.500	2.342	39.535	136.25	2.119	40.008	123.96	1.712	40.871	101.17	1.370	41.596	81.59
48	50.800	2.674	45.131	177.55	2.419	45.672	161.55	1.954	46.658	131.83	1.563	47.486	106.34

PE 4710 JMM HDPE Typical Primary Properties

Property	Unit	Test Procedure	Typical Value
Material Designation	---	PPI-TR4	PE 4710
Cell Classification	---	ASTM D3350	** 445574C
Density [4]	g/cm^3	ASTM D1505	0.959
Melt Index [4]	g/10 minutes	ASTM D1238	<0.15
Flexural Modulus [5]	psi	ASTM D790	> 120,000
Tensile Strengt [5]	psi	ASTM D638	> 3,600
SCG (PENT) [7]	Hours	ASTM F1473	>100
HDB @ 73.4ºF (23°C)[4] HDB @ 140°F (60°C)	psi psi	ASTM D2837 ASTM D2837	1600 1000
HDS (hydrostatic design stress) @ 73.4ºF HDS @ 140ºF	psi psi	PPI-TR4 PPI-TR4	1000 630
Color; UV Stabilize [C]	---	---	Black with minimum 2% carbon black
Brittleness Temperature	°F	ASTM D746	<-180

** Note: Cell Classification is 445576E for all Blue / Green / Gray Polyethylene Pipes.

Attachment E

Southwestern Pond Turtle Memo

DUDEK
27271 LAS RAMBLAS, SUITE 340
MISSION VIEJO, CALIFORNIA 92691
T 949.450.2525

MEMORANDUM

To:	Renee Robin, Compass Energy Storage LLC
From:	Max D. Murray, Biologist, Dudek
Subject:	Compass BESS Project – 2025 Southwestern Pond Turtle Habitat Assessment and Survey Results
Date:	September 19, 2025
cc:	Tommy Molioo, Senior Biologist, Dudek
	Erin Phillips, Project Manager, Dudek
Attachments:	Figures 1 and 2
	A – Species Compendium
	B – Photo Log

This memorandum documents the methods and results of a habitat assessment and visual encounter survey for the southwestern pond turtle (*Actinemys pallida*) in support of the Compass Battery Energy Storage System Project (project).

1 Site Description

The project is located on the grounds of the Saddleback Church in San Juan Capistrano, within a valley between the Santa Ana Mountains to the northeast and the Laguna Woods to the west, at an elevation of approximately 185 to 210 feet above mean sea level (Figure 1, Project Location). The project site contains existing development associated with the church grounds, including agricultural land and a pollinator garden, and undeveloped lands including non-native grassland and upland coastal sage scrub. The eastern boundary of the project is bordered by Oso Creek, which supports mature riparian woodland and flowing water. Vegetation communities and land covers on the project include Fremont cottonwood (*Populus fremontii)*–arroyo willow *(Salix lasiolepis)* riparian woodland, mulefat thickets, ornamental vegetation, upland mustards, urban/developed, and agricultural lands. Habitat for southwestern pond turtle occurs throughout the landscape within the project boundary.

2 Species Account

Southwestern pond turtle is a California Species of Special Concern and is proposed threatened under the Federal Endangered Species Act. Southwestern pond turtles are habitat generalists and can be found in a variety of intermittent and permanent water features from Central California to northwestern Baja California (Hansen and Shedd 2025). This species is an opportunistic omnivore that has been documented feeding on various plants, invertebrates, fishes, amphibians and carrion (Bury 1986, Hansen and Shedd 2025, Lovich 1999). Southwestern pond turtles can be active year-round especially in mild coastal areas with reproduction occurring from April to October (Hansen and Shedd 2025). Southwestern pond turtles have been observed utilizing upland habitat several

hundred meters away from surface water for nesting and aestivation (Semlitsch and Bodie 2003). Hatchlings are small and likely overwinter in the nests to emerge in the following spring (Hansen and Shedd 2025).

3 Methods

Prior to the beginning of the habitat assessment and visual encounter survey, a literature review was conducted to identify observations of southwestern pond turtle in the vicinity of the project using the California Natural History Data Base (CDFW 2025). Recent and historic observations of southwestern pond turtle are common throughout southern Orange County with several observations being recorded within the Oso Creek (CDFW 2025). The southwestern pond turtle habitat assessment and visual encounter survey was conducted using methods described in the United States Geological Survey (2006) protocol. Two biologists scanned Oso Creek and the artificial pond with binoculars looking for swimming or basking pond turtles and recording the habitat quality within the project boundary.

3 Results

Aquatic and upland habitats that are required to support southwestern pond turtles were observed within the project boundary. Four southwestern pond turtles were observed basking in Oso Creek (Figure 2, Southwestern Pond Turtle Habitat Assessment and Visual Encounter Survey). Southwestern pond turtle observations were limited to the upper and middle sections of the natural bottom portion of Oso Creek within the project boundary. This was mainly due to very steeply eroded stream banks in the downstream portion of the creek with dense riparian vegetation making visual surveys impossible. Within the steep eroded stream channel there are some terraces that may provide upland habitat for southwestern pond turtles directly to the east and northeast of the nursery. Several pond sliders (*Trachemys scripta)* were observed in the upstream portion of Oso Creek and were observed in the artificial pond on the church property.

Table 1. Survey Conditions

Date	Hours	Survey	Biologist	Conditions (temperature, cloud cover, wind speed)
08/20/2025	0830–1130	SWPT HA/VES	MDM, KN	70°F–82°F, 0% cc, 0–3 mph

Notes: MDM = Max D. Murray, KN= Kimberly Narel; °F = degrees Fahrenheit; cc = cloud cover, mph = miles per hour.

4 Conclusion

The results of the 2025 habitat assessment and visual encounter survey were positive for southwestern pond turtle. Four individual southwestern pond turtles of different size classes were observed within Oso Creek (Figure 2). Habitat to support all phases of southwestern pond turtle life cycle are present within the project boundary. It is likely that this portion of Oso Creek supports a population of southwestern pond turtle.

5 References

Bury, R.B. 1986. "Feeding Ecology of the Turtle, Clemmys marmorata." Journal of Herpetology 20:515–521.

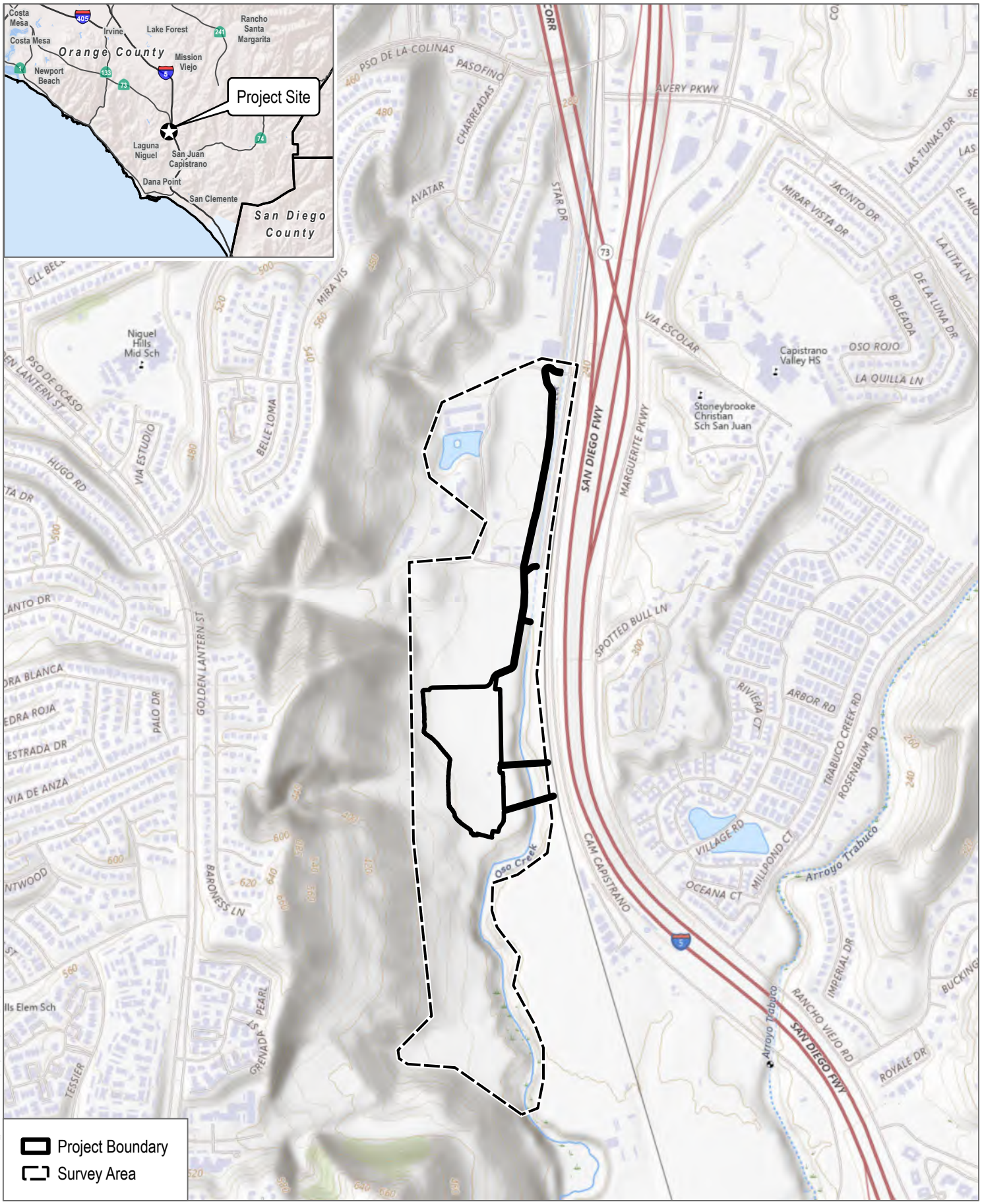
CDFW. 2025. RareFind 5: Commercial subscription. California Natural Diversity Database: Sacramento: CDFW, Biogeographic Data Branch. Accessed August 2025. https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data.

Hansen, R., and J. D. Shedd. California Amphibians and Reptiles. Princeton University Press, 2025.

Lovich, J. 1999. "Western Pond Turtle (Clemmys marmorata)." Species account prepared by U.S. Geological Survey (USGS) for the West Mojave Plan. USGS, Western Ecological Research Center, Department of Biology; University of California, Riverside, CA 92521-0427. Accessed February 11, 2008. http://www.ca.blm.gov/pdfs/cdd_pdfs/clemmys1.PDF

Semlitsch, R.D. and J.R. Bodie. 2003. “Biological Criteria for Buffer Zones Around Wetlands and Riparian Habitats for Amphibians and Reptiles.” Conservation Biology 17:1219–1228.

United States Geological Survey (USGS) 2006. “Western Pond turtle (*Emys marmorata*) Visual Survey Protocol for the Southcoast Ecoregion”. USGS, Western Ecological Research Center. Sacramento, California.



SOURCE: USGS National Map 2025

DUDEK

0 550 1,100 Feet

FIGURE 1

Project Location

Compass Energy Storage Project

SOURCE: USGS NHD 2024; Maxar 2023; Open Street Map 2019

DUDEK

0 250 500 Feet

FIGURE 2

Southwestern Pond Turtle Habitat Assessment and Visual Encounter Survey

Compass Energy Storage Project

Attachment A

Species Compendium

Wildlife Species–Vertebrates

Birds

Bushtits

AEGITHALIDAE—LONG-TAILED TITS AND BUSHTITS

Psaltriparus minimus—bushtit

Finches

FRINGILLIDAE—FRINGILLINE AND CARDUELINE FINCHES AND ALLIES

Haemorhous mexicanus—house finch

Spinus psaltria—lesser goldfinch

Flycatchers

TYRANNIDAE—TYRANT FLYCATCHERS

Sayornis nigricans—black phoebe

Tyrannus vociferans—Cassin's kingbird

Hawks

ACCIPITRIDAE—HAWKS, KITES, EAGLES, AND ALLIES

Buteo jamaicensis—red-tailed hawk

Hummingbirds

TROCHILIDAE—HUMMINGBIRDS

Calypte anna—Anna's hummingbird

Selasphorus sasin—Allen's hummingbird

Jays, Magpies and Crows

CORVIDAE—CROWS AND JAYS

Aphelocoma californica—California scrub-jay

Corvus brachyrhynchos—American crow

Mockingbirds and Thrashers

MIMIDAE—MOCKINGBIRDS AND THRASHERS

Mimus polyglottos—northern mockingbird

Old World Sparrows

PASSERIDAE—OLD WORLD SPARROWS

* *Passer domesticus*—house sparrow

Owls

STRIGIDAE—TYPICAL OWLS

Bubo virginianus—great horned owl

Shorebirds

CHARADRIIDAE—LAPWINGS AND PLOVERS

Charadrius vociferus—killdeer

Swallows

HIRUNDINIDAE—SWALLOWS

Stelgidopteryx serripennis—northern rough-winged swallow

Wood Warblers and Allies

PARULIDAE—WOOD-WARBLERS

Geothlypis trichas—common yellowthroat

New World Sparrows

PASSERELLIDAE—NEW WORLD SPARROWS

Melospiza melodia—song sparrow

Melozone crissalis—California towhee

Pipilo maculatus—spotted towhee

Mammals

Hares and Rabbits

LEPORIDAE—HARES AND RABBITS

Sylvilagus audubonii—desert cottontail

Squirrels

SCIURIDAE—SQUIRRELS

Otospermophilus beecheyi—California ground squirrel

Reptiles

Snakes

COLUBRIDAE—COLUBRID SNAKES

Pituophis catenifer—gophersnake

Turtles

EMYDIDAE—BOX AND WATER TURTLES

* *Trachemys scripta*—pond slider

Actinemys pallida—southwestern pond turtle

* signifies introduced (non-native) species

Attachment B

Photo Log

Photo 1. Upstream boundary of habitat assessment of Oso Creek.

Photo 2. Ponded habitat in the downstream section of Oso Creek.

Photo 3. Ponded habitat in the downstream section of Oso Crek.

Photo 4. Basking sites in the middle section of Oso Creek.

Photo 5. Potential upland habitat in the middle section of Oso Creek.

Photo 6. Basking sites in the upstream portion of Oso Creek.

Photo 7. One southwestern pond turtle observed basking through binoculars.

Photo 8. One pond slider observed basking though binoculars.

Attachment F

CEC Opt-In Application – Biological Resources AMMs

4.2.4 Avoidance and Minimization Measures

The following section describes the measures that are intended to avoid and minimize potential adverse effects of the project to biological resources.

4.2.4.1 Minimization Measures for Construction

Environmental Awareness Training. A qualified biologist shall present an education program on special-status species that may be encountered on the project site, such as: yellow warbler, yellow-breasted chat, California horned lark, orange-throated whiptail, red diamond rattlesnake, southwestern pond turtle, western red bat, and pallid bat to all project employees prior to the start of construction and before new employees begin work onsite. Materials discussed in the program will include, at a minimum, the following topics: (1) species description, general behavior, and ecology; (2) distribution and occurrence near the project site; (3) species' sensitivity to human activities; (4) legal protection; (5) penalties for violation of State and Federal Laws; (6) reporting requirements; and (7) project conservation measures. The biological monitor shall document the names, dates, and affiliation of those persons who attend the training.

Pre-Construction Surveys. As described in **MM-BIO-1** in the following subsection, prior to the onset of work, a qualified biologist shall conduct a pre-construction survey for sensitive biological resources within and near the project site. Target special-status species include but are not limited to, yellow warbler, yellow breasted chat, western red bat, and southwestern pond turtle. Should special-status species be found, then measures recommended by the qualified biologist shall be incorporated into the project to reduce the likelihood of species impacts.

Nesting Bird Season Avoidance. As detailed in **MM-BIO-2** in the following subsection, potential impacts exist for avian species during the breeding season occurring between February 1 and August 31 for general nesting birds and January 1 through September 15 for raptors. Work conducted during these months will require a nesting bird survey conducted by a qualified biologist within and near the project footprint within 72 hours of the onset of activities. Should the qualified biologist discover any nesting birds, then appropriate measures, as determined by the qualified biologist, will be implemented to minimize impacts.

Southwestern Pond Turtle Trapping and Relocation. As detailed in MM BIO-3 in the following subsection, potential impacts exist for southwestern pond turtle that are present in and along the banks of Oso Creek. A pre-construction clearance survey for southwestern pond turtle shall be conducted to trap and relocate any species within the work impact areas. Informal consultation with USFWS shall be conducted to specify the methods of trapping and relocation.

Best Management Practices (BMPs). No significant direct permanent impacts would occur to federally or state-defined wetlands or non-wetland waters as a result of project activities. Short-term and long-term indirect impacts to jurisdictional waters relating to construction activities (edge effects) and trash/pollution would not likely result in significant impacts, especially with the application of the standard BMPs that would be implemented during project construction.

The following BMPs will be implemented:

- BMPs to address erosion and excess sedimentation shall be incorporated into the project plans.

- Work shall be limited to the construction footprint as outlined in the project plans. Access routes, staging areas, and the total footprint of disturbance shall be the minimum number/size necessary to complete the project and will be selected/placed to avoid impacts to sensitive habitat/resources.
- Sensitive resources will be marked and protected by temporary fencing (e.g., orange plastic fencing, silt fencing, signage) or other acceptable method. Works limits will be clearly marked in the field and confirmed by the project biologist/biological monitor prior to the start of construction. All staked/fenced boundaries will be maintained in good repair throughout construction.
- Where applicable, weed-free products shall be used to minimize the accidental spread of exotic plants. All construction equipment used for the project shall be clean and free of soil and plant material before arrival on-stie and before leaving the work area to prevent the spread of invasive plants.
- All storage and staging areas should be placed on existing developed or disturbed locations to the greatest extent feasible (e.g., paved, or bare ground surfaces) that have been reviewed and approved by the project biologist and project archaeologist.
- All areas used for stockpiling shall be kept free from trash and other waste. No project-related items shall be stored outside approved staging areas at any time.
- All contractor equipment and vehicles shall be inspected for leaks immediately prior to the start of construction, and regularly thereafter until the equipment and/or vehicles are removed from project premises. Any leaks shall be properly contained, or the equipment/vehicle(s) repaired, and if failing repair, removed off-site.
- Unless authorized by regulatory authority, project activities particularly involving cleaning or fueling or motorized equipment, will occur greater than 100 feet from jurisdictional or potentially jurisdictional waters. Contaminated water, sludge, spill residue, or other hazardous compounds will be disposed of outside project boundaries at a lawfully authorized destination.
- Dust impacts shall be minimized by implementing appropriate measures that will reduce/control emissions generated by the project. water shall be applied (e.g., using a water truck) at sufficient quantities to prevent airborne dust from leaving the project area.
- In areas of excavation (e.g., pits, trenches, drilling holes) shall be covered overnight or during periods of inactivity. Routes of escape from excavated pits and trenches shall also be installed for wildlife that could potentially become entrapped (e.g., wood planks, sticks, or equivalent with dimensions of roughly 2-inch thick by 6-inch wide, and earthen ramps/slopes). These locations will be regularly inspected over the course of the project and immediately prior to filling. Should any entrapped wildlife be discovered, then work shall be suspended at the excavation site until the animal can be safely relocated by the biological monitor or project biologist.

4.2.4.2 Minimization Measures for Special-Status Species

MM-BIO-1 Pre-Construction Surveys for Special-Status Species. Conduct pre-construction clearance surveys for special-status wildlife species known to occur on site or have the potential to occur, including but not limited to: yellow warbler, yellow-breasted chat, red diamond rattlesnake, western red bat, and pallid bat. The survey shall be conducted no more than 14 days prior to initiation of site preparation and grading activities. A qualified biologist shall walk the entire project site to determine if any special-status wildlife are observed or detected. Acoustic detection for bats may be used in conjunction with visual observation of individuals and sign to determine presence/absence of occupied roosts or foraging behavior. If special-status wildlife species are

observed or detected during the pre-construction surveys, additional measures may be required, such as establishing a buffer around known locations and/or conducting monitoring during construction near occupied areas to move observed individuals out of harm's way. For pallid bat, if a roost may be impacted during construction, additional measures, such as a focused bat survey, replacement roost installation, and/or agency consultation, may be required.

MM BIO-2 Southwestern Pond Turtle Trapping and Relocation (Management) Plan. A pre-construction visual encounter survey for southwestern pond turtle shall be conducted in and along the banks of Oso Creek prior to initiation of construction activities to trap and relocate any detected southwestern pond turtles in the project impact area. Informal consultation with USFWS and CDFW shall be conducted by the Applicant prior to initiation of construction activities within Oso Creek to coordinate on the specific methods of trapping and relocation for southwestern pond turtle that are present in the project impact areas. As southwestern pond turtle is proposed for federal listing as Threatened, no formal Section 7 USFWS consultation under the Federal Endangered Species Act is required. A southwestern pond turtle Management Plan shall be prepared to detail the specific methods for translocation/relocation efforts in coordination with USFWS and CDFW.

No ground-disturbance will be permitted within 1,640 feet (500 meters) of suitable aquatic habitat for southwestern pond turtle during the turtle overwintering period from October to March. No ground-disturbance will be permitted within 656 feet (200 meters) of aquatic habitat occupied by southwestern pond turtle. The project proponent will implement applicable Best Management Practices (BMPs) for southwestern pond turtle in accordance with the most recent and agency-accepted guidelines available at the time of project implementation (e.g., Department of Defense (DOD) Legacy Resource Management Program 2020 and Oregon Department of Fish and Wildlife 2015).

- If ground-disturbance within 1,640 feet (500 meters) of suitable aquatic habitat from October to March or 656 feet (200 meters) of occupied aquatic habitat is not feasible, the project proponent will informally consult with USFWS on appropriate measures to identify and avoid take of any southwestern pond turtles nesting in the construction footprint. These measures may include all or a combination of the following to avoid take of nesting pond turtles:
    - Qualified biologist(s) shall conduct visual encounter surveys for pond turtle nests or evidence of nesting from May to June prior to any ground disturbance within the above buffers.
    - A minimum 50-foot-radius exclusion zone shall be established around any pond turtle nests or suspected nests found during the visual encounter surveys using high-visibility fencing. The exclusion zone shall remain in effect until the biologist has verified that the nest is no longer active.
- Occupied aquatic habitat shall be isolated from adjacent upland nesting habitat within the construction footprint before April in the year of construction. The intent of this measure is to ensure that once hatchling pond turtles leave their upland nests in April, no additional nests will be established in the construction footprint during the following season. Unclimbable, smooth fencing (e.g., Animex HDPE#2 material or wooden fencing) will be installed at the interface between aquatic and upland habitat. The fencing will be maintained between its installation and project start with regular monitoring (1 to 2

hours of observation every monitoring period) to ensure that turtles and other special-status species are not being entrapped by the fencing.

MM-BIO-3 Pre-Construction Nesting Bird Surveys and Avoidance. Construction activities shall avoid the migratory bird nesting season (typically February 1 through August 31) to reduce any potential significant impact to birds that may be nesting in the Survey Area, including yellow warbler, yellow-breasted chat, and California horned lark. If construction activities must occur during the migratory bird nesting season, an avian nesting survey of the project site and within 500 feet of all impact areas must be conducted to determine the presence/absence of protected migratory birds and active nests. The avian nesting survey shall be performed by a qualified wildlife biologist within 72 hours prior to the start of construction in accordance with the Migratory Bird Treaty Act (16 USC 703–712) and California Fish and Game Code Sections 3503, 3503.5, and 3513. If an active bird nest is found, the nest shall be flagged and mapped on the construction plans, along with an appropriate buffer established around the nest, which shall be determined by the biologist based on the species' sensitivity to disturbance (typically 300 feet for passerines and 500 feet for raptors and special-status species). The nest area shall be avoided until the nest is vacated and the juveniles have fledged. The nest area shall be demarcated in the field with flagging and stakes or construction fencing. On-site construction monitoring shall also be conducted when construction occurs in proximately to an active nest buffer. No project activities shall encroach into established buffers without the consent of a monitoring biologist. The buffer shall remain in place until it is determined that the nestlings have fledged and the nest is no longer active.

4.2.4.3 Minimization Measure for Site Restoration (Decommissioning)

Over the long term, once the project facilities are no longer needed, the structures will be removed the project area will be restored to approximate preconstruction conditions as described in the draft Decommissioning Plan (see Appendix 2A). This draft plan can then be updated at a later date (but no more than 1 year prior to closure). A formal plan for the project facility closure will be developed by the project owner and submitted to the CEC at least 1 year prior to facility closure (**MM BIO-4: Decommissioning Plan**).

MM-BIO-4: Decommissioning Plan. Prior to commencing decommissioning activities and at least 12 months in advance of planned decommissioning, the applicant shall file a decommissioning plan with the CEC Compliance Project Manager (CPM) for approval. The decommissioning plan shall:

- Identify and discuss the proposed decommissioning and site restoration activities for the project and all appurtenant facilities constructed as a part of/or because of the project;
- Identify all applicable laws, ordinances, regulations, standards, (LORS) and local/regional plans applicable at that time;
- Discuss how the specific proposed decommissioning activities would comply with those identified LORS and plans;
- Discuss the reasons for selecting the preferred proposal; and

- Provide a schedule for decommissioning and identify the final reporting that shall be required to demonstrate that decommissioning was completed in compliance with the CEC-approved decommissioning plan.

Attachment G

Site Plans Exhibits

Attachment G.1

BESS Site Plan

GRADING PLAN FOR
COMPASS ENERGY STORAGE

BASIS OF BEARINGS

NAD 85(2011), STATE PLANE COORDINATES CA ZONE, 6, PER NGS MONUMENTS 7 8 21 AND TRABUCO

BENCHMARK

TBD

LEGAL DESCRIPTION

(PER FIDELITY NATIONAL TITLE INSURANCE COMPANY ORDER NO. 997-30049472-A-ML6, DATE OCT. 28, 2020)

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF SAN JUAN CAPISTRANO IN THE COUNTY OR ORANGE, STATE OF CALIFORNIA , AND IS DESCRIBED AS FOLLOWS:

PARCEL B:

BEGINNING THEREFROM THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER OF SECTION 26, TOWNSHIP 7 SOUTH, RANGE 8 WEST, SAN BERNARDINO BASE AND MERIDIAN.

EXCEPTING THEREFROM, THAT PART THEREOF INCLUDED WITHIN THE RIGHT OF WAY OF THE ATCHISON, TOPEKA AND SANTA FE RAILWAY.

ALSO EXCEPTING THEREFROM THE INTEREST CONVEYED TO ORANGE COUNTY FLOOD DISTRICT A BODY CORPORATE AND POLITIC, IN AND TO THE LAND CONVEYED BY THAT CERTAIN GRANT DEED EXECUTED BY CRYSTAL CATHEDRAL MINISTRIES, A CALIFORNIA NON-PROFIT RELIGIOUS CORPORATION, RECORDED OCTOBER 04, 1995 AS INSTRUMENT NO. 19950434581 OF OFFICIAL RECORDS

APN 637-082-70 (PORTION)

PARCEL B2:
ALL THAT TRACT COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER OF SECTION 26, TOWNSHIP 7 SOUTH, RANGE 8 WEST, SAN BERNARDINO BASE AND MERIDIAN.

EXCEPTING THEREFROM, THAT PORTION INCLUDED WITHIN THE RIGHT-OF-WAY OF THE ATCHISON TOPEKA AND SANTA FE RAILWAY.

ALSO EXCEPTING THEREFROM, THE FOLLOWING DESCRIBED LAND CONVEYED TO WILLIAM BATHGATE AND OTHERS, BY DEED RECORDED OCTOBER 19, 1928 IN BOOK 206, PAGE 335 OF OFFICIAL RECORDS.

BEGINNING AT THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER OF SECTION 26, TOWNSHIP 7 SOUTH, RANGE 8 WEST, SAN BERNARDINO BASE AND MERIDIAN;

ALSO EXCEPTING THEREFROM THAT PORTION THEREOF BEGINNING AT THE NORTHWEST CORNER OF THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 25, IN TOWNSHIP 7 SOUTH, RANGE 8 WEST, SAN BERNARDINO BASE AND MERIDIAN.

ALSO, EXCEPT THEREFROM THE INTEREST CONVEYED TO ORANGE COUNTY FLOOD CONTROL DISTRICT, A BODY CORPORATE AND POLITIC, IN AND TO THE LAND CONVEYED BY THAT CERTAIN GRANT DEED EXECUTED BY CRYSTAL CATHEDRAL MINISTRIES, A CALIFORNIA NON- PROFIT RELIGIOUS CORPORATION, RECORDED OCTOBER 04, 1995 AS INSTRUMENT NO. 19950434581 OF OFFICIAL RECORDS

APN 637-082-70 (PORTION), APN 637-082-71 (PORTION)

SHEET INDEX

PREPARED BY:

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KIMLEY-HORN AND ASSOCIATES, INC.
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RIVERSIDE, CA 92501

TOPOGRAPHY SOURCE
UAV LIDAR SURVEY COMPLETED APRIL 2024

BY:
DUDEK
A78-075 MAIN STREET, STE G-203
LA QUINTA, CA 92253

ISSUED FOR 30% REVIEW

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
0C	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
0B	ISSUED FOR 30% REVIEW	07/07/25	KJF	MLM
0A	PRELIMINARY	05/02/25	KJF	MLM

ENGIE

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
COVER SHEET

DWG. NAME: CMP-D-P000-01 REVISION NO : 0C

FILE LOCATION: N:\SHARED\01 ECI\EPC SERVICES\02 PROJECTS\EPCS-592 COMPASS BESS\GRADING\300 DESIGN\320 CIVIL & STRUCTURAL\322 SITE DESIGN\12_CAD-GRADING PLAN SHEETS\SHT 2-NOTES.DWG LAST SAVED BY: kjfulton 10/31/2025 2:56 PM PLOTTED BY: Kyle J. Fulton 11/7/2025 11:58 AM Tab:COVER SHEET

"Engineering with Distinction"

ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
0C	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
0B	ISSUED FOR REVIEW	06/20/25	KJF	MLM
0A	PRELIMINARY	05/02/25	KJF	MLM

ENGINEERING RECORD		DATE
DRAWN	*K. FULTON*	04/30/25
DESIGNED	*K. FULTON*	04/30/25
CHECKED	*C. STAFFORD*	11/07/25
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

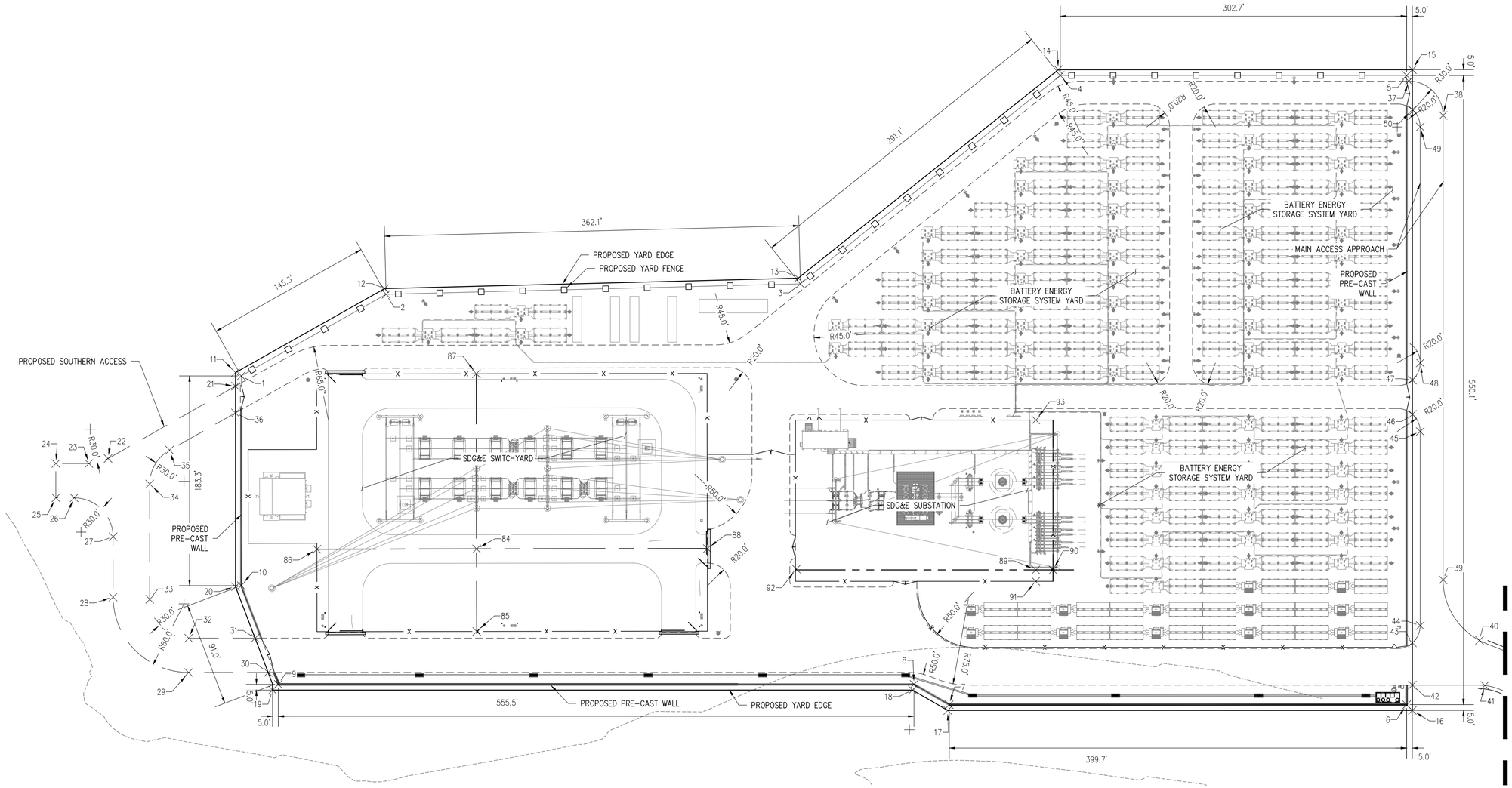
COMPASS BESS YARD

100 MW / 200 MWH BATTERY SYSTEM

NOTES

DWG. NAME: CMP-D-P002-02

REVISION NO : 0C



MATCHLINE: SEE SHT CMP-D-P002-04

0 20FT 50FT 100FT
SCALE: 1"=50'

EASTING/NORTHING POINT TABLE

POINT #	EASTING	NORTHING	DESCRIPTION
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85	6126783.66	2140256.39	SWITCHYARD BASELINE END
86	6126711.72	2140116.71	SWITCHYARD BASELINE END
87	6126558.38	2140256.08	SWITCHYARD BASELINE END
88	6126711.24	2140457.89	SWITCHYARD BASELINE END
89	6126729.84	2140744.93	SUBSTATION BASELINE INTERSETCION
90	6126729.84	2140759.93	SUBSTATION BASELINE END
91	6126739.84	2140744.93	SUBSTATION BASELINE END
92	6126729.14	2140535.63	SUBSTATION BASELINE END
93	6126598.84	2140744.93	SUBSTATION BASELINE END

EASTING/NORTHING POINT TABLE

POINT #	EASTING	NORTHING	DESCRIPTION
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2	6126488.91	2140177.22	FENCE CORNER
3	6126479.75	2140539.18	FENCE CORNER
4	6126297.57	2140766.24	FENCE CORNER
5	6126297.57	2141068.94	FENCE CORNER
6	6126847.67	2141068.94	FENCE CORNER
7	6126847.67	2140669.23	FENCE CORNER
8	6126829.91	2140638.46	FENCE CORNER
9	6126829.91	2140082.97	FENCE CORNER
10	6126743.55	2140050.58	FENCE CORNER

EASTING/NORTHING POINT TABLE

POINT #	EASTING	NORTHING	DESCRIPTION
11	6126557.31	2140045.58	YARD CORNER
12	6126483.94	2140175.85	YARD CORNER
13	6126474.79	2140537.37	YARD CORNER
14	6126292.57	2140764.48	YARD CORNER
15	6126292.57	2141073.94	YARD CORNER
16	6126852.67	2141073.94	YARD CORNER
17	6126852.67	2140667.90	YARD CORNER
18	6126834.91	2140637.12	YARD CORNER
19	6126834.91	2140077.97	YARD CORNER
20	6126744.47	2140045.58	YARD CORNER

EASTING/NORTHING POINT TABLE

POINT #	EASTING	NORTHING	DESCRIPTION
21	6126569.24	2140045.58	APPROACH EDGE
22	6126632.46	2139934.21	APPROACH EDGE
23	6126636.84	2139917.53	APPROACH EDGE
24	6126636.84	2139888.64	APPROACH EDGE
25	6126666.84	2139888.64	APPROACH EDGE
26	6126666.84	2139904.64	APPROACH EDGE
27	6126700.84	2139938.64	APPROACH EDGE
28	6126753.53	2139938.64	APPROACH EDGE
29	6126819.53	2140004.64	APPROACH EDGE
30	6126819.53	2140074.15	APPROACH EDGE

EASTING/NORTHING POINT TABLE

POINT #	EASTING	NORTHING	DESCRIPTION
31	6126789.53	2140062.73	APPROACH EDGE
32	6126789.53	2140004.64	APPROACH EDGE
33	6126755.53	2139970.64	APPROACH EDGE
34	6126654.78	2139970.64	APPROACH EDGE
35	6126625.15	2139987.95	APPROACH EDGE
36	6126592.61	2140045.58	APPROACH EDGE
37	6126302.57	2141070.77	APPROACH EDGE
38	6126548.84	2141080.77	APPROACH EDGE
39	6126738.55	2141100.77	APPROACH EDGE
40	6126791.48	2141132.52	APPROACH EDGE

EASTING/NORTHING POINT TABLE

POINT #	EASTING	NORTHING	DESCRIPTION
41	6126830.89	2141137.32	APPROACH EDGE
42	6126830.55	2141073.94	APPROACH EDGE
43	6126793.61	2141073.94	APPROACH EDGE
44	6126778.55	2141080.77	APPROACH EDGE
45	6126608.84	2141080.77	APPROACH EDGE
46	6126593.79	2141073.94	APPROACH EDGE
47	6126563.90	2141073.94	APPROACH EDGE
48	6126548.84	2141080.77	APPROACH EDGE
49	6126342.57	2141080.77	APPROACH EDGE
50	6126327.51	2141073.94	APPROACH EDGE

LEGEND

- PROPOSED SITE FENCE
- PROPOSED PRE-CAST WALL
- PROPOSED YARD BORDER FENCE
- PROPOSED YARD EDGE (END FLEXIBLE BASE)

NOTES

1. STORM DRAIN CONVEYANCE PLAN ON SHEET 7 AND 8

ISSUED FOR 30% REVIEW

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
0C	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
0B	ISSUED FOR 30% REVIEW	07/07/25	KJF	MLM
0A	PRELIMINARY	05/02/25	KJF	MLM

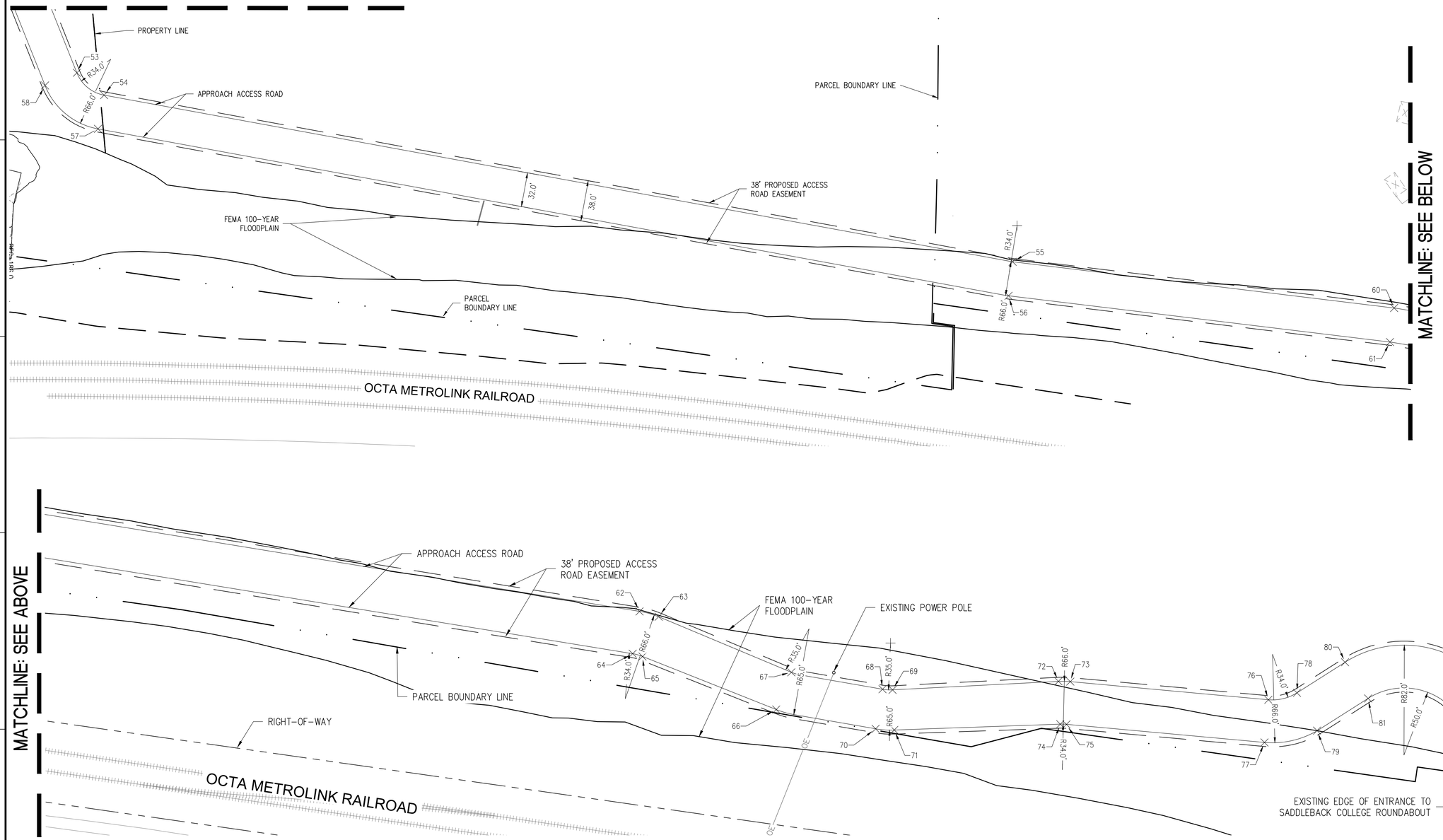
ENGIE

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: 1" = 50'	PLT SCALE: 1:1	

COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
SITE DIMENSION PLAN

DWG. NAME: CMP-D-P002-03 REVISION NO : 0C

MATCHLINE: SEE SHT CMP-D-P002-03



EASTING/NORTHING POINT TABLE

POINT #	EASTING	NORTHING	DESCRIPTION
51	6126805.77	2141167.62	APPROACH EDGE
52	6126842.56	2141204.60	APPROACH EDGE
53	6126939.33	2141243.24	APPROACH EDGE
54	6126960.18	2141268.69	APPROACH EDGE
55	6127115.68	2142116.68	APPROACH EDGE
56	6127147.45	2142112.83	APPROACH EDGE
57	6126991.65	2141262.92	APPROACH EDGE
58	6126951.18	2141213.52	APPROACH EDGE
59	6126864.27	2141178.84	APPROACH EDGE
60	6127158.80	2142472.75	APPROACH EDGE
61	6127190.57	2142468.90	APPROACH EDGE
62	6127233.11	2142929.25	APPROACH EDGE
63	6127237.13	2142943.55	APPROACH EDGE
64	6127264.69	2142924.11	APPROACH EDGE
65	6127266.77	2142931.47	APPROACH EDGE
66	6127306.36	2143031.29	APPROACH EDGE
67	6127278.58	2143042.61	APPROACH EDGE
68	6127291.21	2143110.68	APPROACH EDGE
69	6127291.70	2143118.18	APPROACH EDGE
70	6127320.77	2143105.55	APPROACH EDGE
71	6127321.67	2143119.48	APPROACH EDGE
72	6127285.34	2143242.07	APPROACH EDGE
73	6127285.55	2143250.93	APPROACH EDGE
74	6127317.31	2143243.45	APPROACH EDGE
75	6127317.42	2143248.02	APPROACH EDGE
76	6127299.09	2143398.82	APPROACH EDGE
77	6127330.96	2143395.90	APPROACH EDGE
78	6127293.93	2143420.14	APPROACH EDGE
79	6127322.13	2143435.14	APPROACH EDGE
80	6127271.09	2143456.12	APPROACH EDGE
81	6127298.11	2143473.27	APPROACH EDGE
82	6127279.43	2143554.99	APPROACH EDGE
83	6127331.93	2143549.36	APPROACH EDGE

LEGEND
PROPERTY LINE
RIGHT-OF-WAY
FEMA 100-YEAR FLOODPLAIN
PROPOSED ACCESS APPROACH EDGE
PROPOSED ACCESS APPROACH EASEMENT

NOTES

0 20FT 50FT 100FT
SCALE: 1"=50'

ISSUED FOR 30% REVIEW

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
0C	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
0B	ISSUED FOR 30% REVIEW	07/07/25	KJF	MLM
0A	PRELIMINARY	05/02/25	KJF	MLM

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: 1" = 50'	PLT SCALE: 1:1	

COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
SITE DIMENSION PLAN

DWG. NAME: CMP-D-P002-04 | REVISION NO : 0C

APPROXIMATE EARTHWORK QUANTITIES

TOTAL DISTURBED AREA	14.7	ACRES		
TOPSOIL				
REMOVAL	AREA (SF)	DEPTH (IN)	VOL (CY)	
YARD	531,295	24	39,355	
APPROACH	107,756	24	7,982	
TOTALS	14.7	ACRES	47,337	CY
RE-USED ON SITE-SUB/SWY	113,556	10	3,505	
RE-USED ON SITE-BESS	228,588	20	14,110	
EXPORT / STOCKPILED / WASTED			29,722	CY

CUT/FILL QUANTITIES*	CUT	FILL	NET	
YARD (INCLUDES PAVED ROAD)	3,653	105,078	101,425	FILL
ADS STORMTECH	TBD	TBD	TBD	TBD
EXTERNAL YARD ACCESS ROADS	54	7,466	7,412	FILL
NET CUT/FILL TO R.G.	3,706	112,544	108,838	FILL
ONSITE MATERIAL IS SUITABLE AS FILL				
CUT AVAILABLE FOR FILL			3,706	CY
STRUCTURAL FILL REQUIRED			108,838	CY

SELECT IMPORT**	AREA (SF)	DEPTH (IN)	VOL (CY)
SUB/SWY-CRUSHED ROCK	113,556	6	2,103
SUB/SWY-FLEXIBLE BASE	113,556	8	2,804
SUB/SWY-DRIVE AISLES	36,004	14	1,556
BESS-FLEXIBLE BASE	228,588	8	5,644
AC PAVED ROAD	183,997	TBD	TBD
RIP RAP	4,500	TBD	TBD
		TOTAL	10,004

SUMMARY		
TOTAL CUT (TOPSOIL + NET CUT)	51,044	CY
TOTAL FILL (SELECT IMPORT + NET FILL)	122,548	CY
TOTAL EXPORT / STOCKPILED / WASTED	29,722	CY
TOTAL IMPORT (SELECT IMPORT + STRUCTURAL FILL)	118,841	CY

*TOPSOIL STRIPPED SURFACE COMPARED TO ROUGH GRADE
**ABOVE ROUGH GRADE

MATCHLINE: SEE SHT CMP-D-P002-06

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED SITE FENCE
- PROPOSED PRE-CAST WALL
- PROPOSED YARD BORDER FENCE
- PROPOSED YARD EDGE (END FLEXIBLE BASE)
- PROPOSED ASPHALT ROAD

EG EXISTING GRADE
FG FINISHED GRADE
FS FINISHED SURFACE

NOTES

1. STORM DRAIN CONVEYANCE PLAN ON SHEET 7 AND 8

0 20FT 50FT 100FT
SCALE: 1"=50'

ISSUED FOR 30% REVIEW

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
0C	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
0B	ISSUED FOR 30% REVIEW	07/07/25	KJF	MLM
0A	PRELIMINARY	05/02/25	KJF	MLM

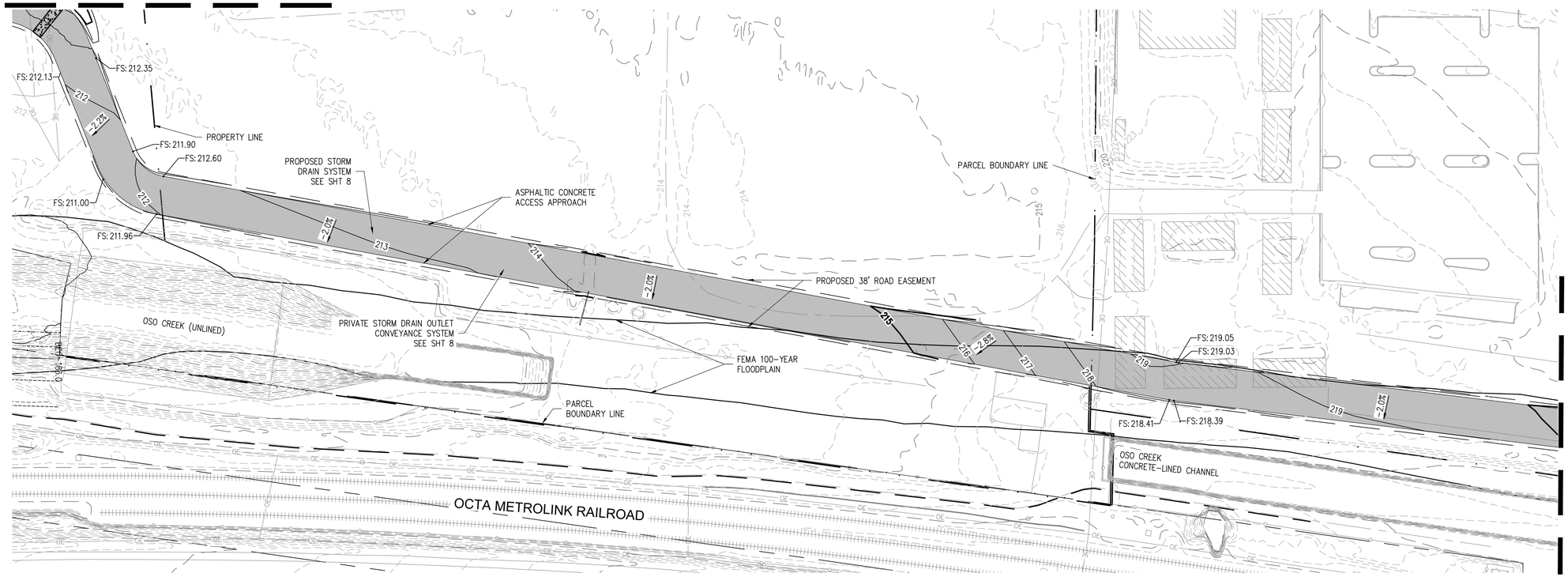
ENGIE

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: 1" = 50'	PLT SCALE: 1:1	

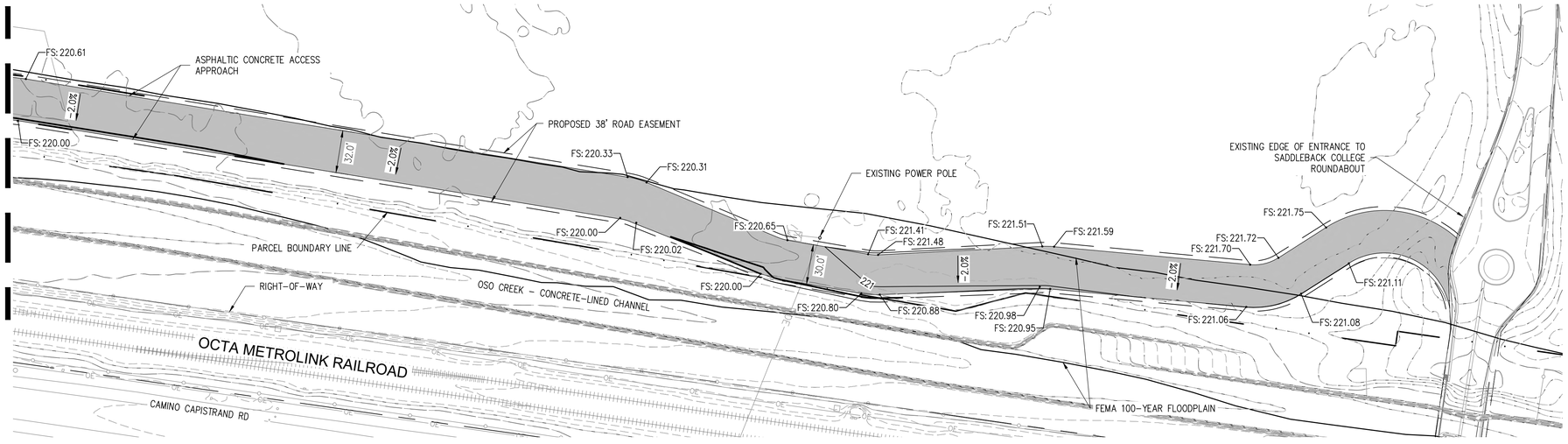
COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
SITE GRADING PLAN

