

January 7, 2022

David L. Drake, P.E.
Engineering Manager/Division Chief
San Bernardino County
Department of Public Works – Flood Control Engineering
825 E Third Street, Rm. 140
San Bernardino, CA 92415-0835

Subject: Proposal for Civil Engineering Services
 Rialto Channel from Willow Avenue to Etiwanda Avenue
 Prior Work Order No. F01272

Dear Mr. Drake:

CASC Engineering and Consulting (CASC) is pleased to submit the enclosed proposal for Civil Engineering Services for the Rialto Channel project. CASC is grateful for this opportunity to serve the San Bernardino County Department of Public Works, Flood Control Engineering Division (County), in a critical capacity to complete this high-priority project, and we are confident that CASC has the talent, skill, and motivation to do so efficiently to the benefit of the County and community it serves.

CASC has a deep understanding of the project, having prepared the sixty-five percent (65%) level plans in 2012 when the project was halted. We have thoroughly reviewed the progress documents and background information to develop the scope of work, estimated fee, and project schedule attached. While CASC and the County have enjoyed a partnership on various projects over the years, we believe it is important to reintroduce to you the main personnel and their roles for this project.

Michael Gentile, P.E., QSD/P will be the overall project manager and will be the single point of contact for the County throughout the project and will lead coordination efforts with outside agencies. In addition to project management duties, he will conduct internal plan check reviews of all contract documents.

Barbara Sherman, P.E. will be a technical advisor and provide guidance to the design team on key design issues during the development of the contract documents. Ms. Sherman will also play a major role in reviewing contract documents for accuracy and will assist in outside agency coordination.

Anthony Mistretta, P.E. will head up the day-to-day design effort as Lead Civil Engineer. As the lead, he will function as the critical liaison between the design team and the project manager, while providing guidance to staff level personnel and management of engineering tasks so that the design effort proceeds efficiently from one stage to the next.

Rick Furlong, P.L.S. will run the surveying team that will provide the updated information required to design to current conditions, and Jess Becerra, L.S.I.T, will prepare the updated base map.

Mead & Hunt will provide structural engineering services. Mead & Hunt has a long history of providing structural engineering for all types of structures including sediment control structures, diversion structures, flood control and water conservation systems and other associated project works. Nathan Rockwood, PE, SE will manage Mead &

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Hunt's portion of the design. Mr. Rockwood and Mr. Gentile are currently managing the Donnell Basin project for the County.

Geotechnical Engineering will be led by LOR Geotechnical Group, Inc., a firm with deep roots in San Bernardino County and vicinity. CASC and LOR have teamed up on many successful projects over the years. Bess Testlab, Inc. will perform utility potholing services under CASC's direction. CASC and Bess also have a long track record of successful projects with each other.

The detailed scope of work that follows is based on CASC's understanding that the County is looking for a turnkey project. CASC is prepared to take the lead and deliver complete design packages ready to bid with coordination with outside agencies in place so that the County may commence the bidding process knowing that the way is clear to proceed.

If you have any questions regarding this proposal, please contact me at your earliest convenience. CASC looks forward to beginning work with the County on this major infrastructure project.

Sincerely,

CASC Engineering and Consulting



Michael J. Gentile, P.E., QSD/P
Senior Engineer

PROJECT UNDERSTANDING

CASC Engineering and Consulting Inc. (CASC) understands that the San Bernardino County Department of Public Works (Department) is requesting civil engineering services to complete the construction documents for Rialto Channel from Willow Avenue to Etiwanda Avenue. The construction documents had previously been completed to a 65% level (estimated) by AEI-CASC Consulting, Inc. in 2012, under Work Order #F01272 (65% Plans). The 65% Plans were divided up into separate plan sets: one set for the street crossings, one set for the channel itself, and one set for the railroad portion of the alignment.

Now, the Department would like to reorganize the plans into two sets: one for the construction of Rialto Channel (Channel Project), including all crossings except for Randall Avenue, and one set for the construction of the Randall Avenue crossing alone (Randall Avenue Project). CASC's understanding is that these two sets are to be billed as separate contracts; therefore, plans, specifications, and estimates for each project will be required. CASC also understands that the Department wishes to bid the Randall Avenue Project first.

To meet the Department's needs, CASC has included a project team that includes:

- Mead & Hunt (M&H): structural engineering
- LOR Geotechnical Group, Inc. (LOR): geotechnical engineering
- Bess Testlabs (BESS): utility potholing

The overall scope of services to be provided includes:

- Review and reorganization of the 65% Construction Documents (CASC + Mead & Hunt)
- Additional Field Survey (CASC)
- Geotechnical Investigation (LOR)
- Utility Potholing (BESS)
- Utility Coordination (CASC)
- Agency Coordination (CASC)
- Revised Hydrology and Hydraulics Report (CASC)
- Revised Structural Calculations and Structural Design (M&H)
- 75%, 95%, and 100% Civil Construction Documents (plans, specifications per Department standards, estimates of probable construction cost) signed and stamped, as part of the overall construction document packages: one package for the Randall Avenue Project, and one package for the Channel Project. (CASC, M&H)
- Bidding Support Services (CASC M&H)
- Construction Support Services (CASC M&H)
- Project Management (CASC)

Detailed descriptions of the engineering services are provided in the following scope of services.

