

AGENDA: September 01, 2022

TO: Regional Transportation Commission

FROM: Sarah Christensen P.E.

RE: Highway 1 Auxiliary Lanes and Bus on Shoulder from State Park Drive to Freedom Boulevard and Coastal Rail Trail Segment 12 Project Contract Amendment with Mark Thomas & Company, Inc. for the Final Design Phase

RECOMMENDATIONS

Staff recommends that the Regional Transportation Commission (RTC) approve the attached resolution ([Attachment 1](#)) authorizing Amendment 1 to the professional engineering services contract with Mark Thomas & Company, Inc. (TP2122) for the Plans, Specifications and Estimates (PS&E) component (final design) of the Highway 1 Auxiliary Lanes and Bus on Shoulders from State Park Drive to Freedom Boulevard and Coastal Rail Trail Segment 12 Project.

BACKGROUND

In 2020, the RTC entered into Cooperative Agreement with Caltrans for the Project Approval & Environmental Document (PA/ED) component of the Highway 1 Auxiliary Lanes and Bus on Shoulders between State Park Drive and Freedom Boulevard Interchanges and Coastal Rail Trail Segment 12 project (Project).

In February of 2020 the Commission adopted the Measure D Strategic Implementation Plan (SIP) which included a delivery strategy for the Highway 1 Auxiliary Lanes and Bus on Shoulders projects. The Commission approved an amendment to the Measure D Expenditure Plan to explicitly include Auxiliary Lanes and Bus on Shoulder improvements between State Park Drive and Freedom Boulevard interchanges. A map showing the project location is included as Figure 1.

In April of 2021, the RTC issued a Request for Proposals (RFP) to procure an engineering consultant to prepare the preliminary engineering and environmental documentation for the project. The RFP included a provision to retain the successful firm for final design, at the option of the RTC. The contract (TP2122) was awarded to Mark Thomas & Company, Inc. with an

original contract value of \$2.08M. Mark Thomas & Company, Inc. was awarded this contract by the Commission in June of 2021 because they were determined to be the most qualified engineering firm to perform design work on this project by the selection panel.

In May of 2022 the Commission programmed the local match for the upcoming cycle 3 of Senate Bill 1 (SB1) Solutions to Congested Corridors (SCCP) and Local Partnership Program (LPP) grant opportunities. The programming action included a total of \$89.7M in Measure D-Highway Corridors category funds and \$12.6M in Measure D-Active Transportation category funds.

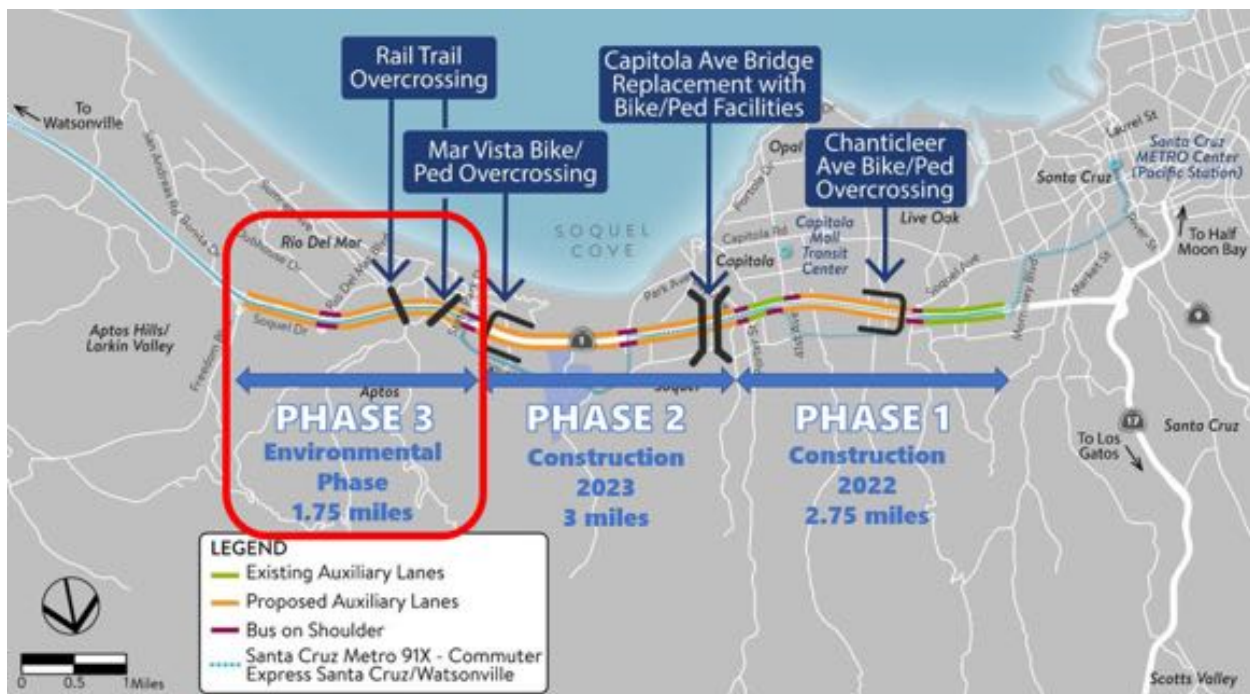


Figure 1 - The Phase 3 project includes auxiliary lanes and bus on shoulder improvements between the State Park Drive and Freedom Boulevard interchanges, widening of the Highway 1 bridge over Aptos Creek & Spreckles Drive, reconstruction of North Aptos & South Aptos Railroad Underpasses, and Segment 12 of the Coastal Rail Trail along the Santa Cruz Branch Rail Line between State Park Drive and just south of the Rio del Mar Boulevard Overhead structure.

DISCUSSION

The Project Approval and Environmental Document (PA/ED) component of the Project is on-going. This project proposes to construct northbound and southbound auxiliary lanes between the State Park Drive and Freedom Boulevard interchanges on Highway 1, extend the bus on shoulder facility by 2.5 miles, widen the Highway 1 bridge over Aptos Creek and Spreckles Drive, reconstruct North Aptos & South Aptos Railroad Underpasses,

construct drainage facilities, and construct retaining walls and soundwalls. The project also includes the construction of an approximate 1.25-mile-long segment of the Coastal Rail Trail (Segment 12) along the Santa Cruz Branch Rail Line between State Park Drive and just south of the Rio del Mar overhead structure.

The total cost for the project is estimated to be approximately \$198M (capital and support). The PA/ED component, including the consultant contract for the preliminary engineering and environmental analysis, is funded by SB1-LPP-F and Measure D-Highway Program funds. The PS&E component of this project is funded by previously programmed Regional Surface Transportation Program Exchange (RSTPX), State Transportation Improvement Program (STIP), and Measure D-Highway funds. Staff plans to include this project in the RTC's applications for Cycle 3 of SB1 competitive programs, which would potentially fully fund construction of this project. If successful, construction could begin as early as 2025, pending availability of funds.

As noted earlier, the RTC awarded a consultant contract to Mark Thomas & Company (TP2122) to complete the Project Approval and Environmental Document (PAED) phase of the project. Since that time, the consultant completed work on the traffic studies, geometric design of the proposed improvements, and completed environmental technical studies. The Draft Environmental Impact Report/Environmental Assessment (EIR/EA) is scheduled to be released in October of 2022 and be completed in April of 2023.

Staff has discussed with Caltrans who should be the implementing agency for the Plans, Specifications and Estimates (PS&E) of this project and agreed that it was appropriate for the RTC to implement this work. The reason for this recommendation includes that Caltrans not having resources available for design, and there is value (both economic and for overall schedule) in having the same consultant for preliminary engineering and environmental analysis continue with final design. There are also benefits to the project schedule because RTC has the ability to advance the PS&E phase while Caltrans does not. Therefore, staff recommends the RTC serve as the implementing agency for the PS&E component of the project.

Staff recommends advancing the final design work of this project concurrent with the environmental work to save 6 to 8 months on the overall schedule and have the project construction-ready sooner. The project's final design will take approximately 2 years and beginning the final design now would demonstrate project readiness for future grant opportunities and allow for the project to start construction as early as 2025.

The scope of services and cost proposal of \$~~9,163,3489,998,225~~ for the PS&E component are included as Attachment 3. Staff has reviewed the estimate and finds it to be fair and reasonable, based on the nature and complexity of the work. Staff recommends amending the consultant contract rather than re-procuring, because the consultant is qualified to perform the final design work and has been performing well under the existing contract. Procuring a new consultant would result in schedule delay due to procurement period and would result in a loss of institutional knowledge on the project. Therefore, **staff recommends the Commission approve the attached resolution (Attachment 1) authorizing the Executive Director to negotiate and execute Amendment 1 to the contract with Mark Thomas & Company, Inc. (TP2122) for an amendment amount not to exceed \$9,998,225 ~~9,163,348~~ for final design services, a total contract value not to exceed \$~~11,244,187~~12,079,064, and a term ending on December 31, 2028, subject to the final negotiations and review by legal counsel as to form.**

FISCAL IMPACT

There are no new fiscal impacts associated with this contract amendment. This project's final design work was previously programmed with a combination RSTPX, STIP and Measure D- Highway category funds, as programmed by the at previous RTC meetings. The Measure D Cash Flow Model shows sufficient capacity in the Measure D Highway category to fund this contract amendment, without issuing revenue bonds.

NEXT STEPS

Cooperative Agreement with Caltrans

A Cooperative Agreement with Caltrans for the PS&E phase of the project will be needed, to memorialize the roles and responsibilities of each agency and designate RTC as the implementing agency, with Caltrans providing oversight. Caltrans is preparing the cooperative agreement and staff plans to return to the Commission at a subsequent meeting to recommend approval to enter into the Cooperative Agreement. Since RTC will primarily be using local funding to advance PS&E, RTC can advance PS&E, prior to final execution of the Cooperative Agreement.

SUMMARY

RTC staff recommends amending the professional engineering services agreement (TP2122) with Mark Thomas & Company, Inc. for the final design

work for the Highway 1 Auxiliary Lanes and Bus on Shoulder Project between State Park Drive and Freedom Boulevard interchanges and Coastal Rail Trail Segment 12 Project.

ATTACHMENTS

1. Resolution
2. Draft Scope of Services, Cost Proposal, and Schedule

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RESOLUTION NO.

Adopted by the Santa Cruz County Regional Transportation Commission
on the date of September 01, 2022
on the motion of Commissioner
duly seconded by Commissioner

A RESOLUTION AUTHORIZING THE EXECUTIVE DIRECTOR TO AMEND THE CONTRACT WITH MARK THOMAS & COMPANY, INC. (TP2122) FOR PROFESSIONAL ENGINEERING SERVICES FOR THE PLANS, SPECIFICATIONS AND ESTIMATES (PS&E) COMPONENT OF WORK FOR THE HIGHWAY 1 AUXILIARY LANES AND BUS ON SHOULDER BETWEEN STATE PARK DRIVE AND FREEDOM BOULEVARD INTERCHANGES AND COASTAL RAIL TRAIL SEGMENT 12 PROJECT

WHEREAS, Highway 1 is the most heavily traveled highway in Santa Cruz County, is often congested and has safety concerns; and

WHEREAS, Highway 1 serves as the backbone for the movement of people and goods through the majority of the urban area in Santa Cruz County, providing access to schools, commercial, residential, and recreational destinations;

WHEREAS, the Measure D expenditure plan approved by voters of Santa Cruz County in 2016 and amended in 2020 to include auxiliary lanes between State Park Drive and Freedom Boulevard interchanges and coastal rail trail segment 12;

WHEREAS, in 2021 the RTC conducted procurement for professional engineering and environmental documentation services, with an option to amend the contract for the final design phase at a later date;

WHEREAS, in 2021 the RTC entered into a professional engineering services agreement with Mark Thomas & Company (TP2122) for the Project Approval and Environmental Document PA&ED component of work for the project;

WHEREAS, in 2021, RTC programmed \$300,000 in State Transportation Improvement Program (STIP) and \$25,000 in Regional State Transportation Program Exchange (RSTPX);

WHEREAS, in May of 2022 the Commission approved the annual Measure D 5 Year Plan for Highway Corridors to program funds for PS&E and to serve as a match for the RTC's applications for cycle 2 of the Senate Bill 1 (SB 1) Solutions to Congested Corridors Program (SCCP) and Local Partnership Program (LPP) competitive grants; and

WHEREAS, staff recommends utilizing the services of Mark Thomas and

Company, Inc., to advance the final design phase of the project concurrent with the remaining environmental work in order to save 6 to 8 months on the overall schedule;

THEREFORE, BE IT RESOLVED BY THE SANTA CRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION THAT:

The Executive Director is authorized to negotiate and execute Amendment 1 to the professional engineering services agreement with Mark Thomas & Company, Inc. (TP2122) for an amendment amount not to exceed \$~~9,163,3489,998,225~~ for the final design services, a total contract value not to exceed \$~~11,244,18712,079,064~~, and a term ending on December 31, 2028, subject to the final negotiations and approval by legal counsel as to form.

