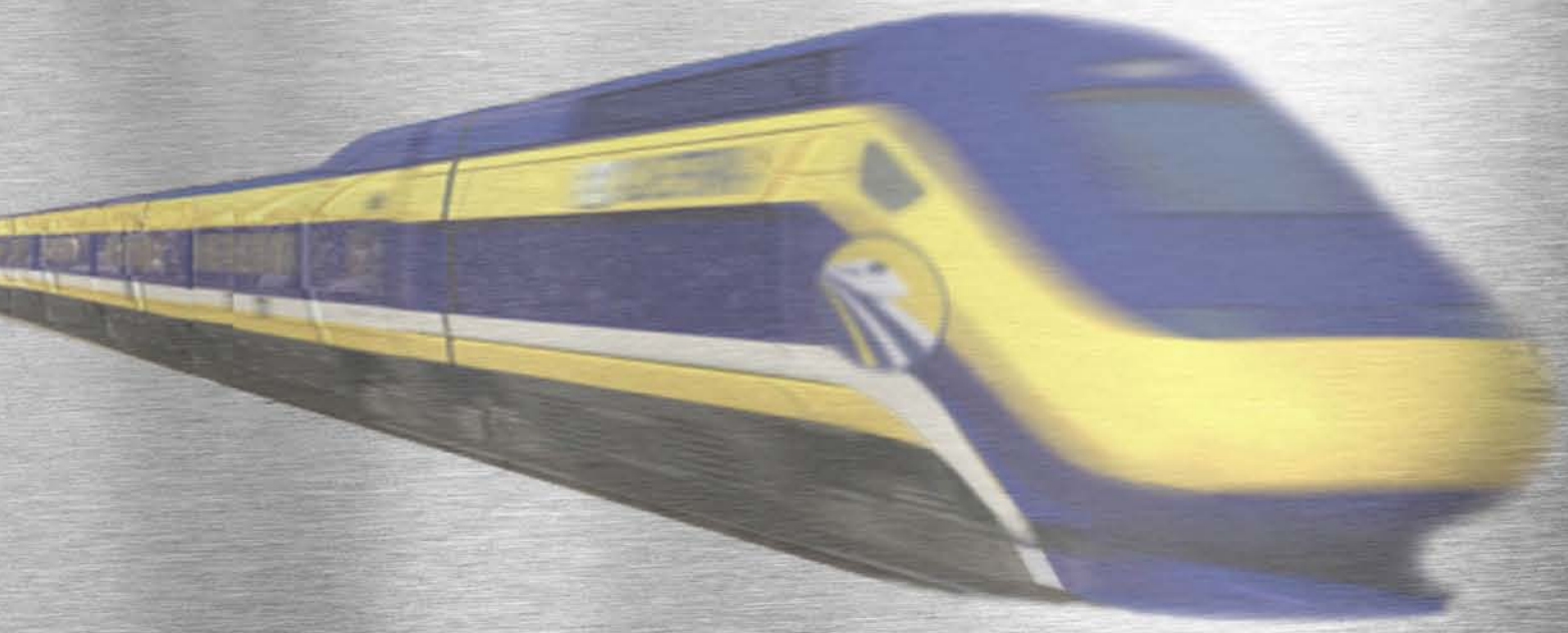
Dragados | Flatiron | Shimmick

Proposal for
Design-Build Services for CONSTRUCTION PACKAGE 2-3

RFP NO.: HSR 13-57

Volume 2 - Executive Summary and Technical Proposal



CALIFORNIA
High-Speed Rail Authority

Executive Summary

Figueres-Perpignan High-Speed Rail Line, Figueres, Spain to Perpignan, France

EXECUTIVE SUMMARY

We know that the success of the California High Speed Rail (HSR) Program will be the model for future HSR programs throughout the nation and will further cement California's legacy as the leader in transportation planning and delivery of signature infrastructure projects. Construction Package 2-3 (the Project) is the most critical segment for your Program, allowing you, the California High-Speed Rail Authority, to complete 65.5 of the first 95 miles of test track to set the standards for future statewide HSR integration. As such, you need a design-builder that delivers on time, reduces Project cost while not compromising HSR quality, knows the community, and has a depth of experience on HSR and California construction projects.