SCOPE OF SERVICES

CASC Engineering and Consulting Inc., along with its subconsultants, proposes the following engineering scope of services for the overall project (Randall Avenue Project and Channel Project):

A. PROJECT MANAGEMENT

CASC's Project Manager (PM), a licensed Civil Engineer in the state of California, will work directly with and oversee the design team for the project. He will be responsible for the design and signing the project plans, specifications, and cost estimate. The following items are included in the Project Management scope of work:

- **Project Administration** – CASC's PM will oversee Project Administration. The following items are included:
 - Progress Reports – CASC will prepare bi-weekly progress reports which will include an update on Project milestones.
 - Budgeting – Based on the project scope items and contract fees, the project budget will be reviewed, and staffing support provided. The PM will analyze project status weekly to confirm the Project is within budget.
 - Cost Accounting – The PM will work with CASC Administrative staff in preparing monthly invoices for the County. The PM is responsible for reviewing the hours worked on the project against the milestones for CASC staff and Subconsultants.
 - Scheduling – CASC will provide a schedule for the project. The schedule will identify the scope of work and milestones for the Project. CASC will be responsible for updating the schedule as needed and will be used in preparing the monthly progress reports. Staff will be adjusted accordingly to keep Project on schedule.
- **Meetings and Coordination** – The PM will be the primary point of contact for the County for the duration of the project and represent CASC at meetings with the County and other jurisdictional agencies. The PM will also oversee coordination between CASC and applicable jurisdictional agencies such as City of Rialto and BNSF.
 - Project Design Team (PDT) Meetings – CASC will meet with the Department monthly to review the project, discuss current status, and address issues that may impact the project schedule. Meeting minutes will be issued within three (3) days after the meeting. CASC will obtain status reports from subconsultants prior to the meeting to keep the PDT informed of their progress. CASC assumes that Mead & Hunt will attend half of the meetings to be available to discuss their scope of work.
 - Milestone Meetings – Assumes one (1) two-hour meeting at the following milestones:
 - Project Kick-Off
 - 75% PS&E Review Mtg w/ SBCFCD
 - 75% Introduction Mtg w/ BNSF
 - 75% Introduction Mtg w/ City of Rialto
 - 95% PS&E Review Mtg w/ SBCFCD
 - 95% PS&E Review Mtg w/ BNSF
 - 95% PS&E Review Mtg w/ City of Rialto
 - 100% PS&E review coordination will be addressed electronically. No meetings required.
 - Meeting agenda and minutes will be prepared and distributed to the project team before and after each meeting, respectively.

- o Agency Coordination – The PM and CASC’s Project Analyst will coordinate with the County and jurisdictional agencies as applicable throughout the duration of the project. Assumes the following budgetary estimates:
 - SBCFCD – 68 hours
 - City of Rialto – 68 hours
 - BNSF – 84 hours

B. GEOTECHNICAL INVESTIGATION

LOR Geotechnical Group, Inc. (LOR) will perform the geotechnical investigation. They have proposed the following scope of work:

- Review of available data developed for the project by the City and any additional reports/plans prepared for the project, if provided.
- Obtain a fee permit from the San Bernardino County Flood Control District for our work in the street and coordinate the boring locations with CASC. At this time, the number of permits that may be required, and the cost for these fees is not known. Thus, the cost of obtaining the permits, as well as the associated fees, will be billed on a time and materials basis. The proposed scope of services has a budget estimate for overall expenses in the fee schedule, which includes required permit fees for the investigation.
- Marking of the boring locations and contacting Underground Service Alert of southern California.
- A total of 28 borings, as requested, to depths of approximately 25 feet or 3 feet below the proposed inverts, or refusal, whichever occurs first. See Attachment A for proposed locations.
- Test selected samples of the subsurface soils to verify the soil classification and determine their various soil engineering properties. Laboratory testing on samples obtained from the borings will include, but not necessarily be limited to: in-place moisture content and density, laboratory compaction characteristics, direct shear, sieve analysis, sand equivalent, R-value, and corrosion. Physical testing will be conducted at our geotechnical laboratory which is Caltrans Certified in proficiency to conduct the necessary testing. Chemical testing and recommendations will be provided by our subconsultant, Project X Corrosion Engineering.
- Evaluate all data developed and formulate recommendations for site development as proposed. This will include the information requested within the provided scope of geotechnical services, as appropriate, shown in Attachment B.
- Prepare a detailed report presenting our findings, conclusions, and recommendations.