AYES: COMMISSIONERS

NOES: COMMISSIONERS

ABSTAIN: COMMISSIONERS

ABSENT: COMMISSIONERS

Sandy Brown, Chair

ATTEST:

Guy Preston, Secretary

Distribution: RTC Fiscal, RTC Project Manager, and Consultant Project Manager

SR1 Auxiliary Lane and Bus on Shoulder, State Park Drive to Freedom Blvd & Coastal Rail Trail Segment 12 Project

PS&E Phase

INTRODUCTION

Mark Thomas & Company, Inc. (Mark Thomas) complete the PS&E phase for the Santa Cruz County Regional Transportation Commission (RTC) that includes improvements required to construct northbound (NB) and southbound (SB) auxiliary lanes and Bus on Shoulder (BOS) along State Route 1 (SR1) from the State Park Drive Interchange to the Freedom Boulevard Interchange in Santa Cruz County, a distance of approximately 2.5 miles, and construct an approximate 1.25 mile segment of the Coastal Rail Trail Segment in the ultimate condition.

Project improvements include adding NB and SB auxiliary lanes between interchanges, median and outside mainline modifications and widening, bus on shoulder (BOS) operations, ramp modifications to accommodate the mainline modifications, widening the existing Aptos Creek Bridge, new retaining walls along the mainline and trail, new sound walls, two (2) new Pedestrian Overcrossings (POC) over SR 1 adjacent to the existing rail bridges for the trail, two (2) new Pedestrian Bridges over Valencia Creek and Aptos Creek, replacement of two (2) railroad underpasses (UP) over SR 1, replacement/relocation of existing lighting, sign illumination (removal), traffic monitoring stations, drainage modifications/improvements, existing utility relocation and accommodation, landscape and irrigation improvements, trail grade crossing improvements at State Park Drive, Aptos Creek Road, Parade Street, and Trout Gulch Road, with connection along Sumner Ave to the Rio Del Mar intersection.

ASSUMPTIONS

1. Mark Thomas will take the lead in monthly Project Development Team (PDT) meetings and will be responsible for the preparation of meeting agendas and minutes as well as coordination of meeting times and locations with Caltrans, Santa Cruz County Regional Transportation Commission (RTC), and Santa Cruz County (County).
2. The project geometry as per approved GADs from the PA&ED phase will be the basis of the design for the PS&E phase.
3. The project will not require revalidation of the CEQA and NEPA environmental documentation. Preparation of the revalidation document has been included as an optional task in this scope.
4. Noise barrier locations is assumed to be determined from the PA&ED phase.
5. No traffic forecast updates will be required.
6. Value Analysis alternatives accepted during the PA&ED phase will be incorporated into the design.

7. The project will require modification/ installation of traffic monitoring stations, ramp lighting, sign illumination (removal), call box, and bike/ped overcrossing lighting. Ramp metering is not included nor is installation or modification of traffic signals on the local streets.
8. The project will require new retaining walls with varying height and length. The retaining walls are assumed to be either Caltrans standard plan Type 1 walls requiring specialty design due to peak ground accelerations (PGA) above 0.6g or specialty designed walls.
9. It is anticipated that the outside northbound bridge barrier will not need to be replaced on the existing Aptos Creek Bridge. This will be confirmed with Caltrans as part of the type selection process.
10. The POCs are anticipated to be single span prefabricated steel truss bridges. The final bridge type will be determined as part of the Type Selection Report, with approval from Caltrans Division of Structures. The final design of the prefabricated steel trusses shall be done by the contractor as a part of the construction contract (Manufacturer-Designed/prefabricated). Mark Thomas will provide final design of the pedestrian bridge substructure elements to support the prefabricated steel trusses as a part of the PS&E package. An optional task is included in the scope in the event Caltrans does not support a prefabricated steel truss structure.
11. The Pedestrian Bridges are anticipated to be prefabricated pedestrian steel truss bridges. The final design of the prefabricated steel trusses shall be done by the contractor as a part of the construction contract (Manufacturer-Designed/prefabricated). Mark Thomas will provide final design of the pedestrian bridge substructure elements to support the prefabricated steel trusses as a part of the PS&E package.
12. Replacement, retrofit or rehabilitation of the Valencia Creek Arch Culvert under SR-1 at the SR-1 Aptos Creek Bridge are included as an optional task in this scope of work.
13. Aesthetics for the POCs and retaining walls will be developed in cooperation with Caltrans and project team members. The project will follow a similar aesthetic design process with the community as the State Park to Bay/Porter segment, including 2 public outreach meetings.
14. The project will not require coordination and meeting with California Highway Patrol.
15. Construction will be administered by Caltrans and will require final processing and approval through the Caltrans Headquarters Office Engineer (HQOE) process. Project plans will be prepared in MicroStation, using drafting standards as documented in Caltrans 2020 Plan Preparation Manual or any subsequent update published prior to the contract notice to proceed.
16. The project will not require utility Longitudinal Exceptions to Caltrans Encroachment Policy.
17. Right of way acquisition is required for the project and will be acquired in fee for Santa Cruz County for Moosehead Drive, SCCRTC for the Rail Trail, and Caltrans for the mainline.
18. Record of Survey and corner record preparation is not required.
19. This scope assumes a single highway construction package. Should it become necessary to split the PS&E package into two bid packages, Mark Thomas will submit a separate scope and fee for the additional effort required.
20. Any project mitigations or negotiations with the regulatory agency or County will be conducted by the RTC, with support from the consultant team.

21. Notices for public meetings will be conducted by the RTC.
22. This scope does not include construction survey.
23. It is assumed that utility relocation final design plans will be prepared by utility owners, and this task has been excluded from this scope and fee.
24. Aerial mapping provided by RTC for the PA&ED phase will be augmented as needed with supplemental field survey for final design.
25. No fee encroachment permit from Caltrans
26. Mark Thomas will coordinate with Santa Cruz County as the right of way agent for the project, to secure any needed permissions to enter upon private property to access and study/investigate the project area.
27. Tree mitigation ratios and approved plant types will be provided by others. Tree mitigation will be completed within the Caltrans R/W where possible as part of the project. Mitigation outside Caltrans R/W may be completed under a separate contract. Tree mitigation plans will be prepared for both on-site and off-site planting.
28. Up to 3 areas will be designated for BMP placement. These areas will be planted with irrigated native grass sod.
29. Aesthetics for Segment 12 of the Coastal Rail Trail and retaining walls will be developed in cooperation with, the County, Caltrans and project team members. Aesthetic designs will be developed using a similar process as the State Park to Bay/Porter segment, including 2 public outreach meetings.
30. Full planting and irrigation design will be prepared for approximately 11,600 linear feet of highway on both northbound and southbound shoulders and 6,300 linear feet along Segment 12 of the Coastal Rail Trail. Planting and irrigation plans will be prepared in 1"=20' format. Planting within Segment 12 of the Coastal Rail Trail will not include permanent irrigation, drought tolerant planting will be selected.
31. The highway planting plans, specifications and estimate (PS&E) package will be prepared concurrently and will be included in the highway widening plans for construction.

WORK PERFORMED BY OTHERS (ASSUMED RESPONSIBILITY IN PARENTHESES):

- Right of way acquisition services, including appraisals. (County)
- Preliminary Title Reports (County/ RTC)
- Cooperative agreements, freeway agreements, and maintenance agreements. (RTC/ County)

The professional services provided for the project include the following:

SERVICES TO BE PROVIDED

Preparation of Plans, Special Provisions and Construction Cost Estimates

All design and report documents will utilize Imperial Units, with geometrics conforming to the December 2020 Revised Seventh Edition of the Highway Design Manual (HDM), Caltrans Standard Plans 2018 Edition, and Caltrans 2018 Standard Specification with all published updates for each document as of date of the notice to proceed for this scope of work. If applicable, County standards

will be used outside of the State right of way. Advertisement, award and administration of the construction contract (AAA) will be done by Caltrans. In general, the PS&E package will include:

- Highway Widening Plans (including BOS improvements)
- Trail Plans
- Drainage Plans
- Utility Plans
- Electrical Plans
- Retaining Wall Plans
- Structure Plans
 - SR-1 over Aptos Creek, Two (2) POC's over SR-1, Two (2) Pedestrian Bridges over Valencia Creek and Aptos Creek, Two (2) Rail UP's over SR-1
- Highway Planting and Irrigation
- Right of Way Engineering
- Traffic Handling/Stage Construction Plans
- Signing and Striping Plans
- Environmental Permit Applications

Prepare Right of Way Acquisition and Transfer Documents

Mark Thomas will prepare up to forty-five (45) plats, legal descriptions, and appraisal maps from record information for up to twenty three (23) right of way acquisitions and up to thirty nine (39) temporary construction easements (TCE's). Plats and legal descriptions will conform to California Land Surveyor's Act requirements and will be prepared in conformance with County requirements. Hard copy, appraisal, and right of way record mapping will not be required for the project as all right of way acquired in fee will be for Santa Cruz County for Moosehead Drive, RTC for Segment 12 of the Coastal Rail Trail, and Caltrans for SR-1.

Coordination and Approvals from Various Agencies

Mark Thomas will coordinate with the RTC, Caltrans, County, as well as utility providers involved to resolve design issues and to obtain project approvals.

SCOPE OF WORK

Task 1 Project Administration and Management

This task shall include general project administration and management. The anticipated level of effort for these tasks is based upon a 30 month project duration (September 2022 through January 2025).

1.1 General Project Management

This task will include ongoing general project management activities, including coordinating subconsultant activities and submittals. General project management will also include obtaining the Caltrans encroachment permit for field investigations as is necessary.

Mark Thomas will maintain project files in electronic format in conformity with Caltrans' Uniform Filing System. A correspondence and submittal log will be used to track correspondence, submittals and other significant project data.

This task will include ongoing general project coordination with subconsultants and internal staff, including preparing memos, letters, e-mails, and phone calls necessary to manage the project, project scheduling, and updates.

1.2 Prepare Monthly Progress Reports/ Invoices

Mark Thomas will prepare a monthly status report which will be included as part of the monthly invoice package. A transmittal letter will briefly highlight the overall project status and any significant scope, schedule, or budget issues on the horizon.

1.3 General Meeting Attendance and Project Coordination

Mark Thomas staff will attend eighteen (18) project related meetings in addition to the monthly PDT Meetings discussed below. Meeting attendance covered by this task shall include meetings with Santa Cruz County, RTC staff, Caltrans functional units, other design consultants, adjacent property owners, and other individuals. This task shall include attendance of a Caltrans Constructability Review Meeting and Caltrans Safety Review Meeting following the submittal of the 95% PS&E package. Mark Thomas will prepare meeting agendas, minutes, and action items lists for meetings as necessary.

1.4 PDT Coordination Meetings

Mark Thomas will attend a project kick off meeting as well as thirty (30) ongoing monthly PDT coordination meetings. Meetings will include representatives from Caltrans, RTC, Santa Cruz County. Work includes the preparation of agendas, meeting minutes, log of action items, data request log, design decision log, etc. The project critical path method (CPM) schedule will be updated monthly and reviewed as part of the meeting.

1.5 Commission Presentations

Mark Thomas will develop project presentation materials for up to five (5) presentations to be given at RTC meetings or bike committee, E&D TAC meetings. Mark Thomas project manager and project director will attend presentations. Project presentation materials will include a PowerPoint presentation and exhibits compiled from existing project information.

1.6 Project Scheduling

Mark Thomas will prepare and maintain a CPM schedule for the project. The CPM schedule will be updated and provided to RTC monthly. The CPM schedule will include agency review periods and utility/right of way items and quality control activities. The schedule will be used as a living document throughout the project.