The Dragados/Flatiron/Shimmick (DFS) Joint Venture has assembled the best talent available—from California and around the globe—***bringing together the only team that has successfully managed and built multi-billion dollar design-build HSR programs, along with some of the most iconic projects in California and locally-sensitive work in the Central Valley.*** We analyzed the Project from every angle to tailor Project-specific solutions to address Project-specific challenges, offering you innovation and forward-thinking approaches and commitments.

Expanded on throughout our Technical Proposal, our approach and commitments offer you the right pieces for the right fit to achieve the goal of successfully delivering this Project and further advancing integration within your overall HSR Program. The figure below presents an overview of how our approach and the benefits we provide bring together an integrated team with this one goal in mind.

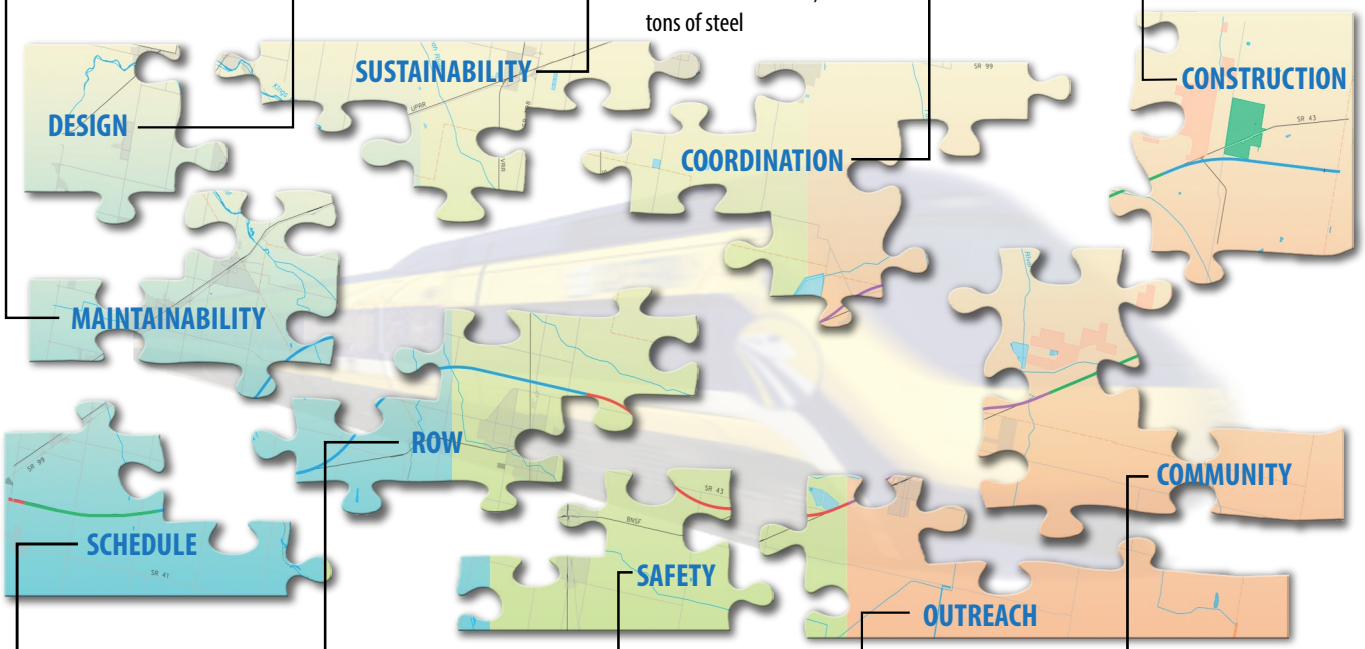
Maintainability
- Design solutions that are easier and safer to maintain
- Maintenance reduced by nearly $2M annually

Design
- Lower life-cycle costs
- 12 ATCs approved
- $291M in ATC cost savings
- Design at 30 percent

Sustainability
- Reduced construction footprint
- Reduced greenhouse gas (CO_2) emissions by over 208,000 tons
- Saved over 1.1M tons of concrete and over 27,000 tons of steel