DWG. NAME: CMP-D-P002-05 REVISION NO : 0C

MATCHLINE: SEE SHT CMP-D-P002-05



MATCHLINE: SEE ABOVE



0 20FT 50FT 100FT
SCALE: 1"=50'

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED SITE FENCE
- PROPOSED PRE-CAST WALL
- PROPOSED YARD BORDER FENCE
- PROPOSED YARD EDGE (END FLEXIBLE BASE)
- PROPOSED ASPHALT ROAD
- EG EXISTING GRADE
- FG FINISHED GRADE
- FS FINISHED SURFACE

NOTES

1. STORM DRAIN CONVEYANCE PLAN ON SHEET 7 AND 8

ISSUED FOR 30% REVIEW

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

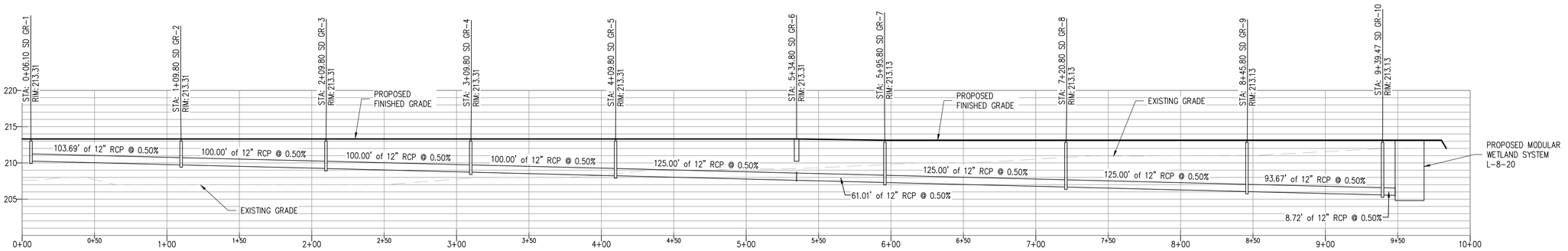
NO	REVISION	DATE	BY	APR
0C	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
0B	ISSUED FOR 30% REVIEW	07/07/25	KJF	MLM
0A	PRELIMINARY	05/02/25	KJF	MLM

ENGIE

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: 1" = 50'	PLT SCALE: 1:1	

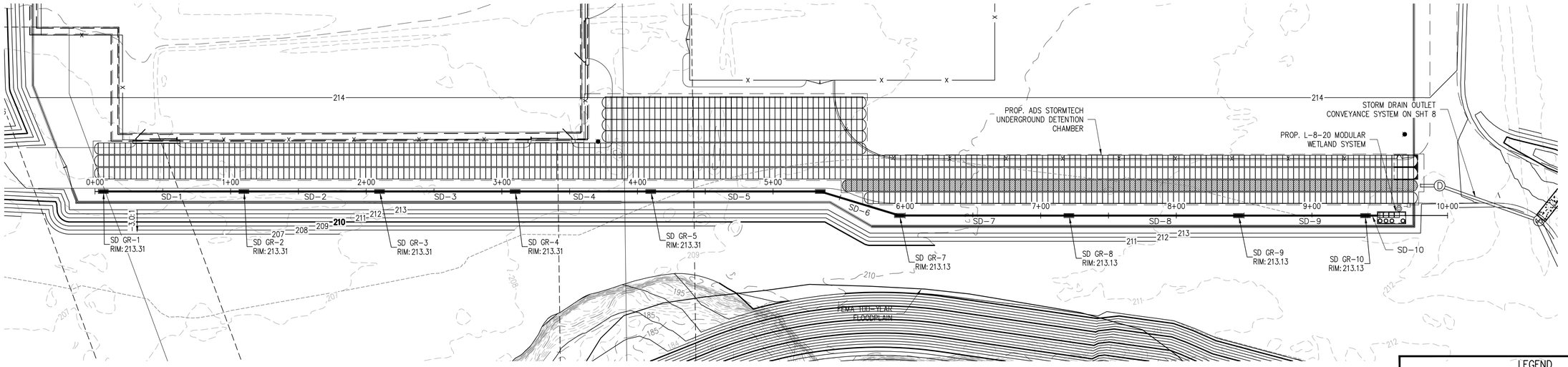
COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
SITE GRADING PLAN

DWG. NAME: CMP-D-P002-06 | REVISION NO : 0C



PRIVATE YARD STORM DRAIN

SCALE: 1"=40' HORIZONTAL
1"=8' VERTICAL



PLAN VIEW

SCALE: 1"=40'

PRIVATE STORM DRAIN						
NAME	SIZE	LENGTH	SLOPE	MATERIAL	IE IN	IE OUT
SD-1	12"	103.69'	0.50%	RCP	210.25	209.73
SD-2	12"	100.00'	0.50%	RCP	209.73	209.23
SD-3	12"	100.00'	0.50%	RCP	209.23	208.73
SD-4	12"	100.00'	0.50%	RCP	208.73	208.23
SD-5	12"	125.00'	0.50%	RCP	208.23	207.61
SD-6	12"	61.01'	0.50%	RCP	207.61	207.30
SD-7	12"	125.00'	0.50%	RCP	207.30	206.68
SD-8	12"	125.00'	0.50%	RCP	206.68	206.05
SD-9	12"	93.67'	0.50%	RCP	206.05	205.58
SD-10	12"	8.72'	0.50%	RCP	205.58	205.54

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED SITE FENCE
- PROPOSED PRE-CAST WALL
- PROFILE FINISHED GRADE
- PROFILE EXISTING GRADE
- PROPOSED STORM DRAIN
- SD STORM DRAIN

NOTES

0 20FT 40FT 80FT
SCALE: 1"=40'

ISSUED FOR 30% REVIEW

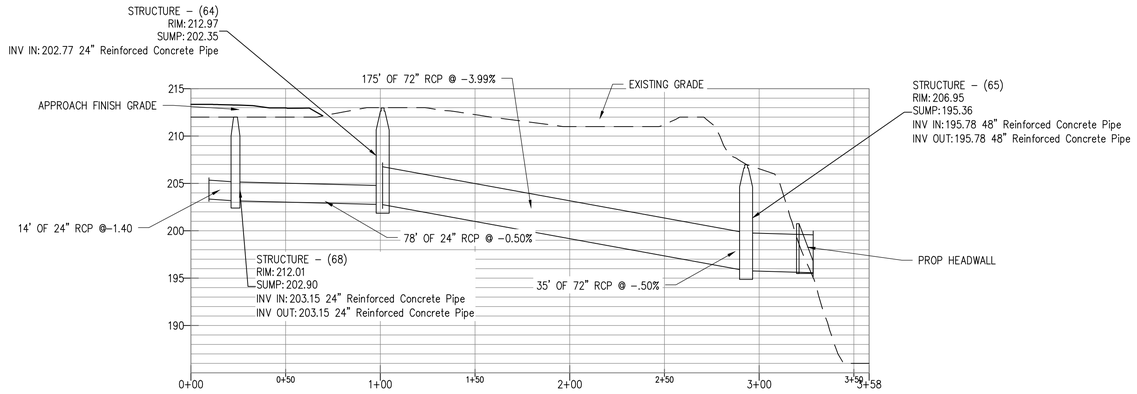
"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
0C	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
0B	ISSUED FOR 30% REVIEW	07/07/25	KJF	MLM
0A	PRELIMINARY	05/02/25	KJF	MLM

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: 1" = 40'	PLT SCALE: 1:1	

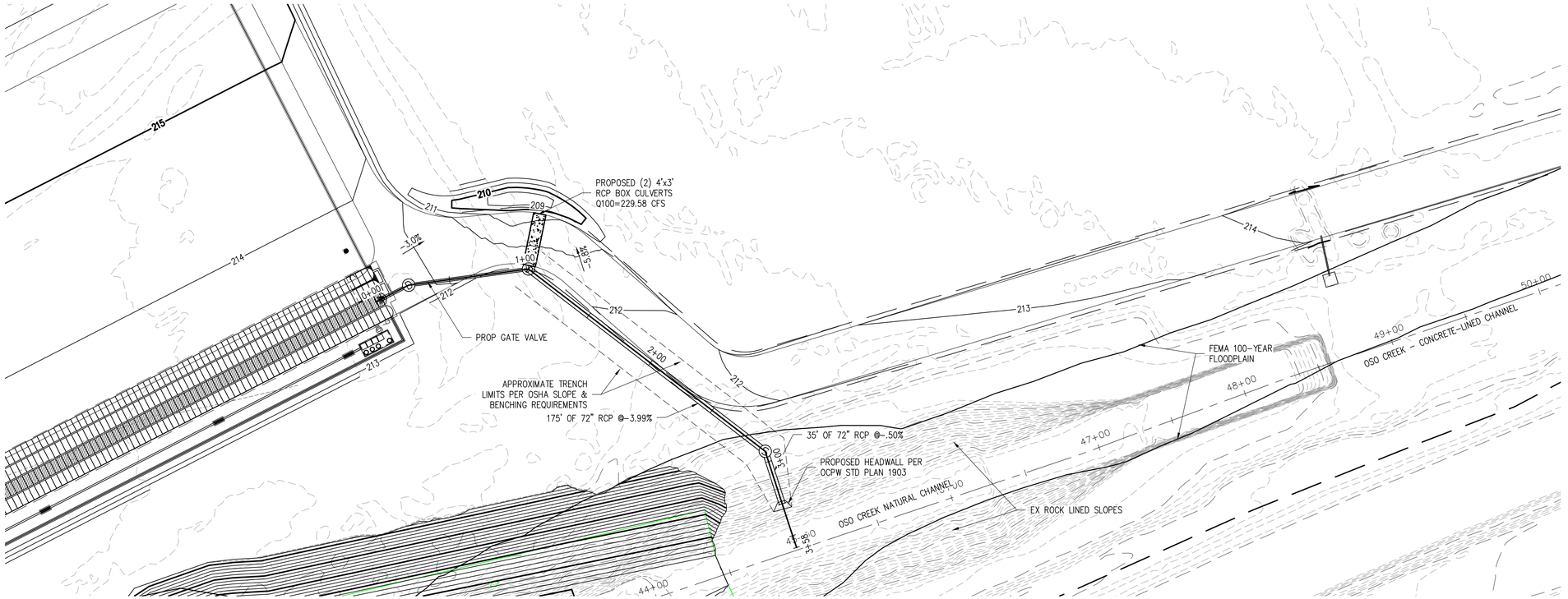
COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
STORM DRAIN PLAN & PROFILE

DWG. NAME: CMP-D-P002-07
REVISION NO : 0C



PROFILE VIEW

SCALE: 1"=40'



PLAN VIEW

SCALE: 1"=40'

LEGEND	
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED SITE FENCE
	PROPOSED PRE–CAST WALL
	PROFILE FINISHED GRADE
	PROFILE EXISTING GRADE
SD	PROPOSED STORM DRAIN / STORM DRAIN

NOTES

0 20FT 40FT 80FT

SCALE: 1"=40'

ISSUED FOR 30% REVIEW

"Engineering with Distinction"

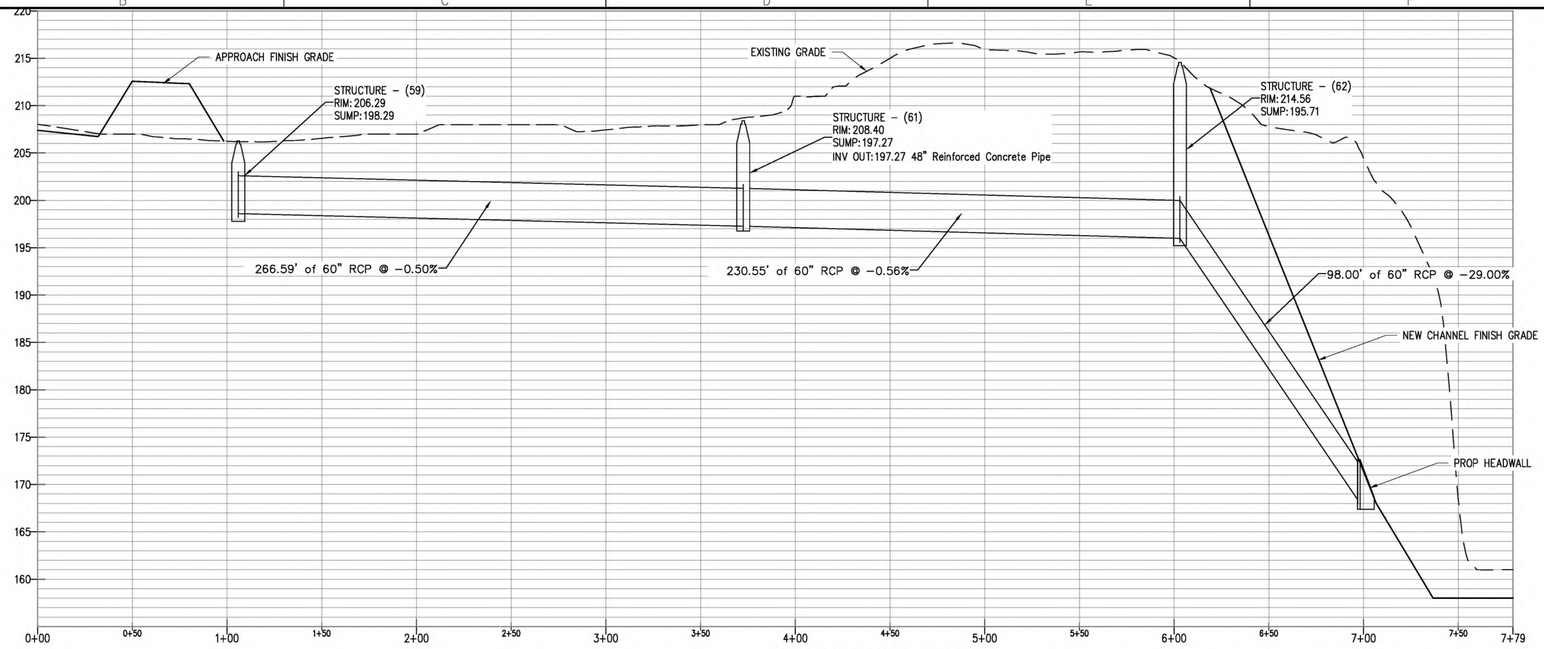
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
0A	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS

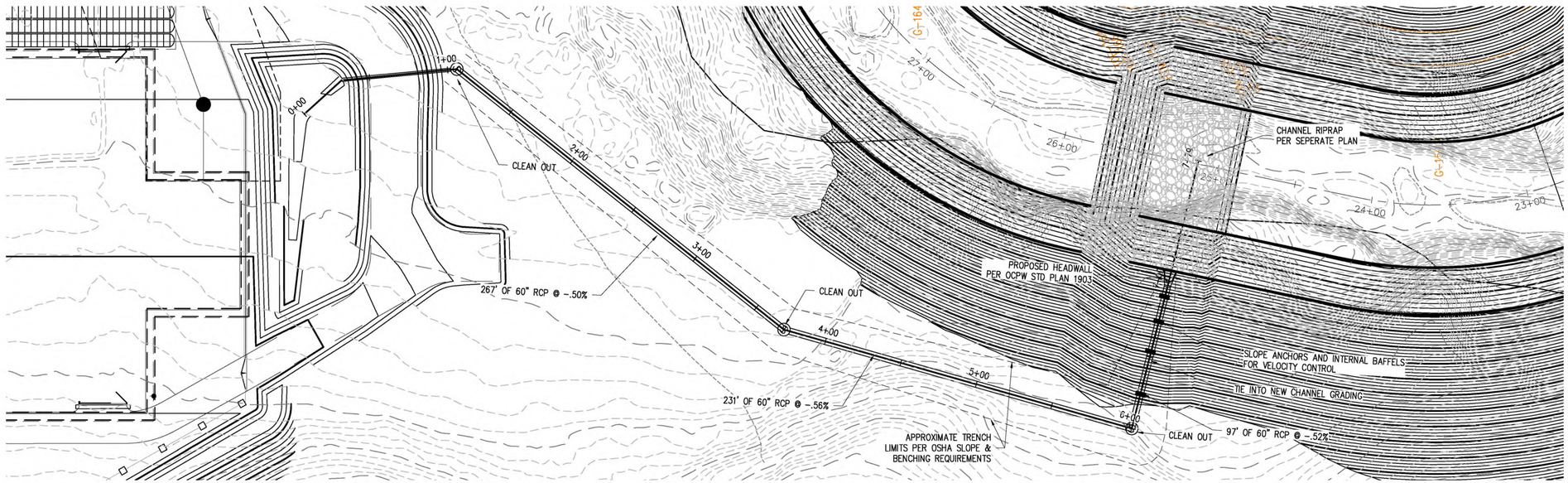
ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: 1" = 40'	PLT SCALE: 1:1	

COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
STORM DRAIN PLAN & PROFILE

DWG. NAME: CMP–D–P002–08 | REVISION NO : 0A



PROFILE VIEW
STM_01_01
SCALE: 1"=40'



PLAN VIEW
SCALE: 1"=40'

LEGEND	
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED SITE FENCE
	PROPOSED PRE-CAST WALL
	PROFILE FINISHED GRADE
	PROFILE EXISTING GRADE
SD	PROPOSED STORM DRAIN STORM DRAIN

NOTES

0 20FT 40FT 80FT
SCALE: 1"=40'

ISSUED FOR 30% REVIEW

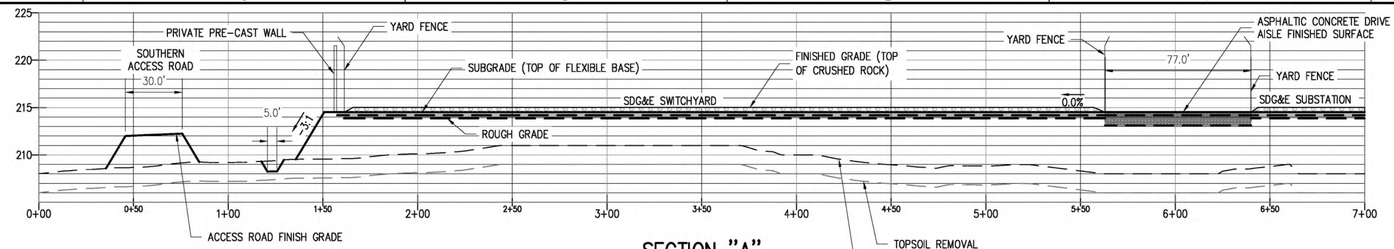
"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
OA	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: 1" = 40'	PLT SCALE: 1:1	

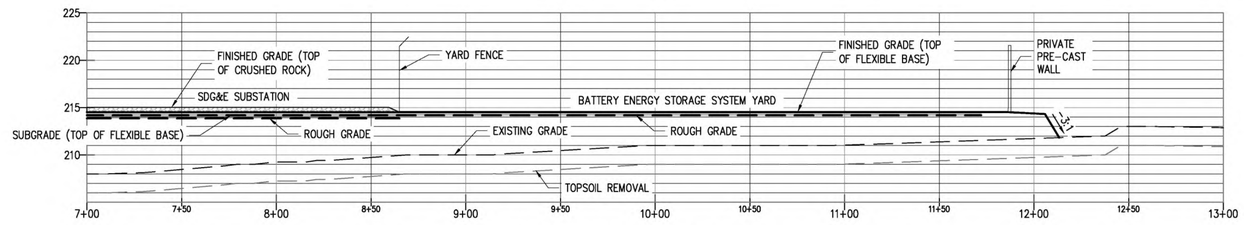
COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
STORM DRAIN PLAN & PROFILE

DWG. NAME: CMP-D-P002-09
REVISION NO : OA



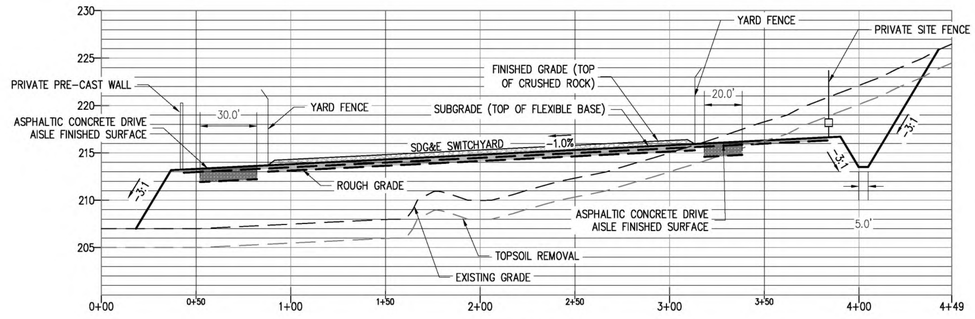
SECTION "A"

SCALE: 1"=40' HORIZONTAL
1"=8' VERTICAL



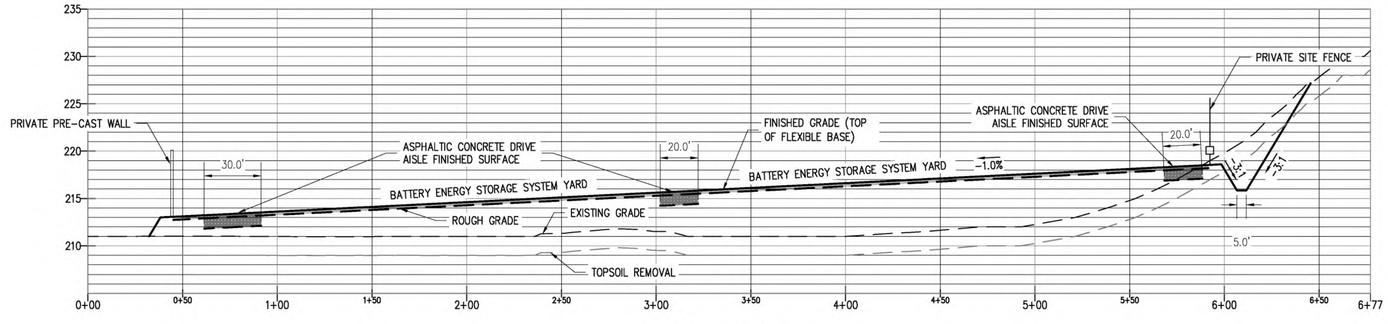
SECTION "A" CONTINUED

SCALE: 1"=40' HORIZONTAL
1"=8' VERTICAL



SECTION "B"

SCALE: 1"=40' HORIZONTAL
1"=8' VERTICAL



SECTION "C"

SCALE: 1"=40' HORIZONTAL
1"=8' VERTICAL

LEGEND
EXISTING GRADE
TOPSOIL REMOVAL
FINISHED GRADE (AS NOTED)
SUBGRADE (AS NOTED)
ROUGH GRADE

NOTES

1. YARD AND ROAD SURFACING DETAILS SHOWN ON SHEET 10.

0 20FT 40FT 80FT
SCALE: 1"=40'

ISSUED FOR 30% REVIEW

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

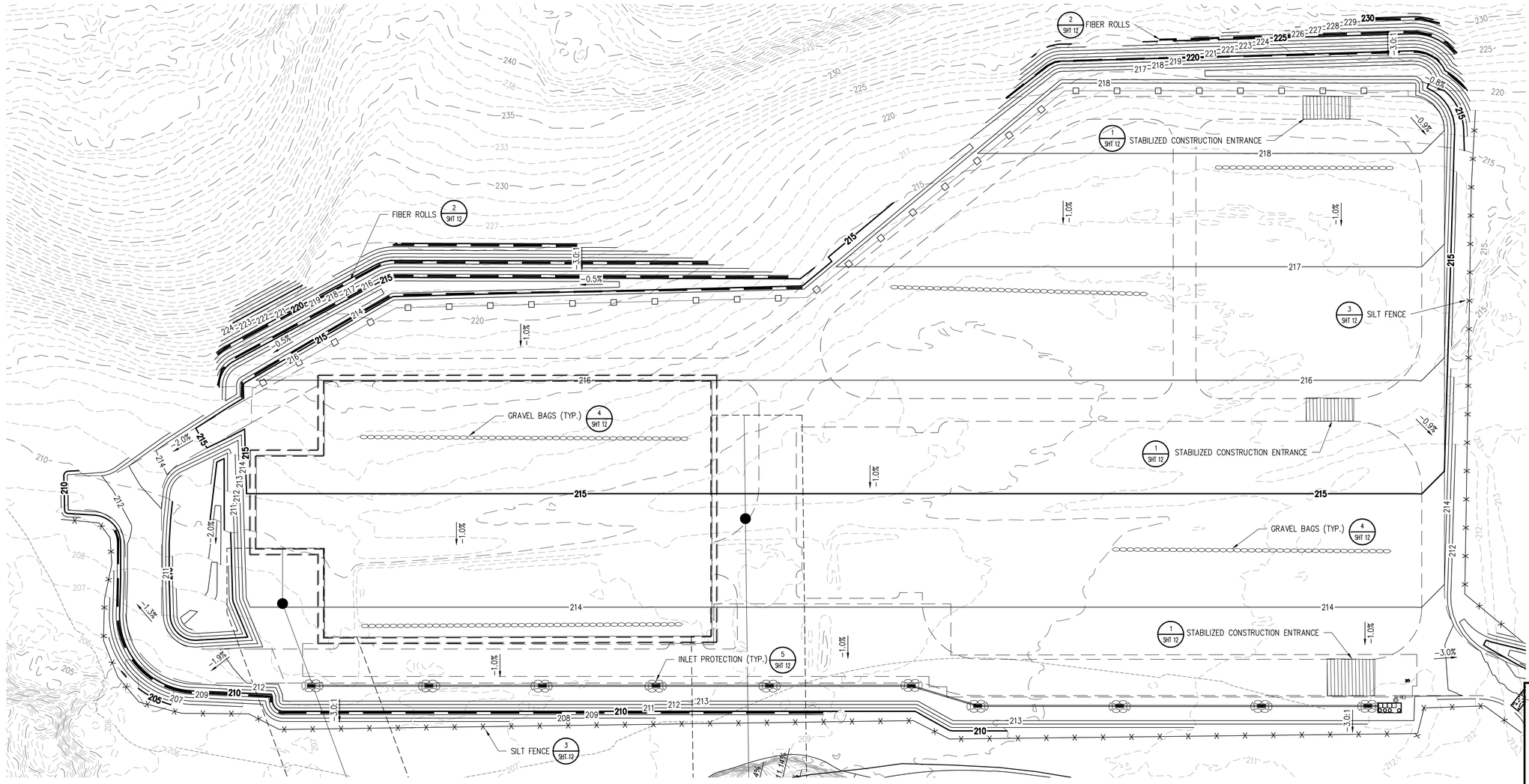
NO	REVISION	DATE	BY	APR
OC	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
OB	ISSUED FOR 30% REVIEW	07/07/25	KJF	MLM
OA	PRELIMINARY	05/02/25	KJF	MLM

ENGIE

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: AS NOTED	PLT SCALE: 1:1	

COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
SITE GRADING SECTIONS

DWG. NAME: CMP-D-P002-10
REVISION NO : OC



LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED YARD BORDER FENCE
- PROPOSED YARD EDGE (END FLEXIBLE BASE)
- PROPOSED ASPHALT ROAD
- GRAVEL BAGS
- FIBER ROLLS
- STABILIZED CONSTRUCTION ENTRANCE
- SILT FENCE

NOTES

0 20FT 50FT 100FT
SCALE: 1"=50'

ISSUED FOR 30% REVIEW

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

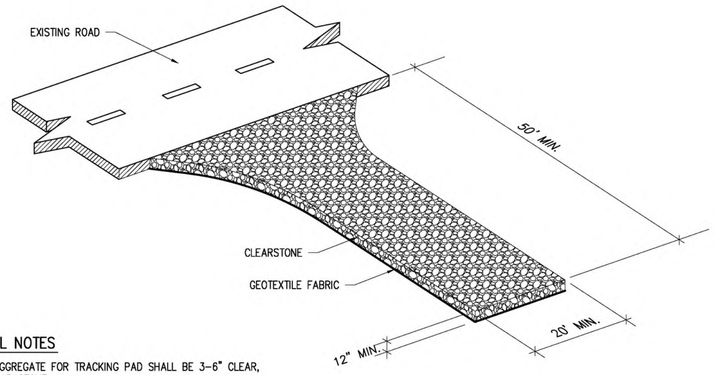
NO	REVISION	DATE	BY	APR
OC	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
OB	ISSUED FOR 30% REVIEW	07/07/25	KJF	MLM
OA	PRELIMINARY	05/02/25	KJF	MLM

ENGIE

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: 1" = 50'	PLT SCALE: 1:1	

COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
EROSION CONTROL PLAN

DWG. NAME: CMP-D-P002-11 REVISION NO : OC



MATERIAL NOTES

1. THE AGGREGATE FOR TRACKING PAD SHALL BE 3–6" CLEAR, ANGULAR STONE.
2. THE TRACKING PAD SHALL BE UNDERLAIN WITH A GEOTEXTILE FABRIC.

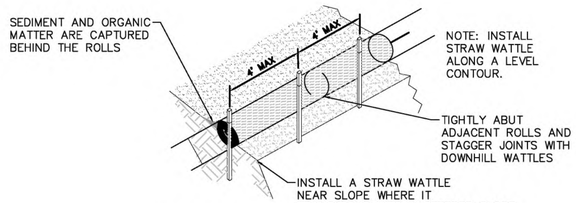
INSTALLATION NOTES

1. INSTALLATION SHALL CONFORM WITH LOCAL REQUIREMENTS.
2. THE TRACKING PAD SHALL BE INSTALLED PRIOR TO ANY TRAFFIC LEAVING THE SITE. STONE TRACKING PAD SHALL BE USED AT ALL POINTS OF CONSTRUCTION EGRESS.
3. DIMENSIONS OF THE TRACKING PAD SHALL BE MINIMUM AS NOTED ON THE FIGURE ABOVE.
4. SURFACE WATER SHALL BE PREVENTED FROM PASSING THROUGH THE TRACKING PAD. FLOWS SHALL BE DIVERTED AWAY FROM TRACKING PADS OR CONVEYED UNDER AND AROUND THEM USING CULVERTS OR OTHER PRACTICES.
5. TRACKING PAD SHALL BE REMOVED FROM THE SITE ONLY AFTER CONSTRUCTION IS COMPLETE AND THE SITE HAS BEEN STABILIZED.

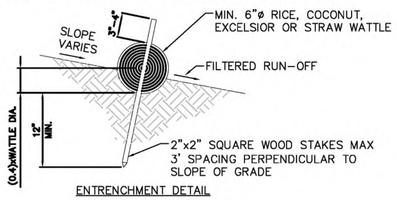
INSPECTION & MAINTENANCE NOTES

1. STONE TRACKING PADS SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24 HOUR PERIOD.
2. ADDITIONAL AGGREGATE SHALL BE PLACED IF THE TRACKING PAD BECOMES BURIED OR IF SEDIMENT IS NOT BEING REMOVED EFFECTIVELY FROM THE VEHICLE TIRES.
3. A MINIMUM 12–INCH THICK PAD SHALL BE MAINTAINED AT ALL TIMES.
4. THE TRACKING PAD PERFORMANCE SHALL BE MAINTAINED BY SCRAPING OR TOP–DRESSING WITH ADDITIONAL AGGREGRATE.
5. ANY SEDIMENT TRACKED ONTO A PUBLIC OR PRIVATE ROAD SHOULD BE REMOVED BY STREET CLEANING AT THE END OF EACH WORKING DAY.
6. MAINTENANCE SHALL BE COMPLETED AS SOON AS POSSIBLE WITH CONSIDERATION FOR SITE CONDITIONS.

STABILIZED CONSTRUCTION ENTRANCE — 1 / SHT 11
SCALE: NONE

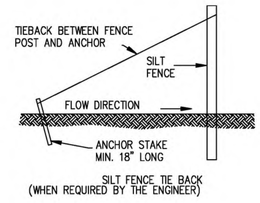


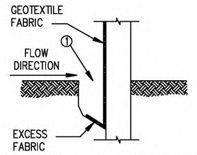
TYPICAL STRAW WATTLE INSTALLATION DETAIL



ENTRENCHMENT DETAIL

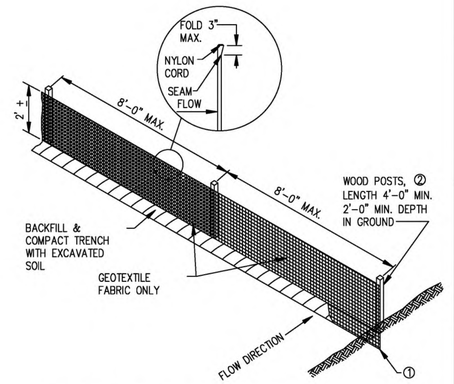
FIBER ROLL — 2 / SHT 11
SCALE: NONE





NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS

TRENCH DETAIL

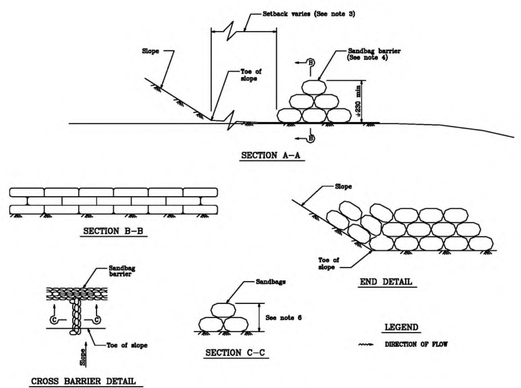


DETAIL OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

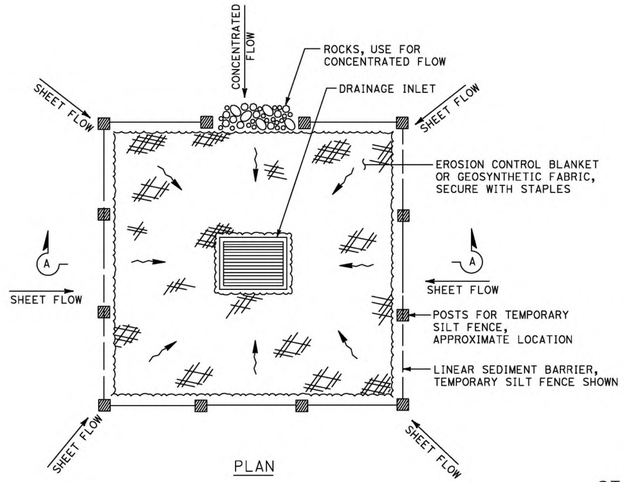
① TRENCH SHALL BE A MINIMUM OF 4" WIDE AND 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL AND COMPACT TRENCH WITH EXCAVATED SOIL.

② WOOD POSTS SHALL BE A MINIMUM SIZE OF 1 1/8" x 1 1/8" OF OAK OR HICKORY.

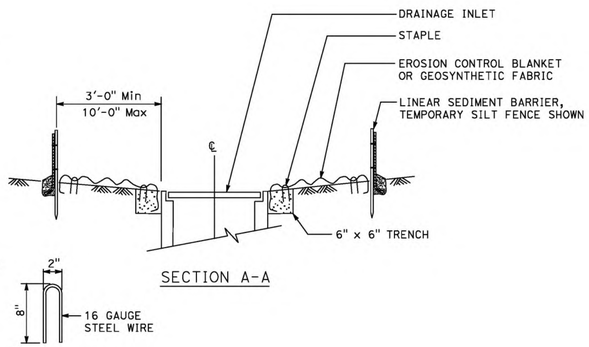
SILT FENCE — 3 / SHT 11
SCALE: NONE



GRAVEL BAG, CALTRANS SC–8 — 4 / SHT 11
SCALE: NONE



PLAN



STAPLE DETAIL

TEMPORARY DRAINAGE INLET PROTECTION, CALTRANS T61 — 5 / SHT 11
SCALE: NONE

NOTES

ISSUED FOR 30% REVIEW

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
0C	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
0B	ISSUED FOR 30% REVIEW	07/07/25	KJF	MLM
0A	PRELIMINARY	05/02/25	KJF	MLM

ENGIE

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
EROSION CONTROL DETAILS

DWG. NAME: CMP–D–P002–12 | REVISION NO : 0C

APPROACH EXTENDED TURN RADIUS FOR CONSTRUCTION ONLY (UNPAVED)

APPROACH EXTENDED TURN RADIUS FOR CONSTRUCTION ONLY (UNPAVED)

ASPHALTIC CONCRETE ACCESS APPROACH

PROPOSED 38' ROAD EASEMENT

OSO CREEK (UNLINED)

MATCHLINE: SEE SHT CMP-D-P002-14

0 20FT 50FT 100FT
SCALE: 1"=50'

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED YARD BORDER FENCE

NOTES

ISSUED FOR 30% REVIEW

"Engineering with Distinction"

ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
0C	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
0B	ISSUED FOR 30% REVIEW	07/07/25	KJF	MLM
0A	PRELIMINARY	05/02/25	KJF	MLM

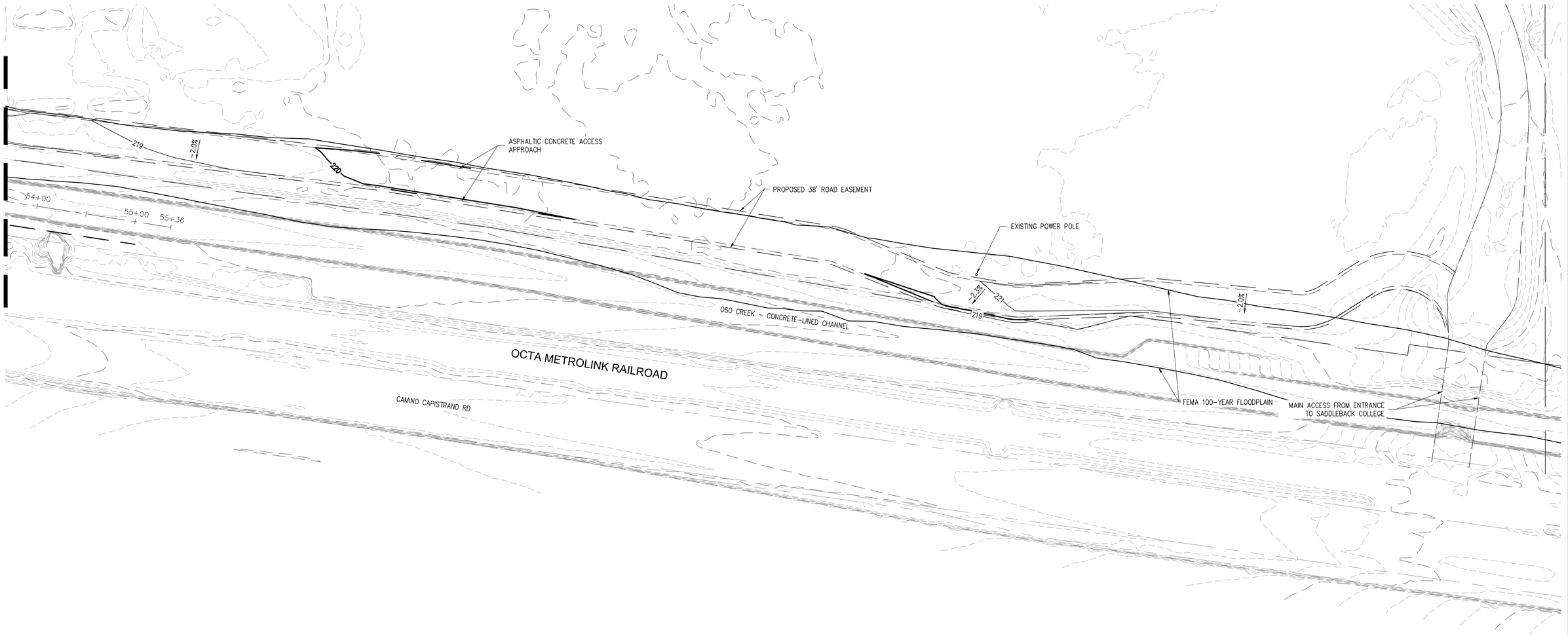
ENGIE

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: 1" = 50'	PLT SCALE: 1:1	

COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
SITE CONSTRUCTION ACCESS PLAN

DWG. NAME: CMP-D-P002-13 | REVISION NO : 0B

MATCHLINE: SEE SHT CMP-D-P002-13



LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED YARD BORDER FENCE

NOTES

0 20FT 50FT 100FT
SCALE: 1"=50'

ISSUED FOR 30% REVIEW

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
0C	ISSUED FOR 30% REVIEW	11/07/25	KJF	CRS
0B	ISSUED FOR 30% REVIEW	07/07/25	KJF	MLM
0A	PRELIMINARY	05/02/25	KJF	MLM

ENGIE

ENGINEERING RECORD		DATE
DRAWN	FULTON	04/30/25
DESIGNED	FULTON	04/30/25
CHECKED	STAFFORD	11/07/25
APPROVED		
DWG SCALE: 1" = 50'	PLT SCALE: 1:1	

COMPASS ENERGY STORAGE
250 MW / 1000 MWH BATTERY SYSTEM
SITE CONSTRUCTION ACCESS PLAN

DWG. NAME: CMP-D-P002-14 | REVISION NO : 0C

Attachment G.2

Oso Creek Civil Plan

County of Orange

PublicWorks

SANTA ANA, CALIFORNIA

KEVIN ONUMA, P.E., DIRECTOR

PLANS FOR REHABILITATION OF

OSO CREEK

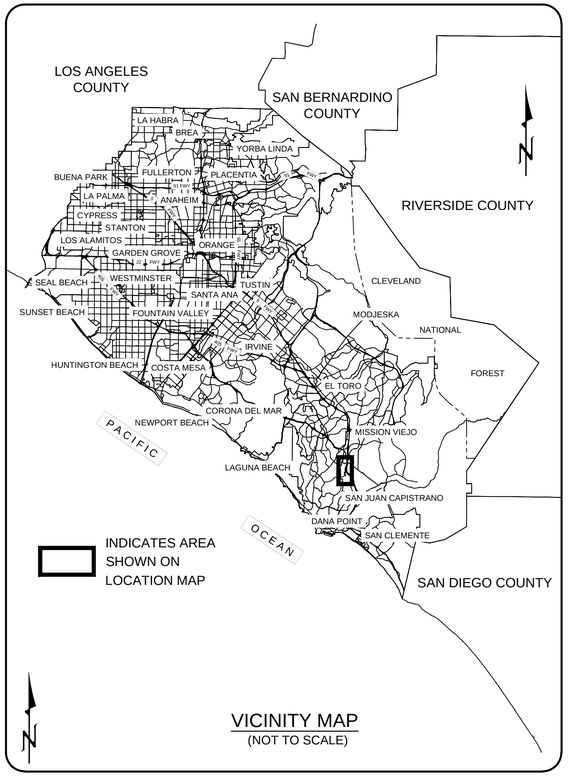
OCFCD FACILITY No.

FROM: DOWNSTREAM LIMIT
STA. 20+00±

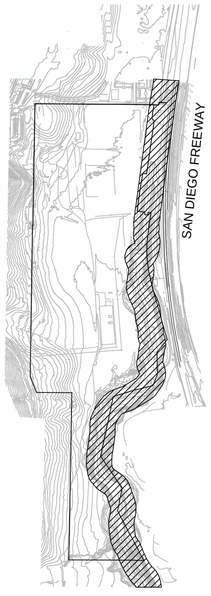
TO: UPSTREAM LIMIT
STA. 44+45±

30% SUBMITTAL

OCTOBER 2025



VICINITY MAP
(NOT TO SCALE)



LOCATION MAP
(NOT TO SCALE)

PROJECT LIMIT

FUNDED BY:
MAINTAINED BY:
POST-PROJECT OWNERSHIP:

INDEX OF SHEETS

SHEET	DESCRIPTION
01	TITLE SHEET
02	GENERAL CONSTRUCTION NOTES
03-05	PLAN & PROFILE
06	TYPICAL SECTIONS
XX	LANDSCAPE PLANS

UTILITIES

UTILITY OWNER	CONTACT	PHONE NO.
PURVEYOR NAME	CONTACT NAME	(XXX) XXX-XXXX
PURVEYOR NAME	CONTACT NAME	(XXX) XXX-XXXX
PURVEYOR NAME	CONTACT NAME	(XXX) XXX-XXXX
PURVEYOR NAME	CONTACT NAME	(XXX) XXX-XXXX
PURVEYOR NAME	CONTACT NAME	(XXX) XXX-XXXX
PURVEYOR NAME	CONTACT NAME	(XXX) XXX-XXXX

SURVEY NOTE

OBTAIN FROM SURVEYOR

APN 637-082-70 (PORTION), APN 637-082-71 (PORTION)

BOUNDARY ADJUSTED PER INS. NO. 1995-0434581, REC. 10/4/95, O.R.

VERTICAL DATUM

DID NOT SEE ANY VERT DATUM NOTES ON ALTA - PLEASE GET FROM SURVEYOR

HORIZONTAL DATUM

OBTAIN FROM SURVEYOR

BASIS OF BEARINGS - NAD 83(2011), STATE PLANE COORDINATES CA ZONE 6, PER NGS MONUMENTS 7 8 21 AND TRABUCO.

DEVIATIONS

NAME OF APPLICABLE MANUAL:

ENTER STANDARD NUMBER:

- DEVIATION DESCRIPTION. REFERENCE DESIGN MEMORANDUM IF APPLICABLE

APPROVED: _____ DATE
EDWARD FRONDOSO, P.E., T.E.
CHIEF ENGINEER
ORANGE COUNTY FLOOD CONTROL DISTRICT

RECORD DRAWING

CONTRACTOR: _____

RESIDENT ENGINEER: _____

INSPECTOR(S): _____

CONSTRUCTION START DATE: _____

CONSTRUCTION COMPLETION DATE: _____

MAINTENANCE ACCEPTANCE

APPROVED: _____ DATE
HUGO PINEDA, P.E.
DEPUTY DIRECTOR
OC OPERATIONS & MAINTENANCE

COUNTY OF ORANGE PUBLIC WORKS DEPARTMENT

RECOMMENDED: _____ DATE
FIONA MAN, P.E.
DEPUTY DIRECTOR
OC CONSTRUCTION

APPROVED: _____ DATE
EDWARD FRONDOSO, P.E.
CHIEF ENGINEER
ORANGE COUNTY FLOOD CONTROL DISTRICT

PREPARED BY

PREPARED UNDER RESPONSIBLE CHARGE OF:

REGISTERED PROFESSIONAL ENGINEER
TORY R. WALKER
No. 45005
Exp. 3-31-2028
CIVIL
STATE OF CALIFORNIA

TORY R. WALKER, P.E. DATE

CITY APPROVAL

_____ DATE
EXECUTIVE DIRECTOR
PUBLIC WORKS AGENCY

_____ DATE
CITY ENGINEER
PUBLIC WORKS AGENCY

NO.	DESCRIPTION	SHT.	APPROVED	DATE

REVISIONS

W. O. NO. EE12345

DWG. NO. XX12345

SHEET 01 OF 06

\\Serverprojects\Projects\2025\251763_ENG\ACAD\SHEETS\251763-01_Title Sheet.dwg

E RE 0 00 O

OR E OU

ROADWAY GENERAL NOTES

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY OR SUBSTRUCTURE SHOWN ON THESE PLANS WAS OBTAINED BY A SEARCH OF AVAILABLE RECORDS. NO CERTIFICATION IS MADE AS TO THE ACCURACY OR THOROUGHNESS OF THESE RECORDS. APPROVAL OF THIS PLAN BY THE COUNTY DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OR THE COMPLETENESS OF THE LOCATION OF THE EXISTENCE OR NONEXISTENCE OF ANY UNDERGROUND UTILITY OR SUBSTRUCTURE WITHIN THE LIMITS OF THE PROJECT.

2. ANY UTILITY WORK WITHIN COUNTY OF ORANGE RIGHT-OF-WAY SHALL CONFORM TO COUNTY OF ORANGE STANDARDS.

3. CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITION DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT TO BE LIMITED TO NORMAL WORKING HOURS.

4. PURSUANT TO THE BUSINESS AND PROFESSIONS CODE/ LAND SURVEYORS ACT SECTION 8771 OF THE STATE OF CALIFORNIA, ALL SURVEY MONUMENTS DESTROYED BY CONSTRUCTION SHALL BE PERPETUATED BY A CALIFORNIA LICENSED LAND SURVEYOR IN ACCORDANCE THE METHODOLOGY AND DOCUMENTATION REQUIREMENTS OF THE LOCAL CITY, AND COUNTY JURISDICTIONS. IN THE EVENT THAT OCPW/OC SURVEY IS NOT COMMISSIONED TO PERFORM CONSTRUCTION SUPPORT SERVICES FOR THIS PROJECT THEN THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ASSOCIATED COST WITH THIS MONUMENT PERPETUATION.

5. THE CONTRACTOR SHALL USE PROPER SAFETY SIGNING AND BARRICADING AS REQUIRED PER THE LATEST EDITION OF CA MUTCD.

6. THE FIRST COAT OF STRIPING AND PAVEMENT MARKING SHALL BE APPLIED THE SAME DAY FOLLOWING THE PLACEMENT OF THE ASPHALT CONCRETE. THE SECOND COAT SHALL BE APPLIED NO SOONER THAN (7) SEVEN CALENDAR DAYS OR LATER THAN (14) FOURTEEN CALENDAR DAYS AFTER THE FIRST COAT. REFLECTIVE FLEXIBLE ROAD TABS CAN BE PLACED THE SAME DAY AFTER PLACEMENT OF THE ASPHALT CONCRETE.

7. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, THE LATEST EDITION STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION, THE LATEST VERSION OF THE ORANGE COUNTY OCPW STANDARD PLANS AND IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS, ALL TO THE SATISFACTION OF THE ENGINEER OF RECORD.