1.7 Risk Management Plan

A Risk Register will be prepared following the guidelines in the Caltrans Risk Management Handbook. Mark Thomas will work with the PDT to jointly identify risks and define probability, severity, impacts, and ownership of each risk which will be documented in the Risk Register. The Risk Register will be reviewed at a Risk Management Workshop with the District 5 Risk Management Coordinator. Following the workshop, the Risk Management Plan will be developed to include methodology, roles and responsibilities, budgeting, timing, risk categories, definitions of risk probability and impact, stakeholder tolerances, reporting and formats, and tracking.

1.8 Quality Assurance / Quality Control

Mark Thomas will prepare a project specific Quality Management Plan to describe the quality procedures that will be implemented for work performed during the development, review, and approval of all project deliverables. This task includes performing quality control activities as well as preparing all quality assurance documentation.

1.9 Public Meeting

Mark Thomas will prepare and attend one (1) open house style public meeting to provide a project update to the public and obtain feedback on POC aesthetic concepts before they are finalized. Mark Thomas will prepare and produce the exhibits for the meeting.

Deliverables

- Monthly Project Progress Reports/ Invoices (24)
- General Meeting Agendas, Minutes, Actions Item List (18 meetings)
- PDT Meeting Agendas, Minutes, and Action Item Lists, Data Request Log, Design Decision Log (kick-off and 18 monthly meetings)
- Risk Register (Up to 3 meetings and risk register updates at least quarterly)
- CPM Schedule (updated monthly)
- Project Quality Control Plan
- Project PowerPoint Presentation (up to 5) and Mounted Project Exhibit (up to 5)
- Public Meeting Exhibits (up to 3)

Task 2 Data Collection

2.1 Data Collection

Assemble all available data from the previous PA&ED phase, Caltrans and Santa Cruz County, including As-Built plans of roadways and site development, parcel maps, records of survey, Caltrans right of way mapping, etc. Utility mapping and facility collection will be done as part of Task 3. Mark Thomas will request electronic files of information where available.

Mark Thomas will obtain an encroachment permit from Caltrans for field work including supplemental survey, geotechnical exploration, hazardous material exploration, tree surveys, and utility potholes.

If necessary, Mark Thomas will work with RTC staff to draft/distribute a form letter for rights of entry for field surveys and exploration.

2.2 Supplemental Topography/ Field Surveys

Mark Thomas will collect supplemental topography consisting of cross sections at 50-foot intervals along slopes adjacent to SR1 and along other local streets. Field surveys and survey work products will be completed in conformance with the current edition (with updates) of the Caltrans Survey Manual. Mark Thomas will survey pavement elevations at 50-foot intervals near pavement conforms, plus locate drainage and visible utility facilities as necessary. Cross section data will be extracted from a LIDAR point cloud collected in a terrestrial mobile scan. Mark Thomas field crews will set project control to support the collection of LIDAR Data.

Mark Thomas will combine aerial photogrammetric mapping and supplemental field topography to develop a digital terrain model for the project.

All survey records will be submitted to the RTC upon completion of the project, including original field notebooks, digital field and computation files, control diagrams and control data. This scope of work is limited to fifty (50) days of field work and twenty-five (25) days of traffic handling. Construction control surveys are excluded from this scope of work.

Deliverables

- Field Survey Data (PNEZD in ASCII format)
- Field Survey Notes

2.3 Right of Way Base Mapping

Mark Thomas will prepare right of way base mapping for the project corridor. Right of way base mapping will be sufficient for right of way acquisition and right of way sufficiency needs and will be based upon available Caltrans right of way mapping, parcel maps, surveyed monumentation collected for aerial mapping control, and preliminary title reports to be provided by the County. Base mapping will be prepared in electronic format (Civil 3D) and will include Caltrans and local roadway right of way, adjacent property lines and ownership information, and easement (including JUAs and CCUA's) information within Caltrans right of way and at potentially effected parcels. This scope of work includes up to ten (10) days of field work.

Deliverables

- Right of way base map in electronic format (Civil 3D)

Task 3 Right of Way Engineering and Utility Coordination

This task covers both right of way services and utility relocation. Mark Thomas will prepare plats and legal descriptions from record information for both right of way acquisitions and TCE's for the project. It is assumed that as all right of way will be acquired by the County. In addition, this task includes

following what used to be called “Caltrans A-B-C” utility coordination process which involves utility mapping, conflict identification, determination of utility relocation liability (i.e. cost sharing), and finally utility agreements. Following the right of way acquisition and utility coordination, Mark Thomas will support the preparation of the Right of Way and Utility Certification for the project.

3.1 Right of Way Needs Mapping

Following the development of the 65% PS&E, Mark Thomas will prepare a right of way needs map based upon the right of way mapping prepared in Task 2 to identify permanent and temporary right of way needs. Mapping will identify necessary area for acquisition, existing underlying ownership information and impacts to existing easements as can be determined from available information. Land rights required for utility relocation (as best understood prior to final utility company prepared utility relocation plans) will also be depicted on the right of way needs mapping. Right of way needs mapping will be prepared to be submitted concurrently with the 65% PS&E and will be updated following development of the 95% PS&E. Mapping will be provided in hard copy and PDF format.

Deliverables

- Draft and Final Right of Way Needs Map (2 hard copies and PDF format)

3.2 Plats and Legal Descriptions

Up to forty five (45) plats and legal descriptions will be prepared and shall conform to California Land Surveyor’s Act requirements. Plats and legal descriptions will be submitted to the RTC and County for review and comment and will be updated once based upon those comments. Additional rounds of review and revision will be performed as supplemental service.

Deliverables

- Plat and Legal Descriptions for fee take acquisition and TCE needs (2 hard copies and PDF format)

3.3 Utility Coordination

Mark Thomas will obtain utility mapping from utility companies and local agencies and prepare a utility base map. Mark Thomas will coordinate with utility companies for relocation requirements (extent, appropriate clearances, timing, rights of way, working space, etc.) and adherence to the project schedule.

Utility Coordination Procedures

Mark Thomas will follow the Caltrans Utility Coordination Process throughout the design. This will include the following:

- Utility “A” Letter – This letter is sent out to all the utility companies who operate in the area to determine if they have facilities within the project limits. The RTC will approve the letter of transmittal and receive evidence of mailing.
- Utility facility maps based upon the information received from Utility Owners will be assembled and incorporated into the base mapping and are verified through topographic surveys.
- Potholing will be completed for existing facilities in the project limits and will follow the Caltrans Policy on Positive Location of High Priority Utilities. For purposes of this scope, it is assumed that

potholing will be completed for all 5 of the existing underground facilities shown within the project limits and this scope includes up to 15 total potholes for a not to exceed amount of \$45,000. The number of potholes and the fee associated with the completion of potholes is a placeholder only. Upon final determination of the required pothole locations, a final cost for potholing will be documented in writing.

- Utility “B” Letters and Positive Location Maps – The “B” Letter will be sent to document the receipt of the facility mapping and incorporation into the project base mapping. Positive Location Maps will be prepared. Mark Thomas will prepare a “Master” colored utility map showing all the utilities along with individual maps for each utility company showing their facilities only.
- Utility Conflict Maps will be prepared for any facilities that are in conflict with the proposed construction. The layout and format of the Conflict Maps is similar to the Positive Location Maps.
- A Report of Investigation (ROI) will be prepared for each existing facility to document facts and circumstances that support the liability determination. The ROI will include the original form, Utility Owner's relocation plans, cost estimates, and claim letter, a copy of the Notice to Owner, and a copy of the Utility Agreement.
- Utility “C” Letters - This letter is sent out to all utility companies whose facilities are in conflict with the proposed project. This letter will request for the utility Owner's claim of liability, relocation plans and estimated relocation costs. A Notice to Owner and Utility Agreement will be prepared for RTC and each utility that is in conflict with the proposed construction. These documents will identify the cost share/liability, timeframes for relocations, and will include Relocation Plans and Cost Estimates (prepared by the utility company involved).
- As a supplemental service, Mark Thomas will prepare Amended Utility Agreements and Revised Notice to Owners due to any changes from the originally planned and agreed upon utility scope of work that arise from utility owner or RTC requests. (Not currently included).

Utility certification packages will be sent to the RTC and Caltrans for approval and included in the Right of Way Certification package.

Deliverables

- Utility “A”, “B”, and “C” Letters
- Potholing Report (PDF format)
- Report of Investigation for each utility facility required for relocation
- Utility positive location map
 - Utility Conflict Map
 - Notice to Owner for each utility facility required for relocation
 - Utility Agreement for each utility facility required for relocation

Utility Coordination Meetings

Mark Thomas will participate in up to twelve (12) utility coordination meetings with affected utility companies. The purpose of the meetings will be to serve as a check in and status update on the utility conflict mapping and relocation process. Mark Thomas will prepare and disseminate meeting agendas before each meeting and meeting minutes with action items after each meeting. These meetings are necessary to verify that satisfactory progress is being made by the utility companies and to make sure utility conflicts do not unnecessarily delay the start of the construction.

Deliverables

- Meeting Agendas, Minutes, Actions Item List (12 meetings)

3.4 Right of Way Certification and Acquisition Coordination

Right of way acquisition will be carried out by agreement between RTC and the County. Coordination will include explanation of project design intent to the County staff, review of different design alternatives, preparation of exhibits, etc. This task may also include preparation and coordination with Caltrans for Section 83 acquisition forms. An allowance of 80 hours of engineering staff time is allocated to this task. Mark Thomas staff will also be available to set “show-me” stakes at approximate location of right of way take if requested. An allowance of 80 hours of field crew time plus office support is allocated to this task.

Prior to achieving Ready to List (RTL) status with Caltrans, Caltrans will require completion of the right of way certification document. Mark Thomas will prepare a draft and final right of way certification (five copies for review) plus one final certification. The Right of Way Certification will document completion of:

1. Right of way, including TCEs, must be acquired or "in control." Caltrans will review the property files described above to verify that acquisition activities (legal description, etc.) match Caltrans requirements for access control, land rights, etc. The property can either be acquired by this time, or the project proponent can have a Caltrans-approved Permit to Enter or orders of possession. The latter two options would occur if an immediate agreement cannot be reached. Typically, a spreadsheet for all required properties is prepared with acquisition status noted.
2. Utility relocation is complete or an approved relocation plan, utility reimbursement agreement, utility-approved relocation schedule, and a statement by the utility absolving Caltrans of any financial obligations. Mark Thomas will prepare the Project Engineers statement for R/W Utility Certification. Mark Thomas will not be responsible for utility relocation plans.
3. Caltrans Utility Policy Certification that the project design and delineation meet Caltrans Utility Policy as specified per Caltrans Project Development Procedure Manual.
4. Certificate of Sufficiency (COS) with Approved Hazardous Substances Disclosure Document (By Caltrans Environmental).

Deliverables

- Draft and Final Right of Way Certification (5 copies each)
- Draft and Final Project Engineers R/W Utility Certifications (5 copies each)
 - Draft and Final Project Engineers Utility Policy Certification (5 copies each)
 - Project Engineer Certification of Sufficiency (1 Copy)

Task 4 PS&E Support

4.1 Geometric Confirmation/ Refinement

Once base mapping and field surveys have been conducted, Mark Thomas will review project geometry as shown in the approved Project Report (PR). Mark Thomas will confirm ramp geometry, wall limits and heights, determine preliminary wall types, and refine project geometrics to reflect current field conditions and current design standards. The topographic information will be used to

determine more precise embankment catch points, retaining wall limits and confirm that project improvements can be constructed within the existing right of way. The geometry included in the PR will be updated for actual field control, topographic conditions, and current design standards. The updated geometry will be documented in a project exhibit.

Work products to include refined geometry exhibit (five copies). One version of the exhibit will be prepared, one plotted on topographic background with geometric information and definition (a GAD lite) and one on aerial background, colored and plotted for general project information and meeting use. .

Deliverables

- Project Geometric Exhibit (Draft and one revision)
- Project Exhibit on aerial photograph background (Draft and one revision)

4.2 Supplemental Design Standard Decision Document (DSDD)

Based on the refined project geometry, Mark Thomas will review and identify additional nonstandard design features that are not included in the original approved DSDD. Prior to development of a supplement DSDD, Mark Thomas will setup a geometric workshop meeting with stake holders, and Caltrans geometrician to go over these nonstandard design items. Once project stake holders are in agreement with these nonstandard design features, Mark Thomas will prepare a supplement DSDD for Caltrans' review and approval. It is assumed that the FHWA Highway Safety Manual safety analysis is not required.