Coordination
- Met with Hanford, KRCD, Caltrans, and others
- Minimized utility relocations at 27 intersections

Construction
- Schedule flexibility
- Local material sourcing
- Mobility and accessibility for local stakeholders



Schedule
- Detailed CPM schedule developed
- Schedule impacts reduced through ATCs and other design optimizations
- Prepared to start work at Notice of Award

ROW
- ROW reduced by 133 acres, including 120 acres of farmland
- 56 parcels saved and $4.7M in reduced acquisition costs
- Expert ROW team for support

Safety
- Project-specific Safety Plan with goal of zero incidents
- Reduced safety risks through design
- HSR-specific safety procedures

Outreach
- Met with Baker Commodities, Leprino Foods, and others
- 30% SB participation goal
- Relationships with local agricultural communities

Community
- Visual impacts reduced (e.g., ATC 17)
- 56 properties saved
- Farmland take reduced by 120 acres

WE HAVE EXPERIENCE WHERE IT MATTERS MOST

High-Speed Rail Experts

- **26** Years of HSR experience,
- **41** individual HSR projects,
- **3,000** miles of HSR planned, designed, built, operated, or maintained.

DFS has successfully designed and built many HSR projects valued at over $1B, such as the $1.5B Figueres-Perpignan Project between Spain and France, the $1.3B Madrid-Segovia-Valladolod Project in Spain, and the $2.3B Poceirao-Caia Project in Portugal.

All of these projects were part of a larger HSR program where we built civil infrastructure per HSR specifications and successfully integrated the rail and systems components.

We have committed staff who collectively bring decades of experience in all elements of HSR design and construction, including Deputy Project Manager Javier Varela, Construction Manager Rafael Molina, Quality Manager Antoni Gimenez, V&V Manager J. Antonio Castro, and HSR Design Integration Lead Alvaro Rojo. We will work closely with you, share our lessons learned, and apply proven strategies throughout design and construction to deliver a safe, high-quality HSR facility on time and on budget.

North America Design-Build Experience

We have been delivering design-build projects in North America for over 20 years. In this time, we have received numerous awards from industry-recognized organizations and publications, such as Design-Build Institute of America (DBIA) and Engineering News Record (ENR), which commended our project achievements and dedication to partnering with Owners, subcontractors, and third parties.

- **50+** DB projects in North America totaling over **$20B.**
- **20+** projects with individual contract values over **$500M.**
- **10+** DB Projects with individual contract values over **$1B.**

DFS Team members have a long history of integrating with Owners to deliver some of their first, largest, and most complex design-build projects on time or ahead of schedule.

DFS Project Manager Lloyd Neal and Design Manager Roger Trevett each have over 20 years of experience on major design-build projects throughout the United States and have worked together on successful projects in the past. Lloyd managed California's first major design-build transporation project ($800M San Joaquin Hills Transportation Corridor), and Roger brings experience managing design of I-15 CORE in Utah, the fastest design-build project over $1B ever built to date. Construction Manager Rafael Molina and Design-Build Coordination Manager Jose Ballesta both worked in similar roles on the $1.2B I-595 Corridor Improvement Project.

California and Local Experience

- **$3+B** rail transit projects in California
- **$3+B** design-build projects in California
- **$900+M** California Projects Built Annually
- **$250+M** worth of projects in the Central Valley

We have experience safely delivering California's largest and most iconic infrastructure projects, including the $1.4B San Francisco-Oakland Bay East Span Skyway, the $803M Eastern Transportation Corridor, the $182M Golden Gate Bridge Seismic Retrofit (Phases 2 and 3A), the $250M New Carquinez Suspension Bridge, the $250M Presidio Parkway, the $650M Gerald Desmond Bridge Replacement, and the $772 MVTA Berryessa Extension.

We bring local resources and relationships to successfully partner with subcontractors, unions, regulatory agencies, third parties, the public, and other community stakeholders throughout the Project area.

Project Manager Lloyd Neal not only managed California's first major design-build transporation project, but he also oversaw the state's first public-agency sponsored and managed design-build project (SR-22 Design-Build). Several of our key managers also bring relevant California and Central Valley experience to oversee safety, design, construction, third-party coordination, environmental compliance, public involvement, and SB outreach components of our organization.