C. SURVEY, MAPPING, AND INVESTIGATIONS

1. AERIAL TOPOGRAPHIC MAPPING

CASC will provide a field survey and office calculations as needed to establish horizontal and vertical control and set aerial targets for aerial mapping of the project as depicted within the red border on the below exhibit. Basis of bearing and elevations will be referenced to the latest Record Map and City, County Control and Benchmarks. CASC will provide a topographic manuscript produced from an aerial survey at a scale of 1"=40' with a two-foot contour interval. This scope of work includes office calculations to perform a check of the topographic information received from the Photogrammetrist.

2. DESIGN SURVEY

CASC will provide cross sections at 50-foot intervals of the existing street along Randall Avenue 300' east and west of the Rialto Channel and along the Rialto Channel 100' north and south of Randall which will be used to facilitate design of the connecting improvements.

CASC will locate all existing physical features. Physical features shall include BCR, ECR, flow lines, centerlines, grade breaks, angle points, top of curb, spandrels, pavement striping, utilities, structures, walls, trees and landscape, painted underground and surface utilities, poles, hydrants, catch basins, signs, valves, manholes, and all other physical features as well as inverts of all accessible utilities. Survey info will be compiled into a base map with 1' contours generated.

3. PRELIMINARY TITLE REPORT REVIEW

CASC will perform a review of the project's current preliminary title report and the Schedule "B" documents for property, to identify the record project Right of Way and all plottable and non-plottable easements, existing road dedications and any other site encumbrances identified in the preliminary title report. The preliminary title report will be provided by the Client or by the Client's title company along with the Schedule "B" documents. NOTE: Any fees associated with the preliminary title report will be the Client responsibility.

4. RESEARCH AND BASE MAPPING

CASC will research and review of the project's existing survey documentation. Research will include obtaining record information (tract maps, parcel maps, records of survey and County of San Bernadino Flood Control right of way maps and deeds) at the San Bernardino County Survey and Flood Control Offices. CASC will calculate and establish the record centerlines, right of ways, property line based upon record information obtained from the San Bernardino County Survey and Flood Control Offices. CASC will update the current digital base map.

5. UTILITY POTHOLING

CASC will provide field and office time to stake out and then locate the resultant pothole locations left by BESS.

CASC's consultant BESS will perform utility potholes using air-vacuum excavation at 56 predetermined locations to document the precise horizontal and vertical position of existing utilities within the investigation area. BESS will obtain the permits required to perform potholing. BESS will require a pothole request list identifying the pothole number, horizontal location in coordinate format and the type of utility to be potholed and 2 sets of half size plans (11"x17") with the pothole locations clearly marked and annotated with the corresponding pothole number. Prior to potholing, BESS will mark with white paint the pothole locations as required by the USA service alert and request an excavation ticket. Includes Traffic Control, Traffic Control Plans, Permits, and Pavement Repair, and Project Coordination.

Data collected as a result of potholing activities will be presented in a Portable Document Format (PDF) report that will include: utility type, size, material, depth and pictures of the exposed utility. Pothole locations (in the field) will be marked with wooden lath and ribbon marked with the pothole number, utility size and depth or MAG nail with pertinent utility data annotated on the ground surface. Once the utility data has been collected the pothole will be restored to its previous condition using native backfill and the appropriate surface restoration materials.

6. UTILITY RESEARCH & COORDINATION

CASC will obtain the contact information for the utilities in the project area and send preliminary notices to the utility companies. The initial utility notices will include requests for atlas maps and plans (if available) for verification of existing utilities. After obtaining said documents, or a letter stating that the utility has no lines in the project area, CASC will plot the utilities on the project base map. This base map will be used for reference in the final grading and improvement plans. In addition to the initial notices, CASC will issue utility notices at the 75% and 95% plan stage.

CASC will use the pothole information provided by BESS to identify conflicts with utilities and determine relocations required. CASC will initiate contact with utilities to be relocated and to the utility project planner assigned to schedule the relocation. CASC will stay in contact with the utility planner to pursue a relocation plan that is agreeable to the Department and other affected jurisdictions. CASC assumes that three meetings with the utility planner and affected jurisdiction(s), in addition to coordination time, will be required for each relocation. Costs for utility relocations will be the responsibility of the County.

CASC will maintain a log of contact information and relocation status. The utility log will be provided to the Department at PDT meetings. CASC will use its letterhead for all correspondence with utilities. Department will reimburse CASC for costs incurred to obtain utility atlas maps and records.

D. PRELIMINARY ENGINEERING AND STUDIES

1. REVIEW OF 65% CONSTRUCTION DOCUMENTS

CASC will review the previously prepared Construction Documents (CDs), including the following plan sets and Drainage Study, to determine: (1) the extent of conformance to current agency standards, and (2) potential revisions to the proposed design based on existing site conditions including, but not limited to, grading, drainage, and utility constraints.