8. WORK SHOWN OR INDICATED ON THESE PLANS, OR CALLED FOR IN THE SPECIFICATIONS, BUT NOT INCLUDED AS PAY QUANTITY ITEMS, SHALL BE CONSIDERED INCIDENTAL WORK, THE COST OF WHICH SHALL BE INCLUDED IN THE CONTRACTOR'S BID FOR PAY QUANTITY ITEMS.

9. ESTIMATE OF QUANTITIES IN THE BID SCHEDULE IS APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING QUANTITIES AND CONDITIONS AT THE SITE.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO EXISTING UTILITIES, PAVEMENT, CURBS, TRAFFIC STRIPING AND MARKING, TRAFFIC SIGNAL EQUIPMENT (INCLUDING DETECTOR LOOPS), STRUCTURES, TREES, LANDSCAPING, AND IRRIGATION SYSTEMS, AS A RESULT OF CONTRACTOR'S OPERATIONS AND WILL BE REQUIRED TO REPAIR, REMODEL OR REPLACE SAME TO THE SATISFACTION OF, AND AS DIRECTED BY, THE ENGINEER OR UTILITY COMPANY.

11. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND NOTIFY ALL UTILITY COMPANIES A MINIMUM OF 5 WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL THE PHASES OF CONSTRUCTION WITH THE VARIOUS UTILITY COMPANIES INVOLVED, UNLESS OTHERWISE NOTED.

12. THE WORK SITE AND EXTERIOR STREETS SHALL BE MAINTAINED IN A NEAT, CLEAN, HAZARD FREE, ORDERLY STATE, THROUGHOUT THE CONSTRUCTION PERIOD. CONTRACTOR SHALL SWEEP THE ENTIRE LENGTH OF AFFECTED STREETS WITH A VACUUM/BRUSH TYPE SWEEPER PRIOR TO LEAVING THE AREA FOR THE DAY. THE CONTRACTOR SHALL IMMEDIATELY HAUL AWAY AND DISPOSE OF, OFF THE PROJECT SITE, ALL EXCESS EXCAVATED MATERIAL AND CONSTRUCTION DEBRIS. ALL DISPOSALS SHALL BE AT THE CONTRACTOR'S EXPENSE.

13. CONTRACTOR SHALL NOTIFY THE FIRE AND POLICE DEPARTMENTS 48 HOURS PRIOR TO THE START OF CONSTRUCTION.

14. THE CONTRACTOR SHALL HAVE COPIES OF THE PLANS AND SPECIFICATIONS FOR THIS PROJECT ON THE SITE AT ALL TIMES, AND SHALL BE FAMILIAR WITH ALL APPLICABLE STANDARDS AND SPECIFICATIONS.

15. THE CONTRACTOR SHALL CONDUCT CONSTRUCTION OPERATIONS IN SUCH A MANNER THAT STORM OR OTHER WATERS MAY PROCEED UNINTERRUPTED ALONG THE STREET OR DRAINAGE COURSES. ALL STORM DRAIN INLETS IN THE PROJECT AREA SHALL BE PROTECTED USING GRAVEL BAGS AND FILTER FABRIC PER THE COUNTY INSPECTOR.

16. LOCATION OF REMOVALS AND WIDTHS OF REMOVALS INDICATE SCOPE OF WORK AND ARE APPROXIMATE ONLY. ACTUAL REMOVALS SHALL BE COORDINATED WITH THE ENGINEER IN THE FIELD.

17. ALL EXISTING IMPROVEMENTS INCLUDING CURB AND GUTTERS, SIDEWALKS, ASPHALT CONCRETE OR PCC PAVING WHICH ARE BEING JOINED, OR MATCHED IN CONNECTION WITH THE PROJECT, SHALL BE JOINED, OR MATCHED IN A MANNER SATISFACTORY TO THE ENGINEER, INCLUDING NECESSARY SAWCUTTING, REMOVAL, OR CAPPING. THE CONTRACTOR SHALL FOLLOW THE COUNTY'S STANDARD ENCROACHMENT CONDITIONS.

18. ALL UTILITY RELATED WORK SHALL BE CONSTRUCTED PER COUNTY OF ORANGE STANDARDS, OR LOCAL UTILITY AGENCY STANDARDS.

19. CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND SHALL REPORT ALL DISCREPANCIES TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK. REVISIONS SHALL NOT BE MADE TO THESE PLANS WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.

20. AT NO TIME IS ANY BUSINESS OR RESIDENCE TO BE WITHOUT ACCESS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

21. THE CONTRACTOR SHALL NOTIFY THE COUNTY INSPECTOR AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION.

22. THE CONTRACTOR SHALL NOTIFY AND COORDINATE WITH RESIDENTS PRIOR TO ANY ACCESS CLOSURES.

STORMWATER POLLUTION PREVENTION NOTES

1. SEDIMENT FROM AREAS DISTURBED BY CONSTRUCTION SHALL BE RETAINED ON SITE USING STRUCTURAL CONTROLS TO THE MAXIMUM EXTENT PRACTICABLE.

2. STOCKPILES OF SOIL SHALL BE PROPERLY CONTAINED TO ELIMINATE OR REDUCE SEDIMENT TRANSPORT FROM THE SITE TO THE STREETS, DRAINAGE FACILITIES OR ADJACENT PROPERTIES VIA RUNOFF, VEHICLE TRACKING, OR WIND.

3. APPROPRIATE BMPS FOR CONSTRUCTION-RELATED MATERIALS, WASTES, SPILLS OR RESIDUES SHALL BE IMPLEMENTED TO MINIMIZE TRANSPORT FROM THE SITE TO STREETS, DRAINAGE FACILITIES, OR ADJOINING PROPERTIES BY WIND OR RUNOFF.

4. RUNOFF FROM EQUIPMENT AND VEHICLE WASHING SHALL BE CONTAINED AT CONSTRUCTION SITES UNLESS TREATED TO REDUCE OR REMOVE SEDIMENT AND OTHER POLLUTANTS.

5. ALL CONSTRUCTION CONTRACTOR AND SUBCONTRACTOR PERSONNEL ARE TO BE MADE AWARE OF THE REQUIRED BEST MANAGEMENT PRACTICES, GOOD HOUSEKEEPING MEASURES FOR THE PROJECT SITE, AND ANY ASSOCIATED CONSTRUCTION STAGING AREAS.

6. AT THE END OF EACH DAY OF CONSTRUCTION ACTIVITY ALL CONSTRUCTION DEBRIS NAND WASTE MATERIALS SHALL BE COLLECTED AND PROPERLY DISPOSED OF IN TRASH OR RECYCLE BINS.

7. CONSTRUCTION SITES SHALL BE MAINTAINED IN SUCH A CONDITION THAT A STORM DOES NOT CARRY WASTES OR POLLUTANTS OFF THE SITE. DISCHARGES OTHER THAN STORMWATER (NON-STORMWATER DISCHARGES) ARE PROHIBITED, EXCEPT AS AUTHORIZED BY AN INDIVIDUAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT OR THE STATEWIDE GENERAL CONSTRUCTION STORMWATER PERMIT. POTENTIAL POLLUTANTS INCLUDE BUT ARE NOT LIMITED TO: SOLID OR LIQUID CHEMICAL SPILLS; WASTES FROM PAINTS, STAINS, SEALANTS, SOLVENTS, DETERGENTS, GLUES, LIME, PESTICIDES, HERBICIDES, FERTILIZERS, WOOD PRESERVATIVES, AND ASBESTOS FIBERS, PAINT FLAKES OR STUCCO FRAGMENTS; FUELS, OILS, LUBRICANTS, AND HYDRAULIC, RADIATOR OR BATTERY FLUIDS; CONCRETE AND RELATED CUTTING OR CURING RESIDUES; FLOATABLE WASTES; WASTES FROM ENGINE/EQUIPMENT STEAM CLEANING OR CHEMICAL DEGREASING; WASTES FROM STREET CLEANING; AND SUPER-CHLORINATED POTABLE WATER FROM LINE FLUSHING AND TESTING. DURING CONSTRUCTION, DISPOSAL OF SUCH MATERIALS SHOULD OCCUR IN A SPECIFIED AND CONTROLLED TEMPORARY AREA ON-SITE PHYSICALLY SEPARATED FROM POTENTIAL STORMWATER RUNOFF, WITH ULTIMATE DISPOSAL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REQUIREMENTS.

8. DISCHARGING CONTAMINATED GROUNDWATER IS PROHIBITED. DISCHARGING OF NON-CONTAMINATED GROUNDWATER BY DEWATERING SHALL COMPLY WITH REQUIREMENTS OF APPLICABLE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS AS FOLLOWS: FOR PROJECTS WITHIN THE SANTA ANA REGION AND SAN DIEGO CREEK/NEWPORT BAY WATERSHED, PERMIT NO. CAG918002, ORDER R8-2019-0061 ISSUED BY THE SANTA ANA REGIONAL WATER QUALITY CONTROL BOARD. FOR OTHER PROJECTS WITHIN THE SANTA ANA REGION, PERMIT NO. CAG998001, ORDER R8-2020-0006 ISSUED BY THE SANTA ANA REGIONAL WATER QUALITY CONTROL BOARD. FOR PROJECTS WITHIN THE SAN DIEGO REGION, PERMIT NO. CAG919003, ORDER NO. R9-2015-0013 ISSUED BY THE SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD. THESE THREE PERMITS MAY BE UPDATED AT ANY TIME DURING THE TERM OF PROJECT. ANY INDICATION OR EVIDENCE OF WATER QUALITY THAT DOES NOT MEET REQUIRED STANDARDS WILL BE REPORTED TO OC PUBLIC WORKS/COUNTYWIDE COMPLIANCE PROGRAM AT (877) 89-SPILL.

CAUTION NOTE TO CONTRACTOR

CONTRACTOR TO CONDUCT VARIOUS WORK OPERATIONS IN THE VICINITY OF SEVERAL BELOW AND ABOVE GROUND UTILITIES. CONTRACTOR IS TO FIELD VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO ANY WORK OPERATIONS WITHIN THE PROJECT LIMITS WHICH MAY DISRUPT OR IMPACT ANY OF THE UTILITIES.

ABBREVIATIONS

AB	= AGGREGATE BASE
AC	= ASPHALT CONCRETE
AP	= ANGLE POINT
BC	= BEGIN CURVE
BCR	= BEGINNING OF CURB RETURN
BEG	= BEGINNING
BMP	= BEST MANAGEMENT PRACTICES
BNDY	= BOUNDARY
BOC	= BACK OF CURB
BTM	= BOTTOM
BW	= BACK OF WALK
C&G	= CURB & GUTTER
CB	= CATCH BASIN
CF	= CURB FACE
CLSM	= CONTROLLED LOW STRENGTH MATERIAL
COMM	= COMMUNICATIONS
CONC	= CONCRETE
CMB	= CRUSHED MISCELLANEOUS BASE
DRWY	= DRIVEWAY
EC	= END CURVE
ECB	= ELECTRIC CONTROL BOX
ECR	= END OF CURB RETURN
EG	= EXISTING GROUND
ELEC	= ELECTRIC
ELEV	= ELEVATION
EM	= ELECTRIC METER
EMH	= ELECTRIC MANHOLE
EP	= EDGE OF PAVEMENT
ESMT	= EASEMENT
EXIST	= EXISTING
FG	= FINISHED GRADE
FH	= FIRE HYDRANT
FL	= FLOW LINE
FG	= FINISHED GRADE
FS	= FINISHED SURFACE
GB	= GRADE BREAK
GV	= GAS VALVE
HP	= HINGE POINT
INV	= INVERT
LIP	= EDGE OF GUTTER PAN ELEVATION (GUTTER LIP)
LS	= LANDSCAPE
MAX	= MAXIMUM
MBGR	= METAL BEAM GUARD RAIL
MGS	= MIDWEST GUARDRAIL SYSTEM
MIN	= MINIMUM
N'LY	= NORTHERLY
OC	= ON CENTER
OCFCD	= ORANGE COUNTY FLOOD CONTROL DISTRICT
PB	= PULL BOX
PCC	= POINT OF COMPOUND CURVE /PORTLAND CEMENT CONCRETE
PPB	= PEDESTRIAN PUSH BUTTON
PP	= POWER POLE
PRC	= POINT OF REVERSE CURVE
PROP	= PROPOSED
PVC	= POINT OF VERTICAL CURVE
PVI	= POINT OF VERTICAL INFLECTION
PVMT	= PAVEMENT
RCP	= REINFORCED CONCRETE PIPE
ROE	= RIGHT OF ENTRY
R/W	= RIGHT OF WAY
SCE	= SOUTHERN CALIFORNIA EDISON
SCG	= SOUTHERN CALIFORNIA GAS
SD	= STORM DRAIN
SDMH	= STORM DRAIN MANHOLE
SHLD	= SHOULDER
SMH	= SEWER MANHOLE
SOF	= SOFFIT
SPPWC	= STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
STA	= STATION
STD	= STANDARD
SWR	= SEWER
TC	= TOP OF CURB
TCB	= TOP OF CATCH BASIN
TG	= TOP OF GRATE
TOE	= TOE OF SLOPE
TPB	= TRAFFIC SIGNAL PULL BOX
TS	= TRAFFIC SIGNAL
TYP	= TYPICAL
UNK	= UNKNOWN
UV	= UTILITY VALVE
VAR	= VARIES
W'LY	= WESTERLY
WM	= WATER METER
WPJ	= WEAKENED PLANE JOINT
WV	= WATER VALVE
WVB	= WATER VALVE BOX

ROADWAY LEGEND

GRADING LIMITS

PROPOSED ROCK

COUNTY OF ORANGE CALIFORNIA

MARK	DESCRIPTION	DATE	APPR.

PREPARED UNDER THE RESPONSIBLE CHARGE OF:

REGISTERED PROFESSIONAL ENGINEER TORY R. WALKER No. 45005 Exp. 3-31-2026 CIVIL STATE OF CALIFORNIA

TORY R. WALKER, PE — DATE

DESIGNED BY: TF
DRAWN BY: PR, MR
CHECKED BY: TF
DRAWING NO.:
FILE NAME: 251763-02 - NOTES.dwg
PLOT DATE: ----
SCALE: AS SHOWN

PREPARED BY: TORY R. WALKER ENGINEERING

County of Orange PublicWorks

ORANGE COUNTY CHANNEL REHAB

NOTES

SHEET REFERENCE NUMBER

02

SHEET 02 OF 06

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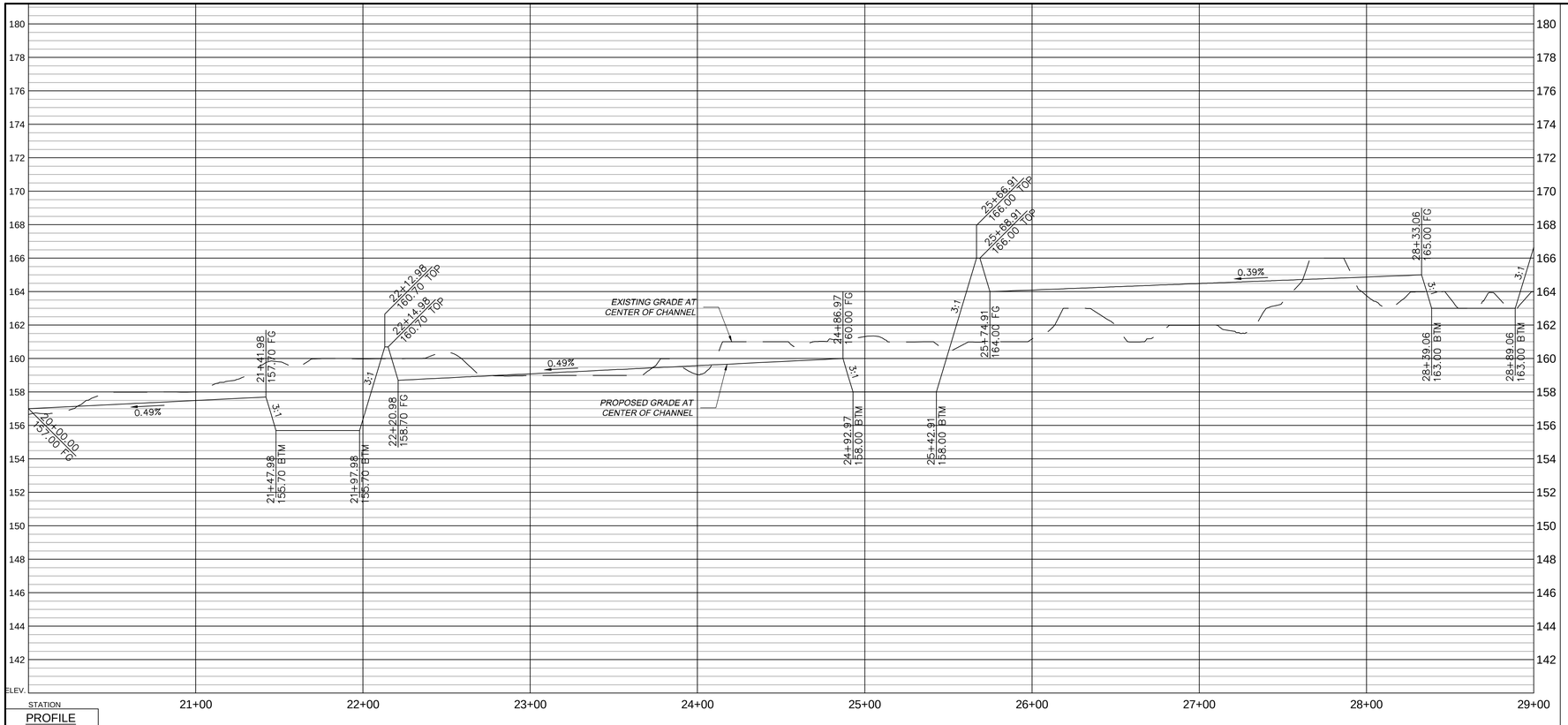

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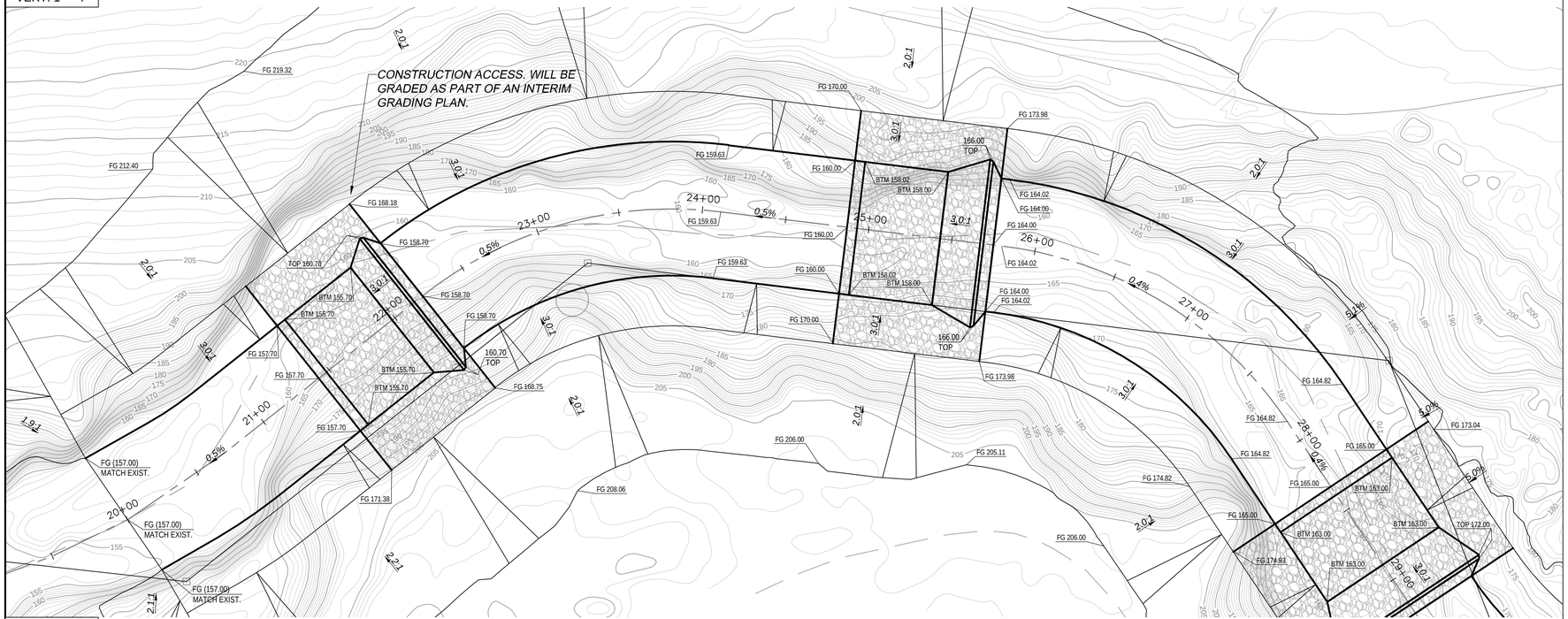
VERT. 1" = 4'



PLAN
1" = 40'

LEGEND

GRADING LIMITS

PRELIMINARY EARTHWORK

CUT: 141,720 CY
FILL: 38,140 CY
NET: 103,580 CY (CUT)

GENERAL NOTES

1. GRADED AREAS TO BE PLANTED WITH NATIVE VEGETATION. THIS WILL BE SHOWN IN MORE DETAIL WITH THE 60% DRAWINGS.

1 1/2 0 1 2
3 inches on original scale

COUNTY OF ORANGE CALIFORNIA

MARK	DESCRIPTION	DATE	APPR.

PREPARED UNDER THE RESPONSIBLE CHARGE OF:

REGISTERED PROFESSIONAL ENGINEER TORY R. WALKER No. 45005 Exp. 3-31-2026 CIVIL STATE OF CALIFORNIA

TORY R. WALKER, PE — DATE

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DRAWN BY:	DRAWING NO.:
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PLOT DATE: ----	

County of Orange PublicWorks

PREPARED BY: TORY R. WALKER ENGINEERING

ORANGE COUNTY CHANNEL REHAB

GRADING PLAN

20+00 - 29+00

SHEET REFERENCE NUMBER

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SHEET 03 OF 06

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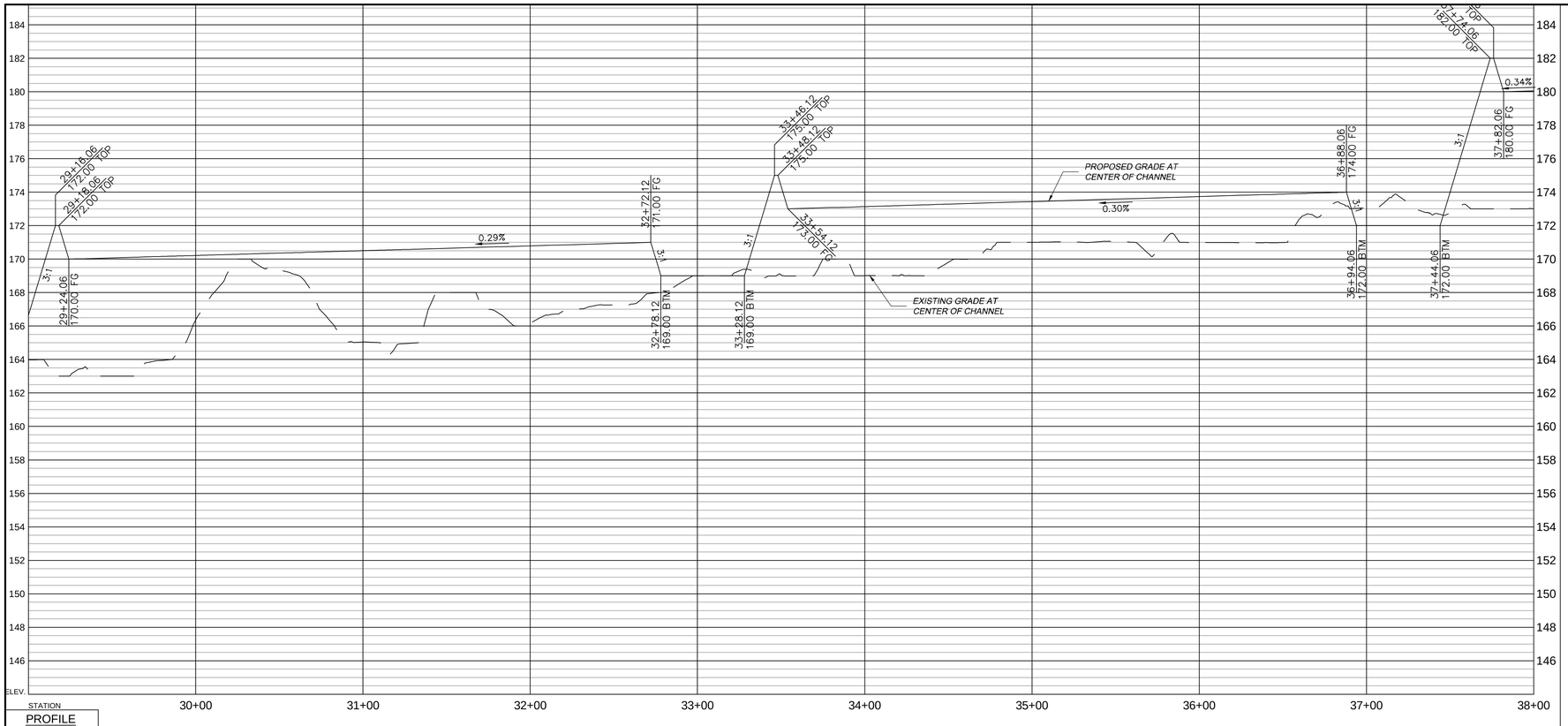

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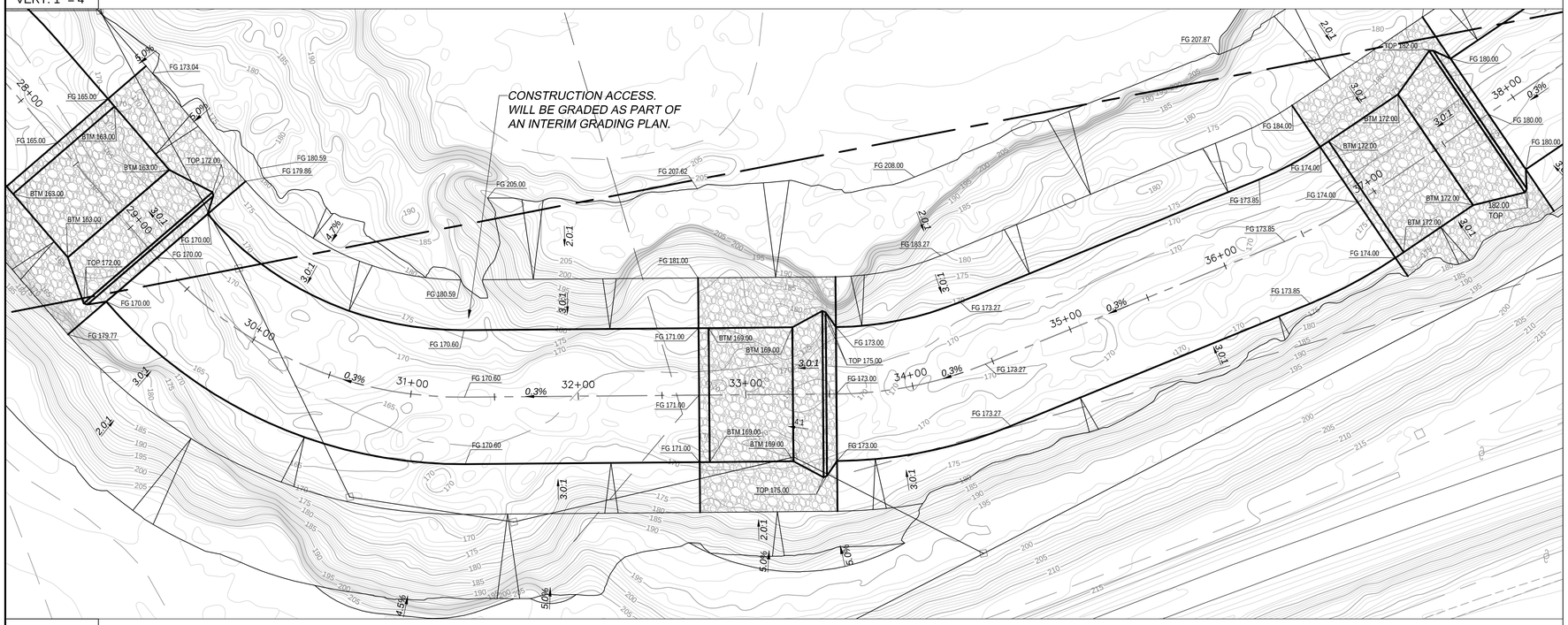

PLAN
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LEGEND

GRADING LIMITS

GENERAL NOTES

1. GRADED AREAS TO BE PLANTED WITH NATIVE VEGETATION. THIS WILL BE SHOWN IN MORE DETAIL WITH THE 60% DRAWINGS.

1 1/2 0 1 2
3 inches on original scale

COUNTY OF ORANGE CALIFORNIA

MARK	DESCRIPTION	DATE	APPR.

PREPARED UNDER THE RESPONSIBLE CHARGE OF:

REGISTERED PROFESSIONAL ENGINEER TORY R. WALKER No. 45005 Exp. 3-31-2026 CIVIL STATE OF CALIFORNIA

TORY R. WALKER, PE — DATE

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DRAWN BY:	PR, MR
DRAWING NO.:	
CHECKED BY:	TF
FILE NAME:	251763-03-05 - P&P.dwg
PLOT DATE:	----
SCALE:	AS SHOWN

County of Orange PublicWorks

PREPARED BY: TORY R. WALKER ENGINEERING

ORANGE COUNTY CHANNEL REHAB

GRADING PLAN

29+00 - 38+00

SHEET REFERENCE NUMBER

04

SHEET 04 OF 06

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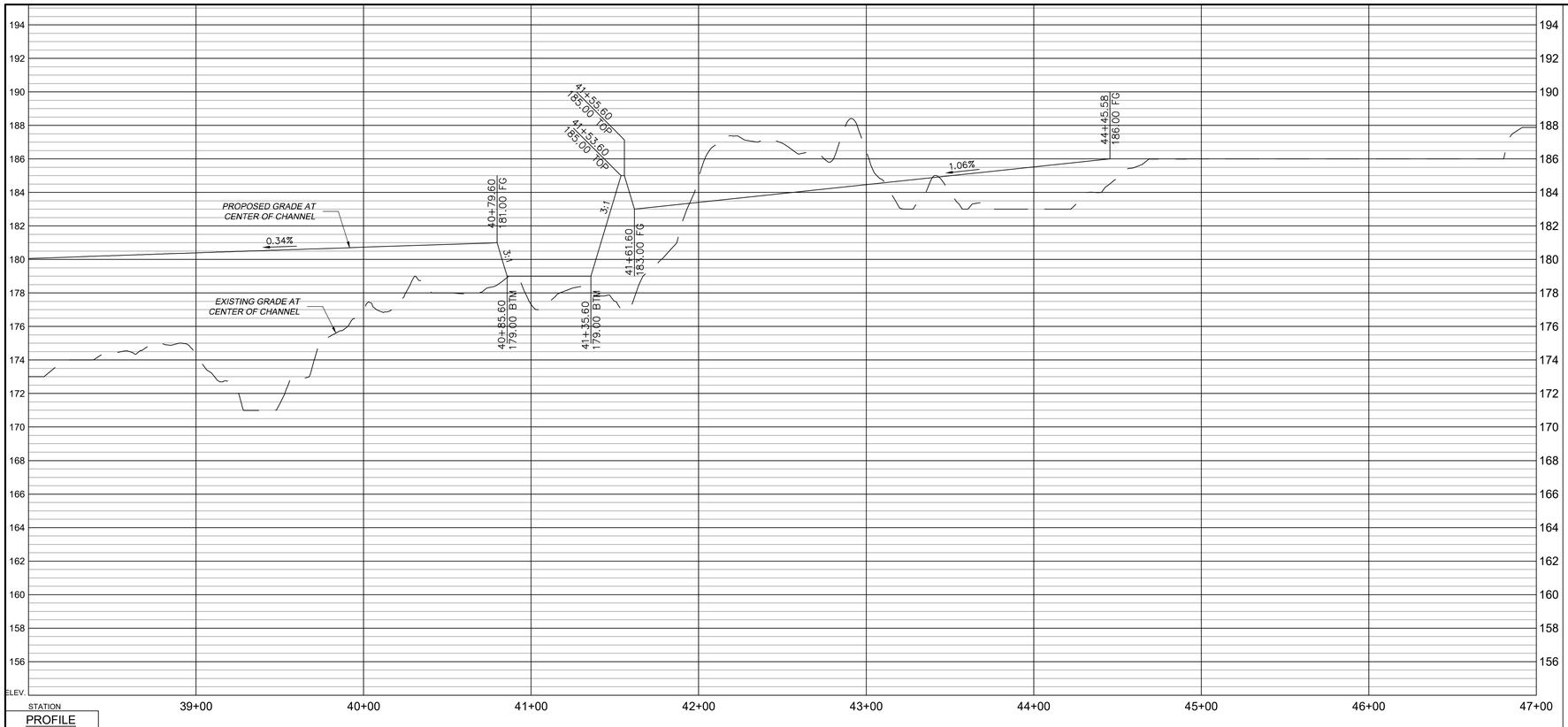

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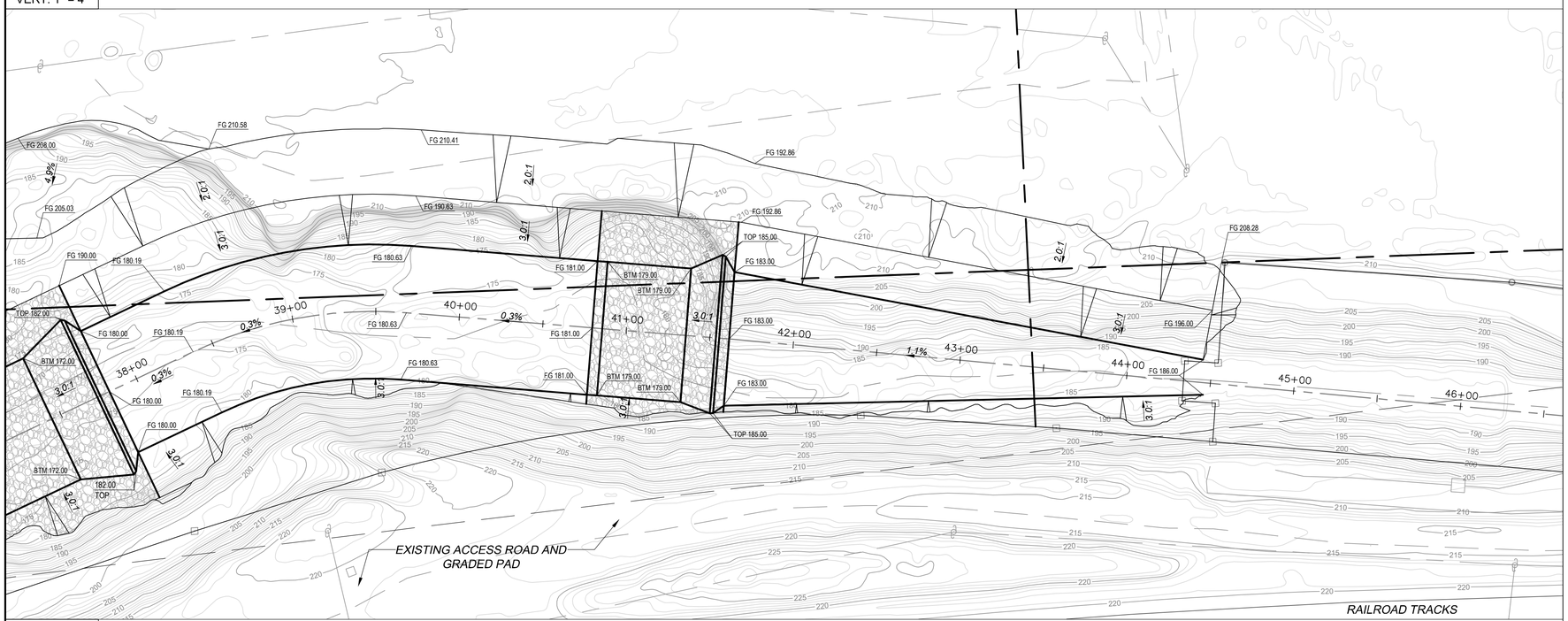
VERT. 1" = 4'



PLAN
1" = 40'

LEGEND

GRADING LIMITS

GENERAL NOTES

1. GRADED AREAS TO BE PLANTED WITH NATIVE VEGETATION. THIS WILL BE SHOWN IN MORE DETAIL WITH THE 60% DRAWINGS.

1 1/2 0 1 2
3 inches on original scale

COUNTY OF ORANGE CALIFORNIA

MARK	DESCRIPTION	DATE	APPR.

PREPARED UNDER THE RESPONSIBLE CHARGE OF:

REGISTERED PROFESSIONAL ENGINEER TORY R. WALKER No. 45005 Exp. 3-31-2026 CIVIL STATE OF CALIFORNIA

TORY R. WALKER, PE — DATE

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TF	TF
DRAWN BY:	DRAWING NO.:
PR, MR	
FILE NAME: 251763-03-05 - P&P.dwg	SCALE: AS SHOWN
PLOT DATE: ----	

County of Orange PublicWorks

PREPARED BY: TORY R. WALKER ENGINEERING

ORANGE COUNTY CHANNEL REHAB

GRADING PLAN

38+00 - 44+45.58

SHEET REFERENCE NUMBER

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SHEET 05 OF 06

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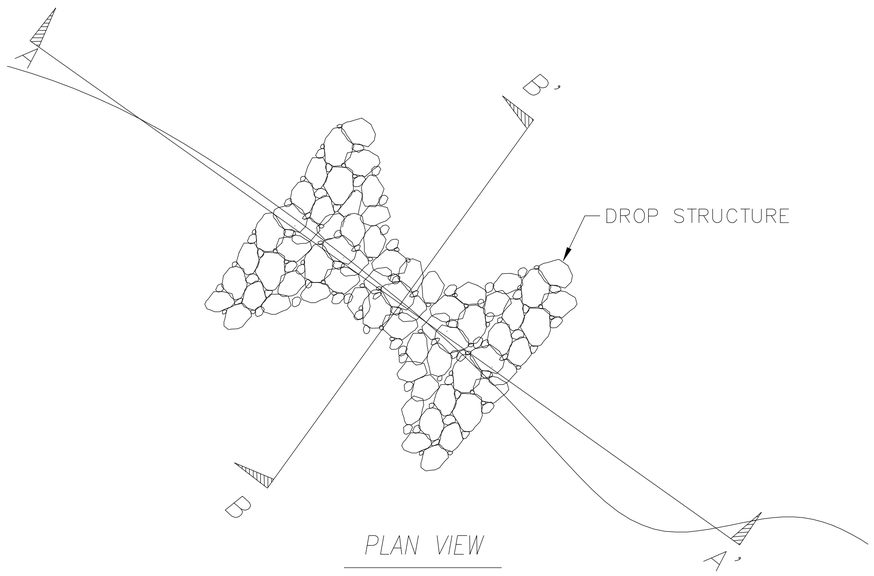
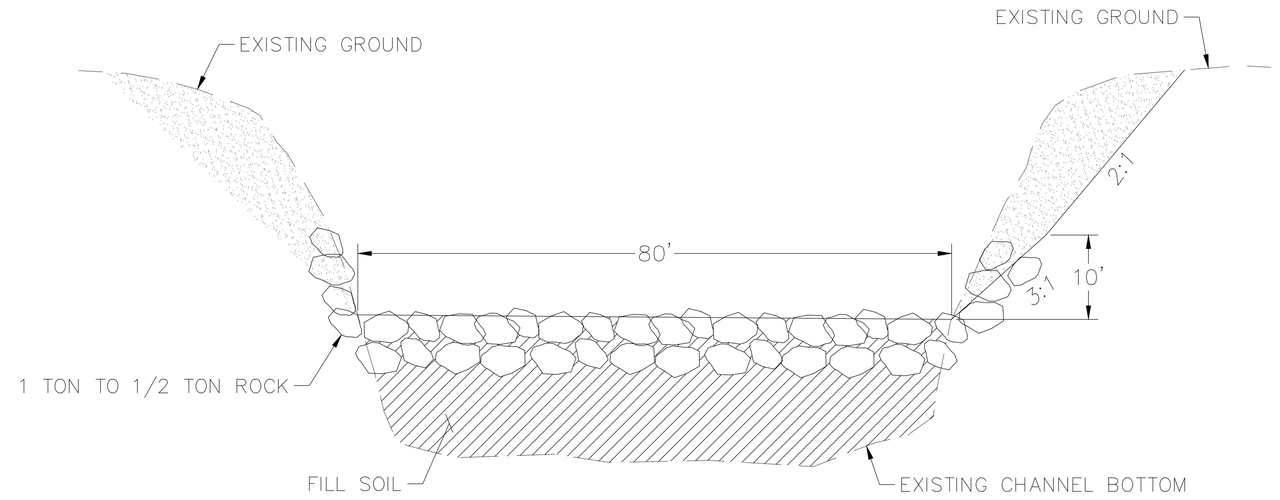


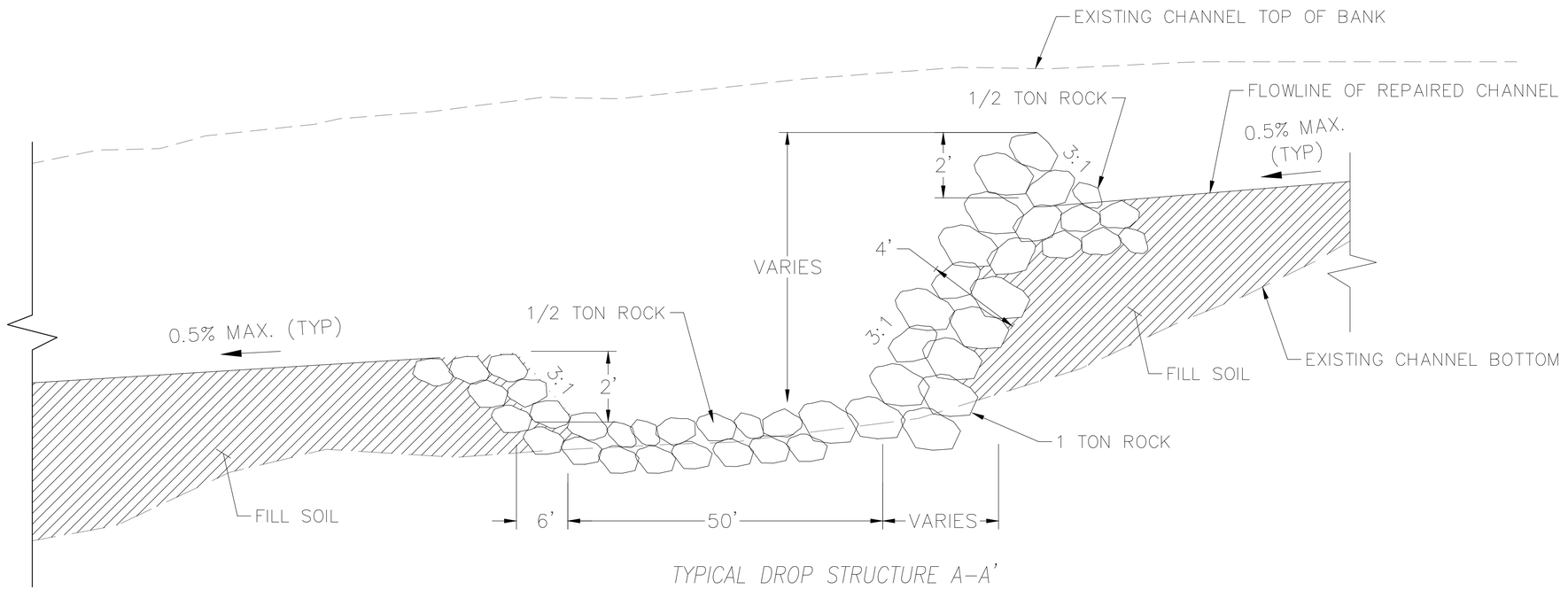
PLAN VIEW

NO SCALE



TYPICAL DROP STRUCTURE
CROSS SECTION B–B' LOOKING DOWNSTREAM

NO SCALE



TYPICAL DROP STRUCTURE A–A'

NO SCALE

COUNTY OF ORANGE CALIFORNIA

MARK	DESCRIPTION	DATE	APPR.

PREPARED UNDER THE RESPONSIBLE CHARGE OF:

REGISTERED PROFESSIONAL ENGINEER TORY R. WALKER No. 45005 Exp. 3-31-2026 CIVIL STATE OF CALIFORNIA

TORY R. WALKER, PE — DATE

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PREPARED BY: TORY R. WALKER ENGINEERING	DRAWING NO.:	FILE NAME: 251763-06 - DETAILS.dwg	PLOT DATE: ----

County of Orange
OC PublicWorks

ORANGE COUNTY CHANNEL REHAB

DETAILS

SHEET REFERENCE NUMBER

06

SHEET 06 OF 06

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DATE PLOTTED: 10/1/2025 1:43:39 PM OCPW.CTB

Attachment G.3

Preliminary Planting Palette

Riparian Channel Seed Mix

Scientific Name	Common Name
Ambrosia psilostachya	Western ragweed
Anemopis californica	Yerba mansa
Artemisia douglasiana	California mugwort
Distichlis spicata	Saltgrass
Eleocharis macrostachya	Common spikerush
Erythranthe cardinalis	Scarlet monkeyflower
Erythranthe guttata	Seep monkeyflower
Typha latifolia	Broadleaf cattail
Juncus bufonius	Toad rush
Juncus xiphioides	Irisleaf rush
Pluchea odorata	Saltmarsh fleabane

California Sycamore - Coast Live Oak Riparian Woodlands Plant Palette (Lower Banks)

Scientific Name	Common Name
Amorpha fruticosa	Western false indigo
Artemisia dracunculus	Wild tarragon
Baccharis salicifolia	Mulefat
Elymus condensatus	Giant wild rye
Heteromeles arbutifolia	Toyon
Platanus racemosa	California sycamore
Pluchea sericera	Arrowweed
Quercus agrifolia	Coast live oak
Sambucus nigra	Black elderberry

California Sycamore - Coast Live Oak Riparian Woodlands Seed Palette (Lower Banks)

Scientific Name	Common Name
Ambrosia psilostachya	Western ragweed
Artemisia douglasiana	California mugwort
Distichlis spicata	Saltgrass
Elymus condensatus	Giant wild rye
Elymus triticoides	Creeping wild rye
Malvela leprosa	Alkali mallow
Phacelia ramossisima	Branching phacelia
Pluchea odorata	Saltmarsh fleabane
Verbena lasiostachys	Western vervain

Coastal sage scrub Plant Palette (Upper banks)

Scientific Name	Common Name
Artemisia californica	Calfornia sagebrush
Atriplex lentiformis	Big saltbush
Baccharis pilularis	Coyote brush
Elymus condensatus	Giant wild rye

Eriogonum fasciculatum	Calfironia buckwheat
Isocoma menzesii	Menzie's goldenbush
Malosma laurina	Laurel sumac
Opuntia littoralis	Coast prickly pear
Quercus agrifolia	Coast Live oak
Rhus integrifolia	Lemonade berry
Sambucus nigra	Black elderberry

Coastal sage scrub Seed Palette (Upper banks)

Scientific Name	**Common Name**
Acmispon glaber	Deerweed
Amsinckia menziesii	Menzie's fiddleneck
Artemisia californica	California sagebrush
Deinandra fasciculata	Clustered tarweed
Encelia californica	California bush sunflower
Eriogonum fasciculatum	California buckwheat
Eriophyllum confertiflorum	Golden yarrow
Eschscholzia californica	California poppy
Lupinus bicolor	Miniature lupine
Salvia apiana	White sage
Salvia mellifera	Black sage
Stipa lepida	Foothill needlegrass

Attachment H

Hydraulic Study

TORY R. WALKER ENGINEERING

PRELIMINARY HYDRAULIC REPORT

for

Oso Creek Stabilization

City of San Juan Capistrano, California

Prepared for:

ENGIE North America Flexible Generation & Retail

8001 Arista Place, Suite 350

Broomfield, CO 80021

SEPTEMBER 2025

Prepared by;

Tory R. Walker, PE

R.C.E. 45005

TABLE OF CONTENTS

TABLES

FIGURES

ATTACHMENTS

1. PURPOSE AND SCOPE

The Oso Creek Stabilization Project involves the repair and rehabilitation of approximately 2,600 linear feet of the Oso Creek channel, which we will refer to in this report as the "study reach". The study reach is located to the east of the Saddleback Church Rancho Capistrano property and west of the I-5 San Diego Freeway and the Southern California Regional Rail Authority (SCRRA) rail line within the city of San Juan Capistrano, California, as shown in **Figure 1** and **Figure 2**.

Over time, the creek has experienced significant vertical scour, horizontal migration, bank instability, and native and non-native vegetation overgrowth. The purpose of this study is to prepare a restoration design for the creek that will stabilize the channel, prevent future bank failure and channel migration, and will enhance native vegetation growth. This preliminary hydraulic report is therefore prepared to support a 30-percent design of a creek restoration plan using the Nationwide Permit 27 (NWP 27) process.

The proposed creek channel restoration begins at the vegetated open channel at the outfall of an existing double box culvert and ends approximately 2,600-feet downstream. The channel flows from north to south and confluences downstream with Trabuco Creek, a tributary of San Juan Creek, which flows into the Pacific Ocean.

The proposed creek channel design incorporates a series of instream stabilization structures consisting of natural rock; native vegetation will be added at the 60-percent design, but the sizing and placement of the natural rock as designed herein will ensure the stability of the restored creek channel without the subsequent reinforcing of the creek channel by that native vegetation.

The primary instream stabilization structures used for this creek restoration will be low-head drop structures consisting of rock weirs and ramps followed by pools/stilling basins. These rock structures will be spaced approximately every 300 feet between flatter channel sections to reduce flow velocities to less than erosive. This restoration design approach will thus, not only stabilize the creek channel, but facilitate the establishment of native vegetation (habitat) in both the channel bed and the 3:1 side slopes.

Another important design feature will be elevating this highly degraded section of Oso Creek; this will allow reestablishment of a hyporheic zone in the creek channel bed. Taken together, these design features will stabilize the channel, reducing the risk of ongoing vertical and horizontal scour and bank collapse, and will provide habitat and water quality improvements.