DFS TEAM'S TOP COMMITMENTS

Safety: We will deliver a safe Project with a goal of zero incidents through our award-winning safety approach. Our design innovations reduce construction and maintenance safety risks and provide a safer permanent facility.

Design: To build upon our pre-bid work, we commit to evaluate every turn of our design to reduce impacts on farmlands, right-of-way (ROW), the community, utilities, and building demolition. We have engaged HSR Verification & Validation and Self-Certification specialists, Sener, to ensure you receive a quality product.

Construction: Our HSR construction best practices fully integrates civil infrastructure with adjacent contracts and the future rail and systems components. We source materials locally and maximize off-highway hauling to minimize impacts by shortening haul routes, lowering the total number of truck haul trips, and reducing the amount of construction traffic on highways.

Schedule: We will achieve substantial completion within 980 working days of Notice to Proceed (NTP) through an approach that entails fully mobilizing our design team at NTP and being prepared to start work at Notice of Award. We commit to work with you and area third parties to further advance schedule flexibility and expedite our Project work.

ROW: Complimenting our pre-bid efforts, we commit to help prioritize your ROW acquisition schedule and explore opportunities to optimize our design and construction work to accommodate your ROW needs.

Third-Party Coordination: We commit to maintain early stakeholder involvement by listening to stakeholders and partnering with you to address concerns, by integrating construction staff during design, and by co-locating our design and construction leads with your staff in our Project offices.

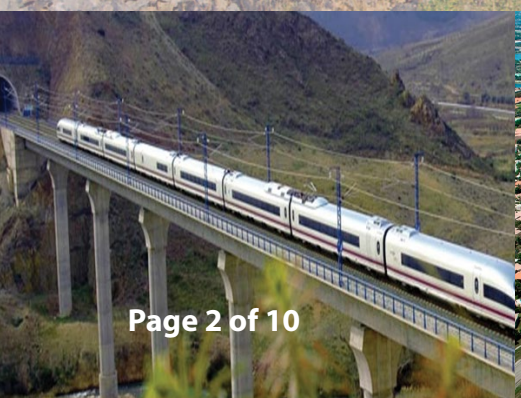
Outreach and Community Focus: We will continue to reach out to local farmers, residents and businesses to minimize construction impacts, to provide meaningful and up-to-date information, and maintain daily contact with all affected parties. We commit to the 30% SB participation goal and to sustain proactive and continuous integration of the local workforce and SBs throughout design and construction.

Environmental: Based on our commitment of providing staff with local knowledge, we will incorporate environmental compliance as an active part of how we manage our work, proactively mitigate risks during design, and confirming compliance during construction.

Sustainability: We have already and will continue to reduce greenhouse gases emissions through design refinements and construction best practices that equally support the community, environment, and Project.

Maintainability: We commit to design and construct the HSR alignment to include an HSR that is protected from a 100-year flood and a horizontal and vertical alignment that improves ridership and operation across the entire system.

Staff: We commit a single point of accountability in Project Manager, Lloyd Neal, who will lead a staff who knows how to deliver HSR and California design-build projects and has a depth of local knowledge and HSR rail and systems integration expertise.



LEGAL

The Dragados/Flatiron/Shimmick (DFS) Joint Venture is comprised of Dragados USA, Inc. (35%), Flatiron West, Inc. (35%), and Shimmick Construction Company, Inc. (30%), in association with Jacobs Engineering Group, Inc. as Lead Designer. Dragados USA, Inc. and Flatiron West, Inc. are wholly owned subsidiaries of Dragados S.A., and Flatiron Constructors, Inc., respectively, who will both act as Guarantor for their individual subsidiary firm as evidenced by the letters of Guarantor support in Volume 1B, Financial Information. All members of the Dragados/Flatiron/Shimmick Joint Venture will have joint and several liability for the contract. There have been no changes in the Proposer's organization or major participants since submission of the SOQ.

FINANCIAL

DFS has the financial resources to meet the contract requirements, as evidenced by our surety and financial information provided in Volume 1B. DFS offers a bonding capacity in excess of $6.5 billion. Each firm is continuously profitable with combined U.S. projects in excess of $5 billion. We have the depth of resources, knowledge and personnel to support your project.