- San Bernardino County Flood Control District Plans for Rialto Channel, Drainage Improvements, Willow Ave. to North of Etiwanda, City of Rialto
- San Bernardino County Flood Control District Plans for Rialto Channel, Channel Crossing Street Improvements, Second Street and Rosewood Street, City of Rialto [Phase 1A]
- Flood Control District Plans for Rialto Channel, Channel Crossing Improvements, Randall Ave. and Merrill Ave., City of Rialto [Phase 1]
- San Bernardino County Flood Control District Plans for Rialto Channel, Channel Crossing Improvements, Foothill Blvd, City of Rialto [Phase 2]
- Drainage Improvement Plans, Rialto Channel, Santa Fe Railroad to South of 2nd Street [Phase 3]

2. REVISED HYDROLOGY AND HYDRAULICS REPORT

CASC will update the previously prepared Hydrology and Hydraulics Report to reflect the revised design shown on the updated project construction documents. Changes in hydrologic or hydraulic design parameters and/or analysis results determined as part of this scope of work will be presented in the report. The report will be submitted for reference with each milestone submittal package (75%, 95%, 100%, and Final).

E. RANDALL AVENUE CROSSING - 75%, 95%, 100% CONSTRUCTION DOCUMENTS

CASC will prepare plans, specifications, and cost estimates for the Randall Avenue Crossing Project. Submittals will be made at the 75% stage, following CASC's review and reorganization of the previously prepared 65% plan

sets; the 95% stage following SBCFCD review of the 75% PS&E package; and the 100% stage. The final mylar submittal will be made following the County's approval of the 100% PS&E package. This scope of work assumes the following work products:

1. CONSTRUCTION DRAWINGS

CASC will prepare Construction Drawings for the Randall Avenue Crossing Project on 24" x 36" sheets per Department standards. The base map prepared by CASC which includes existing utilities will be used as the base for the construction drawings. The proposed drawing set will include:

- ✓ Title Sheet
- ✓ Construction Note Sheet
- ✓ Channel Plan & Profile (1"=20' horizontal; 1"=4' vertical)
- ✓ Street Improvement Plan Detail (1" = 10' horizontal, plan view only)
- ✓ Signing and Striping Plan (Randall Avenue from Cactus to Lilac)
- ✓ Structural Details (Box Culvert, Transition Structures per Structural Engineering Task)
- ✓ Detour Plan (Randall Avenue closure assumed)
- ✓ Construction Details

2. SPECIFICATIONS

CASC will provide technical specifications for the project based on the previously prepared set of project specifications. The specifications will be submitted with the plans for review and comment at the 75%, 95%, and 100% milestones.

3. COST ESTIMATES

Cost Estimates will be provided for the Randall Avenue Crossing Project. The estimate will include quantities and unit prices (utilizing current data or site estimating document to obtain prices). The preliminary cost estimate will be submitted with the plans for review and comment at the 75%, 95%, and 100% milestones, and a final cost estimate as part of the Final Submittal.

Deliverables:

- ✓ 75%, 95%, and 100% Submittal to include construction drawings, specification, and cost estimate as described above (unsigned)
- ✓ Final Submittal to include signed and stamped construction drawings on mylar, signed and stamped specifications, and signed and stamped cost estimate as described above

F. RIALTO CHANNEL - 75%, 95%, 100% CONSTRUCTION DOCUMENTS

CASC will prepare plans, specifications, and cost estimates for the Rialto Channel Project. Submittals will be made at the 75% stage, following CASC's review and reorganization of the previously prepared 65% plan sets; the 95% stage following SBCFCD review of the 75% PS&E package; and the 100% stage. The final mylar submittal will be made following the County's approval of the 100% PS&E package. This scope of work assumes the following work products:

1. CONSTRUCTION DRAWINGS

CASC will prepare Construction Drawings for the Rialto Channel Project on 24" x 36" sheets per Department standards. The base map prepared by CASC which includes existing utilities will be used as the base for the construction drawings. The proposed drawing set will include:

- ✓ Title Sheet with Index
- ✓ Construction Note Sheet
- ✓ Survey and Right-of-Way Data
- ✓ Channel Plan & Profile (1"=40' horizontal; 1"=4' vertical) from Willow Avenue to Etiwanda
- ✓ Crossing Details (1"=20' horizontal; 1"=4' vertical):
 - o Merrill Avenue
 - o Santa Fe Railroad
 - o Cactus Avenue
 - o Rialto Avenue
 - o Bike Trail Crossing (Former R/R Crossing)
 - o 2nd Street
 - o Foothill Boulevard
 - o Etiwanda Avenue
- ✓ Storm Drain Lateral Profiles (1"=20' horizontal; 1"=4' vertical)
- ✓ Structural Details (Per Structural Engineering Task)
- ✓ Street Improvement Plan Details (1" = 10' horizontal, plan view only for all crossings)
- ✓ Stage Construction/Traffic Control Plans (Foothill Boulevard Crossing)
- ✓ Detour Plans
- ✓ Construction Details

2. SPECIFICATIONS

CASC will provide technical specifications for the project based on the previously prepared set of project specifications. The specifications will be submitted with the plans for review and comment at the 75%, 95%, and 100% milestones.