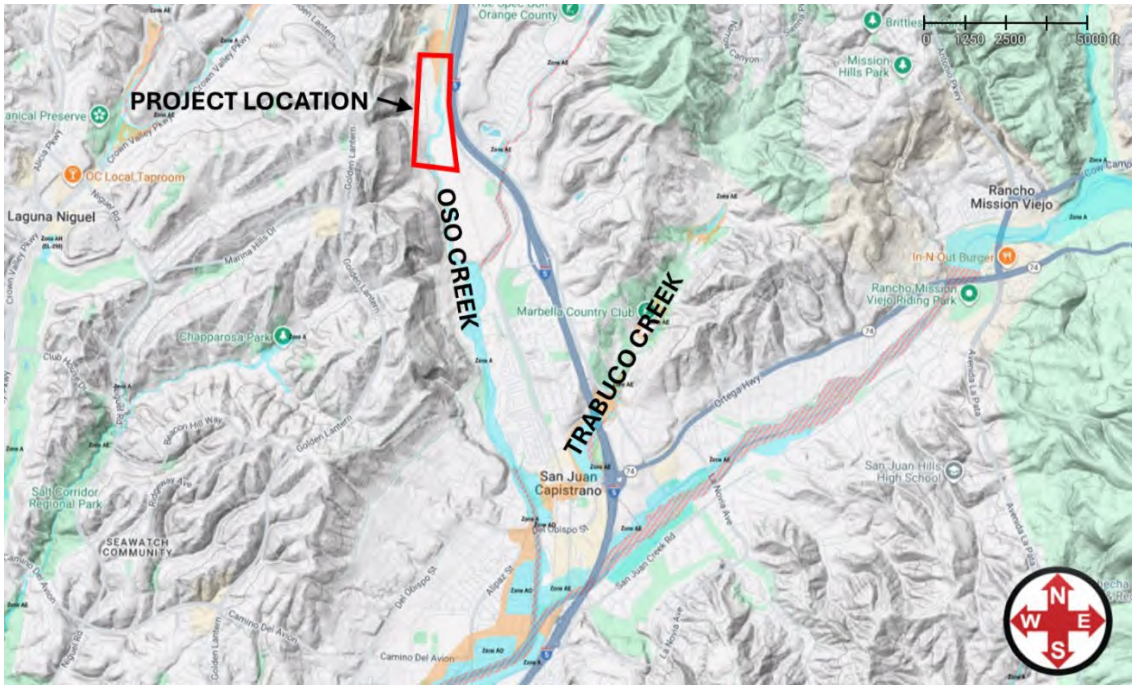

Figure 1 | Vicinity Map Overview

Figure 2 | Project Location

1.1. NATIONWIDE PERMIT 27

To qualify under the Nationwide Permit (NWP) 27, a creek restoration project must follow these principles:

Authorized Activities

- Remove accumulated sediments and stream barriers
- Restore stream meanders, riffle-pool complexes, and any in-stream habitat structures
- Modify stream beds and banks to improve flow and habitat
- Install current deflectors and small water control structures
- Reestablish native vegetation and submerged aquatic plants

- Remove invasive vegetation
- Restore wetland hydrology by removing structures and reshaping ditches

Ecological Requirements

- Use only native plant species
- Design restoration to resemble a natural reference habitat
- Ensure net ecological benefits—no conversions between habitat types (e.g., stream to wetland)

Prohibited Actions

- Stream channelization[1]
- Conversion of tidal waters or wetlands to other aquatic uses
- Use of unsuitable materials (e.g., trash, debris, asphalt)

Each of these items was used to guide the proposed channel restoration design.

2. TOPOGRAPHIC DATA

Topographic survey for the north portion of the project site was prepared by Dudek on September 3, 2024. The survey is on the NAD 83 California State Plane Zone 6 coordinate system and uses vertical datum NAVD 88.

The south portion of the project site utilizes Captiva topographic data from March 3, 2021. The survey uses horizontal datum NAD 83 California State Plane Zone 6 coordinate system and uses vertical datum NAVD 88.

As-built drawings were used to identify the inverts and sizing for the existing double box culvert and downstream concrete and rock channel. These plans are on vertical datum NGVD 29. According to the NGS Coordinate Conversion calculator, the conversion between NAVD 88 and NGVD 29 is 2.2-feet.

[1] The US Army Corps of Engineers (USACE) defines stream channelization as the manipulation of a stream channel to increase the rate of water flow. Manipulation may include deepening, widening, straightening, armoring, or other activities that change the stream cross-section or other aspects of stream channel geometry to increase the rate of water flow through the stream channel. The proposed design does not include any of these activities.

3. HYDROLOGIC DATA

The FEMA 2019 Flood Insurance Study (FIS) shows a 100-year peak flow rate of 6,080 cfs. However, this study has elected to use the peak flow rate provided by Orange County Public Works (OCPW). According to OCPW, the 100-year peak flow rate at the downstream end of the concrete lined channel is 6,500 cubic feet per second (cfs) per the as-built Oso Creek Channel Facility No. L03 plans (Drawing No. L03-101-1A). This is supported by Rivertech's May 1987 report, *Oso Creek Channel Facility No. L03 Hydrology Study,* which determined that the 100-year flow rate to be 6,500 cfs near the downstream end of the study reach. Other peak flow rates were estimated from the 100-year flow rate; the 5-, 10-, 25-, 50-year Oso Creek flow rates were taken from PACE's January 2020 report, *Lower San Juan Creek and Trabuco Creek Invert Stabilization Master Plan.*

We estimated the 2-year flow rate from NOAA Atlas 14 by multiplying the 2-year, 24-hour rainfall intensity by the same ratio between the 10-year flow rate and the 10-year, 24-hour rainfall intensity.

Table 1 | Oso Creek Flow Rates

Storm Event	Flow Rate (CFS)
2-Year	2,178
10-Year	3,558
100-Year	6,500

4. HISTORIC AND EXISTING CONDITION OF OSO CREEK

Over the last 50 years, development within the Oso Creek watershed has increased significantly, decreasing the amount of sediment produced from within the watershed. With the increase in development came traditional means of flood control in the form of concrete channels and storm drain structures. The double box culvert was built in 1984 along with a series of concrete open channels upstream. This addition of the box culvert and concrete lined channels has increased flow velocities, erosion, and scour within the creek channel. We compared the existing Oso Creek study reach topography with topography from the USGS 7.5 minute topographic map from 1949. A profile of both sets of topography along the Oso Creek channel invert are shown in **Figure 3**. This shows that over the past 76 years the channel invert over the study reach has degraded by between 20 and 30 feet.

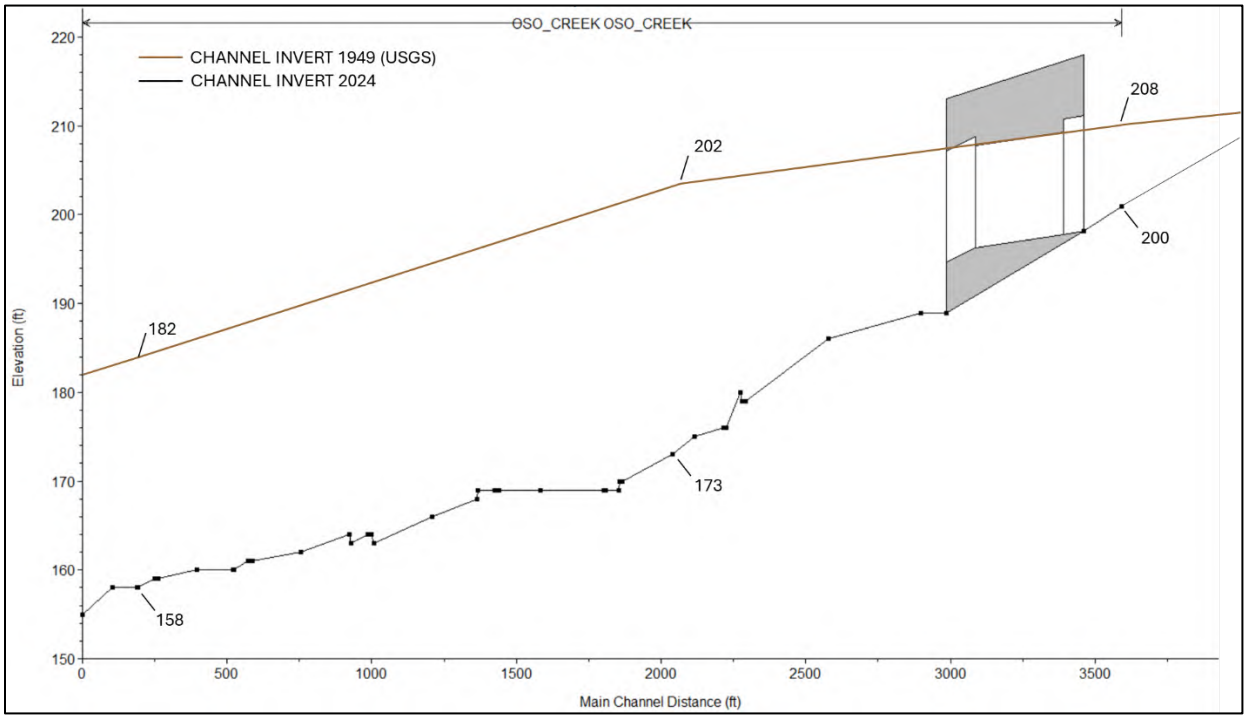

Figure 3 | Channel Profile 1949 vs. 2024 Comparison

Tory R. Walker Engineering (TRWE) conducted a site visit on August 21st, 2025 to assess the current physical characteristics of Oso Creek along the study reach. The existing double box culvert at the upstream end of the project site outlets to a rip rap-lined open channel (see **Figure 4**). The channel then transitions to a densely vegetated open channel lined with the same size rip rap scattered along the banks, which appears to be stable (see **Figure 5** and **Figure 6**). The creek then transitions to a natural channel without rock lining, at which point severe vertical and horizontal erosion begins and continues downstream.

According to the existing topography, the channel has flatter stretches with an average longitudinal slope of approximately 1-percent, and some short but steep stretches where the slope is as high as 20-percent.

Figure 4 | Rip Rap Lined Open Channel at Existing RCB Outfall

Figure 5 | Rip Rap Channel Transitions to Vegetated Channel with Rip Rap

Figure 6 | Stable Vegetated Open Channel with Rip Rap Downstream of Culvert Outfall

At this point (approximately 700-feet downstream of the existing double RCB outfall) the channel has eroded downward into a clay layer. Both native and non-native vegetation are overgrown in various areas, causing re-direction of flows away from the channel thalweg (see **Figure 7**, which was taken within Oso Creek looking upstream). Existing native and non-native vegetation are overgrown along the eastern bank, directing flows toward the western bank, which has recently collapsed.

No deposition of rocks or sediment was seen except for in areas where a scour hole might have occurred, or where a debris dam currently exists, allowing sediment to settle.

Along the western top of bank, deep cracks were observed in the soil near the edge of the creek top of bank (see **Figure 8**).

With time, these surface cracks are expected to deepen, eventually causing more bank failure. The channel at this location and continuing downstream is no longer protected by rock and is unstable and lacks proper bank vegetation in some areas. It is therefore susceptible to the high velocities that cause bank failure and horizontal migration as it continues downstream.

Figure 7 | Oso Creek Existing Condition

Figure 8 | Surface Cracks Along Channel Banks

Plants such as Giant Reed (arundo donax) and willows were observed along the channel. Their shallow and compact roots force the water away towards the west bank, stabilizing the soil beneath them but also diverting flows to the opposite channel bank (see **Figure 9**). Riprap has been placed along the east side of the corridor along the railroad just south of the culvert outfall. This rip rap has somewhat stabilized the eastern slope of the channel along the railroad, leaving the western bank more vulnerable to ongoing collapse.

Additionally, mature plants such as palms were found to be trapping debris that moved through the channel and had formed debris dams (see **Figure 10**). These overgrown plants form natural dams and barriers that re-direct high velocity flows around them and toward the banks, creating new flow paths as the water looks for a path around the blockage.

Figure 9 | Willow Roots Inside Channel

Figure 10 | Palm Tree Debris Dam in Center of Channel Bottom

The team observed clay soils along the channel bottom and along the lower banks throughout the visited channel reach. These soils are highly erosive and experience erosion at the exposed toes of slope throughout the channel. As the toe erodes, the foundation of the slope is compromised, leading to bank collapse. Undercutting and collapse of the channel banks can be seen in **Figure 11.** This photo was taken toward the downstream end of the project reach and shows the lack of rock and deposited sediment in both the channel banks and bottom.

Dry weather flows were observed during the site visit and were estimated to be approximately 1 cfs. These flows are considered a baseflow, as they occur year-round due to various sources throughout the watershed. This baseflow was clear and did not contain sediment (see **Figure 12**).

Figure 11 | Undercutting and Bank Collapse of Clay Soils

Figure 12 | Dry Weather Flows

In summary, the Oso Creek channel exhibits widespread instability as a combined result of the high velocities, unmanaged vegetation, and soils. Lateral migration and vertical scour will continue until the stream channel is rehabilitated. The channel is not expected to achieve a natural state of equilibrium for a very long time.

5. SEDIMENT TRANSPORT ANALYSIS

A sediment transport analysis was considered for the channel but ultimately not conducted due to the conditions observed during the site visit. Through sampling and observation, the channel bed was determined to be composed of clay and largely free of sediment deposition; the channel displayed very limited deposition in small, localized areas of vegetated overgrowth and debris dams, where localized velocities would be low. In addition, the upstream section of the creek is concrete-lined and fed from urban runoff, meaning the water entering the channel at the upstream of the project site is devoid of sediment load. The existing double box culvert at the upstream portion of the study reach is preceded by an upstream network of concrete open channels. This combination of concrete-lined channels and culverts reduces sediment in runoff. Runoff is therefore "hungry" when entering the natural stream section and will look for sediment to pick up.

During our site visit, we saw no natural deposition of rock or sediment. The only sediment deposition that was seen within the study reach was within scour holes or where vegetation overgrowth blocked flows, allowing sediment to settle. Therefore, it was determined that a sediment transport analysis would not be useful in predicting future changes within this stretch of the channel, because there is no sediment being deposited withing the study reach.

The sieve analyses performed on the sediment samples confirmed the field observation that the channel bed was composed of clay and shows that the lower banks contain mostly clay. Locations where the sediment samples were taken can be viewed in **Figure 13**. Results of the sieve analysis are summarized in **Table 2,** and the gradation results are located in **Attachment 1**.

Figure 13 | Soil Sample Locations

Table 2 | USCS Soil Sample Classifications

Sample	USCS Classification
1	Dark Brown CL (Clay)
2	Light Gray SM (Silty Sand)- **Bank Sample**
3	Dark Gray SM/SC (Silty Sand/Clayey Sand)
4	Dark Brown CL (Clay)
5	Gray SC/CL (Clayey Sand/Clay)

6. HYDRAULIC ANALYSIS

6.1. Existing Condition

A hydraulic model of the study reach was prepared using the USACE river hydraulic analysis software HEC-RAS (version 6.4.1). Cross sections were drawn using the existing topographic survey, and the model was run with a mixed-flow regime to account for either subcritical or supercritical flow. The upstream and downstream boundary conditions were set to normal depth, and Manning's roughness coefficients were determined based on the geometry and physical characteristics of the channel as well as the vegetation observed during the August 2025 site visit.

The existing condition model results show the existing condition average velocities and flow depths along the channel. These values were then used to determine the most appropriate locations for the berms, drop structures, and stilling basins along the channel. The existing condition HEC-RAS results are available in **Attachment 4**.

6.2. Proposed Condition

There were several goals with the proposed channel rehabilitation design. Every design consideration took into account the requirements within the NWP 27 discussed in Chapter 1. With this in mind, the first goal was to reduce flow velocities in order to prevent further long-term channel scour and provide the channel banks with long-term stability. The second goal was to promote stable slopes that would allow the growth of native vegetation in the channel and along the banks. The third goal was to ensure that this rehabilitation design would be mostly self-sustaining once vegetation establishes.

A summary of the proposed design includes the following:

1. Channel base width of 80 feet.
2. Western side slope is graded at 3:1 (H:V) up to 10 feet (above the 100-year water surface elevation).
3. The upper portion of the western slope will be graded at 2:1 (H:V) until it meets the top of bank elevation. This will require cut or fill, depending on location.
4. The slopes will be planted with native vegetation, including woody vegetation.
5. The eastern slope at the north (upstream) portion of the restoration reach will remain since it appears stable and is lined with rip rap.

6. The eastern slope along the lower (southerly) portion of the channel will be graded at 3:1 and 2:1 and also replanted with native vegetation.
7. Six instream rock stabilization structures are proposed at between 300 to 400 feet apart (see **Figure 14**). Each drop structure begins with a 2-foot berm, followed by a 3:1 slope, and ending with a pool/stilling basin (see **Figure 15**, **Figure 16**, and **Figure 17**).

The purpose of the rock structures is to dissipate energy and allow for a flatter longitudinal slope of the creek channel in between each structure to approximately 0.5%. The 2-foot rock berm further reduces velocities as flows approach each rock structure. Velocities increase as the flows cascade over the steeper rock. Therefore, the pool/stilling basin provides a depth and a length to absorb the hydraulic jump and reduce velocities before flows exit the pool and continue down the creek.

The bottom width of the creek channel will be 80 feet wide. This width will ensure reduced flow depths, which in turn reduces velocities. Also, the western bank will be graded at a 3:1 side slope to a height of 10 feet. The slope will then be graded at a 2:1 slope until it meets the existing top of bank elevation. The 3:1 side slopes are stable enough to withstand the 100-year flow and are also the recommended slope for planting and establishing native vegetation, which will be planted throughout the rehabilitation area slopes. Vegetation will also be planted along the 2:1 side slopes. These slopes will not be in contact with the 100-year creek flows.

The proposed rehabilitated creek channel has been designed to comply with the ecological requirements of the NWP 27 including, using only native plant species, designing restoration to resemble a natural reference habitat, and ensuring net ecological benefits with no conversions between habitat types.

The proposed condition hydraulic model was created by adding cross sections for the berms, drop structures, and stilling basins, which were placed roughly every 400 feet along the channel at the 0.5% slope. The hydraulic model assumes a channel bottom width of 80 feet, 3:1 side slopes from the toe of slope transitioning into 2:1 side slopes at a height of 10 feet for the entire length of the rehabilitated creek section. The proposed rock structures and grading will begin downstream at Cross Section 1. The grading will include some cut and fill to construct the first two stabilization structures, as the grading fill elevates the channel invert. After the first two structures, the grading will include mostly fill as the structures and channel invert are elevated above the existing (eroded) channel invert. The grading ties in upstream where the vegetated rip rap channel ends (see **Figure 14**).

The Manning's roughness coefficients were adjusted along the rehabilitated portion of the channel to reflect the large natural rock that would be placed along each drop structure and areas of bare graded soil before vegetation establishes. HEC-RAS results are in **Attachment 4**.

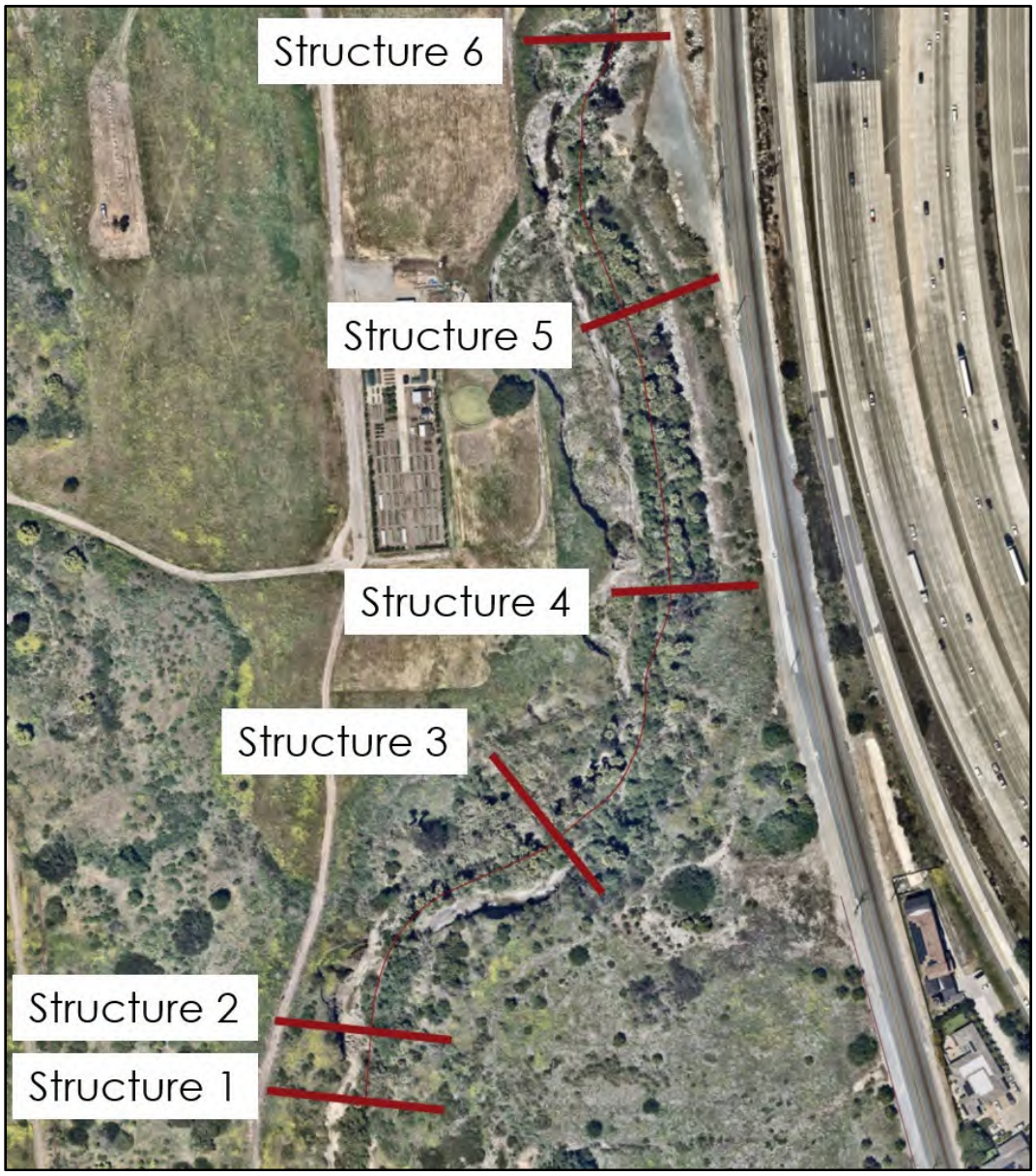

Figure 14 | Drop Structure Locations

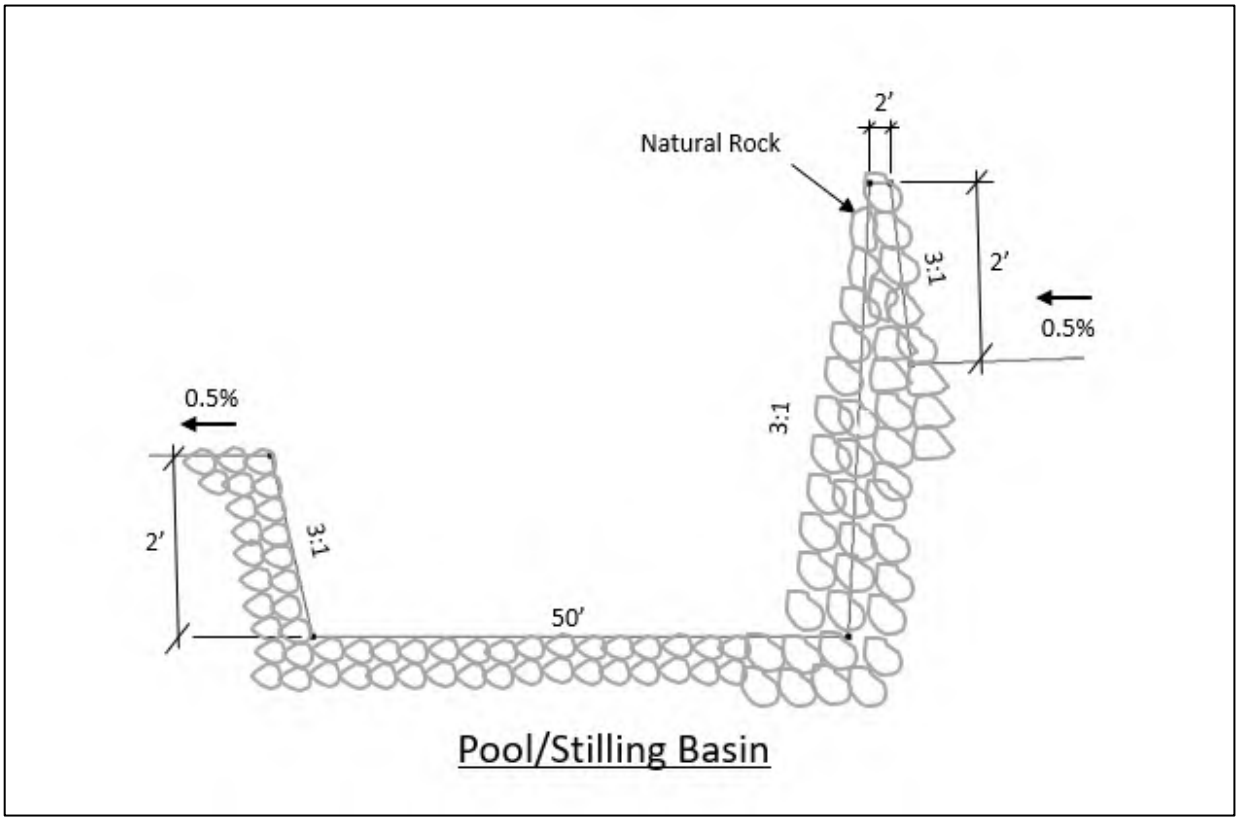

Figure 15 | Typical Rock Stabilization Structure Profile View, Looking West

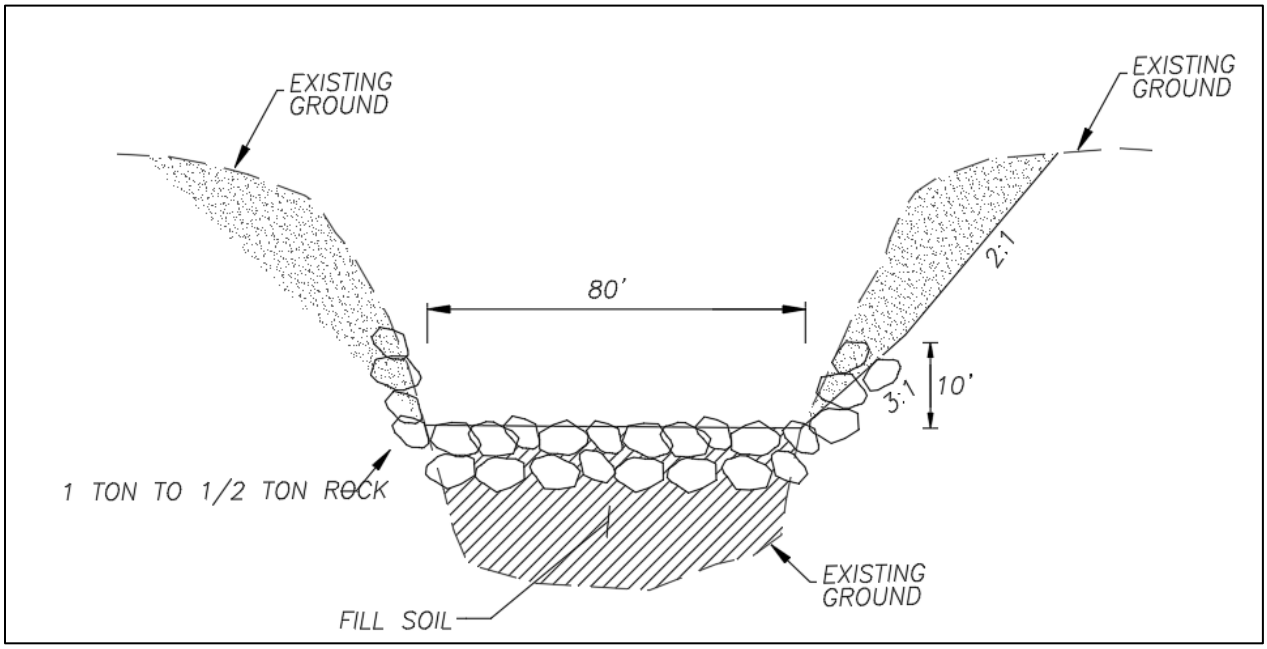

Figure 16| Typical Rock Stabilization Structure Cross Section, Looking Downstream

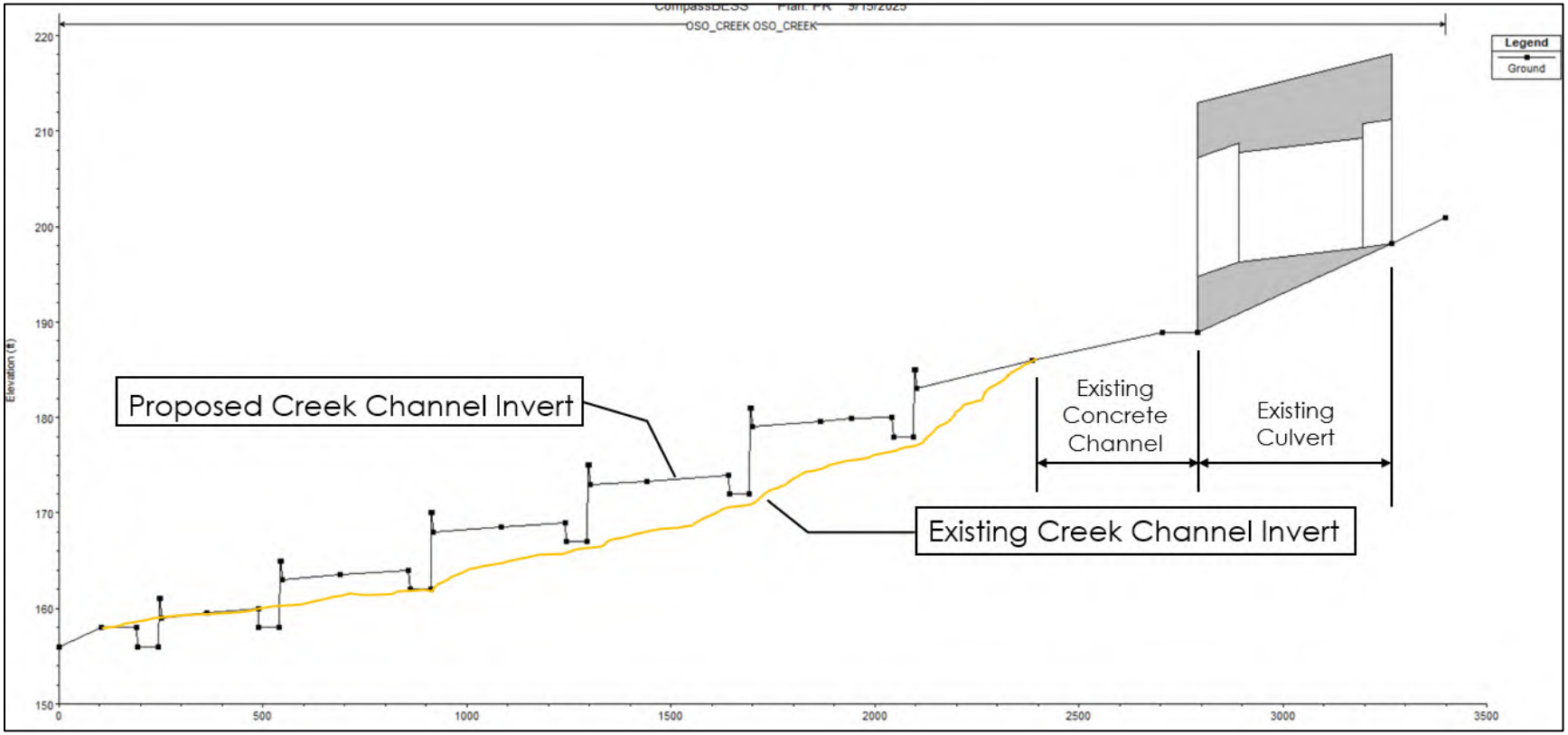

Figure 17 | Existing Vs. Proposed Channel Profile

7. RESULTS

The comparisons between the existing and proposed creek channel velocities can be seen in the tables below; the velocities for all three modeled storm events are significantly reduced in the proposed condition when compared with the existing condition.

The 2, 10, and 100-year proposed condition average velocities are reduced compared to the existing condition average velocities. The complete proposed condition results are located in **Attachment 4**. **Table 3** compares velocities for all three storm events between existing and proposed conditions. This table shows that the proposed design reduces the 2-year velocities between 60% and 70%, the 10-year velocities by 50% to 60%, and the 100-year by approximately 30%. Proposed condition results are found in **Attachment 4**.

Table 3 | Existing and Proposed Channel Average Velocities (ft/s)

	Average Channel Velocity (ft/s) at Top of Study Reach XS 44		Average Channel Velocity (ft/s) at Middle of Study Reach XS 23		Average Channel Velocity (ft/s) at End of Study Reach XS 1	
	EX	**PR**	**EX**	**PR**	**EX**	**PR**
2-Year	17.65	4.24	10.63	5.09	9.03	5.41
10-Year	19.39	5.54	12.10	6.26	11.11	6.56
100-Year	21.42	7.50	14.15	7.95	12.15	8.18

The 100-year proposed average velocities range between 5 to 8-ft/s and the average shear stress is approximately 1 lb/sf along the unlined portions of channel before vegetation establishes. The maximum flow depth along the channel is 9 feet. This shows that the proposed channel should remain stable during a 100-year storm and the 100-year flow depth will remain below the 3:1 side slope maximum depth of 10-feet. Once vegetation establishes over the proposed area of improvements it will further stabilize the channel.

For this preliminary study, the pool/stilling basin lengths were modeled in HEC-RAS. During final design, these lengths will be calculated using USACE stilling basin design calculations.

Preliminary rock sizing for the drop structures was calculated in accordance with the Orange County Flood Control District Design Manual. Rock sizing was based on 100-year velocities. Rock sizes were calculated using a factor of safety of 2 and the resulting diameter was rounded up to the nearest foot. Results can be seen in **Table 4** below and calculations are in **Attachment 5**.

Table 4 | Rock Sizing

	Drop		Stilling Basin	
Rock Structure	Max Velocity (ft/s)	D_{30} (ft)	Max Velocity (ft/s)	D_{30} (ft)
1	12.25	3	6.67	1
2	12.18	3	5.48	1
3	12.01	3	5.44	1
4	12.32	3	5.37	1
5	12.73	3	5.54	1
6	12.17	3	5.32	1

8. CONCLUSIONS AND NEXT STEPS

The design and modeling in this study reflect a 30% proof of concept. The results from this study show that the proposed design will reduce peak flow velocities, prevent future vertical and horizontal scour within the rehabilitated section of the creek, and allow native habitat to flourish. The next phases of design will include 60-percent drawings and calculations. The 60-percent design drawings and calculations will include more detailed grading of the channel and the proposed drop structures and will address the long-term maintenance of the channel.

ATTACHMENT 1

SOIL GRADATION RESULTS

Universal Engineering Sciences (UES)
1441 Montiel Road, Suite 115
Escondido, CA 92026
p. 760.746.4955 | TeamUES.com
LEA NO. 008

Report of Soil Sieve Analysis

Project Name: Oso Creek Gradation Test
Project Number: A25165.00509.000 **Lab Number:** 37548
Sampled By: Client **Date Sampled:** 8/26/2025
Tested By: L.V./J.S. **Date Tested** 9/2/2025

Sample Location:
1

Sample Description:
Dark Brown CL

Specifications:
N/A

Total Wet Wt:	240.5
Total Dry Wt:	180.5

U.E.S. Did not sample material

Sieve Size	Wt. (Grams)	% Retained	% Passing		Specifications	Remarks
2 inch (50.8 mm)	0.0	0	100			
1-1/2 inch (38.1 mm)	0.0	0	100			
1 inch (25.4 mm)	0.0	0	100			
3/4 inch (19.1 mm)	0.0	0	100			
1/2 inch (12.7 mm)	0.0	0	100			
3/8 inch (9.5 mm)	0.0	0	100			
#4 (4.75 mm)	0.0	0	100			
#8 (2.36 mm)	1.2	1	99			
#16 (1.18 mm)	3.5	2	98			
#30 (0.6 mm)	5.2	3	97			
#50 (0.3 mm)	7.0	4	96			
#100 (0.15 mm)	39.1	22	78			
#200 (0.075 mm)	97.1	53.8	46.2			

Tested in Accordance with ASTM C117,C136

Reviewed By: _____ Date: September 11, 2025

Larry Sachs
Lab Supervisor

Universal Engineering Sciences (UES)
1441 Montiel Road, Suite 115
Escondido, CA 92026
p. 760.746.4955 | TeamUES.com
LEA NO. 008

Report of Soil Sieve Analysis

Project Name: Oso Creek Gradation Test
Project Number: A25165.00509.000 **Lab Number:** 37548
Sampled By: Client **Date Sampled:** 8/26/2025
Tested By: L.V./J.S. **Date Tested** 9/2/2025

Sample Location:
2

Sample Description:
Light Gray SM

Specifications:
N/A

Total Wet Wt:	263.4	U.E.S. Did not sample material				
Total Dry Wt:	259.4					
Sieve Size	Wt. (Grams)	% Retained	% Passing		Specifications	Remarks
2 inch (50.8 mm)	0.0	0	100			
1-1/2 inch (38.1 mm)	0.0	0	100			
1 inch (25.4 mm)	0.0	0	100			
3/4 inch (19.1 mm)	0.0	0	100			
1/2 inch (12.7 mm)	0.0	0	100			
3/8 inch (9.5 mm)	0.0	0	100			
#4 (4.75 mm)	11.8	5	95			
#8 (2.36 mm)	17.9	7	93			
#16 (1.18 mm)	33.1	13	87			
#30 (0.6 mm)	85.1	33	67			
#50 (0.3 mm)	144.3	56	44			
#100 (0.15 mm)	177.0	68	32			
#200 (0.075 mm)	193.5	74.6	25.4			

Tested in Accordance with ASTM C117,C136

Reviewed By: Larry Sachs
Lab Supervisor

Date: September 11, 2025

Universal Engineering Sciences (UES)
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Report of Soil Sieve Analysis

Project Name: Oso Creek Gradation Test
Project Number: A25165.00509.000 **Lab Number:** 37548
Sampled By: Client **Date Sampled:** 8/26/2025
Tested By: L.V./J.S. **Date Tested** 9/2/2025

Sample Location:
3

Sample Description:
Dark Gray SM/SC

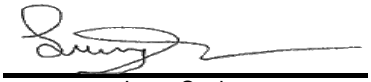
Specifications:
N/A

Total Wet Wt:	566.8
Total Dry Wt:	566.8

U.E.S. Did not sample material

Sieve Size	Wt. (Grams)	% Retained	% Passing		Specifications	Remarks
2 inch (50.8 mm)	0.0	0	100			
1-1/2 inch (38.1 mm)	0.0	0	100			
1 inch (25.4 mm)	0.0	0	100			
3/4 inch (19.1 mm)	0.0	0	100			
1/2 inch (12.7 mm)	0.0	0	100			
3/8 inch (9.5 mm)	8.4	1	99			
#4 (4.75 mm)	39.4	7	93			
#8 (2.36 mm)	99.2	17	83			
#16 (1.18 mm)	181.0	32	68			
#30 (0.6 mm)	262.5	46	54			
#50 (0.3 mm)	313.5	55	45			
#100 (0.15 mm)	347.5	61	39			
#200 (0.075 mm)	363.7	64.2	35.8			

Tested in Accordance with ASTM C117,C136

Reviewed By: 
Larry Sachs
Lab Supervisor

Date: September 11, 2025

Universal Engineering Sciences (UES)
1441 Montiel Road, Suite 115
Escondido, CA 92026
p. 760.746.4955 | TeamUES.com
LEA NO. 008

Report of Soil Sieve Analysis

Project Name: Oso Creek Gradation Test
Project Number: A25165.00509.000 **Lab Number:** 37548
Sampled By: Client **Date Sampled:** 8/26/2025
Tested By: L.V./J.S. **Date Tested** 9/2/2025

Sample Location:
4

Sample Description:
Dark Brown CL

Specifications:
N/A

Total Wet Wt:	94.4	U.E.S. Did not sample material				
Total Dry Wt:	82.2					
Sieve Size	Wt. (Grams)	% Retained	% Passing		Specifications	Remarks
2 inch (50.8 mm)	0.0	0	100			
1-1/2 inch (38.1 mm)	0.0	0	100			
1 inch (25.4 mm)	0.0	0	100			
3/4 inch (19.1 mm)	0.0	0	100			
1/2 inch (12.7 mm)	0.0	0	100			
3/8 inch (9.5 mm)	0.0	0	100			
#4 (4.75 mm)	0.0	0	100			
#8 (2.36 mm)	4.8	6	94			
#16 (1.18 mm)	14.5	18	82			
#30 (0.6 mm)	22.3	27	73			
#50 (0.3 mm)	28.2	34	66			
#100 (0.15 mm)	34.2	42	58			
#200 (0.075 mm)	38.6	47.0	53.0			

Tested in Accordance with ASTM C117,C136

Reviewed By: _____ Date: September 11, 2025

Larry Sachs
Lab Supervisor

Universal Engineering Sciences (UES)
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Escondido, CA 92026
p. 760.746.4955 | TeamUES.com
LEA NO. 008

Report of Soil Sieve Analysis

Project Name: Oso Creek Gradation Test
Project Number: A25165.00509.000 **Lab Number:** 37548
Sampled By: Client **Date Sampled:** 8/26/2025
Tested By: L.V./J.S. **Date Tested** 9/2/2025

Sample Location:
5

Sample Description:
Gray SC/CL

Specifications:
N/A

Total Wet Wt:	236.1
Total Dry Wt:	227.4

U.E.S. Did not sample material

Sieve Size	Wt. (Grams)	% Retained	% Passing		Specifications	Remarks
2 inch (50.8 mm)	0.0	0	100			
1-1/2 inch (38.1 mm)	0.0	0	100			
1 inch (25.4 mm)	0.0	0	100			
3/4 inch (19.1 mm)	0.0	0	100			
1/2 inch (12.7 mm)	0.0	0	100			
3/8 inch (9.5 mm)	0.0	0	100			
#4 (4.75 mm)	0.0	0	100			
#8 (2.36 mm)	5.5	2	98			
#16 (1.18 mm)	21.3	9	91			
#30 (0.6 mm)	40.2	18	82			
#50 (0.3 mm)	62.6	28	72			
#100 (0.15 mm)	99.7	44	56			
#200 (0.075 mm)	123.5	54.3	45.7			

Tested in Accordance with ASTM C117,C136

Reviewed By: _____ Date: September 11, 2025

Larry Sachs
Lab Supervisor

ATTACHMENT 2

HEC-RAS WORK MAP

LEGEND

BANK STATIONS

CHANNEL CENTERLINE

HEC-RAS CROSS SECTION

45 XS NUMBER

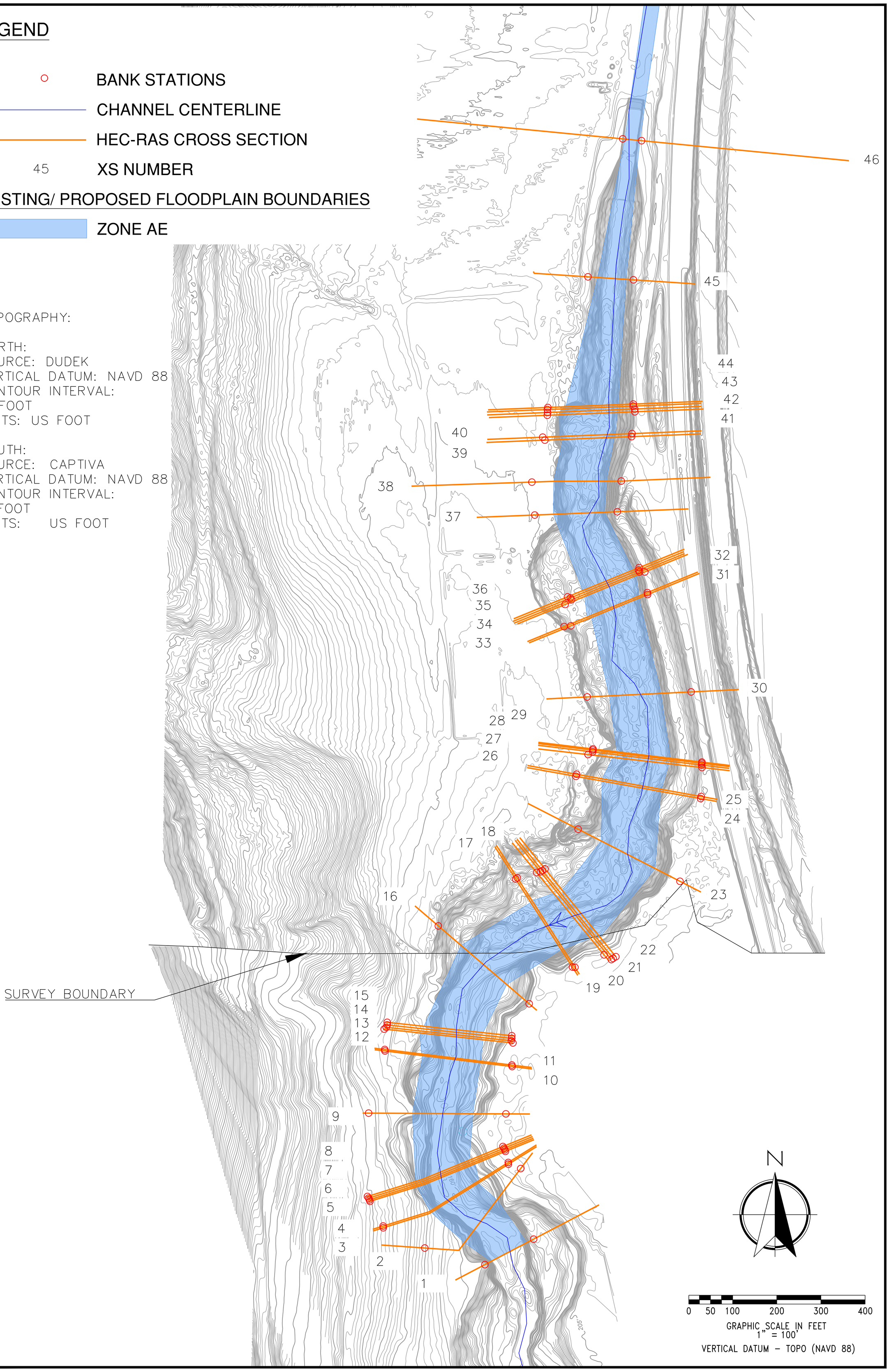
EXISTING/ PROPOSED FLOODPLAIN BOUNDARIES

ZONE AE

TOPOGRAPHY:

NORTH:
SOURCE: DUDEK
VERTICAL DATUM: NAVD 88
CONTOUR INTERVAL:
2-FOOT
UNITS: US FOOT

SOUTH:
SOURCE: CAPTIVA
VERTICAL DATUM: NAVD 88
CONTOUR INTERVAL:
1-FOOT
UNITS: US FOOT



TORY R. WALKER ENGINEERING
122 Civic Center Drive, Suite 206 Vista, CA 92084

REGISTERED PROFESSIONAL ENGINEER
ROSANNA FRANSSON
No. C77964
Exp. 6-30-2027
CIVIL
STATE OF CALIFORNIA

OSO CREEK HYDRAULIC WORK MAP SEPTEMBER 2025

ATTACHMENT 3

CULVERT AS-BUILTS

SHEET 3B OF 35

LENGTH: 71'

RISE: 11.5'

LENGTH: 305'

LENGTH: 100'

RISE: 12.5'

STATION: 70+76.80

INVERT: 194.71'

INVERT: 196.27'

INVERT: 197.77'

INVERT: 198.17'

STATION: 66+00.00

STATION: 67+00.00

STATION: 70+05.67

LENGTH: 1.03'

L03-101-1A

CONSTRUCTION NOTES

4 CONSTRUCT R.C. DROP STRUCTURE PER PLAN, PROFILE AND DETAILS ON SHEETS 8B, 9B & 18B.

5 CONSTRUCT ACCESS ROAD PER PLAN AND PROFILE.

6 FURNISH AND INSTALL 5.0' HIGH CHAIN LINK FENCE PER EMA STD. 412.

7 FURNISH AND INSTALL 3.5' HIGH GUARD CABLE FENCE PER EMA STD. 413.

9 FURNISH AND INSTALL 20' WIDE 5' HIGH DOUBLE SWING GATE PER EMA STD. PLAN 412.

10 CONSTRUCT 6' HIGH TEMPORARY CHAIN LINK FENCE ALONG WESTERLY LIMITS OF CONSTRUCTION.

11 CONSTRUCT 34' WIDE R.C. RECTANGULAR CHANNEL PER PLAN, PROFILE AND TYPICAL SECTION, SEE SHEET 17B.

12 CONSTRUCT 16'5½" DOUBLE BARREL R.C. BOX CULVERT, DEBRIS EXTENSION & APPURTENANCES, INCLUDING A.C. PAVING, SEE SHEETS 11B, 12B & 19B.

13 REMOVE AND RECONSTRUCT SAN JUAN BASIN AUTHORITY DIVERSION STRUCTURE, CONSTRUCT 16" ACP TO DROP STRUCTURE. SEE DETAILS ON SHEETS 31B TO 34B & 35.

14 CONSTRUCT R.C. BOX WITH INLET STRUCTURE, SEE SHEET 14.

15 CONSTRUCT GROUTED STONE LINING, SEE SHEET 14.

16 CONSTRUCT INLET TYPE V PER EMA STD. PLAN 305.

17 CONSTRUCT PIPE INLET, PER DETAILS & TABLE, SHEET 12B.

18 CONSTRUCT PIPE INLET WITH MODIFIED JUNCTION STRUCTURE TYPE V PER DETAILS AND TABLE, SHEET 12B.

19 CONSTRUCT 12' WIDE, 5' HIGH SINGLE SWING GATE PER EMA STD. PLAN 412.

20 FURNISH & PLACE 20" ASBESTOS CEMENT TRANSMISSION PIPE; T-40,II. SEE SHEETS 29 & 30.

21 ADJUST MANHOLE TO GRADE

34 CONSTRUCT R.C. HEADWALL PER DETAILS ON SHEET 14.

36 REMOVE AND SALVAGE BATHGATE BRIDGE.

40 REMOVE EXIST. 20" ACP WATERLINE.

41 CONSTRUCT JUNCTION STR. TYPE V.

TYPICAL SECTION
NO SCALE
STA. 70+76.80 TO STA. 75+00

TYPICAL SECTION
NO SCALE
STA. GG+01.75 TO STA. 70+76.80

3 inches on original drawing

STATION	65	66	67	68	69	70	71	72	73	74	75	STATION
CU. YDS. EXC.	1,330	958	1,012	1,590	2,631	2,261	2,667	2,942	3,324	3,619		CU. YDS. EXC.
CU. YDS. FILL	4,371	5,296	4,943	4,790	1,484	1,565	1,574	1,444	1,093	839		CU. YDS. FILL

PROFILE
HORIZ: 1" = 40'
VERT: 1" = 4'

PLAN
1" = 40'

SURVEY LINE CURVE DATA
Δ = G°38'54"
R = 8600'
L = 997.90'
T = 499.51'

BILL BATHGATE CAMINO

ROBERT H. SCHULLER CAPISTRANO

OSO CREEK CHANNEL (L03)

ACCESS ROAD

SAN JUAN BASIN AUTHORITY PUMP STA.

DOUBLE BARREL BOX

FLOWLINE OF EXISTING CHANNEL

A.T. & S.F. RY. R/W

E.A.T. & S.F. RY. TRACKS

PROPERTY LINE & NORTH BOUNDARY LINE OF CITY OF SAN JUAN CAPISTRANO

30" WATER LINE CROSSING 70+74 FP 90-00154 PE

REMOVED 8" FIBERGLASS SEWER CROSSING AND ENCASEMENT

INSTALLED BRICK END MORTAR PLUG IN UPSTREAM END OF MANHOLE

INSTALLED 8" A.C.P. FOR FUTURE USE.