Deliverables

- Supplemental Design Standard Decision Document (Draft and two revisions)
- Supplemental DSDD Geometric Workshop Agenda, Minute, Actions Item List (1 meeting)

4.3 Foundation Report and Log of Test Borings

PARIKH will prepare foundation report and log of test borings for the Aptos Creek Bridge Widening, North Aptos POC and South Aptos POC and for the eight retaining walls (Caltrans right-of-way walls). The following is a task breakdown for the proposed work.

- Research and Data Collection: Review of readily available geologic and soil literature in the vicinity of the site including review of any as-built drawings and existing LOTB.
- Permits/USA Clearances: We will comply with the Caltrans Permit requirements. Encroachment permits from Caltrans and the county will be provided by the RTC.
- We will locate the borings and call for USA clearance.
- Field Exploration: The following table shows our field exploration plan for each structure. As per Caltrans general guidelines, retaining walls will require a boring maximum every 200' length. These explorations will provide an evaluation of subsurface conditions for the proposed structures. Traffic control will be assumed for 4.5 shifts. It is assumed SCCRTC will provide the access through the private properties for South and North Aptos POC borings.

Foundation Reports

Structure Elements	Number of Borings
Aptos Creek Bridge Widening	1 boring @120' at each abutment with lane closure 1 boring @ 100' at Spreckels Drive with lane shift (requires County Encroachment permit)
North Aptos POC	1 boring @120' depth at each abutment
North Aptos POC	1 boring @120' depth at each abutment
Valencia Creek Pedestrian Trails Bridge	1 boring @100' depth at each abutment
Aptos Creek Pedestrian Trail Bridge	1 boring @100' depth at each abutment
RW 1 (Soil Nail/Soldier Pile) (Approx. Length 445)	3 borings @ 50'
RW 2 (Soil Nail/Soldier Pile) (Approx. Length 235)	2 borings @ 50'
RW 6 (Soil Nail/Soldier Pile) (Approx. Length 615)	3 borings @ 50' (one additional boring will be shared with North Aptos POC boring)
RW 7 (Soil Nail/Soldier Pile) (Approx. Length 385)	2 borings @ 50' (one additional boring will be shared with North Aptos POC boring)
RW 8 (Soil Nail/Soldier Pile) (Approx. Length 600)	2 borings @ 50' (two additional boring will be shared with North Aptos POC boring and overhead sign)
RW 4 (MSE Wall) (Approx. Length 450)	2 borings @ 50' (one additional boring will be shared with Aptos Creek Bridge widening boring)
RW 5 (MSE Wall) (Approx. Length 300)	1 boring @ 50' (one additional boring will be shared with Aptos Creek Bridge widening boring)
RW 3 (Caltrans Standard) (Approx. Length 176)	1 boring @ 50'
Sound Wall NB-S86a (Caltrans Standard) (Approx. Length 606)	2 boring
Sound Wall NB-S9 (Caltrans Standard) (Approx. Length 885)	2 boring

The boring locations will depend upon the available access and the boring data from previous studies. We anticipate using a truck-mounted and track-mounted rig for the bridge MSE wall and Caltrans standard wall (along Hwy 1) borings. We anticipate portable rig for soil nail/soldier pile borings. Coordination and encroachment/permit to enter is to be provided by the RTC. We will classify and continuously log subsurface soil conditions encountered in each test boring at the time of drilling. Obtain "relatively undisturbed" and bulk samples of substrata from test borings. The borings will be drilled and capped in accordance with the permit requirements.

- **Laboratory Testing:** We will perform laboratory tests on representative soil samples such as moisture density, consolidation tests, unconfined compression, gradation analyses, corrosion tests and Plasticity Index test, corrosion test, as necessary.
- **Soils Analysis/Evaluation:** We will perform engineering analyses and develop design recommendations for the proposed structure foundation design. The design should follow AASHTO LRFD specifications (8th edition, September 2017) with California amendment 2019.
- **Prepare Foundation Reports (Type Selection) for the bridges and retaining walls:** Prepare preliminary recommendations for the 3 bridges and 8 retaining walls (Caltrans right-of-way walls) and provide Draft Preliminary Foundation Reports with the LOTB. The foundation design will be based on analyses using Caltrans seismic design and LRFD guidelines. It is assumed SNAIL runs for the soil nail wall will be performed by Mark Thomas. We will provide geotechnical design parameters for the analysis. We will discuss seismic considerations, evaluate the liquefaction potential and comment on the site soil conditions from this standpoint. Information related to Caltrans Seismic design criteria (SDC v 2.0) shall be provided. Information related to the recently revised Seismic design guidelines (2019) and the ARS curves (using Caltrans ARS online tool) will be provided.
- We will prepare Final Foundation Reports for each structure (Total 13 reports). Using the general plan as a base map, we will provide boring logs (LOTB).

Deliverables

- Preliminary and Final Foundation Reports (5 bridges, 8 retaining walls) (5 hard copies and PDF format)

4.4 Geotechnical Design Report and Materials Report

Highway 1 Improvements

PARIKH will prepare a separate Geotechnical Design Report (GDR) and a Pavement Design and Materials Report (PDMR). This is a new requirement as per Caltrans effective June 3, 2020. The GDR will include 10 overhead signs, 2 sound walls, slope stability and embankments. The PDMR will include the pavement design and discussions on corrosion. Alternative pipe Recommendation to maintain existing Valencia Creek culvert will be included in the PDMR. No other culverts are known or proposed at this time. Detail scope for preparing this report is as follows:

- **Research and Data Collection:** Review of additional available geologic and soil literature in the vicinity of the site.
- **Permits/USA Clearances:** We will comply with the Caltrans and County Permit requirements. Encroachment permits will be provided by the RTC.
- We will locate the borings and call for USA clearance.
- **Field Exploration:** The boring program is provided in the table below.

Project Elements	Number of Borings	Approximate Depths (ft)
Pavement (some samples will be hand excavated)—Pavement Design and Materials Report	8-10 (R-value samples)	3-5'
10 Overhead Signs - GDR	10	45'
Sound Wall 1 (Approx. Length 340')	1	40'
Sound Wall 2 (Approx. Length 750')	1 (one additional boring will be shared with south Aptos POC boring)	40'
Sound Wall 3 (Approx. Length 560')	2	40'
Sound Wall 4 (Approx. Length 665')	1 (one additional boring will be shared with north Aptos POC boring)	40'

Portable rigs will be used for the sound wall borings, since the borings are on the top of the slope. Based on the above, 8-10 R value samples will be collected, 10 overhead sign borings and 5 sound wall borings are proposed. These explorations will provide an evaluation of subsurface conditions for the proposed roadway portion of the project, sound wall and overhead sign locations. The boring locations will depend upon the available access and any permit conditions. Traffic control is assumed for 5 shifts. We will classify and log subsurface soil conditions encountered in each test boring at the time of drilling. Obtain "relatively undisturbed" and bulk samples of substrata from test borings. The borings will be drilled and capped in accordance with the permit requirements. Generally, the borings are required to be backfilled with cement grout.

- **Laboratory Testing:** We will perform laboratory tests on representative soil samples such as moisture density, unconfined compression, corrosion tests, gradation analyses, R-value tests, corrosion tests and Plasticity Index test, as necessary.
- **Soils Analysis/Evaluation:** We will perform engineering analyses and develop design recommendations for the overhead sign structures, sound walls and proposed embankments, and pavement design.
- **Prepare Draft Geotechnical Design Report (separate) and Pavement Design and Materials Report (separate):** We will prepare preliminary recommendations including pavement section, sound wall, overhead signs, drainage basins, and embankment construction will be incorporated in the reports. Traffic Index will be provided by the designer. Draft LOTB will be included in the report.
- **Prepare final Geotechnical Design Report (separate) and Pavement Design and Materials Report (separate):** The Final GDR will include response to review comments from agency. Final design recommendations will be based on the updated design requirements. Using the general plan as a base map, we will provide boring logs using the standard Caltrans LOTB sheets. Final PDMR will also be prepared using the same process.

Deliverables:

- Draft and Final GDR (Includes 10 Overhead Signs, 4 Noise Barriers) (5 hard copies and PDF format)
- Draft and Final PDMR (Includes Pavement Design & corrosion tests) (5 hard copies and PDF format)

Trail Improvements

PARIKH will prepare a Geotechnical Design Report (1 report) and log of test borings for the Segment 12 Trail retaining walls (3 walls) and structural pavement sections. Two trail structures at Soquel Drive (Br. No 36C-0077 & 36C-0069) will only be limited to exploration (one boring at each bridge site) and seismic evaluation during PS&E phase. If further foundation retrofit is necessary, it will be an optional task. The following is a task breakdown for the proposed work.

- Research and Data Collection: Review of readily available geologic and soil literature in the vicinity of the site including review of any as-built drawings and existing LOTB.
- Permits/USA Clearances: We will comply with the county permit requirements. Encroachment permits from county will be provided by the RTC.
- We will locate the borings and call for USA clearance.
- Field Exploration: The following table shows our field exploration plan for each structure. As per Caltrans general guidelines, retaining walls will require a boring maximum every 200' length. These explorations will provide an evaluation of subsurface conditions for the proposed structures.

Foundation Reports

Structure Elements	Number of Borings
RW 9 (Soldier Pile) (Approx. Length 800)	5 borings @ 50'
RW 10 (Caltrans Standard) (Approx. Length 400)	2 borings @ 50' (one additional boring will be shared with south Aptos POC boring)
RW 11 (Caltrans Standard) (Approx. Length 500)	3 borings @ 50'
Pavement (some samples will be hand excavated)	5-6 (R-value samples)
Soquel Drive & Aptos Creek (Br. No 36C-0077)	1 boring @ 100'
Soquel Drive & Valencia Creek (Br. No 36C-0069)	1 boring @ 100'

The boring locations will depend upon the available access and the boring data from previous studies. We anticipate using a portable rig for the borings. Coordination and encroachment/permit to enter is to be provided by RTC. We will classify and continuously log subsurface soil

conditions encountered in each test boring at the time of drilling. Obtain "relatively undisturbed" and bulk samples of substrata from test borings. The borings will be drilled and capped in accordance with the permit requirements.

- **Laboratory Testing:** We will perform laboratory tests on representative soil samples such as moisture density, consolidation tests, unconfined compression, gradation analyses, corrosion tests and Plasticity Index test, corrosion test, as necessary.
- **Prepare Draft Geotechnical Design Report:** We will prepare a Draft Geotechnical Report with recommendations for 3 retaining walls and structural pavement sections. The foundation design will be based on analyses using Caltrans seismic design and LRFD guidelines.
- **Two Rail Bridges Seismic Evaluation:** Seismic evaluation will be performed based on the site-specific boring data and results will be provided in separate memos for each bridge. If full foundation retrofit is necessary, a foundation report will be prepared as an optional task (not included in base budget). We will discuss seismic considerations, evaluate the liquefaction potential and comment on the site soil conditions from this standpoint. Information related to Caltrans Seismic design criteria (SDC v 2.0) shall be provided. Information related to the recently revised Seismic design guidelines (2019) and the ARS curves (using Caltrans ARS online tool) will be provided.
- **Prepare final Geotechnical Design Report (1 Report) for 3 retaining walls.** Structural pavement sections will be included in the geotechnical design report. Using the general plan as a base map, we will provide boring logs (LOTB).

