BIGGS CARDOSA ASSOCIATES INC
STRUCTURAL ENGINEERS

Volume I - Technical Proposal


Metro Orange Line Warner Center


Metro Orange Line NoHo Station


Metro Orange Line Balboa Blvd Station


Metro Orange Line Sepulveda Station


Metro Orange Line Van Nuys Station

LOS ANGELES METRO ORANGE (G) LINE IMPROVEMENTS CONSTRUCTION SUPPORT SERVICES CONSULTANT

Los Angeles County Metro Transportation Authority | March 18, 2021 2:00pm

Biggs Cardosa Associates, Inc.

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EVALUATION CRITERIA

refer to the following pages for each of the evaluation criteria

A. Experience and Capabilities of Firms on the Team (25%)

1. Demonstrate how the Executive Summary conveyed the understanding of the overall Scope of Services as described in the Submittal Requirements (4%) ***pages: 1-5***

2. Demonstrate how the Experience and Qualifications described in the proposal relative to the Scope of Services conveys the level of experience required for similar or related projects and how the proposal demonstrates an understanding of the level of effort, unique challenges, and lessons learned: and how the proposal proves a record of satisfactory performance for Metro and/or other clients (5%) ***pages: 6-22***

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PROPOSAL LETTER

Metro Bus at the NoHo Red Line Metro Station
across the street from the Metro Orange Line Station

PROPOSAL LETTER

HONORABLE CHAIRMAN AND MEMBERS OF THE BOARD
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ONE GATEWAY PLAZA
LOS ANGELES, CA 90012-2952

SUBJECT: REQUEST FOR PROPOSAL CONTRACT NO. RFP No. PS70129
Metro Orange Line Improvements Construction Support Services Consultant

In response to the above referenced Request for Proposals (RFP) and in accordance with the accompanying Instructions to Proposers and Submittal Requirements, we the undersigned hereby offer to perform and complete the work as required in the Contract Documents.

If recommended for contract award, will provide to Metro all required Certificates of Insurance.

The proposal submitted in response to subject RFP shall be in effect for one hundred eighty (180) days after the proposal due date.

Further, the undersigned agrees to execute the Metro prepared Contract within ten calendar days after receipt of Notice of Award and provide to Metro all required Certificates of Insurance. The Proposer represents that the following person(s) are authorized to negotiate on its behalf with Metro in connection with this RFP and will provide appropriate evidence of authorization upon request:

Michael A. Thomas	Principal	714.550.4665 / 949.287.8787
Printed Name	Title	Phone
Printed Name	Title	Phone
Printed Name	Title	Phone

In addition to the formal certifications provided, the Proposer certifies that it has:

A. Examined and is fully familiar with all of the provisions of the RFP Documents and any amendment thereto;

B. Satisfied itself as to the requirements of the Contract;

C. Carefully reviewed the accuracy of all statements shown in this Proposal;

D. Examined the experience, skill and certification (if any) requirements specified in the Statement of Services and that the entities (Contractor, Subcontractor, Supplier) performing the work fulfill the specified requirements, and

E. Satisfied itself with respect to other matters pertaining to the RFP which in any way affect the performance of the Work.

F. Unless otherwise noted within this letter, the proposal has been submitted without exception and all Metro Contract Terms and Conditions are acceptable to the Proposer.

Noted exceptions will be evaluated for responsiveness and significance, and may initiate discussions with the selected firm to clarify or resolve such exceptions. It is understood that if it is not in the best interests of Metro to accept proposed exceptions, notice will be provided to the Proposer to accept the Terms and Conditions as stated in the RFP, or be eliminated from further consideration.

Exceptions (if any):

Therefore, the undersigned hereby agrees that Metro will not be responsible for any errors and/or omissions in the Proposal.

The undersigned acknowledges receipt, understanding and full consideration of the following amendment to the RFP Documents:

Amendment No(s):

Amendment 1 - February 12, 2021

Amendment 2 - February 17, 2021

The Proposer further certifies that:

A. The only persons, firms, corporations, joint ventures/partnerships, and/or other parties interested in the Proposal as principals are those listed as such in the Proposal Forms;

B. The Proposal is made without collusion with any other person, firm, corporation, joint venture/partnership, and/or other party;

C. Joint ventures/partnerships are to provide a signed copy of their agreement with their Proposal; and

1.

Proposer's Name: Biggs Cardosa Associates, Inc.

Business Address: 550 South Main Street, Ste. 1200
Orange, CA 92868

Contractor's License No.: N/A

License Expiration Date: N/A

Classification Type: N/A

If the Work/Services require DIR Registration, per California Labor Code §1725.5, complete below:

a. DIR Registration No.: 1000016014

b. DIR Registration Date: July 1, 2020 - expires June 30, 2021

Phone: 714.550.4665 Fax: N/A

E-mail address: mthomas@biggscardosa.com

Michael A. Thomas
Signature of Authorized Official

Michael A. Thomas
Type or Print Name

Principal
Title

March 17, 2021
Date

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of Texas

County of Montgomery

On 03/17/2021 before me, Anahi Gonzalez Notary Public, State of Texas
(insert name and title of the officer)

personally appeared Michael A. Thomas,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Texas that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Anahi Gonzalez (Seal)

NOTARY PUBLIC STATE OF TEXAS

Anahi Gonzalez

ID NUMBER
132788072
COMMISSION EXPIRES
November 18, 2024

Notarized online using audio-video communication

1. EXECUTIVE SUMMARY

Metro Orange Line Van Nuys Station

01 EXECUTIVE SUMMARY

Biggs Cardosa is excited to present our proposal to provide construction support services for the Metro Orange (G) Line Improvements project. Biggs Cardosa, as a structural engineering and construction management firm, provides a unique perspective on transportation and regional transit projects. Since its inception 35 years ago, Biggs Cardosa has worked on **thousands of transportation and transit projects throughout California.**

Biggs Cardosa has selected a team of consultants based on our thorough understanding of the project requirements, the depth of resources needed for this particular alternative delivery method project, local knowledge from our extensive research, working relationships with project stakeholders and local agencies and their successful working history with Biggs Cardosa. We bring to Metro the best team to deliver this project. The team's combined and directly relevant experience working on similar projects is unparalleled. **All key staff will be available, to the extent proposed or designated by Metro, for the duration of the project. No key personnel will be removed or replaced without prior written concurrence from Metro.**

Our carefully crafted powerhouse team brings together three experienced construction management firms: **Biggs Cardosa (MSZ), Anser Advisory Management** and **MNS Engineers. Anser Advisory** is a national capital program and project advisory firm offering solutions to public and private sector clients implementing capital projects and programs. **MNS Engineers** is a leader in the construction management field with a depth of resources and a reputation for success at meeting budget and scheduling goals. Both firms are **teamed with us exclusively** and offer expertise in construction management services coupled with a **wealth of project experience with Metro, especially in alternative project delivery methods.**

Each of our other subconsultants is also very experienced in their corresponding specialty areas, as evidenced in their firm profiles and resumes included in this proposal. Our team also fully satisfies the MSZ, SBE and DVBE participation requirements. **Nine out of thirteen of our subconsultants are SBE and/or DVBE certified.** Biggs Cardosa is committed to meeting or exceeding Metro's SBE goal of 27% and DVBE goal of 3% for this project.

BIGGS CARDOSA TEAM SUMMARY

Biggs Cardosa Associates, Inc. MSZ

Key Roles: Project Director, Deputy Project Director, Resident Engineer/Structures Rep., Lead/Structures Construction Inspector

Other Roles/Services: Project/Field Engineers, Design Oversight, Landscaping Inspection, Project Administration

Anser Advisory Management, LLC dba Anser Advisory

Key Roles: Construction Safety Representative, Cost Analysis

Other Roles/Services: Estimator, Risk Management, Claims Manager

MNS Engineers
Key Role: Assistant Resident Engineer

Other Roles/Services: Senior Construction Inspector(Civil)

Zephyr, SBE
Other Roles/Services: Safety Officer, Flagger

AMG, SBE
Key Roles: Signal/Systems Design Review/DB Coordinator, Senior Construction (Systems/Signal Inspector)

Alta Vista Solutions and Atlas Company
Other Roles/Services: Quality Control Manager, Materials Testing IQA

Pacifica Services
Other Role/Service: Third Party Utilities Coordination

MARRS, SBE
Other Role/Service: Document Control

NSI Engineering, SBE/DVBE
Other Role/Service: Quality Assurance

Diaz Yourman & Associate, SBE
Other Role/Service: Geotechnical Construction Inspector

GPA Consulting, SBE
Other Role/Service: Geotechnical Construction Inspector

CAPO, SBE
Other Role/Service: Schedule Review

Guida, Inc, SBE
Other Role/Service: Survey IQA

Casamar Group, SBE/DVBE
Other Role/Service: SWPPP Compliance

The Biggs Cardosa team has an excellent track record of successfully completing projects on time and within budget. We have successfully worked with many other California agencies on transportation and transit infrastructure improvement contracts of similar nature and complexity. Our team members' stellar performance has been attested to by the numerous references provided in this proposal and prestigious awards that our projects have received.

As **Project Director, Michael Thomas, PE, SE** will be Metro's key point of contact on the project. Looking at Michael's qualifications, it would appear that every step he has taken in his career, every project that he has undertaken, has been somehow specifically geared to perfectly position him as the Project Director for the Orange (G) Line Improvements Project. Michael has the **experience** (32 years), the **stability** (32 years at the same firm), and the **professional credentials** (California PE and SE) for the job. Michael has been **managing** complex multi-disciplinary **transportation and transit projects** for the past 20 years. Michael has developed a passion for delivering complex projects that require approval by rail and transit companies. He understands the project from the point of view of public agencies and always seeks win-win solutions. Michael takes pride in having a perfect record of finishing every project that he has started, and his clients find him proactive, energetic, creative, responsive and a consensus-builder.

Michael has experienced with **alternative delivery method projects** from different sides as the Independent Check Engineer/Independent Site Engineer (ICE/ISE) Manager for the P/CM on **High-Speed Rail's CP2-3 Contract** and as the Project Director for the **Mount Vernon Viaduct project.** Michael is the only person in California known to have led independent checks for Design/Build projects under both the Design/Builder (traditional) and the P/CM (an idea borrowed from the delivery of HSR in Europe). Michael gained such a unique and valuable perspective on the advantages and disadvantages of the two systems that he was invited to participate in a high-level task force for High-Speed Rail to compare the two systems and issue a recommendation to the CHSRA's Chief Engineer, Scott Jarvis, which will set the roadmap for how future HSR Design/Build contracts are delivered.

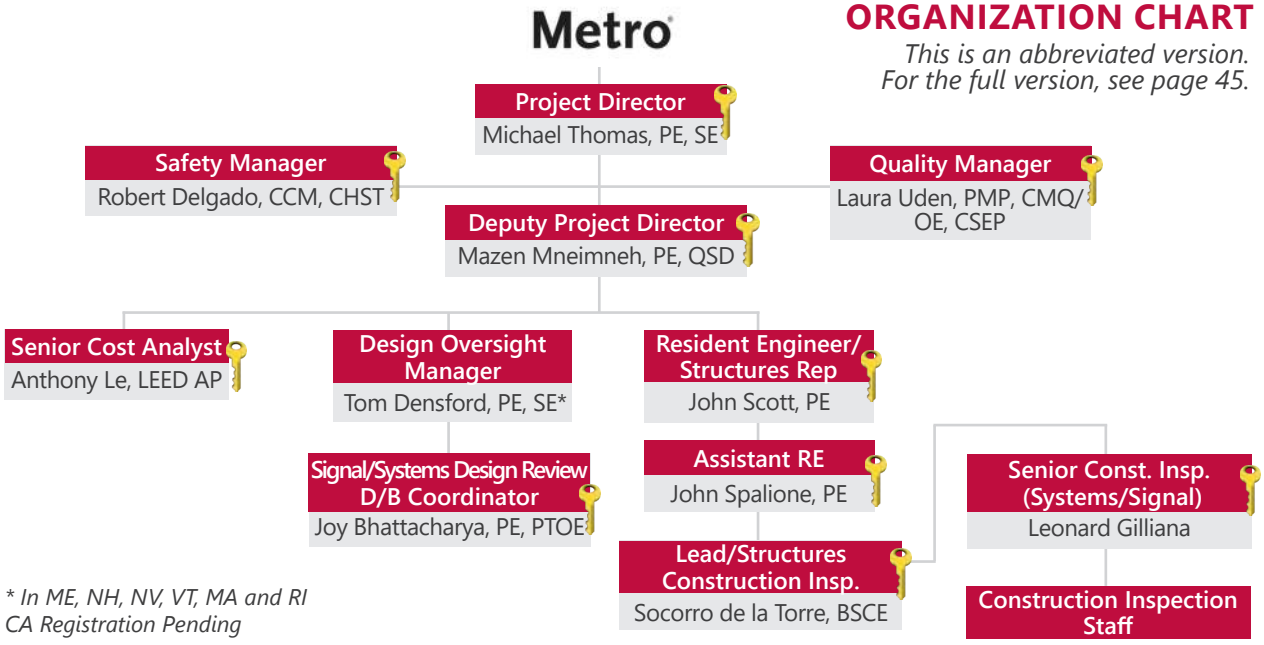
In addition to the key roles outlined in the RFP, we have included two additional key roles we believe to be crucial to the success of the project: a Deputy Project Director and a Signal/Systems Design Review/DB Coordinator. The proposed Key Personnel includes:

- **Mazen Mneimneh, PE, QSD** will be **Deputy Project Director** to Michael. Mazen is a registered Civil Engineer in California. He brings 22 years of design, construction management and professional engineering experience to the team, specializing in public works construction projects. He has worked on large projects with alternative delivery methods and knows what it takes to successfully deliver a public works project. Mazen will assist Michael in overseeing the support functional managers in charge of design and construction activities, including activities of the Design/Builder.
- **John Scott, PE** will be **Resident Engineer and Structures Representative.** John is a U.S. Army veteran with 30 years of professional engineering experience. He is a registered Civil Engineer with recent construction field engineering, inspection, structural observation and design management experience. Throughout his career, John has worked for several engineering companies as well as the Caltrans, where he supervised the construction of several transit stations along the I-110 Harbor Freeway Transitway. He is a well-respected former PM for the District 7 Office of Project Management North.
- **John Spaliano, PE** will be **Assistant Resident Engineer.** Mr. Spalione has over 41 years of experience in the construction industry and specializes in transportation projects. John has completed numerous transportation and transit projects in Southern California, ranging from roadway and bridge improvements and rehabilitation to vertical structures such as transportation and transit rail centers.

- **Socorro de la Torre** will serve as **Lead Structures Construction Inspector.** Socorro has 14 years of experience in the construction management and inspection of heavy civil projects, particularly construction and inspection of highways, bridges and light rail transit facilities. She has also played various roles as a field engineer, project engineer, assistant superintendent and assistant structure representative/lead inspector. Socorro has worked on several multimillion-dollar construction projects with Caltrans, Metro and a number of other local agencies.
- **Robert Delgado, CCM, CHST** will be **Safety Manager.** Robert has more than 25 years of experience in the construction industry. In the past several years Robert's career path evolved into a focus of safety oversight, which led him to provide oversight on various projects and to develop company safety policies, specifically within the construction management industry. His expertise includes developing and implementing safety policies, jobsite inspections, accident investigations, training, coaching and verifying regulatory compliance.
- **Anthony Le** will be **Senior Cost Analyst.** He will oversee the Design/Builder's procurement and implement Design/Build cost control measures. Anthony has over 30 years of experience as a Senior Estimator with construction experience in construction budget and cost estimation under a variety of contract delivery methods, from conceptual plans to preconstruction through 100% Construction Documents.
- **Joy Bhattacharya, PE, PTOE** will provide **Signal Systems Design Review** and serve as the team's **Design/Build Coordinator.** Joy has relevant and in-depth experience in the development, design and implementation of various traffic engineering strategies in major metropolitan areas, including Adaptive/Responsive Traffic Signal Systems and Transit Priority Systems; Incident Management Plans; design of automated Electronic Toll Collection systems; preparation of PS&E for field implementation of CCTV, Changeable Message Signs, and freeway and arterial operations using micro-simulation.
- **Leonard Gilliana, PE, PTOE** will be **Senior Construction Inspector for Systems and Signals.** Leonard brings nearly 40 years of public sector expertise in the area of traffic signal operations, construction, design and inspection to the Advance Mobility Group. He has been the Traffic Signal Inspection Supervisor for multiple large-scale projects in the City of Walnut Creek. He has taught signal inspection to his entire staff for the City. He has developed several courses that are taught across the country for the traffic signal industry.
- **Laura Uden PMP, CMQ/OE, CSEP** Laura will be the Quality Manager and will develop the Quality Management Plan which will represent a living document that contains Quality Control and Quality Assurance procedures that will be followed by all members of the team. Quality is of utmost importance for Biggs Cardosa and our team.

ORGANIZATION CHART

This is an abbreviated version.
For the full version, see page 45.



** In ME, NH, NV, VT, MA and RI CA Registration Pending*

ALTERNATIVE PROJECT DELIVERY METHODS

Biggs Cardosa and several of our key team members have gained a wealth of experience in utilizing **alternative project delivery methods,** including traditional Design/build, Progressive Design/Build and CM/CG types. Biggs Cardosa's Design/Build experience includes the Gerald Desmond Bridge Replacement Project, BART to San Jose, RCTC's I-15 Express lanes, and the California High Speed Rail Program. Most pertinently, we have been on all sides of these Design/Build projects (on the Owner's side, on the PCM's side and on the Contractor's side). This has given us a **unique perspective that is absolutely essential in the industry.** We know what works and what doesn't work. We know what it takes to deliver a high-quality Design/Build project on budget and on time, and we will use our unique experience to advise and help Metro successfully deliver its Orange (G) Line Improvements Project in that manner. Our understanding of Alternative Project Delivery Methods is described in detail in Section 5.4.

CONSTRUCTION SAFETY SUPPORT

Safety is another all-encompassing item that affects all aspects of the project. Our team will merge the project's Safety program with the Orange Line into one effective safety oversight program and will address the operational needs of Orange Line buses and passengers to improve safety at all the intersections. The Biggs Cardosa team will develop safety requirements for the Design/Build procurement. After selection, our team will provide ongoing safety oversight of the selected Design/Build team. The Design/Build team will be required to develop a project specific Safety Plan in accordance with Metro's Safety Manual and Metro safety plan requirement developed for Metro by our CSSC Team. This will require that the Design/Build team follow the construction plans and procedures and submit a detailed method for critical construction activities. A sequence of work/phasing plan based on the safety requirements and on Metro Orange Line on-going operations will need to be developed by the Design/Builder.

The Biggs Cardosa team will deploy an analytical structural model, calibrated by the actual construction operations as they happen, to accurately monitor construction phases and meet the performance requirements within the established tolerances specified in the procurement specifications.

CONSTRUCTION & PROJECT MANAGEMENT APPROACH

Biggs Cardosa believes that developing an integrated set of processes and procedures to be adopted across all stakeholders and departments of our team is crucial for the effective, efficient operation and overall success of the project. The functions of the project team and the interrelationships with stakeholders, consultants and the Design/Build Contractor must be defined clearly. The steps to develop the project processes and procedures are:

- Initial briefing by the project team
- Interviews with key PMs and stakeholders
- Provision of draft flow charts & function outlines for each department for review and discussion
- Finalization of the flow charts and function outline with department-related adjustments
- Preparation of draft procedures, based on the final flow chart and function outlines
- Present draft procedures for each department & element of the team for review and approval
- Issue the Project Management Plan for implementation

The resulting PMP is a comprehensive living document that contains project-specific information pertaining to:

PROJECT CONTROL APPROACH

Project control is a key component that provides the process and method and assists the team in managing the project in an organized and systematic manner. Our project control goal is to complete the project ahead of schedule and under budget.

Schedule Control: The master schedule is critical for the overall management and completion of the project. It will be the responsibility of our project control staff to maintain, update and generate monthly schedule reports. The purpose of the

scheduling function is to provide a method for developing, maintaining, evaluating, forecasting and reporting the status of the project through completion and close-out. The Master Integrated Schedule will be the vehicle for generating all schedule reports and will encompass all elements of the project and reflect all ties, constraints and milestones between the elements on a detailed and summary level. The master schedule will be used to incorporate all of the various elements of the project together, and to develop the interface milestones and possible liquidated damage milestones for each phase of the project. The most important part of the schedule is the usage by the team members for management, coordination, evaluation and enforcement. We have developed a simple method to make the schedule usable and effective evolving around management.

Budget and Cost Control: The development of an integrated Cost Control System is essential to successful management of the project. Project controls will assist in the development and maintenance of budget and contingency for the project, review of the methodology for budget development, trend forecasting and suggesting improvement where needed.

Cost Estimating and Change Control: The cost and resource-loaded master schedule can also be used for requesting and making progress payments. The Biggs Cardosa team understands budget control is key to the successful completion of the project, and that successful budget control often involves working with a number of different funding sources and stakeholders. We will establish and maintain the monthly estimates, change orders log and estimate and item overruns, and we will make certain potential change orders have been assigned a correct dollar amount and are not underestimated. We will also establish an as-built schedule and compare it with the project schedule to identify potential delays. We will require the Contractor also submit a two-week look-ahead schedule so we have a complete grasp of the as-built schedule. It is our practice to obtain a weekly work schedule from the Contractor, and by having the weekly schedule, two-week look-ahead schedule and schedule updates, our project control engineer can identify potential construction issues. We also use partnering methods to help resolve potential claims and issues and come to a resolution as soon as possible. We maintain proper logs and list change orders in the body of the monthly estimate to have a running total of all cost. We will assist in facilitating payment for material on-hand to be reflective of the material used.

QUALITY CONTROL & QUALITY ASSURANCE

This task involves two interdependent processes: Quality Management System and Quality Inspection Services. Quality inspections (or field QA) supports the quality engineering, and both are an essential component of a construction project QMS. We are proposing the quality site inspection activities by **Atlas Company**, supported by a team of qualified construction inspectors and materials testers from Biggs Cardosa, MNS, Anser, and Metro. Should Metro decide to transfer all quality-related services to CSSC for this project, our team stands ready to provide a full range of quality management services on behalf of Metro in the most efficient manner. **Laura Uden** of NSI Engineering will develop the Quality Management Systems for this project Michael has a long history working with Laura on his projects that have won accolades from Owners, and has chosen her to be the Quality Manager for our team. Michael has worked with Laura on the BART to San Jose Design/Build, Tustin/Rose BNSF Grade Separation, Rosecrans BNSF Grade Separation, and HSR Design/Build CPM contracts. Laura has almost 20 years of hands-on experience as a heavy civil transportation design and construction QA Oversight Engineer and QA Manager on both Design/Bid/Build and Design/Build projects. The CHSRA highlighted Laura's contributions to the Program in a short video at https://www.youtube.com/watch?v=jJuiOxSzAaA. Laura will develop the Quality Management System (QMS) for this project, which will address:

- D/B contractor's QA/QC management plan
- Metro's Quality Management Procedures & Processes
- Standards compliance
- Metro's verification of plan implementation
- D/B contractor's document control plan
- QA/QC management plan update process

The QMS is a comprehensive living document that contains Quality Control and Quality Assurance Procedures that will be followed by all members of the team. Quality is of utmost importance for Biggs Cardosa and our team.

2. EXPERIENCE AND CAPABILITIES OF THE FIRMS ON THE CONSULTANT'S PROJECT TEAM

Metro Orange Line Sepulveda Station

BIGGS CARDOSA TEAM INTRODUCTION

Biggs Cardosa Associates, Inc., in association with our subconsultants, is excited to submit a proposal to provide Construction Support Services for the Metro Orange (G) Line Improvements project. We believe that we have assembled the **best overall team for this project** with an unparalleled level of experience in project management, construction management, inspections, past experience with similar projects, and working history with Metro.

Biggs Cardosa, as a structural engineering and construction management firm, provides a unique perspective on grade separations, transportation and transit projects. Since the firm's inception 35 years ago, Biggs Cardosa has worked on **hundreds of projects throughout California with similar project components.** We also have developed a strong practice with projects that utilize alternative delivery methods.

As indicated in the RFP there are several key staff roles that are vital to the successful completion of the proposed project. Our proposed key personnel have been carefully selected based on their experience, qualifications, work history with Metro, experience with transit projects and their demonstrated knowledge and expertise in all applicable standards, codes, guidelines, specifications and ordinances. Our key personnel have an average of 20+ years of experience in the industry and related fields. In addition to the roles **Biggs Cardosa** will be providing (Project Director, Deputy Project Director, Resident Engineer/Structures Rep and Lead Structures Construction Inspector), we have included four other firms who have been purposefully chosen to provide key staff: **Anser Advisory** (Safety Manager and Senior Cost Analyst); **MNS** (Assistant Resident Engineer); **AMG** (Signal/Systems Design Review/ DB Coordinator and Senior Construction Inspector (System/ Signal) and **NSI** (Quality Assurance Manager).

Our team also fully satisfies the MSZ, SBE and DVBE participation requirements. **Nine out of thirteen of our subconsultants are SBE and/or DVBE certified.**

Detailed resumes for our Key Staff Members are included in Section 4 of our Proposal.

TEAM HIGHLIGHTS

- ✓ Fulfillment of MSZ, SBE and DVBE RFP requirements
- ✓ Successful track record of completing projects on time and within budget
- ✓ Excellent past performance working with Metro and other proposed stakeholders
- ✓ Experience with similar projects
- ✓ Staff availability, expertise and commitment
- ✓ Demonstrated knowledge and experience with all applicable standards, codes, guidelines, specifications and ordinances
- ✓ In-depth understanding of the project requirements, key issues, and constraints

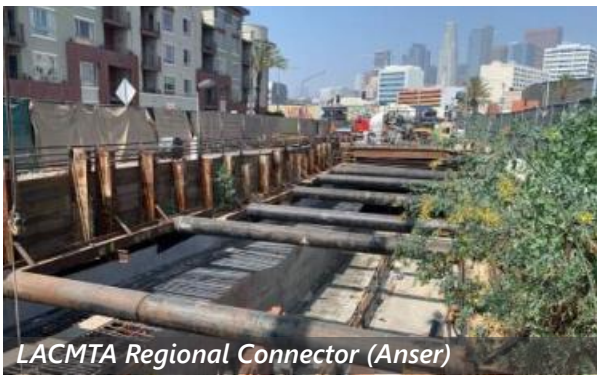
LACMTA Rosecrans/Marquardt Grade Separation (Biggs Cardosa)

TEAM EXPERIENCE WITH METRO

Biggs Cardosa has been working with Metro since 2015. We are currently serving as the prime consultant for the design of Metro's $155M Rosecrans/Marquardt Grade Separation project in Santa Fe Springs. Biggs Cardosa is leading a multi-disciplinary team of consultants and is providing structural engineering design services at this important BNSF crossing, which has been rated by the CPUC as one of the most hazardous railroad crossings in California.

Since its inception 35 years ago, Biggs Cardosa has worked as the Prime Consultant with over 100 California government agencies. Biggs Cardosa has provided construction management, inspections, structural engineering, constructability review, and other equivalent services to several California transportation agencies including **Los Angeles County Metropolitan Transportation Authority, Orange County Transportation Authority, San Bernardino County Transportation Authority, Santa Clara Valley Transportation Agency, Transportation Authority of Marin, and Fresno County Transportation Authority,** as well as 24 counties, 60 cities, and over 20 other agencies such as towns, redevelopment agencies, water districts, and ports. Our portfolio contains thousands of transportation, bridge and roadway projects performed directly for public agencies.

Anser Advisory began major work with Metro in 2013 on the $1.75B Regional Connector providing construction management services. As a major teaming partner on the Construction Management Support Services team, Anser provides risk management, claims mitigation, cost estimating, scheduling, inspection, and project controls services. Anser has taken a very proactive approach to providing and maintaining local staff that has been committed to the project for a long duration. Not only has Anser's staff remained on the project for years, but they have grown in their level of responsibility and capabilities. This has been accomplished through ongoing workshops, training on lessons learned, and investment of senior management to engage staff regularly regarding their purpose and responsibilities on the project.



LACMTA Regional Connector (Anser)

LACMTA Division 20 Portal Widening and Turnback Facility (Anser)

In 2018, Anser Advisory began providing construction management services on the Division 20 Portal Widening and Turnback Facility. The $450M project will accommodate increased service levels on both the Metro Red and Purple lines by widening the heavy rail tunnel portal south of the US-101 freeway, building a new turnback facility, and expanding and reconfiguring the rail storage tracks. Anser provides diverse disciplines with familiarity and knowledge while working in and around active tracks to complete the following project components: 1st Street Bridge retrofit, soffit modifications, pier demolition, Caltrans Type 7 retaining walls, precast tunnel roof panels, relocation and protection of utilities, installation of new turnback and storage tracks in an active rail maintenance and staging yard, installation and testing of train control systems, and installation and testing of traction power components.

Through work on Regional Connector and Division 20, Anser Advisory has made significant contributions in utility location and relocation, constructability reviews, and third-party coordination to identify risks and mitigate impacts to cost and schedule. The Anser Advisory team is comprised of professionals who are excellent communicators who facilitate efficient communication between all project team members, third parties, and stakeholders.

MARRS Services, Inc. (MARRS), a certified M/WBE/SBE firm, has completed projects for both Metro and the City of Los Angeles providing construction support services for projects of similar complexity to improve safety and mobility, and reduce congestion. Over the past decade MARRS has completed two as-needed construction management support services (CMSS) contracts for Metro under which they have provided resident engineering, inspection, office engineering, cost estimating, scheduling and claims support services for over 25 projects ranging in cost from $500K to $120M.

Metro Purple Line Subway Extension (Casamar)

Dias Yourman Associates (DYA) has provided both geotechnical, environmental, and construction support services to Metro for more than 70 projects (over 100 task orders), including light rail transit, track improvements and double-track projects, bus rapid transit, stations, subways, pedestrian crossings, parking lots, and transit and rail maintenance facilities, as well as highway corridors.

GPA is particularly skilled in transportation projects and has ample experience working with the Metro. GPA has worked on nearly 30 projects under Metro. Experience with Metro includes two task orders under the Metro Environmental Compliance On-call, which included environmental services for capital improvement projects for the Los Angeles Union Station, the North San Fernando Valley Bus Rapid Transit, and a number of freeway and interchange projects including task orders for two primes under the agency's Highway Program On-call (AE30673), the Interstate 605 Corridor Improvement project, the Interstate 710 Corridor Improvement project, and the Interstate 5 North HOV and Truck Lanes Project.

"MARRS has held multiple PM/CM contracts with Metro over the last decade, and has performed excellently every time. MARRS led a team for Metro's award winning Division 13 project, which is certainly a marquee achievement, among others."

Timothy Lindholm, Senior Executive Officer
Metro Capital Projects

Casamar Group has been prequalified by Metro as a Jobs Coordinator in accordance with its PLA and CCP requirements. Casamar Group has also been selected by Metro to be on their bench to provide Labor Compliance services for its transit and transportation projects and is under contract, as a member of this compliance bench, providing these services for numerous transit projects including the $83M Orange Line Extension project in Chatsworth, CA, their CNG Fueling facility for the Division 13 Maintenance and Fueling facility and currently the $1.6B Westside Wilshire Subway Extension. Furthermore, Casamar staff provides environmental SWPPP compliance inspections of nine Metro maintenance facilities.

Casamar provides revenue compliance and facilitation support services for Metro's Express Lanes and was also a key member of the most recent Metro Tolling System evaluation/demonstration project.

Wilshire Subway Tunnel (Casamar)

Biggs Cardosa Associates, Inc. (MSZ)

Biggs Cardosa Associates, Inc. (Biggs Cardosa) is a California corporation established in 1986 that provides professional consulting services in the specialized field of structural engineering design, project management, construction management, and inspection services. Biggs Cardosa qualifies for this project under **Medium Size Enterprise (MSZ) requirements** as it has 121 employees and our average annual gross receipts over the last three years are between $25 and $250 million. We are the right mid-size firm to ensure your project will get the attention needed because we are not focused on larger endeavors.