DFS is backed by two of the largest construction companies in the world. Dragados is a wholly owned subsidiary of Grupo ACS, the fourth largest contractor in the world, with annual revenues in excess of $51 billion. Flatiron is a wholly owned subsidiary of HOCHTIEF, the seventh largest contractor in the world, with $37 billion in annual revenues. These two firms together operate in all of the world's major construction markets. We are the only team backed by firms ranked in the top 10 on the most recent Engineering News Record's Top Global Contractors.

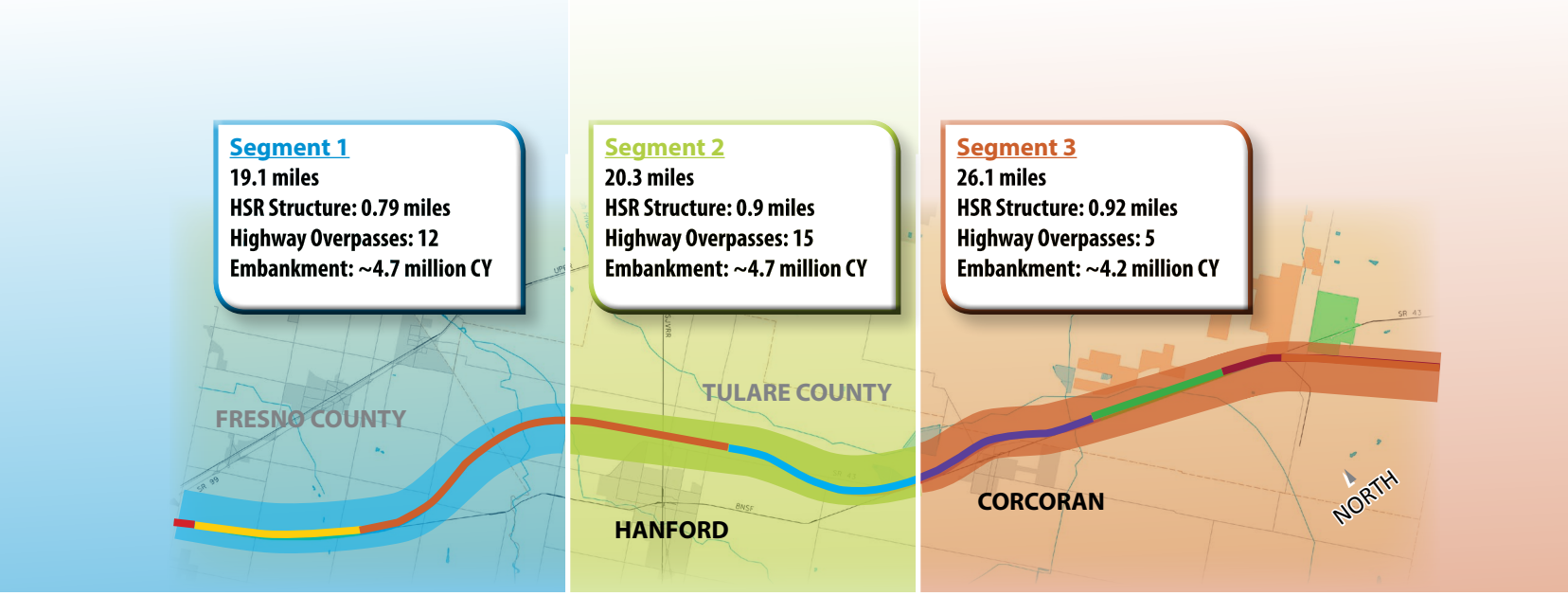
TECHNICAL

This is not a standard transportation project—it is an HSR project with specific demands that we know how to handle and are primed to meet. It is also a politically-sensitive Project that requires close collaboration with local agencies and community stakeholders. These two features have shaped our entire understanding and approach to the work. These features are why we selected our team to bring together HSR best practices with California construction expertise. Both features are embedded in our organizational and management approach to ensure accountability and to maintain clear and timely communication with you and other third parties. Both were vital to our pre-bid focus to reduce cost and mitigate risks through our ATCs and other design innovation. Both are critical for our construction plan that builds in schedule flexibility and sources materials locally to minimize impacts. Both features drive our commitment to the 30% SB participation goal and Community Benefits Agreement (CBA).