Deliverables:

- Draft and Final GDR (For Segment 12 Trail) (5 hard copies and PDF format)
- Draft and Final Memo for Soquel Drive & Aptos Creek Rail Bridge Seismic Evaluation (5 hard copies and PDF format)
- Draft and Final Memo for Soquel Drive & Valencia Creek Rail Bridge Seismic Evaluation (5 hard copies and PDF format)

4.5 Type Selection Report

Mark Thomas will prepare two type selection reports documenting the South Aptos POC, North Aptos POC, South Aptos Underpass replacement, North Aptos Underpass replacement, Valencia Creek Pedestrian Bridge, Aptos Creek Pedestrian Bridge, Trail Bridge over Driveway, the SR1 Aptos Creek Bridge Widening and thirteen(13) specialty retaining wall structures. The type selection reports will document the bridge and retaining wall types and configurations considered, construction phasing and constructability, proposed aesthetics, estimated costs, foundation recommendations, and the preferred structure types. The widening of the SR1 Aptos Creek Bridge will include seismic retrofit assessments. A structure General Plan and draft Foundation Plan will be prepared for each structure. Effort will include attendance at a Type Selection Meeting and updating the Type Selection Report after the Type Selection meeting. One type selection report will be submitted to Caltrans and SCCRTC for their approval that will include the North Aptos POC, South Aptos POC, North Aptos Underpass replacement, South Aptos Underpass replacement, Trail Bridge over Driveway, SR1 Aptos Creek Bridge Widening and ten(10) specialty retaining wall structures along SR1 or within Caltrans right-

of-way. One type selection report will be submitted only to SCCRTC for their approval that will include the Valencia Creek Pedestrian Bridge, Aptos Creek Pedestrian Bridge and three(3) specialty retaining wall structures along the rail trail outside Caltrans right-of-way.

Deliverables

- Draft Type Selection Reports (10 hard copies and PDF)
- Final Type Selection Reports (10 hard copies and PDF)

4.6 Structure Calculations

Mark Thomas will prepare structural calculations for the selected bridge and retaining wall alternatives. The structure design will be performed in accordance with AASHTO LRFD Bridge Design Specifications, 8th Edition with California Amendments and Caltrans Seismic Design Criteria, Version 2.0. The latest updated versions of the Caltrans Bridge Design Manuals will be used.

Mark Thomas will perform an independent design check of the bridge in conformance with Caltrans bridge design procedures. Calculations and computer runs will be performed to check the bridge layout and structural integrity. Upon completion of the design check, discrepancies between the design and check will be reconciled. Similarly, an independent check of the retaining wall designs will be performed by an engineer at Mark Thomas who was not involved in the original design of the walls.

Deliverables

- Bridge Design Calculations
- Retaining Wall Calculations
- Bridge Independent Check Calculations
- Retaining Wall Independent Check Calculations

4.7 Corridor Aesthetic Plans

Mark Thomas will develop conceptual aesthetic design plans for retaining walls, barrier treatments, noise barriers, gore paving treatments, landscape planting, and two pedestrian overcrossing structures, columns, fence, and abutments. The aesthetics design will be based on aesthetic guidelines prepared for the corridor. This scope includes a refinement of the aesthetic work developed in the PA/ED phase to be presented at up to two (2) public meetings and one set of revisions. Mark Thomas will work with RTC, Santa Cruz County, and Caltrans District 5 Landscape Architect and Structures Architect to gain consensus on the concept plan. The aesthetic concept plans will be used to gain consensus at the public meetings shown above and to seek project approval with RTC. Both draft and final aesthetic plans will be color rendered for use at the public meeting. A draft and final estimate will be prepared for the aesthetic concepts that may be incorporated into the 11-page estimate.

Deliverables

- Attendance at up to two public meetings
- Draft highway aesthetic plans – Up to three (3) 24x36 boards (5 copies) and one PDF copy
- Draft trail aesthetic plans – Up to three (3) 24x36 boards (5 copies) and one PDF copy
- Final highway aesthetic plans – Up to three (3) 24x36 boards (5 copies), one PDF copy, and one electronic copy of each rendering as camera-ready artwork for RTC communications.
- Final trail aesthetic plans – Up to three (3) 24x36 boards (5 copies), one PDF copy, and one electronic copy of each rendering as camera-ready artwork for RTC communications.

- Draft and final aesthetics estimate

4.8 Transportation Management Plan

Mark Thomas will prepare a Transportation Management Plan (TMP) for the project. The TMP will conform to Caltrans TMP Guidelines by addressing project strategies and approaches to reduce traffic impacts of construction through Public Information, Motorist Information, Incident Management Strategies, Construction Strategies and Alternative Route Strategies. The TMP will include calculations for lane closures and preparation of lane closure charts. Mark Thomas will prepare the TMP at the 65% milestone and finalize the TMP at the 95% project completion milestones. The TMP checklist will be updated at the 100% and RTL milestones and the final report at the 95% stage will be reproduced with the updated TMP checklist attached. This scope of work assumes that PIMS hourly traffic count data is available within the project limits. This scope assumes that a separate lane closure report will not be required, and all lane closure information will be contained in the TMP. The scope excludes conducting traffic counts, although counts can be conducted as an additional out of scope service.

Deliverables

- Draft TMP Report at 65% submittal (5 copies and PDF format)
- Final TMP Report at 95% submittal (5 copies and PDF format)
- Final TMP Report with updated TMP Checklist at RTL at 100% submittal (5 copies and PDF format)

4.9 Drainage Report

WRECO will review and summarize site conditions, assess watershed characteristics, identify design criteria, review readily available data, and prepare design calculations to assess the capacity of the proposed drainage systems. WRECO will prepare a Drainage Report which will include calculations to assess the need for any drainage improvements, as well as summarized results and design recommendations. The report is expected to include the following:

- An evaluation of the existing facilities and proposed conditions,
- Unusual and special conditions, and
- Hydraulic analyses.

Other members of the Project Team will verify as-built information and utility conflicts as well as provide survey information to WRECO. They will also be responsible for drafting and preparing the drainage design (first conceptual drainage layout and flowlines) including the PS&E. WRECO will verify and compare the Project Team's plans with WRECO's Drainage Report for consistency.

Deliverables

- Draft Drainage Report at 65% submittal (5 copies and PDF format)
- Revised Draft Drainage Report at 95% submittal (5 copies and PDF format)
- Final Drainage Report at 100% submittal (5 copies and PDF format)

4.10 Storm Water Data Report

WRECO will update the PA&ED-Level Stormwater Data Report with the development of the PS&E, summarizing the project impacts to water quality and recommended BMPs. WRECO will update the

BMPs that were considered during the PA&ED Phase based on more detailed design, survey, soil, and groundwater information. WRECO will perform detailed calculations to complete the design and detail usage of the treatment BMPs.

Deliverables

- Draft SWDR at 65% submittal (5 copies and PDF format)
- Revised Draft SWDR at 95% submittal (5 copies and PDF format)
- Final SWDR at 100% submittal (5 copies and PDF format)

4.11 Preliminary Site Investigation and Aerially Deposited Lead

If the ISA Report from the PA&ED phase recommends field sampling and testing, WRECO can conduct a PSI that includes an Aerially Deposited Lead (ADL) study and other potential constituents of concerns (COC) identified in the ISA. The PSI Study will include shallow soil sampling in areas proposed for soil disturbance during upcoming multi-modal improvements. Soil samples will be collected from the unpaved shoulder/planters along the sidewalk and existing roadway (traffic control required). The PSI will be performed in accordance with the American Society for Testing and Materials (ASTM) International Standard E1903-11, Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process, and Caltrans ADL study standards successfully applied in this region by WRECO.

Although leaded fuel has been prohibited in California since the 1980s, ADL from vehicle emissions may still be present in surface and near-surface soils in unpaved areas along California highways and roadways. Because lead is ubiquitous in the environment, sampling and analysis of soil is performed during project development to determine if lead concentrations are at levels that require special management and/or disposal. The Department of Toxic Substances Control-Caltrans Statewide Agreement for Caltrans For Reuse of Aerially Deposited Lead-Contaminated Soils, March 2016 (Agreement), provides guidelines for soil reuse based on lead concentrations in soil. To use the Agreement, a minimum number of samples must be taken from specific depths in ADL risk areas. Soil samples will be collected from approximately 22 borings spaced equidistant (as feasible) and sampled to 5-feet below ground surface using a Direct Push Technology (DPT) rig with an acetate liner. The acetate liner will be cut into specific depth intervals (0-1 feet, 1-2 feet, and 2-3 feet), and analyzed for lead (EPA Method 6020) and pH (EPA Method 9045) in ADL risk areas (exposed soil areas within 50 feet of the roadway). Concentrations of lead will be compared to regulatory levels (80 milligrams per kilogram [mg/kg]) to evaluate soil re-use/disposal.

Other COCs in the project area/corridor consist of train tracks located near the project area/corridor may impact shallow soil with Polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH), metals, semi-volatile organic compounds (SVOC), and volatile organic compounds (VOC). Based on the agricultural use of the land near the project area/corridor, pesticides and heavy metals may be present in exposed soil. Additional COCs that the soil samples will be analyzed for include Total Petroleum Hydrocarbons (TPH) as gasoline (TPHg), diesel (TPHd), motor oil (TPHmo), PCBs (EPA Method 8082), organochlorine pesticides (EPA Method 8081), organophosphorus pesticides (EPA Method 8131), California Administrative Manual (CAM 17) Metals (EPA Method 6020), and PAHs/SVOCs (EPA Method 8270C).

Field Work - WRECO will prepare a Sampling Analysis Plan (SAP) and a Health and Safety Plan (HASP) for the proposed field work activities. Sample locations will be marked in white stakes and paint and Underground Service Alert (USA) North 811 will be notified a minimum of 72 hours prior to the start of field sampling. WRECO will obtain applicable permits, rights-of-entry, or drilling permits as needed, and subcontract a licensed drilling company to perform the field work. WRECO will sample up to 30 borings using a Direct Push Technology (DPT) rig to take continuous core soil samples at specific locations. DPT uses a hydraulically operated percussion hammer along with vehicle weight to advance the sampling barrel with an acetate liner used to contain the soil sample. All borings will be sampled to a depth of 5 feet below ground surface (bgs) for the purpose of ADL sampling in risk areas (exposed soil areas within 50 feet of the roadway). The acetate liner will be cut into specific intervals, 0-1 feet, 1-2 feet, and 2-3 feet bgs, capped at each end with a Teflon sheet and plastic lid, labeled, and placed into an ice chest with ice. Samples will be logged on the chain-of-custody which will be given to the laboratory upon delivery of the soil samples for analyses. The borings will be backfilled with grout and capped with native soil. The soil samples will be analyzed for lead and pH using EPA 6010 and EPA 9045, respectively, following Caltrans protocol. WRECO will provide oversight during drilling and sampling activities and submit samples to a state-certified laboratory, following chain of custody protocol, and analyzed for specific COCs.

Based on potential RECs identified in the ISA, other COCs in soil may include volatile organic compounds (VOC; EPA Method 8260), TPH as gasoline, diesel, and motor oil (EPA Method 8015), PCBs (EPA Method 8082), pesticides (EPA Method 8141/8081), and CAM 17 Metals. Groundwater samples will be collected and analyzed for the COCs listed in the VOC and Fuel General Permit Waste Discharge Requirements (WDR). Some deeper borings will be sampled to the saturated zone in order to obtain groundwater samples to verify if groundwater meets the WDR permit screening levels for potential dewatering activities. Groundwater levels are presumed to be between 16-26 feet bgs based on previous information in the Project area.

Structural Elements Sampling (Asbestos and Lead Survey) - As part of the PSI Project, structural elements sampling for Lead-based Paint (LBP) and Asbestos-containing Material (ACM) will be conducted at the three locations where the existing railroad bridges and Rio Del Mar Boulevard overpass crossover Highway 1. Structural elements sampling will consist of collecting ACM and LBP samples from all three structures and analyzed for ACM using polarized light microscopy (PLM) by EPA Method 600/M4-82-020 and EPA Method 600/R-93-116, and LBP using EPA Method SW 846 3050B/7000B, Flame Atomic Absorption Spectroscopy. In addition, samples will be collected from the paint on the bridge railings at the at each bridge locations and analyzed for LBP using EPA Method SW 846 3050B/7000B Flame Atomic Absorption Spectroscopy. ACM and LBP samples will be collected under supervision of a Certified Asbestos and LBP consultant.

PSI Report - The results of the PSI will be summarized and presented in a report, describing the drilling methods, sampling procedures, structural element sampling procedures, analytical results for soil and structural elements, data evaluation, conclusions, and recommendations for worker safety and soil management (re-use or disposal). WRECO will submit a Draft PSI Report to RTC, Santa Cruz County, and the Project Team, and then incorporate comments received into the Draft-Final PSI Report. Once final comments are received, they will be included in the Final PSI Report. The report will comply with the CEQA/NEPA requirements.