The firm specializes in transit projects which include grade separations, highways, bridges, roads, and other related structures. We provide Construction Management and Inspection services for rehabilitations and retrofits, as well as construction of new and replacement structures. The firm is experienced in all aspects of construction as well as structural design process of transportation projects that have to comply with federal, state, and local requirements - from funding assistance and permitting, to design, administration, construction management and inspections.

Biggs Cardosa, as a structural engineering and construction management firm, provides a unique perspective on transit–related projects. Since the firm's inception over 35 years ago, Biggs Cardosa has worked on **hundreds of projects throughout California which involved both heavy and light rail structures.**

Experience with Alternative Delivery Methods

Biggs Cardosa has made a concerted effort to become a leader in all aspects of design/build projects since it was introduced to the transportation industry in California over 15 years ago. We have participated in design/build projects in all different roles, representing the Owner, working for the design/build Contractor, and overseeing the design/build as part of the PCM teams. We have also pursued several design/build projects that we have not won. Paradoxically, the design/build projects that we spent months optimizing and preparing preliminary designs for, but which we didn't win, may have provided us with the greatest knowledge of the design/build industry, of what works and what doesn't work.

For detailed experience with Alternative Delivery Methods please see Section 3.A. of our Proposal.

BIGGS CARDOSA ASSOCIATES INC

Biggs Cardosa (MSZ)
121 employees

Years in Business
35

Type of Organization
California Corporation

Services & Capabilities
- Project Management
- Construction Management
- Inspections
- Office Engineering
- Scheduling
- Labor Compliance
- Claims Review
- Structural Engineering
- Cost Estimating
- Value Engineering
- 3D Visualization
- QA/QC

Office Locations
- Orange
- San Jose
- San Francisco
- Oakland
- Fresno
- Sacramento

Transit Experience

Biggs Cardosa has been providing project management, structural engineering and construction management on transit projects throughout California since our inception. Projects include grade separations, light rail transit systems, Caltrain projects, transit centers and airports, including:

SVBX BART Line Segment and Stations, Fremont/Milpitas (Design/Build). Biggs Cardosa acted as the Line Segment Structures Lead and provided preliminary and some final design for approximately 40-line segment structures (BART bridges, stations, UPRR bridges, station guideways and roadway bridges over BART).

BART - Milpitas Station Overview

Eastridge to BART Regional Connector/Capitol Expressway Lightrail, San Jose. Providing structural design services for the proposed Capitol Expressway LRT project which consists of a 2.5 mile-long extension of a light rail line along Capitol Expressway. The project includes a 2-mile long aerial guideway structure with retained fill approaches, one aerial station, one at-grade station, a pedestrian overcrossing (POC) structure and the associated station access structures.

Capitol Expressway Lightrail

Tasman Corridor LRT Elevated Stations and Aerial Guideway, San Jose/Milpitas. Provided project management and design for a 7,100-foot-long elevated structures, the elevated platform stations integrated with the guideway and multiple pedestrian structures from park-and-ride lots.

Tasman Corridor LRT Guideway

Caltrain Santa Clara Station PUC Extension, Santa Clara. Provided project management and structural engineering for the design of a pedestrian undercrossing at the Santa Clara Caltrain Station. The structure serves as a connection to the Caltrain station platform and extends the undercrossing.

Caltrain Santa Clara Station

LAWA LAX Automated People Mover, Los Angeles (Progressive Design/Build). As a member of the Seismic Peer Review Panel, Biggs Cardosa reviewed and made recommendations to the Contractor, the Airport and City of Los Angeles. Reviewed structures included four in-line transit stations and connecting pedestrian bridges.

LAX People Mover

Construction Management and Inspection Services

Biggs Cardosa's experience in construction management and inspection services for transit projects includes all aspects of the construction oversight, including value engineering and constructability reviews during the project's design phase to close-out. Without limitation, our team not only provides construction management and inspection expertise but is also experienced in structural design. This knowledge and experience are our team advantages and a unique edge that will allow our construction managers to develop a business sense to provide advice, leadership and coordination amongst project stakeholders, with the focus to improve schedule performance and minimize cost overruns, by considering alternative technical solutions and evaluating design changes, to ensure successful project completion.

Our Construction Management services include submittal review, RFI, and CCO processing, claims review, and scheduling, as well as permit monitoring, structural observation and construction inspection.

As an engineering firm that performs design and construction engineering, Biggs Cardosa's inspectors come from an engineering background which enables them to have the insight and knowledge to understand the importance and relevance of the elements being inspected and the ability to identify potential problems in the field before they become major issues. One of the unique strengths offered by our inspectors is their intimate knowledge of design requirements and goals.

Biggs Cardosa's model is flexible and cost-efficient due to the following:

- We have high inspector capacity as we have over 50 engineers who can provide structural inspections
- We provide high inspector quality because our inspectors have engineering backgrounds
- Our inspectors have flexibility as our inspectors can be pulled back into the office and be placed on other assignments if their services are not needed for any given time period at the project site

Financial Responsibility

With a solid balance sheet (no debt), and over $32 million of yearly billings, we can comfortably demonstrate financial responsibility for the project. Our firm has remained well-capitalized and profitable for every one of its 35 years in business and has never filed for bankruptcy.

Firestone Boulevard Regional Corridor Capacity Enhancements "The Boulevard Project"

RECORD OF SATISFACTORY PERFORMANCE & ABILITY TO MEET DEADLINES

Biggs Cardosa is committed to being responsive to the schedule needs of this complex project. Biggs Cardosa and our team will establish a realistic and achievable schedule, maintain a risk matrix that includes schedule impacts, and ensure that this project is delivered on time. Some examples of the team's ability to deliver projects on time are included below:

- **High Speed Rail CP2-3:** Biggs Cardosa is leading the Independent Check Engineer (ICE) function under the PCM for this $1.8 billion Design-Build contract, and is performing full independent checks for all structures on the project. The contract did not provide a maximum number of concurrent submittals allowed from the D-B. Despite a verbal commitment to space out the submittals, the D-B has been making as many as 76 submittals per month for the ICE's review. Biggs Cardosa mobilized large additional resources to turn around virtually all submittals to the PCM within the statutory time. Out of the 592 submittals received during the course of the project, Biggs Cardosa has returned 574 reviews on time, an on-time performance of 97%.

- **G Street BNSF Grade Separation:** The design team committed to and adhered to an extremely aggressive schedule. When Biggs Cardosa was given NTP in May 2008, only a very rough concept existed. In June 2010, the project was awarded for construction. Within those 26 months, the design team filed a SE from CEQA, completed a feasibility study and the full PS&E, coordinated the relocation of many utilities, led an extensive community outreach effort, supported the acquisition of 6 full parcels and several partial takes, and oversaw an early demolition contract to clear the right-of-way. Although the project was the least advanced project approved for funding under Prop 1B's Highway-Railroad Crossing Safety Account (HRCSA) program, according to the CTC, it was the first project to be constructed and complete under the program.

- **Tustin/Rose BNSF Grade Separation:** This is one of seven projects that was included in OCTA's grade separation program. Biggs Cardosa met every single interim milestone and the final deadline for the project.

- **Firestone Boulevard Bridge over San Gabriel River (HBP):** Biggs Cardosa led a very successful coordination with the US Army Corps, LACFCD, CA Fish & Wildlife and the RWQCB to design, environmentally clear, secure all permits, acquire all right-of-way, relocate all utilities and advertise this project in under three years. Its sister bridge, over the Los Angeles River was in this process for over 9 years from start of preliminary engineering to advertising for construction.

Tustin/Rose Grade Separation

EXPERIENCE WITH UNIQUE PROJECT CHALLENGES & LESSONS LEARNED

Biggs Cardosa has completed thousands of transportation and transit projects throughout California. Every project is unique, and has its own set of challenges. Biggs Cardosa welcomes challenges and uses the creativity of our experienced staff to come up with innovating and creative solutions.

Unique Challenges: On the Santa Clara Caltrain Pedestrian Undercrossing Extension Project (which received a number of noteworthy awards, including the ACEC California Golden State Award, there were two major innovative applications of existing techniques: 1) the strategy of combining precast concrete with cast-in-place concrete for rapid construction and 2) the detailing of the gap between the existing pedestrian underpass and the new underpass to minimize impact on UPRR operations.

The existing pedestrian underpass from the Caltrain station to the northbound platform consists of a cast-in-place concrete structure with long horizontal ribs running the length of the tunnel. Originally, the design that we completed—and for which received approvals from UPRR—consisted of a similar cast-in-place concrete structure. The plan was to install temporary bridge sections beneath the tracks during frequent nighttime track closures and then install the permanent cast-in-place structure beneath the temporary bridge.

Midway through the project, however, UPRR requested that we limit the construction duration and impact to tracks to a long weekend (three to four days maximum). This request resulted in changing the underpass to a precast structure in order to shrink construction time to the barest minimum: **96 hours over the four-day 2016 Thanksgiving weekend.** This would minimize the time that UPRR would need to close its three tracks over the new underpass. Closing these tracks requires diverting UPRR freight trains - as well as Caltrain, Amtrak and Capitol Corridor passenger trains that rely on the UPRR tracks - onto the Caltrain track that is over the existing underpass. **The excavation and tunnel installment were successfully completed in 96 hours.**

Caltrain PUC - Rapid Excavation

Minimizing disruption for the rail operators was a major consideration for this project. More than 90 trains operate along this corridor each day. The UPRR carries millions of dollars' worth of freight every day, and Caltrain and other operators carry up to 10,000 passengers each day: any delay would result in severe financial impact to the rail commerce and disruption to commuters.

Lessons Learned: Each project that we work on also provides an opportunity to learn something new, and then apply this knowledge to future projects, in order to help them go more smoothly. Biggs Cardosa has a practice of having information sessions led by our senior staff to pass on this knowledge to the younger generation of engineers and inspectors.

A few of our lessons learned are as follows:

LESSONS LEARNED from the City of Oakland Construction Management Support & Inspections of Five Bridges (HBP)

Biggs Cardosa provided Construction Management and Inspection services for the City of Oakland Seismic Retrofits of five bridges. Being very sensitive to the City's budget constraints, we worked closely with the City throughout the duration of the project, continually adjusting our scope during construction to stay within budget, especially as we got closer to project completion.

One example is that there were a significant amount of QA welding inspection needed for the **Coliseum project location** that required full-time inspection during welding operations which would expend a lot of our remaining budget. To alleviate

this problem, we coordinated with the City to have both the City and Biggs Cardosa staff onsite the first two days so our inspection staff could show the City staff what to look for during the QA welding operations, and then the City staff performed the remainder of the QA welding inspections. This helped save our inspection budget for more critical elements that were constructed later in the project.

During construction, we continually reviewed the Contractor's schedule to evaluate upcoming construction tasks. We reviewed the project plans and specifications to identify any conflicts with the upcoming construction work, and we ensure that all submittals for this work are approved, and that all responses for RFIs related to the work have been provided to the Contractor. Performing this due diligence helps ensure that potential claims are minimized which results in projects that are constructed on time and within budget.

On the **Hegenberger project**, there was a significant amount of drill and bond dowel inspections still needed that required full-time inspection during bonding operations which would expend a lot of our remaining budget. To alleviate this problem, we coordinated with the City to have both the City and Biggs Cardosa staff onsite the first two days so our inspection staff could show the City staff what to look for during the bonding operations, and then the City staff performed the remainder of the bonding inspections. This helped save our inspection budget for more critical elements that were constructed later in the project.

LESSONS LEARNED from Napa County 2017 Storm Damage Repair Projects

Several important experiences were gained from these projects. The more noteworthy "lessons learned" include the following;

1. Encourage the agency to have the CM team provide a constructability review prior to issuing the bid documents. The constructability review will allow the CM team to check that the bid items are consistent with the measurement and payment clauses provided in the specifications. Ensuring that the bid items are consistent with the measurement and payment clauses (ie. using Caltrans standard bid items when using Caltrans standard specifications) will help with tracking and documenting the pay items.

2. If already not in the scope of services, request that the scope of services includes QA survey control. Without QA survey control, the project is entirely dependent on the contractor's survey to construct the project to the proper alignment and elevations. If there is a bust in the elevation or alignment, the CM team will not know whether the error was in the design or the construction survey, and performing QA survey prior to construction is much more efficient than performing the QA survey after the construction then having to address the issue.

3. Whenever stained concrete is used, consider the proposed locations of construction joints if required as the stained surface will have visibly different finishes between different pours based on the ambient conditions at the time of the pour even when using the same mix design.

Hegenberger Overhead

Anser Advisory

Anser Advisory Management, LLC, dba Anser Advisory (Anser) is a national program and construction management consulting firm offering a wide range of advisory services to public and private sector organizations. Anser's services begin with early phase strategic organizational and program planning and continue through managing the tactical execution of each project or initiative. Anser operates nationally, with a diverse, talented staff of over 400 professionals, however, leverage of their local offices help to support Southern California clients, including offices located in Santa Ana, El Segundo, San Diego, and Palm Desert possessing over 160 employees including construction managers, inspectors, schedulers, architects, engineers, estimators, management consultants, financial analysts, procurement specialists, system configuration specialists, and construction auditors.

Anser, a Delaware Limited Liability Company, was established in 1996, performing work out of 14 U.S. offices.

Anser has provided construction management services in California for the past 25 years. They have current and previous contracts with Metro, Orange County Transportation Authority (OCTA), Caltrans Districts 2, 5, 6, 9, 10, 11 and 12, County of Riverside Transportation Department (RCTD), San Bernardino County Transportation Authority (SBCTA), Riverside County Transportation Commission (RCTC), Orange County Transportation Authority (OCTA), Port of Los Angeles, Port of Long Beach, San Diego Association of Governments (SANDAG), County of San Diego, and Coachella Valley Association of Governments (CVAG).

MNS Engineers Inc.

Established in 1962, MNS is a C-Corporation providing quality infrastructure consulting services to the transportation, water resources, and government service markets throughout California. MNS specializes in construction management and construction support services for federal, state, county, special districts, and municipal and transit agencies. MNS's team members have managed numerous grade separation projects and roadway improvement projects involving at-grade crossings requiring coordination and compliance with rail entities such as Caltrain, Union Pacific Railroad (UPRR), and Bay Area Rapid Transit (BART) requirements and procedures. The firm's fully consolidated team members have completed construction management and inspection services for over 100 railway, transit, roadway, bridge, and structure construction projects totaling over $1.5B in improvements.

As of February 2021, MNS has 168 employees throughout nine offices (Antioch, Buellton, Oakland, Ontario, San Francisco, San Jose, San Luis Obispo, Santa Barbara, and Westlake Village).

MNS has demonstrated high levels of technical knowledge in all aspects of public works/transit construction, including grade separations (such as with the Lewis Road Grade Separation for the County of Ventura), track and station reconstruction (such as the Warm Springs Grade Separation for the City of Fremont) involving track coordination and a new BART transit station, new transit facilities and transit systems for Caltrain and BART, as well as new structure construction and crossing signal improvements. Similar alternative delivery projects include working on the High-Speed Rail project as well as currently working on $400M Caltrans HOV Corridor Improvement project on US 101 through the construction management/general contractor procurement method.

MNS recently worked as a subconsultant on Metro's State Route 170 Soundwall Package #11. George Haines, who will be acting as Senior Construction Inspector (Civil) on the proposed project served as an Assistant Resident Engineer/Construction Inspector on the Soundwall Project.

Zephyr Rail

SBE

Established in 2015 in Orange County, CA, Zephyr UAS, Inc. (ZUI) is a small, family-owned company that aims to provide efficient and cost-effective engineering, construction management, aerial mapping, and inspection solutions for projects with the most aggressive schedules or budget constraints. ZUI uses a state-of-the-art fleet of unmanned aerial vehicles (UAVs) to produce high-resolution aerial imaging and orthorectified photography to support the development of survey-grade mapping and digital terrain models. In addition, ZUI's equipment can collect full color-rich, infrared, near infrared or multispectral imaging to aid engineers and scientist with monitoring and/or identification needs. Furthermore, ZUI's UAVs can produce cinematic-quality video and photography. ZUI's pilots are certified specifically for small unmanned aerial vehicles (sUAVs) under FAA Part 107.

In 2018, ZUI was positioned to be a full-service railroad engineering consultant because of the industry experience and "in-the-trenches" local knowledge of its founders. ZUI's three partners have almost a century of combined railroad engineering experience focused on the development of freight and passenger rail operations in Southern California. ZUI's staff have performed and overseen Design Engineering and Construction Management Services for every kind of railroad project: capacity improvement projects, double track projects, triple track projects, grade separations, railroad bridges, and at-grade crossing projects.

Because of that experience, members of the ZUI staff have an impressive reputation in the industry spanning nearly 30 years as one of the most qualified, responsive group of professionals serving the railroad community in the Southern California basin, and across the United States.

Advanced Mobility Group (AMG)

SBE

Advanced Mobility Group (AMG) is a California Corporation and certified Small Business Enterprise (SBE), established in 2018 to provide specialized innovative transportation services. AMG assists with disruptive technologies to empower the private and public sector in early adoption of proven advanced transportation solutions and intelligent infrastructure.

AMG is staffed by a 30-member team with offices located in Walnut Creek, Oakland, and San Francisco. AMG's engineering professionals serve public sector clients throughout California and have performed key work on projects across the nation.

AMG's team of transportation professionals offer a wide range of services that address clients' needs throughout the duration of a project's life cycle from planning to operations and maintenance – including permitting assistance, programming, public engagement, conceptual and final design, schedule analysis, technical services, procurement services, project delivery, construction support, dispute/claims resolution, systems integration, revenue generation, and ongoing infrastructure management.

Alta Vista Solutions & Atlas Company

Atlas Technical Consultants LLC (DBA Alta Vista Solutions an Atlas Company) Atlas is a world-class organization, dedicated to creating lasting infrastructure. Atlas is connected to the communities they service and committed to keeping people safe, connected, and productive by providing infrastructure that lasts for generations. Atlas has over 100 years of combined experience offering a full suite of comprehensive professional services to include program management, engineering design, construction management, materials testing, inspection, and certification; environmental compliance, due diligence, subsurface investigation and remediation, industrial hygiene, geotechnical services, and disaster response and recovery.

Alternative Delivery and Grade Crossing Experience includes:

- 6th Street Bridge Viaduct Replacement Project, Los Angeles, CA (CMGC)
- Gerald Desmond Bridge IQA Services, Long Beach, CA (D-B)
- San Francisco International Airport Control Tower/ Airport Parking Garage, San Francisco, CA (PDB)
- LAWA, LAX Automated People Mover, Los Angeles, CA (P3)
- Bellflower Regional Transit Center and Parking Structure, Bellflower, CA (Grade Crossing Improvements)
- SANDAG 3rd and 4th Street Grade Crossings, San Diego, CA (Grade Crossing Improvements)
- SANDAG Superloop Transit Project, San Diego, CA (Grade Crossing Improvements)
- Pedestrian Midblock Crossing Enhancements, National City, CA (Crossing Improvements)
- SANDAG Bayshore Bikeway Segments 4B and 5, San Diego and National City, CA (Grade Crossing Improvements)
- California Avenue Grade Separation, Beaumont, CA (Grade Separation)
- DART, Dallas Southern Gateway, Dallas, TX (Grade Separation)

Pacifica Services

Pacifica is a corporation incorporated in the State of California on February 16, 1979. Since its inception, Pacifica has successfully managed billions of dollars in construction projects, which includes educational facilities, public works, utility infrastructure and alternative energy projects. Pacifica has provided these services throughout the country to a diverse and ever-changing marketplace in the most efficient, consistent, and responsive manner. The greatest commitment Pacifica makes to its clients is that of excellence. This present standard of excellence reflects Pacifica's corporate philosophy: a shared desire to perform beyond the expectations of Pacifica's clients. This philosophy has produced exceptional benchmarks of expediency, effectiveness, and value for Pacifica's clients and have resulted in projects of the highest quality, delivered on or ahead of schedule and within budget.

Pacifica prides itself on the vast experience and expertise of its employees. Pacifica currently has a staff of 50+ professionals with a broad range of technical capabilities and diversified experience on public works projects. With the exception of executive management and administrative personnel, 100% of Pacifica's overall business is dedicated to construction management services. Types of professional personnel employed by Pacifica fall into one or more of the following categories:

Executive Management	Project Execution
Project Management	Construction Management
Project Engineering	Inspections
Design Management	Environmental Compliance
Energy Management	Scheduling/Planning
Facility Management	Risk Management
Quality Control	Safety
Cost Management	Labor Compliance
Business Development	Administration
Accounting/Finance	Human Resources

MARRS

SBE

MARRS Services, Inc. (MARRS), a certified M/WBE/SBE firm, has completed projects for both Metro and the City of Los Angeles providing construction support services for projects of similar complexity to improve safety and mobility, and reduce congestion. From the four offices in Southern California, MARRS provides full service project management, construction management, civil design, utility engineering, project controls and environmental compliance services. For over three decades, MARRS Principal and key personnel have provided services for the full project life cycle – planning through design and construction on projects similar to the Orange (G) Line project located within the Metro right-of-way, as well as within the City of Los Angeles.

Over the past decade MARRS has completed two as-needed construction management support services (CMSS) contracts for Metro under which they provided resident engineering, inspection, office engineering, cost estimating, scheduling and claims support services for over 25 projects ranging in cost from $500K to $120M.

MARRS staff of 60 includes project managers, construction managers, licensed engineers, office engineers, inspectors, schedulers, estimators, cost engineer, GIS/CAD technician and environmental compliance personnel. The firm is led by Principal, Riaz Chaudhary, PE, who has more than 45 years of experience providing services for the major civil infrastructure, and transportation projects, with a focus on project development and implementation leadership throughout Southern California. Mr. Chaudhary maintains open, transparent and continuous communication with all internal team members, and owners/clients to ensure that any and all challenges are provided with timely solutions.

NSI

SBE / DVBE

Established in 2004 by a team that worked together for decades on projects for the energy industry, Department of Defense and large infrastructure civil and rail construction, NSI Engineering Inc. (NSI) is a certified DBE/SBE/OMWBE S-Corporation that provides project and quality management consulting services for rail transit, highway construction and other major projects. Services include developing, deploying and monitoring FTA and ISO9001 compliant quality management systems, training project teams, and developing and implementing quality management oversight programs. NSI Engineering has experience representing the Owner/Agency (e.g., on BSVII and HSR-CP4), design teams (e.g., DRLE, PSAI), and construction teams on multiple projects.

NSI supports multifaceted transportation project supporting Metro, Valley Transit Authority and the Seattle Sound Transit, among other agencies. NSI delivers exceptional service to this industry through a talented team of project and quality management and engineering professionals whose collective knowledge in these areas spans more than 100 years.

NSI has in-depth experience on rail and highway construction projects. NSI has specialized expertise in transportation industry quality management, quality assurance, and process improvement. As quality management NSI can:

- Prepare transit project design and construction specifications specific to D/B, D/B/B, and other types of project structures.
- Prepare Quality Assurance Program Plans (QAPPs).
- Provide training to project staff in the implementation of quality assurance and quality control procedures.
- Conduct QA audits of design documents, act as a liaison for external agency audits.
- Maintain quality assurance records and assist with quality control records.

Diaz Yourman & Associates

SBE

Diaz•Yourman & Associates (DYA) is a privately held geotechnical consulting services corporation, founded in California in December 1992, with a staff of 21 employees, including 15 engineers, the majority of whom have advanced degrees in geotechnical engineering. DYA has one office, located in Santa Ana. DYA is a certified Small Business Enterprise, Minority Business Enterprise, and Disadvantaged Business Enterprise (SBE/MBE/DBE) through several agencies, including Metro and the California Unified Certification Program (CUCP).

DYA provides expert geotechnical design, environmental site assessments (ESA)/Phase I Initial Site Assessments (ISA), Phase II hazardous materials studies, construction support and observation, and forensic services to public agencies, owners, utilities, and the U.S. Government for a wide array of project types, including highways, streets and roads, bridges, rail and transit and grade separations.

DYA has worked on more than 20 Design/Build projects in the last 25 years in a variety of roles, including both lead and supporting Design Geotechnical Engineer, Construction Observation and Testing, Construction Support, and Program Management Geotechnical Support, Construction Management Geotechnical Support, and Construction Quality Assurance/Quality Control.

DYA provided preliminary geotechnical engineering design for the Expo LRT Phase I project and was then requested by the Design/Build contractor to evaluate the effects of the La Brea and La Cienega Aerial Structure approach embankment portions of the project on an existing adjacent County of Los Angeles storm drain. Subsequent to the recommendations, DYA was requested to provide construction observation during the ground improvement.

DYA performed the preliminary and final design geotechnical services for the Canoga/Northern Extension Orange Line, Phase II project. During construction, DYA was tasked with analyzing MSE wall conditions under a Construction Management Support Services contract.

GPA Consulting

SBE

GPA Consulting is a multi-disciplinary consulting firm specializing in environmental planning, biology studies, and historic preservation. The firm serves a variety of municipalities, private-sector clients, and state and federal agencies, helping them to successfully achieve project approval and implementation. GPA's expertise includes managing the environmental process and completing California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documentation, technical analysis, environmental document peer reviews, regulatory permitting, agency coordination, and construction and mitigation monitoring.

GPA is particularly skilled in transportation projects and has ample experience working with Metro. GPA has worked on nearly 30 projects under Metro. Experience with Metro includes two task orders under the Metro Environmental Compliance On-call, which included environmental services for capital improvement projects for the Los Angeles Union Station, the North San Fernando Valley Bus Rapid Transit, and a number of freeway and interchange projects including task orders for two primes under the agency's Highway Program On-call (AE30673), the Interstate 605 Corridor Improvement project, the Interstate 710 Corridor Improvement project, and the Interstate 5 North HOV and Truck Lanes Project.

GPA, founded in 2003, is a certified woman-owned (WBE), disadvantaged (DBE), and small business enterprise (SBE) registered as a California Corporation. GPA employs 28 full-time and one half-time employees, who work out of four offices in Los Angeles, El Segundo, Ventura, and Sacramento.

Capo Projects Group

SBE

Capo is uniquely positioned to provide scheduling support to their clients due to their years of providing hands-on experience on a variety of alternate delivery method projects including design/build and progressive design/build. Capo's team is comprised of experts in Schedule, Cost Controls, and Claim Management for high profile large-scale alternative delivery, design/build and bid-build heavy civil projects along with full scale capital improvement programs. Capo's team members have worked directly for multiple top national General Contractors as Project Engineers and Managers, gaining hands-on experience they are able to directly apply to their responsible scopes of work. The Capo team has extensive and wide-ranging experience, and hands-on knowledge of diverse scopes of work from highway, roadway, arterial, and light-rail projects, including but not limited to utility improvements and construction, bridge construction and retrofit, grading, paving and site work, and mechanical work. The firm has a proven, results-oriented issue resolution, value engineering and claims management track record on these engagements.

Capo's firm experience in the industry includes progressive design/build support of full scheduling development and maintenance for the Joint Venture team responsible for the $350M LAX LULEP (LAWA Utilities and LAMP Enabling Projects) Program, design/build support of schedule development and maintenance for the Joint venture team responsible for the $1.2B OCTA OC 405 Project, constructability, independent third party estimate and schedule analysis for the $53.8B Sound Transit ST3 Program, and Owner's side scheduling and claims review for the $140M SBCTA Mount Vernon Viaduct Project. These projects and programs, amongst others, are representative and illustrate the ability for the Capo Projects Group team to dutifully perform the assigned scopes of work.

Guida Surveying Inc.

SBE

Guida Surveying, Inc. (Guida) is a multi-disciplined land surveying firm that has provided project-based and on-call geomatics services throughout California since 1995. Guida has had a long history of providing skilled surveyors, field crews, and office personnel who have significantly contributed to this region's infrastructure growth. Guida currently has 91 employees. The firm offers a depth of staffing resources which can provide flexibility to accommodate working off hours, variable days, and locations, if needed. Guida believes in building positive and long-term relationships with their clients; therefore, Guida will make every effort to keep their time commitments without sacrificing quality and accuracy. With a high return rate of satisfied clients, Guida continues to offer the latest industry technology, while maintaining traditional company values. No matter the size of the project – big or small – Guida is confident in their ability to provide excellent services. Land surveying is Guida's passion and they are proud to say they do it well.

Guida has provided land surveying services on design and construction freeway and interchange projects throughout Southern California having worked with agencies such as Metro and Caltrans. Additionally, Guida brings to Metro:

- A strong depth of experience working with Metro on some of the region's most exciting transportation projects; Guida understands Metro's processes, procedures, and requirements. There is no learning curve.
- A depth of available and experienced land surveying and mapping staff. Guida's innovative team members not only know how to utilize some of the most accurate and newest technologies on the market, but they know how to blend these with traditional methodologies to create quality work products.

CASAMAR GROUP
Project, Resource & Compliance Management

Casamar Group

SBE / DVBE

Casamar Group, LLC (Casamar), a certified D/S/MBE, DVBE and SDVOSB firm, was founded in 2007 to provide assistance to public/government agencies, the engineering/architecture (A/E), construction (D/B) and project/construction management (PM/CM) communities with comprehensive contract and project management/administration, compliance and resource management support services including, but not limited to:

- Stormwater (QSD/QSP) Compliance
- PM/CM Support Service

The firm was established by Mr. Joe Garcia, a California Registered Professional Engineer (Civil), a Qualified Stormwater Practitioner (QSP) and a service-connected Disabled Veteran, who has over 27 years of professional experience in the Design and Construction Management industry of a number of Transportation, Water/Wastewater, Utilities, Environmental, Energy (photovoltaic) and Industrial projects throughout California. The U.S. Casamar is a Limited Liability Company (LLC), which currently has 14 employees, with their main office located in Newhall, CA and two satellite offices (Chula Vista & La Verne, CA).

Casamar staff brings the experience of having served numerous public agencies, including Metro, the Orange County Transportation Authority (OCTA), the Riverside County Transportation Commission (RCTC), Rio Hondo, Santa Barbara, San Bernardino, Southwestern and the Long Beach community college districts, numerous local unified school districts, CALTRANS, Los Angeles County ISD, the cities of Long Beach, Carson, Norwalk, Santa Monica and Irvine, the U.S Army Corps of Engineers, the Metropolitan Water District of Southern California (MWD) and numerous other water districts and public works clients.

Stormwater (QSD/QSP) Compliance

The Casamar staff, with over 60 years of combined engineering, construction management, construction contract compliance, field monitoring/auditing and mitigation of non-compliance issues experience; has the capability of providing SWPPP (QSD/QSP) construction and industrial compliance monitoring, verification and documentation services. Its staff consists of California licensed professional engineers with civil and industrial engineering experience.

MOUNT VERNON VIADUCT BNSF INTERMODAL YARD P/CM DESIGN/BUILD SAN BERNARDINO COUNTY

Client Public Owner/Agency/Firm
San Bernardino County
Transportation Authority

Contact Name & Position
Dennis Saylor, Project Manager
San Bernardino County
Transportation Authority
1170 W. 3rd Street, 2nd Floor
San Bernardino, CA 92410
909.884.8276
dsaylor@sanbag.ca.gov

Contract Delivery Method
Design/Build

Contract Number
18-1001826

Contract Duration
2018- 2023 (est.)

Contract Value
$15,885,960

Construction Project Value
$140,000,000

PROJECT DESCRIPTION

Biggs Cardosa is the Prime Consultant providing SBCTA Program and Construction Management services for the Mt. Vernon Viaduct at the Intermodal Yard in San Bernardino. The team is blazing new trail because this project is the first Design/Build project in California funded under FHWA's Highway Bridge Program (HBP) and administered by Caltrans Local Assistance.

The scope of the Biggs Cardosa-led team consists of supporting SBCTA in managing all phases of the Design/Build contract to replace an aging 1000-foot-long bridge spanning over 22 BNSF and Metrolink tracks across the San Bernardino BNSF Intermodal Yard. The existing bridge will be demolished (and the new bridge

will be constructed) within narrow construction work windows. The Biggs Cardosa team evaluated innovative demolition and construction techniques to maximize the work that can be accomplished during these work windows.

Responsibilities of the Biggs Cardosa-led team include preparing bridging documents and Design/Build technical provisions, utility coordination, BNSF and SCRRA coordination, right-of-way appraisals, negotiation and acquisition, demolition of structures in acquired properties and securing of properties ahead of main contractor being on board, assisting with procurement and management of a Design/Build Contractor, design reviews, environmental monitoring of the D/B Contractor, and Construction Management/ Independent Quality Assurance of all construction activities.