3. COST ESTIMATES

Cost Estimates will be provided for the Rialto Channel Project. The estimate will include quantities and unit prices (utilizing current data or site estimating document to obtain prices). The preliminary cost estimate will be submitted with the plans for review and comment at the 75%, 95%, and 100% milestones, and a final cost estimate as part of the Final Submittal.

Deliverables:

- ✓ 75%, 95%, and 100% Submittal to include construction drawings, specification, and cost estimate as described above (unsigned)
- ✓ Final Submittal to include signed and stamped construction drawings on mylar, signed and stamped specifications, and signed and stamped cost estimate as described above

G. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

CASC will prepare two separate Stormwater Pollution Prevention Plans (SWPPPs): one for the Rialto Channel Project and one for the Randall Avenue Crossing Project. The SWPPPs will be prepared in accordance with the

California Construction General Permit (NPDES Permit No. 2009-0009-DWQ as amended by 2010-2014-DWQ and 2012-0006-DWQ), using the current CASQA template (December 2019). The SWPPPs will be prepared by a Qualified SWPPP Developer (QSD) and will be a part of the 95% and 100% submittals described in Paragraph I above. CASC assumes that the County of San Bernardino will prepare the Notice of Intent (NOI) and upload the required documents to the California Stormwater Multiple Application and Report Tracking System (SMARTS), prepare annual reports, and file the Notice of Termination at the conclusion of the project.

Deliverables:

- ✓ Stormwater Pollution Protection Plan (SWPPP) for Rialto Channel using the CASQA template (95% and 100% Submittals)
- ✓ Stormwater Pollution Protection Plan (SWPPP) for Randall Avenue Crossing using the CASQA template (95% and 100% Submittals)

H. STRUCTURAL ENGINEERING (MEAD & HUNT)

Mead & Hunt will provide structural engineering services for the Rialto Channel Project. Based on discussions with CASC, Mead & Hunt proposes to perform the following tasks:

- ✓ Review of 65% design documents and structural calculations.
- ✓ Conduct a site visit to observe site conditions.
- ✓ Coordinate with a geotechnical engineer (facilitated by CASC) for the completion of the geotechnical design parameters to be used in the structural and civil engineering.
- ✓ Complete a Design Criteria document to be reviewed by CASC
- ✓ Complete structural calculations, drawings, and details for:
 - Five (5) different sized double-cell cast-in-place concrete culverts.
 - Two (2) different sized single-cell cast-in-place concrete culverts.
 - One (1) cast-in-place culvert under a railroad crossing.
 - Six (6) different rectangular shaped channel lining sections.
 - Three (3) different trapezoidal shaped channel lining sections.
 - Several different culvert to channel transitions.
- ✓ A preliminary drawing sheet list is as follows:
 - Randall Avenue Crossing:
 - S-1: General and Structural Notes.
 - S-2: Typical structural details for water containing concrete structures.
 - S-3: Typical structural details for water containing concrete structures.
 - S-4: Double-Cell Box Culvert sections, table, and details.
 - S-5: Channel lining and two (2) different transitions
 - Rialto Channel:
 - S-1: General and Structural Notes.
 - S-2: Typical structural details for water containing concrete structures.
 - S-3: Typical structural details for water containing concrete structures.
 - S-4: Double-Cell Box Culvert sections, table, and details.
 - S-5: Single-Cell Box Culvert sections, table, and details.
 - S-6: Single-Cell Box Culvert sections, table, and details.
 - S-7: Box Culvert under the railroad crossing.
 - S-8: Rectangular Channel lining sections, table, and details.

o S-9: Trapezoidal Channel lining sections, table, and details.

- ✓ Assist CASC in developing Design Specifications for each project:
 - Completion of Division 03 (Concrete) and 05 (Steel) specifications.
 - Collaboration on other Division specifications as needed.
- ✓ Construction cost estimate for structural design items for each project.
- ✓ Participate in detailed design coordination meetings and perform project management.

I. BID PHASE SUPPORT

CASC and Mead & Hunt shall respond to bidder requests for clarification during the advertising and bidding phase of each project. If required, CASC and Mead & Hunt will assist the Department in preparing addenda. CASC assumes up to five (5) requests for clarification and one (1) addendum for the Randall Avenue Crossing project. For the Rialto Channel project, CASC assumes up to ten (10) requests for clarification and two (2) addenda.