Task Assumptions:

- A delineation of the limits of hazardous wastes is not a part of our scope of work
- Access to the Project area will be provided to WRECO at no cost
- WRECO will sample only areas readily accessible without resorting to methods requiring special Cal/OSHA certifications or permits including: confined space, harnessing, SCUBA, repelling, trench or tunnel, etc. Concealed spaces, cavities, covered materials, and otherwise inaccessible spaces that might contain suspect materials will not be sampled. WRECO will not dismantle or otherwise destroy infrastructure to reach otherwise inaccessible suspected hazardous materials.
- The field work will be performed along the roadway, and traffic control is required. Traffic control will be provided by a subcontractor to WRECO
- A DPT rig will be used for collecting soil and groundwater samples. WRECO plans to use DPT for up to 30 borings (shoulders and median of the freeway).
- Assuming two (2) days for DPT sampling with traffic control, and one (1) day for structural element sampling.
- A utility location contractor will be used to clear locations along the roadway prior to drilling.
- No restrictions on work times will be imposed for a typical 8-hour workday.
- Normal turnaround time will be used for laboratory analyses (10 days).

Deliverables

- Draft PSI Report at 65% submittal (5 copies and PDF format)
- Revised Draft PSI Report at 95% submittal (5 copies and PDF format)
- Final PSI Report at 100% submittal (5 copies and PDF format)

4.12 Landscape Conceptual Design

Mark Thomas will prepare one draft landscape planting concept plan and one revision plan that responds to RTC, Caltrans, and County comments. This landscape concept plan will outline all the areas of potential new planting required due to tree removals, grading, invasive removal identified in the PA/ED phase, and construction of highway and trail features. The draft concept will be prepared as a black and white drawing for the full length of each corridor. The final concept will be provided in color. Up to two (2) photo simulations will be provided to illustrate planting around the two pedestrian over crossings (POC). Fee includes preparation of estimates of probable construction cost for planting and irrigation. The location of trees within the study area will be mapped by an arborist using GPS technology capable of submeter accuracy, or survey data available at the time. Data will include location, size (dbh), and species at a minimum and will be provided on a topographic base map indicating which trees will be removed and which would be impacted by the project.

Deliverables

- Draft Highway Landscape Concept Plan - 100 scale in black and white in PDF format
- Draft Trail Landscape Concept Plan - 100 scale in black and white in PDF format
- Final Highway Landscape Concept Plan - 100 scale in color in PDF format
- Final Trail Landscape Concept Plan - 100 scale in color in PDF format
- Existing Highway Tree Base Map - 100 scale in PDF format
- Existing Trail Tree Base Map - 100 scale in PDF format
- Two, color-rendered photos simulations - one PDF copy, and one electronic copy of each rendering as camera-ready artwork for RTC communications.

4.13 Landscape and Aesthetic Concept Workshops

Mark Thomas will lead one workshops with the RTC, County, and Caltrans. The workshop's purpose would be to review the concepts and receive feedback from the community.

Deliverables

- One (1) Landscape Concept Workshops

4.14 Environmental Permitting

Dredge and Fill Activities associated with geotechnical investigations and bridge construction in waters of the United States are regulated by the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act (CWA), the Regional Water Quality Control Board under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act; the California Department of Fish and Wildlife through sections 1600 to 1616 of the Fish and Game Code; and Coastal Development Permit through Santa Cruz County.

Geotechnical investigation that are in-water or would disturb adjacent sensitive resources will require environmental permits. ICF will work with Mark Thomas to prepare permit applications for geotechnical investigation as soon as possible following NTP. Geotechnical investigations will likely influence the bridge foundation design, which intern will influence construction impacts to jurisdictional waters. ICF will work with Mark Thomas to develop a geotechnical drilling plan that can utilize the USACE nationwide permit for survey activities, the water quality certification issued for certain NWP 6 activities, and a CEQA Categorical Exception. To allow geotechnical in-water work to start as early as possible, field access will be critical to complete the tree surveys and land cover profiles needed to support permitting.

In addition to schedule priorities, the ICF permit approach emphasizes efficiency by doing work for the permits at the same time the environmental document is being prepared to ensure consistency wherever feasible. ICF will also utilize Caltrans permit checklists and permit processes described on their Standard Environmental Reference (SER) webpage.

Apart from the keys to success for permit application preparation, another key consideration for obtaining permits and controlling costs is environmental mitigation development. ICF will commence with mitigation planning from early in the project execution to identify a range of potential options including on-site restoration at the project sites, restoration of adjacent areas where allowed by underlying landowners, off-site restoration or mitigation opportunities, and the use of mitigation banks or in-lieu fees. ICF and Mark Thomas will integrate mitigation considerations into the bridge design approach to identify synergies wherever possible. ICF will identify the advantages and disadvantages of each, including agency acceptance, costs, timing, and risks and present them to the Transportation Commission for consideration prior to developing the draft restoration and compensatory mitigation plan for submission to the agencies.

The permitting task includes the payment of associated permit fees by ICF up to the estimated amount, which will then be reimbursed by RTC.

The ICF scope includes virtual attendance at up to 4 permit related meetings with local or permitting agencies, and up to 3 field site visits. ICF will oversee the permit application process, and coordinate

with local agencies and the engineering team during the preparation of the applications, up to the budget provided.

Conduct Tree Survey - To determine the number and size of riparian trees to be removed, ICF will conduct a tree survey and prepare a Tree Survey Results Memorandum with photographs, a table, and map showing the location of each tree >4” in diameter at breast height and providing the tree species, size, and general health status in support of the riparian mitigation and restoration plan.

Geotechnical Environmental Permit Applications

Section 404 Pre-Construction Notification - The bridge crosses a creek regulated by the Corps pursuant to Section 404 of the Clean Water Act. Section 404 is triggered when there is a discharge of dredged or fill material to a water of the U.S. Based on ICFs current understanding of the project, this scope assumes that the geotechnical borings proposed will occur below the ordinary high water mark of the creek and qualify for nationwide permit 6 (Survey Activities, NWP 6) authorization and the Water Quality Certification issued for NWP 6 activities by the State Water Resources Control Board. The work effort will include preparation and submittal to the Corps of a PCN, which includes information regarding compliance with Section 401, the Endangered Species Act, and Section 106 of the National Historic Preservation Act. ICF will also prepare and submit the Notice of Intent form and other information required by the Water Board for coverage under the Water Quality Certification issued for NWP 6. ICF assume Caltrans will complete any ESA and Section 106 consultations for the geotechnical work, if required. ICF also assume the work will be exempt from CEQA (Class 6) and CDFW will not require any further impact analysis under CEQA. NEPA compliance has already been completed by the Corps for the nationwide permit program, so no NEPA document is presumed to be necessary.

Section 401 Water Quality Certification - Section 401 of the CWA requires that the discharge of dredged or fill material into waters of the United States, including wetlands, does not violate state water quality standards. The State Water Resources Control Board has granted certification for 14 nationwide permits, including NWP 6. However, certification is subject to 10 conditions and notification requirements. Under this task, ICF will prepare the necessary notification and fee to the RWQCB demonstrating that the geotechnical boring activities will comply with the conditions of the pre certified permit.

Streambed Alteration Agreement - A streambed alteration agreement, in compliance with California Fish and Game Code, is required when projects 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, or 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. ICF will prepare and submit a notification package for a Streambed Alteration Agreement to the CDFW through their online permitting portal. The notification will describe the project features, construction period, construction methods, impacts on vegetation, fish, and wildlife, and the proposed mitigation/restoration plan (described above). ICF will revise a draft version of the application once based on comments from RTC and submit the online notification and fee to CDFW.

Construction Environmental Permit Applications

Clean Water Act Section 404 Permit - ICF will assist with the development of written descriptions based on information provided by Mark Thomas specific to each project action needing authorization by regulatory agencies. Once the technical project activity descriptions, disturbance boundaries, staging/laydown areas, and construction methods are complete and approved for use in applications, they will be used to determine the extent of impacts to jurisdictional resources and create the impact maps completed by the GIS staff under permitting tasks. Based on ICFs preliminary review of the project, ICF believe the project can be authorized under Nationwide Permit (NWP) 14 (Linear Transportation Projects). ICF will prepare and submit a pre-construction notification (PCN) demonstrating compliance with the appropriate NWP conditions and regional conditions including Water Quality Certification (WQC), the federal Endangered Species Act (ESA), and Section 106 of the National Historic Preservation Act (NHPA). The outcome of ESA and NHPA consultations initiated by Caltrans will provide ESA and NHPA compliance.

Clean Water Act Section 401 Water Quality Certification - CWA Section 401 prohibits federal permitting or licensing agencies from issuing authorizations for construction activities having discharges into waters of the U.S., until the appropriate water quality certifying agency has issued a WQC, or waiver procedures have been satisfied. The new 401 Water Quality Certification Rule requires applicants to request a pre-filing meeting with the RWQCB at least 30 days prior to submitting a certification request. The pre-filing meeting is not mandatory. ICF will request the pre-filing meeting with RWQCB and lead a virtual meeting, if necessary. ICF would then prepare and submit the required WQC Application materials to the RWQCB. An application fee, copies of the PCN submitted to the Corps and the notification to CDFW will be included. Pursuant to the new 401 Water Quality Rule, the WQC Application will be submitted electronically to the Corps concurrently after which the Corps will set a “reasonable period of time” for issuance of the Certification. ICF will time submittal of the application so that that CEQA process is complete and the RWQCB can issue WQC within the “reasonable period of time” set by the Corps.

Streambed Alteration Agreement Notification - A Streambed Alteration Agreement (SAA), in compliance with Section 1602 of the California Fish and Game Code, is required when a project will substantially divert, obstruct, or change the natural flow of a river, stream or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed. ICF will prepare the required streambed alteration notification packages to be filed electronically with CDFW through the online permit portal. The notification will describe the project features; construction period; construction methods; impacts to vegetation (including trees), fish, and wildlife; and the proposed mitigation, restoration, and monitoring plans. The cost estimate for this task includes the notification fee. Within 60 days of a complete notification package determination, CDFW is required to issue a Draft Streambed Alteration Agreement. ICF will assist RTC with Draft SAA review and provide suggested revisions to be incorporated into the Final SAA, as necessary.

Riparian Restoration and Compensatory Mitigation Plan

ICF anticipates that the mitigation plan will need to include the revegetation of all temporarily disturbed areas and new fill areas. Our plan will utilize all available onsite areas for planting and adjacent uplands outside the project footprint if additional planting areas are necessary to meet the mitigation requirements. If adequate space is not available on or immediately adjacent to the project

site, the revegetation and restoration plan will include a description of supplemental compensatory mitigation acceptable to the RTC.

Coordinate with RTC on Location of On-Site Restoration Areas - ICF will attend one site visit with RTC to identify suitable mitigation areas within or adjacent to the project area. Prior to the site visit ICF will participate in one conference call with RTC to identify mitigation requirements and potential onsite and offsite planting areas. Following the conference call, it is assumed that RTC will coordinate with landowners and any applicable agencies to identify constraints to revegetating onsite or on other lands (e.g., private property, vegetation clear zones adjacent to utilities/infrastructure). Suitable onsite mitigation areas identified under this task will be incorporated into the Draft Riparian Restoration and Compensatory Mitigation Plan.

Prepare a Draft Riparian Restoration and Compensatory Mitigation Plan - Based on coordination with RTC, ICF will create a Riparian Restoration and Compensatory Mitigation Plan that includes restoring riparian and upland vegetation within the project area. For the purpose of this scope of work it is assumed that offsite mitigation sites, if proposed, will be identified and access provided by RTC. The draft plan will include plan view drawings showing the location of mitigation planting areas, tables showing species, quantities, and container sizes to be planted, maintenance and monitoring protocols, and success criteria acceptable to the California Department of Fish and Wildlife, Regional Water Quality Control Board, and the U.S. Army Corps of Engineers. The plan will also include contingency measures to be enacted if the mitigation does not meet success criteria. The final plan will be capable of being implemented by the restoration contractor hired by RTC to perform the work, but this task does not include the preparation of formal construction documents (i.e., plans and specifications). ICF will review the Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) and agency websites to identify possible compensatory mitigation options to offset impacts to the environmental resources that cannot be covered by onsite or offsite restoration sites. ICF will provide the possible compensatory mitigation options to RTC for their consideration. The acceptable options would be submitted to the agencies with the Draft Riparian Restoration and Compensatory Mitigation Plan for their approval.