HIGH SPEED RAIL PROJECT, CENTRAL VALLEY SEGMENT (CP2-3) DESIGN/BUILD FRESNO COUNTY TO TULARE/KERN COUNTY

Client Public Owner/Agency/Firm
High Speed Rail Authority

Contact Name & Position
Benjamin Ruiz, Jr., PE, SE California High Speed Rail Authority, Deputy Contract Manager CP 2-3
1775 Park Street , Selma, CA 93662
559.558.5204 | Benjamin.Ruiz@hsr.ca.gov

Contract Delivery Method
Modified D/B

Contract Number
HSR13-81

Contract Duration
2014-2021 (est.)

Contract Value
$19,987,228

Construction Project Value
$2,200,000,000

PROJECT DESCRIPTION

The California High Speed Rail project is the largest infrastructure project in the nation and is planned to operate trains at more than 200 miles an hour over 800 miles of new tracks. The project will be the first high speed rail project in the Country, and will transport passengers more efficiently, safely and with less environmental impact than other forms of transportation. Biggs Cardosa has been involved in several segments of the project, including the Central Valley Segment.

For this segment, Biggs Cardosa Associates is the Independent Checking Engineer (ICE)/ Independent Site Engineer (ISE) for Construction Package 2-3 (CP 2-3). This contract stretches over 60 miles through the Central Valley from just south of Fresno to just north of the Tulare/Kern county line.

To address a recurring quality issue on many California D/B projects, which is believed to be caused at least in part by lax quality control and assurance by what is traditionally a Contractor-procured Quality Team (classic conundrum of fox guarding the chicken coup), the Authority deviated

from the standard D/B model for this contract, and extricated the independent check function from the Design/Builder and moved it to the PCM's.

Biggs Cardosa was contracted by the PCM explicitly to fulfill this function on the Project. Biggs Cardosa's responsibilities as the Project's ICE including reviewing and recommending the disposition for all Technical Design Submittals, performing full independent structural design calculations for over 50 high-speed rail and roadway bridge structures along or over/under the alignment, and identifying, checking, and tracking that each structure will be in compliance with the project's design criteria.

Many of the submittals in this segment also required Caltrans oversight, or approval by BNSF and/or the jurisdictions in which the bridges are located.

Because of the novel nature of delivering a D/B Project modified this way, Biggs Cardosa prepared a comprehensive ICE/ISE Management Plan at the outset of the Project to carefully define responsibilities and tasks for all parties concerned.

Biggs Cardosa also participated in a one-year effort with the Authority and the ICE/ISE Managers of the other two Construction Packages under construction to document what was working well and what needed to be modified before using this method on future contracts.

REGIONAL TRAFFIC SIGNAL SYNCHRONIZATION PROJECT (CV SYNC) COACHELLA VALLEY, CA

Client Public Owner/Agency/Firm
Coachella Valley Association of Governments (CVAG)

Contact Name & Position
Eric Cowle
Transportation Program Manager
CVAG
73710 Fred Waring Drive, Suite 200
Palm Desert, CA 92260
760.346.1127

Contract Delivery Method
Design/Bid/Build

Contract Number
CVL-2015-0309

Contract Duration
2021-2022 (est.)

Contract Value
AMG $960,000
Anser $687,000

Construction Project Value
$21,200,000

PROJECT DESCRIPTION

This project located in the Coachella Valley consists of upgrading the local agencies' existing legacy (outdated) traffic signal controllers, traffic management systems, and communication systems with the latest off-the-shelf technologies in order to provide inter-agency traffic signal synchronization along three regional roadways including Highway 111, Ramon Road, and Washington Street. The project improvements include advanced traffic management systems (ATMS), advanced transportation controllers (ATC), selected Intelligent Transportation System (ITS) elements, ITS sub-systems, and Ethernet/IP-based communications that will be expandable and scalable for future integration of ITS technologies and strategies, such as Integrated Corridor Management (ICM), Smart Cities, and Connected and Autonomous Vehicles. This project will also include a Regional Traffic Management Center (RTMC) and local Traffic Operation Centers (TOC) that will have the capability to monitor and control connected traffic signals and be used as a monitoring tool for research and analysis to help determine regional system enhancements, operations, and maintenance.

The proposed improvements will meet State standards and requirements. All work and resulting facilities will fully conform to Federal Highways Administration (FHWA), State of California Department of transportation (Caltrans), Caltrans Standard Plans and Specifications, latest edition, and the Caltrans Local Assistance Procedures Manual (LAPM, 2019) requirements. Coordination with

local jurisdictions, utility companies, and others is required. All work and resulting facilities will fully conform to the current adopted Coachella Valley State Implementation Plan (CVSIP) for PM10 and include Best Management Practices during the construction process.

CV Sync will make it more efficient to get across the Coachella Valley while reducing travel times for residents and visitors and improve the air quality by helping reduce emissions. The highly technical hardware and software systems being installed will give the cities the ability to coordinate traffic flow and will be especially useful in coordinating future large-scale events that draw hundreds of thousands of tourists to the region.

Advanced Mobility Group (AMG) is providing integration support fiber optics and wireless communications, software/cloud-based system, ATMS, and traffic signals. Specifically, the AMG team is assisting with bid administration and pre-construction assistance, schedule evaluation, construction oversight and inspection, coordination of agency inspections and acceptance, office engineering, and project close-out.

When the project starts construction, **Anser** will perform electrical inspection for traffic, signing, and striping inspection, quantity calculations, checking grade and alignment, construction traffic control, quality control, hardscape inspection, trenching inspection, fiber optic and wireless communications, hardware/software installation, communication networks, cyber security, tenant improvements, and duties that may be required to determine that construction of the Project is being performed in accordance with the contract documents.

3. SUMMARY OF EXPERIENCE AND QUALIFICATIONS RELATIVE TO THE PROJECT

Metro Orange Line Balboa Blvd Station

03 SUMMARY OF EXPERIENCE & QUALIFICATIONS

SUMMARY OF EXPERIENCE AND QUALIFICATIONS RELATIVE TO THIS PROJECT

Biggs Cardosa's experience providing construction management and inspection services for transportation and transit projects includes all aspects of the construction oversight, including value engineering and constructability reviews during the project's design phase through close-out. Our resident engineers, structure representatives, office engineers and inspectors perform a complete array of pre-construction, construction management, inspections and post construction services to create a turnkey project on any construction project Biggs Cardosa manages.

Our CM services include submittal review, RFI response, CCO processing, claims review and scheduling, as well as permit monitoring, structural observation and construction inspection. We perform construction management and inspection services per the Standard Specifications for Public Works Construction (Greenbook), standard Caltrans procedures using the Caltrans Construction Manual and other related Caltrans specialty manuals, guidelines and criteria. We are also familiar with Metro policies and protocols.

As an engineering firm in both construction management and structural engineering, our inspectors come from an engineering background which enables them to have the engineering insight and knowledge to understand the importance and relevance of the elements being inspected and allows them the ability to identify potential problems in the field before they become a major issue. One of the unique strengths offered by our inspectors is their intimate knowledge of the structural design requirements and goals. As well as being proficient with the "Greenbook" inspection procedures and having multiple certifications from ACI, ICC and AWS, our field inspectors are skilled in structural engineering and maintain proficiency with structural design.

Biggs Cardosa's inspection services model is more flexible and cost-efficient compared to other CM firms due to the following:

- More inspector capacity as we have over 50 engineers who can provide construction inspections
- Better inspection quality because our inspectors have an engineering background
- Biggs Cardosa inspectors have more flexibility as our inspectors can be pulled back into the office and placed on other assignments if their services are not needed at the jobsite

Biggs Cardosa has completed numerous construction management and inspection projects and is very familiar with the SSPWC "Greenbook", Caltrans Local Assistance Procedure Manual, Caltrans Construction Manual, MUTCD, ADA Guidelines, CAL OSHA, SWPPP and PMP. We follow industry standards for construction documentation and filling systems and will provide the format acceptable to the Metro, as requested. Biggs Cardosa's proposed personnel possess all necessary licenses and certifications required to perform the work on any task that may be assigned under this contract.

Santa Clara Caltrain Station PUC Extension

The members of the proposed Biggs Cardosa team have been selected based upon each firm's experience relevant to this project, their history working on similar projects and their experience working with Metro. Our team is fully capable of addressing any Metro needs or concerns that may arise as part of this project. The following table represents a summary of our team's experience.

BIGGS CARDOSA TEAM EXPERIENCE SUMMARY

	Experience with Metro	Experience with Alternative Delivery Methods	Transportation Projects	Transit Projects	Grade Separations	Active Bus/Rail Corridor	Projects on Lengthy Corridor within Urban Environment	Crossing Signal and Civil Improvements	Environmental Compliance	Utility Coordination	Coordination with City Agencies	Coordination with Regulatory Agencies
Biggs Cardosa	●	●	●	●	●	●	●	●	●	●	●	●
Anser	●	●	●	●	●	●	●	●	●	●	●	●
MNS	●	●	●	●	●	●		●	●	●	●	●
Zephyr	●	●	●	●	●	●	●	●		●	●	
AMG	●	●	●	●		●	●	●			●	●
Atlas	●	●	●	●	●	●	●	●	●	●	●	●
Pacifica	●	●	●	●	●	●	●	●	●	●	●	●
MARRS	●	●	●	●	●	●	●	●	●	●	●	●
NSI	●	●	●	●	●	●	●	●	●			●
Diaz Yourman	●	●	●	●	●	●	●	●	●	●	●	●
GPA	●		●	●	●	●	●		●		●	●
Capo	●	●	●	●	●	●	●	●			●	
Guida	●	●	●	●	●	●	●	●	●	●	●	●
Casamar	●	●	●	●	●	●	●		●			

3.A. MANAGEMENT OF PROJECTS THAT UTILIZED AN ALTERNATIVE DELIVERY METHOD

Our team has experience managing projects delivered through various alternative delivery methods, including **Progressive Design/Build,** and understands the challenges of thorough design reviews and the importance of capturing critical stakeholder input prior to cost negotiations with the Contractor. **Biggs Cardosa and our subconsultants have embraced this approach** and have developed expertise in alternative project delivery methods.

Several of our team members have worked on the **LAWA LAX Automated People Mover (APM) project, which utilizes the Progressive Design/ Build Project Delivery Method**. As the fourth busiest airport in the world, and second busiest in the US, LAX is also ranked as one of the most congested airports in the world due to poor public transportation. With the 2028 Olympics fast approaching, the new Automated People Mover (APM) will help to relieve the congestion.

LAWA LAX Automated People Mover

The APM is a 2.25-mile elevated guideway train system which will connect travelers between the Los Angeles International Airport and new parking, car rental and transit facilities. Leading the project is LINXS (LAX Integrated Express Solutions), a team consisting of Fluor, Balfour Beatty, ACS Infrastructure Development, Dragados USA, HOCHTIEFF PPP Solutions, Flatiron and Bombardier Transportation. The APM is a component of the Landside Access Modernization Program (LAMP) which consists of five major renovation projects targeting transportation throughout the LAX area.

As a member of the Seismic Peer Review Panel, **Biggs Cardosa** reviewed and made recommendations to the Contractor, the Airport and the City of Los Angeles on this project on the following:

- Compared the Performance-Based Design Procedures for the APM Stations to Los Angeles Tall Buildings Structural Design Council (LATBSDC) Alternative Design Procedures.
- Evaluated AASHTO Design Criteria as an alternative code where CBC and LATBSDC do not provide guidance.
- Evaluated APM station and pedestrian bridge design criteria, basis of design and analysis results for the four in-line transit stations and their connecting pedestrian bridges.
- Evaluated ground motion model selection and Critical Structural System's Performance Criteria.
- Evaluated final APM station and pedestrian bridge design criteria.
- Evaluated the final Non-Linear Time History Analysis results for the four in-line transit stations and connecting pedestrian bridges.

Our subconsultants who are involved in this project include **Anser, Atlas, MARRS and Capo**. Anser is currently serving as Project Manager for the Intermodal Transportation Facility West (ITFW) and the Consolidated Rent-A-Car Facility (ConRAC).

In addition to the LAX People Mover Project, **Biggs Cardosa has worked on numerous other high-visibility transportation and transit projects in California that utilize the Design/ Build delivery method.** For the Gerald Desmond Design/Build Replacement project in Long Beach, **Biggs Cardosa** provided structural engineering design for "low level" approaches and retaining walls and an independent check of the "high level" approaches. Biggs Cardosa was also the lead structural specifications writer for the team and provided seismic design leadership for the team. **Atlas** provided IQA Services on this project.

Gerald Desmond Bridge

On the BART SVBX Project, Biggs Cardosa performed Value Engineering services throughout the duration of the project and assisted the tunnel and line segment teams with selection of efficient structural systems that were incorporated into the stations. Although the project's funding milestone requirements presented a very aggressive design schedule, the SVBX Line Segment and Stations designs were completed on time and under budget.

BART Berryessa Station

Considering the demanding UPRR, third party utility and multiple city coordination and approval requirements of this project, as well as the fact that approximately 60 percent of the structures within the SVBX Line Segment and Stations projects were initially designed to the 65% design level as a Design/Bid/Build contract before direction to redevelop and administer these structures as a Design/Build contract was provided, delivering this project on time and under budget was an enormous success for the client.

Biggs Cardosa provided structural engineering design, structure representative support, inspection and other services for the Design/Build Plaza Bridge at Marine Way in Irvine (that received the 2020 ACEC California Golden State award), the Riverside County Transportation Commission's I-15 Express Lanes project and the California High-Speed Rail Program. Additionally, the San Bernardino County Transportation Authority (SBCTA) **awarded Biggs Cardosa the $140M PCM Design/Build contract for the replacement of Mount Vernon Viaduct**.

Biggs Cardosa has been a key participant in all aspects of these Design/Build projects (on the owner's side, the PM/CM's side, and the Contractor's side). The following is a highlight of our key teaming partners with Alternative Delivery Method experience:

Plaza Bridge at Marine Way

Anser's Progressive Design/Build experience includes the Expansion of Terminal 2 at San Diego International Airport, multiple projects at California State University, San Marcos and Expo Line Phase 1 which utilized an early version of a P D/B contract. Expo Line Phase 1 was partially bid at a 15% completion level. A D/B contractor was selected based on qualifications, the design was advanced to the 85% completion level and then a construction cost was negotiated and finalized for each segment of work.

San Diego International Airport T2

Atlas' relevant experience includes:

- 6th Street Bridge Viaduct Replacement Project, Los Angeles, CA (CM/GC)
- SFO Control Tower/Airport Parking Garage, San Francisco, CA (P D/B)

MARRS' recent projects involving Progressive Design/Build, CM/GC and Design/Build include:

- LAWA LAX APM enabling projects (P D/B)
- LA Metro El Monte Busway Bridge Widening and New Pedestrian Bridge Construction (D/B)
- Metro Crenshaw/LAX Light Rail Project (D/B)
- LA Metro Purple Line Segment 1 (D/B)
- LAWA LAX Midfield Satellite Concourse (P D/B):
- LAWA LAX Bradley West (CM/GC)

Capo's Alternative Project Delivery experience includes P D/B support of full scheduling development and maintenance for the joint venture team responsible for the $350M LAX LULEP (LAWA Utilities and LAMP Enabling Projects) Program; D/B support of schedule development and maintenance for the joint venture team responsible for the $1.2B OCTA OC I-405 Project, constructability, independent third-party estimate and schedule analysis for the $53.8 B Sound Transit ST3 Program. Capo, is also involved in the Mount Vernon Viaduct project and is providing Owner's side scheduling and claims review.

3.B. CONSTRUCTION MANAGEMENT OF GRADE SEPARATION, CROSSING SIGNAL, CIVIL AND OTHER IMPROVEMENTS

Biggs Cardosa has provided Construction Management Services for numerous bridge, road/corridor and grade separation projects Our CM experience also includes transit projects that involved crossing signals, traffic signals and other civil improvements. The following table represents a summary of our most relevant project experience.

Project, Location	Bridge Spans Over	Project Length	Project Cost	Biggs Cardosa - Prime	CM/PCM Services	Inspections	Rail/Grade Sep.	Crossing/Traffic Signals	Civil Improvements	Materials Testing	Environmental	Alt. Delivery Method	Awards
Mount Vernon Viaduct over BNSF Intermodal Yard, San Bernardino	22 BNSF & Metrolink tracks	1,000'	$140 M	●	●	●	●			●	●	●	
High Speed Rail CP2-3, Central California	various	various	$2.2 B		●	●	●					●	
"The Boulevard" Project, South Gate	N/A	2 miles	$18 M	●	●	●		●	●	●	●		●
Central Avenue Rehabilitation, Montclair	N/A	2.4 miles	$11 M	●	●	●		●	●	●	●		
Pioneer Blvd. Rehabilitation, Norwalk	N/A	1.2 miles	$3.5 M	●	●	●		●	●	●	●		
G Street Grade Separation, Merced	Rail	145'	$18 M	●	●	●	●	●	●	●	●		●
ACE Fullerton Grade Separation, City of Industry	Rail over Road	2 miles	$159 M	●			●	●	●		●		
Rosecrans/Marquardt Grade Separation, Santa Fe Springs	Road, Rail	580'	$155 M	●			●	●	●		●		
Tustin Rose Grade Separation, Placentia/Anaheim	Road, Rail	401'	$74 M	●		●	●	●	●		●		●
Blossom Hill Caltrain Station POC, San Jose	Rail	69'	$1.5 M		●	●	●						
Firestone Blvd. Bridge Widening, South Gate	LA River	473'	$8.5 M	●	●	●			●	●	●		
Firestone Blvd. Bridge Replacement, Norwalk	San Gabriel River	239'	$13 M	●	●	●			●	●	●		●
Santa Margarita Pkwy Bridge, Rancho Santa Margarita	Arroyo Trabuco	1,199'	$4.5 M	●	●	●				●	●		
Plaza Bridge at Marine Way, Irvine	Road	400' width	$24 M	●	●	●			●	●	●	●	●
North Spring Street Viaduct, Los Angeles	Los Angeles River, Rail	678'	$45 M		●	●	●						●
Embarcadero Bridge Replacement, Oakland	Lake Merritt Channel	535'	$25 M	●	●	●			●	●	●		
Seismic Retrofit of Five Bridges, Oakland	Creek, Slough, Hill, Rail Tracks	various, including 658',899'	$22 M	●	●	●	●		●	●	●		
I-15 Express Lanes, Santa Ana Bridge, Riverside County	Santa Ana River	1,800'	$300 M									●	
McKinley Grade Separation, Corona	Road, Rail	289'	$112 M	●			●		●		●		

3.C. CONSTRUCTION MANAGEMENT on ACTIVE BUS or RAIL TRANSIT CORRIDOR

Biggs Cardosa has extensive experience managing projects on active transit corridors, including rail projects, Metro bus routes and grade separations.

Biggs Cardosa has recently completed a two-mile-long Firestone Boulevard Regional Corridor Capacity Enhancements "The Boulevard" Project in the City of South Gate. This project is located on an active Metro bus line (Line 115). Biggs Cardosa was the Prime Consultant, and provided complete construction management and inspection services. Bus shelters along "The Boulevard" were retrofitted as part of the project. Biggs Cardosa coordinated with Metro and received approvals to provide alternate bus stop locations and bus shelters during construction to ensure that the bus schedule was not interrupted. We also provided Public Outreach services which included email blasts to users and stakeholders in order to keep them informed about temporary bus stop relocations.


"The Boulevard" Bus Stop Canopy

Montague Expressway POC is located adjacent to the newly developed Milpitas BART Station. The bridge spans over a high traffic volume expressway which serves three Valley Transportation Authority (VTA) bus routes. Due to the County's traffic requirements, construction was planned such that the roadway traffic impacts were minimized during the construction period. Only one full road closure, during off-peak hours, was required by developing a construction methodology whereby the bridge was fabricated off-site, assembled on the expressway shoulder and auxiliary lane and hoisted into position on a Saturday morning.


Montague Expressway POC

Biggs Cardosa is also experienced with managing construction projects along active rail corridors. We provided design and construction management services for the G Street Grade Separation project in Merced, CA. The G Street/BNSF Underpass provides the City's first grade separation of this **heavily used rail corridor**, improving safety, reducing noise and travel delays and providing a reliable route for the City's emergency services. **Close coordination with BNSF and Amtrak was required** for construction operations including pile driving between trains and weekend closures during superstructure erection.


G Street Grade Separation CM, Merced

Biggs Cardosa provided the design and construction support services for the Santa Clara Caltrain Station PUC Extension. For this project, it was critical to develop a design that could be constructed such that it would minimize construction impacts to the railroad corridor. Our role in construction management of the railroad corridor began in the early phases of the design and continued through the support provided during the construction phase. **UPRR requested that we limit the construction duration and impact to tracks to a single long weekend**. This request resulted in changing the underpass to a precast structure in order to shrink construction time to the very minimum. **Excavation and tunnel erection were successfully completed in 96 hours.**

Construction of **Warm Springs BART West Access POC in Fremont** required careful consideration of the constraints associated with the UPRR spur track, UPRR mainline tracks and BART tracks as well as BART station operations. Biggs Cardosa developed a construction sequence and guidelines

for the work near the UPRR and BART tracks; the construction sequence and the design itself were developed in order to accommodate these rail corridors. **Short construction work windows were utilized for the erection of bridges over the UPRR tracks.** For the BART tracks, the construction window was further reduced. **The truss bridge span was moved into erection position and hoisted onto the permanent supports in about 5-6 hours during a night-time track closure**.

For the BART Earthquake Safety Program, Biggs Cardosa developed a staged construction sequence that allowed the Rockridge BART Station to remain in operation throughout construction. The work within BART station parking lots was planned to minimize disruption to parking. Additionally, the project involved careful coordination with access facilities such as the escalators, stairways and elevator. Since BART trains were on the upper deck level of the station structure, the seismic retrofit construction was planned to allow all of the construction operations to occur during short night-time closures of the BART system. For the construction staging, there was also some coordination with AC Transit for the local bus route with bus stops adjacent to the Rockridge BART Station.

The South Bayfront Pedestrian Bicycle Bridge is located in a rather constrained project site in the City of Emeryville. **The bridge spans over eight UPRR tracks in a busy railroad corridor.** Due to the tight site constraints and UPRR requirements, **the bridge design and construction were planned such that the bridge could be hoisted into position within a four-hour railroad corridor closure.**

South Bayfront POC

Our subconsultant Anser has firsthand knowledge and experience managing Metro's first Design/Build Operate & Maintain (DBOM) contract related to express lanes. The project served to convert freeway lanes from High Occupancy to High Occupancy Toll (HOT) and consisted of 14.2 miles that were changed to HOT lanes on I-10 and 11 miles that were changed to HOT lanes on I-110. Anser's team worked closely with Caltrans, California Highway Patrol, peripheral cities and Metro's Bus Operations for coordination of improvements during active bus transportation. Their responsibilities included vetting DBOM design in conjunction with Caltrans for contractual compliance.

In addition, Anser provided contract administration and management of Design/Build for the Southwestern Yard (SWY) Train Facility consisting of various vertical structures. This facility was designed to serve the light rail vehicles that will operate within the Crenshaw/LAX Transit Corridor project and Metro's Green Line light rail system.

Anser provided Progressive Design/Build services for the installation of 10-ft diameter x 120-ft deep piles using the wet boring method for Los Angeles World Airports (LAWA) Automated People Mover (APM) project.

Southwestern Yard Train Facility

Anser is currently assisting Metro with oversight and management of the Division 20 Portal Widening and Turnback Facility, which is expanding and improving the storage and maintenance facility servicing the Metro subway system. This project must be completed while maintaining the functionality of the active railyard and Anser is working closely with Metro's operations personnel to ensure that the construction contractor's work does not impede the movement and servicing of trains. Anser is familiar with Metro's need to maintain operations while also keeping construction on schedule and is able to assist Metro in balancing both.

3.D. MANAGEMENT OF A PROJECT ENCOMPASSING WORK ALONG A LENGTHY CORRIDOR WITHIN AN URBAN ENVIRONMENT

Our team has extensive knowledge and experience in managing construction projects that encompass work along lengthy corridors within dense urban environments throughout California.

Biggs Cardosa is the Independent Checking Engineer/Independent Site Engineer for High-Speed Rail Construction Package (CP) 2-3. CP 2-3 is a **D/B contract which stretches approximately 60 miles through the Central Valley** from just south of Fresno to just north of the Tulare/Kern county line. Biggs Cardosa also provided preliminary bridge design services for 25 Overhead Railroad Structures as part of the Design/Build submittal for High-Speed Rail CP-1 package, which covers another **60-mile segment** from Merced to Fresno.

Biggs Cardosa has worked on numerous structures along the **50-mile-long Caltrain Corridor from San Francisco to South San Jose**. These structures have included grade separations, overheads, underpasses, transit stations and pedestrian structures, all are located within dense urban environments.

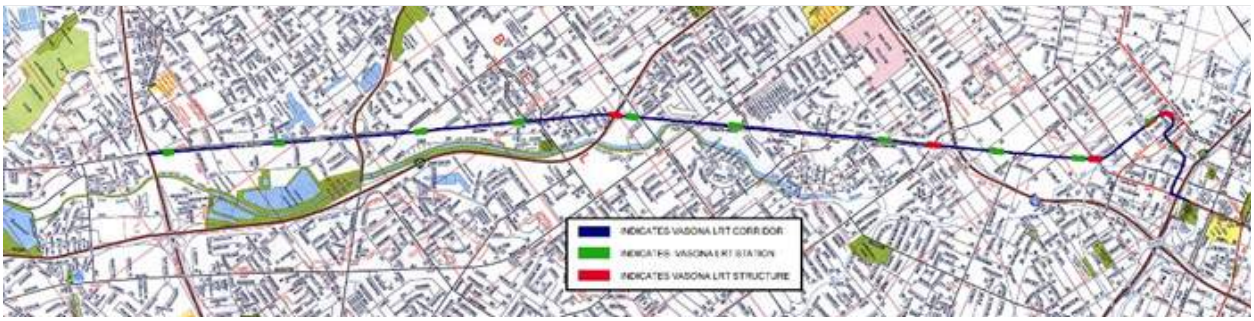
Biggs Cardosa designed multiple structures along the SR-85 corridor, a new freeway facility in Silicon Valley. We designed **37 bridge structures and a multitude of retaining walls and sound walls at various locations along the corridor.**

The Santa Clara County Light Rail Transit system extension along the Tasman Corridor required the construction of a **1.4-mile-long elevated structure through developed areas of San Jose and Milpitas.** Biggs Cardosa provided Structure Representative services for on-site design support, including coordinating and processing Contractor submittals (falsework, shoring, welding, etc.), reviewing concrete mix designs, reviewing Contractor-generated bridge survey information, assisting with preparation of bridge contract change orders, response to bridge RFI's and oversight of materials sampling and testing.

Biggs Cardosa provided structural engineering design services for the **Vasona Corridor Light Rail Project** in San Jose, including design for all major structural elements along the **five-mile extension** of the VTA light rail system **from the City of Campbell into downtown San Jose**. The project extends from the existing Guadalupe Corridor Light Rail System in downtown San Jose and provides an intermodal connection to the JPB/Caltrain facilities at the historic Diridon Station.

Biggs Cardosa has recently completed a **two-mile-long Firestone Boulevard Regional Corridor Capacity Enhancements "The Boulevard"** Project in the City of South Gate. Biggs Cardosa was the Prime Consultant and provided complete construction management and inspection services.

The goal of the project was to improve one of the major gateways into the city by easing traffic circulation and increasing driver and pedestrian safety which helps support a more vital, bustling mixed-use area that is attractive to businesses and residents alike. To achieve this goal, the number of traffic lanes on Firestone Boulevard between Alameda Street and Hunt Avenue was increased from four to six. Improvements also included synchronization of traffic signals, installation of new street signage and construction of raised medians which have proved effective at improving traffic movement where there is a mixture of significant



Vasona Corridor Lightrail Project

pedestrian and vehicular traffic. Much of this work was accomplished without requiring full closures.

Biggs Cardosa provided similar services on two other major LA-area corridors: the **1.2-mile-long Pioneer Blvd in Norwalk and the 2.5-mile-long Central Ave in Montclair.** For the Pioneer Blvd project, we provided construction management services to the City of Norwalk to revitalize major segments of Pioneer Boulevard between Alondra Boulevard and Rosecrans Avenue. The project added landscaped and hardscaped raised medians along the Boulevard as well as synchronized traffic signals and pedestrian crosswalks. Raised medians have proven to be particularly effective at improving traffic flow in areas similar to Pioneer Boulevard where there is a mixture of significant pedestrian and vehicular traffic. Pioneer Blvd. was an important project as it is **one of the busiest transit hubs** in the city.

Pioneer Blvd, Norwalk

Biggs Cardosa also provided CM and inspection services on the Central Avenue Rehabilitation project for the City of Montclair. The project is located between Phillips Boulevard (southern City limit) and I-10 (northern City limit). This first phase of the project covered approximately 2.5 miles. This project included street, landscaping and traffic improvements to this vital corridor and facilitated the installation of a recycled water line for water conservation efforts.

Central Avenue, Montclair

As mentioned in the previous subsection, from 2010 to 2014, **Anser supported Metro's first Design/ Build Operate & Maintain (DBOM) contract** related to Express Lanes. The project served to convert freeway lanes from High Occupancy to High Occupancy Toll (HOT) and consisted of **14.2 miles** that were converted on I-10 and **11 miles** that were converted to HOT lanes on I-110.

Anser monitored work for compliance with schedule, budget, technical, safety and legal requirements, and provided supervision of supporting engineers. The team provided professional staff to support overall management, design review, document control, third-party coordination, systems inspection, field construction scheduling, estimating, monthly payments and design coordination for all aspects of this DBOM project. For this project, Caltrans field engineers reported directly to Metro's Resident Engineer for direction and progress updates.

Anser's staff includes experts who, prior to their employment at Anser, have been involved in many of Metro's busway and light rail projects including the original Orange Line Busway, the Eastside Extension of the Gold Line, the Expo Light Rail Line and the Crenshaw/LAX Light Rail Line. Each of these projects involved linear construction over many miles through highly urbanized Los Angeles neighborhoods. Anser staff know well the environment in which this project will take place and the challenges that come with construction in a built-up environment. Anser is able to provide the experts who understand construction management and have the experience of working with Los Angeles area stakeholders.

Expo Phase 1

3.E. PERFORMING REVIEWS, NEGOTIATIONS, AND OVERSIGHT DURING SEPARATE PHASES OF A PROJECT UTILIZING AN ALTERNATIVE DELIVERY METHOD SUCH AS PROGRESSIVE DESIGN/BUILD OR CM/GC

Biggs Cardosa is currently assisting San Bernardino County Transportation Authority (SBCTA) by providing Project Consultant Management (PCM) services on the Mount Vernon Viaduct Replacement Project. This project is a Design/Build Project wherein the design/builder has been contracted to perform three distinct work components on the project: Existing bridge demolition, design and construction of the replacement structure. As the Contractor performs this work, the railroad companies will be relocating selected facilities and their associated utilities to make room for Contractor activities. One of the most challenging aspects of this project has been coordinating the work of various third-parties who do not have direct contractual relationships with each other in order to achieve project goals. Negotiation of activity durations within an authorized construction work window is one of many examples where alternative delivery methods were needed to accomplish the overall project goal within time limits promised to the various stakeholders.

In another instance, Biggs Cardosa is performing design oversight for the California High Speed Rail Authority (CHSRA), a fast-paced, well-known and somewhat controversial major Design/Build public works program underway in several counties. This project requires us to interface with multiple layers of project management staff, both consultant and agency staff, and provide periodic reports on the quality of design products produced by the design/build firm. It inherently involves negations between the designers and independent check engineers (ICE) to resolve identified issues in order to achieve a mutually acceptable set of construction documents to be used in the field as soon as they become available.