8" A.C.P. FOR FUTURE USE.

LEGEND		UTILITY		OWNER
(1)	PROTECT	A	12" SEWER	CITY OF SAN JUAN CAPISTRANO
(2)	LIMITS OF CONSTRUCTION AREA	B	39" SEWER	MOULTON-NIGUEL WATER DISTRICT
(3)	REMOVE	E	DIVERSION STRUCTURE*	SAN JUAN BASIN AUTHORITY*
(4)	REMOVE AND SALVAGE	F	4" TELEPHONE CONDUIT AND WIRE	PACIFIC TELEPHONE COMPANY
(5)	REMOVE INTERFERING PORTIONS	G	20" ACP	SAN JUAN BASIN AUTHORITY
(6)	REMOVE AND RELOCATE	H	POWER POLES, GUY WIRES, AND OVERHEAD WIRES	S.D.G. & E.
(7)	TO BE REMOVED OR RELOCATED BY OTHERS	I	2" BLOWOFF AND 20" BUTTERFLY VALVE	SAN JUAN BASIN AUTHORITY
(8)	PROPERTY CORNERS & MONUMENTS TO BE TRANSFERRED & RESET BY THE EMA.			

NOTES

*1. DIVERSION STRUCTURE INCLUDES 15'-25' LONG SHEET PILES ACROSS AND ALONG EXISTING CREEK WHICH SHALL BE REMOVED.

2. DECK OF EXISTING BATHGATE BRIDGE SHALL BE REMOVED AND DELIVERED TO LOCATION AS DIRECTED BY THE ENGINEER.

BENCH MARK: O.C.S. B.M. L-785
3.5 MI. N. ALONG A.T.&S.F. RY. FROM STATION AT SAN JUAN CAPISTRANO, 0.2 MI. N. OF MILEPOST 194, 21.5' W. OF WEST RAIL, 10' S. OF T.P. 57/6, 3.3' W. OF A WITNESS POST, SET IN TOP OF A CONCRETE POST PROJECTING 0.2' ABOVE THE GROUND. (1976) EL. 239.109

OSO CREEK CHANNEL HYDRAULIC DATA

STATION TO STATION	Q100	b	S	n=0.013(2CB) n=0.015 d/n	V/n	n=0.013(2CB) n=0.017 d/n	V/n	dc	Vc
GG+50 TO 70+76.80	6,500	(2)16.5' & 34'	0.005	9.68	21.49	10.74	19.27	11.16	18.51
70+76.80 TO 75+00	6,400	34'	0.0046	9.33	21.39	10.13	19.61	10.86	18.23

MARK	DATE	DESCRIPTION
A	5/15/84	AS BUILT
Δ	10-92	P.P. 90-00154 PE

REVISIONS
DESIGNED O.Z.K.
DRAWN F.T. CHECKED G.J.H.

ORANGE COUNTY ENVIRONMENTAL MANAGEMENT AGENCY

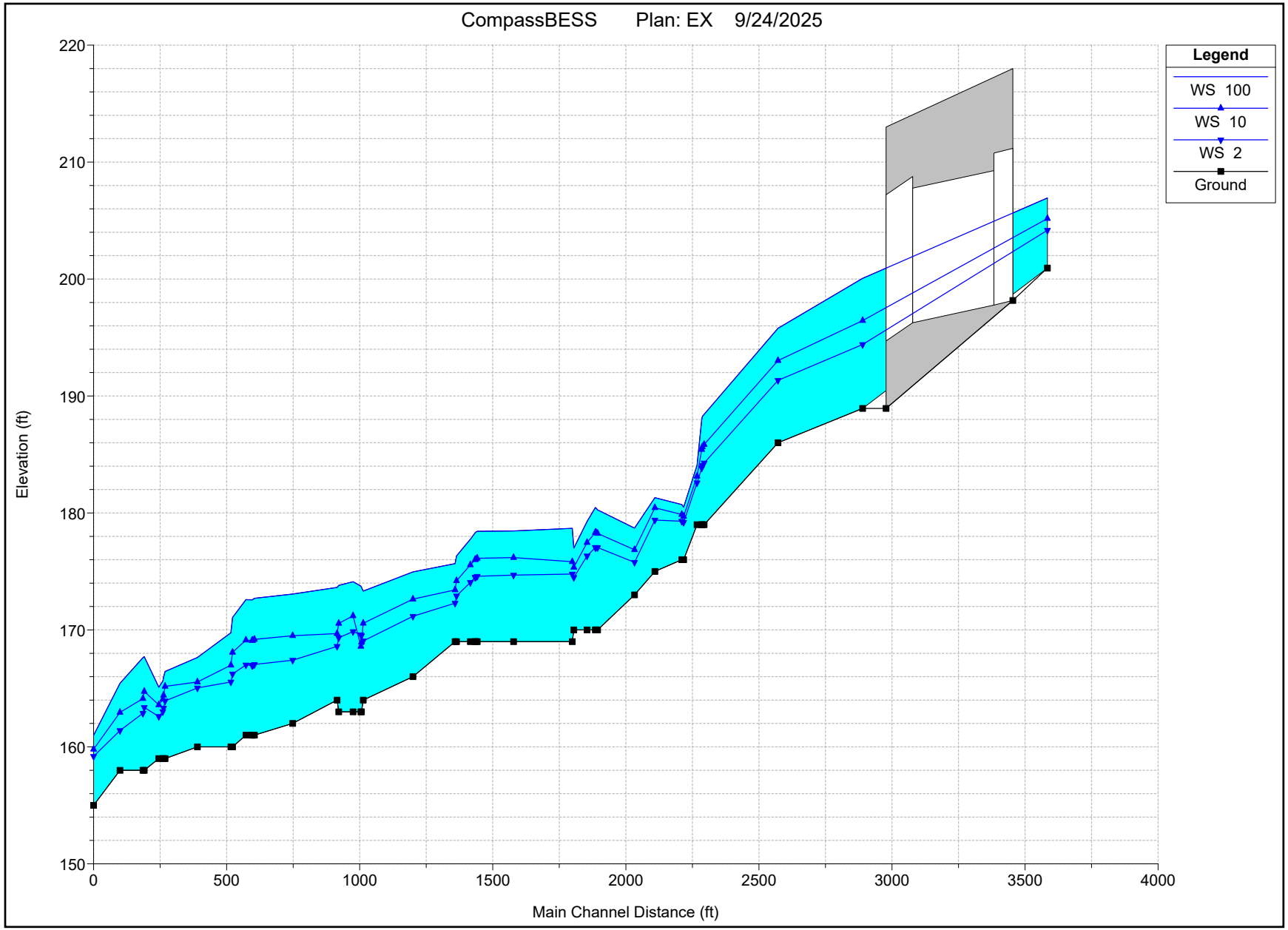
ALTERNATE B
OSO CREEK CHANNEL
PLAN AND PROFILE
STA 65+00 TO STA 75+00

PREPARED UNDER SUPERVISION OF [illegible] DATE 2-7-84
SCALE AS SHOWN | DATE JAN. 1984 | DWG. NO. L03-101-1A | SHEET 3B OF 35

JN 237-83-02

ATTACHMENT 4

HEC-RAS RESULTS


CompassBESS Plan: EX 9/24/2025
Legend
WS 100
WS 10
WS 2
Ground
Elevation (ft)
Main Channel Distance (ft)
220
210
200
190
180
170
160
150
0
500
1000
1500
2000
2500
3000
3500
4000

HEC-RAS Plan: Ex River: OSO_CREEK Reach: OSO_CREEK-DS-0

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Max Chl Dpth	Shear Chan
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(lb/sq ft)
OSO_CREEK-DS-0	48	100	6500.00	200.94	206.94	211.74	225.06	0.012241	34.14	190.37	35.64	2.60	6.00	3.39
OSO_CREEK-DS-0	48	10	3558.00	200.94	205.17	208.37	217.17	0.012228	27.79	128.05	34.86	2.56	4.23	2.49
OSO_CREEK-DS-0	48	2	2178.00	200.94	204.17	206.44	212.63	0.012230	23.33	93.36	34.42	2.50	3.23	1.91
OSO_CREEK-DS-0	47		Culvert											
OSO_CREEK-DS-0	46	100	6500.00	188.94	200.06	200.06	205.29	0.001973	18.35	354.31	33.93	1.00	11.12	0.85
OSO_CREEK-DS-0	46	10	3558.00	188.94	196.45	196.45	200.05	0.001928	15.22	233.75	32.79	1.00	7.51	0.64
OSO_CREEK-DS-0	46	2	2178.00	188.94	194.41	194.41	197.03	0.001924	13.00	167.54	32.13	1.00	5.47	0.50
OSO_CREEK-DS-0	45	100	6500.00	186.00	195.79	195.79	199.21	0.007557	14.83	438.39	64.18	1.00	9.79	3.01
OSO_CREEK-DS-0	45	10	3558.00	186.00	193.03	193.03	195.61	0.008182	12.89	276.04	53.52	1.00	7.03	2.49
OSO_CREEK-DS-0	45	2	2178.00	186.00	191.33	191.33	193.36	0.008748	11.42	190.80	47.14	1.00	5.33	2.11
OSO_CREEK-DS-0	44	100	6500.00	179.00	188.43	190.62	195.56	0.020612	21.42	303.41	52.66	1.57	9.43	6.73
OSO_CREEK-DS-0	44	10	3558.00	179.00	185.85	187.77	191.70	0.023436	19.39	183.51	40.69	1.61	6.85	5.98
OSO_CREEK-DS-0	44	2	2178.00	179.00	184.27	185.78	189.11	0.026851	17.65	123.38	35.21	1.66	5.27	5.38
OSO_CREEK-DS-0	43	100	6500.00	179.00	188.25	190.43	195.42	0.020203	21.48	302.63	51.75	1.57	9.25	6.72
OSO_CREEK-DS-0	43	10	3558.00	179.00	185.64	187.53	191.53	0.023358	19.46	182.83	40.58	1.62	6.64	6.01
OSO_CREEK-DS-0	43	2	2178.00	179.00	184.07	185.58	188.92	0.026253	17.67	123.24	34.89	1.66	5.07	5.36
OSO_CREEK-DS-0	42	100	6500.00	179.00	188.03	190.25	195.35	0.020589	21.71	299.43	51.06	1.58	9.03	6.86
OSO_CREEK-DS-0	42	10	3558.00	179.00	185.42	187.35	191.46	0.024176	19.70	180.57	40.45	1.64	6.42	6.18
OSO_CREEK-DS-0	42	2	2178.00	179.00	183.85	185.42	188.84	0.027010	17.92	121.56	34.54	1.68	4.85	5.51
OSO_CREEK-DS-0	41	100	6500.00	179.00	184.07	186.67	194.41	0.079993	25.79	252.01	97.84	2.83	5.07	12.48
OSO_CREEK-DS-0	41	10	3558.00	179.00	183.14	184.97	190.55	0.096573	21.84	162.91	94.03	2.93	4.14	10.19
OSO_CREEK-DS-0	41	2	2178.00	179.00	182.58	183.97	188.01	0.082694	18.70	116.49	75.60	2.66	3.58	7.76
OSO_CREEK-DS-0	40	100	6500.00	176.00	180.49	182.95	190.29	0.077971	25.10	258.93	105.07	2.82	4.49	11.90
OSO_CREEK-DS-0	40	10	3558.00	176.00	179.71	181.34	185.90	0.075908	19.96	178.24	100.20	2.64	3.71	8.38
OSO_CREEK-DS-0	40	2	2178.00	176.00	179.20	180.40	183.67	0.079357	16.95	128.51	95.58	2.58	3.20	6.63
OSO_CREEK-DS-0	39	100	6500.00	176.00	180.72	183.12	189.51	0.058853	23.79	273.23	97.13	2.50	4.72	10.24
OSO_CREEK-DS-0	39	10	3558.00	176.00	179.86	181.39	185.20	0.053116	18.52	192.11	92.36	2.26	3.86	6.85
OSO_CREEK-DS-0	39	2	2178.00	176.00	179.29	180.39	183.00	0.050160	15.45	140.99	85.32	2.12	3.29	5.15
OSO_CREEK-DS-0	38	100	6500.00	175.00	181.31	182.33	185.34	0.015587	16.12	403.34	92.40	1.36	6.31	4.09
OSO_CREEK-DS-0	38	10	3558.00	175.00	180.44	180.48	182.31	0.009207	10.96	324.52	89.69	1.02	5.44	2.01
OSO_CREEK-DS-0	38	2	2178.00	175.00	179.40	179.40	180.76	0.009769	9.36	232.67	85.67	1.00	4.40	1.61
OSO_CREEK-DS-0	37	100	6500.00	173.00	178.70	180.20	183.93	0.018418	18.34	354.50	76.44	1.50	5.70	5.18
OSO_CREEK-DS-0	37	10	3558.00	173.00	176.85	178.10	181.00	0.024722	16.33	217.84	70.57	1.64	3.85	4.69
OSO_CREEK-DS-0	37	2	2178.00	173.00	175.78	176.84	179.30	0.032406	15.05	144.68	65.23	1.78	2.78	4.44
OSO_CREEK-DS-0	36	100	6500.00	170.00	180.27	179.56	182.05	0.005438	10.73	605.97	117.15	0.83	10.27	1.71
OSO_CREEK-DS-0	36	10	3558.00	170.00	178.25	177.63	179.57	0.005741	9.21	386.24	97.76	0.82	8.25	1.38

HEC-RAS Plan: Ex River: OSO_CREEK Reach: OSO_CREEK-DS-0 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Max Chl Dpth	Shear Chan
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(lb/sq ft)
OSO_CREEK-DS-0	36	2	2178.00	170.00	177.05	176.21	178.00	0.005144	7.84	277.88	82.43	0.75	7.05	1.05
OSO_CREEK-DS-0	35	100	6500.00	170.00	180.42	179.35	181.94	0.004772	9.88	657.65	130.16	0.78	10.42	1.46
OSO_CREEK-DS-0	35	10	3558.00	170.00	178.34	177.62	179.48	0.005262	8.58	414.85	109.60	0.78	8.34	1.21
OSO_CREEK-DS-0	35	2	2178.00	170.00	177.06	176.08	177.95	0.004900	7.59	286.78	85.92	0.73	7.06	0.99
OSO_CREEK-DS-0	34	100	6500.00	170.00	180.47	179.30	181.91	0.004868	9.62	675.45	141.58	0.78	10.47	1.41
OSO_CREEK-DS-0	34	10	3558.00	170.00	178.33	177.62	179.47	0.005300	8.54	416.80	111.59	0.78	8.33	1.21
OSO_CREEK-DS-0	34	2	2178.00	170.00	177.04	176.08	177.94	0.004995	7.62	285.79	86.50	0.74	7.04	1.00
OSO_CREEK-DS-0	33	100	6500.00	170.00	179.27	179.27	181.62	0.008109	12.31	528.04	112.04	1.00	9.27	2.32
OSO_CREEK-DS-0	33	10	3558.00	170.00	177.47	177.47	179.20	0.008980	10.54	337.63	97.88	1.00	7.47	1.89
OSO_CREEK-DS-0	33	2	2178.00	170.00	176.32	176.32	177.69	0.009796	9.37	232.55	85.99	1.00	6.32	1.61
OSO_CREEK-DS-0	32	100	6500.00	170.00	176.99	178.01	180.91	0.015897	15.88	409.31	97.90	1.37	6.99	4.02
OSO_CREEK-DS-0	32	10	3558.00	170.00	175.35	176.21	178.40	0.021053	14.00	254.12	91.19	1.48	5.35	3.57
OSO_CREEK-DS-0	32	2	2178.00	170.00	174.49	175.16	176.85	0.024684	12.32	176.78	86.81	1.52	4.49	3.07
OSO_CREEK-DS-0	31	100	6500.00	169.00	178.69	178.09	180.72	0.005878	11.44	568.09	104.07	0.86	9.69	1.92
OSO_CREEK-DS-0	31	10	3558.00	169.00	175.83	176.23	178.11	0.012936	12.11	293.72	89.78	1.18	6.83	2.55
OSO_CREEK-DS-0	31	2	2178.00	169.00	174.78	175.15	176.59	0.014177	10.78	201.99	78.99	1.19	5.78	2.19
OSO_CREEK-DS-0	30	100	6500.00	169.00	178.47	176.44	179.61	0.002686	8.57	758.17	120.76	0.60	9.47	1.02
OSO_CREEK-DS-0	30	10	3558.00	169.00	176.18	174.71	176.98	0.002855	7.17	496.02	108.99	0.59	7.18	0.80
OSO_CREEK-DS-0	30	2	2178.00	169.00	174.69	173.62	175.33	0.003423	6.44	338.29	100.57	0.62	5.69	0.71
OSO_CREEK-DS-0	29	100	6500.00	169.00	178.43	175.29	179.23	0.001551	7.19	903.74	123.47	0.47	9.43	0.69
OSO_CREEK-DS-0	29	10	3558.00	169.00	176.12	173.54	176.62	0.001455	5.69	625.52	117.10	0.43	7.12	0.47
OSO_CREEK-DS-0	29	2	2178.00	169.00	174.59	172.35	174.95	0.001479	4.83	451.35	109.91	0.42	5.59	0.37
OSO_CREEK-DS-0	28	100	6500.00	169.00	178.35	175.54	179.22	0.001831	7.49	868.11	126.45	0.50	9.35	0.76
OSO_CREEK-DS-0	28	10	3558.00	169.00	176.03	173.79	176.61	0.001813	6.07	585.90	116.79	0.48	7.03	0.55
OSO_CREEK-DS-0	28	2	2178.00	169.00	174.51	172.69	174.94	0.001831	5.21	417.71	105.69	0.46	5.51	0.44
OSO_CREEK-DS-0	27	100	6500.00	169.00	178.30	175.56	179.21	0.001963	7.67	847.95	125.50	0.52	9.30	0.80
OSO_CREEK-DS-0	27	10	3558.00	169.00	176.00	173.82	176.60	0.001910	6.23	571.52	113.79	0.49	7.00	0.58
OSO_CREEK-DS-0	27	2	2178.00	169.00	174.49	172.72	174.93	0.001913	5.32	409.13	103.50	0.47	5.49	0.46
OSO_CREEK-DS-0	26	100	6500.00	169.00	177.76	176.17	179.12	0.003741	9.35	695.08	123.72	0.70	8.76	1.27
OSO_CREEK-DS-0	26	10	3558.00	169.00	175.55	174.34	176.52	0.003621	7.88	451.61	101.50	0.66	6.55	0.97
OSO_CREEK-DS-0	26	2	2178.00	169.00	174.05	173.08	174.85	0.004450	7.13	305.26	93.23	0.70	5.05	0.88
OSO_CREEK-DS-0	25	100	6500.00	169.00	176.33	176.33	178.73	0.008202	12.44	522.54	109.41	1.00	7.33	2.36
OSO_CREEK-DS-0	25	10	3558.00	169.00	174.20	174.20	176.14	0.008797	11.17	318.43	82.09	1.00	5.20	2.05
OSO_CREEK-DS-0	25	2	2178.00	169.00	172.90	172.90	174.44	0.009697	9.96	218.73	72.08	1.01	3.90	1.77
OSO_CREEK-DS-0	24	100	6500.00	169.00	175.67	176.08	178.64	0.010005	13.82	470.30	98.04	1.11	6.67	2.91
OSO_CREEK-DS-0	24	10	3558.00	169.00	173.42	173.95	176.02	0.013208	12.92	275.39	78.23	1.21	4.42	2.82

HEC-RAS Plan: Ex River: OSO_CREEK Reach: OSO_CREEK-DS-0 (Continued)

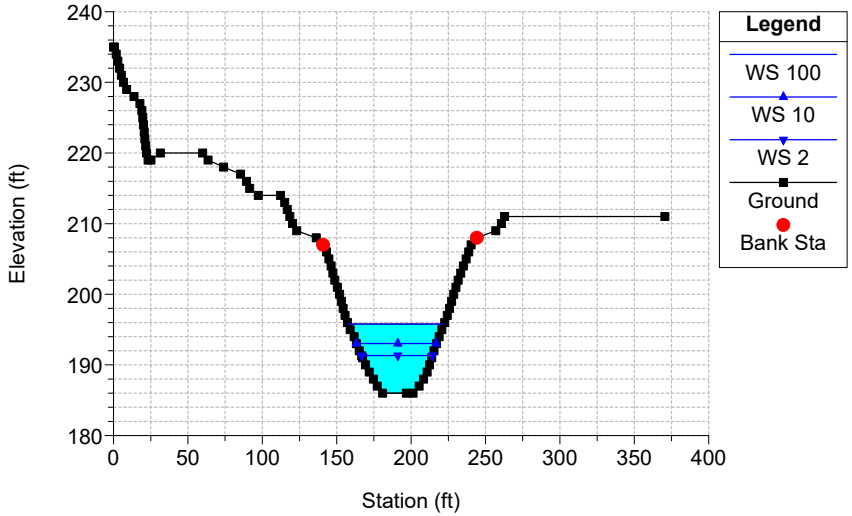
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Max Chl Dpth	Shear Chan
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(lb/sq ft)
OSO_CREEK-DS-0	24	2	2178.00	169.00	172.29	172.73	174.33	0.015311	11.45	190.20	72.66	1.25	3.29	2.44
OSO_CREEK-DS-0	23	100	6500.00	166.00	174.96	172.93	176.04	0.002708	8.36	777.62	128.28	0.60	8.96	0.99
OSO_CREEK-DS-0	23	10	3558.00	166.00	172.63	171.16	173.43	0.002987	7.15	497.60	111.85	0.60	6.63	0.80
OSO_CREEK-DS-0	23	2	2178.00	166.00	171.17	170.11	171.80	0.003411	6.37	341.71	100.83	0.61	5.17	0.70
OSO_CREEK-DS-0	22	100	6500.00	164.00	173.32	172.47	175.27	0.005247	11.19	580.66	99.37	0.82	9.32	1.81
OSO_CREEK-DS-0	22	10	3558.00	164.00	170.56	170.56	172.42	0.009028	10.94	325.22	87.53	1.00	6.56	2.00
OSO_CREEK-DS-0	22	2	2178.00	164.00	169.06	169.06	170.71	0.009371	10.29	211.74	64.41	1.00	5.06	1.84
OSO_CREEK-DS-0	21	100	6500.00	163.00	173.64	171.89	175.09	0.003401	9.67	672.53	103.20	0.67	10.64	1.30
OSO_CREEK-DS-0	21	10	3558.00	163.00	168.95	169.93	172.20	0.016937	14.46	246.02	70.17	1.36	5.95	3.55
OSO_CREEK-DS-0	21	2	2178.00	163.00	169.50	168.44	170.40	0.004253	7.62	285.87	75.30	0.69	6.49	0.96
OSO_CREEK-DS-0	20	100	6500.00	163.00	173.75	171.65	175.04	0.002915	9.11	713.80	106.49	0.62	10.75	1.14
OSO_CREEK-DS-0	20	10	3558.00	163.00	168.59	169.66	172.13	0.019627	15.09	235.78	70.65	1.46	5.59	3.93
OSO_CREEK-DS-0	20	2	2178.00	163.00	169.58	168.29	170.35	0.003493	7.02	310.32	79.62	0.63	6.58	0.81
OSO_CREEK-DS-0	19	100	6500.00	163.00	174.12	170.01	174.80	0.001248	6.61	982.65	125.08	0.42	11.12	0.57
OSO_CREEK-DS-0	19	10	3558.00	163.00	171.20	168.29	171.69	0.001281	5.60	635.33	106.87	0.40	8.20	0.45
OSO_CREEK-DS-0	19	2	2178.00	163.00	169.86	167.19	170.16	0.001016	4.39	496.09	101.93	0.35	6.86	0.29
OSO_CREEK-DS-0	18	100	6500.00	163.00	173.80	171.29	174.69	0.002551	7.55	861.37	147.04	0.55	10.80	0.83
OSO_CREEK-DS-0	18	10	3558.00	163.00	170.55	169.43	171.53	0.004297	7.91	449.80	103.99	0.67	7.55	1.02
OSO_CREEK-DS-0	18	2	2178.00	163.00	169.33	168.39	170.02	0.004240	6.66	327.17	96.83	0.64	6.33	0.78
OSO_CREEK-DS-0	17	100	6500.00	164.00	173.64	171.54	174.66	0.003022	8.10	802.89	148.37	0.61	9.64	0.97
OSO_CREEK-DS-0	17	10	3558.00	164.00	169.69	169.63	171.42	0.008809	10.54	337.64	93.64	0.98	5.69	1.88
OSO_CREEK-DS-0	17	2	2178.00	164.00	168.59	168.59	169.92	0.010448	9.23	235.91	91.48	1.01	4.59	1.61
OSO_CREEK-DS-0	16	100	6500.00	162.00	173.07	169.64	174.23	0.002071	8.63	752.87	93.19	0.54	11.07	0.97
OSO_CREEK-DS-0	16	10	3558.00	162.00	169.51	167.44	170.46	0.002566	7.82	454.70	77.03	0.57	7.51	0.88
OSO_CREEK-DS-0	16	2	2178.00	162.00	167.41	166.18	168.23	0.003319	7.25	300.40	70.35	0.62	5.41	0.84
OSO_CREEK-DS-0	15	100	6500.00	161.00	172.71	169.05	173.93	0.001899	8.89	730.93	79.96	0.52	11.71	0.99
OSO_CREEK-DS-0	15	10	3558.00	161.00	169.19	166.73	170.11	0.002179	7.67	463.69	72.06	0.53	8.19	0.82
OSO_CREEK-DS-0	15	2	2178.00	161.00	167.04	165.28	167.79	0.002593	6.92	314.64	66.12	0.56	6.04	0.74
OSO_CREEK-DS-0	14	100	6500.00	161.00	172.60	169.13	173.91	0.002053	9.18	707.97	78.16	0.54	11.60	1.06
OSO_CREEK-DS-0	14	10	3558.00	161.00	169.11	166.76	170.09	0.002339	7.92	449.20	70.04	0.55	8.11	0.88
OSO_CREEK-DS-0	14	2	2178.00	161.00	166.98	165.29	167.77	0.002748	7.13	305.53	64.03	0.58	5.98	0.78
OSO_CREEK-DS-0	13	100	6500.00	161.00	172.57	169.13	173.91	0.002097	9.27	701.16	77.36	0.54	11.57	1.08
OSO_CREEK-DS-0	13	10	3558.00	161.00	169.09	166.75	170.08	0.002372	7.98	445.80	69.36	0.55	8.09	0.89
OSO_CREEK-DS-0	13	2	2178.00	161.00	166.96	165.29	167.76	0.002752	7.16	304.09	63.26	0.58	5.96	0.79
OSO_CREEK-DS-0	12	100	6500.00	161.00	172.59	168.70	173.84	0.001875	8.96	725.33	76.09	0.51	11.59	1.00
OSO_CREEK-DS-0	12	10	3558.00	161.00	169.13	166.31	170.00	0.001923	7.49	475.21	68.50	0.50	8.13	0.77

HEC-RAS Plan: Ex River: OSO_CREEK Reach: OSO_CREEK-DS-0 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Max Chl Dpth	Shear Chan
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(lb/sq ft)
OSO_CREEK-DS-0	12	2	2178.00	161.00	167.00	164.91	167.66	0.002055	6.51	334.68	63.93	0.50	6.00	0.63
OSO_CREEK-DS-0	11	100	6500.00	160.00	171.06	169.51	173.57	0.004476	12.71	511.61	60.80	0.77	11.06	2.10
OSO_CREEK-DS-0	11	10	3558.00	160.00	168.09	166.75	169.78	0.004260	10.43	341.03	53.91	0.73	8.09	1.54
OSO_CREEK-DS-0	11	2	2178.00	160.00	166.23	165.11	167.46	0.004224	8.90	244.83	49.91	0.71	6.23	1.21
OSO_CREEK-DS-0	10	100	6500.00	160.00	169.76	169.76	173.42	0.007777	15.34	423.61	58.55	1.01	9.76	3.20
OSO_CREEK-DS-0	10	10	3558.00	160.00	166.98	166.98	169.64	0.008246	13.09	271.81	51.05	1.00	6.98	2.56
OSO_CREEK-DS-0	10	2	2178.00	160.00	165.54	165.33	167.37	0.007548	10.84	200.84	47.61	0.93	5.54	1.89
OSO_CREEK-DS-0	9	100	6500.00	160.00	167.64	168.42	172.17	0.011250	17.06	380.95	59.04	1.18	7.64	4.11
OSO_CREEK-DS-0	9	10	3558.00	160.00	165.54	165.91	168.45	0.010738	13.67	260.21	55.96	1.12	5.54	2.91
OSO_CREEK-DS-0	9	2	2178.00	160.00	165.04	164.43	166.41	0.005700	9.37	232.40	55.19	0.81	5.04	1.41
OSO_CREEK-DS-0	8	100	6500.00	159.00	166.45	167.35	170.60	0.012567	16.34	397.72	75.32	1.25	7.45	3.96
OSO_CREEK-DS-0	8	10	3558.00	159.00	165.17	165.17	167.31	0.008647	11.73	303.28	72.05	1.01	6.17	2.19
OSO_CREEK-DS-0	8	2	2178.00	159.00	163.93	163.93	165.51	0.009289	10.09	215.91	68.53	1.00	4.93	1.78
OSO_CREEK-DS-0	7	100	6500.00	159.00	165.94	167.08	170.48	0.014897	17.10	380.06	76.58	1.35	6.94	4.43
OSO_CREEK-DS-0	7	10	3558.00	159.00	164.42	164.96	167.19	0.013375	13.35	266.42	72.59	1.23	5.42	2.97
OSO_CREEK-DS-0	7	2	2178.00	159.00	163.31	163.74	165.40	0.014835	11.58	188.14	69.21	1.24	4.31	2.46
OSO_CREEK-DS-0	6	100	6500.00	159.00	165.63	166.93	170.42	0.016361	17.57	370.00	77.00	1.41	6.63	4.72
OSO_CREEK-DS-0	6	10	3558.00	159.00	164.08	164.82	167.12	0.015608	13.99	254.40	72.77	1.32	5.08	3.31
OSO_CREEK-DS-0	6	2	2178.00	159.00	163.01	163.60	165.33	0.017702	12.21	178.45	69.34	1.34	4.01	2.79
OSO_CREEK-DS-0	5	100	6500.00	159.00	165.11	166.54	170.14	0.018083	17.99	361.31	77.97	1.47	6.11	5.01
OSO_CREEK-DS-0	5	10	3558.00	159.00	163.59	164.45	166.84	0.017878	14.45	246.20	74.10	1.40	4.59	3.60
OSO_CREEK-DS-0	5	2	2178.00	159.00	162.60	163.25	165.03	0.019973	12.50	174.24	71.44	1.41	3.60	2.98
OSO_CREEK-DS-0	3.1	100	6500.00	158.00	167.71	166.34	169.46	0.004158	10.61	612.41	95.84	0.74	9.71	1.57
OSO_CREEK-DS-0	3.1	10	3558.00	158.00	164.74	164.11	166.31	0.005694	10.07	353.27	76.93	0.83	6.74	1.57
OSO_CREEK-DS-0	3.1	2	2178.00	158.00	163.37	162.86	164.53	0.005832	8.64	252.11	71.07	0.81	5.37	1.26
OSO_CREEK-DS-0	3	100	6500.00	158.00	167.64	166.36	169.44	0.004357	10.78	603.22	95.40	0.76	9.64	1.63
OSO_CREEK-DS-0	3	10	3558.00	158.00	164.13	164.13	166.23	0.008710	11.62	306.17	74.17	1.01	6.13	2.17
OSO_CREEK-DS-0	3	2	2178.00	158.00	162.88	162.88	164.45	0.009275	10.05	216.67	69.08	1.00	4.88	1.77
OSO_CREEK-DS-0	2	100	6500.00	158.00	165.44	165.44	168.79	0.007878	14.69	442.35	66.18	1.00	7.44	3.01
OSO_CREEK-DS-0	2	10	3558.00	158.00	162.94	163.06	165.41	0.009321	12.61	282.22	62.21	1.04	4.94	2.49
OSO_CREEK-DS-0	2	2	2178.00	158.00	161.39	161.70	163.48	0.012415	11.59	187.96	59.51	1.15	3.39	2.36
OSO_CREEK-DS-0	1	100	6500.00	155.00	160.98	162.82	167.14	0.030249	19.91	326.39	87.88	1.82	5.98	6.64
OSO_CREEK-DS-0	1	10	3558.00	155.00	159.80	160.96	163.73	0.030700	15.91	223.61	86.40	1.74	4.80	4.76
OSO_CREEK-DS-0	1	2	2178.00	155.00	159.20	159.91	161.69	0.027094	12.68	171.79	85.55	1.58	4.20	3.28

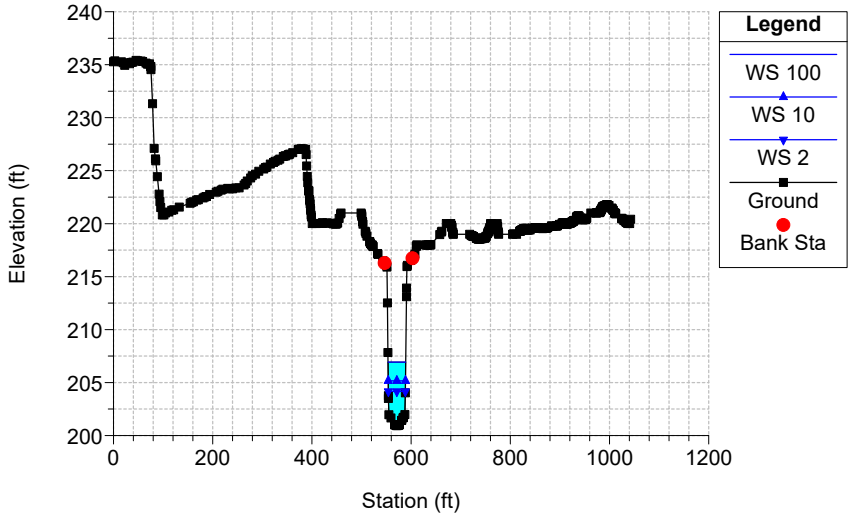
CompassBESS Plan: 1) Ex 9/24/2025

RS = 45



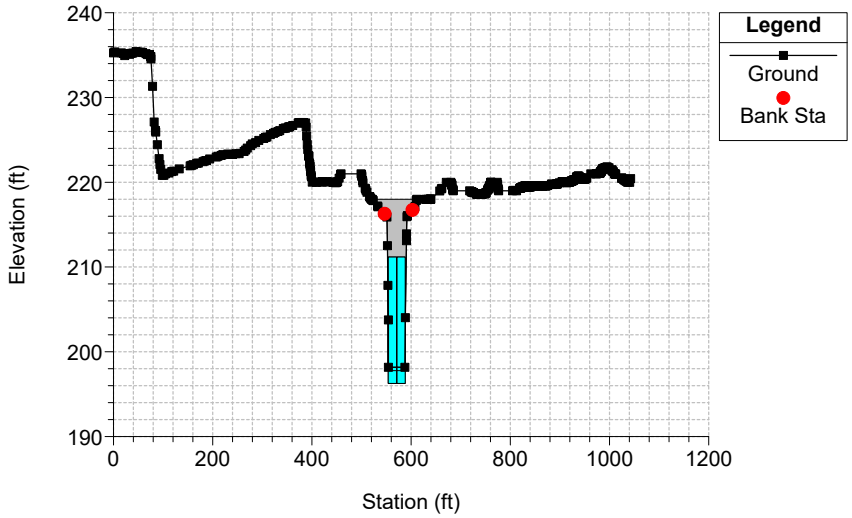
CompassBESS Plan: 1) Ex 9/24/2025

RS = 48



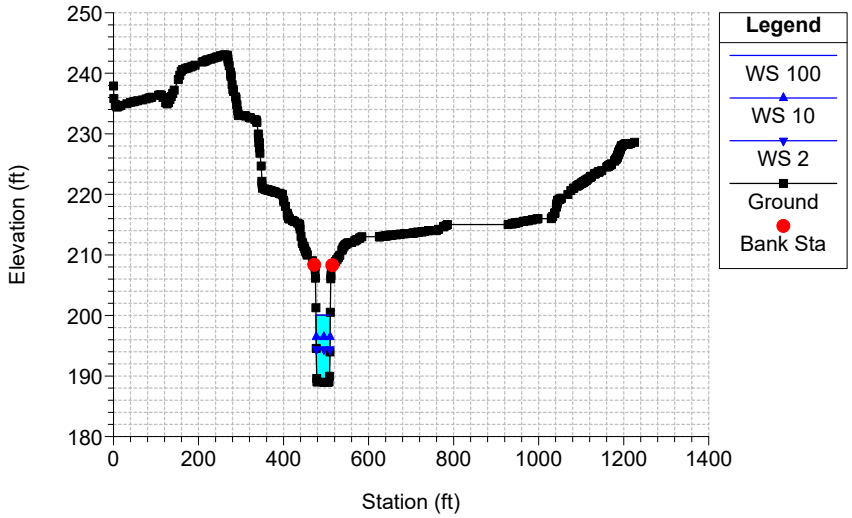
CompassBESS Plan: 1) Ex 9/24/2025

RS = 47 Culv

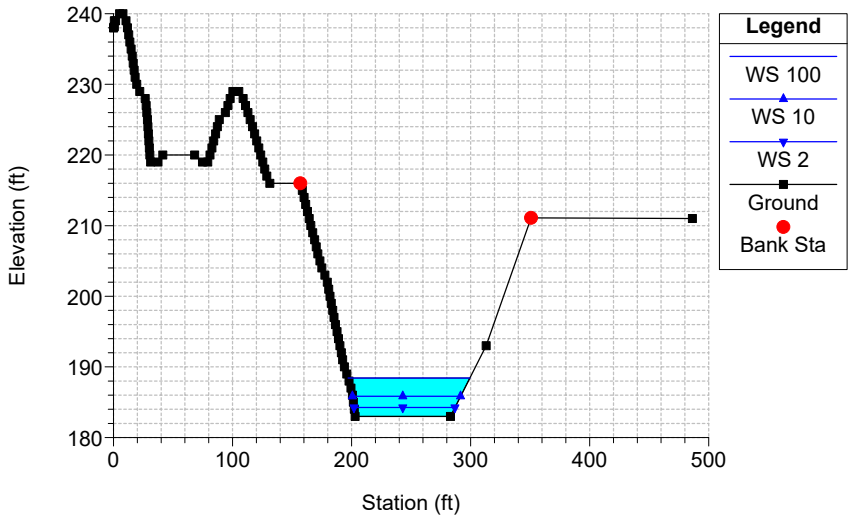


CompassBESS Plan: 1) Ex 9/24/2025

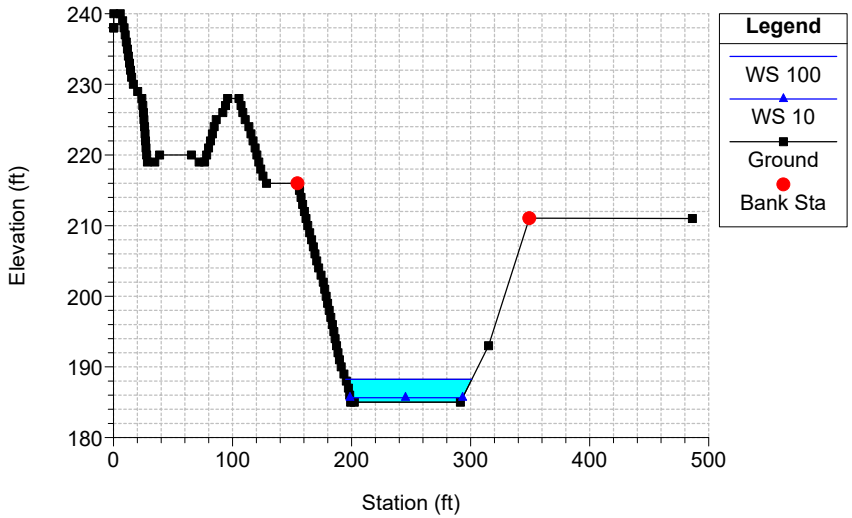
RS = 46



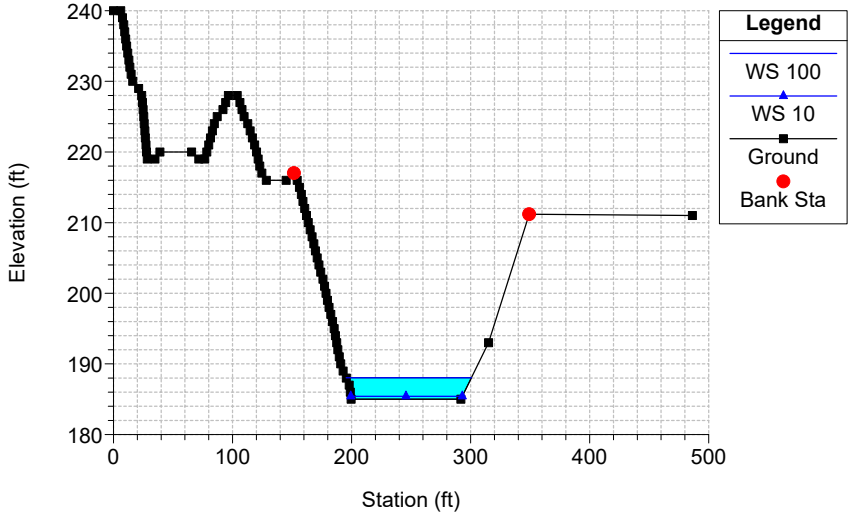
CompassBESS Plan: 1) Ex 9/24/2025
RS = 44



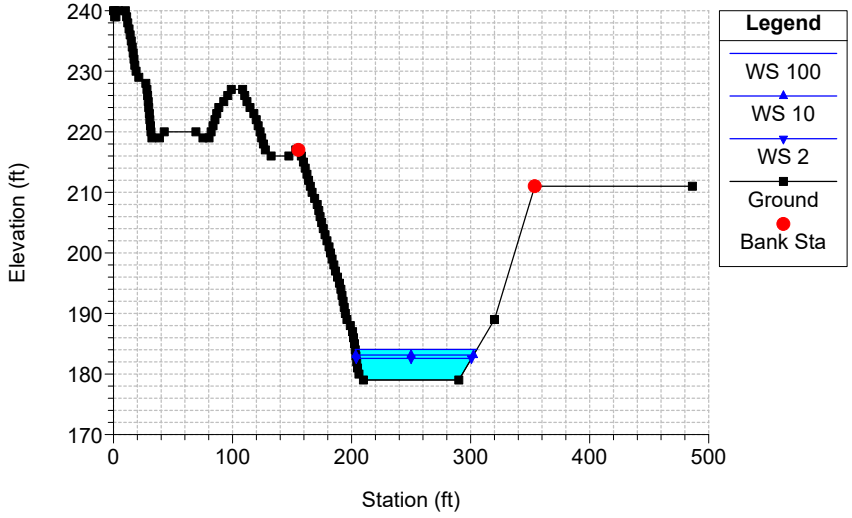
CompassBESS Plan: 1) Ex 9/24/2025
RS = 43



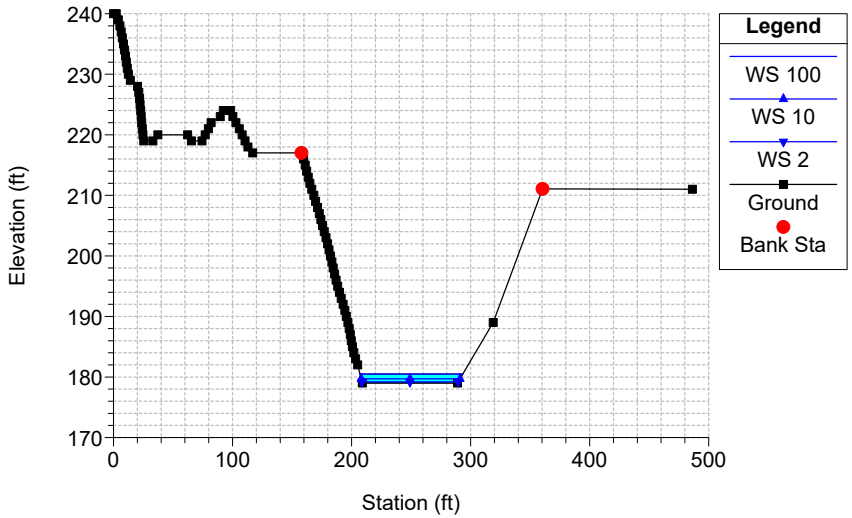
CompassBESS Plan: 1) Ex 9/24/2025
RS = 42



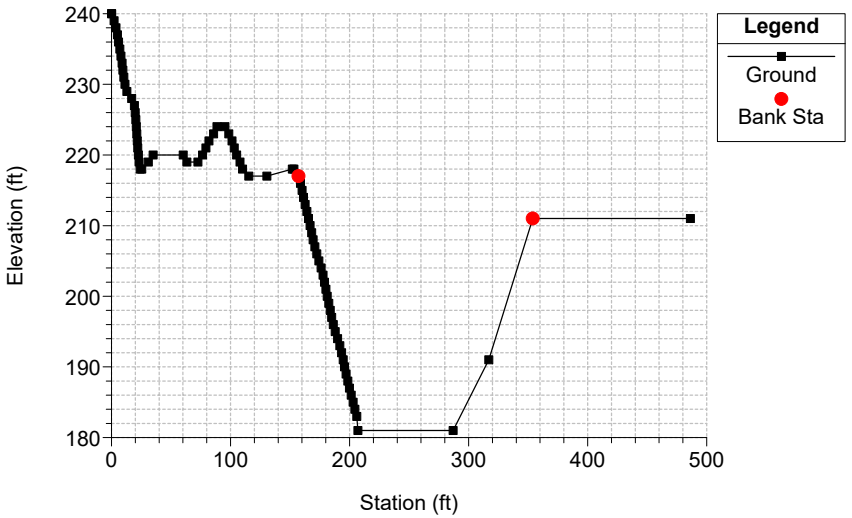
CompassBESS Plan: 1) Ex 9/24/2025
RS = 41



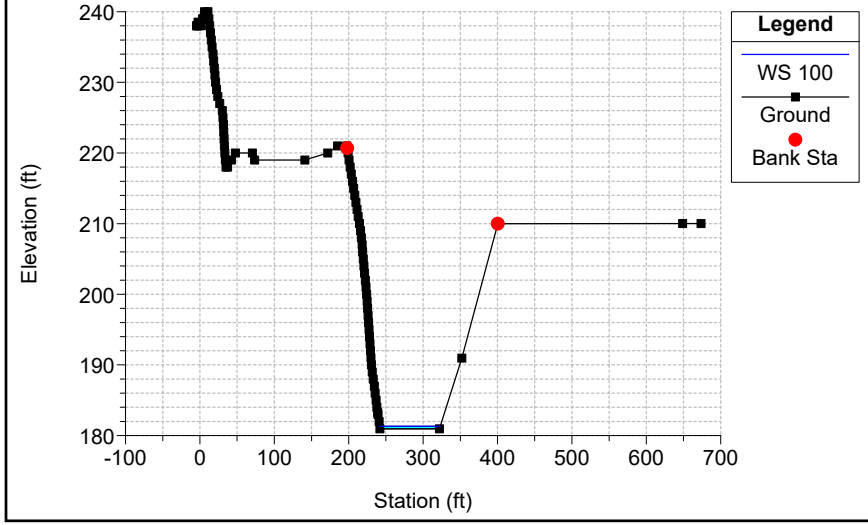
CompassBESS Plan: 1) Ex 9/24/2025
RS = 40



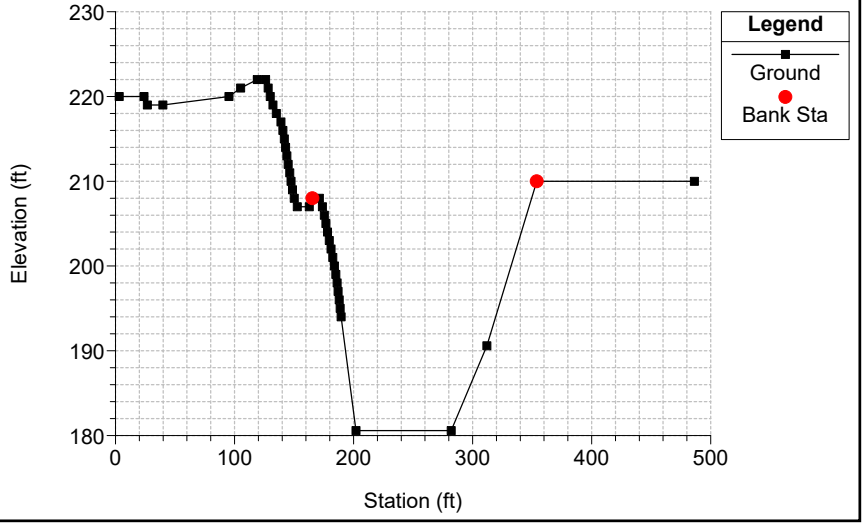
CompassBESS Plan: 1) Ex 9/24/2025
RS = 39



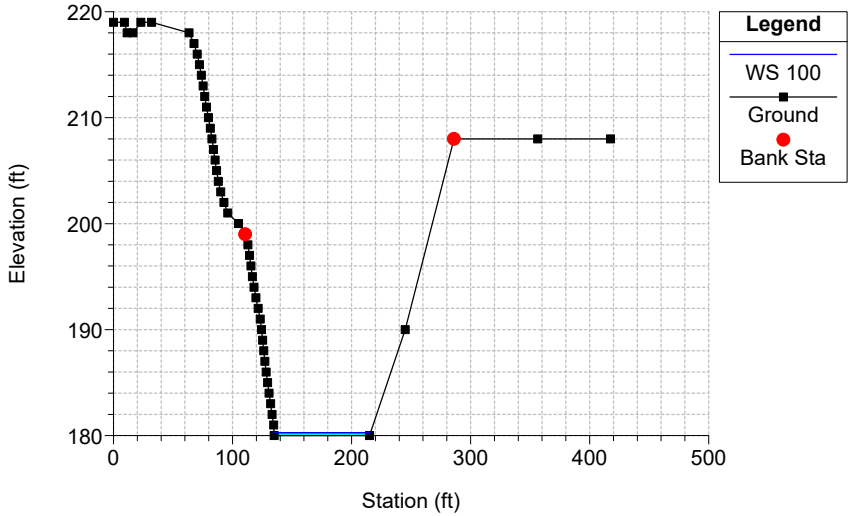
CompassBESS Plan: 1) Ex 9/24/2025
RS = 38



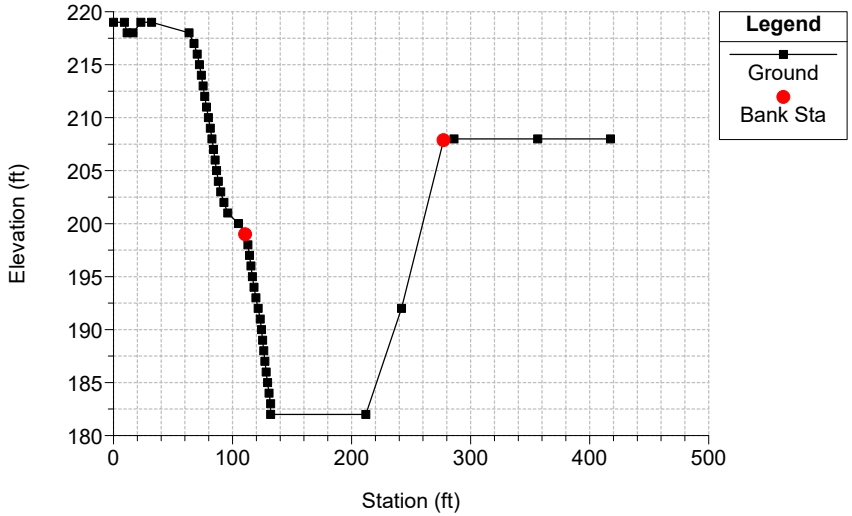
CompassBESS Plan: 1) Ex 9/24/2025
RS = 37