Coastal Development Permit - ICF will prepare a Coastal Development Permit Application Package for the project in conformance with the County and/or California Coastal Commission (CCC) requirements for all relevant activities pertaining to the project. The package shall conform to the standard format accepted by the County's Local Coastal Program and Coastal Commission, cover relevant activities pertaining to the project, and include mapping and photographs completed for the project, sufficient to identify and visually describe location(s) to be included in the Permit.

Deliverables

- Draft and Final Tree Survey Memorandum (PDF format)
- Draft and Final Geotechnical Investigation Permit Applications (PDF format)
- Draft and Final Construction Permit Applications (PDF format)
- Draft Riparian Restoration and Compensatory Mitigation Plan (PDF format)
- Draft Permit Application Package for Caltrans review
- Final Draft Permit Application Package resolving Caltrans comments
- Final Permit Application Package resolving CCC comments, if necessary

4.15 Sound Wall Outreach and Voting

Mark Thomas will prepare exhibits to aid in the sound wall impacts. The exhibits will include plan and cross-sectional views and can be used during sound wall voting to realistically depict sound wall options, improving voter project understanding. This scope does not include 3D renderings.

Deliverables

- Sound Wall Exhibits

4.16 Rail Trail Coordination

The proposed Monterey Bay Sanctuary Scenic Trail Network Segment 12 will require modifications to Seven (7) existing railroad crossings. The seven (7) railroad crossings are:

1. State Park Drive – DOT 768262F
2. SR 1 - Cabrillo Hwy – DOT 768263M
3. Soquel Drive – DOT 768264U
4. Aptos Creek Road – DOT 768265B
5. Trout Gulch Road – DOT 768267P
6. Soquel Drive – DOT 768268W
7. SR 1 - Cabrillo Hwy – DOT 768269D

Modifications to existing railroad crossings are under the jurisdiction of the California Public Utility Commission (CPUC), and will require the completion and approval of a Form GO88-B.

Following completion of the Preliminary Engineering submittal to the RTC, MT will organize and lead the field diagnostic meetings for seven (7) railroad crossing with the RTC, CPUC, the County of Santa Cruz, Caltrans, other public agency stakeholders and the design team. MT will prepare the draft applications and provide all project materials to the stakeholders, as well as the detailed agenda. MT will draft the minutes of the field diagnostic meetings and publish to all attendees, incorporating all comments, input and action items identified.

The Site Diagnostic Meeting is a required step of the CPUC review and approval process for modifications to existing railroad crossings. We have assumed two meetings will be required for all seven (7) crossings. If a subsequent field diagnostic meeting is required later in the design process to obtain the concurrence of all stakeholders, MT will require an additional fee to organize and attend this additional meeting.

Following the receipt of the stakeholders Letters of Concurrence, we will prepare the final applications specified above for CPUC's approval of the crossing modifications.

A public agency or railroad must be the applicant for all new or modified railroad crossing applications to the CPUC. It is assumed that the RTC will be the applicant for the required applications.

Deliverables

- Draft and Final CPUC Applications (PDF Format)
- Field Diagnostic Agenda and Minutes (PDF Format)

TASKS 5,6, 7, AND 8 PS&E

The PS&E package will be prepared in conformance with Caltrans design and drafting standards. PS&E packages will be submitted at 65% (Task 5), 95% (Task 6), 100% (Task 7), and Final (Task 8) stages of completion as described below. The total plan package will be developed over a series of submittals which are described below with the following plan sheets comprising the final plan package:

Roadway Plans

Approximate sheet count:

	Plan	Estimated Number of Sheets
1.	Title Sheet	1
2.	Typical Cross Section	12
3.	Key Map and Line Index	1
4.	Survey Control Map	1
5.	Layout (Highway and Trail)	24
6.	Profile and Superelevation Diagram	20
7.	Construction Details	40
8.	Erosion Control Plans and Details	24
9.	Contour Grading	9
10.	Drainage Plans	24
11.	Drainage Profile and Details	24
12.	Drainage Quantity Sheets	5
13.	Utilities	15
14.	Stage Construction, Traffic Handling and Detours	38
15.	Construction Area Signs	4
16.	Pavement Delineation Plans & Quantities	24
17.	Summary of Quantities	5
18.	Signs/Quantities	30
19.	Standard Plan Retaining Walls	20
20.	Sound Wall Plans and Details	18
21.	Electrical	55
	Total Estimated Roadway Plan Sheets	394

Structure Plans (Aptos Creek Bridge Widening, two (2) POCs, two (2) Underpasses, three (3) pedestrian bridges and thirteen (13) specialty retaining walls)

Approximate sheet count:

	Plan	Estimated Number of Sheets
1.	Bridge General Plan	15
2.	Index to Plan	8
3.	Deck Contours	5
4.	Foundation Plan	8
5.	Abutment Layout and Details	22
6.	Bent Layout and Details	30
7.	Typical Section	11
8.	Girder Layout and Reinforcement Details	30
9.	Aesthetic Details	16
10.	Miscellaneous Details	30
11.	Railing Details	16
12.	Joint Seal Assembly	16
13.	Log of Test Borings	30
14.	Retaining Wall General Plan	13
15.	Retaining Wall Details	65
16.	Retaining Wall Aesthetic Details	13
17.	Log of Test Borings	26
	Total Structure Plan Sheets	354

Highway Planting and Irrigation Plans

Approximate sheet count:

	Plan	Estimated Number of Sheets
1.	Irrigation Removal Plans	6
2.	Irrigation Removal Quantities	1
3.	Plant List and Specifications	2
4.	Planting Plans	21
5.	Irrigation Schedule and Specifications	2
6.	Irrigation Plans	21
7.	Planting/Irrigation Details	6
8.	Irrigation Quantities	2
	Total Estimated Highway Planting and Irrigation Plan Sheets	61

Jurisdictional Mitigation Planting and Temporary Irrigation Plans

Approximate sheet count:

	Plan	Estimated Number of Sheets
1.	Plant List and Specifications	1
2.	Planting Plans	4
3.	Irrigation Schedule and Specifications	1
4.	Irrigation Plans	4
5.	Planting/Irrigation Details	2
6.	Irrigation Quantities	1
	Total Estimated Jurisdictional Mitigation Planting and Temporary Irrigation Plan Sheets	13

Trail Mitigation Planting and Irrigation Plans

Approximate sheet count:

	Plan	Estimated Number of Sheets
1.	Plant List and Specifications	1
2.	Planting Plans	11
3.	Irrigation Schedule and Specifications	1
4.	Irrigation Plans	11
5.	Planting/Irrigation Details	3
6.	Irrigation Quantities	2
	Total Estimated Trail Mitigation Planting and Irrigation Plan Sheets	29

Freeway Widening Design

Freeway widening design plans will follow Caltrans plan format. Typical cross sections and layouts will be provided. Construction details will be required for pavement elevation conforms and vertical control.

Drainage Plans

Culverts, ditches, inlets, and other drainage features will be shown on the drainage plans. Drainage systems will be numbered with letters assigned to individual drainage items. Drainage profiles will be on separate sheets, followed by drainage details and drainage quantities. Details will be required for any City or County standards, including manholes.

Erosion Control Plans

Erosion control plans including planting requirements for biostrips and bioswales within the project limits will be prepared. Erosion control plans will be prepared in conformance with current Caltrans requirements.

Utility Plans

Utility plans will be prepared which depict mapped utility facilities at the time of the start of construction. Utility facilities to be relocated by the contractor will be shown, while facilities to be

relocated by others will be shown. Utility plans will also include pothole locations. Any utility facilities that will be relocated prior to construction will be shown as an existing condition.

Traffic Handling/Stage Construction Plans

Traffic handling plans will be prepared for stage construction. This scope assumes a total of two stages. These plans, which will include temporary signing, assume that existing pavement grades will be maintained.

Electrical Plans

Y&C will obtain electronic base plans and as-built electrical plans from Mark Thomas and verify as-builts in the field. Using the obtained information, Y&C will prepare in conformance with Caltrans design and drafting standards, electrical plans, specifications, and cost estimates for lighting, sign illumination (removal), traffic monitoring station, call box, and bike/ped overcrossing lighting. The electrical PS&E will include permanent electrical systems as well as temporary electrical system for construction staging. The PS&E will be submitted to Caltrans, the RTC, and Santa Cruz County for review at 65%, 95%, and 100% levels. Any comments by the review agencies will be incorporated into final PS&E.

- Five sheets of 1"=50' Traffic Monitoring Station (TMS) Plan (five TMS)
- One sheet of 1"=50' CCTV plan
- Thirteen sheets of 1"=50' Lighting and Sign Illumination (Removal) Plan
- Two sheets of 1"=50' POC Lighting Plan
- One sheet of no scale POC Lighting Details
- Three sheets 1"=20' trail crossing lighting plan (assume 3 locations)
- Three sheets of 1"=50' Electrical Service for Irrigation Plan (assume 3 locations)
- One sheet of 1"=20' traffic signal layout plan (for Hwy 1 NB Off-ramp/Rio Del Mar Blvd)
- One sheet of no scale traffic signal equipment and conductor schedules
- Sixteen sheets of 1"=50' temporary lighting plan (assume 2 construction stages)
- Four sheets of 1"=50' temporary TMS plan
- One sheet of 1"=50' temporary CCTV plan
- Two sheets of no scale electrical quantities
- Two sheets of no scale electrical details

Specifications

Mark Thomas will prepare specifications for the project. The special provisions will follow Caltrans Standard Special Provisions (SSPs) and Standard Plans. It is understood that the project will be AAA by Caltrans; therefore, approval by Caltrans for all nonstandard SSPs (NSSP) will be required.

Construction Cost Estimates

Mark Thomas will prepare an itemized engineer's estimate at all submittal stages of the project. The format will be similar to the Caltrans Basic Engineering Estimating System (BEES) format. The unit costs will be determined by reviewing similar recent project bid summaries, recent similar Caltrans Contract Cost Data book, the California Highway Construction Cost Index information and reviewing the Caltrans ESC site for unit costs.

Contract Plan Preparation

Plans will be prepared for each bid package and submitted at the 65%, 95%, 100% and Final stages. Electronic submittal of sample plans will be made with the 65% and 95% packages. Submittal of MicroStation format plans will be made at the 100% and Final PS&E. The purpose of the phased approach is to provide sufficient level of plan development for meaningful reviews, but not provide excessive detailed design that may have to be revised for subsequent submittals. It is assumed that 5 sets of half size plans and estimate will be submitted to Caltrans for each submittal, plus one set to the County, and one set to the RTC. Five sets of hard copy specifications and 20 CDs with specifications in PDF format will be submitted to Caltrans, and 1 CD with specifications will be submitted to the County, and RTC.

Deliverables

- 65% Submittal: The 65% submittal represents a complete bid package with respect to geometric layout, utility and drainage; however, the overall details remain unchecked. The corresponding bridge submittal is the "Unchecked Details." Electrical plans will include locations of electrical equipment, loops, controllers and service locations. The conductor schedule will not be completed at this time. Special provisions will consist of marked-up Caltrans Special Provisions, with new specials and inserts clearly marked. Nonstandard SSPs will be identified to the degree possible. A BEES listing will be included, with appropriate SSP referenced adjacent to the contract item. Sample files (one page of each sheet, Layout, Construction Details, Erosion Control, etc.) of each plan type in MicroStation format will be submitted on a CD. Mark Thomas will participate in a constructability review with the PDT following the completion of the 65% PS&E and prior to submittal of the 95% PS&E, so that constructability review comments may be incorporated into the 95% documents.
- 95% Submittal – The 95% submittal represents a Draft PS&E. Major design features have been reviewed; however, some plan details are submitted for the first time at this submittal. Special provisions will consist of revised Caltrans SSPs, with new specials and inserts clearly marked. A BEES listing will be included, with appropriate SSPs referenced adjacent to the contract item. Stricken text will be shown. Sample files (one page of each sheet, Layout, Construction Details, Erosion Control, etc.) of each plan type in MicroStation format will be submitted on a CD ROM for Caltrans drafting unit format review. Mark Thomas will participate in a bidability review with the PDT following the completion of the 95% PS&E and prior to submittal of the 100% PS&E so that bidability review comments may be incorporated into the 100% documents. Mark Thomas will coordinate with Caltrans on scheduling a Safety Review meeting after the 95% PS&E submittal. Comments received from the Safety Review Committee (SRC) will be addressed and incorporated into the 100% PS&E package accordingly.
- 100% Submittal – This submittal represents final checked plans, ready for bidding, with changes as requested in the 95% review. A full set of MicroStation files will be submitted with the 100% package. Stricken text will be hidden with the specifications.
- Final PS&E Submittal – The final submittal will be a compliance submittal of the final bid ready documents. The final PS&E will be accompanied by a PS&E checklist. Following submittal of the final PS&E to Caltrans, Mark Thomas will prepare the Resident Engineer (RE) File and Survey File. The RE file will include a list of project contacts, memos to Resident Engineer, Quantity Calculations for use in releasing progress payments, utility agreements, permits, right of way contracts, and copies of relevant reports. The Survey File will include copies of all survey notes and calculations. Mark Thomas will prepare slope stake notes for slope staking. Control line

traverses and ties to right of way lines will also be included. Mark Thomas will submit general cross sections with the survey file.