Biggs Cardosa has been involved in several segments of the project, including the Central Valley Segment. For this segment Biggs Cardosa is the Independent Checking Engineer/Independent Site Engineer for Construction Package 2-3. CP 2-3 is a Design/Build contract which stretches approximately 60 miles through the Central Valley

California High-Speed Rail CP 2-3

from just south of Fresno to just north of the Tulare/Kern county line.

Biggs Cardosa is performing independent structural design calculations for approximately 50 high-speed rail and roadway bridge structures and checks each structure for compliance with the project design criteria.

As stated previously, Anser includes experts familiar with the Progressive Design/Build approach from past projects. This required us to perform periodic reviews, conduct or assist with negotiations and oversee work to ensure contract compliance. For example, the Expo Line Phase 1 project utilized an early version of a Progressive Design/Build contract wherein the project was partially bid at a 15% completion level. A Design/Build contractor was selected based on qualifications, the design was advanced to the 85% completion level, and then a construction cost was negotiated and finalized for each segment of work. From this experience, our team understands the challenges of thorough design reviews and the importance of capturing critical stakeholder input prior to the cost negotiations with the contractor.

Anser also understands the benefits of the Progressive Design/Build approach including the collaborative relationship it builds between the owner and contractor as well as the ability to manage cost and schedule throughout the life of the project.

G Street Grade Separation CM, Merced

3.F. MONITORING ENVIRONMENTAL COMPLIANCE FOR STORM WATER DISCHARGES, DUST CONTROL, NOISE CONTROL, AND DISPOSAL OF CONTAMINATED AND HAZARDOUS MATERIALS.

The Biggs Cardosa team has reviewed the September 2020 Final Environmental Impact Statement/Final Environmental Impact Report FEIS/FEIR) for the East San Fernando Valley Transit Corridor Project, the proposed mitigation measures therein and the Construction Mitigation Measures appearing in Appendix AA. We are aware that a formal Environmental Commitment Record (ECR) does not appear in the environmental document. We are also aware that the proposed mitigation measures to be implemented will depend on the final set of contract documents to be developed for construction.

Our subconsultant GPA has extensive experience in managing environmental commitments to ensure environmental compliance and sustainability for construction projects for Metro. Once they are finalized, GPA Environmental Compliance Manager Richard Galvin will oversee commitments identified in the Environmental Commitment Record/MMRP, Regulatory Permits and water quality requirements. GPA regulatory compliance will include:

- Stormwater compliance, QSP/QSD management
- Section 404, 401 and 1602 Permit Condition management
- Monitoring dust control compliance in accordance with AQMD/ECR standards
- Monitoring Construction noise in accordance with City/County Noise standards and ECR
- Monitoring and Compliance of Hazardous Materials identified in the Plans Specifications and Estimates (ADL, Chromium, contaminated soils and groundwater)
- PS&E compliance with tree removal, ESA's, ADL disposal/Reuse management and hazardous materials disposal/handling
- Environmental Commitments, Mitigation Measures for Biological Resources, Noise Reduction Measures, Air Quality/Dust Control, historic/archaeological resources and 4(f) resources

A few examples of relevant experience include:

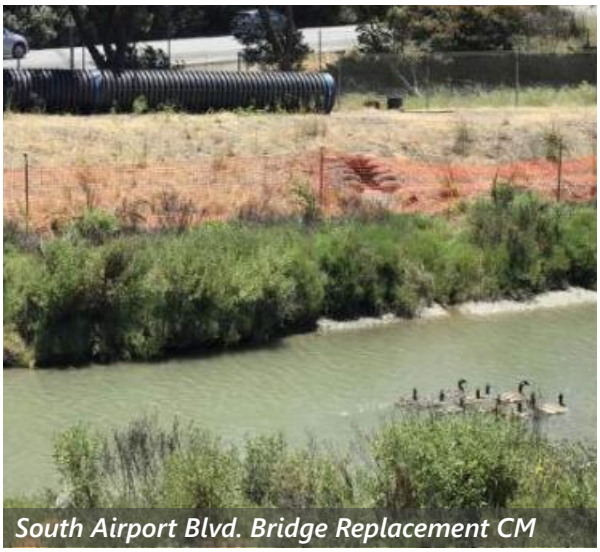
Riverside Drive Bridge near Zoo Drive Bridge Rehabilitation and Widening, Los Angeles (2007-2020) The City of Los Angeles, in cooperation with the California Department of Transportation (Caltrans) District 7, rehabilitated and widened the historic Riverside Drive Bridge over the Los Angeles River. The existing bridge was built in 1938, is eligible for the National Register of Historic Places and was designated as a City of Los Angeles Historic-Cultural Monument. GPA prepared the Historic Property Survey Report, Finding of Adverse Effect document and Memorandum of Agreement in accordance with Caltrans' National Historic Preservation Act Section 106 Programmatic Agreement with the State Historic Preservation Officer. GPA worked closely with the City, Caltrans and other stakeholders to ensure that the design of the bridge reduces impacts on the historic integrity of the bridge to the extent feasible. GPA also prepared a Natural Environment Study, Wetland Delineation and Visual Impact Assessment for the project. GPA prepared and circulated the draft Initial Study/Environmental Assessment with Programmatic Section 4(f) Evaluation, and prepared the final Initial Study/Mitigated Negative Declaration/Environmental Assessment and Section 4(f) Evaluation with Finding of No Significant Impact. GPA obtained a Clean Water Act Section 404 Authorization, Clean Water Act Section 401 Water Quality Certification, a California Fish and Game Code 1602 Streambed Alteration Agreement and completed pre-construction bat and bird surveys and exclusion. GPA conducted construction compliance monitoring and coordinated regulatory permit amendments.

Fletcher Drive Bridge Seismic Retrofit, Los Angeles (2011-2013) The City of Los Angeles retrofitted the Fletcher Drive Bridge over the Los Angeles River to meet the California Department of Transportation's (Caltrans') updated seismic standards. GPA conducted pre-construction monitoring of mitigation and environmental permit compliance and continued to monitor compliance

throughout project construction. Monitoring tasks included photographing, documenting and conducting pre-construction surveys, pre-construction notification for 401 and 404 permits and monthly monitoring visits to ensure conditions of the U.S. Army Corps of Engineers Section 404 Permit, California Department and Fish and Game 1602 Streambed Alteration Agreement and Regional Water Quality Control Board Section 401 Certification were compliant throughout construction. GPA also conducted historic mitigation monitoring, ensuring compliance with the Secretary of the Interior's Standards.

Interstate 5 HOV/Truck Lanes Project, Santa Clarita, Los Angeles County (2017-Ongoing) The Los Angeles County Metropolitan Transportation Authority (Metro), in cooperation with the California Department of Transportation (Caltrans) District 7, proposes to widen the existing I-5 to include High Occupancy Vehicle lanes and truck-climbing lanes from SR-14 in the south to Parker Road in the north in the City of Santa Clarita and unincorporated Los Angeles County. GPA prepared updated technical studies, including a Jurisdictional Delineation, Natural Environment Study, Habitat Mitigation and Monitoring Plan, and Revegetation Plan. GPA prepared the regulatory permitting applications, including a Clean Water Act Section 404 Pre-construction Notification, Clean Water Act Section 401 Water Quality Certification application and California Fish and Game Code Section 1602 Streambed Alteration Notification package and coordinated the permitting process. GPA is currently preparing the National Environmental Policy Act (NEPA) Revalidation and Environmental Commitments Record and assisting with incorporating all environmental commitments into the final bid package.

Warner Avenue Bridge, Huntington Beach (2014-2019) The City of Huntington Beach repaired the bridge deck and unsound concrete on the piers and girders, and replaced rock slope protection along the channel banks beneath the bridge. To mitigate for habitat loss, a Hazardous Materials Management Plan and Habitat Mitigation Monitoring Plan was prepared to outline the restoration for habitat impacts. GPA performed pre-construction surveys, construction monitoring and permit compliance monitoring during the construction phase. GPA also performed nesting bird surveys in the Bolsa Chica Preserve adjacent to the project area during the nesting season. After construction, GPA prepared the planting plan, oversaw site restoration and re-vegetation planting, conducted long-term mitigation monitoring in the restoration areas adjacent to the bridge and produced yearly Mitigation Monitoring Reports and the Final Mitigation Monitoring Report for the Coastal Commission and California Department of Fish and Wildlife.



South Airport Blvd. Bridge Replacement CM

South Airport Blvd. Bridge Replacement CM

3.G. COORDINATION WITH UTILITY OWNERS (SUCH AS LOS ANGELES DEPARTMENT OF WATER AND POWER, SOUTHERN CALIFORNIA GAS, AND SOUTHERN CALIFORNIA EDISON)

Summary of Experience & Qualifications
Pacifica's utility personnel have decades of project experience working with the local utility owners such as the **Los Angeles Department of Water and Power, Southern California Gas and other entities.** Our experience has involved working in conjunction with LA Metro Third Party Administration and the utility owners to support the management of overall utility work to mitigate the potential for changing field conditions caused by unknown utilities and adhere to the overall project schedule and budget. With work on projects like Metro's Orange Line Improvements Project, Regional Connector Transit Corridor and Crenshaw/LAX Transit Extension, our team exhibits the local knowledge of utility owners and has access to their current points of contact and utility inventories. We have supported Metro in utility coordination with more than 50 utility owners throughout the region and an approximate value of more than $500M in utility relocation costs.

Utility Coordination Approach
The utility coordination process will be fluid throughout the course of the project's schedule as the potential for unknown utility findings, efficiencies gained from value engineering and design iterations by other disciplines can influence this process.

Our team will work proactively with utility owners, such as Verizon, Southern California Edison and AT&T by holding routine coordination meetings and design/constructability review workshops to help maintain accountability to schedule and awareness of project constraints. We will advocate in supporting the third-party owner in developing and obtaining approval from the respective agencies on the required supporting documentation such as traffic control plans.

Identifying & Mitigating Potential Utility Issues

Master Agreements
The importance of developing master agreements with clear language in order to alleviate project delays or cost impacts is paramount. Our team will work with Metro to collect, inventory and vet those agreements to understand the cost and design-sharing responsibilities between Metro and the Third-Party owner. With agreements in place, the process of obtaining design approvals from the impacted owners will be initiated as soon as possible in the project's lifecycle. Our relationships with the City plan check engineers and other reviewers will allow us the ability to request over-the-shoulder reviews in order to have opportunities to establish and hasten owner acceptance of the impacts and proposed mitigations.

Utility Betterments
Recognizing when betterments are introduced by third parties is critical. Whether it be an adjacent project, a deteriorating facility or one that lacks the necessary capacity within a project's footprint, it is not typically in the project's scope to address or facilitate any betterment-type improvements. Ultimately, it is Metro's decision to choose to assist the owner in implementing any betterments—especially, if that betterment may be a part of a negotiation that leads to the overall success of the project.

Unknown Utility Findings
It is almost inevitable that the Contractor will find a utility we did not know was there. To mitigate this possibility, we explore the use of extensive field investigation/verification including potholing, ground penetration radar, surveys and exploratory trenching and work to prepare comprehensive utility packages with all known utility features. We are familiar with Navigate LA and will also utilize that City resource.

Resource Availability of Third Party
There is a potential for risk relating to availability of a third party's resources to perform work and meet project schedule. We will assist in phasing the design work completed by the Third Party by providing advance schedule lookaheads to the utility owner, so the critical path elements are addressed early in the available work windows.

3.H. COORDINATION WITH CITY AGENCIES (SUCH AS CITY OF LOS ANGELES BSS, BSL, DWP, DOT) AND REGULATORY AGENCIES (SUCH AS CALIFORNIA PUBLIC UTILITIES COMMISSION)

Since the firm's inception in 1986, Biggs Cardosa has worked with a wide spectrum of clients ranging from public agencies including cities, counties, transportation agencies and Caltrans, to various regulatory agencies and private clients including architects, engineers, developers, high tech companies and private property owners.

The majority of Biggs Cardosa's work is with public agencies. During our 35 years in business, Biggs Cardosa has provided design and construction management services to **over 100 California Public Agencies including 24 counties, 60 cities and over 20 other agencies** (towns, redevelopment agencies, water districts, transit and transportation agencies). This includes numerous Southern California public and regulatory agencies such as LA Metro, City of Los Angeles, Community Redevelopment Agency of Los Angeles, Port of Long Beach, California Public Utilities Commission, Los Angeles County, Orange County Transportation Authority, San Bernardino County, San Bernardino County Transportation Authority, numerous Southern California cities and Caltrans districts 7, 8 and 12.

All of Biggs Cardosa's team members have also coordinated with numerous California public agencies and have complied with numerous regulatory agency requirements.

Most of our projects require extensive coordination with permitting and local agencies. We have proven and recognized experience in coordinating projects that involve communication with multiple government agencies, utilities, special Districts and environmental permitting agencies. Our team members have managed numerous grade separation projects requiring coordination and compliance with entities such as BNSF, UPRR, Metrolink, BART and other rail companies' requirements and procedures.

As one example, on the Santa Clara Caltrain Pedestrian Underpass Extension Project, Biggs Cardosa engaged extensively with the client from the earliest stages through to the completion of the project. Biggs Cardosa, as the Prime Consultant, also coordinated with a large number of stakeholders, including the City of Santa Clara, the Peninsula Corridor Joint Powers Board, UPRR, BART, Altamont Commuter Express, Capitol Corridor, Amtrak and the South Bay Historical Railroad Society, which is based at the Santa Clara Caltrain Station.

We coordinated with Silicon Valley Power to bring

Santa Clara Caltrain Station PUC Extension

new electrical service into the station. We also coordinated with a number of utility owners to develop a strategy for dealing with an existing AT&T and Sprint fiber optic cable network located near the top of the ramp. Ultimately, we reconfigured the ramp so that we would not have to move or impact the cables. We met regularly with representatives of ACE, Capitol Corridor, Amtrak, UPRR and Caltrain during project construction.

Coordination with the City of Los Angeles Departments Biggs Cardosa and our team members have worked on numerous projects that required close coordination with the City of Los Angeles and its various departments. The City of Los Angeles Department of Public Works, Bureau of Engineering, Bridge Improvement Program, was Biggs Cardosa's client on the Riverside

Drive and Canoga Avenue over LA River Bridge Rehabilitation projects. Since these were all river crossings, we also had to coordinate our work

Riverside Drive Bridge Rehabilitation

with the Los Angeles County Flood Control District (LACFCD) and the Public Works Department. We are looking forward to working with LADOT once again in coordinating preparation of the project's Traffic Management Plan (TMP) as required by the approved Environmental Document.

We are familiar with the various City plan check counters, both at 201 North Figueroa Street as well as the Van Nuys City Hall and West Los Angeles facilities at 6262 Van Nuys Boulevard and 1828 Sawtelle Boulevard respectively. We expect to interface with Van Nuys City Hall staff who are closest to the project site but are aware that for a project of this magnitude, certain decisions can only be made downtown.

We are also familiar with the Bureau of Engineering,

McKinley Drive Grade Separation

having worked with them on bridge rehabilitation projects. We can coordinate with their staff regarding instances where planned station improvements may require permits from both Building and Safety and Bureau of engineering due to the close proximity to existing buildings or open spaces adjacent to the site where utility connections must be made. In those instances, we hope that Bureau of Engineering will take the lead as they have influence within LADBS.

Coordination with California Public Utilities Commission (CPUC) Biggs Cardosa has been involved in several projects which required CPUC coordination including: Rosecrans/Marquardt Grade Separation, McKinley Grade Separation, Tustin/Rose Grade Separation, Navy Drive Grade Separation, Bradley Moody Memorial Underpass Grade Separation, G Street Grade Separation and West Fontana Channel Improvements, among others.

The McKinley Grade Separation project in Corona involves significant coordination with the railroad, the California Public Utilities Commission (CPUC), Caltrans District 8, Riverside County Flood Control and Water Conservation District (RCFC&WCD) and other agency stakeholders.

Our subconsultant MNS regularly invites project stakeholders such as City, County, and regulatory agencies to weekly meetings as part of the regular construction engineering duties. Encroachment permits for work in Caltrans, UPRR and highway rights-of-way in other jurisdictions are common to the projects they manage. MNS coordinated directly with the City of Los Angeles on the US 101 Universal Studios Boulevard Improvements and Sound Wall No. 11 projects. We have a thorough understanding of Metro's methods and procedures as well as other local agency, utility, transit and railroad requirements associated in working with these agencies.

4. KEY PERSONNEL SKILLS AND EXPERIENCE

Metro Orange Line Warner Station

04 KEY PERSONNEL SKILLS AND EXPERIENCE

KEY PERSONNEL SKILLS AND EXPERIENCE

Biggs Cardosa has assembled an experienced and qualified team of professionals to deliver this project. These professionals are leading specialists in each key discipline with extensive experience with all relevant project aspects: southern Califonia transit and transportation projects, projects covering long urban transit corridors, grade separations, Metro projects and projects using various alternative delivery methods. Our key personnel have an average of 29 years of experience, and possess all appropriate licenses and certifications.

Our staffing approach introduces two additional key roles in addition to the ones defined under Attachment A "description of positions" of the solicitation: Mazen Mneimneh PE as the "Deputy Project Director" and Joy Bhattacharya as the "Signal/Systems Design Review/DB Coordinator". Their roles and experience are highlighted throughout our proposal. This approach will allow us to perform and support all aspects of the design and construction management of the required scope of services. ***All key staff will be available to the extent proposed or designated by Metro, for the duration of the project. No key personnel will be removed or replaced without the prior written concurrence of Metro***

Michael will be leading for you an all-star cast of Managers, each with impeccable credentials in his/her field, and all of them with extensive experience in alternative delivery methods, including Progressive Design/Build, CM/GC and design/build.

Michael Thomas, PE, SE Project Director **Biggs Cardosa**	**Mazen Mneimneh, PE, QSD** Deputy Project Director **Biggs Cardosa**	**John Scott, PE** Resident Engineer/ Structures Representative **Biggs Cardosa**	**Socorro de la Torre** Lead Structures Construction Inspector **Biggs Cardosa**
 *32 yrs Experience* *Project Management, Structures & Rail Design/Build, PCM Expertise*	 *22 yrs Experience* *Project Management, Construction Management*	 *30 yrs Experience* *Project Management, Structures & Rail Design/Build Design Manager*	 *15 yrs Experience* *Construction Management & Inspection*
Robert Delgado, CCM, CHST Safety Manager **Anser**	**Anthony Le, LEED AP** Senior Cost Analyst **Anser**	**Laura Uden, PMP, CMQ/OE, CSEP** Quality Manager **NSI**	**John Spalione, PE** Assistant Resident Engineer **MNS**
 *25 yrs Experience* *Construction Management, Safety Oversight*	 *30 yrs Experience* *Construction Cost Estimating*	 *28 yrs Experience* *Rail Transit and Heavy Civil Design & Construction, Design Build Experience*	 *40 yrs Experience* *Construction Management & Inspection*
Joy Bhattacharya, PE, PTOE Signal/Systems Design Review/DB Coordinator **AMG**	**Leonard Gilliana** Senior Construction Inspector (Systems/Signal) **AMG**		
 *30 yrs Experience* *Project Management, Signal/Systems Expertise*	 *40 yrs Experience* *Inspector Traffic Signal Operations*		

KEY STAKEHOLDERS

- Metro
- City of Los Angeles
- Various City of Los Angeles Departments (BSS, BSL, DWP, DOT)
- CPUC
- Other Regulatory Agencies
- Neighboring Construction Projects
- Utility Companies (Southern California Gas, Southern California Edison, etc.)
- Local Businesses
- Schools
- Residents

Metro

Project Director
Michael Thomas, PE, SE

Safety Manager
Robert Delgado, CCM, CHST

Quality Manager
Laura Uden
PMP, CMQ/OE, CSEP

Deputy Project Director
Mazen Mneimneh, PE, QSD

Senior Cost Analyst
Anthony Le, LEED AP

Design Oversight Manager
Tom Densford, PE, SE*

Resident Engineer/ Structures Representative
John Scott, PE

Estimator
Pavel Raskin

Signal/Systems Design Review / D/B Coordinator
Joy Bhattacharya, PE, PTOE

Design Review Support Staff
John Wong, PE Lead Design Reviewer/Structures
(As needed) Additional Design Review Staff

Assistant Resident Engineer
John Spalione, PE

Quality Control Manager
Jinesh Mehta, PE

Safety Officer
Jose Romero

Flagger
Nick Moskos

Lead/Structures Construction Inspector
Socorro de la Torre, BSCE

Materials Testing IQA
Isaac Harris

SWPPP Compliance Officer
Allison Costa, QSD/QSP, CPSWQ

Risk Manager
Shawn Paroline

Schedule Reviewer
Adam Brown

3rd Party/Utilities Coordinator
Kate Suenram, PE

Surveying IQA
Tim Fettig, PLS
(As needed) Additional Surveying Staff

Claims Manager
Kevin Lai, PE, JD

Document Control
Micaela Arellano

Project Administration
Kelly Markwick

Office Engineer/ Project/Field Engineer
Bruce Fock-Yat, BSCE

Environmental Compliance Staff

Richard Galvin	**Environmental Compliance Officer**
George Gorman	Sr. Environmental Planner

(As needed) Additional Environmental Staff

Construction Inspection Staff

Leonard Gilliana	**Senior Const. Insp. (Systems/Signal)**
George Haines	Senior Construction Inspector (Civil)
Jorge G. Sandoval, PE, GE	Construction Inspector (Geotechnical)
Anna Mendiola, RLA	Construction Inspector (Landscaping)

(As needed) Additional Inspection Staff

Lauren Hebert, MSCE	Project/Field Engineer (Office Engineer)
Ardalan Vajdi, MSCE	Construction Inspector (Structures)

** In ME, NH, NV, VT, MA and RI - CA Registration Pending*

MICHAEL THOMAS, PE, SE

Project Role: Project Director

Michael has the perfect experience and credentials to be the Project Director for this project. He has been managing complex multidisciplinary transportation and transit projects for the last 25 years, focusing on grade separations and transit projects in busy urban corridors. Michael has developed a passion for delivering complex projects that require approval by multiple regulatory agencies and stakeholders. Michael is a consensus builder who sees the project from different points of view, and who always seeks win-win solutions. Michael takes pride in having a perfect record of finishing every project that he has started, and his clients find him proactive,energetic, creative and responsive.

Through the process of managing and delivering transportation projects, Michael became increasingly concerned that our State and local agencies were falling behind in providing the mobility improvements needed to maintain the economic competitiveness of California into the 21st century. Constrained transportation funding was clearly a major factor, but this wasn't the whole story. Michael honed in on two other factors that are both interrelated, and related to the need for more transportation funding: projects were simply taking much to long to deliver from concept to completed construction, and the cost of delivering them was outstripping available resources. There had to be a better way.

It was this motivation and mission to find a better, cheaper and faster project delivery solution that motivated Michael to pivot his practice and focus on alternative delivery. This was 15 years ago and a time when California was just starting to dabble in Design/Build. Since then, Michael has spearheaded Biggs Cardosa's push into alternative project delivery, and amassed substantive experience with several variations of Design/Build, and Construction Manager at Risk (CMAR), on both the side of the Owner and the Contractor, including:

- BART to San Jose: D/B, Owner's side, prepared bridging documents
- G St Grade Sep: Hybrid D/B/B + CMAR, Owner's side, designer & CM
- RCTC I-15: D/B, Contractor's side, designer/Engineer of Record (EOR)
- Gerald Desmond Bridge: D/B, Contractor's side, designer/EOR
- US-101 Santa Barbara: CMAR, Owner's side, designer/EOR
- Mount Vernon Viaduct: D/B, Owner's side, bridging documents, procurement, Project Management and Construction Management
- High Speed Rail CP2-3: Modified D/B, Owner's side, design reviews and full independent check calculations (under PCM contract)
- Brea Canyon Widening: CMAR, Owner's side, designer/EOR

Key Qualifications

Experience: 32 Years

Biggs Cardosa: 32 Years

» **California Design/Build or PCM**
- Mount Vernon Viaduct
- BART to San Jose
- Gerald Desmond Bridge
- RCTC I-15 Express Lanes
- California HSR

- 25 RR Grade Separations
- Program Management
  - Mount Vernon Viaduct
  - California HSR CP2-3
  - National Trails Hwy (128 Bridges)
  - Port of Long Beach Pier G
- Construction Management
  - Mount Vernon Viaduct
  - North Spring St Bridge
  - Firestone Bridge
  - Embarcadero Bridge
  - G Street Grade Sep
- Local Experience
  - Rosecrans Marquardt Grade Separation, Santa Fe Springs
  - Gerald Desmond Bridge
  - 17th Street Grade Sep.
- Key Agency Experience
  - Metro
  - City and County of Los Angeles
  - CPUC

Education & Registration

» B.S. & M.S. Civil Engineering
San Jose State University

» Professional Engineer (Civil)
CA C31736

» Structural Engineer
CA S2639

RELEVANT PROJECT EXPERIENCE

Mount Vernon Viaduct BNSF Intermodal Yard, Design/Build, PCM, San Bernardino: Project Manager for Program/Construction Management (PCM) team to support SBCTA in managing all phases of a Design/Build contract to replace aging 1,000-ft bridge spanning over 22 BNSF and Metrolink tracks. Bridging docs, procurement, construction management. **10/2018-Present**

BART Extension to San Jose, D/B, Bridging Docs, Fremont to San Jose, CA: Fremont to San Jose, CA: Team Leader for 3 out of 5 Contracts in this 10-mile commuter rail extension. The work consists of relocating the UPRR tracks to one side of the right-of-way, constructing a new 2-track commuter rail line, and grade separating all the roadways crossing the alignment. **2004-2008**

California High Speed Rail CP2-3, D/B, PCM, Central Valley, CA: ICE/ ISE Manager for 60 miles of California High Speed Rail infrastructure from south of Fresno to Kern County. Led Independent Check Engineer (ICE) and Independent Site Engineer (ISE). Under ICE, Michael directs the independent checks for all structural and civil work. Under ISE, Michael directs the technical field engineers and inspectors to ensure that the construction conforms to the approved plans and Specs. **10/2014-2021**

Gerald Desmond Bridge Replacement, D/B, Designer, Long Beach: Project Director for structural design of the approach bridges and bifurcating ramp structures for $1.2B project that included a 2000-foot long signature cable stay bridge and several approach bridges and ramp structures. **2011-2020**

Firestone Blvd Regional Corridor, CM, South Gate: PIC for construction improvement to a major gateway to the city involving an active transit bus corridor. To achieve this goal the number of traffic lanes were increased from four to six lanes on Firestone Boulevard between Alameda Street and Hunt Avenue. Improvements also included coordination with the active bus corridor, the synchronization of traffic signals, installation of new street signage and construction of raised medians. **10/2017 – 02/2019**

Rosecrans/Marquardt GS, D/B/B, Designer, Santa Fe Springs: Project Manager for $155 million grade separation of Rosecrans Ave, Marquardt Ave and BNSF for L.A. Metro. As the most hazardous at-grade crossing in the State, this grade separation will alleviate the current and potential traffic impacts and hazards posed by the existing at-grade rail crossing. This project will allow the CPUC to give BNSF the green light to complete their triple-track project and close the gap to provide 21 continuous miles of triple track on the third busiest rail corridor in the nation. **01/2015- Present**

Central Avenue Bridge over UPRR/Amtrak/ Metrolink (HBP), D/B/B, Designer, Montclair: Principal-in-Charge of a multidisciplinary team. Project management, state and federal funding assistance, ROW engineering, environmental documentation and PS&E. The project will rehabilitate or replace the existing 450-foot- long aging bridge and improve traffic flow and safety. **05/2020- Present**

Tustin Avenue / Rose Drive Grade Sep, D/B/B, Designer, Anaheim / Placentia: Project Manager for PS&E of a $70 million grade separation of Tustin Avenue/Rose Drive for the Orange County Transportation Authority (OCTA). Project required close coordination with the adjacent Orangethorpe Avenue Grade Separation. **04/2008-10/2016**

North Spring St Widening, CM, Los Angeles: Principal-in-Charge for as-needed Structural Support Services to supplement the City of Los Angeles construction staff . The 678-foot long structure incorporates a 30-foot bridge widening and seismic retrofit of the existing historic 1928 arch bridge. **2015-2017**

RCTC I-15 Express Lanes, D/B, Designer, Riverside Co., Structures Project Director for the design of 2 of 11 bridge widenings from Type Selection to RFC phase, including Santa Ana River Bridge and Riverside Avenue UC. **2017- 2019**

Central Avenue Project, CM, Montclair: PIC for the Construction Management and Inspection Services for the rehabilitation of Central Avenue, between Phillips Boulevard (southern City limit) and I-10 (northern city limits). The project's objective was street rehabilitation, signal modifications, median landscaping/irrigation improvements, recycle water line and handicap accessibility upgrades. **07/2019-08/2020**

MAZEN MNEIMNEH, PE, QSD

Project Role: Deputy Project Director

Mazen Mneimneh has more than 22 years of experience in the design, design management and construction management of transportation and transit-related projects. Mazen has experience with projects utilizing alternative delivery methods, as he spent more than eight years working on challenging (vertical) projects ranging in value from $500M to $1.3B. Mazen has served as a resident engineer on numerous complex civil projects, including construction management for roadway, bridges and transit facilities. Mazen also has experience with long transit corridors, bridge replacements, grade separations, road widenings, traffic signals, landscaping, and sidewalk improvements. On several of his recent CM projects Mazen had to coordinate and receive approvals from Metro and other Southern Califonia transit agencies to relocate bus shelters and adjust bus schedules during construction. Mazen also has experience managing projects requiring interfacing and coordination with various utility companies, railroads, environmental and regulatory agencies.

Mazen oversees construction issues, contract administration, structural inspections, testing, material submittals, shop drawings, RFI's, and change orders. Mazen is skilled at managing complex projects with multiple stakeholders. As a registered engineer, he can review contractor's drawings for constructability, provide value engineering and lead redesigns. Mazen can also perform a variety of duties from contract administration to establishing coordination among various design packages to mitigate ambiguity. He schedules work in logical steps and budgets time required to meet deadlines. In addition, Mazen controls and monitors costs, keeps track of project and consultant expenditures, prepares and negotiates contract change orders and assists clients in managing bid processes.