J. CONSTRUCTION PHASE SUPPORT

CASC and Mead & Hunt shall provide construction phase support for each project per the following scope of services:

1. Randall Avenue Crossing:

- Review and respond to up to twenty (20) contractor submittals
- Review and respond to up to twenty (20) requests for information (RFIs)
- One (1) site visit from Mead & Hunt personnel
- Up to four (4) site visits from CASC personnel
- Participation in up to two (2) design team meetings (each for CASC and Mead & Hunt)

2. Rialto Channel:

- Review and respond to up to eighty (80) contractor submittals
- Review and respond to up to eighty (80) requests for information (RFIs)
- Up to nine (9) site visits from Mead & Hunt personnel
- Up to twenty (20) site visits from CASC personnel
- Participation in up to twelve (12) design team meetings (each for CASC & Mead & Hunt)

K. EXPENSES

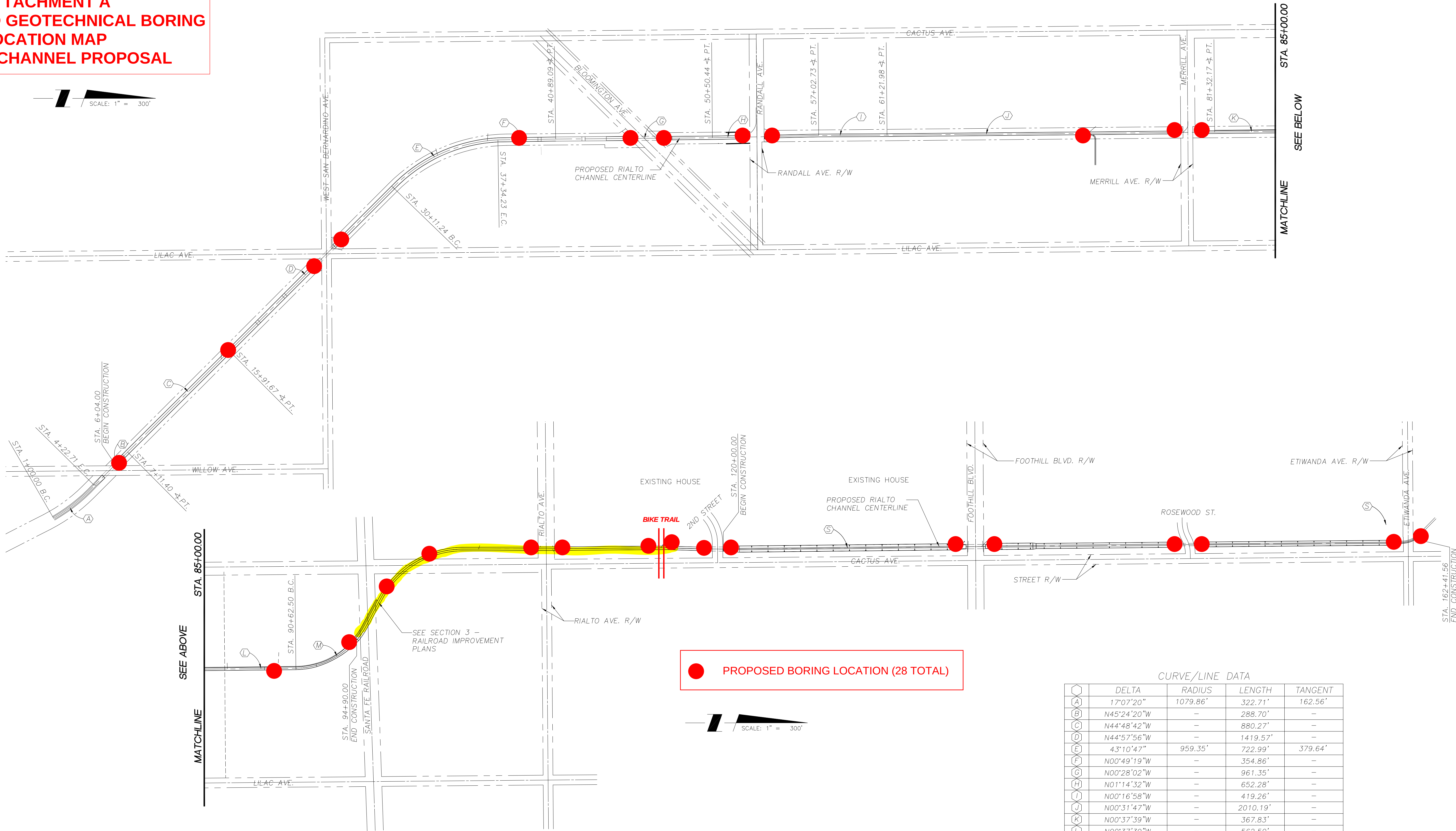
At the Department's request, this proposal includes a line item for expenses including associated fees related to utility research, potholing, field investigations, etc. Expenses will be invoiced to the Department at cost plus 15%. Expenses do not include deposits and costs to relocate utilities. Such costs and deposits are to be paid directly by the County of San Bernardino.