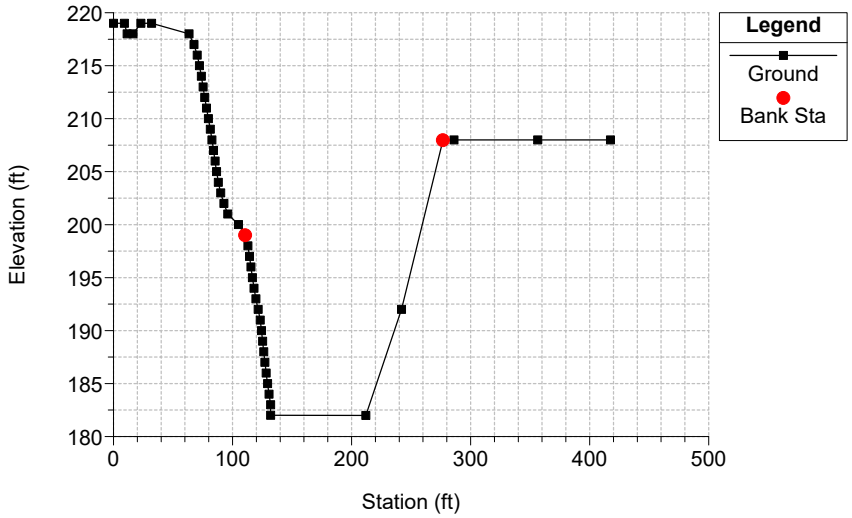
CompassBESS Plan: 1) Ex 9/24/2025
RS = 36



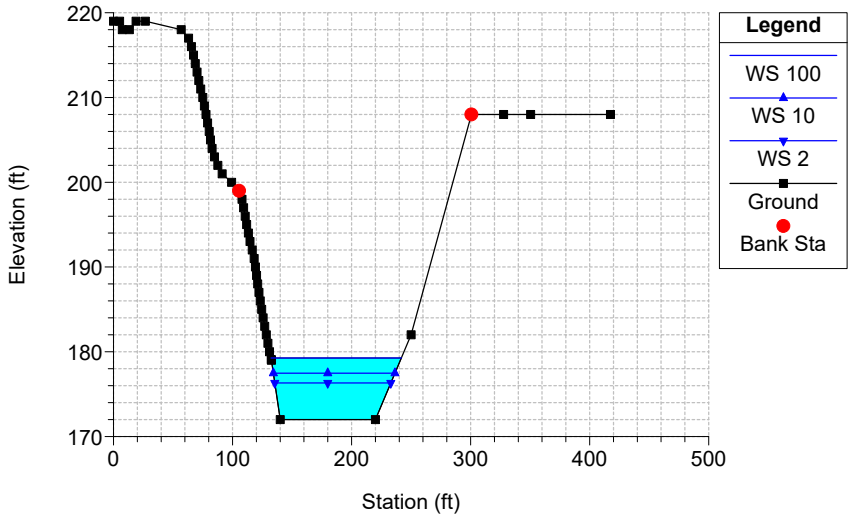
CompassBESS Plan: 1) Ex 9/24/2025
RS = 35



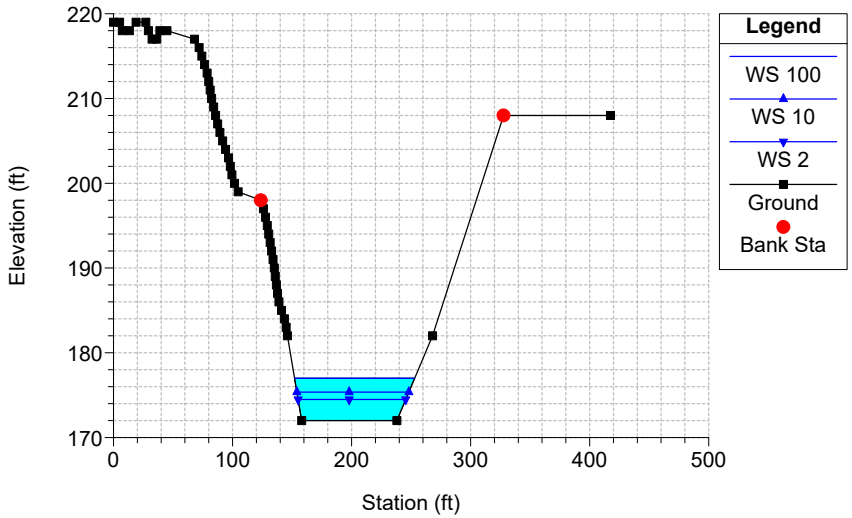
CompassBESS Plan: 1) Ex 9/24/2025
RS = 34



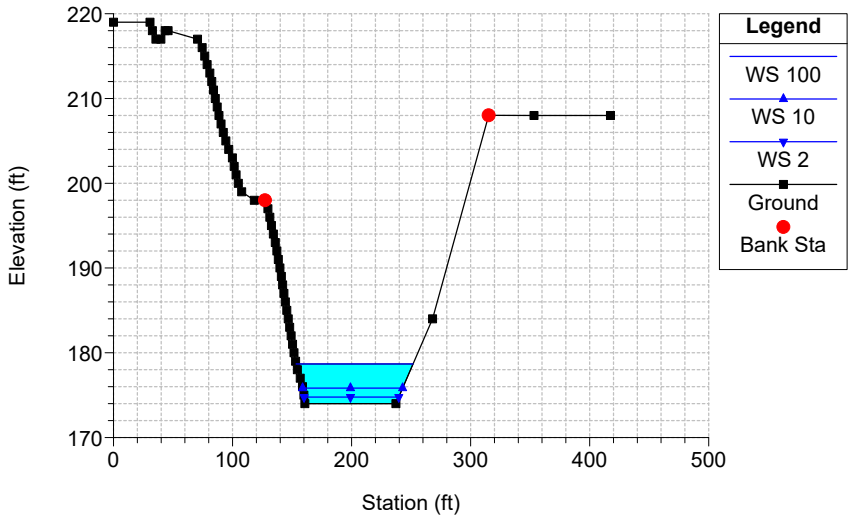
CompassBESS Plan: 1) Ex 9/24/2025
RS = 33



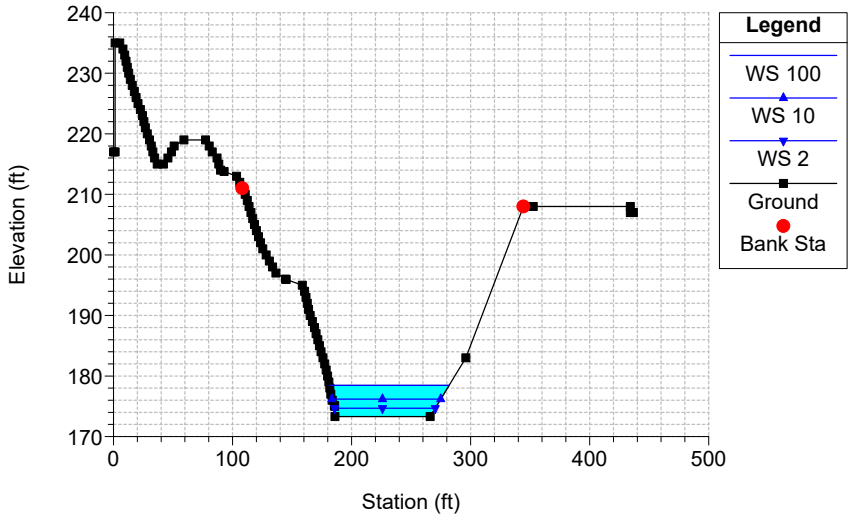
CompassBESS Plan: 1) Ex 9/24/2025
RS = 32



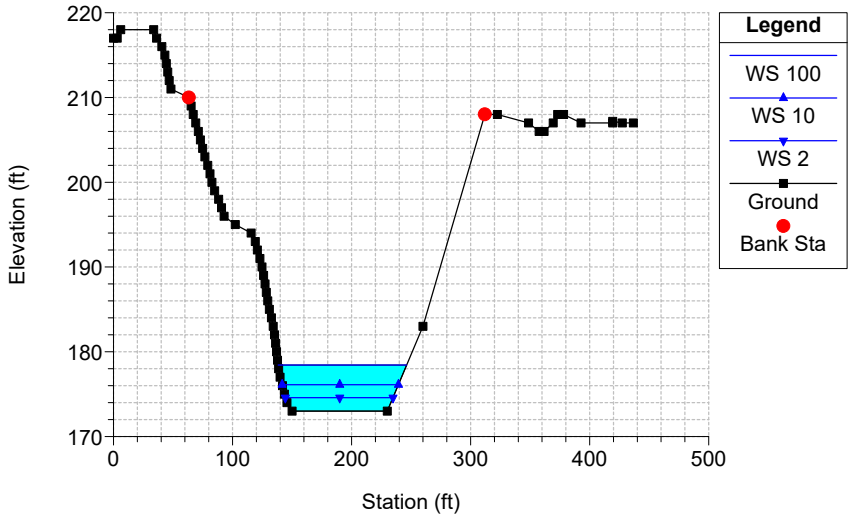
CompassBESS Plan: 1) Ex 9/24/2025
RS = 31



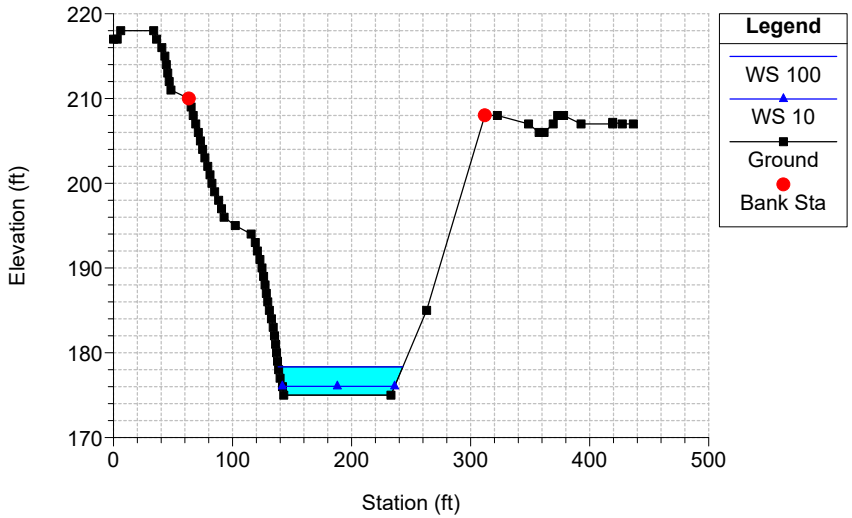
CompassBESS Plan: 1) Ex 9/24/2025
RS = 30



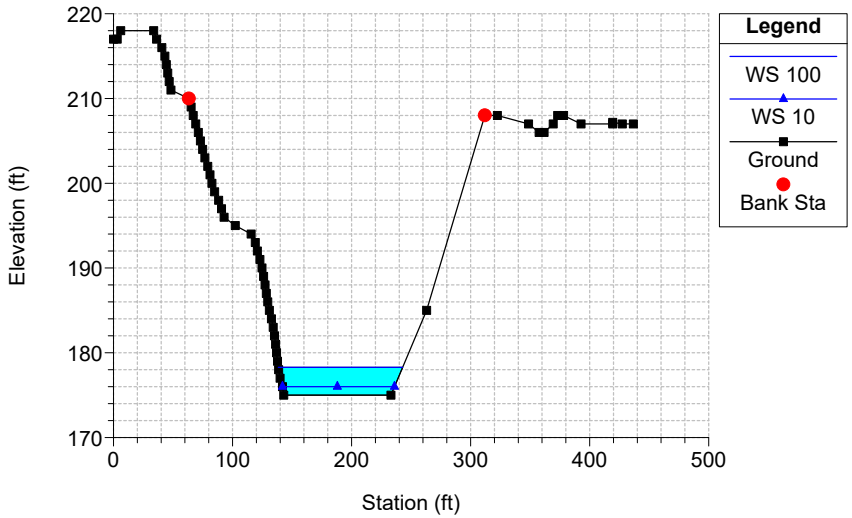
CompassBESS Plan: 1) Ex 9/24/2025
RS = 29



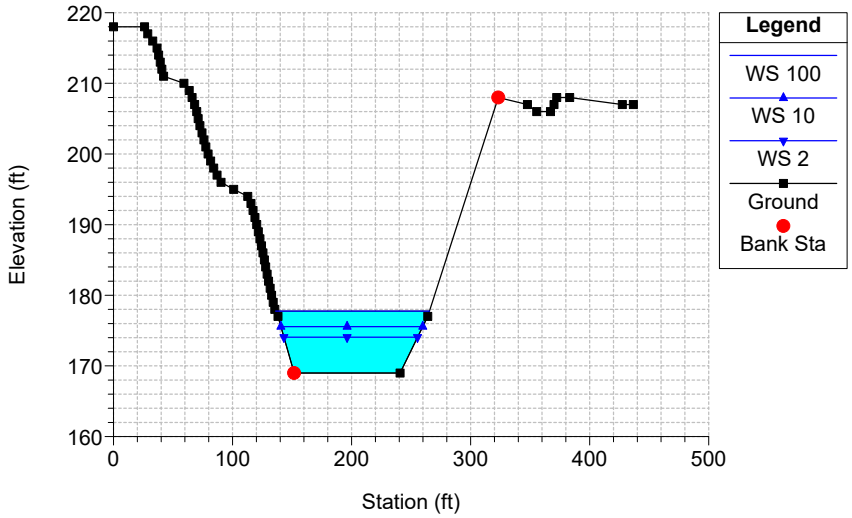
CompassBESS Plan: 1) Ex 9/24/2025
RS = 28



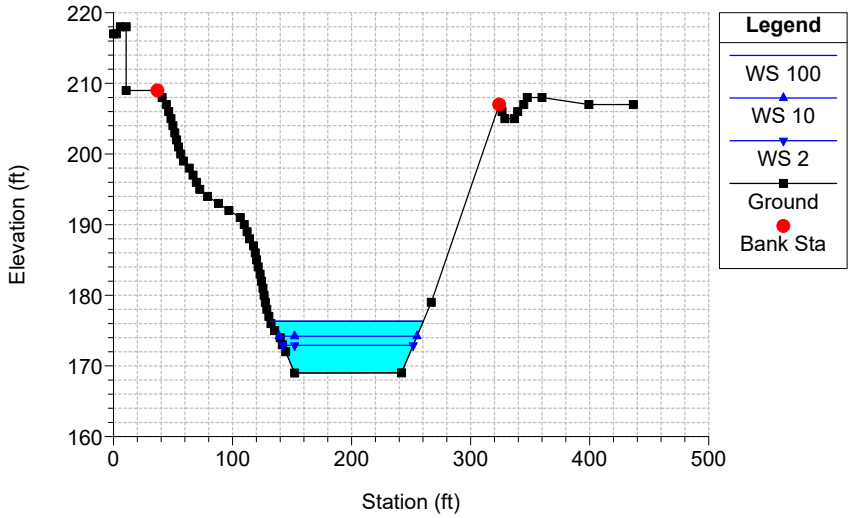
CompassBESS Plan: 1) Ex 9/24/2025
RS = 27



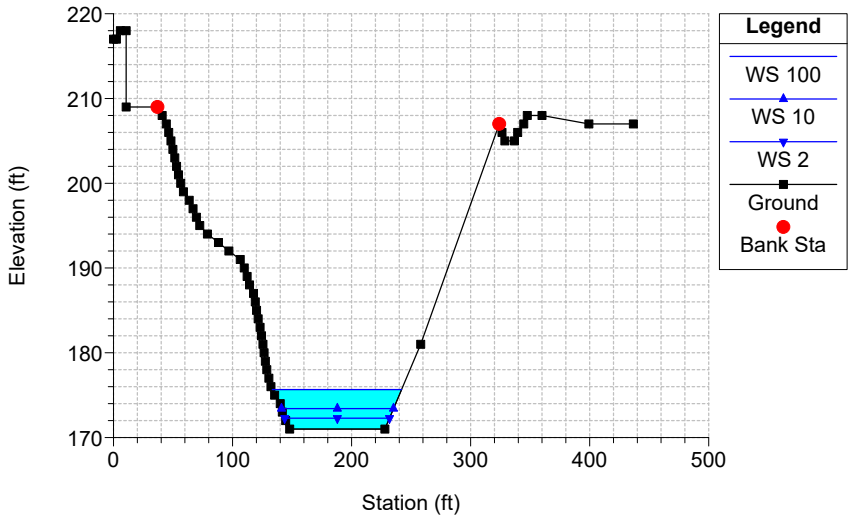
CompassBESS Plan: 1) Ex 9/24/2025
RS = 26



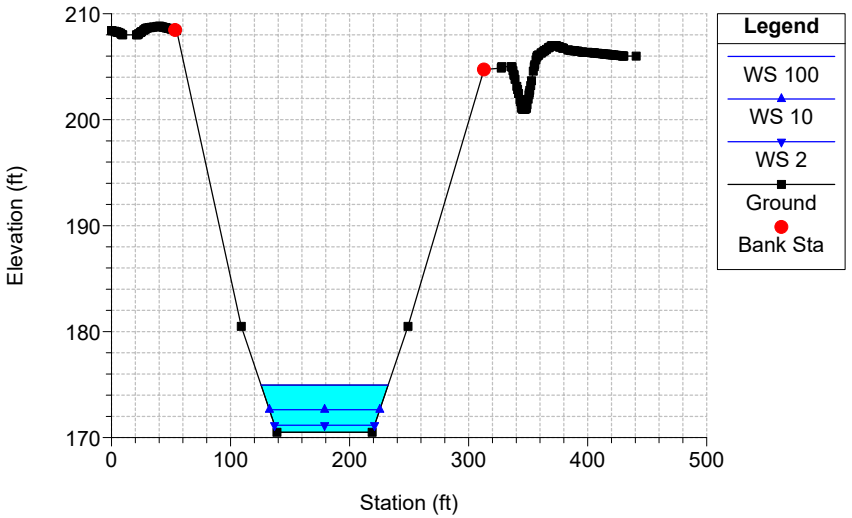
CompassBESS Plan: 1) Ex 9/24/2025
RS = 25



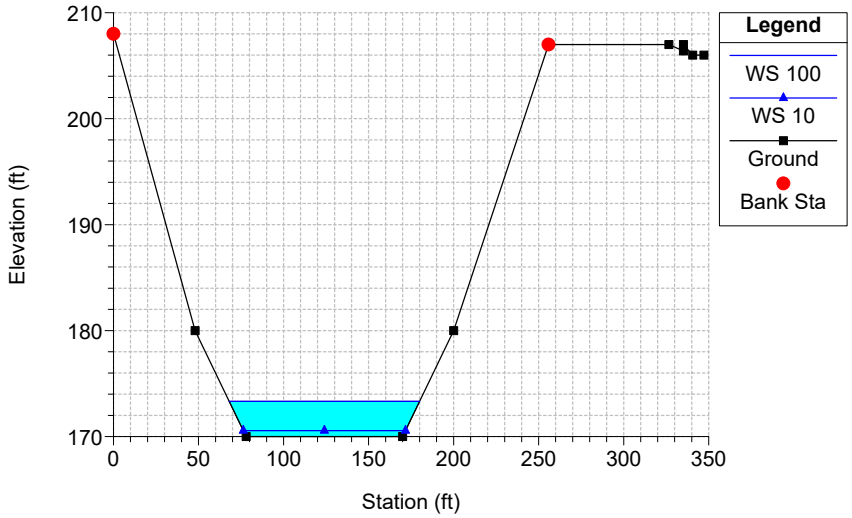
CompassBESS Plan: 1) Ex 9/24/2025
RS = 24



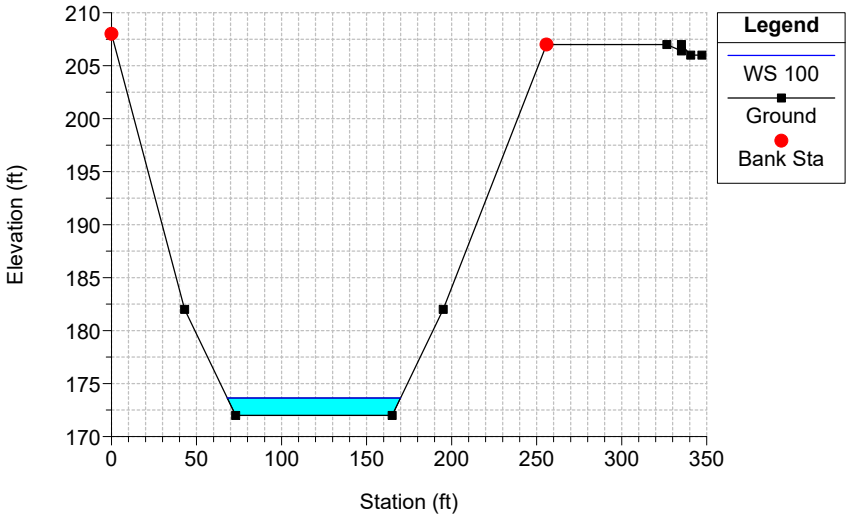
CompassBESS Plan: 1) Ex 9/24/2025
RS = 23



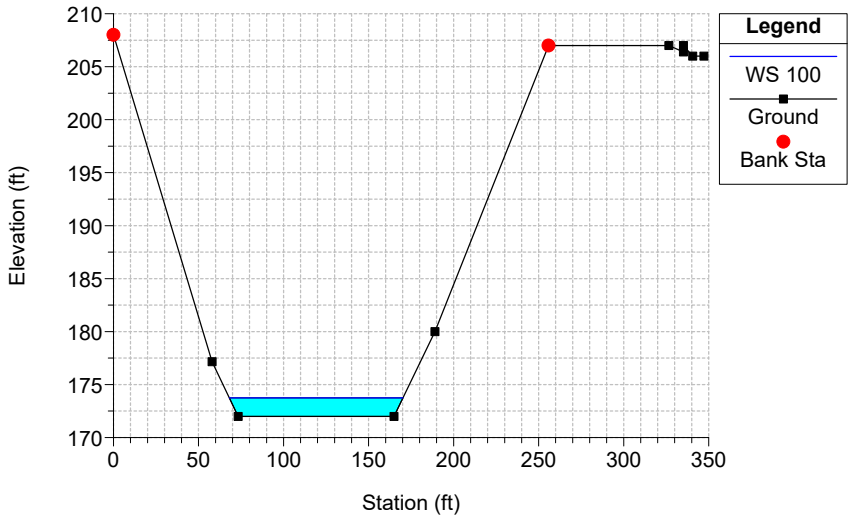
CompassBESS Plan: 1) Ex 9/24/2025
RS = 22



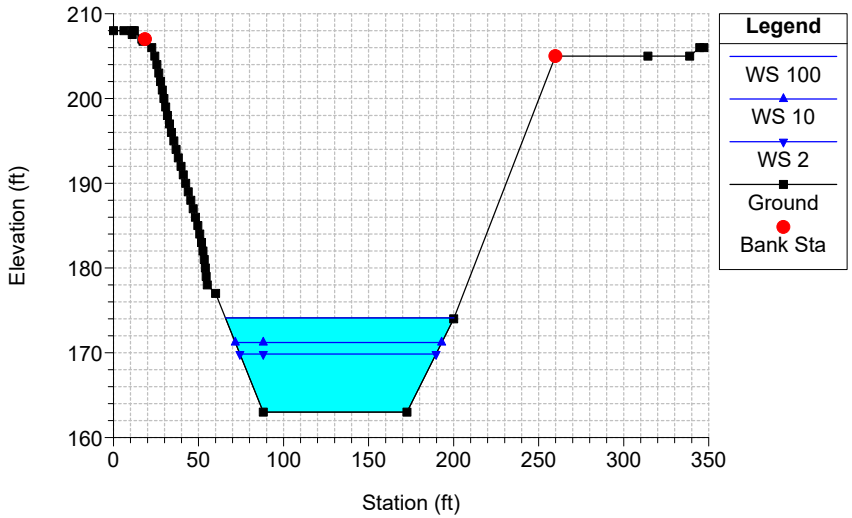
CompassBESS Plan: 1) Ex 9/24/2025
RS = 21



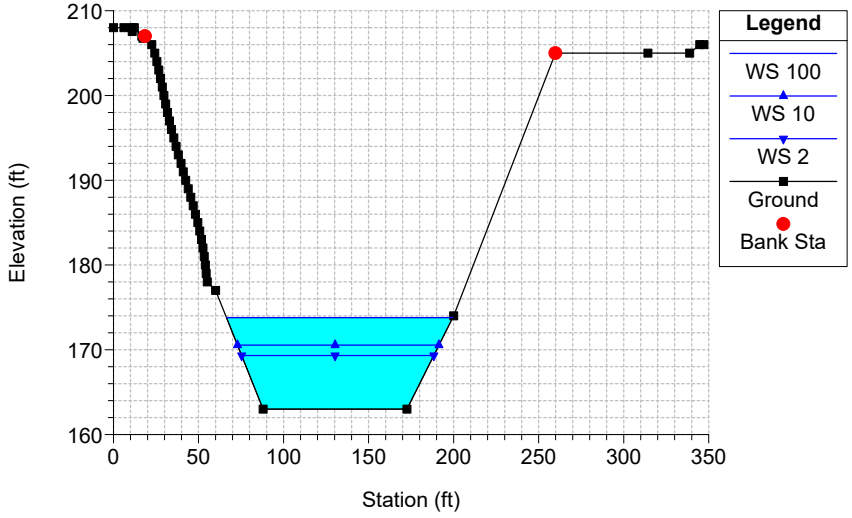
CompassBESS Plan: 1) Ex 9/24/2025
RS = 20



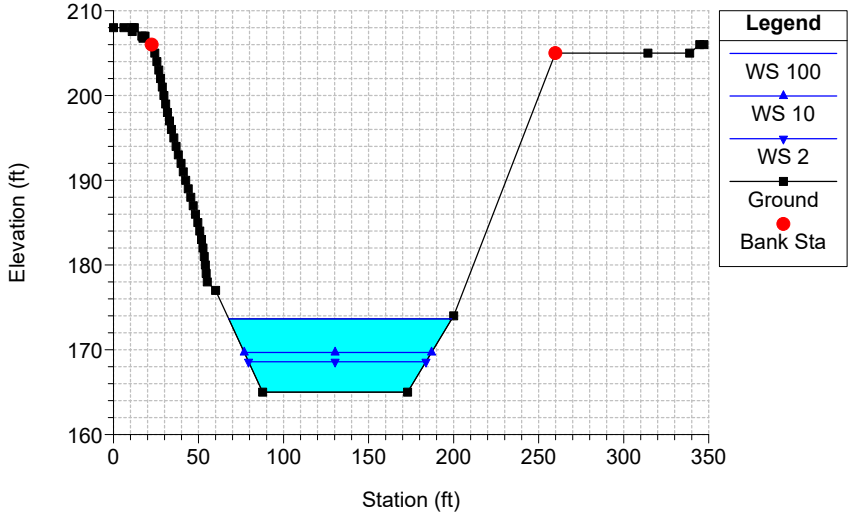
CompassBESS Plan: 1) Ex 9/24/2025
RS = 19



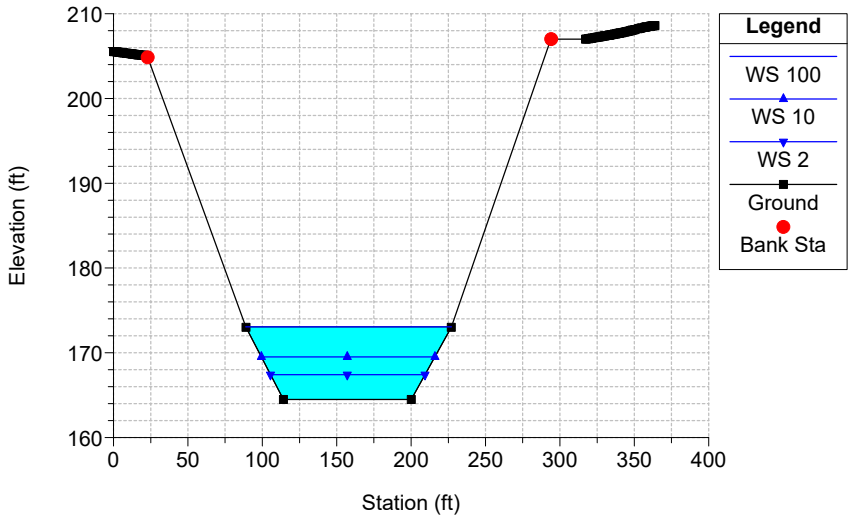
CompassBESS Plan: 1) Ex 9/24/2025
RS = 18



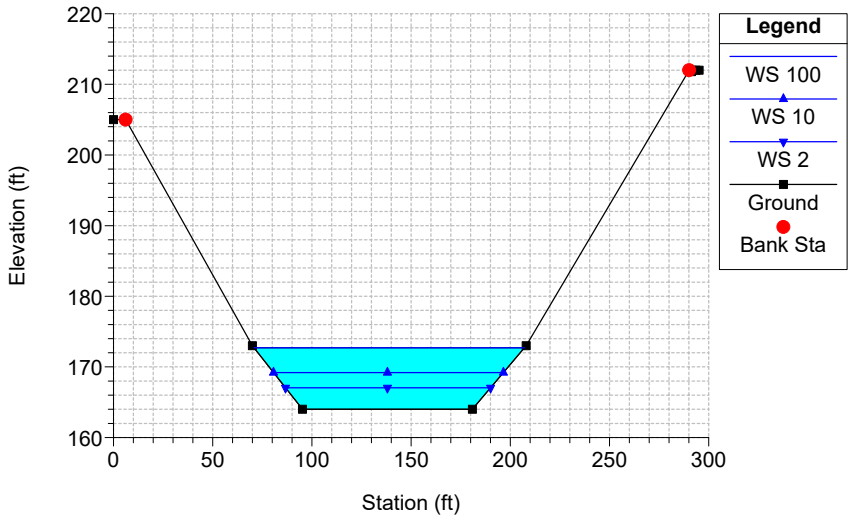
CompassBESS Plan: 1) Ex 9/24/2025
RS = 17



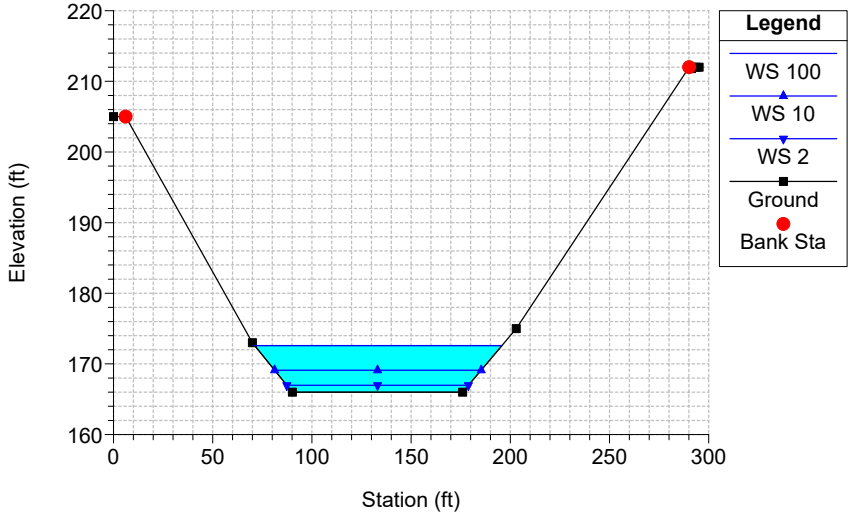
CompassBESS Plan: 1) Ex 9/24/2025
RS = 16



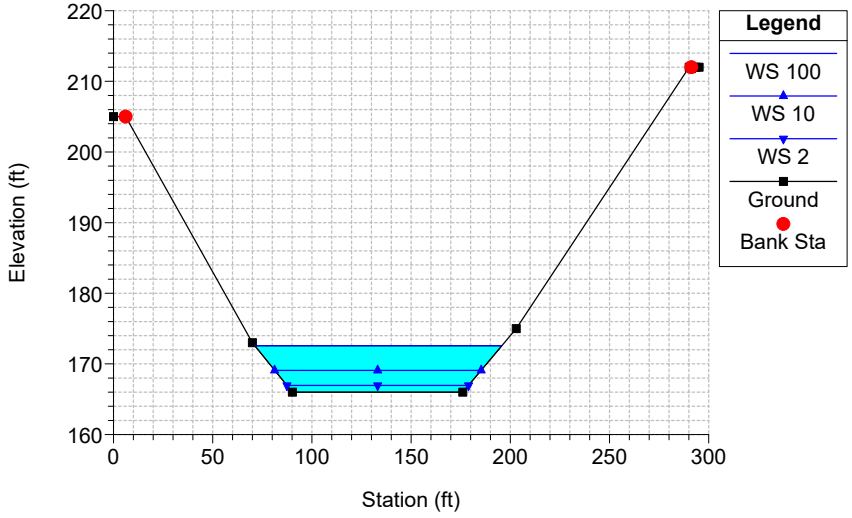
CompassBESS Plan: 1) Ex 9/24/2025
RS = 15



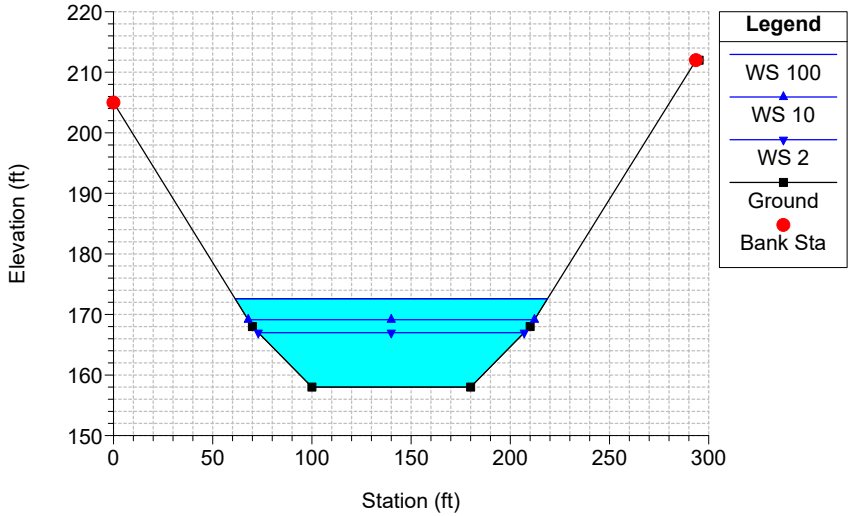
CompassBESS Plan: 1) Ex 9/24/2025
RS = 14



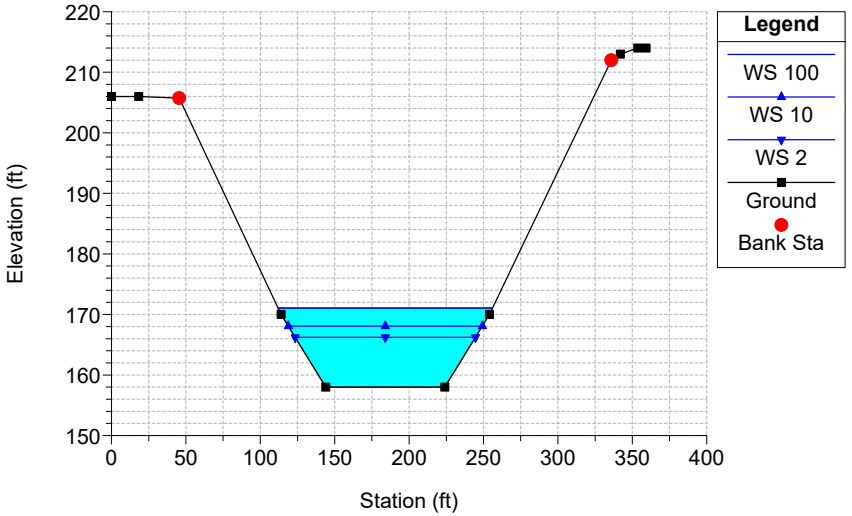
CompassBESS Plan: 1) Ex 9/24/2025
RS = 13



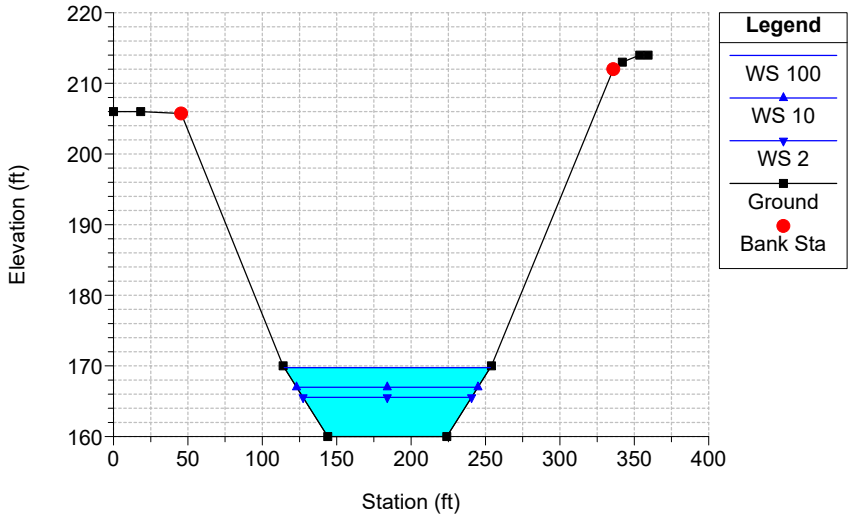
CompassBESS Plan: 1) Ex 9/24/2025
RS = 12



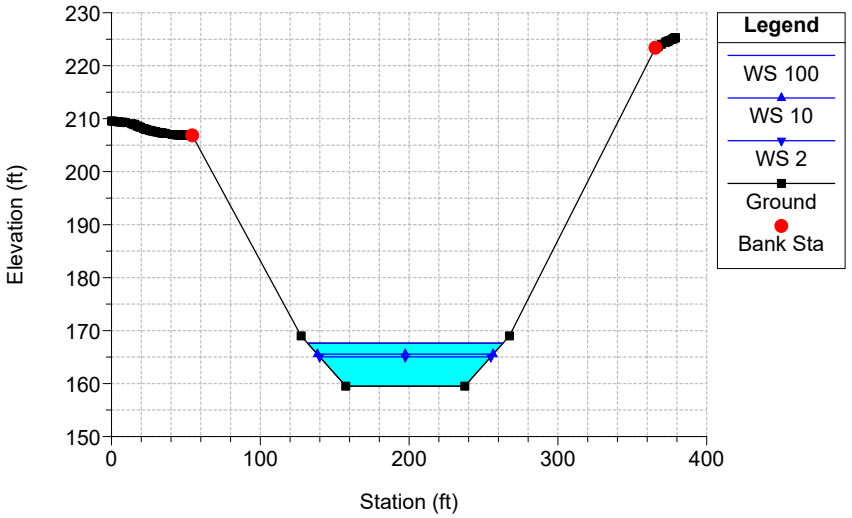
CompassBESS Plan: 1) Ex 9/24/2025
RS = 11



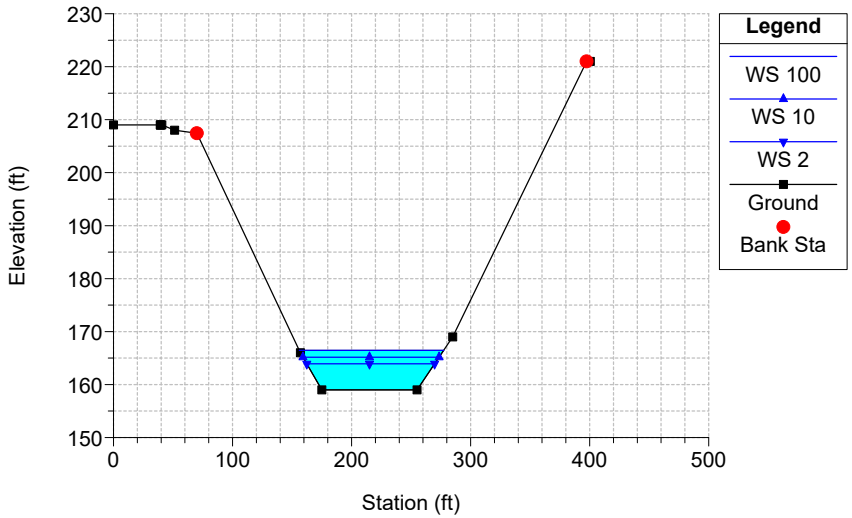
CompassBESS Plan: 1) Ex 9/24/2025
RS = 10



CompassBESS Plan: 1) Ex 9/24/2025
RS = 9



CompassBESS Plan: 1) Ex 9/24/2025
RS = 8



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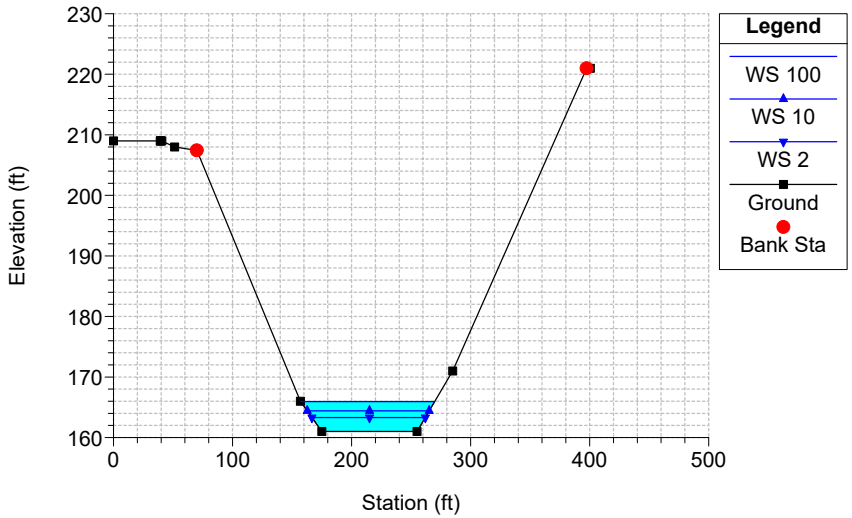
RS = 7



CompassBESS Plan: 1) Ex 9/24/2025
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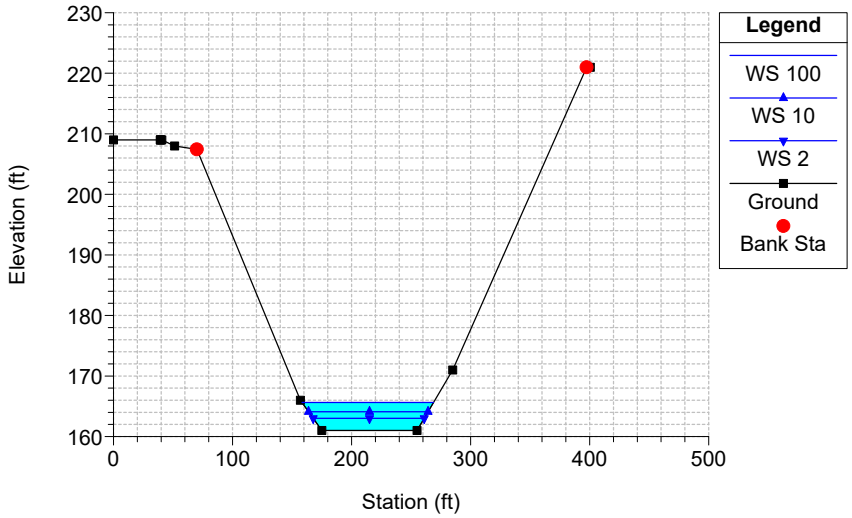

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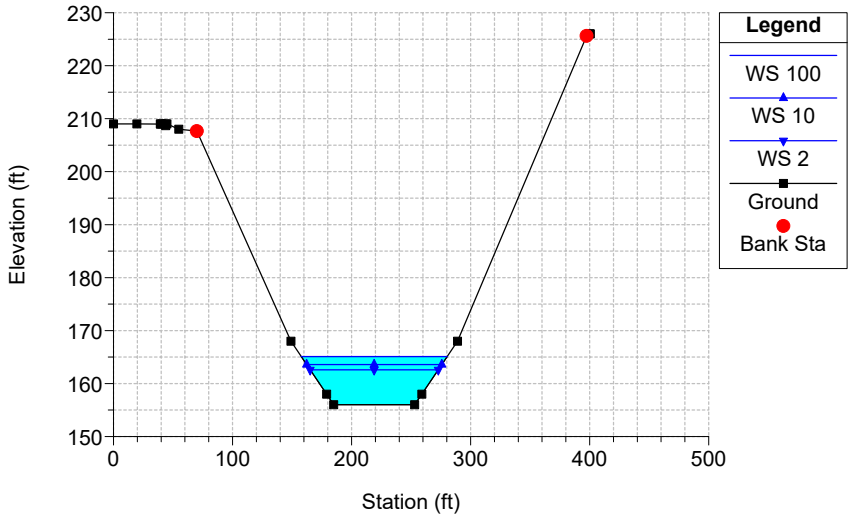

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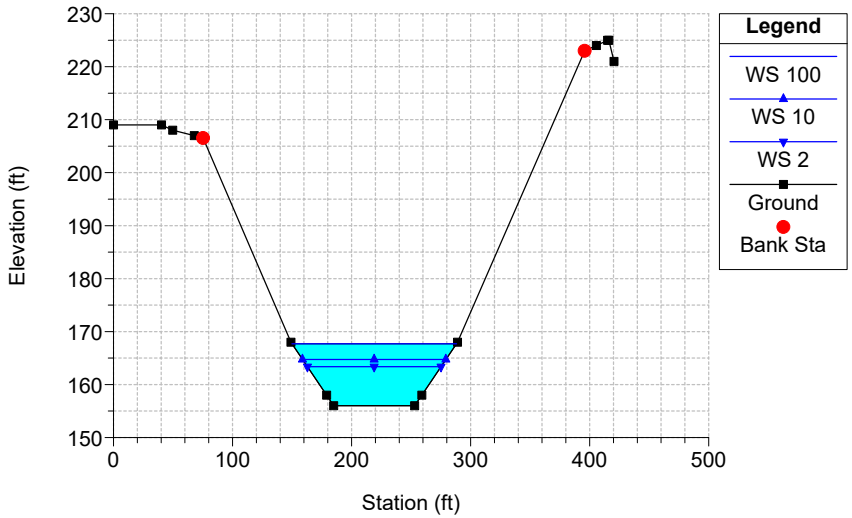

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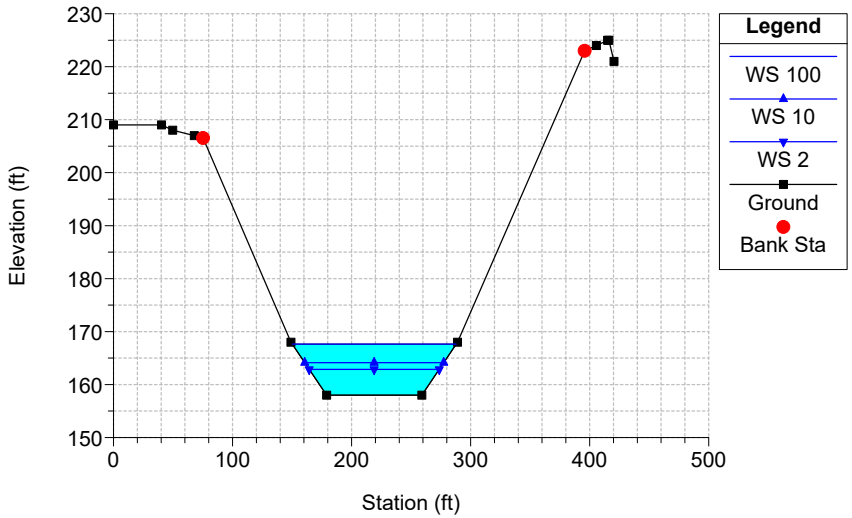
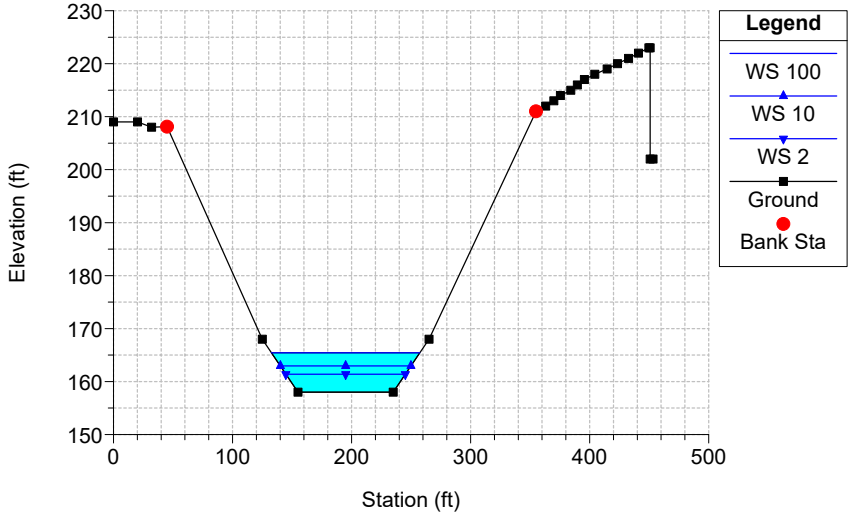
RS = 3