Key Qualifications

- Bridge and Transit Project Construction
- Alternative Delivery Methods
- Construction Manager and/or Structures Rep for Transportation Projects in California

Education & Registration

- B.S. Civil Engineering, Beirut Arab University
- M.S. Engineering Management, Santa Clara University
- Civil Engineer CA C65560

Experience: 22 Years
Biggs Cardosa: 12 Years

RELEVANT PROJECT EXPERIENCE

Five Point Gateway – Marine Way Plaza Bridge, (Design/Build) Irvine, CA: Structures Representative for a 400-foot wide, three-span bridge that covers Marine Way and supports a park with pedestrian paths that bring together the two halves of new Broadcom campus. Mazen lead a team of bridge inspectors and manage the independent quality assurance testing program to ensure the project is in accordance with Caltrans Specifications and the contract drawings. **Length of Time on Project: 11/2015 – 01/2017**

Firestone Boulevard Regional Corridor Enhancements Project, South Gate, CA: Construction Manager for the improvement to a major gateway to the city involving an active transit bus corridor. To achieve this goal the number of traffic lanes were increased from four to six lanes on Firestone Boulevard between Alameda Street and Hunt Avenue. Improvements also included coordination with the active bus corridor, the synchronization of traffic signals, installation of new street signage and construction of raised medians. **Length of Time on Project: 10/2017 – 02/2019**

Pioneer Boulevard Rehabilitation, Norwalk, CA: Resident Engineer the rehabilitation of Pioneer Boulevard between Rosecrans Avenue and Alondra Boulevard, Project No. 7149. The work involves construction of landscaped median islands along the center of the street, installation of a new traffic signal on Pioneer Boulevard at Ferina Avenue/Hopland Avenue, repaving the roadway, bus transit coordination and upgrading corner accessibility ramps. **Length of Time on Project: 11/2017 – 01/2019**

Santa Margarita Parkway Bridge Hinge Repair (HBP), Rancho Santa Margarita, CA: Resident Engineer/Structures Representative for the Bridge Hinge Repair construction management, materials testing and habitat restoration services. The major activity of the bridge consists of supporting and jacking a 1,199-foot-long and 72-foot-wide northern bridge of Santa Margarita Parkway. The project includes full hinge demolition and replacement, replacement of the joint seal, and assemblies and joint sidewalk armor at each abutment. **Length of Time on Project: 04/2020 – 04/2021**

Auxiliary Lot Project, City of Norwalk, CA: Project Manager for the parking lot transit project for the City of Norwalk Public Works Department. The project converts the empty lot adjacent to the Norwalk/Santa Fe Springs Transportation Station to a parking lot. The project provided a safe designated parking lot for buses as well as a yard location for the City's maintenance crew. Having this parking lot next to the transit station will facilitate the commuter's accessibility to a safe and fast trip, allowing commuters to arrive at the station and be able to have a fast commute transfer. **Length of Time on Project: 06/2019 – 04/2020**

Burj Khalifa, Dubai UAE (Alternative delivery method): The Tower is the tallest building in the world; it consists of the main tower which is surrounded by a lower podium structure. In order to accelerate the project, a unique alternative delivery method was adopted that started with having several design packages not completed. The CM, Owner and the designer agreed on a sequencing of design activities with a construction phasing plan that allows each phase to start when design for that phase is complete. This allowed the contractor to start construction of the phases with completed design early while other design packages are being developed. Mazen's main responsibility was to manage the constructability review of the structural aspect of the project during the sequencing phase in addition to several construction packages. Activities included participating in resolving several structural design and constructability issues with the consultant and the contractor. Monitored site activities such as work inspections, testing, contractor's submittals, performance mock-up, etc. Close monitoring of the structural performance/abidance of the supervision consultants and subcontractors and recommend action when necessary. Other responsibilities included value engineering and assistance on logistics plan and bid strategies for the project. Monitored the construction and productivity schedule and updated the budget according to the change orders. **Length of Time on Project: 09/2005 – 12/2011**

Central Avenue Project, City of Montclair, CA: Construction Manager for the Construction Management and Inspection Services for the rehabilitation of Central Avenue, between Phillips Boulevard (southern City limit) and I-10 (northern city limits). The project's objective was street rehabilitation, signal modifications, median landscaping/irrigation improvements, recycle water line and handicap accessibility upgrades. **Length of Time on Project: 07/2019-08/2020**

Firestone Blvd Bridge Widening over Los Angeles River, (HBP) South Gate, CA: Resident Engineer & Structures Representative for a 473-foot long bridge and 300-ft road widenings; a federally funded Highway Bridge Project following Caltrans Procedures. As the resident engineer and structure representative, Mazen has led the full-service construction management team for this major bridge project. In addition to widening the south side of the bridge, this project also included demolition and replacement of the existing southwest bike ramp and retaining walls. **Length of Time on Project: 02/2016 – 07/2017**

Firestone Blvd Bridge Replacement over San Gabriel River (HBP), Norwalk, CA: Structures Representative for the replacement of a 239-foot long three-span structure carrying six traffic lanes and concrete sidewalks over the San Gabriel River. Responsible for the technical and administrative control of the structure elements. Mazen oversaw design issues, construction methods, structural inspections, testing, material submittals, shop drawings, RFI's, proposed change orders. **Length of Time on Project: 04/2014 – 12/2015**

Tustin Avenue/Rose Drive Grade Separation Project, Anaheim/Placentia, CA: The overhead structure is a 401-foot long and 118-foot wide and is supported on columns on large diameter CIDH piles. Responsibilities include: reviewing contractor submittals (mixed designs, rebar shop drawings, prestressing tensioning reports, calculations, etc.), assist with preparation of bridge contract change orders, respond to bridge RFI's and onsite coordination between contractor and the designer. **Length of Time on Project: 04/2015 – 04/2016**

JOHN SCOTT, PE

Project Role: Resident Engineer/Structures Representative

John Scott is a U.S. Army veteran with over 30 years of professional engineering experience. He is a registered Civil Engineer with design, design management, structural observation and construction field engineering experience. Throughout his career, John has worked for several engineering companies as well as the California Department of Transportation in order to gain sufficient experience to take the CA SE exam. He has since qualified and will be taking the exam in April 2021.

John has worked on a variety of projects through the years, many requiring special skills he acquired from the nation's oldest civil engineering institution and military installation. His projects include upgrades at VA facilities, alterations in secure facilities doing Defense Department aerospace construction work, upgrades at sensitive communications facilities and work at government laboratories. Clients include NASA's Jet Propulsion Laboratory, Lockheed Martin, Edison International, U.S. Department of Veterans Affairs and a number of public and private entities. John has performed structural inspection on the following Metro Silver Line Busway facilities: 37th St Station, Slauson Avenue Station, Manchester Ave Station, Rosecrans Ave Station, Carson St Station and Pacific Coast Hwy Station.

Key Qualifications

- Design/Build Experience
- Grade Separation Exp.
- Metro Station Const. Exp.

Education & Registration

- B.S. Civil Engineering F.S. U.S. Military Academy, West Point, NY
- Civil Engineer CA C56912

Experience: 30 Years
Biggs Cardosa: 3 Years

RELEVANT PROJECT EXPERIENCE

Mount Vernon Viaduct BNSF Intermodal Yard, PCM, San Bernardino, CA: Deputy Design Manager for the Project Consultant Management (PCM) team to support SBCTA in managing all phases of a Design/Build contract to replace an aging 1000-foot historical bridge spanning 22 BNSF and Metrolink tracks in the middle of the San Bernardino BNSF Intermodal Yard. Responsibilities include preliminary engineering, utility coordination, railroad coordination, assisting with procurement and management of a Design/Build contractor, design reviews and construction management support.

Length of Time on Project: 05/2019 – 03/2020

I-105/I-710 Freeway Interchange, Caltrans District 7, Lynwood, CA: Structures Construction Field Engineer for construction of Los Angeles River Bridge, a highway bridge along the I-105 mainline. Project included close coordination with Metro during construction to ensure anchor bolts for poles supporting future catenaries along the Green Line corridor were positioned correctly before deck concrete was cast. **Length of Time on Project: 01/1991 – 09/1991**

I-110 Harbor Freeway Transitway Projects, Caltrans District 7, Los Angeles, CA: Lead Structures Construction Field Engineer responsible for various structures including Phase I and II construction for the Slauson Avenue Transit Station, the Manchester Avenue Undercrossing replacement and bus station, the Carson Street and PCH Metro Transit Station projects. **Length of Time on Project: 04/1993 – 06/1997**

Fullerton Road Grade Separation, City of Industry, CA: Provided services as Structures Representative and Structure Construction Inspector for all structures constructed on the project, including checking lines and grades from construction staking, formwork fabrication, rebar placement, concrete placement, daily reports, pictures, traffic control, barrier construction and ensuring that all work was done to Caltrans and COI standards. Assisted the Resident Engineer by reviewing structure-related submittals, answering RFIs, and performing other client requested services. As interim Design Manager, supervised staff and coordinated with roadway,

geotechnical and electrical design subconsultants on this 3-bridge, multiple wall railroad grade separation project. **Length of Time on Project: 02/2015 – 05/2020**

Caltrans Division of Structures Field Construction Engineer, Caltrans District 7, Los Angeles, CA: Performed field inspection services on I-110 Transitway, I-5/I-10/SR-60/US-101 East Los Angeles Freeway Interchange Seismic Retrofit Project, Slauson Avenue Seismic Retrofit Project and I-105/I-710 Freeway Interchange Project (Phase 2) as an Assistant Resident Engineer and Principal Structures Field Engineer. **Length of Time on Project: 05/1994 – 06/1997**

Arroyo Seco Bridge Inspection, NASA Jet Propulsion Laboratory, Pasadena, CA: Performs hands-on bridge condition inspection. Coordinates inspection access and reviews traffic control procedures with JPL prior to field inspection. Reviews bridge as-built plans at JPL Facilities, Maintenance and Operations. Performs bridge load rating calculations for the rating vehicles prescribed in the NASA Load Rating form. Prepares biennial Bridge Inspection Reports (BIRs) including Element Level Inspection (ELI) and Structure Inventory and Appraisal (SI&A) data forms in NASA-prescribed electronic format. Recommends preventive maintenance measures. **Length of Time on Project: 06/2020 – 11/2020 (reoccurs every two years)**

Santa Margarita Parkway Hinge Replacement Project, Santa Margarita, CA: Served as consultant Resident Engineer/Structure Representative for the City's BPMP/HBP programmed repair of an 85-foot-wide hinged section of the northern Santa Margarita Parkway Bridge (55C-0520L) that carries westbound traffic across Arroyo Trabuco. The project scope included a full-width hinge demolition and replacement, replacement of joint seal and joint seal assemblies at each abutment as well as joint sidewalk armor plates. All construction activities were performed in strict accordance with the latest Caltrans Local Assistance Procedures Manual, Office of Structure Construction technical manuals, Highway Design Manual, Construction Manual, Caltrans Standard Specifications and City Standards. Responsibilities were to ensure that all aspects of contract administration adhered to the established contract requirements and that completed work was compliant with same. As Structures Representative, reviewed and performed structural analysis on proposed temporary support system designed to carry live traffic while bridge was under construction. **Length of Time on Project: 02/2020 – 07/2020**

San Onofre to Pulgas Double Track Project, Oceanside, CA: Served as consultant Resident Engineer for San Diego Association of Governments (SANDAG) on its $37.1 M railroad construction project along the LOSSAN railroad corridor. The project included infrastructure and signalization improvements along with 4.2 miles of new track, a new control point (CP Don), new Positive Train Control (PTC) elements, crossovers and the decommissioning of an existing control point with conversion of signal house to PTC element. Supervised team of engineering, inspection and clerical support professionals in the course of administering the construction contract. This project was the initial stage of a planned two-stage project. **Length of Time on Project: 11/2013 – 01/2016**

SOCORRO DE LA TORRE

Project Role: Lead Structures Construction Inspector

Socorro de la Torre has 15 years of experience in the construction management and inspection of heavy civil projects, particularly construction and inspection of highways, bridges and light rail transit. She has also played various roles as a field engineer, project engineer, assistant superintendent, and assistant structure representative/inspector. She has worked on numerous multimillion-dollar construction projects with Caltrans, Metro, and numerous local agencies. Projects included bridge replacement, grade separations, road widenings, falsework, landscaping, pre-stressed and reinforced concrete, cast-in-drilled holes (piles), trenching and shoring, precast girders, mass concrete, bridge demolition, rock slope protection, sign structures, sound walls and retaining walls.

Key Qualifications

- 15 years Construction Management and Structures Inspection Experience
- Transit Project Experience
- Metro Exp.
- City of Los Angeles experience

Education & Registration

- B.S. Civil Engineering, California State University, Los Angeles
- ACI Concrete Field Testing Tech – Grade 1
- Metro 3rd Party Contractor Safety Trained Confined Space
- BNSF Safety Trained
- Primavera Fundamentals Training

Experience: 15 Years
Biggs Cardosa: 6 Years

RELEVANT PROJECT EXPERIENCE

Firestone Boulevard Regional Corridor Enhancements Project "The Boulevard", South Gate, CA Biggs Cardosa provided construction management and inspection to easing traffic circulation and increasing driver and pedestrian safety. To achieve this goal, the number of traffic lanes was increased from four to six lanes on Firestone Boulevard between Alameda Street and Hunt Avenue. Improvements also include the synchronization of traffic signals, installation of new street signage and construction of raised medians which have proved effective at improving traffic movement where there is a mixture of significant pedestrian and vehicular traffic. Responsibilities included construction inspection of the entire project included; sidewalk replacement, median curbs, irrigation and landscape at center medians, stamp concrete, and traffic signal installation. Also assisted with tracking quantities and provided documentations of daily reports. **Length of Time on Project: 04/2018 - 10/2018**

SR 47 Schuyler Heim Bridge Replacement, Port of Long Beach, CA: Assistant Structure Representative and Structures Inspector for a $210 million project. Provided daily inspection and documentation of assigned structures. Worked directly with Caltrans Structure Representative to resolve field and design issues. **Length of Time on Project: 07/2013 – 08/2014**

North Spring Street Viaduct Widening and Rehabilitation (HBP), City of Los Angeles, CA: Assistant Structures Rep and Construction Inspector for 678-foot long historic arch bridge structure, which involved the 30-foot bridge widening and seismic retrofit of the existing structure over Metrolink/UPRR tracks and the Los Angeles River. **Length of Time on Project: 06/2016-03/2017**

Pioneer Boulevard Rehabilitation, Norwalk, CA: Construction Inspector for the rehabilitation of Pioneer Boulevard between Rosecrans Avenue and Alondra Boulevard. The work involves construction of landscaped median islands along the center of the street, installation of a new trafc signal on Pioneer Boulevard at Ferina Avenue/Hopland Avenue, repaving the roadway including repairs to gutters, and upgrading corner accessibility ramps. **Length of Time on Project: 11/2017 – 01/2019**

Five Point Gateway – Marine Way Plaza Bridge, (Design/Build) Irvine, CA: Structures Inspector for this award-winning 400-foot wide, three-span bridge that depressed Marine Way below a plaza. The bridge supports a park with pedestrian paths that brings together the two halves of the corporate campus. **Length of Time on Project: 11/2015 – 01/2017**

Firestone Blvd Bridge Widening over Los Angeles River (HBP), South Gate, CA: Construction Inspector for the widening of a 439-ft long bridge over a major river. As the primary inspector on this project, Socorro performed all the types of inspections required, including roadway, structural, and traffic handling, such as, construction of road widening, removal and replacement of sidewalk and curb and gutter, removal of existing asphalt pavement and replacement with jointed plain concrete pavement, relocation of street lighting, striping, and traffic control systems. Assisted project rep with submittal review and respond to Request for Information, track quantities on a daily basis and review and prepared progress payments, and provide documentation of daily reports. Perform SWPPP walks with Contractor for SWPPP reports. In addition to widening the south side of the bridge, this project also included demolition and replacement of the existing southwest bike ramp and retaining walls. **Length of Time on Project: 02/2016 – 07/2017**

I-405 Widening, Culver City, CA: Assistant Structure Representative for a $17 million widening project, involving construction of 400mm to 2100mm diameter cast-in-drilled hole (CIDH), wet and dry piles. Project involved two prestressed cast-in-place bridge widenings and 3 retaining walls on piles and spread footings. Oversaw installation of isolation casing and column casing. Duties and responsibilities included inspection and documentation for CIDH drilling, inspection of prestressing system; inspection of column casings installation and painting; inspection of isolation casing installation; inspection of temporary support and jacking; inspection of rebar placement and concrete pour. Assisted structures rep with submittal review, quantity take-off and progress pay estimates. **Length of Time on Project: 03/2012 – 08/2014**

I-10 Auxiliary Lanes, Los Angeles, CA: Assistant Structure Representative and Inspector for a $20 million project which consisted of Olympic Blvd UC (Widen), Eleventh Street UC (Widen), S110-W10 Connector Viaduct (Widen), Ninth St UC (Widen), W10/S110 Connector UC, Ninth Street Offramp Separation (East) (Replace), RW 349, RW 351, RW 200, RW 1, RW 2, SW 21, SW 353, and SW 355. Bridge widenings, seismic retrofit, retaining walls, soundwalls and approach slab replacement. Duties included checking of bearing grade calculations; inspection of rebar placement and concrete pours for concrete barrier, retaining walls, approach slabs, excavation and structural backfill, bridge footings, abutments, columns and bent superstructure; inspection of soundwall construction, falsework, prestressing system, pre-cast girders, and survey to verify bearing grades and footing elevations, as well as deck grades. **Length of Time on Project: 07/2011 – 03/2012**

I-5/SR 170 Interchange, Pacoima, CA: Project Engineer for a $110 million project which consisted of 2 new connectors (717 m, 11 span N SR 170-N I-5 Connector and 251m, 7 span I-5-SR 170 HOV Connector); 5 major bridge widenings; 5,000 meters of retaining walls and sound walls and 55 overhead sign structures. Duties and responsibilities included assisting the project manager and superintendent with planning and coordination of work. Supported field personnel by performing layouts, calculating quantities and ordering material. Ensured that work was constructed according to the project plans and specifications. Produced lift drawings to aid field personnel in construction of work. Collaborated with design team to resolve issues. Maintained and updated the 4-week look-ahead schedule. Tracked quantities for payment and cost analysis. Picked bridge and falsework grades from 4-scale. Performed Quality Control of the field work completed by field workers. **Length of Time on Project: 05/2010 – 05/2011**

Exposition Light Rail Transit (Phase 1), (Design/ Build) Los Angeles, CA: Field Engineer for a $700 million Joint venture design-build project which consisted of 9.6 miles of twin track light rail line, including construction of 11 passenger stations, three park-and-ride lots, and a 1,000-foot cut-and-cover tunnel in front of USC campus. Duties and responsibilities consisted of the tunnel segment, (2) bridges and a passenger station. Created the 4 week look-ahead schedule. Staged work for field crews and subcontractors and ordered materials. Provided layout and grade elevations for each structure. Managed segment of work and performed engineering QC inspection during all phases of construction including bridge construction, excavation, backfill, demolition, walls, barriers, drainage, electrical, utility underground work, painting, sign structures, landscape, paving, train railing, and tunneling. Held meetings with designers, subcontractors, owner, QC/QA inspectors and third parties. Resolved field issues directly with designers and contractors. Lead Field Engineer, responsible for training four entry level engineers. Acted as superintendent and supervised a crew of more than 60 men on a daily basis. **Length of Time on Project: 04/2008-04/2010**

ANSER ADVISORY

ROBERT DELGADO, CHST, CCM

Project Role: Safety Manager

Mr. Delgado has more than 25 years of experience in the construction industry. He began his career as a carpenter building bridges throughout California. Soon thereafter, Mr. Delgado obtained his General Contractors and General Engineering Contractors license. Nearly two decades later, his career path evolved into a focus of safety oversight, which led him to provide oversight on various projects and development of company safety policies specifically within the construction management industry. His expertise includes developing and implementing safety policies, jobsite inspections, accident investigations, training, coaching, and verifying regulatory compliance.

Key Qualifications

- Construction Health and Safety Technician
- Certified Construction Manager

Education & Registration

- Associate of Arts, International Business Management, Santa Ana College, Santa Ana, CA
- Associate of Arts, Carpentry, Santa Ana College, Santa Ana, CA
- Certified Construction Manager (CCM), #16050
- Construction Health & Safety Technician (CHST)

Experience: 25 Years
Anser: 2 Years

RELEVANT PROJECT EXPERIENCE

Anser Advisory Management, LLC Various Projects, Santa Ana, CA: As Corporate Safety Manager, Mr. Delgado is responsible for project safety oversight on various projects including highway, bridge, and public works construction. He is responsible for implementing safety policies, conducting jobsite inspections and accident investigations, facilitating safety training, and overseeing compliance with regulatory requirements. **Length of Time on Project: 02/2019-Present**

Malleum, LLC Various Projects, Reno, NV: As Construction Manager and Safety Director, Mr. Delgado oversaw land development and the construction of several single-family residences. His responsibilities included monitoring the work of the contractor, verifying safety compliance with regulatory requirements, conducting jobsite inspections, and daily reporting. **Length of Time on Project: 02/2018- 01/2019**

Arcadis Various Projects, Irvine, CA: As Associate Vice President, Transportation, and Safety Manager. Mr. Delgado was responsible for safety oversight of various transportation and public works projects. In addition, he oversaw the transportation infrastructure practice and led various pursuit teams. **Length of Time on Project: 09/2013-10/2015**

Caltrans District 11 Southway Expressway SR-125 Toll Road, San Diego County, CA: As Assistant Project Manager, Safety Manager, and SWPPP Inspector, Mr. Delgado provided SWPPP review and implementation, inspection, and safety compliance oversight and reporting. Chicano Park is 7.9 acres and located beneath the San Diego-Coronado Bridge in Barrio Logan, a predominantly Mexican American and Mexican immigrant community in central San Diego. The park is home to the country's largest collection of outdoor murals, various sculptures, earthworks, and an architectural piece dedicated to the cultural heritage of the community. Mr. Delgado was part of a team that oversaw the restoration of 18 murals which were first painted in the 1970s. **Length of Time on Project: 03/2010-11/2013**

Ortiz Enterprises Various Projects, Southern California, CA: Mr. Delgado served as Carpenter Foreman and Safety Training Officer on numerous projects including the I-60 Interchange Widening in Diamond Bar, I-10 Widening in Pomona, and Light Rail Transit Trolley in San Diego. Responsibilities included training personnel on safety requirements; daily reporting of activities, man hours, and equipment; and developing productive relationships with project stakeholders. **Length of Time on Project: 09/1994-02/2004**

ANSER ADVISORY

Key Qualifications

» LEED Accredited Professional (AP)

Education & Registration

» Bachelor of Science, Electrical Engineering, University of Hawaii at Manoa, Honolulu, HI

Experience: 31 Years
Anser: 1 Year

ANTHONY LE, LEED AP

Project Role: Senior Cost Analyst

Mr. Le is a Senior Cost Analyst with over 30 years of construction estimating experience. He has led estimates and estimating teams in preconstruction and construction cost analysis on complex projects with contract values ranging up to $1.6 billion. As Lead Estimator, Mr. Le has been responsible for the creation and oversight of the project estimate as it progresses through the design stages and into construction. His key experience relevant to this project includes:

» Progressive Design/Build experience on the $476.9M San Diego International Airport Terminal 2 Expansion and $1.6B Los Angeles World Airports Midfield Satellite Concourse North.

» Design/Build cost negotiation experience for multiple California State University, San Marcos projects.

» Facilitating the reconciliation process throughout the design progression and award.

» Providing the necessary cost information when negotiating subcontract and contractor awards of work.

» Preparing Independent Cost Estimates for changes in scope of work, reconciling the changes with the appropriate trades, and negotiating settlement amounts to ensure fair and reasonable pricing is obtained.

RELEVANT PROJECT EXPERIENCE

San Diego International Airport Terminal 2 Expansion, San Diego, CA: The project consisted of approximately 470,000 square feet of public and nonpublic areas, providing 10 additional contact aircraft gates. The expansion was three stories including passenger circulation, airline check-in/ticket lobby, security screening, baggage handling, waiting areas, seating areas, concessions food court space, public art, restrooms, office space, special technology systems, and other related service/support areas. Airside facilities (approximately 1.3 million square feet) included the aircraft parking aprons, taxiways, and taxi lanes that serve the Terminal 2 West Expansion. As Senior Estimator, Mr. Le was responsible for the development and oversight for the project budget as the project progressed throughout the design stages and into award and construction. **($476.9M progressive design/build) Length of Time on Project: 04/2009-05/2011**

Los Angeles International Airport (LAWA) Midfield Satellite Concourse North, Los Angeles, CA: The $1.6 billion Design/Build project adds 12 wide body gates to the Tom Bradley International Terminal at LAX. The project includes a gateway building to the existing Bradley West terminal, baggage optimization building and structures, and upgrades to the Los Angeles Department of Water and Power substation for the terminal extension. Mr. Le was involved in the development and oversight of the cost estimate throughout the design of the project and evaluated the subcontractor pricing during the award of the project as it entered into the construction phases. **($1.6B progressive design/build project) Length of Time on Project: 04/2016-05/2017**

California State University, San Marcos (CSUSM) University Student Union, San Marcos, CA: The University Student Union was the first building on campus dedicated solely to students. The facility provided conference rooms, food services, lounges, retail space, student organization offices, recreational and game areas, and student union administrative offices. The project also included outdoor pavilions, a rooftop patio, multiple

terraces, and an open-air amphitheater. Mr. Le was the Lead Estimator for the project and developed the initial concept budget. He continually updated and refined the estimate as it progressed through design and was instrumental in the bid, negotiation, and award of all trade contracts on the project. He prepared independent cost estimates for all scope changes, reconciled them with the trades, and negotiated the scope changes for the project. ($37M design/build w/ price finalized at design completion) Length of Time on Project: 04/2011-12/2013

CSUSM Field House Expansion, San Marcos, CA: The project includes a 26,000 GSF addition to the existing M. Gordon Clarke Field House/University Student Union building and includes a 1,400-seat basketball facility, recreational gymnasium, support spaces and locker rooms. The project achieved LEED Silver certification. Mr. Le was the Lead Estimator for the project and developed the initial concept budget. He continually updated and refined the estimate as it progressed through design and was instrumental in the bid, negotiation, and award of all trade contracts on the project. **($9.4M design/ build w/ price finalized at design completion**) **Length of Time on Project: 02/2014-03/2016**

CSUSM Parking Structure Phases 1 & 2, San Marcos, CA: Parking Structure 1 and 2 consisted of six floors of cast-in-place, above grade concrete decks. The total project added approximately 2,800 parking spaces. Mr. Le was the Lead Estimator for the project and developed the initial concept budget. The project was $8 million below the owner's budget and a great deal of these savings was a result of the exceptional job of value engineering that Mr. Le provided during the schematic design phase of the project. By evaluating the soil conditions and rock elevations, Mr. Le proposed raising the ground floor elevation, eliminating rock blasting and importing soil resulted in a net savings of over $1.5 million while maintaining the overall integrity of the design. **($24M design/build) Length of Time on Project: 09/2008 - 2016-05/2010**

MNS ENGINEERS INC

JOHN SPALIONE, PE

Project Role: Assistant Resident Engineer

Mr. Spalione has over 40 years of experience in the construction industry and specializes in transportation projects. John has completed numerous transportation projects in Southern California, ranging from roadway and bridge improvements/rehabilitation to vertical structures such as transportation/rail centers. John's experience with the City, staff, and processes and procedures gives him a firm understanding of the City's expectations when completing projects from inception to fruition.

Key Qualifications

- Construction Management and Inspection
- Transportation Projects
- Public Agency Coordination

Education & Registration

- BS, Civil Engineering, Santa Clara University, Santa Clara, CA
- Professional Civil Engineer, CA, No. 59253

Experience: 40 Years
MNS: 17 Years

RELEVANT PROJECT EXPERIENCE

Golden Valley Road Interchange at State Route 14, City of Santa Clarita, CA: Santa Clarita, CA: Construction Inspector. This $7M interchange construction project widened a two- span post-tensioned box girder bridge overcrossing across State Route 14. Construction involved attaching the new 61-foot-wide bridge to the immediate north of the existing bridge. The structural foundation was constructed with diaphragm abutments at each end of the bridge, supported on new spread footings, and a 51- foot-wide wall pier center bent in the center median of State Route 14. Additional items included demolishing the bridge; realigning Golden Valley Road; constructing the jointed plain concrete pavement (JPCP) ramp termini at both off-ramps; installing high occupancy vehicle (HOV) lanes and ramp metering at each on-ramp; installing extensive stage construction signage, temporary striping, temporary signals, video traffic detection systems, and traffic control devices; and relocating a 6-inch high pressure gas line through the bridge. The project also required over 7,000 cubic yards of earthwork; hot mix asphalt (HMA) paving and lean concrete base (LCB); and irrigation, and landscape and hardscape. The project was constructed within both Caltrans and City rights-of-way under Caltrans oversight and per Caltrans standards and specifications. **Length of Time on Project: 03/2014-07/2016**

Burbank Regional Intermodal Transportation Center, City of Burbank, CA: Resident Engineer. This project was phased to accommodate existing Metrolink operations at one long asphalt concrete loading platform located between the two sets of tracks to maintain passenger parking lots on both sides of the station. Two concrete passenger loading platforms with structural steel framed and tinted glass canopy shelters were constructed on the outer faces of the two rail lines and the interior platform was demolished. Each platform included full drainage and water system for maintenance. Each canopy was equipped with power and communication via message boards and Public Address (PA) speakers. Site amenities included decorative trash cans and benches and construction of a decorative crossing to tie the east and west platforms and parking lots together. During the project, the City acquired the adjacent property to the south. Contract change orders were executed to demolish a city block of buildings and construct a Design/Build parking lot to meet the City development conditions. Coordination with the Burbank Public Works Department and local businesses was instrumental in the reconstruction of public streets in the area. **Length of Time on Project: 01/1997-11/1998**

Norwalk Transportation Center, Cities of Norwalk and Santa Fe Springs, CA: Assistant Resident Engineer / Office Engineer. A joint effort between the Cities of Norwalk and Santa Fe Springs, this $7M project constructed two concrete passenger loading platforms with a structural steel pedestrian bridge with elevators spanning the rail right-of-way of three main lines used for Metrolink and Amtrak. In order to construct a rail

siding on the Norwalk side of the tracks, widening a reinforced concrete bridge over the Imperial Highway and constructing embankment fills for the track construction were necessary. A reinforced concrete box culvert for storm drainage controls was constructed on the Norwalk side. Additionally, a bus wash facility and parking lot was constructed for the City of Norwalk as part of this project. Additional construction work included traffic signal construction and street improvements on Imperial Highway. **Length of Time on Project: 11/1995-08/1996**

Sierra Highway Bridge over the Railroad, City of Santa Clarita, CA: Resident Engineer/Construction Inspector. This $7M project joined two independent bridge structures over the Metrolink (MTA) Antelope Valley line and a tributary creek to the Santa Clara River to provide additional lanes for traffic on Sierra Highway, including a Class I bike trail. The phased project accommodated the removal and reconstruction of the entire northbound bridge after construction a 14-foot closure to allow for traffic control during construction. The 300-foot-long bridge consisted of cast-in-place, post- tensioned box girders and deck. Additional work involved decorative stamped median, asphalt concrete (AC) overlay, architectural barrier walls, drainage facilities, and retaining walls in the railroad right-of-way. **Length of Time on Project: 08/2006-09/2008**

Sylmar/San Fernando Metrolink Station, City of Los Angeles, CA: Assistant Resident Engineer / Office Engineer. This $2.5M project was a joint effort between the Cities of Los Angeles, San Fernando, and Sylmar to construct one concrete passenger loading platform with canopy shelters and a landscaped parking lot. A signalized intersection was reconstructed at the entry off of Hubbard and new street improvements along the parking lot. Storm drainage infrastructure was completed. During the project, an earthquake rattled much of Southern California; a temporary asphalt concrete (AC) loading platform was constructed in emergency conditions at numerous stations including Sylmar. **Length of Time on Project: 01/1994-06/1994**

Downey Bridge Construction, City of Los Angeles, CA: Assistant Resident Engineer / Office Engineer. This project constructed a steel girder bridge spanning the Los Angeles River between Taylor Yard (Amtrak and Metrolink maintenance facility) and Union Station for train service with two tracks. Construction work involved demolishing two concrete slope walls for the abutment construction and three cast-in-drilled-hole (CIDH) columns for mid-span support. Coordination with the US Army Corps of Engineers was vital for work in the river. Extensive coffer dams and diversion measures were required to work in the river bottom. **Length of Time on Project: 05/1993 – 08/1993**

JOY BHATTACHARYA, PE, PTOE

Project Role: Signal/Systems Design Review, DB Coordinator

Joy is AMG's Vice President of Innovative Transportation Solutions. He leads AMG's innovative transportation solutions' team that bridges the gap between the past practices and making agencies prepared for the future. Being in a new era of advanced mobility and digital transformation, he provides the solutions that would prepare Cities for Connected Communities, Connected Autonomous Vehicles (CAV), and SmartCity solutions. He has in-depth experience in the development, design and implementation of various engineering strategies in major metropolitan areas, including Adaptive/ Responsive Traffic Signal Systems and Transit Priority Systems; Incident Management Plans; design of automated Electronic Toll Collection systems; preparation of PS&E for field implementation of CCTV, Changeable Message Signs, Highway Advisory Radio, Ramp Metering and ATMS systems; and freeway and arterial operations using micro-simulation. Local projects to his credit include the Mountain House ATMS, City of Hayward Adaptive Signal Systems, Webster Street SMART Corridor System, I-80 Integrated Corridor Management, and the Santa Clara VTA Capitol Corridor Transportation Study.