Structure Plans

SR-1 Aptos Creek Bridge Widening: The existing SR-1 Aptos Creek Bridge is proposed to be widened. The proposed widening is approximately 42-feet wide. The widening is planned to match the existing bridge span configuration, either a precast prestressed concrete girder or a cast in place post-tensioned concrete girder, both with cast in drilled hole pile shafts, spread footings, and driven piles may be used depending upon geotechnical recommendations.

South Aptos POC: A pedestrian and bicycle overcrossing is proposed to connect the north and south sides of the rail trail over SR1. The proposed POC is a 16-foot wide structure with an alignment that parallels the existing railroad alignment over SR-1 on an offset alignment. The structure is planned to have a total of 1 or 2 spans; and consist of a prefabricated steel truss.

North Aptos POC: A pedestrian and bicycle overcrossing is proposed to connect the north and south sides of the rail trail over SR1. The proposed POC is a 16-foot wide structure with an alignment that parallels the existing railroad alignment over SR-1 on an offset alignment. The structure is planned to have a total of 1 or 2 spans; and consist of a prefabricated steel truss.

Valencia Creek Pedestrian Bridge: A pedestrian and bicycle bridge to connect the north and south sides of the rail trail over Valencia Creek and Soquel Drive. The proposed pedestrian bridge is a 16-foot wide structure that parallels the existing railroad bridge alignment over Valencia Creek on an offset alignment. The structure is planned to have a total of 3 spans; and consist of a prefabricated steel truss.

Aptos Creek Pedestrian Bridge: A pedestrian and bicycle bridge to connect the north and south sides of the rail trail over Aptos Creek and Soquel Drive. The proposed pedestrian bridge is a 16-foot wide structure that parallels the existing railroad bridge alignment over Aptos Creek on an offset alignment. The structure is planned to have a total of 3 spans; and consist of a prefabricated steel truss.

North Aptos Underpass Replacement: A railroad underpass replacement over SR-1. The proposed replacement underpass is a 33-foot wide structure on the existing railroad alignment over SR-1. The structure is planned to have a total of 2 spans; and consist of a steel through girder.

South Aptos Underpass Replacement: A railroad underpass replacement over SR-1. The proposed replacement underpass is a 24.5-foot wide structure on the existing railroad alignment over SR-1. The structure is planned to have a total of 2 spans; and consist of a steel through girder.

Trail Bridge over Driveway: A pedestrian and bicycle bridge to connect the north and south sides of the rail trail over an existing private driveway between the South Aptos POC and the Valencia Creek Pedestrian Bridge. The proposed pedestrian bridge is a 16-foot wide structure that parallels the existing railroad alignment on an offset alignment. The structure is planned to have 1 or 2 spans; and consist of either a cast-in-place post-tensioned slab or a prefabricated steel truss.

Retaining Walls: Two (2) soldier pile walls, 4 (4) subhorizontal ground anchor walls, three (3) soil nail walls, one (1) Type 7B wall, and three (3) mechanically stabilized embankment (MSE) walls are assumed for the project and design plans.

Structure design will be coordinated with the Office of Special Funded Projects (OSFP) of Caltrans' Division of Structures. At each submittal stage outlined below, Mark Thomas will submit up to 10 structural PS&E sets to Caltrans, two each to the County and RTC. It is assumed that the entire project will be advertised and awarded by Caltrans as a single contract and therefore, PS&E packages to Caltrans will include all structure design elements. However, it is assumed that Caltrans will not be approving reports or reviewing calculation packages for structures outside of Caltrans right-of-way.

Deliverables

- Unchecked Details Submittal - Unchecked details consist of complete structure plans that are designed and detailed and deemed ready for the independent check. This submittal is made concurrent with, or in advance of the 65% roadway submittal.
- Checked Details Submittal - Checked details consist of complete, independently checked structure plans that are designed and detailed. Structure special provisions, estimate, calculations and Final Foundation Reports will be prepared for each structure. This submittal is made concurrent with, or in advance of the 95% roadway submittal.
- 100% Submittal - This submittal represents final PS&E, ready for bidding, with all comments addressed from the 95% review. This submittal is made concurrent with the 100% roadway submittal.
- Final Approved PS&E - Final corrected PS&E are submitted as the Final PS&E for Caltrans Approval. This submittal is made concurrent with the Final roadway submittal.

Planting and Irrigation PS&E

Mark Thomas will prepare the Planting and Irrigation PS&E for the highway and for trail mitigation and will prepare intermediate submittals for review at the 65%, 95%, 100% and Final PS&E stages. In addition, we will prepare riparian planting and mitigation plans for permitting for up to four riparian/permitted areas in the highway and trail corridor. A detailed response to comments will be provided to all comments received in each submittal. 65% package is intended to be concurrent with roadway plans and assumed to only include planting plan, plant list and irrigation mainline layout. All planting and irrigation plans will be prepared at 20-scale. This scope excludes coordination for new or relocated water meters. It is assumed existing water meters and controllers are functioning within the project limits and can be used for this project.

Deliverables

- 65% Highway Planting PS&E - Package will include Planting plans and irrigation mainline layout. Package will include BEES estimate and draft SSPs.
- 65% Trail Mitigation Planting and Irrigation PS&E - Package will include Planting plans and irrigation mainline layout. Package will include BEES estimate and draft SSPs.
- 95%, 100% and Final Highway Planting PS&E - Packages will include Planting, Irrigation and related quantities and details. Package will include edited SSPs, NSSPs (if applicable) and BEES estimate.

- 95%, 100% and Final Trail Mitigation Planting and Irrigation PS&E - Packages will include Planting, Irrigation and related quantities and details. Package will include edited SSPs, NSSPs (if applicable) and BEES estimate.

Mark Thomas will provide input to structure detailing, plan development, specifications and estimate to ensure the design intent of the aesthetics plan, approved under task 2 above, can be constructed. We will provide input at each submittal (65%, 95%, 100% and Final PS&E stages) and provide responses to comment where necessary. A detailed response to comments will be provided to all comments received in each submittal. This scope excludes structural design drawings necessary for Caltrans approvals and preparation or coordination of shop drawings.

Deliverables

- Related SSPs for aesthetic items.
- Input to unit cost data for aesthetic selections

General Cross Section

General cross sections will be developed at 1" = 10 foot scale and will be placed on a grid showing the existing ground, subgrade and finished surface. The conform elevation will be plotted on the cross sections. Cross sections will be created at 50-foot intervals in tangent sections and at 25-foot intervals in curved sections. General cross sections will be prepared concurrent with Final Approved PS&E package and are prepared for quantity verification and are not part of the contract bid package.

Deliverables

- 1 full size copy of general cross sections on bond paper
- 1 CD with cross sections in PDF format

Survey File

Mark Thomas will prepare and compile the Survey File prior to RTL. Survey file will include general cross sections, slope stake notes, alignment and survey control information. Survey file will be submitted to Caltrans Survey Construction office for review and acceptance.

Deliverables

- Electronic submittal of survey file in PDF format

Resident Engineers File

Mark Thomas will prepare and compile the Resident Engineers (RE) file prior to RTL. RE file will include critical project information including quantity calculation back-up, environmental commitments, environmental documentation, environmental permits, project correspondence, and design notes, structure calculations, details including 4-scale deck contour plots to the RE. RE file will follow RTL guidelines for format and information.

Deliverables

- Electronic submittal of RE file in PDF format

TASK 9 GRANT APPLICATION SUPPORT

The following tasks outline the grant application support Mark Thomas will provide to RTC.

9.1 Grant Applications

Mark Thomas will prepare up to three (3) grant application for RTC. This may include preparation of exhibits, gathering information, writing grant applications and identifying grant requirements. Because grant writing efforts can vary widely depending upon the grant application, work under this task shall be done on a time and materials basis. We have included ODC costs under our optional task for support by a traffic sub.

Deliverables

- Draft and Final Grant Applications (3 total) (PDF format)

9.2 Funding Strategy Support

Mark Thomas will provide support to the RTC to develop and implement a funding strategy for the project. This task also includes preparation of a project video shoring the proposed improvements.

Deliverables

Funding Support Materials (Electronic format)

TASK 10 BID PHASE SUPPORT

The following tasks outline the bidding support Mark Thomas will provide to RTC and Caltrans.

10.1 Bidding Support

Mark Thomas will respond to bidder inquiries and prepare addenda as needed during the bidding phase.

Deliverables

- Bidder Inquiries and Addenda (PDF format)

TASK 11 DESIGN SUPPORT FOR CM/GC (OPTIONAL TASK)

It is our understanding that the RTC is considering alternative delivery of the project involving the Construction Manager/General Contractor (CM/GC) method. The following outlines additional tasks that we have assumed if CM/GC is initiated at the beginning of the PS&E phase.

11.1 Monthly Workshops with CM/GC Contractor

Mark Thomas will participate in monthly workshops with the RTC, contractor and Caltrans that are assumed to take place at the RTC offices over an 18-month period. The workshops are intended to provide the opportunity for open discussion between the contractor, Caltrans and Mark Thomas Design Team as the design of the project proceeds. This will provide an opportunity for potential advance construction projects to be evaluated and opportunities for construction cost savings to be evaluated. The workshops would be broken out into the following main disciplines: Roadway and Drainage, Structures, Utilities/Electrical.

It is assumed up to five (5) Mark Thomas team members would attend these monthly workshops.

Deliverables

- General Workshop Agendas, Minutes, Actions Item List (18 workshops)

11.2 Design Workshops at 65%, 95% and 100% Submittals

Mark Thomas will participate in design workshops with the RTC, contractor, Independent Cost Estimator (ICE) and Caltrans that are assumed to take place at the RTC offices following the 65%, 95% and 100% major submittals. The design workshops are intended to provide the opportunity for the Mark Thomas to present the design approach represented in the submittal so the contractor, ICE and Caltrans have a better understanding of the design prior to beginning their detailed design and address any initial comments the reviewers may have.

It is assumed up to five (5) Mark Thomas team members would attend these design workshops.

Deliverables

- General Workshop Agendas, Minutes, Actions Item List (3 workshops)

11.3 Opinion of Probable Construction Cost Workshops

Mark Thomas will participate in Opinion of Probable Construction Cost (OPCC) workshops with the RTC, contractor, Independent Cost Estimator (ICE) and Caltrans that are assumed to take place at the RTC offices following review of the 65%, 95% and 100% major submittals. The OPCC workshops provide an opportunity for the quantities and corresponding construction costs prepared by the Mark Thomas Design Team, the contractor and the ICE to be compared. Any major differences in quantity and/or construction cost are discussed. The intent following each OPCC workshop is to reach consensus on the development of the quantities so an overall OPCC estimate can be developed.

It is assumed up to five (5) Mark Thomas team members would attend these OPCC workshops. It is assumed RTC or Caltrans would prepared the workshop agendas, minutes and action items.

11.4 Risk Management Workshops

Mark Thomas will participate in up to two (2) risk management workshops with the RTC, contractor, ICE and Caltrans that are assumed to take place at the RTC office. The risk management workshops provide an opportunity for the risk associated with the project to be discussed between the RTC, the Mark Thomas Design Team, Caltrans, the contractor and the ICE and for a risk register to be prepared and then tracked through the design phase.

It is assumed up to five (5) Mark Thomas team members would attend these risk management workshops. It is assumed RTC or Caltrans would prepared the workshop agendas, minutes and action items and prepare and update the risk register