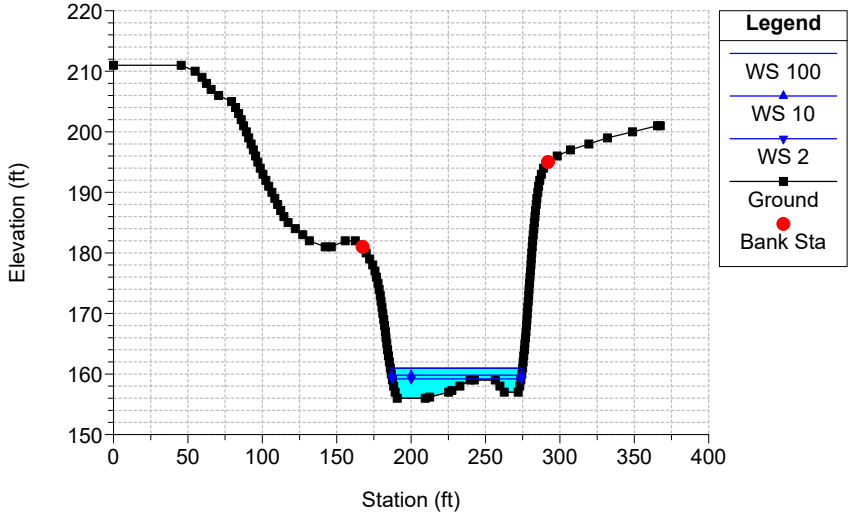
CompassBESS Plan: 1) Ex 9/24/2025

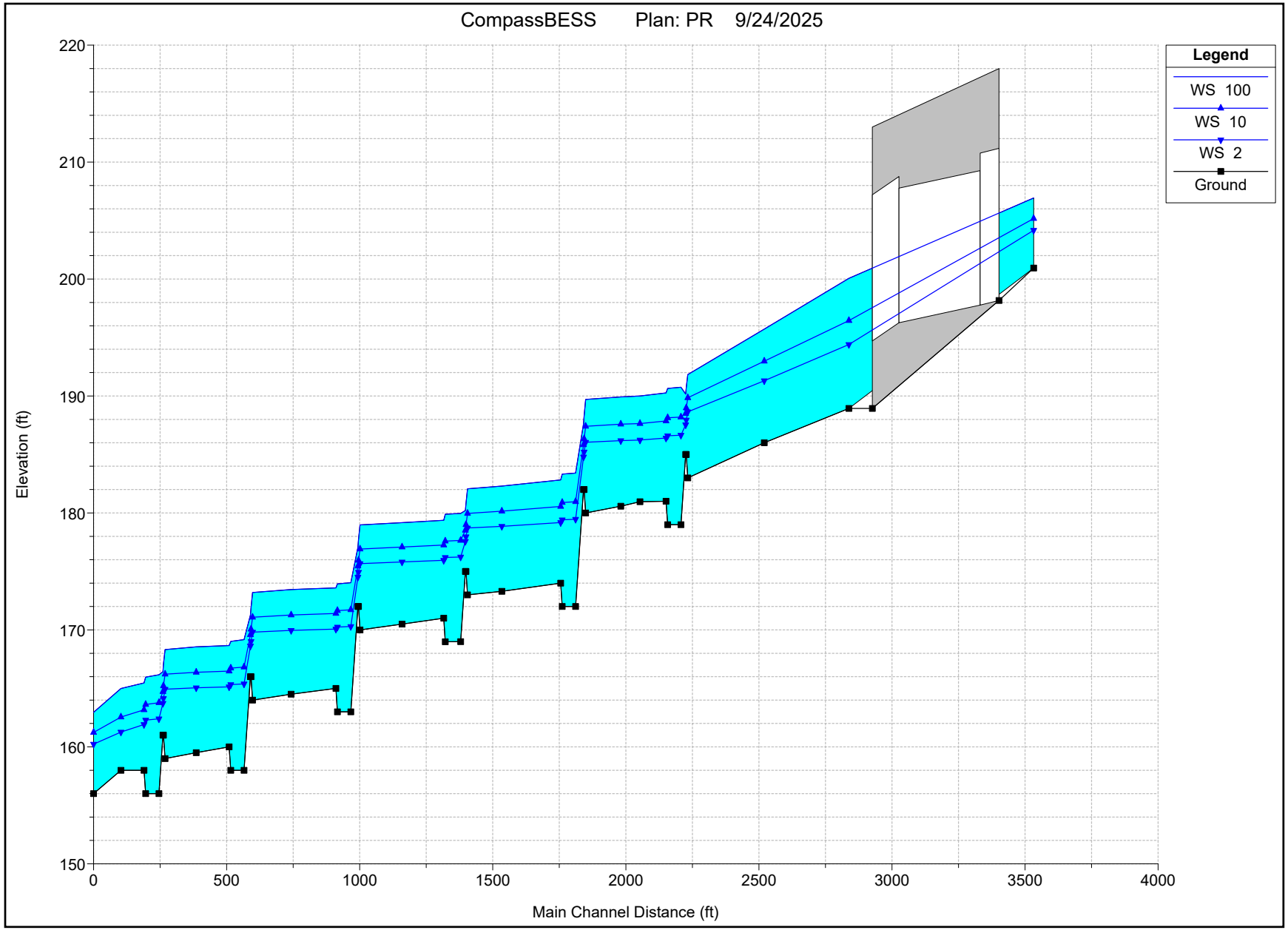
RS = 2



CompassBESS Plan: 1) Ex 9/24/2025

RS = 1




CompassBESS Plan: PR 9/24/2025
Legend
WS 100
WS 10
WS 2
Ground
Elevation (ft)
Main Channel Distance (ft)
220
210
200
190
180
170
160
150
0
500
1000
1500
2000
2500
3000
3500
4000

HEC-RAS Plan: PR River: OSO_CREEK Reach: OSO_CREEK-DS-0

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Max Chl Dpth	Shear Chan
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(lb/sq ft)
OSO_CREEK-DS-0	48	100	6500.00	200.94	206.94	211.74	225.06	0.012241	34.14	190.37	35.64	2.60	6.00	3.39
OSO_CREEK-DS-0	48	10	3558.00	200.94	205.17	208.37	217.17	0.012228	27.79	128.05	34.86	2.56	4.23	2.49
OSO_CREEK-DS-0	48	2	2178.00	200.94	204.17	206.44	212.63	0.012230	23.33	93.36	34.42	2.50	3.23	1.91
OSO_CREEK-DS-0	47		Culvert											
OSO_CREEK-DS-0	46	100	6500.00	188.94	200.06	200.06	205.29	0.001973	18.35	354.31	33.93	1.00	11.12	0.85
OSO_CREEK-DS-0	46	10	3558.00	188.94	196.45	196.45	200.05	0.001928	15.22	233.75	32.79	1.00	7.51	0.64
OSO_CREEK-DS-0	46	2	2178.00	188.94	194.41	194.41	197.03	0.001924	13.00	167.54	32.13	1.00	5.47	0.50
OSO_CREEK-DS-0	45	100	6500.00	186.00	195.71	195.71	199.15	0.021242	14.87	436.99	64.27	1.01	9.71	8.44
OSO_CREEK-DS-0	45	10	3558.00	186.00	192.98	192.98	195.56	0.022762	12.88	276.20	53.69	1.00	6.98	6.92
OSO_CREEK-DS-0	45	2	2178.00	186.00	191.30	191.30	193.32	0.024317	11.38	191.33	47.53	1.00	5.30	5.84
OSO_CREEK-DS-0	44	100	6500.00	183.00	191.83	188.62	192.70	0.004690	7.50	866.81	117.90	0.49	8.83	2.07
OSO_CREEK-DS-0	44	10	3558.00	183.00	189.85	186.82	190.33	0.003433	5.54	641.80	109.32	0.40	6.85	1.22
OSO_CREEK-DS-0	44	2	2178.00	183.00	188.64	185.78	188.92	0.002494	4.24	513.80	103.25	0.34	5.64	0.75
OSO_CREEK-DS-0	43	100	6500.00	185.00	190.72	190.16	192.56	0.015870	10.87	597.92	118.05	0.85	5.72	4.90
OSO_CREEK-DS-0	43	10	3558.00	185.00	188.97	188.50	190.21	0.016493	8.92	398.76	109.50	0.82	3.97	3.68
OSO_CREEK-DS-0	43	2	2178.00	185.00	187.95	187.54	188.83	0.016906	7.54	289.02	104.49	0.80	2.95	2.87
OSO_CREEK-DS-0	42	100	6500.00	185.00	190.17	190.17	192.47	0.022574	12.17	533.98	116.12	1.00	5.17	6.34
OSO_CREEK-DS-0	42	10	3558.00	185.00	188.50	188.50	190.13	0.025469	10.24	347.58	107.77	1.00	3.50	5.04
OSO_CREEK-DS-0	42	2	2178.00	185.00	187.54	187.54	188.76	0.027998	8.84	246.44	102.50	1.00	2.54	4.14
OSO_CREEK-DS-0	41	100	6500.00	179.00	190.75	184.50	191.17	0.001617	5.23	1241.95	128.67	0.30	11.75	0.93
OSO_CREEK-DS-0	41	10	3558.00	179.00	188.20	182.74	188.43	0.001162	3.85	923.92	119.20	0.24	9.20	0.54
OSO_CREEK-DS-0	41	2	2178.00	179.00	186.65	181.72	186.78	0.000816	2.92	744.99	111.85	0.20	7.65	0.33
OSO_CREEK-DS-0	40	100	6500.00	179.00	190.65	184.58	191.09	0.001679	5.32	1221.17	127.35	0.30	11.65	0.96
OSO_CREEK-DS-0	40	10	3558.00	179.00	188.13	182.80	188.37	0.001200	3.90	911.35	118.57	0.25	9.13	0.55
OSO_CREEK-DS-0	40	2	2178.00	179.00	186.60	181.77	186.74	0.000855	2.97	734.34	112.61	0.20	7.60	0.34
OSO_CREEK-DS-0	39	100	6500.00	181.00	190.26	186.64	191.04	0.003960	7.09	917.36	119.35	0.45	9.26	1.82
OSO_CREEK-DS-0	39	10	3558.00	181.00	187.86	184.83	188.34	0.003397	5.53	643.36	108.93	0.40	6.86	1.21
OSO_CREEK-DS-0	39	2	2178.00	181.00	186.41	183.78	186.71	0.002899	4.45	489.61	102.47	0.36	5.41	0.84
OSO_CREEK-DS-0	38	100	6500.00	180.96	190.00	186.54	190.81	0.001509	7.24	898.32	118.52	0.46	9.04	0.69
OSO_CREEK-DS-0	38	10	3558.00	180.96	187.65	184.76	188.14	0.001296	5.64	630.81	108.72	0.41	6.69	0.46
OSO_CREEK-DS-0	38	2	2178.00	180.96	186.23	183.73	186.55	0.001099	4.53	481.30	102.53	0.37	5.27	0.31
OSO_CREEK-DS-0	37	100	6500.00	180.58	189.92	186.20	190.70	0.001388	7.08	918.32	116.67	0.44	9.34	0.65
OSO_CREEK-DS-0	37	10	3558.00	180.58	187.59	184.40	188.04	0.001127	5.42	656.87	107.51	0.39	7.01	0.41
OSO_CREEK-DS-0	37	2	2178.00	180.58	186.18	183.35	186.47	0.000909	4.27	509.80	102.00	0.34	5.60	0.27
OSO_CREEK-DS-0	36	100	6500.00	180.00	189.70	185.62	190.40	0.003335	6.72	967.83	119.47	0.42	9.70	1.61
OSO_CREEK-DS-0	36	10	3558.00	180.00	187.41	183.82	187.81	0.002564	5.05	704.60	110.44	0.35	7.41	0.98

HEC-RAS Plan: PR River: OSO_CREEK Reach: OSO_CREEK-DS-0 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Max Chl Dpth	Shear Chan
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(lb/sq ft)
OSO_CREEK-DS-0	36	2	2178.00	180.00	186.05	182.78	186.28	0.001948	3.91	557.30	104.94	0.30	6.05	0.63
OSO_CREEK-DS-0	35	100	6500.00	182.00	188.28	187.62	190.24	0.015397	11.23	578.65	104.86	0.84	6.28	5.11
OSO_CREEK-DS-0	35	10	3558.00	182.00	186.34	185.82	187.68	0.016359	9.30	382.60	97.13	0.83	4.34	3.91
OSO_CREEK-DS-0	35	2	2178.00	182.00	185.22	184.78	186.18	0.016917	7.89	276.15	92.51	0.80	3.22	3.08
OSO_CREEK-DS-0	34	100	6500.00	182.00	187.63	187.63	190.15	0.022528	12.73	510.51	102.28	1.00	5.63	6.78
OSO_CREEK-DS-0	34	10	3558.00	182.00	185.83	185.83	187.60	0.025040	10.67	333.53	95.06	1.00	3.83	5.34
OSO_CREEK-DS-0	34	2	2178.00	182.00	184.79	184.79	186.11	0.027563	9.21	236.47	90.71	1.01	2.79	4.39
OSO_CREEK-DS-0	33	100	6500.00	172.00	183.42	177.60	183.89	0.001862	5.51	1179.79	126.28	0.32	11.42	1.04
OSO_CREEK-DS-0	33	10	3558.00	172.00	180.96	175.82	181.22	0.001325	4.04	880.51	117.12	0.26	8.96	0.60
OSO_CREEK-DS-0	33	2	2178.00	172.00	179.46	174.77	179.61	0.000937	3.07	709.85	110.46	0.21	7.46	0.36
OSO_CREEK-DS-0	32	100	6500.00	172.00	183.32	177.59	183.79	0.001900	5.54	1172.74	126.49	0.32	11.32	1.05
OSO_CREEK-DS-0	32	10	3558.00	172.00	180.89	175.80	181.15	0.001342	4.06	877.19	117.26	0.26	8.89	0.60
OSO_CREEK-DS-0	32	2	2178.00	172.00	179.42	174.77	179.56	0.000947	3.07	708.43	111.06	0.21	7.42	0.36
OSO_CREEK-DS-0	31	100	6500.00	174.00	182.83	179.72	183.73	0.004873	7.64	851.02	116.14	0.50	8.83	2.15
OSO_CREEK-DS-0	31	10	3558.00	174.00	180.56	177.92	181.11	0.004160	5.94	598.62	106.49	0.44	6.56	1.42
OSO_CREEK-DS-0	31	2	2178.00	174.00	179.18	176.85	179.53	0.003560	4.78	455.65	100.51	0.40	5.18	0.98
OSO_CREEK-DS-0	30	100	6500.00	173.30	182.30	178.93	183.14	0.001599	7.38	880.85	116.87	0.47	9.00	0.72
OSO_CREEK-DS-0	30	10	3558.00	173.30	180.15	177.13	180.63	0.001233	5.56	640.08	107.48	0.40	6.85	0.44
OSO_CREEK-DS-0	30	2	2178.00	173.30	178.86	176.09	179.15	0.000947	4.32	504.73	102.22	0.34	5.56	0.28
OSO_CREEK-DS-0	29	100	6500.00	173.00	182.06	178.46	182.81	0.003792	6.95	935.84	122.02	0.44	9.06	1.75
OSO_CREEK-DS-0	29	10	3558.00	173.00	179.96	176.72	180.38	0.002851	5.17	688.45	113.87	0.37	6.96	1.05
OSO_CREEK-DS-0	29	2	2178.00	173.00	178.71	175.71	178.96	0.002128	3.97	549.09	109.13	0.31	5.71	0.65
OSO_CREEK-DS-0	28	100	6500.00	175.00	180.80	180.21	182.66	0.015518	10.93	594.91	114.11	0.84	5.80	4.91
OSO_CREEK-DS-0	28	10	3558.00	175.00	179.00	178.53	180.26	0.016516	9.00	395.38	107.25	0.83	4.00	3.73
OSO_CREEK-DS-0	28	2	2178.00	175.00	177.97	177.57	178.86	0.017123	7.61	286.30	103.20	0.81	2.97	2.92
OSO_CREEK-DS-0	27	100	6500.00	175.00	180.21	180.21	182.57	0.022476	12.32	527.45	111.81	1.00	5.21	6.45
OSO_CREEK-DS-0	27	10	3558.00	175.00	178.53	178.53	180.18	0.025376	10.32	344.84	105.40	1.01	3.53	5.10
OSO_CREEK-DS-0	27	2	2178.00	175.00	177.57	177.57	178.79	0.027900	8.87	245.50	101.51	1.01	2.57	4.16
OSO_CREEK-DS-0	26	100	6500.00	169.00	179.96	174.26	180.39	0.001613	5.37	1248.87	136.76	0.30	10.96	0.96
OSO_CREEK-DS-0	26	10	3558.00	169.00	177.65	172.56	177.88	0.001133	3.88	941.96	128.84	0.25	8.65	0.54
OSO_CREEK-DS-0	26	2	2178.00	169.00	176.24	171.59	176.36	0.000798	2.92	764.18	122.29	0.20	7.24	0.32
OSO_CREEK-DS-0	25	100	6500.00	168.99	179.89	174.18	180.29	0.001628	5.08	1279.80	142.18	0.30	10.90	0.89
OSO_CREEK-DS-0	25	10	3558.00	168.99	177.60	172.52	177.81	0.001153	3.70	962.82	134.00	0.24	8.61	0.50
OSO_CREEK-DS-0	25	2	2178.00	168.99	176.19	171.56	176.32	0.000819	2.80	779.06	128.04	0.20	7.20	0.30
OSO_CREEK-DS-0	24	100	6500.00	171.00	179.38	176.48	180.23	0.001749	7.42	875.92	125.97	0.50	8.38	0.74
OSO_CREEK-DS-0	24	10	3558.00	171.00	177.26	174.75	177.77	0.001499	5.75	618.25	116.73	0.44	6.26	0.49

HEC-RAS Plan: PR River: OSO_CREEK Reach: OSO_CREEK-DS-0 (Continued)

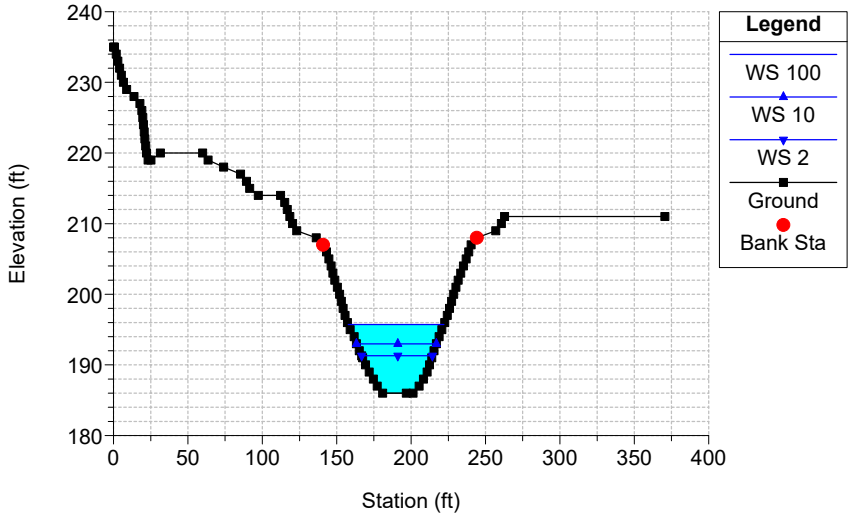
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Max Chl Dpth	Shear Chan
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(lb/sq ft)
OSO_CREEK-DS-0	24	2	2178.00	171.00	175.96	173.73	176.29	0.001290	4.63	470.49	110.44	0.40	4.96	0.34
OSO_CREEK-DS-0	23	100	6500.00	170.50	179.17	175.99	179.95	0.001575	7.07	919.50	132.04	0.47	8.67	0.67
OSO_CREEK-DS-0	23	10	3558.00	170.50	177.08	174.25	177.54	0.001265	5.42	656.47	119.49	0.41	6.58	0.43
OSO_CREEK-DS-0	23	2	2178.00	170.50	175.81	173.24	176.10	0.001006	4.27	509.65	111.87	0.35	5.31	0.28
OSO_CREEK-DS-0	22	100	6500.00	170.00	178.98	175.06	179.55	0.003032	6.09	1067.64	145.86	0.40	8.98	1.36
OSO_CREEK-DS-0	22	10	3558.00	170.00	176.91	173.45	177.23	0.002298	4.57	779.06	133.46	0.33	6.91	0.82
OSO_CREEK-DS-0	22	2	2178.00	170.00	175.67	172.51	175.86	0.001718	3.52	618.34	126.03	0.28	5.67	0.52
OSO_CREEK-DS-0	21	100	6500.00	172.00	177.73	177.06	179.41	0.014727	10.38	626.26	126.41	0.82	5.73	4.49
OSO_CREEK-DS-0	21	10	3558.00	172.00	175.95	175.45	177.12	0.015933	8.66	410.69	115.72	0.81	3.95	3.49
OSO_CREEK-DS-0	21	2	2178.00	172.00	174.93	174.51	175.78	0.016586	7.37	295.46	109.59	0.79	2.93	2.77
OSO_CREEK-DS-0	20	100	6500.00	172.00	177.07	177.07	179.31	0.022795	12.01	541.16	121.90	1.01	5.07	6.23
OSO_CREEK-DS-0	20	10	3558.00	172.00	175.46	175.46	177.04	0.025371	10.09	352.78	112.30	1.00	3.46	4.93
OSO_CREEK-DS-0	20	2	2178.00	172.00	174.52	174.52	175.70	0.028004	8.72	249.71	106.69	1.01	2.52	4.06
OSO_CREEK-DS-0	19	100	6500.00	163.00	174.04	168.41	174.49	0.001840	5.39	1206.61	134.15	0.32	11.04	1.00
OSO_CREEK-DS-0	19	10	3558.00	163.00	171.72	166.67	171.96	0.001271	3.92	907.51	123.74	0.26	8.72	0.56
OSO_CREEK-DS-0	19	2	2178.00	163.00	170.29	165.67	170.43	0.000889	2.96	735.51	117.31	0.21	7.29	0.34
OSO_CREEK-DS-0	18	100	6500.00	163.00	173.94	168.40	174.40	0.001897	5.44	1193.96	133.73	0.32	10.94	1.02
OSO_CREEK-DS-0	18	10	3558.00	163.00	171.65	166.67	171.90	0.001302	3.95	900.19	123.47	0.26	8.65	0.58
OSO_CREEK-DS-0	18	2	2178.00	163.00	170.25	165.67	170.38	0.000906	2.98	731.09	117.15	0.21	7.25	0.34
OSO_CREEK-DS-0	17	100	6500.00	165.00	173.60	170.32	174.36	0.001511	7.00	928.98	130.93	0.46	8.60	0.65
OSO_CREEK-DS-0	17	10	3558.00	165.00	171.41	168.62	171.87	0.001274	5.43	655.13	119.29	0.41	6.41	0.43
OSO_CREEK-DS-0	17	2	2178.00	165.00	170.07	167.64	170.36	0.001076	4.35	500.18	112.16	0.36	5.07	0.29
OSO_CREEK-DS-0	16	100	6500.00	164.50	173.46	169.76	174.09	0.001221	6.40	1015.41	139.84	0.42	8.96	0.54
OSO_CREEK-DS-0	16	10	3558.00	164.50	171.28	168.08	171.65	0.000996	4.92	723.37	127.46	0.36	6.78	0.35
OSO_CREEK-DS-0	16	2	2178.00	164.50	169.96	167.12	170.19	0.000799	3.89	560.31	119.38	0.32	5.46	0.23
OSO_CREEK-DS-0	15	100	6500.00	164.00	173.20	169.29	173.82	0.003164	6.28	1034.48	138.83	0.41	9.20	1.44
OSO_CREEK-DS-0	15	10	3558.00	164.00	171.08	167.60	171.43	0.002416	4.73	752.48	126.85	0.34	7.08	0.88
OSO_CREEK-DS-0	15	2	2178.00	164.00	169.81	166.63	170.01	0.001818	3.66	595.40	119.42	0.29	5.81	0.56
OSO_CREEK-DS-0	14	100	6500.00	166.00	171.86	171.27	173.66	0.015602	10.77	603.70	120.27	0.85	5.86	4.81
OSO_CREEK-DS-0	14	10	3558.00	166.00	170.06	169.60	171.31	0.016698	8.97	396.49	109.66	0.83	4.06	3.72
OSO_CREEK-DS-0	14	2	2178.00	166.00	169.01	168.63	169.92	0.017329	7.64	285.13	103.51	0.81	3.01	2.95
OSO_CREEK-DS-0	13	100	6500.00	166.00	171.26	171.26	173.57	0.022616	12.18	533.57	116.82	1.00	5.26	6.35
OSO_CREEK-DS-0	13	10	3558.00	166.00	169.59	169.59	171.23	0.025287	10.27	346.52	107.01	1.01	3.59	5.06
OSO_CREEK-DS-0	13	2	2178.00	166.00	168.62	168.62	169.85	0.027703	8.87	245.48	101.31	1.00	2.62	4.15
OSO_CREEK-DS-0	12	100	6500.00	158.00	169.30	163.47	169.70	0.001635	5.06	1285.03	144.93	0.30	11.30	0.88
OSO_CREEK-DS-0	12	10	3558.00	158.00	166.88	161.74	167.10	0.001203	3.76	947.22	133.29	0.25	8.88	0.52

HEC-RAS Plan: PR River: OSO_CREEK Reach: OSO_CREEK-DS-0 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Max Chl Dpth	Shear Chan
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(lb/sq ft)
OSO_CREEK-DS-0	12	2	2178.00	158.00	165.41	160.74	165.54	0.000865	2.88	757.34	124.45	0.21	7.41	0.32
OSO_CREEK-DS-0	11	100	6500.00	158.00	169.15	163.53	169.60	0.001880	5.40	1202.71	135.75	0.32	11.15	1.01
OSO_CREEK-DS-0	11	10	3558.00	158.00	166.79	161.77	167.04	0.001322	3.97	896.53	123.96	0.26	8.79	0.58
OSO_CREEK-DS-0	11	2	2178.00	158.00	165.35	160.75	165.49	0.000933	3.01	723.08	116.75	0.21	7.35	0.35
OSO_CREEK-DS-0	10	100	6500.00	160.00	168.82	165.48	169.56	0.001483	6.92	938.87	132.92	0.46	8.82	0.64
OSO_CREEK-DS-0	10	10	3558.00	160.00	166.54	163.76	167.01	0.001291	5.46	651.94	119.26	0.41	6.54	0.43
OSO_CREEK-DS-0	10	2	2178.00	160.00	165.17	162.74	165.47	0.001109	4.41	493.35	111.00	0.37	5.17	0.30
OSO_CREEK-DS-0	9	100	6500.00	159.50	168.72	164.95	169.37	0.001241	6.46	1005.81	138.22	0.42	9.22	0.55
OSO_CREEK-DS-0	9	10	3558.00	159.50	166.45	163.23	166.84	0.001028	5.02	708.64	123.90	0.37	6.95	0.36
OSO_CREEK-DS-0	9	2	2178.00	159.50	165.09	162.23	165.33	0.000835	3.99	545.39	115.28	0.32	5.59	0.24
OSO_CREEK-DS-0	8	100	6500.00	159.00	168.43	164.57	169.15	0.002936	7.19	1000.47	131.38	0.41	9.43	1.73
OSO_CREEK-DS-0	8	10	3558.00	159.00	166.27	162.79	166.67	0.002262	5.30	728.76	120.37	0.35	7.27	1.03
OSO_CREEK-DS-0	8	2	2178.00	159.00	164.96	161.76	165.19	0.001729	4.06	575.37	113.19	0.29	5.96	0.64
OSO_CREEK-DS-0	7	100	6500.00	161.00	167.12	166.52	169.00	0.013358	11.49	611.82	118.69	0.82	6.12	5.10
OSO_CREEK-DS-0	7	10	3558.00	161.00	165.24	164.76	166.55	0.014819	9.48	398.49	107.98	0.81	4.24	3.92
OSO_CREEK-DS-0	7	2	2178.00	161.00	164.15	163.75	165.10	0.015764	8.01	284.49	100.77	0.80	3.15	3.10
OSO_CREEK-DS-0	6	100	6500.00	161.00	166.52	166.52	168.91	0.019361	12.91	541.63	115.64	0.97	5.52	6.67
OSO_CREEK-DS-0	6	10	3558.00	161.00	164.76	164.76	166.48	0.022508	10.79	347.93	104.85	0.98	3.76	5.29
OSO_CREEK-DS-0	6	2	2178.00	161.00	163.75	163.75	165.03	0.025283	9.27	244.66	98.13	0.99	2.75	4.34
OSO_CREEK-DS-0	5	100	6500.00	156.00	166.05	162.07	166.81	0.002930	7.49	986.38	128.30	0.42	10.05	1.84
OSO_CREEK-DS-0	5	10	3558.00	156.00	163.73	160.17	164.16	0.002329	5.61	704.77	114.37	0.36	7.73	1.12
OSO_CREEK-DS-0	5	2	2178.00	156.00	162.37	159.05	162.63	0.001765	4.29	555.20	106.24	0.30	6.37	0.70
OSO_CREEK-DS-0	3.1	100	6500.00	156.00	165.86	162.07	166.65	0.003153	7.67	961.58	127.13	0.43	9.86	1.94
OSO_CREEK-DS-0	3.1	10	3558.00	156.00	163.59	160.17	164.04	0.002493	5.73	688.64	113.52	0.37	7.59	1.18
OSO_CREEK-DS-0	3.1	2	2178.00	156.00	162.27	159.05	162.54	0.001873	4.37	544.29	105.62	0.31	6.27	0.73
OSO_CREEK-DS-0	3	100	6500.00	158.00	165.29	163.55	166.58	0.002635	9.56	742.46	123.73	0.62	7.29	1.20
OSO_CREEK-DS-0	3	10	3558.00	158.00	163.10	161.78	163.98	0.002842	7.82	485.54	110.57	0.61	5.10	0.90
OSO_CREEK-DS-0	3	2	2178.00	158.00	161.88	160.76	162.49	0.002780	6.45	355.47	103.27	0.58	3.88	0.67
OSO_CREEK-DS-0	2	100	6500.00	158.00	164.74	163.55	166.29	0.003504	10.46	674.91	120.41	0.71	6.74	1.47
OSO_CREEK-DS-0	2	10	3558.00	158.00	162.39	161.78	163.63	0.004812	9.21	408.94	106.34	0.78	4.39	1.32
OSO_CREEK-DS-0	2	2	2178.00	158.00	161.18	160.76	162.13	0.005572	7.99	284.45	99.06	0.79	3.18	1.11
OSO_CREEK-DS-0	1	100	6500.00	156.00	162.95	162.91	165.65	0.008211	13.18	493.35	90.90	1.00	6.95	2.58
OSO_CREEK-DS-0	1	10	3558.00	156.00	161.23	161.11	162.95	0.008199	10.52	338.34	89.20	0.95	5.23	1.84
OSO_CREEK-DS-0	1	2	2178.00	156.00	160.23	160.06	161.41	0.008204	8.73	249.46	87.99	0.91	4.23	1.39