Key Qualifications

- Innovative transportation solutions's
- Signal Systems Expertise for transit Projects

Education & Registration

- **M.S. Transportation** Engineering/Operations Research, University of Delaware, Newark, Delaware, 2001
- **M.Eng Transportation** Engineering, University of Tokyo, Tokyo, Tokyo, 1995
- **B.Tech (hons) Civil**, Indian Institute of Technology, Kharagpur, West Bengal, 1992
- **Professional Engineer** #68928, California Board for Professional Engineers, Land Surveyors, and Geologists
- **Professional Engineer** #1103, Professional Traffic Operations Engineer

Experience: 30 Years
AMG: 3 years

RELEVANT PROJECT EXPERIENCE

V2X Signal Lab at GoMentum Station, Concord, CA (Project Manager). Joy led the planning, design, and construction phasing and implementation of the state-of-the-art CAV and Vehicle to Everything (V2X) Traffic Signal Lab (V2X Signal Lab) at GoMentum Station, that will be dedicated to research, training, and testing of CAV hardware and software technologies. Traffic engineers in Contra Costa County and the Bay Area will have access to traffic signal cabinets, multiple traffic signal controllers, video detection, Dedicated Short Range Communication (DSRC)/5G communication, and other traffic signal related equipment, to test the connectivity and safe crossing of CAVs equipped with On-Board Units (OBUs) and traffic signal controllers equipped with DSRC/5G technology.

The lab provides the capability of conducting full intersection signal control demonstrations and tests. The unique environment of the CAV-Sig Lab exposes traffic engineers and technicians to the complexities of signal deployment and prepare us for future CAV operations, including setup and maintenance of traffic signal controllers, conflict monitors, load switches, detection and DSRC/5G based communication systems on traffic signal cabinets. The lab provides the opportunity for hands-on experience working with futuristic traffic signals and associated technologies, testing various CAV and DSRC functional services, including collision avoidance, ATSPM, Emergency Vehicle Preemption, Vulnerable User Services, V2V, V2I, V2P, and V2C communications. Additionally, the lab is poised to educate and train signal technicians and traffic engineers in both the public and private sectors. **Length of Time on Project: 04/2018-present**

I-80 Integrated Corridor Mobility Project, Alameda CTC, Alameda and Contra Costa County, CA, (Project Manager). AMG staff were responsible for evaluating the existing system and providing solution by designing, developing, and implementing communication between the field elements and the TMC and between the City

TMC and Regional TMC. Staff worked closely with 11 cities and 2 transit agencies to implement the system. AMG staff is responsible for the successful implementation and operation of all the advanced strategies implemented as part of the project. The project included the implementation and integration of traffic and transit operations strategies including adaptive ramp metering, ramp metering priority for transit, traffic operations systems, active traffic management, and incident management along a 19.5-mile section of I-80 between the Bay Bridge Toll Plaza and the Carquinez Bridge. In addition to the freeway improvements, the project consists of local arterial and transit improvements along San Pablo Avenue, including signal synchronization, transit signal priority and flush plan for incidents. **Length of Time on Project: 08/2013-03/2018**

Advanced Traffic Management System (ATMS) Design for Route 238 Improvements, Hayward, CA (Project Manager). Mr. Bhattacharya managed the evaluation and design of an Advanced Traffic Management System with adaptive coordination capabilities. The design plans were completed on a fast-track schedule, and the roadway improvements and signal modifications are now under construction. ITS services for the project included: Developing the ATMS functional requirements: Preparing draft and Final Concept of Operations reports: Analyzing traffic detection and communications requirements and Evaluating adaptive control traffic signal systems and selecting the system that most effectively meets the City's signal system requirements.

Joy also designed the detection and fiber optic/ copper signal interconnect at 32 intersections for Phase I and 15 intersections for Phase 2. Joy prepared the PS&E for an ATMS that includes layout of the signal interconnect cable from the field traffic signal controller to the control room, SIC wiring and control room layout, and control room detail. The design was prepared to meet the requirements of SCATS installation for all the 47 intersections. In addition, 8 additional intersections were added to the SCATS system by upgrading the communication, controller, and detection at those intersections. Beyond the Route 238 Corridor Improvements Project the Advanced Traffic Management System will be expanded to most corridors within the city of Hayward in future phases. **Length of Time on Project: 03/2018-11/2020**

SR-4 ICM, Alameda CTC, Contra Costa County, CA, (Project Manager). Joy managed the development of the project's SEMP, ConOps, and High-Level System Requirements, identified risks, necessary disaster recovery plan, procedures during failure or incidents, and identified appropriate solutions for daily operation of city traffic engineers, first responders such as CHP, local police departments, and fire departments. Requirements also documented procedures for O&M and support of the system, its sub-systems, and components. This project involved significant coordination among project stakeholders including Caltrans and District 4, MTC, CHP, local cities, and transit agencies such as BART, County Connection, Tri-Delta. **Length of Time on Project: 06/2014-12/2017**

Metropolitan Transportation Commission's Program for Arterial Systems Synchronization (PASS) (Project Manager). Mr. Bhattacharya was responsible to synchronize traffic signal timing for 127 signals for various municipalities through MTC's PASS program. The PASS project focuses on traffic signal timing upgrades for arterials that carry regional traffic, serve as transit corridors, traverse through multiple jurisdictions, and intersect freeway on ramps and off ramps. Additionally, work was completed for the Counties of Marin and Alameda County. **Length of Time on Project: 04/2006-12/2012**

Fremont Boulevard Adaptive Signal Control Technology Project, Fremont, CA (Project Manager). As a sub consultant, Mr. Bhattacharya managed the signal detector and communication evaluation, field implementation and fine-tuning of SynchroGreen in the City of Fremont. The purpose of providing the adaptive control along Fremont Boulevard is to overcome delay and manage queues due to periodic traffic volume fluctuations. The project extent is 2.2 miles consisting of 9 traffic signals, of which 7 signals belongs to the City and Caltrans owns the remaining 2 signals. Joy conducted field reviews of the existing signal system, recommended upgrades to detection and communication systems to enable the adaptive system functionality of SynchoGreen. Multiple areas of improvements were identified within the constraints of having the availability of limiting detector channels. The adaptive system is implemented through fine-tuning of the system in the field. Currently, the system is being tested prior to the final approval. **2014-2016**

LEONARD GILLIANA

Project Role: Senior Construction Inspector (Systems/Signals)

Leonard brings nearly 40 years of public sector expertise in the area of traffic signal operations, construction, design and inspection to the Advance Mobility Group. He has been the Traffic Signal Inspection Supervisor for multiple large-scale projects in the City of Walnut Creek. He has taught signal inspection to his entire staff for the City. He has developed several courses that are taught across the country for the traffic signal industry.

Key Qualifications

» Traffic/Signal Expertise

Education & Certifications

» AA Degree, Electronic Technology, Diablo Valley College
» Traffic Signal Inspection
» Traffic Signal Operation
» Traffic Signal Timing
» Traffic Signal Design
» Cal Trans and MUTCD Standard**s**

Experience: 40 Years
AMG: <1 Year

RELEVANT PROJECT EXPERIENCE

Senior Traffic Signal Inspector, Advanced Mobility Group, CA, Leonard is currently serving as the Traffic Signal Inspector for AMG on multiple projects. **Length of Time on Project: 11/2020-present**

Co-Founder and Instructor, LRN Transportation Training, Leonard is the Co-Founder and Partner Instructor for new industry standard courses now taught across the country, including the areas of: Traffic Signal Inspection, Beginning and Advanced Traffic Signal Maintenance, Traffic Signal Design, and Traffic Signal Timing, and Working with the latest Cal Trans and NUTCD standards. **Length of Time on Project: 02/2013-present**

Senior Traffic Signal Technician, City of Walnut Creek, CA, Leonard helped build three traffic signal central systems over a 40-year career with the City of Walnut Creek, most recently a Trafficware – ATMS.now system. He also developed the traffic signal maintenance protocols for the City of Walnut Creek and have helped train various traffic signal technicians and contractors regarding Walnut Creek standards and provided oversight on the construction of over 100 traffic signals for the City and specifically was responsible for verifying that traffic signal facilities were built to state and local standards.

Responsibilities included the design and inspection of the installation of several miles of communication cable to improve traffic signal operation in Walnut Creek; oversight of the upgrade of over 40 traffic signal cabinets from TS1 to TS2; development of a robust traffic signal maintenance program; design and implementation of a unique IP communication protocol to communicate with all of the equipment in the field including controllers, CCTV, BBU and Video detection **Length of Time on Project: 04/1995-00/2019**

LAURA UDEN, PMP, CMQ/OE, CSEP

Project Role: Quality Manager

Laura has 19 years' hands-on experience as a rail transit and heavy civil design and construction QA Oversight Engineer and QA Manager on both Design-Bid-Build and Design/Build projects, three LA MTA projects: Rosecrans/ Marquardt Grade Sep, Lone Hill to CP White Double Track and Division 20 Portal Widening (in process).

Key Qualifications

- Traffic/Signal Expertise
- Relationship with Metro
- Provided Quality Assurance on Major Transit Projects throughout California

Education & Certifications

- B.S. Industrial and Systems Engineering, San Jose State University
- M.S. Systems Engineering Management, San Jose State University, 1996
- Ph.D. Management, University of Salford, United Kingdom
- Project Management Professional (PMP) #1269397, PMI, 06/2009, expires 06/2021
- Secretary, California High Speed Rail Authority Business Advisory Council Professional Services Committee

Experience: 28 Years
NSI: 17 Years

RELEVANT PROJECT EXPERIENCE

LA County Metro Transportation Authority, Orange, CA: Quality Assurance Manager. QA Manager for the Prime Contractor on the LA Metro Rosecrans/ Marquardt Grade Separation Final Design and Environmental Project to grade separate the Rosecrans Ave and Marquardt Ave intersection from the existing diagonal at-grade crossing of the BNSF railway, including incorporating the requirements of the Positive Train Control (PTC) program, the future California High Speed Rail, and other operating expansion and capital improvement plans. Developed the Quality Management System (QMS), and all QA and QC procedures. Provided training consistent with the QMS, updating quality requirements and procedures and performing QA audits to help ensure quality design execution. Supported Quality Management System (QMS) updates throughout the project. Audited subcontractors against the QMS procedures. **Length of Time on Project: 04/2015-Present**

LA County Metro Transportation Authority, Orange, CA: Quality Assurance Manager. QA Manager for the Prime Contractor on the LA Metro Lone Hill to CP White Double Track Preliminary Engineering and Environmental Project in conjunction with the Southern California Regional Rail Authority (SCRRA) for double-tracking of approximately 3.9 miles of railroad track between Lone Hill Avenue in San Dimas and White Avenue in La Verne. Project includes upgrading twelve at-grade crossings, an enlarged side platform at the Pomona Fairgrounds Seasonal Station, 2 industrial spurs, relocation of utilities, relocation of signal houses, a new Control Point, construction of a new bridge and lengthening of culverts. Responsible for developing the Quality Management System (QMS) to include all QA and QC procedures. Responsible for providing training consistent with the QMS, updating quality requirements and procedures and performing QA audits to help ensure quality design execution. Audited subcontractors against the QMS procedures. **Length of Time on Project: 06/2015-Present**

BART Silicon Valley Phase II, Millbrae, CA: Quality Assurance Oversight Manager. Design and construction of a 6-mile extension of the BART system from the planned Berryessa Extension terminus, ending at-grade in Santa Clara near the Caltrain Station. Includes a 5-mile-long subway tunnel through downtown San Jose and four stations. Prepared quality sections of procurement documents. Collected lessons learned. Developed the VTA Oversight Quality Management Plan (QMP) and the overarching Quality Management System (QMS) for the entire program, including all QA and QC procedures. Prepared quality training for VTA and Contractors. Reviewed and approved Contractor quality management plans. Led QA audits of the

activities of the Contractors and Subcontractors and prepared QA audit reports. Innovation: Laura identified electronic QMS system and requirements management tools to track performance across the entire program. **Length of Time on Project: 11/2018-Present**

California High Speed Rail Authority, (Design/ Build), Wasco, CA: Quality Assurance Oversight Manager. QA Oversight Lead for the PCM team on Construction Package 4 of the California High Speed Rail Project to perform initial construction of the high-speed railway on a 22-mile segment. CP 4 includes construction of at-grade, retained fill and aerial sections of the high-speed rail alignment and the relocation of four miles of existing BNSF track. Supported development of the Quality Management Plan (QMP) and Quality Management System (QMS), including all QA and QC procedures. Conducted reviews of the DB Contractor's management plans. Led QA audits of the activities of the Design Contractors and Subcontractors, and the DB Contractor, and prepared QA audit reports. Managed closure of audit findings and corrective actions, initiated preventive actions. Innovation: Laura developed a series of checklists to enforce the DB Contractor's adhere to contract requirements, which were adopted by the Authority Representative (RDP). **Length of Time on Project: 06/2016-Present**

Sound Transit, Seattle, WA: Quality Engineer. QA Engineer for the Prime Contractor on the Sound Transit Lynnwood Link Extension Project to provide a connection from Northgate to Lynnwood, with 8.5 miles of track and four stations. Provided input to and reviewed the Quality Management System (QMS) and prepared Quick Tips sheets. Conducted QA audits of the activities of the Design team, helped develop QA audit reports for submittal to Sound Transit. **Length of Time on Project: 05/2016-Present**

California High Speed Rail Authority, (Design/ Build), San Jose, CA: Quality Assurance Manager. QA Manager for the Engineering and Environmental Prime Contractor on the San Francisco to San Jose and San Jose to Merced segments of the California High Speed Rail Project to design a high-speed railway from Northern California to Los Angeles. Developed the Quality Management Plan (QMP) and the Quality Management System (QMS), including all QA and QC procedures. Led QA audits of the activities of the Design Contractors and Subcontractors, and prepared QA audit reports. Managed closure of audit findings and corrective actions against the Design Contractors. Innovation: Laura developed a QMP recommended by the Authority to be implemented Program-wide. **Length of Time on Project: 2009-2013 & 12/2015-Present**

BART, Oakland, CA: Quality Assurance Manager. QA Manager for the Prime Contractor providing general engineering services for the BART Train Control Modernization Program to upgrade the entire BART system to a new Communication-Based Train Control (CBTC) system. Developed the Quality Management Plan (QMP) and the Quality Management System (QMS), including all QA and QC procedures. Trained design team in quality procedures. Led QA audits of the activities of the Design Contractors and Subcontractors, and prepared QA audit reports. Managed closure of audit findings and corrective actions against the Design Contractors. **Length of Time on Project: 2009-2013 & 12/2015-Present**

Sound Transit, Seattle, WA: Quality Engineer. QA Engineer for the Final Design Prime Contractor on the Sound Transit East Link Extension Project to provide a connection from South Bellevue to Redmond, including 8 stations. Updated the Quality Management System, prepared Quick Tips sheets. Led QA audits of the activities of the Design Contractors and Subcontractors. Wrote QA audit reports for submittal to Sound Transit. Managed closure of audit findings and corrective actions against the Design Contractors. **Length of Time on Project: 06/2013-11/2015**

Support Staff

Support Staff	Role(s)	Firm	Yrs Exp	Representative Experience
Bruce Fock-Yat	Project/Field Engineer (Office Engineer)	BCA	8	▪ Metro - Rosecrans Marquardt Grade Separation (Document Control/labor compliance) ▪ Santa Margarita Parkway Bridge Hinge Repair (Construction Inspector) ▪ Firestone Boulevard Regional Corridor Enhancements Project (Office Engineer)
Tom Densford	Design Oversight Manager	BCA	30	▪ Mount Vernon Viaduct BNSF Intermodal Yard, PCM – (Review of Contractor Qualifications) ▪ Metro - Rosecrans Marquardt Grade Separation (Plan Review) ▪ US 50 Bridge Widening- Design/Build (Document Design)
John Wong	Design Review Support (as-needed)	BCA	13	I-15 Express lanes - Design/Build (Structures Design Engineer) ▪ Fullerton Road grade Separation (Design Engineer) ▪ Tustin Ave/Rose Drive Grade Separation (Design Engineer)
Anna Mendiola, RLA	Landscaping Construction Inspector	BCA	25	▪ Central Avenue Rehabilitation Project (Landscape Inspector) ▪ Pioneer Boulevard Rehabilitation (Landscape Inspector) ▪ Foster Road Side Panel (Landscape Inspector)
Lauren Hebert	Alternate Project/Field Engineer (Office Engineer)	BCA	5	▪ Mount Vernon Viaduct BNSF Intermodal Yard, PCM (Office Engineer) ▪ Central Avenue Rehabilitation Project (Office Engineer, Supplemental Inspector) ▪ Firestone Boulevard Regional Corridor Enhancements Project (Supplemental Inspector)
Ardalan Vajdi	Alternate Lead Structures Construction Inspector	BCA	18	▪ Mount Vernon Viaduct BNSF Intermodal Yard, PCM - (Construction Inspector) ▪ Metro Blue Line Willowbrook & Rosa Parks Station Improvement & Patsaouras Plaza Busway Station Rep. Construction Inspector and Office Engineer) ▪ Rosemead Blvd Traffic & Street Improvements & Traffic Signal Enhancement Projects (Caltrans) (Construction Inspector)

Support Staff

Support Staff	Role(s)	Firm	Yrs Exp	Representative Experience
Kelly Markwick	Project Administration	BCA	3	▪ Mount Vernon Viaduct BNSF Intermodal Yard, PCM - Progressive D/B (Project Administration)
Pavel Raskin	Estimator	Anser	30	▪ Metro Division 20 Portal Widening & Turnback Facility (Lead Estimator) ▪ Metro Expo Rail Operations & Maintenance Facility (Sr. Cost Estimator) ▪ Metro - Multi-Story Parking Structure for Gold Line Light Rail Projects (Sr. Cost Estimator)
Shawn Paroline	Risk Manager (as-needed)	Anser	27	▪ Metro Division 20 Portal Widening & Turnback Facility (Risk Mitigation Manager) ▪ California High Speed Rail Authority CP 2-3 (Design/Build) (Risk Mitigation Manager) ▪ Riverside County Transportation Department (RCTD) Scott Road Interchange (Risk Mitigation Manager)
Kevin Lai PE, JD	Claims Manager (as needed)	Anser	21	▪ Los Angeles World Airport Midfield Satellite Concourse Project - Design/ Build (Risk Mitigation) ▪ San Bernardino County Transportation Authority (SBCTA) I-10 Project - Design Build (Contract Manager) ▪ San Gabriel Valley Council of Governments Fairway Grade Separation / Caltrans Lemon Avenue SR-60 Interchange Project (Construction PM/ Claims Manager)
George Haines	Senior Construction Inspector (Civil)	MNS	31	▪ Metro, State Route 170 (Hollywood Freeway) Soundwall Package No. 11 (Construction Inspector) ▪ Riverside Avenue Bridge, Caltrans (Construction Inspector) ▪ Ranchero Road Interchange, San Bernardino County Transportation Authority (Construction Inspector)
Nick Moskos	Flagger	Zephyr	33	▪ Southern California Regional Rail Authority (SCRRA)/Metrolink - Inspection & Flagging Services (Construction Track Inspection/Flagging) ▪ Metro Expo Phase II Project (Inspector/ Flagging) ▪ BNSF – 26th Street - Hobart Yard Track Expansion (Construction Management/ Inspection)

Support Staff

Support Staff	Role(s)	Firm	Yrs Exp	Representative Experience
Jose Romero	Safety Officer	Zephyr	26	▪ Metro Division 20 Portal Widening & Turnback Facility (Track Inspection/ Safety Oversight) ▪ Southern California Regional Rail Authority (SCRRA)/Metrolink - Inspection & Flagging Services (Safety Oversight)
Jinesh Mehta, PE	Quality Control Manager (Optional)	Alta Vista	20	▪ On-Call Materials Sampling and Testing Services, Caltrans (Quality Control) ▪ Quality Program Support, California Department of Transportation, Statewide - Design/Build, CMGC (Quality Control) ▪ California High-Speed Rail Project Management Support, California High-Speed Rail Authority - Design/Build (Team Manager)
Issac Harris	Materials Testing IQA	Alta Vista	14	▪ Various Projects, California Department of Transportation, Statewide, CA (IQA) ▪ Inspection of Structures, Los Angeles Metropolitan Transportation Authority, (Lead Structural Inspector) ▪ Materials Sampling & Testing & Plant Inspection Support Services, District 7, California Department of Transportation – (IQA)
Kate Suenram, PE	Third Party Utilities Coordinator	Pacifica	15	▪ Orange Line Improvements Study (Utility Coordination) ▪ Regional Connector Transit Corridor (Design/Build) (Utility Manager ▪ I-405 Sepulveda Pass Widening (Design/Build) (Encroachment Support)
Micaela Arellano	Document Control/ Configuration Management (Optional)	MARRS	17	▪ LAX Midfield Satellite Concourse (MSC) Terminal (Progressive Design/Build) (Document Control Technician) ▪ Kiewit Infrastructure West Co. (Document Control Specialist)
Jorge Sandoval, PE, GE	Geotechnical Construction Inspector	Diaz Yourman	30	▪ SR-22 Freeway Widening, (Design/Build) (Earthwork Paving Manager) ▪ Metro Expo Light Rail Transit (LRT) Storm Drain Protection Evaluation (Design/ Build) (Geotechnical Project Engineer) ▪ RCTC I-15 Express Lanes (Design/Build) (Sr. Geotechnical Field Engineer)

Support Staff

Support Staff	Role(s)	Firm	Yrs Exp	Representative Experience
Rich Galvin	Environmental Compliance Officer	GPA	26	▪ Mount Vernon Viaduct BNSF Intermodal Yard, PCM (Environmental Compliance Manager) ▪ Metro - Rosecrans Marquardt Grade Separation (CEQA/NEPA Documentation) ▪ LACMTA Interstate 605/State Route 60 Corridor Improvement (Environmental Compliance Officer)
George Gorman	Senior Environmental Planner	GPA	10	▪ Metro I-405 Improvements (Senior Environmental Planner) ▪ Metro I-605 Corridor Improvements (Senior Environmental Planner) ▪ Metro I-5 High-Occupancy Vehicle truck lanes (Senior Environmental Planner)
Adam Brown	Schedule Review	CAPO	12	▪ LAWA, Taxiway 25L Rehabilitation (Project Scheduler) ▪ LAWA, 98th Street Extension Project (Schedule Manager)
Tim Fettit, PLS	Survey IQA	Guida	33	▪ Metro LINK US (Survey Project Manager) ▪ Metro Rosecrans/Marquardt Ave Grade Separation (Survey Project Manager) ▪ Metro I-605/SR-60 Interchange (Survey Project Manager)
Allison Costa, QSD/QSP, CPSWQ	SWPPP Compliance Officer	Casamar	18	▪ Metro Rain Event Stormwater Sampling (Stormwater Compliance Specialist) ▪ Professional and Technical Stormwater Quality Assurance Services, California Department of Transportation-Caltrans (Stormwater Compliance Specialist)

BIGGS CARDOSA
ASSOCIATES INC
STRUCTURAL ENGINEERS

500 S. Main Street, Ste. 1200
Orange, CA 92868-4507
Telephone 714.550.4665

March 5, 2021

Los Angeles County
Metropolitan Transportation Authority (LACMTA)
One Gateway Plaza
Los Angeles, CA 90012-2952

Attention: Helen Gates-Bryant

Subject: **Letter of Commitment - RFP No. PS70129**
Metro Orange (G) Line Improvements Construction Support Services Consultant

Dear Ms. Gates-Bryant,

Biggs Cardosa appreciates the opportunity to provide, Project Management, Resident Engineering, Construction Inspection, Design Oversight and Office Engineering for the **Metro Orange (G) Line Improvements Construction Support Services Consultant Project**

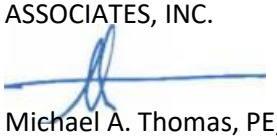
Biggs Cardosa proposes and commits the following personnel for this project:

- Michael Thomas, PE, SE – Project Director (KEY)
- Mazen Mneimneh, PE – Deputy Project Director (KEY)
- John Scott, PE – Resident Engineer/Structures Representative (KEY)
- Bruce Fok-Yat – Project/Field Engineer (Office Engineer)
- Tom Densford – Resident Engineer/Structures Representative
- John Wong, PE – Design Review Support (as needed)
- Socorro de la Torre – Lead/Structures Construction Inspector (KEY)
- Anna Mendiola, RLA – Landscaping Construction Inspector
- Kelly Markwick – Project Administration

Biggs Cardosa looks forward to a successful endeavor with LACMTA and is fully positioned to begin work on this contract. Should you have any questions or require additional information, please do not hesitate to contact me as I am authorized to obligate the firm.

Sincerely,

BIGGS CARDOSA
ASSOCIATES, INC.



Michael A. Thomas, PE, SE
Principal
714.550.4665, mthomas@biggscardosa.com

ANSER ADVISORY
2677 N. Main St, Suite 410, Santa Ana, CA 92705
T. 714.276.1135 | info@anseradvisory.com

March 17, 2021

Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 1200
Orange, CA 92868

Subject: **Letter of Commitment - RFP No. PS70129**
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

Anser Advisory Management, LLC, dba Anser Advisory, appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide safety management and cost analysis for the Metro G-Line Improvements Project.

Anser proposes and commits the following personnel for this project:

- Robert Delgado – Safety Manager
- Anthony Le – Senior Cost Analyst

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,

Sudhir Damle, PE
President
213.400.4780 (c) I 714.276.1135 (o)
Sudhir.Damle@anseradvisory.com

Name
Title
Email

MNS ENGINEERS INC

3350 Shelby Street, Suite 370
Ontario, CA 91764
Ph 909.460.8844

March 2, 2021

Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 1200
Orange, CA 92868

SUBJECT: Letter of Commitment – RFP No. PS70129
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

MNS Engineers, Inc. (MNS) appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide an Assistant Resident Engineer and Senior Construction Inspectors for the Metro G-Line Improvements Project.

MNS proposes and commits the following personnel for this project:

- John Spalione, PE – Assistant Resident Engineer
- George Haines – Senior Construction Inspector
- Charles Littlejohn – Senior Construction Inspector
- Michael McFadden, EIT – Senior Construction Inspector
- Kenneth Shaner – Senior Construction Inspector
- John Stage – Senior Construction Inspector

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,

Greg Chelini, PE
Vice President

805.896.9474
gchelini@mnsengineers.com

February 19, 2020

Mr. Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 1200
Orange, CA 92868

Subject: **Letter of Commitment - RFP No. PS70129**
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

Zephyr UAS, Inc. (Zephyr) appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide Safety Management and Flagging for the Metro G-Line Improvements Project.

Zephyr proposes and commits the following personnel for this project:

- Jose Romero – Safety Management
- Nick Moskos – Flagging

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,

Jacqueline L. Patterson

Jacqueline L. Patterson
Vice President
714-835-6355
Jacqueline.Patterson@zuirail.com

2/19/2021

Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 1200
Orange, CA 92868

Subject: **Letter of Commitment - RFP No. PS70129**
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

Advanced Mobility Group appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide Signal Systems Design Review and Construction Inspection Services for the Metro G-Line Improvements Project.

Advanced Mobility Group proposes and commits the following personnel for this project:

- Signal Systems Design Review/DB Coordinator – Joy Bhattacharya, PE, PTOE
- Senior Construction Inspector (System/Signal) – Leonard Gilliana

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,

Joy Bhattacharya
VP Innovative Traffic Solutions
415.688.0024
joy@amobility.com

811 Wilshire
Blvd. Ste 1410, Los Angeles, CA
619.629.7819 | oneatlas.com

2/19/2021

Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 1200
Orange, CA 92868

Subject: **Letter of Commitment - RFP No. PS70129**
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

Atlas Technical Consultants LLC DBA Alta Vista Solutions and Atlas Company (Atlas) appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide Quality Control Management and Material Testing Independent Quality Assurance (IQA) for the Metro G-Line Improvements Project.

Atlas proposes and commits the following personnel for this project:

- Jinesh Mehta, PE – Quality Control Manager
- Aythem Al-Saleh, PE – Material Testing, IQA

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,

Maen Wahbeh, PhD, PE
Executive Chairman
(818) 292-0659
mwahbeh@altavistasolutions.com

February 6, 2021

Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 1200
Orange, CA 92868

Subject: **Letter of Commitment - RFP No. PS70129**
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

Pacifica Services, Inc. appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide Utility Engineering for the Metro G-Line Improvements Project.

Pacifica Services proposes and commits the following personnel for this project:

- Kate Suenram – Utility Engineer

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,

Jeffrey Camacho
Senior Vice President
(626) 405-0131
JCamacho@pacificaservices.com

MARRS Services, Inc.

340 E. Commonwealth Avenue
Fullerton, CA 92832
T: 714-213-8650
F: 714-213-8657

February 19, 2021

Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 1200
Orange, CA 92868

Subject: **Letter of Commitment - RFP No. PS70129**
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

MARRS Services, Inc. (MARRS) appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide document control services for the Metro G-Line Improvements Project.

MARRS proposes and commits the following personnel for this project:

- Micaela Arellano – Document Control

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,
MARRS Services, Inc.

Riaz Chaudhary, PE, QEP
Principal
Office: (714) 213.8650
Email: Riaz@marrscorp.com

300 S. First Street, Suite 300G ◆ San Jose, CA 95113 ◆ 408-288-8200 / 408-316-4241

March 5, 2021

Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 1200
Orange, CA 92868

Subject: **Letter of Commitment - RFP No. PS70129**
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

NSI Engineering Inc appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide quality management for the Metro G-Line Improvements Project.

NSI Engineering Inc proposes and commits the following personnel for this project:

- Laura Uden- Quality Manager

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,

Laura Uden

Laura Uden
President
408-288-8200
Laura@nsieng.com

February 24, 2021

DYA No. PW21-021

Mr. Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 400
Orange, CA 92868-4692

Subject: **Letter of Commitment - RFP No. PS70129**
Metro Orange Line (G-Line) Improvements Construction Support Services Consultant

Dear Mr. Thomas:

Diaz•Yourman & Associates (DYA) appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team proposing on the above-referenced project. We will be able to provide geotechnical support services for the project.

DYA proposes and commits the following personnel for this project:

- Jorge Sandoval, PE, GE – Geotechnical Construction Inspector

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,

DIAZ•YOURMAN & ASSOCIATES

Christopher M. Diaz, PE, GE
President

CMD:cde

1616 EAST 17th STREET, SANTA ANA, CALIFORNIA 92705-8509 (714) 245-2920 Fax: (714) 245-2950

February 12, 2021

Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 1200
Orange, CA 92868

Subject: **Letter of Commitment - RFP No. PS70129**
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

GPA Consulting (GPA) appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide environmental compliance services for the Metro G-Line Improvements Project.

GPA proposes and commits the following personnel for this project:

- Richard Galvin – Environmental Compliance Manager
- George Gorman – Senior Environmental Planner
- Danielle Thayer – Associate Environmental Planner

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,

Richard Galvin
Vice President
(310) 792-2690, 102
richard@gpaconsulting-us.com

CAPO PROJECTS GROUP

30200 Rancho Viejo Road, Suite I
San Juan Capistrano, CA 92675
949-281-6251
www.capopg.com

Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street. Suite 1200
Orange, CA 92868

Subject: **Letter of Commitment - RFP No. PS70129**
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

Capo Projects Group appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide Schedule Review for the Metro G-Line Improvements Project.

Capo Projects Group proposes and commits the following personnel for this project:

- Adam Brown – Schedule Review
- Chase Wirtz – Schedule Review

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,

Chase Wirtz
Partner
805-558-0707
chasewirtz@capopg.com

2/17/21

Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 1200
Orange, CA 92868

Subject: **Letter of Commitment - RFP No. PS70129**
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

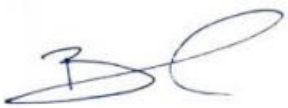
Guida Surveying, Inc., (Guida) appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide land surveying services for the Metro G-Line Improvements Project.

Guida proposes and commits the following personnel for this project:

- Tim Fettig – Survey IQA
- Tony Andrade, PLS – Survey Manager
- Adam D'Alvia, PLS – PLS Party Chief
- Mark Petrie, PLS – PLS Party Chief
- Eric Nickle – Party Chief

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,



Bernie McInally, PLS
Principal, Executive Vice President
949.777.2041
Bmcinally@guidainc.com

Casamar Group, LLC
Project, Resource & Compliance Management

February 12, 2021

Michael Thomas
Principal
Biggs Cardosa Associates, Inc.
500 South Main Street, Suite 1200
Orange, CA 92868

Subject: **Letter of Commitment - RFP No. PS70129**
Metro G-Line Improvements Construction Support Services Consultant

Dear Mr. Thomas,

Casamar Group, LLC (Casamar) appreciates the opportunity to support the Biggs Cardosa Associates, Inc. team to provide Stormwater (SWPPP) Compliance for the Metro G-Line Improvements Project.