L. EXCLUSIONS

The following services are not included in this proposal:

- Alternatives Analysis
- Environmental Clearances
- Public Outreach – meetings, exhibits, mailings, and other communications
- Services related to property acquisitions, including appraisals

ATTACHMENT A
PROPOSED GEOTECHNICAL BORING
LOCATION MAP
RIALTO CHANNEL PROPOSAL



BENCHMARK:
DRIVE PIN W/C.S. TAG IN CURB AT NORTHEAST CORNER OF FOOTHILL BLVD. AND CACTUS AVENUE, 65 FEET NORTH OF FOOTHILL BLVD., 37 FEET EAST OF CACTUS AVENUE, IN TOP AND 3.2 FEET SOUTH OF NORTH END CURB RETURN.
NGVD-29 ZONE 5
1,273.11

BASIS OF BEARING:
CENTERLINE OF CACTUS AVENUE AS MEASURED BETWEEN SAN BERNARDINO COUNTY SURVEYOR'S GPS CONTROL POINTS 20742 AND 20746 NAD 83, ZONE 5, EPOCH 1992.6
BEARING N00°29'49" W

CURVE/LINE DATA				
	DELTA	RADIUS	LENGTH	TANGENT
A	17°07'20"	1079.86'	322.71'	162.56'
B	N45°24'20"W	—	288.70'	—
C	N44°48'42"W	—	880.27'	—
D	N44°57'56"W	—	1419.57'	—
E	43°10'47"	959.35'	722.99'	379.64'
F	N00°49'19"W	—	354.86'	—
G	N00°28'02"W	—	961.35'	—
H	N01°14'32"W	—	652.28'	—
I	N00°16'58"W	—	419.26'	—
J	N00°31'47"W	—	2010.19'	—
K	N00°37'39"W	—	367.83'	—
L	N00°37'39"W	—	562.50'	—
M	61°43'06"	486.68'	524.25'	290.80'
S	N00°33'13"W	—	4153.09'	—
T	45°56'16"	166.09'	88.47'	70.39'

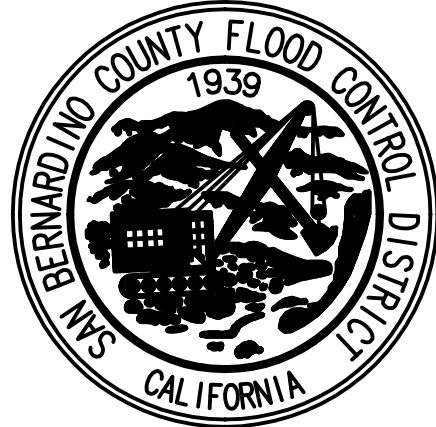
Drawing Name: Z:\98702\Storm Drain\CHANNEL IMPROVEMENTS\98702-ultimate-SHT02A.dwg
Last Updated: May 15, 2012 1:43pm by axillians

AEI CASC
CONSULTING
5053 LA MART DRIVE
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PH. (951) 342-7990 FAX (951) 275-0159

DESIGNED BY: A.M.T.
DRAWN BY: O.S.
CHECKED BY: C.V.A.
PLANS PREPARED UNDER THE SUPERVISION OF:
ARIC M. TORREYSON RCE 66068
DATE



CITY OF RIALTO
CITY ENGINEER RCE 34908
DATE



REVISIONS			
MARK	DATE	DESCRIPTION	BY:

SUBMITTED BY: _____ Date _____			
RECOMMENDED BY: _____ Date _____			
APPROVED BY: _____ Date _____			
FLOOD CONTROL ENGINEER			
PROJ. ENG.	DES. BY:	REV'D BY:	DRAWN BY:

SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT
RIALTO CHANNEL

SURVEY AND RIGHT-OF-WAY DATA

DATE
07/01/06
F.B. REP.
F01272
FILE NO.
2-120
SHEET. NO.
2A of 29

ATTACHMENT B
SCOPE FOR RIALTO CHANNEL
GEOTECHNICAL INVESTIGATIONS AND REPORTS

The following list of general information provided in the Geotechnical report should include but not be limited to the following:

A. Site Conditions

1. Suitability of the site for the type of construction, structures, and foundations proposed.
2. Geological description and history of the site.