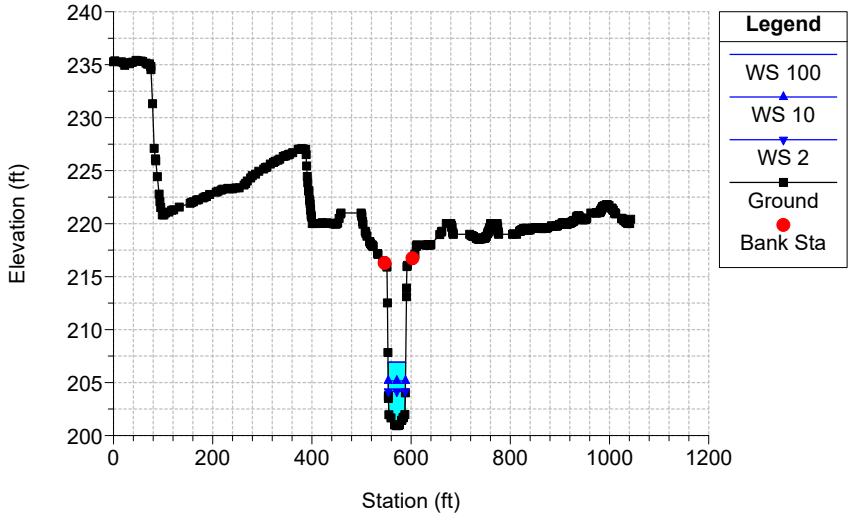
CompassBESS Plan: PR 9/24/2025

RS = 45



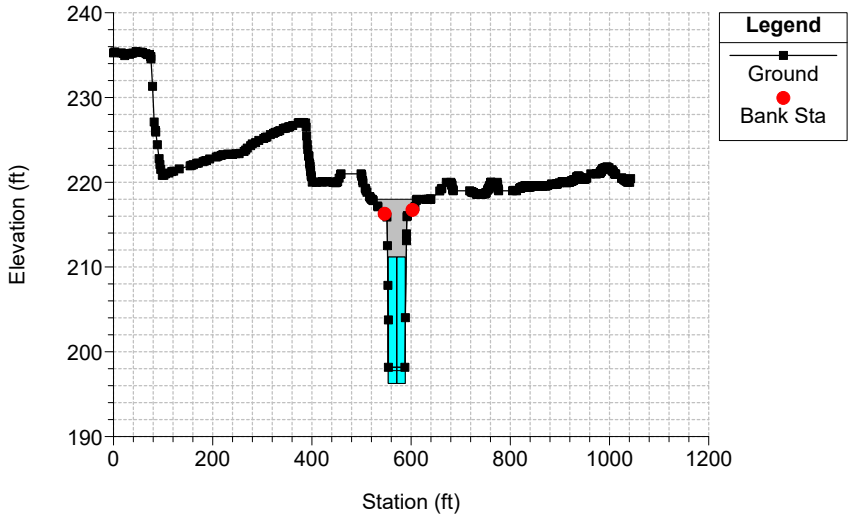
CompassBESS Plan: PR 9/24/2025

RS = 48



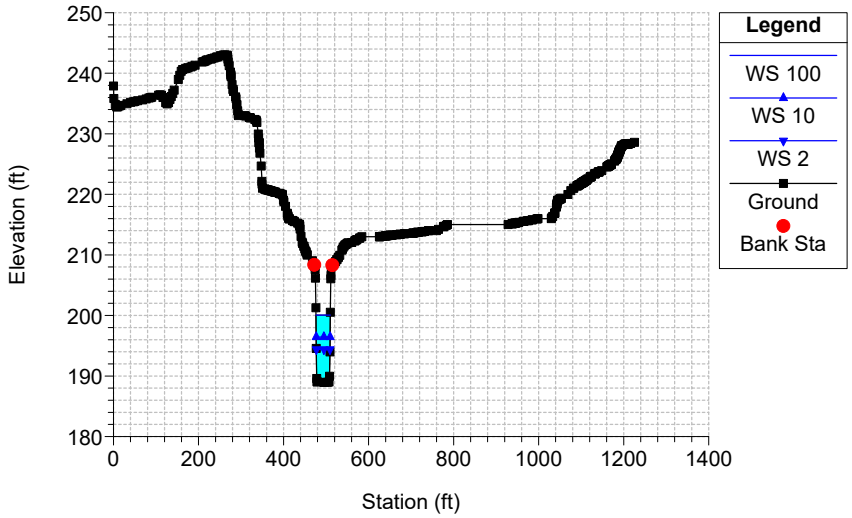
CompassBESS Plan: PR 9/24/2025

RS = 47 Culv

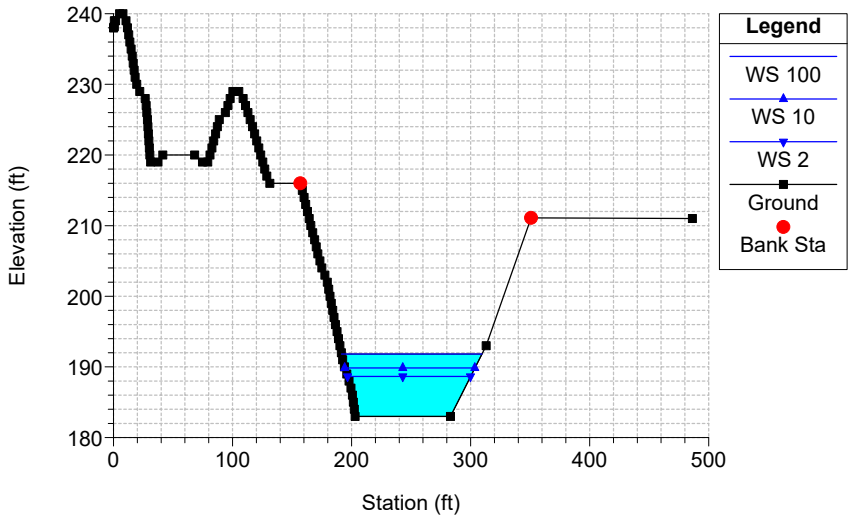


CompassBESS Plan: PR 9/24/2025

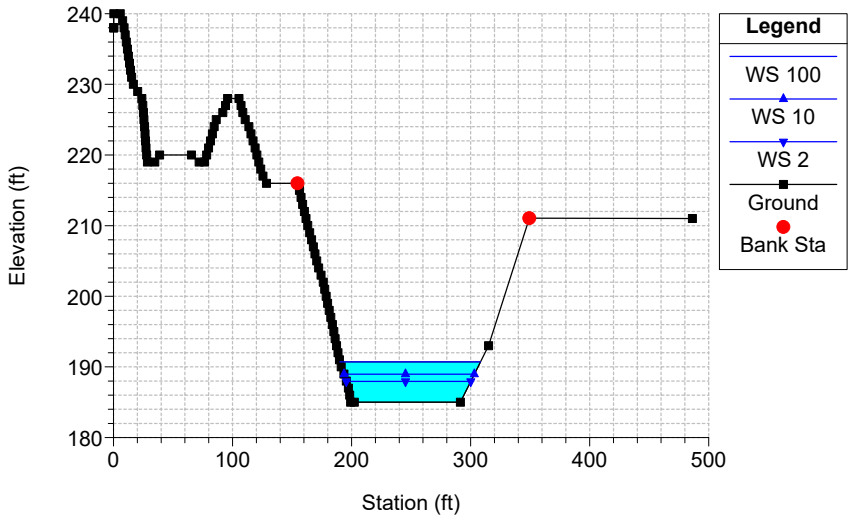
RS = 46



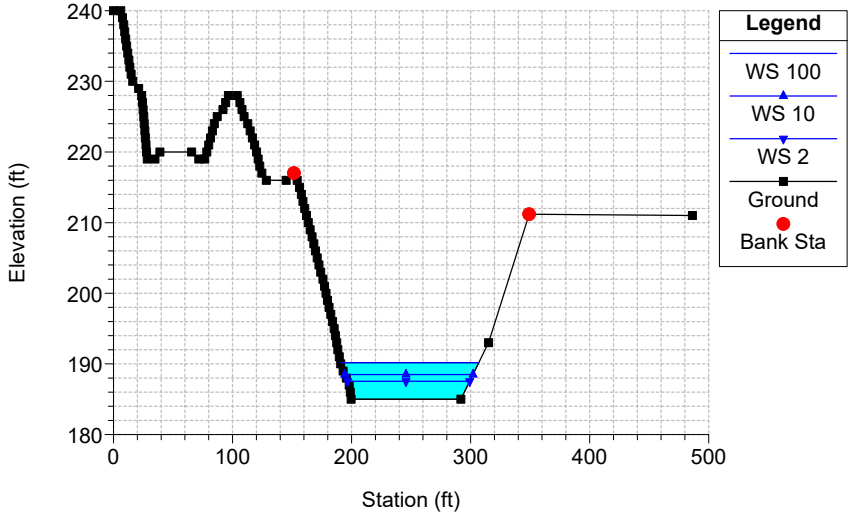
CompassBESS Plan: PR 9/24/2025
RS = 44



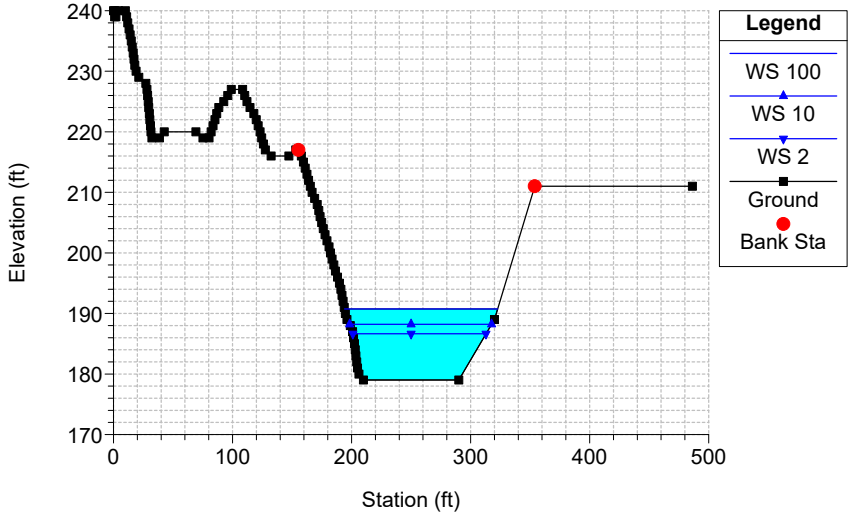
CompassBESS Plan: PR 9/24/2025
RS = 43



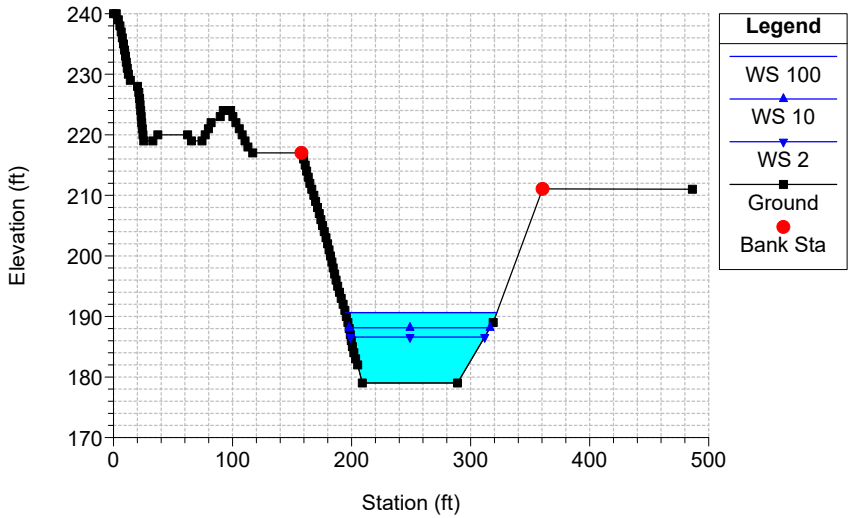
CompassBESS Plan: PR 9/24/2025
RS = 42



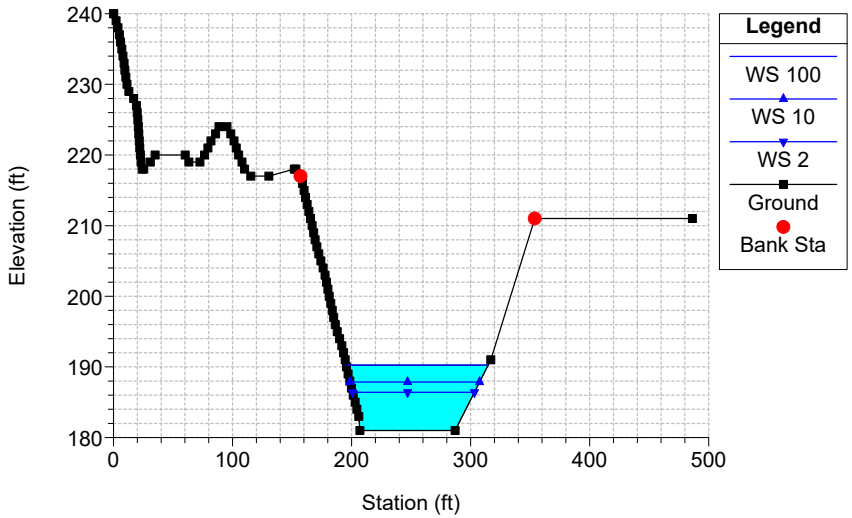
CompassBESS Plan: PR 9/24/2025
RS = 41



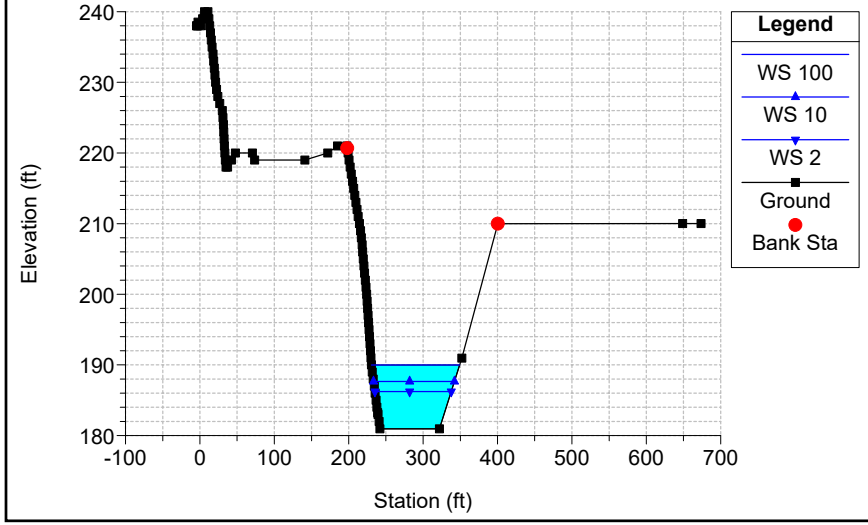
CompassBESS Plan: PR 9/24/2025
RS = 40



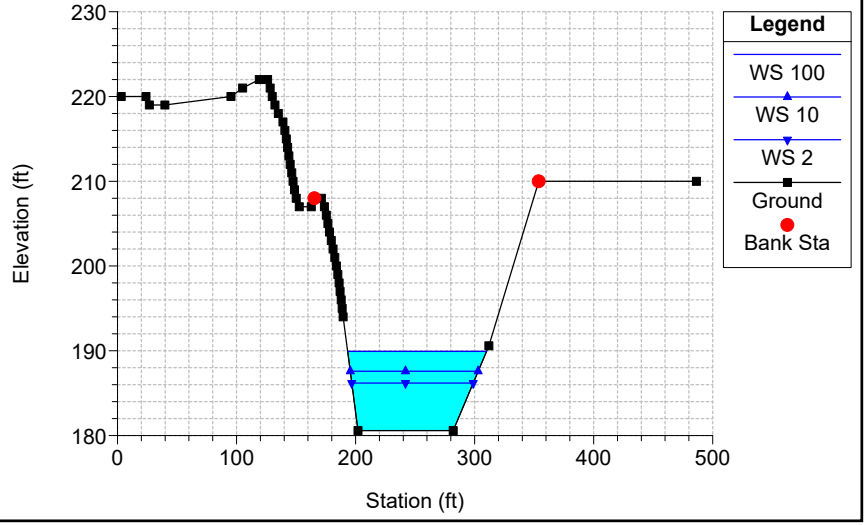
CompassBESS Plan: PR 9/24/2025
RS = 39



CompassBESS Plan: PR 9/24/2025
RS = 38

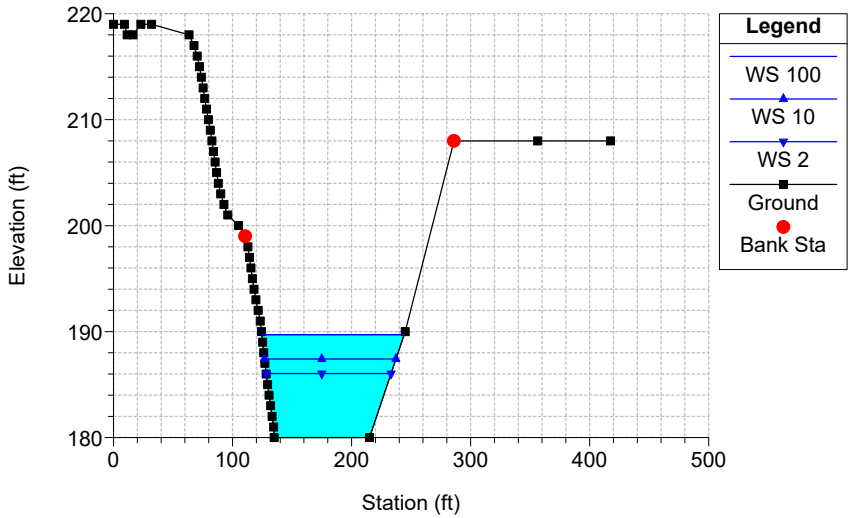


CompassBESS Plan: PR 9/24/2025
RS = 37



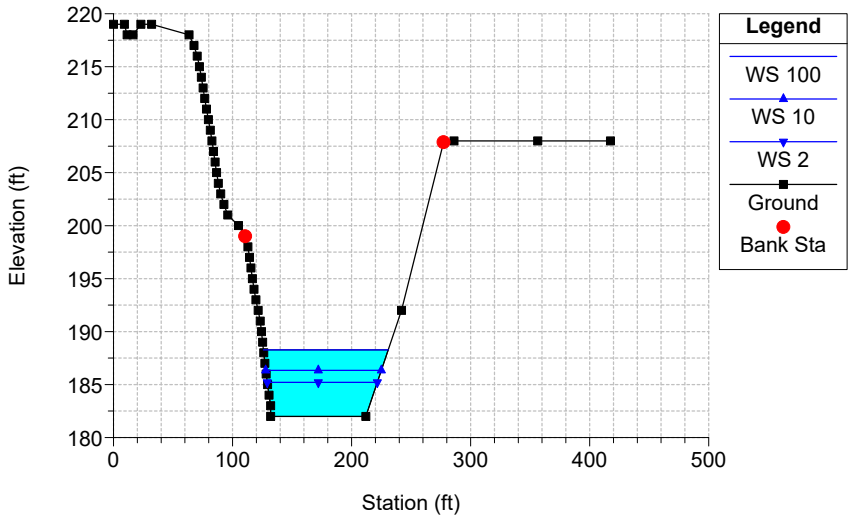
CompassBESS Plan: PR 9/24/2025

RS = 36



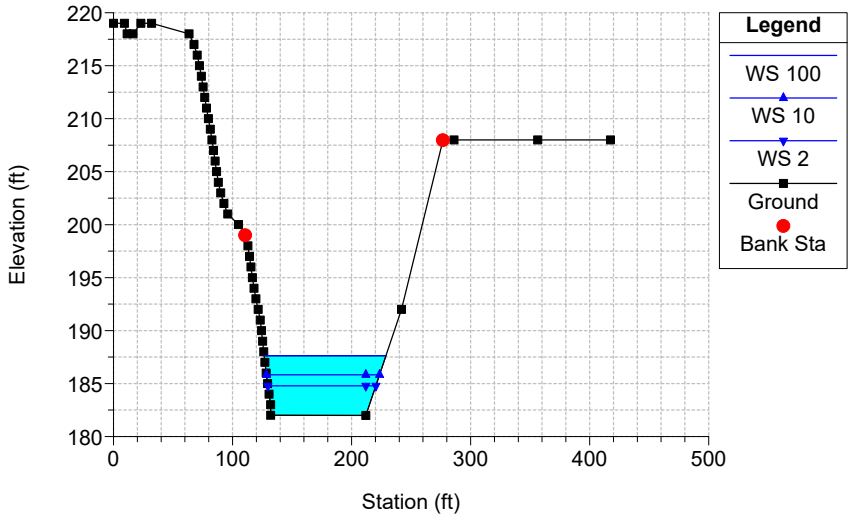
CompassBESS Plan: PR 9/24/2025

RS = 35



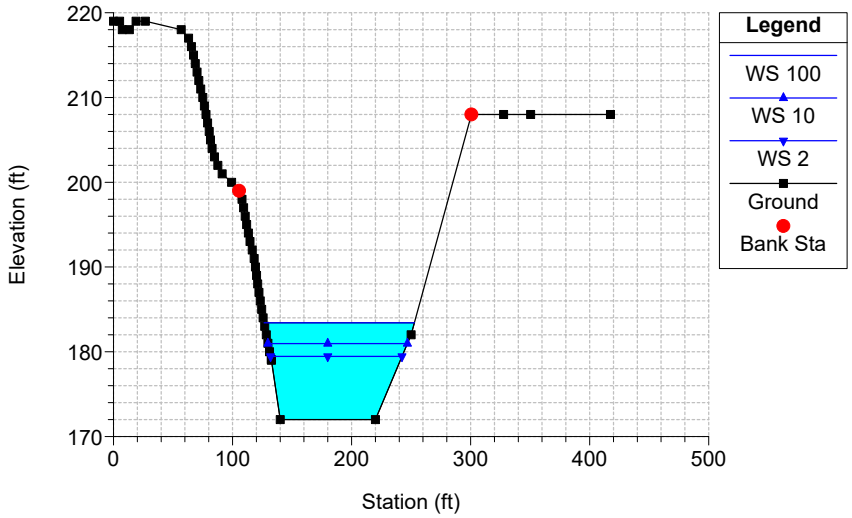
CompassBESS Plan: PR 9/24/2025

RS = 34

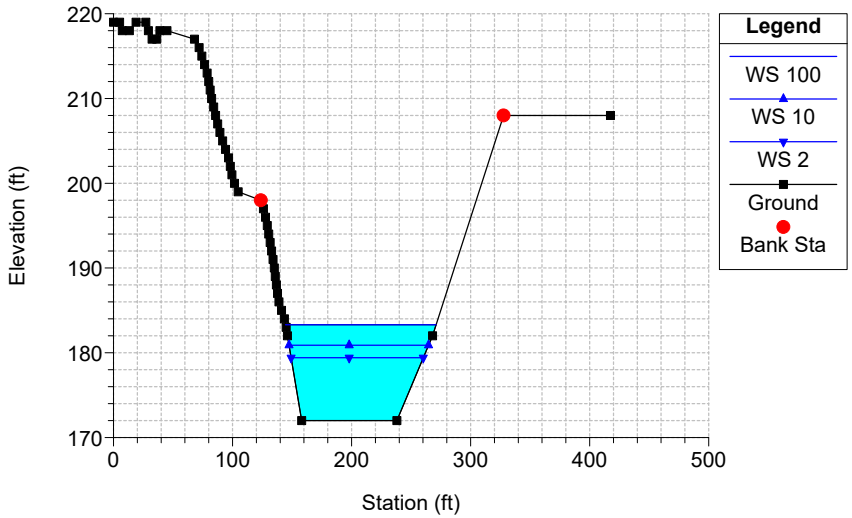


CompassBESS Plan: PR 9/24/2025

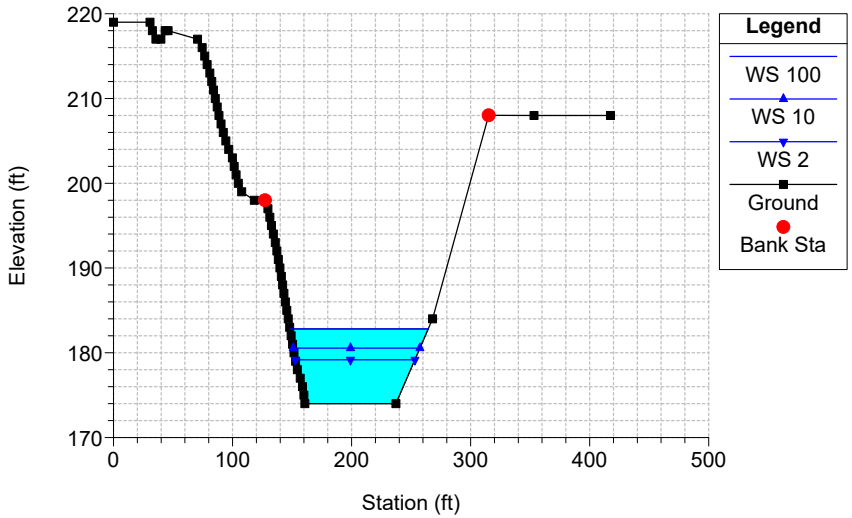
RS = 33



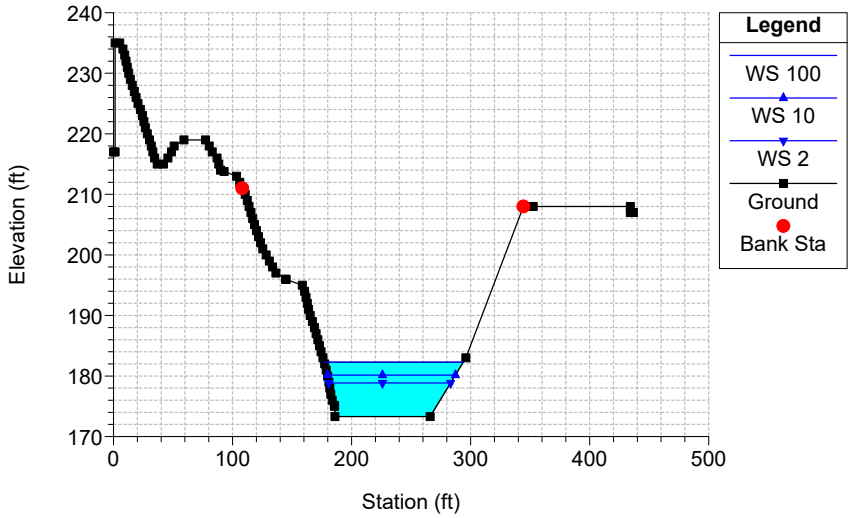
CompassBESS Plan: PR 9/24/2025
RS = 32



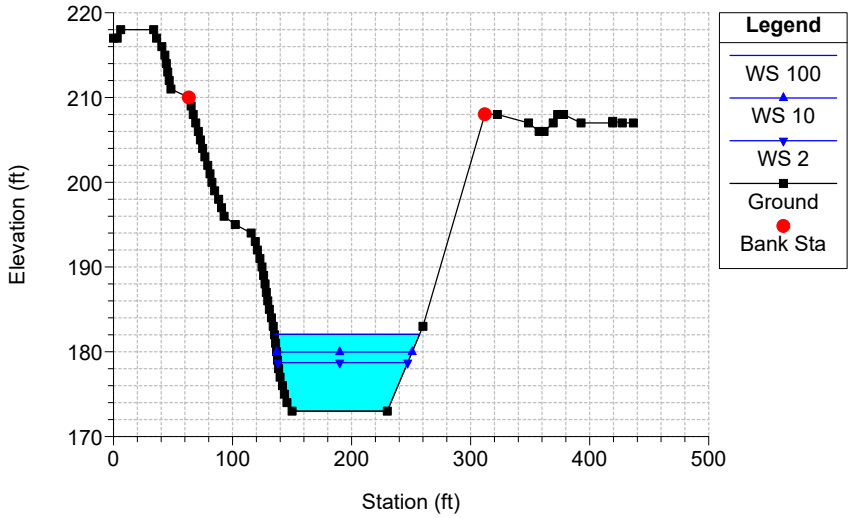
CompassBESS Plan: PR 9/24/2025
RS = 31



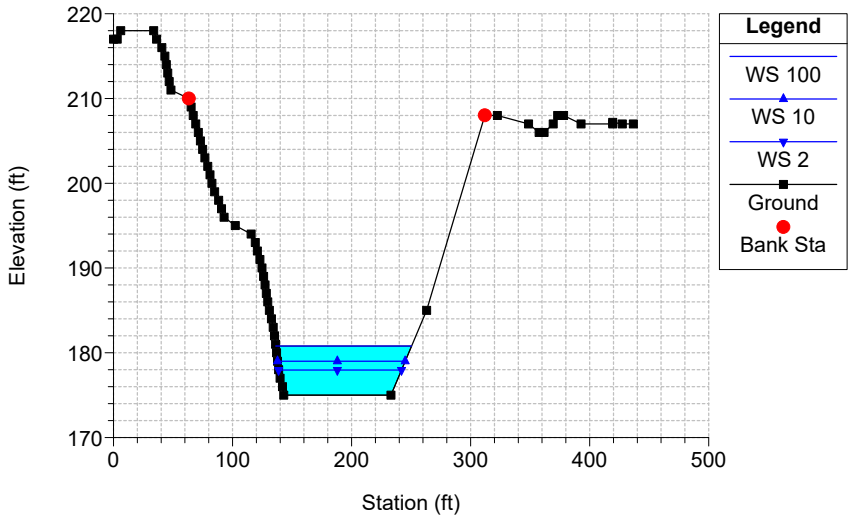
CompassBESS Plan: PR 9/24/2025
RS = 30



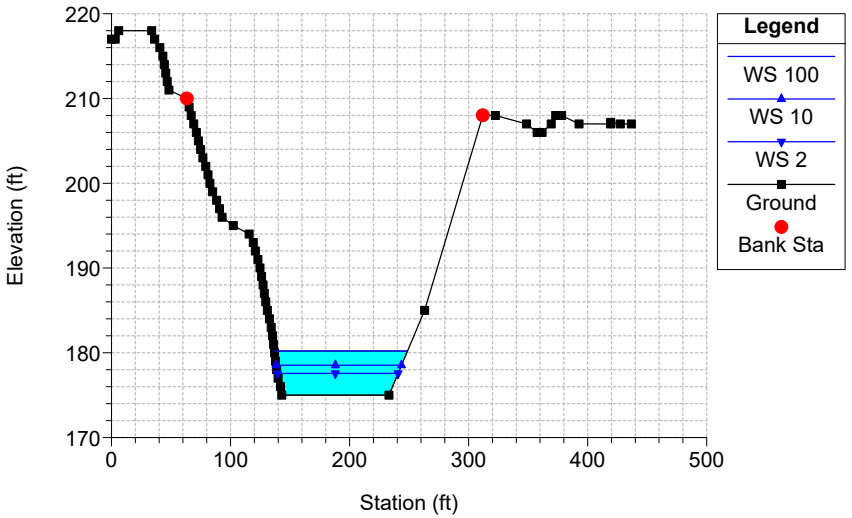
CompassBESS Plan: PR 9/24/2025
RS = 29



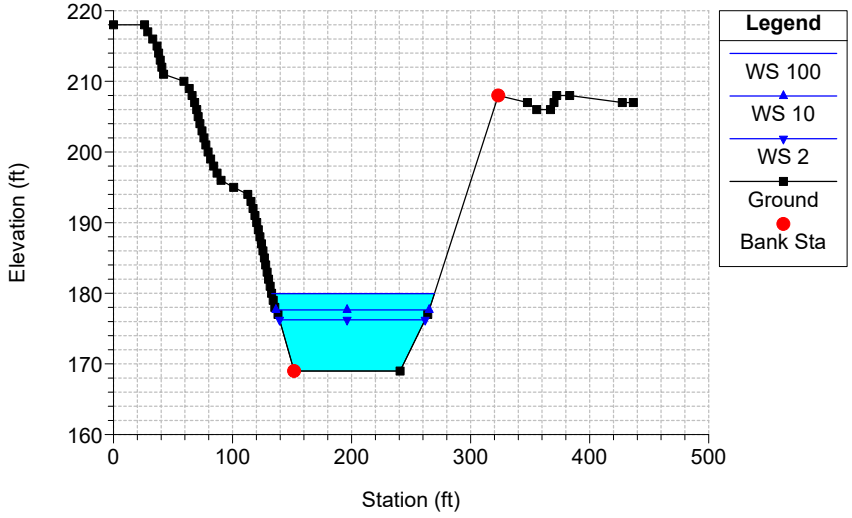
CompassBESS Plan: PR 9/24/2025
RS = 28



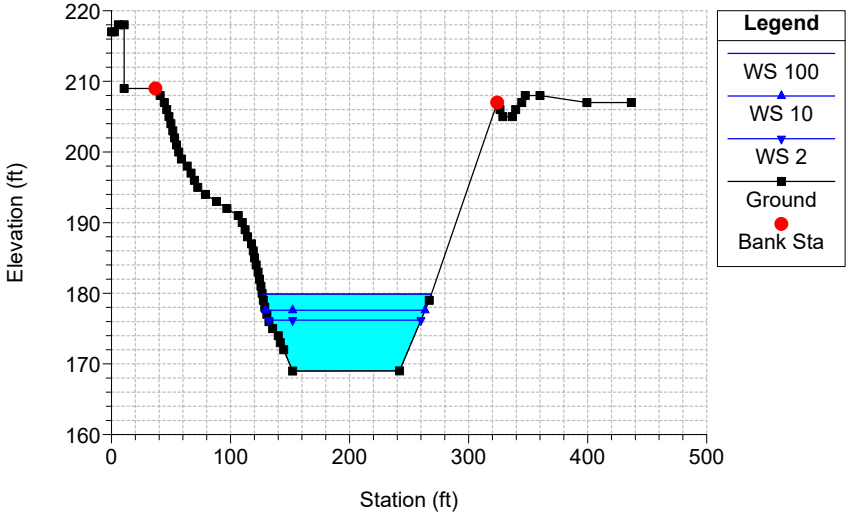
CompassBESS Plan: PR 9/24/2025
RS = 27



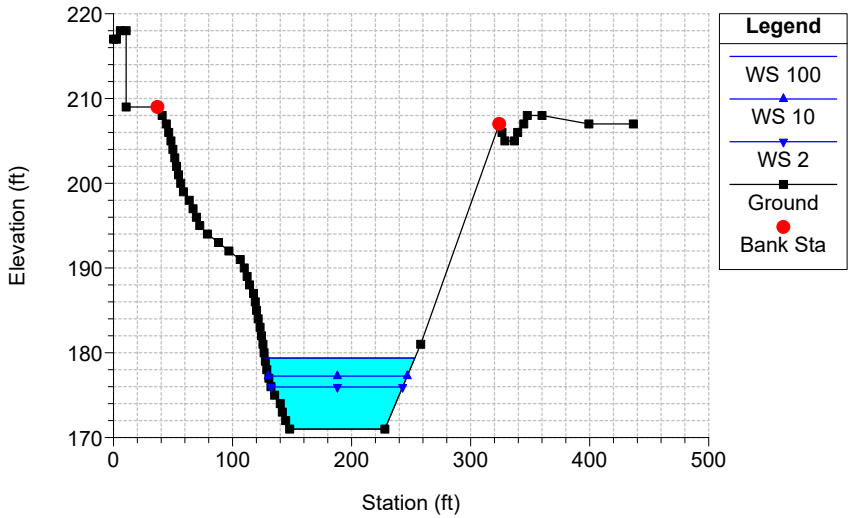
CompassBESS Plan: PR 9/24/2025
RS = 26



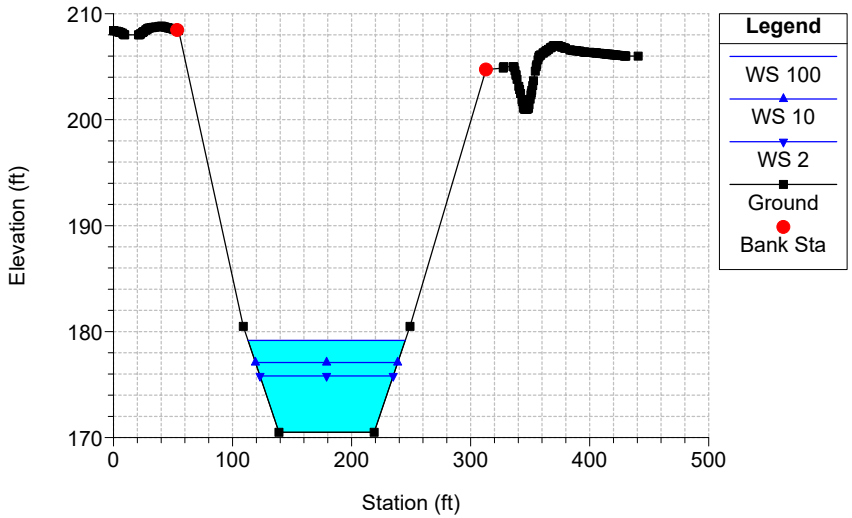
CompassBESS Plan: PR 9/24/2025
RS = 25



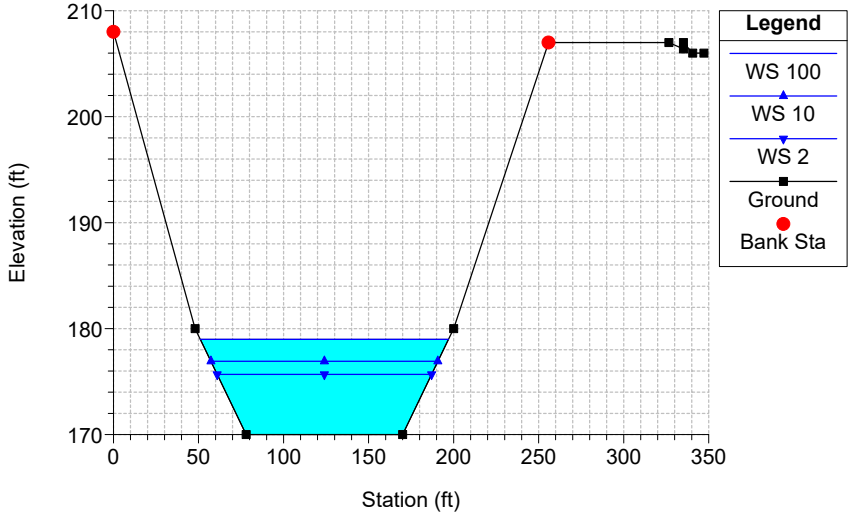
CompassBESS Plan: PR 9/24/2025
RS = 24



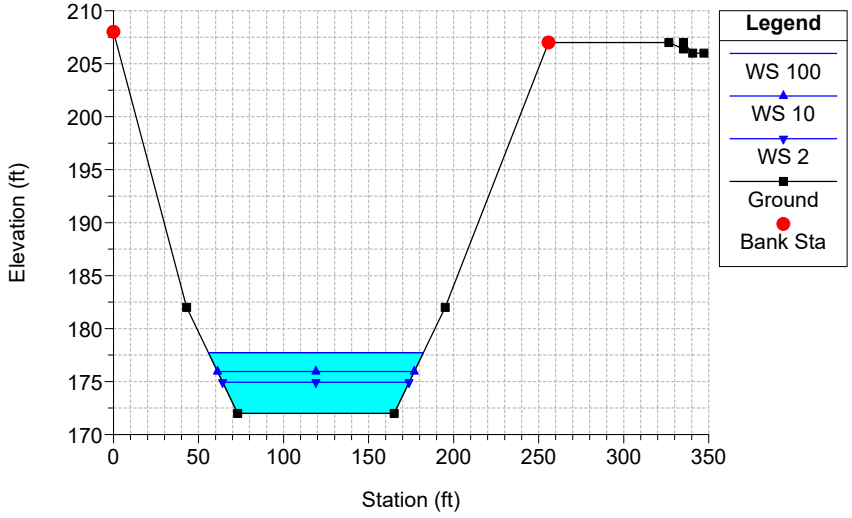
CompassBESS Plan: PR 9/24/2025
RS = 23



CompassBESS Plan: PR 9/24/2025
RS = 22

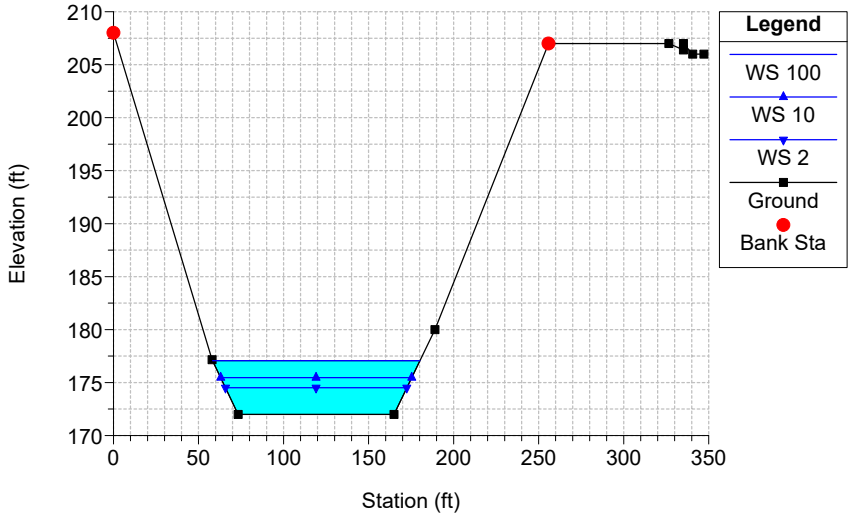


CompassBESS Plan: PR 9/24/2025
RS = 21



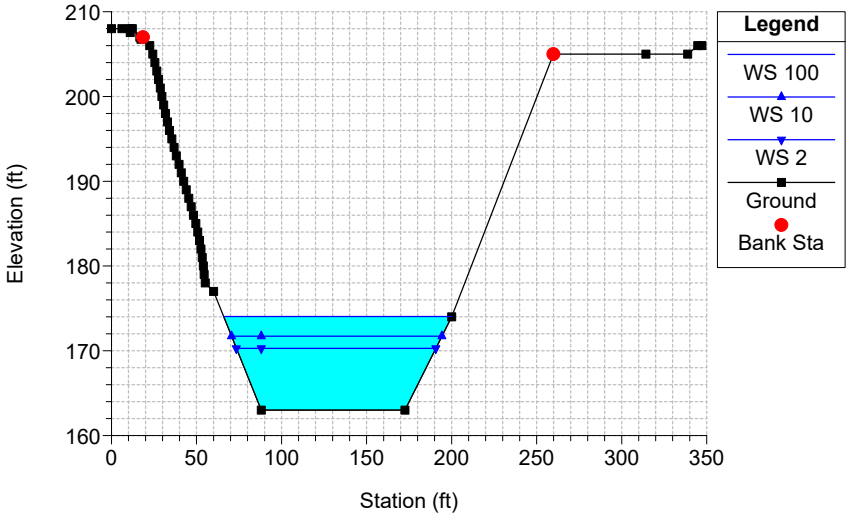
CompassBESS Plan: PR 9/24/2025

RS = 20



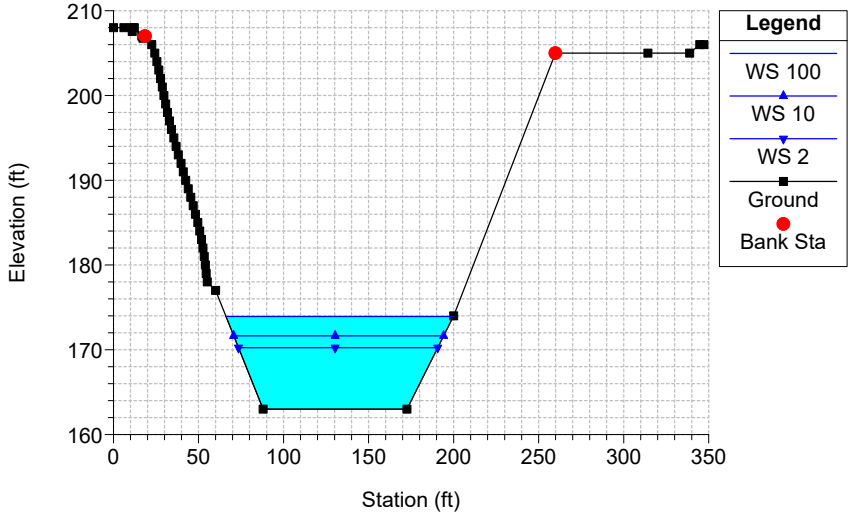
CompassBESS Plan: PR 9/24/2025

RS = 19



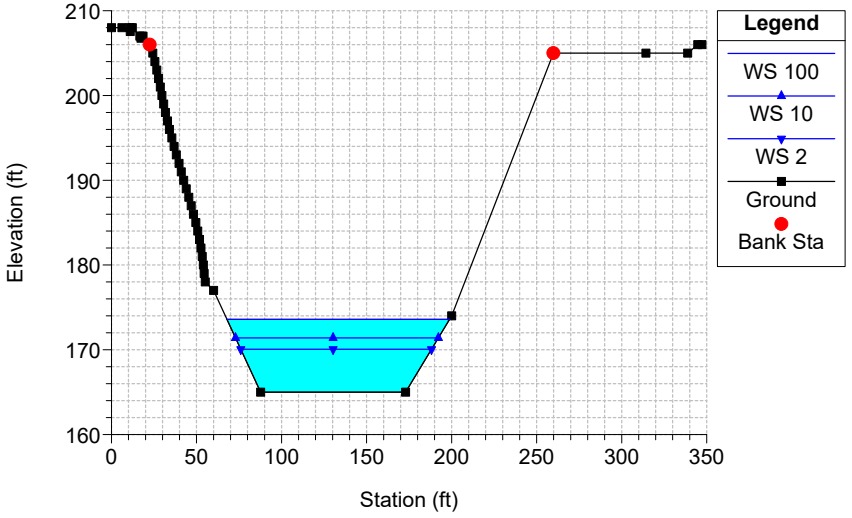
CompassBESS Plan: PR 9/24/2025

RS = 18

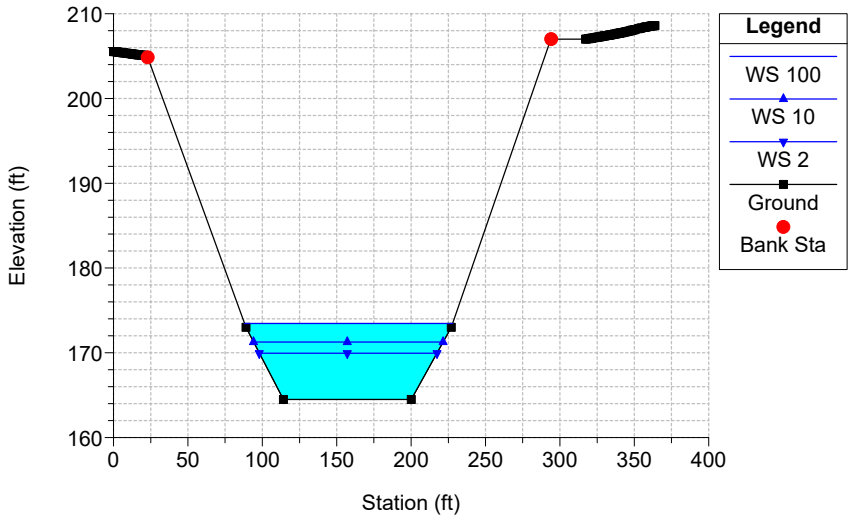


CompassBESS Plan: PR 9/24/2025

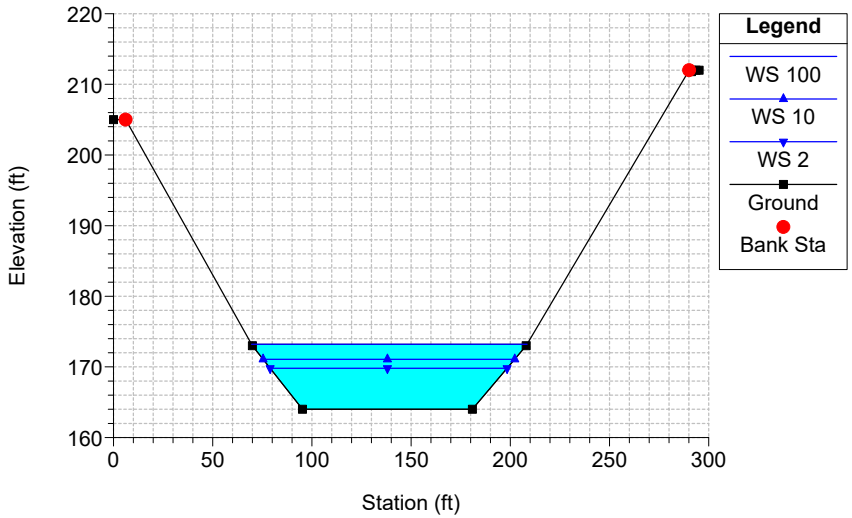
RS = 17



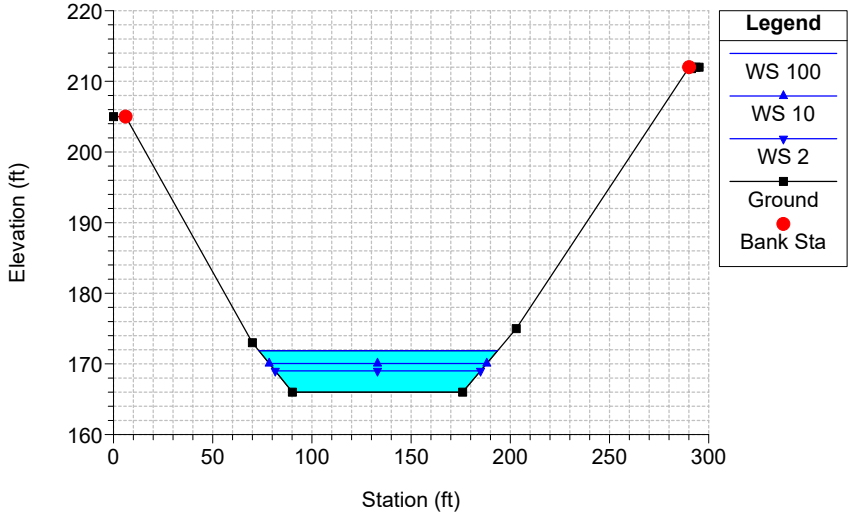
CompassBESS Plan: PR 9/24/2025
RS = 16



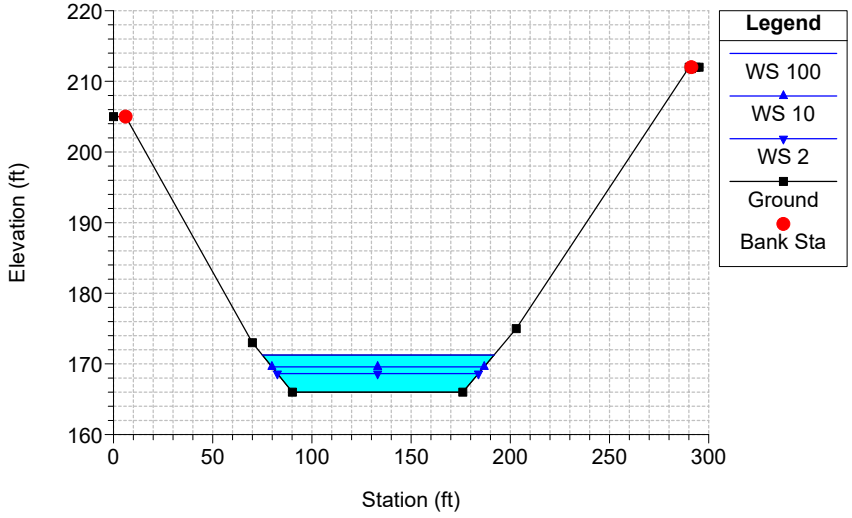
CompassBESS Plan: PR 9/24/2025
RS = 15



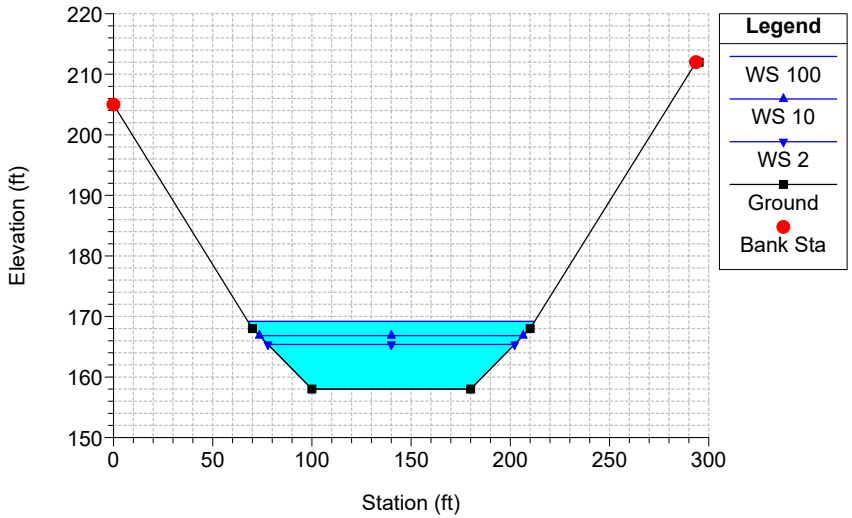
CompassBESS Plan: PR 9/24/2025
RS = 14



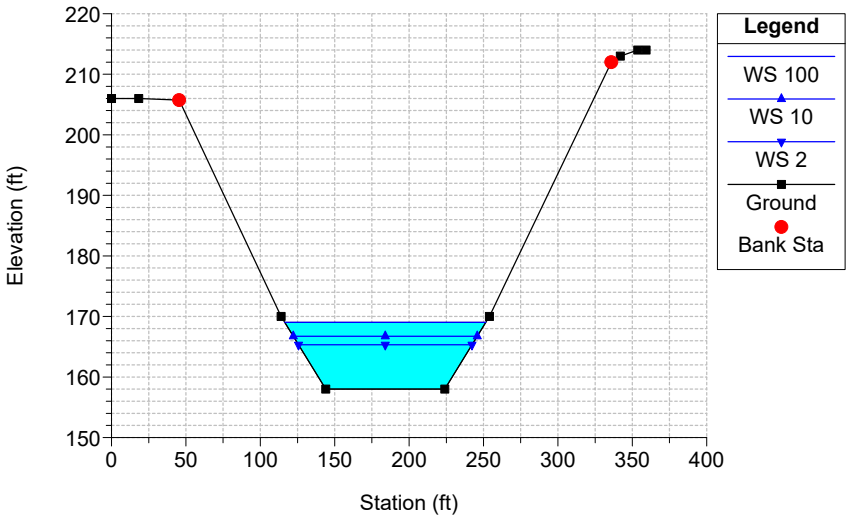
CompassBESS Plan: PR 9/24/2025
RS = 13



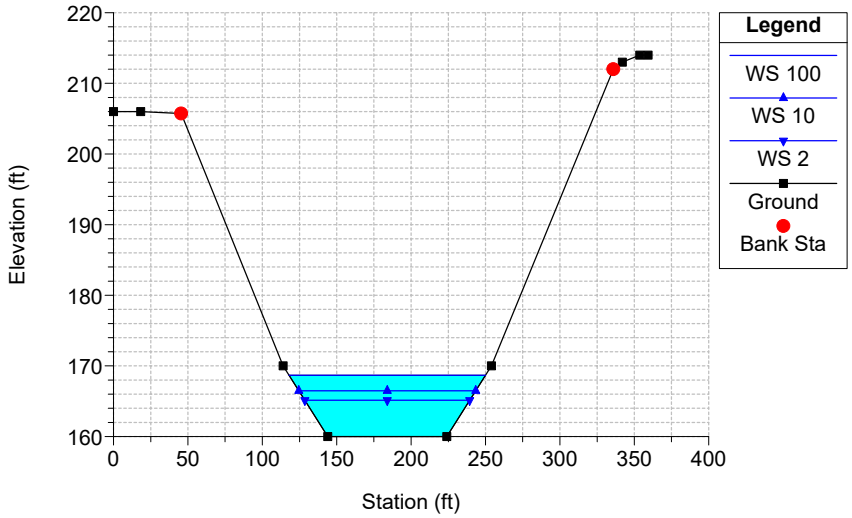
CompassBESS Plan: PR 9/24/2025
RS = 12



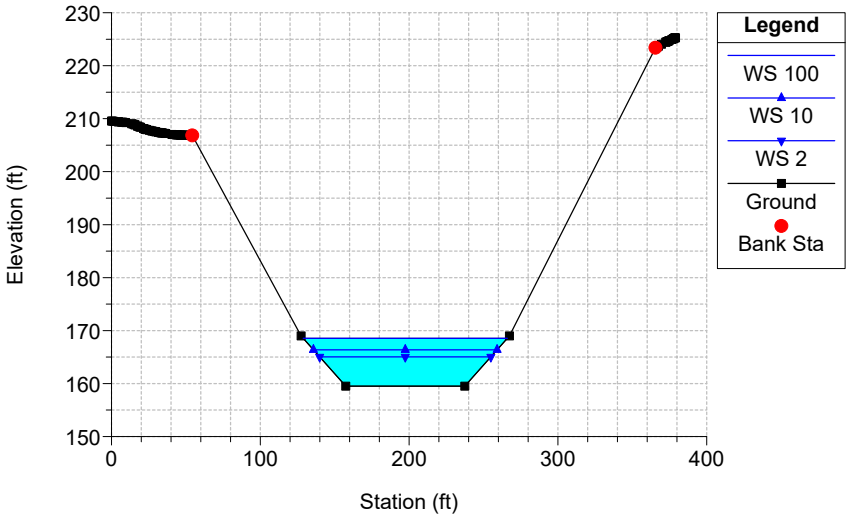
CompassBESS Plan: PR 9/24/2025
RS = 11



CompassBESS Plan: PR 9/24/2025
RS = 10

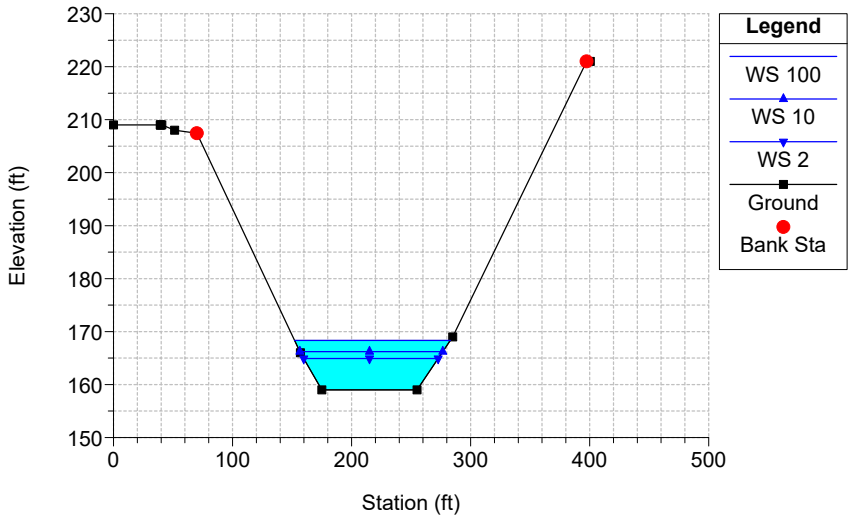


CompassBESS Plan: PR 9/24/2025
RS = 9



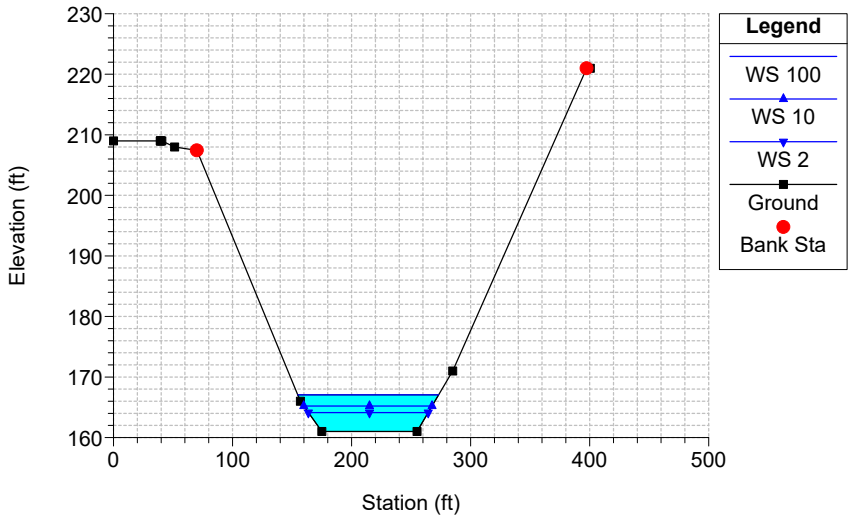
CompassBESS Plan: PR 9/24/2025

RS = 8



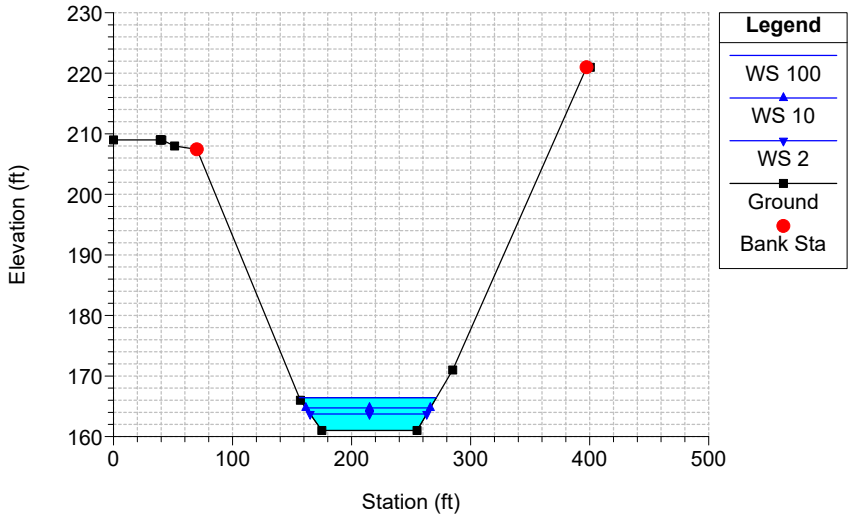
CompassBESS Plan: PR 9/24/2025

RS = 7



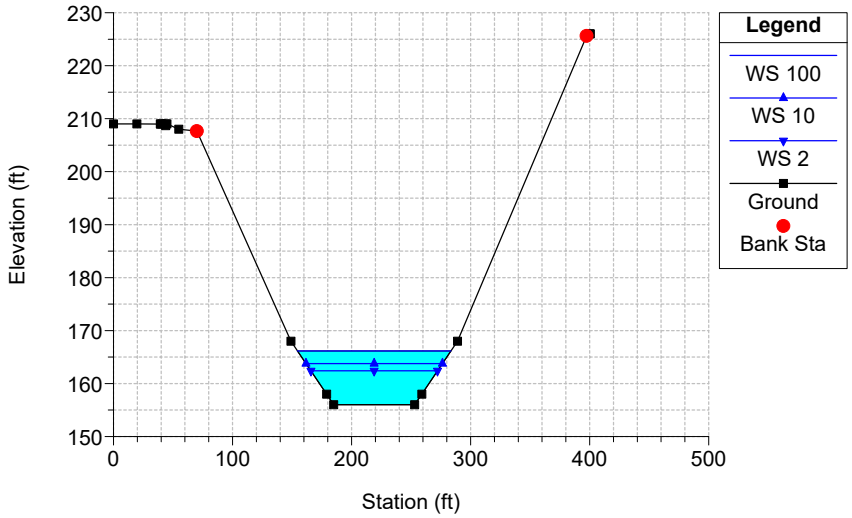
CompassBESS Plan: PR 9/24/2025

RS = 6

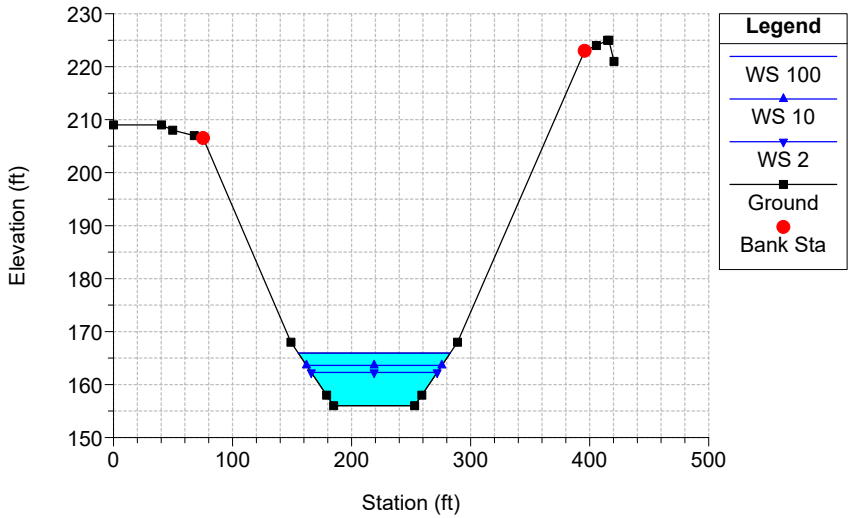


CompassBESS Plan: PR 9/24/2025

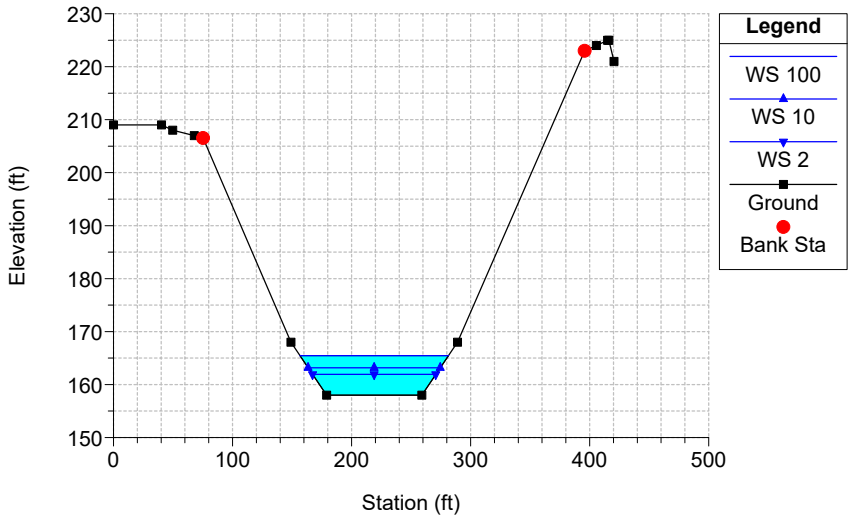
RS = 5



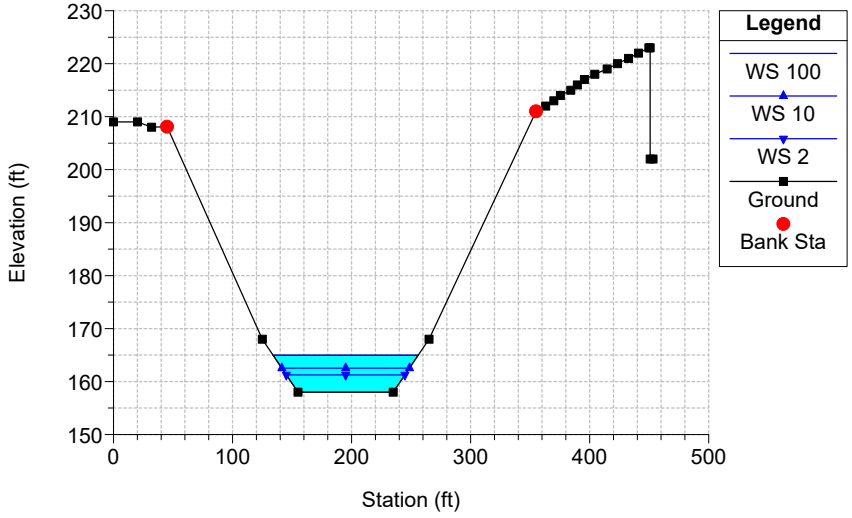
CompassBESS Plan: PR 9/24/2025
RS = 3.1



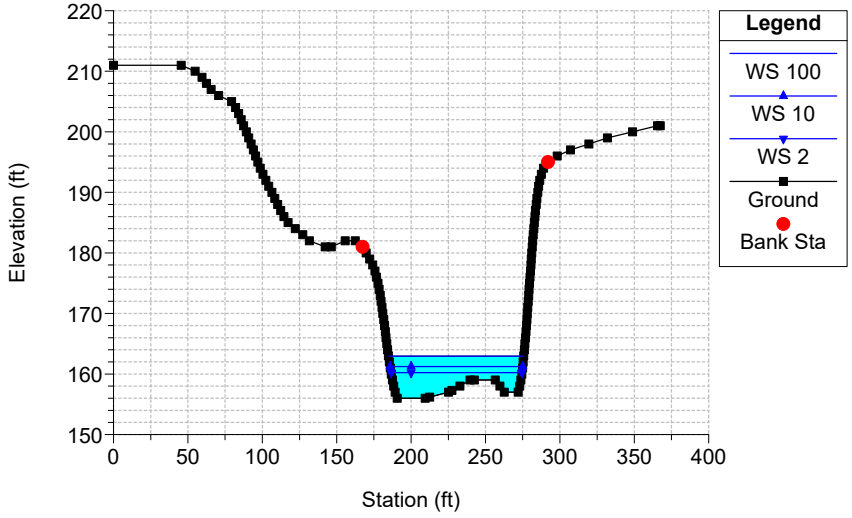
CompassBESS Plan: PR 9/24/2025
RS = 3



CompassBESS Plan: PR 9/24/2025
RS = 2



CompassBESS Plan: PR 9/24/2025
RS = 1



ATTACHMENT 5

ROCK SIZING CALCULATIONS

$$D_{30} = (FS)C_s C_V C_T D \left[\left(\frac{\gamma_w}{\gamma_s - \gamma_w} \right)^{1/2} \frac{V}{\sqrt{K_1 g D}} \right]^{5/2}$$

Where: D_{30} = riprap size of which 30 percent is finer by weight (ft)
FS = safety factor
C_s = stability coefficient for incipient failure
C_V = vertical velocity distribution coefficient
C_T = thickness coefficient
D = local depth of flow (ft)
γ_w = unit weight of water (lb/ft³)
γ_s = saturated surface dry specific unit weight of stone (lb/ft³)
V = local depth-averaged velocity (ft/s)
K_1 = side slope correction factor
g = gravitational constant = 32.2 ft/s²

Use of this equation should be limited to longitudinal slopes less than 2 percent. Further explanation regarding the variables shown above is included in EM 1110-2-1601 (USACE, 1994).

S_f = safety factor (see *c* below)

* C_s = stability coefficient for incipient failure, D_{85}/D_{15} = 1.7 to 5.2

= 0.30 for angular rock

* = 0.375 for rounded rock

C_T = vertical velocity distribution coefficient

= 1.0 for straight channels, inside of bends

= 1.283 - 0.2 log (R/W), outside of bends (1 for (R/W) > 26)

= 1.25, downstream of concrete channels

= 1.25, ends of dikes

C_T = thickness coefficient (see d(1) below)

* = 1.0 for thickness = $1D_{100}$(max) or 1.5 D_{50}(max), whichever is greater

* d = local depth of flow, length (same location as V)

γ_w = unit weight of water, weight/volume

* V = local depth-averaged velocity, V_{ss} for side slope riprap, length/time

K_1 = side slope correction factor (see *d*(1) below)

g = gravitational constant, length/time²

$$K_1 = \sqrt{1 - \frac{\sin^2 \theta}{\sin^2 \phi}} \qquad (3\text{-}4)$$

where

θ = angle of side slope with horizontal

ϕ = angle of repose of riprap material (normally 40 deg)

Structure 1 at Drop:

D30=	**2.2**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	4.61	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	12.25	ft/s
K1	0.87	
g	32	ft/s2

Structure 1 at Basin:

D30=	**0.4**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	8.12	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	6.67	ft/s
K1	0.87	
g	32	ft/s2

Structure 2 at Drop:

D30=	**2.2**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	4.69	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	12.18	ft/s
K1	0.87	
g	32	ft/s2

Structure 2 at Basin:

D30=	**0.3**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	8.75	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	5.48	ft/s
K1	0.87	
g	32	ft/s2

Structure 3 at Drop:

D30=	**2.1**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	4.69	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	12.01	ft/s
K1	0.87	
g	32	ft/s2

Structure 3 at Basin:

D30=	**0.2**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	9.03	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	5.44	ft/s
K1	0.87	
g	32	ft/s2

Structure 4 at Drop:

D30=	**2.2**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	4.72	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	12.32	ft/s
K1	0.87	
g	32	ft/s2

Structure 4 at Basin:

D30=	**0.2**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	8.89	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	5.37	ft/s
K1	0.87	
g	32	ft/s2

Structure 5 at Drop:

D30=	**2.4**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	4.99	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	12.73	ft/s
K1	0.87	
g	32	ft/s2

Structure 5 at Basin:

D30=	**0.3**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	9.27	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	5.54	ft/s
K1	0.87	
g	32	ft/s2

Structure 6 at Drop:

D30=	**2.2**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	4.6	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	12.17	ft/s
K1	0.87	
g	32	ft/s2

Structure 6 at Basin:

D30=	**0.2**	**ft**
FS	2	
Cs	0.3	
Cv	1	
Ct	1	
D	9.67	ft
γW	62.4	lb/cu ft
γS	150	lb/cu ft
V	5.32	ft/s
K1	0.87	
g	32	ft/s2