Casamar proposes and commits the following personnel for this project:

- Allison Costa, QSD/QSP, CPSWQ – Stormwater (SWPPP) Compliance Specialist

We look forward to a successful endeavor and are fully positioned to begin work with you on this contract. Should you have any questions or require additional information, please do not hesitate to contact the undersigned, who is authorized to obligate the firm.

Sincerely,

Joe Garcia, P.E., QSP
Principal
(661) 254-2373
jgarcia@casamargroup.com

5. PROJECT UNDERSTANDING AND APPROACH

Metro Orange Line NoHo Station

PROJECT OVERVIEW & UNDERSTANDING OF THE PROJECT SITE

This project is located within the districts of North Hollywood, Garnsey, Van Nuys, Encino Village, Reseda and Warner Center in the City of Los Angeles in northwestern Los Angeles County. Per the project description in the RFP, this project consists of installing Crossing Gates at up to 35 intersections along the Orange Line corridor; providing Sepulveda BRT Grade Separation (SGS) with an aerial station; constructing Van Nuys (BRT) Grade Separation (VGS) with an aerial station; Advanced utilities relocation and ROW acquisition; and using Community Outreach to garner public support. Also, per the RFP, actual services to be performed by the consultant will vary according to Metro needs at various times throughout a fiscal year and as set forth during the life of the Project. Thus, the CSSC must have the capability to provide a full range of services associated with construction management and individuals with specialized expertise.

Our team has studied the existing project documentation, has visited the project sites, has researched project stakeholders and existing and upcoming adjacent construction projects that we may need to coordinate with.

Metro Orange (G) Line, Warner Center Area

Looking east across intersection of Busway and Sepulveda Blvd. (Courtesy Google)

Looking north at traffic leaving intersection of Busway and Sepulveda Blvd. (Courtesy Google)

The two photos above show the existing conditions along the Orange Line at Sepulveda Blvd. where one of the proposed aerial stations will be constructed. Traffic volumes here are typically heavy at all times. The photo below looking west at this intersection shows the constrictions to the construction site. The location must remain open to riders who use public transportation at this major transit hub.

Looking west at intersection of Busway and Sepulveda Blvd. (Courtesy Google)

Looking northwesterly at Busway origination point across from NoHo Red Line Station (Courtesy Google)

Not clearly evident from this photo is the crosswalk connecting the Metro Red Line Station (not shown to the right) and the Orange Line Station. Commuters must run across Lankershim Blvd. and often outside the limits of the crosswalk in order to catch the bus waiting at the Orange Line Station. This well-known safety issue is expected to be resolved by proposed project improvements.

NoHo Area Overview

NoHo Station

Van Nuys Area Overview

Looking easterly along the Busway at Van Nuys Blvd., south of LA City Hall West (Courtesy Google)

West Los Angeles City Hall near intersection of Busway and Van Nuys Blvd. (Courtesy Google)

Van Nuys Station

Additionally, the **Orange Line connects several educational facilities,** including LA Valley College and LA Pierce College, to the transit system. As a result, many of the corridor users are school and college age riders who compose the majority of pedestrian traffic who must be safeguarded from traffic collisions.

School Chiltren at Balboa Blvd. Station

Looking northeasterly at skewed intersection of Busway with Victory Blvd. (Courtesy Google)

As shown by the photo above, the Orange Line crosses several arterial highways in a manner that does not provide much warning to motorists approaching the intersection. The proposed addition of safety gates similar to those at railroad at-grade intersections (along with the anticipated modified traffic control improvements triggered by the activation of safety gates) will dramatically improve safety for motorists, cyclists and transit riders at such locations.

We understand that the existing transportation facilities along the Busway corridor have inherent issues that are to be addressed on this Design/ Build project. In short, they stem from the geometry and traffic volumes at controlled Busway intersections making it difficult for through traffic to avoid collisions with Metro buses, **cyclists and pedestrians** using the Orange Line Busway and Bikeway.

Cyclists Loading Bikes at Balboa Station

Per the 2019 Final Feasibility Report for the Sepulveda Transit Corridor, transit ridership within the San Fernando Valley is highest around and north of the Metro Orange Line, with ridership decreasing southward until Ventura Boulevard. Also, per the Feasibility Report, a number of concepts showing the terminus of the planned corridor to be the Sepulveda or Van Nuys Metro Orange Line Station have been considered. This means that even more traffic can be expected to occur along the already heavily congested Sepulveda and Van Nuys Blvd. arterial highways, especially approaching the Metro Orange Line. An increase of 17 to 24% has been forecast, depending upon the impacts of other transit projects to be constructed within the study period. From a CM perspective, this means that traffic control through construction zones will be even more challenging, both for vehicular and pedestrian traffic during peak and non-peak traffic periods. It also underscores the need for an effective community outreach program.

Looking south at Van Nuys Orange Line Station from 14471 Aetna St. (Courtesy Google)

Looking southeasterly at Balboa Orange Line Station vicinity Birmingham Community Charter and Independence High Schools (Courtesy Google)

Per the Project Background from Exhibit 6, IA, conversion of the Metro Orange Line from buses to trains is scheduled for 2051. This means that construction in strict adherence to approved plans and fully documented as-built plans are a necessity for this project.

Our CM team knows the importance of avoiding changes and thoroughly documenting those changes that inevitably do occur. Whatever type of foundation is selected by the aerial station designer, it is important to drive piles in the correct locations and not overpour footings, especially given the constricted sites with existing buildings on both sides of the street. It will be equally important (from a liability standpoint) to fully document the existing conditions of existing buildings and other existing facilities to remain so as to determine whether or not construction activities are the cause of any cracks or other damage that may be discovered during the course of construction.

Another aspect of construction in such an environment is the need for flexibility. Not everything can be constructed at night during periods of lightest traffic, nor can all impediments to construction during the day be eliminated. Our team understands that the schedule may call for two teams to be operating on the project at times. Depending upon the plans and specifications developed for this project, we may have to coordinate between multiple teams that must effectively communicate what was done by certain crews during the day to crews (like utility relocation crews) working exclusively at night.

This is always a challenge, but our team has experience in multiple team, multiple crew coordination and has anticipated the very likely potential of such coordination work. For this reason, we show assistants for each of our key field personnel. The individuals proposed for such assistant positions are sufficiently experienced and credentialed and know that they may be called to serve in the capacity of the key personnel they assist. With some exceptions, this flexibility extends to our materials testing staff who may be called upon to perform tests at off-hours in order to keep the project schedule from stalling. More detail on our approach to project staffing is below under Subsection 5.1.

Metro Orange (G) Line Balboa Blvd. Station

Metro Orange (G) Line Van Nuys Station

5.1. APPROACH TO STAFFING

Our approach to staffing this project is two-fold: First, we provide staff that is the most experienced and knowledgeable; Secondly, we ensure that those individuals proposed are available throughout the duration of the project. We maintain strong relationships with our project partners to ensure that current and future teams work well together. Although we often add new talent to our pool of human resources, our core team and leadership remains fairly constant, providing a sense of stability and reliability our clients can depend on. We also strive to assign personnel to projects who have specific project knowledge that is beneficial to the team. In this case, we are proposing a Resident Engineer who has familiarity with the project as a former Metro Orange Line passenger and resident of North Hollywood. We are also proposing CM team members who are specialists and, in some cases, are creating the standards others have used and most will continue to use in the future. Their resumes speak for themselves.

As mentioned in our Executive Summary, Biggs Cardosa has carefully selected team members with specialties in those areas that the project may require. We have also considered breadth and depth of resources necessary to staff a fairly long linear project area with multiple worksites. Please refer to the tables on the following page that show our staff in their proposed roles over the projected life of the project, not just the construction phase. They are based on our proposed CSSC Staffing Plan in Tab 1 of Volume III as modified by Amendment Nos. 1 and 2.

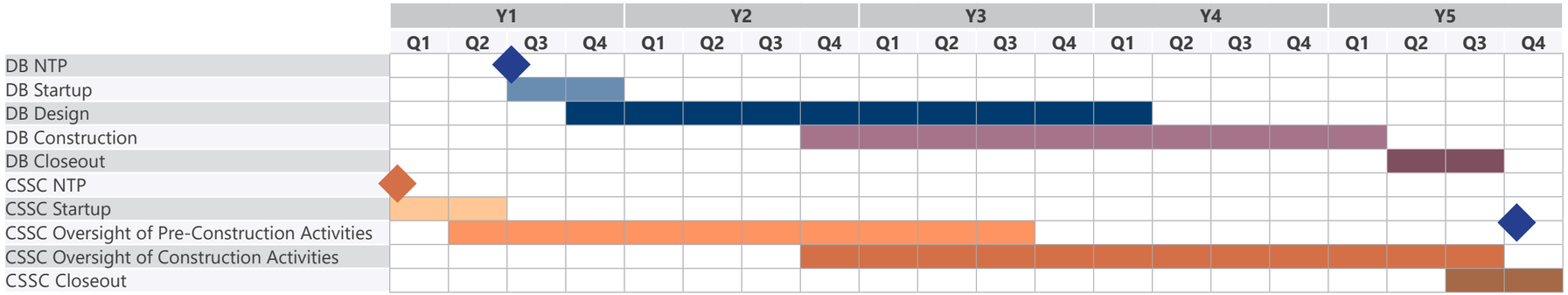
We have begun developing a detailed staffing plan and a P D/B milestone schedule for the project. Our schedule will largely be based on the schedule of the Design/Builder. The schedule proposed herein uses as its basis typical durations required for the described alternative delivery method and scope provided by Metro in the RFP. From that baseline schedule, we have estimated the Design/Builder's Final Design and Construction durations, the start and oversight activities of the CSSC team, which includes design and other Project Development Team (PDT) meetings with Metro.

The chart presented here is a graphical density representation of the level of intensity of each activity in the project over the assumed duration of the project. All team members are represented and are activated at various levels of activity based on the proposed schedule. A green box means the person is engaged in that activity. The particular shade of green corresponds to the percentage of involvement, with darker shades indicating an increasing degree of participation up to full-time involvement. A white box represents that the person does not need to be active on the project at that time.

The Metro Orange Line Improvements Project, though larger in linear limits is relatively smaller in scope when compared to a typical Caltrans Design/Build freeway construction project. All of the same functional tasks may be required, but the project size cannot justify use of such a large number of full-time personnel. We have therefore envisioned an expandable core staffing plan. This approach works perfectly well for our team, as we intend to have the right people assigned to the project at the right time–only when they are needed.

You can clearly see from the exhibit on the next page that we have developed a staffing plan that is quite comprehensive yet flexible enough to cover various project scenarios including overlapping multiple shifts, extended holiday weekend work windows, parallel work done at multiple locations and phased construction to facilitate any number of alternative project delivery methods. We are prepared to assist Metro with whatever challenge is brought before us by already having in place those professionals

STAFFING LEVELS



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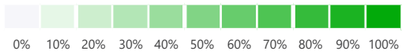
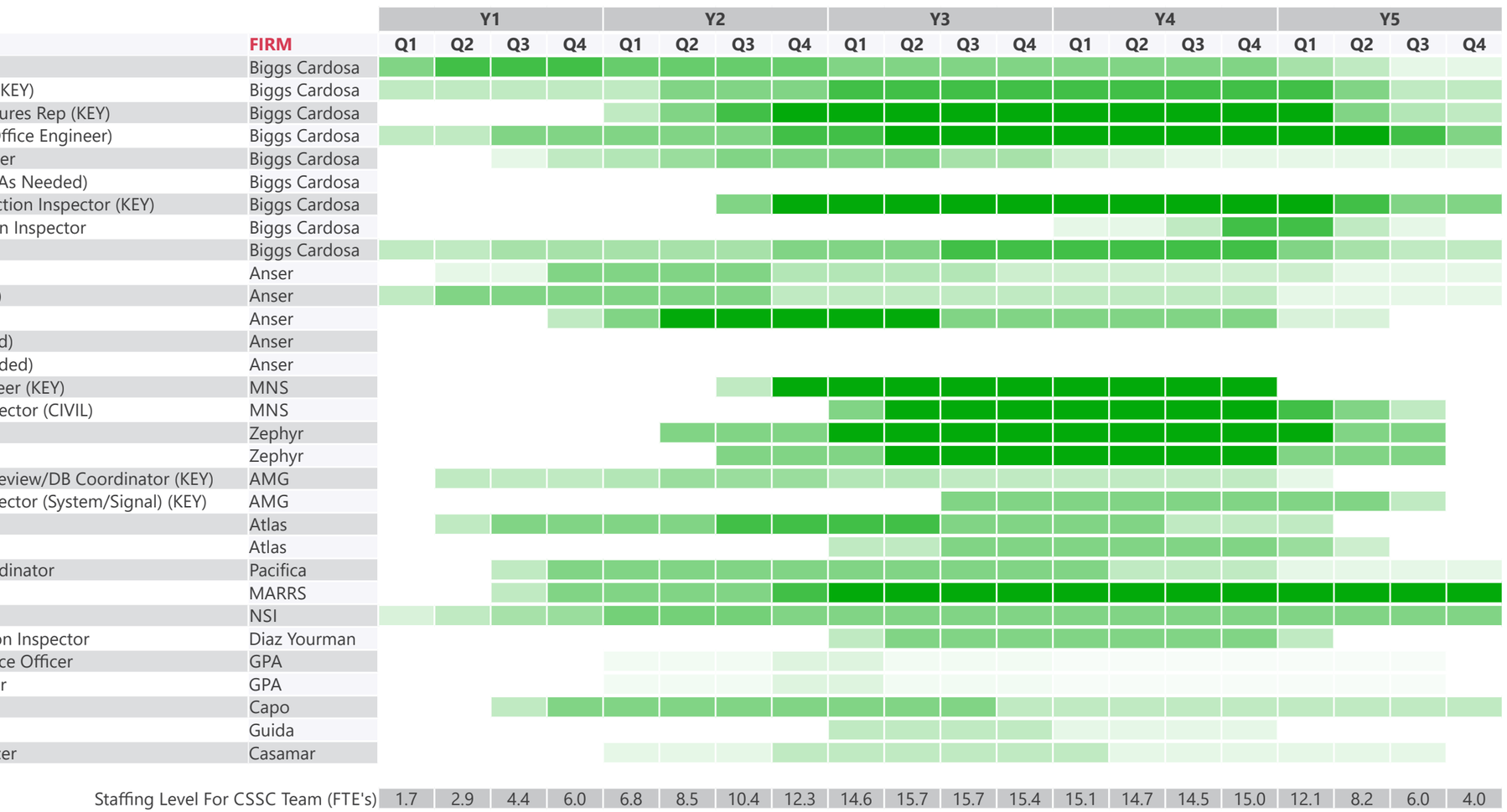


NAME	PROJECT ROLE	FIRM
Michael Thomas	Project Director (KEY)	Biggs Cardosa
Mazen Mneimneh	Deputy Project Director (KEY)	Biggs Cardosa
John Scott	Resident Engineer/Structures Rep (KEY)	Biggs Cardosa
Bruce (Alt. Lauren)	Project/Field Engineer (Office Engineer)	Biggs Cardosa
Tom Denford	Design Oversight Manager	Biggs Cardosa
John Wong	Design Review Support (As Needed)	Biggs Cardosa
Socorro (Alt. Ardy)	Lead/Structures Construction Inspector (KEY)	Biggs Cardosa
Anna Mendiola	Landscaping Construction Inspector	Biggs Cardosa
Kelly Markwick	Project Administration	Biggs Cardosa
Robert Delgado	Safety Manager (KEY)	Anser
Anthony Le	Senior Cost Analyst (KEY)	Anser
Pavel Raskin	Estimator	Anser
Shawn Paroline	Risk Manager (As Needed)	Anser
Kevin Lai	Claims Manager (As Needed)	Anser
John Spalione	Assistant Resident Engineer (KEY)	MNS
George Haines	Senior Construction Inspector (CIVIL)	MNS
Jose Romero	Safety Officer	Zephyr
Nick Moskos	Flagger	Zephyr
Joy Bhattacharya	Signal/Systems Design Review/DB Coordinator (KEY)	AMG
Leonard Gilliana	Senior Construction inspector (System/Signal) (KEY)	AMG
Jinesh Mehta	Quality Manager	Atlas
Issac Harris	Material Testing IQA	Atlas
Kate Suenram	Third Party/Utilities Coordinator	Pacifica
Micaela Arellano	Document Control	MARRS
Laura Uden	Quality Manager (KEY)	NSI
Jorge G. Sandoval	Geotechnical Construction Inspector	Diaz Yourman
Richard Galvin	Environmental Compliance Officer	GPA
George Gorman	Sr. Environmental Planner	GPA
Adam Brown	Schedule Reviewer	Capo
Tim Fettig	Surveying IQA	Guida
Allison Costa	SWPPP Compliance Officer	Casamar



Staffing Level For CSSC Team (FTE's)	1.7	2.9	4.4	6.0	6.8	8.5	10.4	12.3	14.6	15.7	15.7	15.4	15.1	14.7	14.5	15.0	12.1	8.2	6.0	4.0

who have the expertise to provide the service(s) required. Once more, as also stated previously and as shown in Section 4, each of our subconsultant team members has committed in writing to their exclusive and enduring participation throughout the project to its completion. We guarantee that we will be there with Metro to the very end. Our Project Director has given his personal pledge to that effect.

Perhaps you have heard the Kenyan proverb, "*Sticks in a bundle are unbreakable*." This proverb best describes our team philosophy. The availability of human and financial resources, the depth and breadth of our successful engineering experience in diverse types of projects including structure focused projects and the leading-edge technical expertise of our personnel all working together gives us maximum levels of capability and flexibility to provide the services that we anticipate to be required on the Metro Orange Line Improvements Project.

Our Biggs Cardosa team subconsultant members share similar philosophies, which is why we work so well together with them. For example, Anser has developed and will implement an innovative cost estimating staffing approach that ensures stakeholders of getting real-time cost information when they need it (as they are making key decisions) and tapers down the number of staff when only cost updates are required. Similarly, CAPO, from their experience on large and complex Caltrans and Metro projects, suggests an approach to scheduling progressive design/build projects in a manner that captures the various project components such as site relocations, potential ROW issues, environmental concerns, required reviews and approvals, traffic control and phasing and other components that may impact the critical path at the outset of scheduling. Thus, they also foresee use of increased staff initially to taper down as the need for scheduling diminishes to the monthly updating of the well-thought out and comprehensive schedule.

Biggs Cardosa has selected subconsultants with sufficient depth of resources to successfully manage and staff multiple projects successfully. We do this to ensure that we can meet the peak demand for resources whenever it occurs. Just as the crest of a river lags the initial deluge of torrential rain, we can predict when additional resources will be required on a given project that has been building in momentum. However, our ability to correctly predict the need for additional resources is of little value unless we know that those resources will indeed be available at the time they are needed. Like us, our team subconsultant members are well-established firms with large pools of resources which they have committed to us and we, in turn, are committing them to Metro. In a collaborative working environment, we understand the importance of properly sized yet flexible project staffing that neither breaks the project budget nor leaves the client without sufficient resources to tackle unexpected problems whenever they may arise.

We believe the availability of human and financial resources, the depth and breadth of our successful engineering experience in diverse transportation and transit projects, especially those including structures, and the leading-edge technical expertise of our team affords us the maximum levels of capability and flexibility to provide the consultant services that we are anticipated to be required by Metro. Because this project includes Federal (DOT FTA) funding, we have maximized our use of certified Disadvantage Business Enterprise (DBE) firms which will help ensure that Metro fulfills its required DBE percentage for the project. While Metro's stated DBE goal is an SBE commitment of (27%) and a DVBE commitment of (3%) for the current fiscal year, we understand that this percentage may change in the future and we will be required to adhere to the Federal requirement in effect at that time. As we have demonstrated, Biggs Cardosa can provide the requested services as required by contract.

5.2. TEAMWORK AND RELATIONSHIPS

The Biggs Cardosa team understands the importance of clear communication procedures and providing well-trained personnel to integrate seamlessly with Metro staff and work cooperatively with their assigned Project Managers and project delivery personnel. The team members proposed for this project are trained and experienced construction management professionals. All team members assigned to Metro projects will receive an in-house orientation supplemented by ongoing technical, safety and administrative training. At a minimum, training topics will include effective writing of the Daily Report, 10-hour Cal/OSHA safety course content, Metro procedures and other required project information. Biggs Cardosa provides regular personnel training on established and new procedures, specifications, documentation and reporting requirements, equipment and regulations. We also provide formal training throughout the year by having staff attend classes, participate in seminars and in-house training and hold regularly scheduled in-house team training exercises through our subconsultant partners.

We also understand that our role as consultants providing construction support services to Metro includes assisting Metro in its interactions with various project stakeholders to meet environmental commitments and other project goals. We will work with Metro's assigned Public Outreach staff to ensure that the public safety campaign remains effective and that feedback is conveyed to the Contractor in order to improve campaign effectiveness. We will work with Metro's operations and maintenance staff to ensure that wayfinding signage and other helpful aids to Metro riders are maintained in an acceptable manner with minimal disruption to Metro patrons or operations. We will work with the City of Los Angeles Department of Transportation to coordinate construction operations with City transit (DASH) operations to minimize adverse impacts to both entities. We will also work with other City agencies, such as the Bureaus of Engineering, Street Lighting and Street Services, to coordinate their ongoing maintenance operations with our construction operations so that new pavement is not sawcut unnecessarily and that opportunities to take full advantage of utility shutdowns are not lost.

We approach each project with the understanding that each project stakeholder, including the Contractor, is important to the overall success of the project. We work towards building a cooperative culture, to work together as a team to resolve issues and challenges at the lowest levels while keeping the project moving forward. This is facilitated through formal partnering as well as through day-to-day dialogue and open communication with the Contractor and internally within the construction management team. This approach has resulted in more successful projects by not only keeping them on schedule and within budget, but also by providing a quality end product for our clients.

Promoting Teamwork in the Office & in the Field

It is with this understanding that the Biggs Cardosa team employs a strict, fair and cooperative approach: Proactively addressing disputed issues during the course of construction, diffusing animosity among parties and virtually eliminating unresolved claims at the end of the project. We adopt a fair yet firm posture – tempered by fair and cooperative interactions with the Contractor – that is difficult to duplicate since many firms lack the management infrastructure, temperament or sophisticated field personnel to tactfully execute such an artful balance.

Successful projects result from committed and dedicated professionals working on interesting and important projects with well-defined contract documents, efficient systems, proper resources and high energy. Every project will encounter difficulties; successful projects overcome such obstacles, anticipate and take advantage of opportunities and take proactive steps to limit foreseeable risks. We are a team ready to roll up our sleeves and work together to solve problems and create opportunities for cost savings and schedule reduction.

Staffing Projects with Experienced & Qualified Personnel

Our staffing plan demonstrates a thorough understanding of the challenges associated with this project and being able to assemble the appropriate professionals and companies that have the qualifications and experience in this specific type of project. Everyone listed on the Biggs Cardosa team has performed their respective roles on similar projects but, more importantly, exhibit the drive and energy to work together as one team for the singular result of delivering a successful project. This practice promotes teamwork.

Relationships with Stakeholders

The Biggs Cardosa team is a strong believer of partnering and promotes the partnership process on every project and program. Our team members

have extensive understanding and experience in partnering and implement partnering on every project they work on. We work tirelessly to minimize disputes and, if there are any disputes, to resolve them at the appropriate level. We also have in-house dispute resolution experts who can engage and resolve any disputes if need be.

Teamwork is fostered by consistent communication and making sure everyone understands the important role they play within the team. We also understand that promoting teamwork means building the team's skills. At Biggs Cardosa, we are committed to training and skill-building on our team. We consistently encourage the pursuit of licensing and certifications that strengthen personal skills. Our team member Anser is an authorized Certified Construction Manager (CCM) testing and training partner as approved by the Construction Management Association of America (CMAA).

The Biggs Cardosa team embraces the concept of *One Team* which extends to Metro, the design/builder and Metro's partner agencies. Therefore, our team will integrate with all parties in our efforts to maximize communication and trust which is paramount to successfully deliver the project.

Personnel working in a team environment

The collaboration of all job participants in all aspects of the project is crucial to timely, cost-effective delivery. But collaboration does not just "happen" by itself. It must be fostered by consciously building healthy personal relationships and sustained by intentional effort. The Biggs Cardosa team believes in partnering as an effective tool in fostering teamwork. We believe that partnering should include all stakeholders as well as the Contractor. The mechanisms to deliver this goal will be pre-submittal workshops, CPM scheduling workshops, pre-construction workshops, effective weekly progress meetings and weekly jobsite visits with senior management so that all employees and agents know the team. This enables a positive site culture towards safety but also helps foster better relationships between all personnel.

Stakeholder and Community Engagement

The Biggs Cardosa construction management team is experienced in conducting community outreach and stakeholder engagement activities on behalf of public agencies for construction projects, effectively communicating complex technical topics to key stakeholders and to the public. To garner public input and confidence, and to disseminate information, Biggs Cardosa uses a variety of techniques including: Conducting stakeholder meetings with residents and businesses that might be affected by construction activities; Providing public information through such sources as web sites, project information hotlines, newsletters, flyers, news releases, advertisements and public presentations; and Addressing the public on a case-by-case basis, listening to individual concerns and going door-to-door to publicize construction events.

Recently, our team utilized its community engagement expertise to address an issue on the South Airport Boulevard project for the City of South San Francisco. An emergency closure of a very busy thoroughfare was required that would impact businesses in the northeast portion of the city. Biggs Cardosa was instrumental in leading stakeholder meetings with impacted businesses and brought in a special team to conduct traffic control at major intersections north of the bridge closure along the arterial highway for the six-month duration of the closure. In addition, in coordination with the City and a local business grantor, we negotiated and revised the contract to include an incentive clause as an innovative method to reopen the bridge to traffic as soon as possible.

5.3. SMALL BUSINESS ENTERPRISES GOALS

Subcontracting Plan

Biggs Cardosa is committed to maximizing small business subcontracting opportunities on this project and fostering long-term business relationships with our SBE-certified teaming partners. We understand the importance of communicating opportunities to our subcontractors in a timely, proactive and efficient manner for them to submit qualified individuals for consideration to add to the team. We will apply a communication model used on other projects and will share the look-ahead (i.e., upcoming opportunities) at bi-monthly SBE/DVBE team meetings. Communication that requires a shorter response time or initiation of action will be communicated via a texting opt-in method, or if preferred, through email. We can also post upcoming opportunities in a private online social media group to maximize distribution. Through our SBE/DVBE team meetings, we will provide forecasts on upcoming work.

As part of our inclusive culture, meetings with Metro will be recapped to all team members through written or verbal debriefs. Highlights of the conversations and action items can be shared via the private social media group as previously mentioned. The benefit of having a private social media platform is that everyone hears or reads the same message, and they can refer to the messages when it is convenient for them. For each discrete task, a work plan will be developed to detail the scope of work along with the responsible party/company/individual identified. The team will review each element or package of work and identify which SBE/DVBE firms can provide qualified personnel. In addition, through the transparent communications and SBE/DVBE team/forecast meetings, our SBE/DVBE team members will be well-prepared to provide resumes for upcoming opportunities.

In the event that SBE/DVBE resumes received do not meet the standards or if another resume was stronger, the team's DBE Liaison will review with the SBE/DVBE firms what Metro was looking for and will have a discussion on what they did have, what they did not have and, if applicable, what to look for in the next opportunity.

We will collaborate with aligned community resources to help grow our small and diverse businesses even after the project is completed. We realize that this project only covers a fraction of a business' growth plan, and we aim for sustainability of our team members through the development of these firms beyond this contract. We will align with community-based organizations like State EDD WorkSource Centers, CalVet, Small Business Development Centers (SBDCs), and others to support the needs of our SBE/DVBE team members long after this project. The development of these connections for our team members provides resources that can be tapped during and post contract for the sustainable viability of our SBE/DVBE subcontractors.

Subcontracting Methods

Discrete tasks will be subcontracted to the team we have identified and committed to in our proposal. One of our priorities is to provide opportunities to our subconsultants that will enhance their capacity, overall business strength and growth potential. Our goal is to provide the maximum opportunity possible for our SBE/DVBE subconsultants to proactively present the best qualified personnel for each element of our scope of work. To achieve this goal, we will provide the forecasted scopes/elements/packages to our SBE/DVBE subconsultants as far in advance as possible so that they can submit proposed personnel to our Deputy Project Director (DPD). Our DPD will work with our SBE Liaison to ensure that SBE/DVBEs are

fully utilized to the extent possible, and that they submit their most-qualified applicants for Metro's consideration and approval.

When any of our SBE/DVBE firm candidates are not selected we will provide a formal debrief to the firm. The SBE/DVBE firm will actively participate and engage in the discussion on the barriers, strengths and weaknesses of their submittals. The SBE/DVBE firm will leave each debrief with an action plan that incorporates lessons learned for the next pursuit or submittal.

With our forecasting and predictive modeling, we will also report the proposed SBE/DVBE utilization for the next relevant period as defined by the DEOD along with the dollar value of each SBE/DVBE contract. Our SBE Liaison will work together with our Deputy Project Director (DPD) to ensure we identify and ensure the participation of our SBE/DVBE subcontractors to the maximum extent possible.

This reporting will be based on real-time use and on forecasting - both of which will be shared in a password-protected, cloud-based environment that we can share with DEOD. Where SBE/DVBE firms may be challenged in identifying qualified and seasoned employees based on the scope and qualifications from Metro, we will work with these firms to identify entry-level positions that might be easier to fill should this be a deterrent.

Satisfying Subcontracting Goals

We will meet or exceed the goals Metro has established by initially selecting firms that we believe we can help grow. Our goal is to create atmospheres for solution-driven approaches, collaborative thinking, and problem solving; open and transparent communications on upcoming opportunities and how to prepare and plan; having a SBE Liaison as an integral part of all phases and scopes of work along with the role of ombudsman with direct support and communication access to the managing partner lead; and developing programming that will provide opportunities to team build, build relationships, and identify sustainable resources that can support the SBE/DVBE firms even after the life of this project.

The SBE Liaison, along with the Deputy Project Director (DPD) and other key personnel on the project, will identify the various packages/elements and scope encourage SBE/DVBE participation on all elements or packages of work.

5.4. ALTERNATIVE PROJECT DELIVERY METHODS

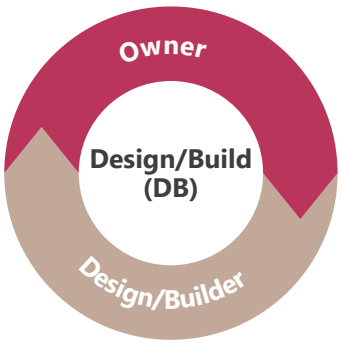
In the recent years, project owners have had a tendency of stepping away from the traditional Design/Bid/Build method of project delivery and are instead increasingly using alternative delivery methods. Alternative project delivery methods maximize the positive outcomes of projects and provide the greatest value and benefit to the owners and their customers. The owners are typically using an alternative delivery method because they want to get the best project delivered rapidly

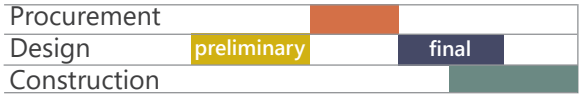
Alternative delivery projects have flexibility in design and construction means and methods not found in design/bid/build projects. It is a very outcome-oriented process. In addition, alternate delivery methods such as Design/Build not only shorten project timelines, but also reduce costs and risks to the owners.