B. Seismicity

1. Earthquake occurrence probability.
2. Response spectra in accordance with the 2019 California Building Code (CBC) and ASCE 7-16.
3. Effective maximum Peak Ground Acceleration (PGA_{max})
4. Potential for liquefaction and recommendations for liquefaction mitigation.
5. Increase in lateral soil pressure due to seismic forces.
6. Potential for on site surface rupture.
7. Potential for damage to pipelines and features which connect to structures.
8. History of seismic events and locations of faults in the area.
9. The following CBC (ASCE 7-16) Seismic coefficients are to be provided:
 - Short Period Acceleration, S_s
 - 1 second Period Acceleration, S_1
 - Soils Site Class
 - Site Coefficient, F_a
 - Site Coefficient, F_v
 - Maximum Credible Earthquake (MCE)

If applicable, as stated in ASCE 11.4.8 a site response analysis and/or a ground motion hazard analysis shall be performed in accordance with ASCE section 21.1 and 21.2.

C. Factual Geotechnical Data

1. Sampling and test methods.
2. Soil boring and test pit logs.

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- a. Soil types
 - b. Penetration test by blow counts
 - c. Phreatic water surface elevations
 - d. Piezometric water surface elevations, number and frequency of observations
3. Test well pumping data.
4. Laboratory test results.
 - a. Visual classifications
 - b. Moisture content
 - c. Grain size analysis
 - d. Plastic properties
 - e. Unit weights
 - f. Compaction test
 - g. Compression test
 - h. Consolidation test
5. Site map showing locations of all field samples and instrumentation.
 - a. Expansive clays
 - b. Landslide potential, soil or bedrock instability, weak planes, sink holes, etc.
 - c. Caliche
 - d. Peat or pockets of weak, highly compressible soil.
 - e. Collapse potential

D. Ground Water Recommendations

1. Potential for encountering ground water.
2. Maximum design ground water surface elevation.
3. Recommendation on buoyant weight of submerged soil and volume of soil above foundations, considering shear angle, to be considered for resisting hydrostatic uplift.
4. If the elevation of the ground water is high, seepage rates for structure underdrains.

E. Site Preparation Recommendations

1. Methods, equipment, and level of effort needed to perform excavations.
2. Fill and backfill materials, compaction and methods of placement.
3. Preparation of excavated surfaces for placement of foundations.

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4. Depth of aggregate base/drainrock to be placed over subgrade.
5. Temporary excavation slope during construction.
6. Permanent fill and cut slopes and drainage recommendations for the slopes.
7. Feasibility of dewatering the site for construction. (Note: Since dewatering is the Contractor's responsibility, the study should confirm feasibility, but not recommend any single dewatering method.)

F. Design Recommendations for Pipelines

G. Pavement Design Considerations

H. Soil Corrosivity Design Considerations

1. Soil resistivity values for pipeline alignments.
2. Sulfate, chloride, and pH content of the soils.
3. Recommendations on reducing sulfate exposure on concrete structures and on the cement type to be used.
4. Influence of other cathodically protected pipelines or structures.
5. Influence of high voltage electrical transmission lines, electrically powered transportation facilities, and DC power lines.

I. Design Recommendations for Structures

1. Active lateral soil pressures on cantilever walls, above and below the ground water surfaces.
2. At-rest lateral soil pressures on walls prevented from deflecting (non-yielding), above and below the ground water surface.
3. Active Seismic lateral soils pressure on cantilever walls, above and below ground water surfaces, including the shape of the loading and resultant location as a value of wall height.
4. At-Rest Seismic lateral soils pressure on walls prevented from deflecting (non-yielding), above and below ground water surfaces, including the shape of the loading and resultant location as a value of wall height.
5. Effects of surcharge load on lateral soil pressures on walls due to adjacent foundations and traffic (HS20).
6. Passive soil pressures resisting lateral forces. Provide ultimate value or allowable (working) value with assumed safety factor.

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7. Friction value between soil and footings. Provide ultimate value or allowable (working) value with assumed safety factor.
8. Design bearing pressures under foundations for DL+LL and DL+LL+seismic/wind conditions, with corresponding anticipated settlements.
9. Unit weight of compacted backfill.
10. Anticipated differential settlements for each structure. Consider that multicelled water containing structures can have some or all cells full or empty in varying combinations.
 - a. Methods of reducing the amount of anticipated settlements and differential settlements.
11. Coefficient of subgrade reaction for mat foundations.
12. Drainage requirements for buried wall surfaces and beneath buried structures.
13. General foundation recommendations:
 - a. Minimum plan dimensions for spread footings.
 - b. Depth of embedment below finished grade.
 - c. Special conditions such as change in soil conditions across a structure, large differences in foundation elevations (need for stepped footings), etc.
14. If required, alternate foundation systems - Piles and Piers:
 - a. Recommendation on the necessity of piles or piers versus standard foundation.
 - b. Design bearing and lateral capacity values for pile and pier capacities including adjustment for downdrag.
 - c. Recommended pile tip elevations for piles, and embedment into bedrock for piers.
 - d. Specifications for design and construction of piles and/or piers.

J. Review of Earthwork Specifications and Design Drawings

1. General review comments.
2. Review of conformance to the geotechnical report recommendations.
3. Review for local code or regulation requirements.