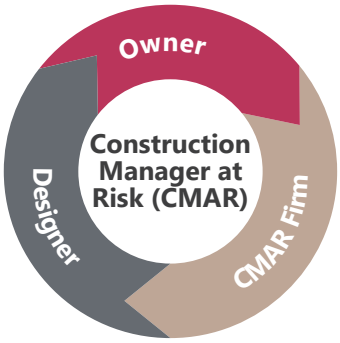
Biggs Cardosa has embraced this approach and has a thorough understanding of common alternative project delivery methods. The following diagrams illustrate and summarize our understanding of several different alternative delivery methods:

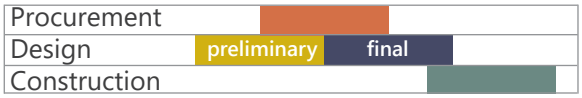
Some of the projects we have worked on with the Design/Build delivery method include many high-visibility transportation projects in California such as the San Francisco Bay Area Rapid Transit (BART) Extension to San Jose, Riverside County

Alternative Project Delivery Methods

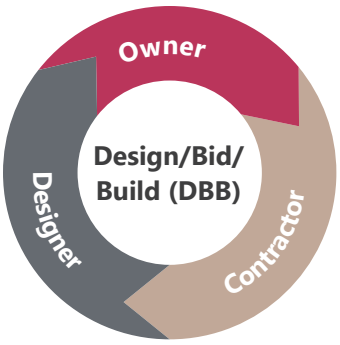


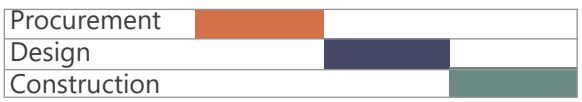


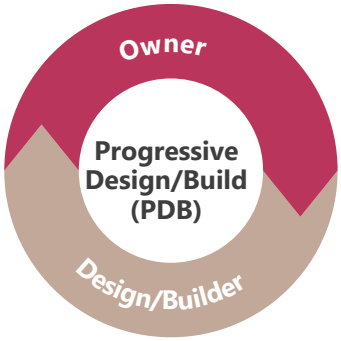




Traditional Design/Bid/Build Method







Transportation Commission's I-15 Express Lanes, Gerald Desmond Bridge in Long Beach, and the California High Speed Rail Program. Recently the San Bernardino County Transportation Authority awarded Biggs Cardosa the $140M PCM Design/Build contract for the replacement of the Mount Vernon Viaduct. Biggs Cardosa has been a key participant in all aspects of these Design/Build projects (on the owner's side, the PM/CM's side, and the Contractor's side).


Gerald Desmond Bridge

Progressive Design/Build combines the benefits of Design/Build (singular point of accountability) with the benefits of Construction Management at Risk (preconstruction services and owner input throughout execution). Through this collaborative delivery method, the owner is provided more innovative design options and more control over the project development process while still providing schedule, price and performance guarantees.

Coordination is key in a Progressive Design/Build scenario. A P D/B team will nominally consist of the Owner, Consultants, Operations and Maintenance staff, Designer and Contractor working together throughout the entire project to review the progress and direction of the project from their respective viewpoints. Team decisions are based on overall project critical success factors versus a single factor, such as cost. The Team will discuss milestone dates, for instance 30, 60 and 90% Design, where the entire team will come together for review.

Our team is highly experienced in this collaborative approach. Several of our team members have had recent Design/Build experience on the SBCTA Mount Vernon Viaduct Replacement project. Our proposed Cost Analyst has fairly recent experience with Progressive Design/Build in his work at CSU San Marcos Campus projects and the San Diego and Los Angeles International Airports. Our estimating approach is to progress the estimate throughout the life of the project and provide the necessary feedback to decisions as they are made rather than waiting for each design milestone to be met and then providing the cost of that design. This provides real-time cost information for the decisions that need to be made for a successful project without causing schedule impacts through multiple cycles of redesign.

Our Cost Estimating approach is to be involved and accessible to the design team throughout the project development process to provide cost and constructability feedback to ensure streamlined and efficient design. We provide real-time updates so that any potential impacts can be addressed early in the process to avoid major impacts and to minimize or eliminate so-called *Surprises*. At major design milestones, a formal estimate report is generated that provides a snapshot at that stage of design. It is not a separate estimating exercise that would require an extensive reconciliation with potential value for re-work by the design team. Our cost estimating staff has the skills and experience to provide real-time cost information to the project team that will allow stakeholders the ability to make well-informed decisions. With this collaboration, Metro will receive the best value for the project budget.

We are also aware of the Construction Manager/General Contractor (CM/GC) project delivery method, which allows the owner to engage a construction manager during the design process to provide constructability input. The timing of this RFP suggests that Metro has considered utilizing this method. In using this method, the CM is generally selected on the basis of qualifications, past experience or a best-value basis. During the design phase, the CM provides input regarding scheduling, pricing, phasing and other input that helps the owner design a more constructible project. At approximately 60 to 90% design completion, the owner and the construction manager negotiate a 'guaranteed maximum price' for the construction of the project based on the defined scope and schedule. If this price is acceptable to both parties, they can execute a contract for construction services, and the CM essentially becomes the GC. The CM/GC delivery method is sometimes called the Construction Manager At-Risk (CMAR) method in some states.

5.5. QUALITY MANAGEMENT PROGRAM

Biggs Cardosa's vision for the CSSC Quality Manager role is to protect the Metro's interests during administration of the Orange Line Improvements project by focusing not only on those processes and requirements that are typically defined, but also on those things that should be done but are often overlooked. Our strategy to achieve this quality vision is twofold: First, we partner fully with Metro and the CM team to clearly define all applicable requirements, whether Federal, State or local; Secondly, through an embedded partnership with the Contractor, we will help them achieve their total quality objectives. This proven approach has resulted in improved communications and teamwork as well as a better overall outcome due to better understanding of processes and means for achieving all quality objectives and facilitating Metro's goals.

Leading the team in this area will be our proposed Quality Manager, Laura Uden of NSI Engineering. As an integral member of the project team, which includes both Metro and the D/B Contractor, she will work conjointly with all parties to ensure all fully understand the project delivery method with emphasis on the means by which requirements are identified and managed. Another benefit of this approach is the proactive identification and documentation of roles and responsibilities, which results in avoiding duplication or overlapping of assignments, and avoids gaps in key activities needed to ensure Project success. An example of where this approach greatly benefits Metro is in the creation of a checklist defining exactly what is required in the Contractors quality documentation, which results in a much more expedient approach to creating and accepting the quality management plan and supporting procedures. Identification of the teaming approach further establishes clear expectations for independent oversight, as well as the timing for various parties to come together to solve problems.

Using an Enterprise Quality Management System, NSI has successfully simplified the process and reduced the time needed to manage project-level documentation and review of Contractor policies, track Contractor level internal audits and monitor resolution and analysis of Non-compliance Reports (NCRs). With a track record of performing compliance assessments to the FTA 2019 Quality Management System Guidelines, NSI also brings to the Biggs Cardosa team a keen, current awareness of changes to federal requirements affecting local transit projects such as the January 2021 Executive Order reaffirming and strengthening the Buy American Act of 1978.

By integrating quality incentives as part of the procurement process, we will work with the D/B Contractor to achieve quality objectives in noticeable ways to both Metro and the Contractor. This approach aligns the objectives between the Owner and Contractor to ensure a clear understanding of project deliverables and quality outcomes within budget and on-time. As part of this essential relationship, the early identification of requirements, and resolution of differences in requirements, helps the integrated Project team proactively resolve conflicts before issues arise. If conflicts arise between Owner and Contractor interpretations of requirements, our approach helps facilitate resolution through a dispute resolution board (DRB). The CSSC's oversight role would also include the independent inspection, verification and validation of the Contractor's construction activities. Additionally, through a commitment to closed-loop communication with the Contractor, we will achieve faster and more complete resolution of issues should these arise through the project. This also facilitates a commitment to incorporating lessons learned as a prerequisite component of continuous improvement throughout the project and not just after completion.

Building upon our experience in advancing a Progressive Design/Build approach on other projects, we recognize that essential steps are necessary to ensure that all parties understand the objectives for achieving quality in this project model and to ensure that these objectives support the Owner's oversight goals. Recognizing Metro's commitment to continuous improvement in Project Oversight, we can fully perform this role as an independent CSSC team or in support of the Metro QMO Program should this project require that effort.

Our Site Quality Management subconsultant Atlas is one of few CM firms on the West Coast with a certified ISO-9001 Quality Management System and is uniquely postured to assist Metro in implementing

a robust quality management program (QMP) on this project. Quality begins before construction begins and ends after all construction is complete, punch list items and non-conformances are closed, and project documentation from all parties is filed for future use. Our approach is simple:

1. Place the most qualified quality assurance manager in charge of the work.
2. Supplement the quality manager with seasoned, certified and trained QA staff.
3. Design a quality process that covers all applicable requirements.
4. Enforce the quality process with attention to detail to ensure communicative compliance.
5. Supplement the team with the accredited laboratories and calibrated lab and field equipment necessary to perform the work.
6. Continuously monitor progress and seek opportunities for continuous improvement.

Figure 1: Team Approach to Quality

The graphic above on PLAN-DO-CHECK-LEARN and ACT summarizes our approach. The PLAN stage begins with QMP implementation. The QMP will include a description of how source, construction material verification, and workmanship inspections will be performed. Once the QMP is implemented, we will follow the PLAN to DO the work. Doing the work is essentially performing field QA inspections.

1. **PLAN** the Work
2. **DO** the Work
3. **CHECK** and Analyze the Work
4. **LEARN & ACT** on the Information

Altas will perform different types of inspections on this project. Whether in the field or at the shop, every inspection conducted will be driven by the standards defined by the applicable ISO certification and demonstrates a commitment to continuous improvement across all work performed. Atlas prioritizes Internal Process Assessment (IPA) to quickly resolve team issues. While IPAs are internal, they translate directly into the work done. On the jobsite, Non-Conformance Reports (NCRs) will be issued, not only to reflect the QC's performance, but also to document any issues. We understand our oversight role to be providing a secondary check to the Contractor's QC work.

Figure 2: A simple tagging process makes transfer of material effective and error-free

One example of an inspection protocol that differentiates the Biggs Cardosa team is our process for shop inspection and material release. Prior to arriving at the facility, our inspectors are required to review the submitted QMP (including their welding QMP, where applicable) to make sure we know who the QC staff are and whether their qualifications are acceptable and current. Upon arriving at the facility, our inspectors begin tracking material and verifying specification compliance. We will share this tracking log with Metro to ensure transparency. The tracking log will be updated with QC data and QA inspections and cover material identification, in-process inspections, non-conformity and repair work (if repair is necessary). Before leaving the fabricator, all material is then verified and tagged for shipping. Each tag represents different requirements: green tags denote a fabricator-to-fabricator shipment while orange tags denote fabricator-to-jobsite accepted materials. In some cases, we will have a blue tag which designates non-conforming material that has been accepted by the Engineer of Record (EOR). This tracking system helps to simply and accurately determine what material should be onsite.

5.6. INITIATIVES AND TRAINING PROGRAMS

Biggs Cardosa recruits and retains excellent staff. Because we have strong relationships with clients who give us work on a perpetual basis, we are able to offer exciting and challenging assignments to less tenured engineers who are eager to apply their recently gained educational knowledge in actual professional practice. Many of our interns have returned to work with us after completing graduate degrees at the master's level and beyond. They return to us partially because we invest in their postgraduate education and they develop a sense of loyalty to Biggs Cardosa as a result. The other reason is that they simply like working in an environment where work can also be enjoyable. The diversity of staff in all areas including age is an attractive force within our firm that we have been fortunate to develop and maintain through the years.

Biggs Cardosa is proud to announce our participation in Workforce Initiative Now (WIN), an extension of our commitment to deliver superior services to our clients while strengthening the local communities in which we perform our services. Biggs Cardosa will collaborate with Pierce and Valley Colleges as well as Cal State Northridge and UCLA to provide mentorship, skills training, internships and job placement services for people interested in pursuing careers in construction management with a focus on the transportation and public works sectors which have recently experienced a significant labor shortage.

Through WIN, we will seek to increase the skills and experience of local labor needs and Metro's talent pipeline. The initiative is structured to enhance local economies and help create career opportunities in the communities where we are doing business. We seek to introduce to this project entry-level opportunities under the title of Construction Project Engineers who through collaboration with Metro will enter into a three-to-four (3-4) year track that will provide a graduated program along with a graduated pay grade in a structured work program that will give them real life work experience coupled with a variety of certifications that will reflect their knowledge in construction management. The following are certifications that can be acquired through this program:

- P6 Scheduling
- OSHA 30-Hour Training
- Safety Trained Supervisor (STS)
- ACI Concrete Field Testing
- Certified Erosion, Sediment, Stormwater Inspector (CESSWI)
- Qualified SWPPP Practitioner (QSP)
- Envision Sustainability Professional (ENV SP)
- Construction Manager-In-Training (CMIT)
- Certified Associate in Project Management (CAPM)
- Associate Risk Management Professional (ARMP)

With a project like the Metro Orange (G) Line Improvements, there is no doubt that it will become an economic boom to the immediate area, resulting in further growth which means more opportunities for graduates of this program.

5.7. CONTROL CONSTRUCTION COSTS

A large part of the overall construction budget is the CSSC contract cost. Although this cost is relatively small compared to the actual contractor's bid price, it is still significant enough for constant monitoring throughout the life of the project. Controlling costs starts with a strong staffing plan, consistent communication and the ability to be flexible. The Biggs Cardosa team utilizes many tools to create reports that are transparent to Metro and will give a clear understanding of all CSSC costs on the project.

A clearly defined scope of work will be developed for each task in which we will develop an estimate for the level of effort associated with the assigned project or task. This estimate is derived from a staffing plan that outlines everyone's role for a task. Having a staff schedule helps in project management by clearly identifying when a role or specialty will be required on the project. This plan also helps our Deputy Project Director (DPD) forecast future costs along the life of the project.

Staff will only be utilized and brought onto the project when the contractor's operations require a certain type of inspection. Other CSSC services such as survey and quality assurance testing will be utilized on a day-to-day basis only when required. The Resident Engineer or Assistant RE will request these services via email to the survey or materials testing contacts. The services will be tracked on a log for easy cost tracking and management throughout the project. To limit the number of mobilizations for our subconsultants, we will ensure that the Contractor has sufficient work before bringing them on site without causing delay to the Contractor's operations. Furthermore, we will recommend to Metro that any retesting and/or resurveying costs be deducted from the Contractor to cover additional costs not anticipated by the CM team. These costs will be pre-determined in the contract by an hourly rate which includes all labor, equipment and materials required to retest/ resurvey.

Biggs Cardosa will staff the project with project controls experts capable of developing and implementing the project controls plan to monitor and to control construction costs on the project. The project control plan will outline the necessary aspects of monitoring the monthly payments, invoices, schedule, quality, risk and change management programs to ensure an integrated approach to control construction costs and to effectively mitigate unforeseen situations in an expedited manner. Biggs Cardosa staff will carefully implement such a control plan to ensure that goals are achieved and yet not to encroach upon Design/Builder's means, methods and obligations to perform. We will bring forth valuable lessons learned from previous design build projects and work closely with both the owner and the D/B Contractor as partners in a successful endeavor to construction the project. We will pay close attention to detail aspects of construction, looking for signs of distress or underperformance and address these issues early on upon detection so that they do not unnecessarily develop in magnitude due to lack of action. The project controls plan will include reporting of Key Performance Indicators (KPI) on a regular basis to ensure that the health of the project is transparent and is contemporaneous enough to allow for intervention or guidance when needed.

Project Staffing Plan

The Deputy Project Director (DPD) will look at the project staffing plan each month and update it based on the contractor's schedule. This will allow him to project costs and make adjustments in the staffing plan to stay within the project budget. Any forecasted cost issues will be immediately brought up to Metro's Contract Manager. The DPD will sit down and have an open discussion to resolve and agree on any proposed changes to the staffing plan and costs associated with those changes.

SBE/DVBE Project Staffing

We understand that SBE/DVBE involvement is important to Metro with a 30% SBE/DVBE goal, which is why our staffing plan highlights the SBE/ DVBE work to ensure that our SBE/DVBEs team members are being utilized to meet the goal. We have chosen highly specialized, certified subconsultants who are familiar with Metro work and who are eagerly preparing to play their integral

roles as part of our construction support team. We will track SBE/DVBE subconsultant participation along with overall CSSC costs on a weekly and monthly basis. Our SBE/DVBE Plan also provides for proactive measures ensuring both participation and cost controls.

Other Direct Costs

Other Direct Costs (ODCs) are another type of cost expenditure Metro has authorized for CSSC use on this project. These costs may include vehicles expenses, production and distribution of public outreach materials, professional photographs, field office costs, groundbreaking and ribbon-cutting ceremonies and any other costs necessary to ensure that established project goals (such as a zero-accident safety standard) will be met. We will work with Metro to develop a budget for these costs and monitor them throughout the contract period. Only approved and fully sanctioned ODCs for this project will be invoiced to Metro and will include receipt and justification backup for transparent invoicing.

Monthly Cost Reporting

We have identified two components of the CSSCs monthly cost report: 1) Project Invoice and 2) Monthly Narrative Report. These documents explain CSSC costs in an organized way to clearly explain historical and projected future costs to Metro.

Invoicing

One of the first tools we will utilize as a tracking mechanism is our inspector's timesheet. Our inspectors are to fill out their timesheets daily and include detailed explanations of the work they perform that day. The timesheets with descriptions and or photographs will be included as part of the monthly invoice. It is the Deputy Project Director's responsibility to review each invoice and associated timesheets to ensure that only time spent on the project will be billed to Metro. Any costs which are unclear will be fully vetted prior to submitting to Metro for processing. All invoices will be reviewed with Metro's Project and Contract Manager prior to formal submission.

Monthly Narrative

In addition to the monthly invoice, our Office Engineer will prepare a monthly narrative to include with each Monthly Cost Report. This report will outline the work performed the past month and look ahead at the field work to be completed next month. It will also include financial data such as the amount invoiced to the contractor, anticipated changes, and projected final contract amount. Our monthly narrative will also document CSSC cost. This cost will report dollars expended and also dollars projected based on the contractor's CPM schedule. We will all that also identify potential risks for additional CSSC cost due to unintended events in the field.

Additional Work

Scope, schedule and budget always go hand in hand; the ability to control scope and design changes will be a critical factor to completing a project on time and within budget. A well-implemented change control process considers the impact to both cost and schedule for each change in scope. Our focus on project controls as a whole will benefit Metro in that we make it a standard practice to evaluate the overall affect a change in scope may have on schedule as it is identified. All changes in scope must be thoroughly investigated and substantiated. Any changes agreed to by the RE and the Metro Contract Manager must be captured in an Amendment. Due to the nature of approvals the amendment process may take several months; therefore, the process should begin early enough so that the amendment is executed prior to an overrun in the project budget. If additional work must take place prior to an executed amendment, the RE will develop a letter of understanding with Metro approving the additional work.

5.8. SAFETY CULTURE

Zero-Accident Safety Culture

The National Institute for Occupational Safety and Health (NIOSH) reports that about 20,000 construction workers are injured each year in highway and street construction accidents. In California, there are 3,623 deaths each year (equivalent to approximately 10 deaths a day) with more traffic deaths in Los Angeles than homicides. The majority of these incidents can be prevented. It is our goal to have zero incidents, both worker- and public-related, during construction. The solution to achieve zero incidents must include enforcement, education and engineering. The Biggs Cardosa team will work with Metro, City of Los Angeles, the Design/Builder, LA Metro Transit Police, LASD Transit Services Bureau, LAUSD and other participating agencies or private entities in assuring a Zero-Accident Safety Culture is created by a continuous collaborative effort. Zero-Accident Safety protocols that supplement Metro's Construction Safety and Security Manual (CSSM) will be established at the outset of the project and fully implemented throughout the construction period.

We recognize that the Orange Line Improvements will be a high visibility project for Metro. For this reason and others, we support the zero-accident standard, safety and security culture Metro has established. To implement such a standard and culture, we propose strict site security measures with emphasis on Contractor, Consultant and public safety. The Orange Line operates daily from 3:38 AM to 3:15 AM eastbound and from 4:50 AM to 4:15 AM westbound, almost a 24-hour operation. We realize that stations must remain operational with minimal impact throughout the construction period. To accomplish this safely, we will support Metro's ongoing safety and rider awareness program by ensuring that the Contractor submits and follows a comprehensive and detailed Site-Specific Safety Plan that, once approved, adequately addresses safety and security at all stations and portions of the Busway corridor where incidents have occurred or are more statistically likely to occur. These will include areas of low illumination, skewed crossing angles where crossing gates have yet to be installed or are not yet operational and locations such as Lankershim and Chandler (across from the Red Line Station) or Westfield Topanga & The Village (at Warner Center) that typically attract both school-age children and younger adults as well as those of all ages seeking food, beverage or entertainment venues. We will encourage the Contractor to engage the help of the North Hollywood Police Station (about one-half mile north of the Busway on Burbank Boulevard at Irvine Avenue) as well as Sheriff's Department staff at Pierce and Valley College in developing and implementing their safety plan. We also recognize the City's Office of Community Beautification as a graffiti abatement resource. This is important because instances of graffiti application take place almost exclusively at night or early morning.

Administrative Specifications

Our efforts start by reviewing existing project specifications and reference material (such as CA MUTCD) for any different or inconsistent approaches that could affect both cost and safety. We can get safer performance via the specifications by requiring the Contractor to meet the highest standard. Metro's expectation for contractor safety performance should be made clear in the specifications. Contractors should be expected to include actions to prevent all injuries and incidents, not just meet compliance requirements. This is the difference between compliance and zero injury performance.

Job Hazard Analysis, Task Hazard Assessment, and other pre-task hazard assessments are routinely used in the industry to improve safety performance. Many contractors use these items but do not necessarily *require* them. Specifications should require all bidders to integrate this process into safety programs.

Specifications should identify the kind of incidents the Contractor is required to report and the timeframe and process for reporting them to give the project team greater visibility of performance and potential risks. To be successful, the Contractor should not be penalized for reporting, but should be encouraged to investigate and share lessons learned with Metro and the CM team. Specifications should call out specific training for workers such as OSHA 30/10. The specifications should include adequate language to enforce safety throughout the project. This includes clearly defining Contractor deliverables such as the Project Safety Plan, Site-Specific Safety Plans, Project Safety Review Reports and Corrective Action timelines as well as providing punitive measures for not adhering to safety requirements.

Traffic Management in Construction Zones
The Traffic Management Plan (TMP) is a tool developed to help ensure all potential traffic impacts have been identified and that an appropriate traffic handling plan has been prepared. In addition, the TMP provides a mechanism to address potential safety issues that may not have been addressed during the design phase. During construction, this can be used to modify or enhance traffic handling plans if problems are observed. For example, a planned detour may be rerouting traffic closer to a school and creating a conflict between pedestrians and vehicular traffic. In this situation the TMP would be used to alter the detour or provide additional safety measures. An important part of the TMP is to make sure that it is in place and has adequate funding to support necessary field changes. Biggs Cardosa will verify that the TMP and adequate funding are part of the project.

Commitment to Collaboration As stated previously, Biggs Cardosa will approach zero-accident safety through a commitment to collaboration. This includes hosting structured safety meetings to share incidents and accidents, review safety measures and learn methods to better interface and work together. We will provide our team with the proper safety training and encourage team members to obtain certifications such as Safety Trained Supervisor (STS). We will share all closures and detours with GPS-based apps to provide up-to-date information for all to use. We will seek to host social gatherings to encourage sharing and celebrate safety milestones and number of project hours without incident. Another consideration would be to create a Worker Safety Month and a safety awards program to incentivize safety on the project. We hope to include presentations to area schools in our collaborative efforts. The intent of these types of measures is to bring and keep safety in the forefront of everyone's mind every day.

It has been noted that sometimes safety is viewed as an impediment to construction or maintenance when it should be acknowledged that by implementing appropriate safety measures, time and money can be saved. Project staff and Contractors need to feel that it is acceptable to ask for appropriate time and budget for safety measures. Every member of the project team needs to value safety as much as mobility in all aspects of project planning and implementation: as such Biggs Cardosa will consider safety in schedules, work and the determination of appropriate safety measures.

COVID-19 Safety Measures Coronavirus Disease 2019 (COVID-19) is an infectious disease requiring the implementation of additional safety measures and protocols to protect employees from this potential worksite hazard. Biggs Cardosa's experience in successfully managing projects since the onset of this highly contagious respiratory disease will be an asset to the project, allowing for proactive oversight to minimize workplace exposures. The Biggs Cardosa team will provide guidance and oversight of the following:

- The Contractor's hazard assessments
- The creation and distribution of a COVID-19 Exposure Control Plan
- Implementation of the Injury and Illness Prevention Program that will cover all known worksite hazards
- Training of staff on COVID-19 issues and the prevention of spreading the virus
- Compliance and best practice implementation including, but not limited to, CDC and Cal OSHA recommendations
- Active updates to craft and worksite impacts
- Mitigation efforts implemented to control employee exposure

Effective COVID-19 control planning will focus on lessening the spread and ensuring the safety of our staff. Biggs Cardosa will promote effective communication by ensuring the Contractor provides updates on workplace hazards and current impacts. Furthermore, we will review the jobsite preventative measures implemented by the Contractor to ensure that all appropriate steps are in place for site-specific dangers. The oversight will extend to reviewing the Contractor's plans related to jobsite cleanliness, social distancing, engineering controls due to social distancing, temperature control, daily training procedures, face-covering practice and resource management.

Additional Project Understanding Considerations

With such a large and complex project, it can be challenging to identify *all* the potential concerns and issues that are associated with it. However, we will mention a few of them briefly here as "food for thought" as you compare our collective Biggs Cardosa team knowledge to other CSSC contenders.

Team's Approach to Safety Gate Installations

We have a team partner in AMG who has written the book on implementing methods of advanced signalization and the design thereof. Our proposed Senior Construction Inspector for Systems and Signals has both designed and inspected such traffic safety systems, having also instructed other inspectors on the proper installation and inspection of same. With that level of experience, we are amply prepared to address installing loop detectors, CCTV triggered systems, tying in existing systems with future signal houses for LRT as required by FTA, adding PTC elements at specified locations, tailoring systems to allow for responding emergency unit override capability and a number of other features. The Biggs Cardosa team has the resources to cover double or triple the number of active work locations, whether the work is done during the day, at night, both day and night, over the weekend or in conjunction with other construction activities with constrained construction work windows.

Understanding of Aerial Structures and Station Footprints

We don't know how others would approach the construction of the Van Nuys Aerial LRT/BRT Station, but we know that it must be designed and built to handle the most severe of traffic conditions now, in the near future and when the busway is converted to a light rail transit line in the next 25 years or so. We have looked at the station renderings Metro has provided. We have also carefully reviewed the advanced conceptual engineering (ACE) drawings in Appendix GG of the Environmental Document (FEIS/FEIR). We are aware that environmental justice may require the inclusion of multiple hydraulic elevators (overhead traction types usually being more costly) at stations such as Van Nuys, where the street median will be used for future LRT/BRT platforms (U.S.C. §12101 *ET SEQ*., 42 U.S.C. §§ 4151 *et seq*.). It will be very important to investigate and determine permissible locations of proposed cylinders for these hydraulic elevators prior to finalizing the design. The Biggs Cardosa team is well aware of the many utilities running beneath both Van Nuys and Sepulveda Boulevards, possibly including fuel lines to the Van Nuys Airport. We recognize the potential that LAWA may also play become a project stakeholder.

Understanding of the Bigger Transit Picture

Our proposed Resident Engineer once commuted from North Hollywood to downtown San Diego for a six-month period before establishing residency on a railroad construction project near Oceanside. He understands that though a passenger may use the Orange Line as part of their commute, the commute may originate far away from the western San Fernando Valley. We are aware that transit lines from City of Santa Clarita serve the North Hollywood Red and Orange Line Stations. We are also aware that transit lines from Antelope Valley Transit Authority and Palos Verdes Transit

Authority serve the Sepulveda and Van Nuys Boulevard Orange Line stations. Biggs Cardosa fully realizes that, no matter how extensive a public awareness campaign may be planned and how far-reaching publication of construction events may be distributed, there are still some commuters that will not be reached. We also recognize that it is never the commuter's responsibility to know about the various changes in construction phasing that may impact (translated as extend) a person's commute. We will therefore take every conceivable measure to reach as many commuters utilizing long-distance transit stations, work with the Design/Builder to minimize construction impacts to wayfinding signage, limit adverse impacts to Metro operations and exercise empathy toward those patrons using Metro facilities.

Approach to Partnering

We want to help the Contractor avoid common pitfalls and produce an end result that Metro can afford and that all project participants can be proud of. In order to do this, Biggs Cardosa has developed the following Partnering Strategy which encompasses these crucial elements:

- Participation in off-site team building events
- Avoidance of bargaining and horse-trading
- Fair and consistent enforcement of contract requirements without pretense
- The seeking of collaborative remedies without compromising the quality of the finished product
- Documentation of significant non-compliant work in a timely and matter-of-fact manner, even if the Contractor has already begun what might appear to be corrective action
- Formal interaction with contractual parties; reduction of emails; following-up oral conversations with confirming correspondence in order to eliminate misunderstandings and providing a definitive and enduring physical project record
- Working with, not against, the Contractor to help facilitate internal and external interactions and approvals to safely undertake permitted encroachment activities
- Seeking ways to enhance processes without interfering with means, methods and responsibilities
- Always seeking common ground and paths that lead toward solutions that will keep the project moving forward
- Making sure the entire team works cohesively with third parties who have significant stake in the overall success of the project

Thorough Understanding of Intricate Scheduling Complexities

Complex Scheduling

The various site relocation project components can be captured in a single schedule or in multiple schedules with very carefully orchestrated schedule settings to allow analysis of the overall project progress. Either approach will need to include any potential ROW issues, environmental concerns, required reviews and approvals, traffic control and phasing and other components that may impact the critical path. The schedule will need to reflect appropriate activities, a reasonable critical path and demonstrate the Progressive Design/Builder's (PD/B's) plan to satisfy the required milestone dates.

Proactive scheduling communication with the P D/B is a key to project success. Communication must start early with a scheduling coordination meeting. This allows for a common understanding of how the schedule will be created, addressing potential questions, getting everyone on the same page and for establishing an atmosphere of partnering. Communication needs to include the value of the schedule to the P D/B for managing the work, for Metro and the project team to evaluate the progress of the work, and to use as a tool to identify potential issues early on, before it becomes too late to take certain substantive actions to avert significant delay and associated cost increases. Finally, communication needs to be ongoing regarding schedule observations and any opportunities to perform schedule recovery.

Schedule Review

Biggs Cardosa has a proven method for successful schedule review. We start with a standard review comment document as a checklist of items related to alignment with the contract and schedule health. We implement our understanding of both design and construction to review the schedule alignment with the scope of work and project

needs. Because of our team's combined years of experience, we can ensure the schedule reflects project complexities and constraints that can impact items such as shop drawing preparation, procurement lead times, production rates and the sequence of work. Our team also uses native file formats of the schedule. The native format allows importing schedules into scheduling software so that automated reports and schedule comparison tools can be utilized. The native file also allows closer analysis of schedule calendars, relationships, lag and, if necessary, forensic analysis of delays and evaluation of possible corrective adjustments to the projected recovery work plan.

Based on our experience with project scheduling and a track record of successful schedule review, we believe our scheduling approach will be the key to success of the project Orange Line Improvements Progressive Design/Build (P D/B) Project. This will vary in nature when compared to a typical Design/Bid/Build project because of the number of concurrent activities that will be necessary to meet the aggressive schedule required for timely completion of all deadlines and incremental milestones.

Looking Ahead

We understand the importance of forecasting key dates and staying on schedule, even when recovery is required, so that milestones are not missed. We will leverage our long history as subject matter experts and highly successful corporate trainers on the topic of scheduling to partner with the P D/B to identify possible opportunities to implement schedule recovery techniques as soon as we discover that any of the required milestone dates will not be met. Those techniques may include fast tracking, slack management and resource crashing in order to adjust the proposed work plan or find opportunities to expedite construction of critical activities if needed. This we can do because of our extensive experience with alternative project delivery methods.

Proactive Approach

The Biggs Cardosa team will investigate the following as part our constructability review of design documents:

- Locations of secure elevator equipment rooms.
- Locations of future signal houses for future BRT conversion to LRT.
- Handling of drainage from elevated platforms during construction.
- Adherence to: The Americans with Disabilities Act of 1990 (ADA), as amended
- Adherence to: The Architectural Barriers Act of 1968, as amended