Project Management Understanding and Approach

Our approach to project management is structured on an understanding of how to integrate your values into how we manage and organize every aspect of our work. Expanded upon in Section 9.5.1, we have scrutinized the Project's diverse geographic and environmental setting, every schedule constraint, and the unique needs of the local community and third parties to develop an approach for Project success.

Organizing and Managing to Your Values: We organized our team for effective communication and integration both internally and externally with you, third parties, and the public. Our management approach leverages a proven Project Management Plan from past projects, Project-tailored management commitments that ensure accountability, three logical work segments, co-location to better manage our work from the right place, a dedication to integration at all levels, and a commitment to partnering up to the Authority, side to side with third parties, and down to our subconsultants and subcontractors.



How we segmented our work allows us to proactively respond to third-party needs and best manage the unique geography and local interests of the area.

Schedule Confidence: By submitting a detailed CPM schedule in addition to the Level 2 requirement, we offer you a forward-thinking approach that mitigates one of the largest project risks, ROW acquisitions. Our commitment to achieving Substantial Completion within 980 working days after NTP is founded upon a schedule that promotes flexibility through 1) solutions already approved (i.e., our ATCs), 2) logical work segments, 3) maximizing embankments, 4) reductions to the Project footprint, 5) using precast elements, and 6) strategically locating our material source and haul routes .

Effective and Reliable Quality: We know that quality is championed from a commitment at all levels of our organization. We build on this approach through a robust Quality Management Plan (QMP) and right-sized staffing levels. We control our work and the work of others to advance your overall quality commitments, and we align our verification, validation, and self-certification efforts with your Master Quality Plan.

Effective Communication: Initiated in the pre-bid phase, we have and will continue to implement a four-step approach that develops a local perspective, defines relevant audiences, crafts the relevant message, and fully tracks and follows up to minimize impacts to businesses, residents, and traffic. The community will benefit from our environmental stewardship, precisely orchestrated traffic management, and vibrant community outreach efforts.

Risk and Opportunity: We will continue our task forces during the pre-bid phase to further identify, analyze, mitigate, and control risks and develop mitigation strategies that reduce costs, increase schedule flexibility, and improve coordination. To date, we have identified concrete strategies that eliminate, mitigate, or manage the Project's top 20 risks.

COORDINATING WITH THIRD PARTIES

This is crucial to obtaining early buy-in and delivering a successful project. To ensure this happens, we have assigned Third Party Coordination Manager, Drew Erickson to oversee coordination and the design/review approval process with BNSF, UPRR/SJVRR, Caltrans, and other utilities, permitting, and local agencies in the area. We elevated this position and assigned a full-time, third-party coordination team to expedite coordination. Our approach also expands upon our pre-bid work to share our design, listen to concerns, mitigate issues early, and formulate action plans for permitting and early work packages. Upon Notice of Award, Drew and his team will build on what we learned and invite third parties to participate in our task forces, attend one-on-one meetings, and engage in our review processes.

Design Understanding and Approach

We have crafted a design approach that understands your needs and develops solutions that make a difference. Detailed further in Section 9.5.2, the following is only a sample of the efficient, schedule-sensitive, environmentally sound, durable, safe, and maintainable approaches and solutions we will implement.

Immediate Mobilization and Design Advancement: To initiate mobilization within 180 days from NTP, we will engage over 100 pre-bid design team members working from their home offices upon Notice of Award. We have also advanced our design to 30% and are ready to move to 60% to support third-party coordination and offer our team and the Authority a 3-month schedule advantage to analyze and mitigate right-of-entry, ROW, utility, third-party, railway, and environmental risks.

Schedule Flexibility: We have already accounted for the multitude of long-lead approvals and permits (e.g., the USACE Section 408 Minor Permit under ATC 3) required prior to starting construction. Our approach to quickly and aggressively pursue long-lead approvals and permits provides you a design that maximizes flexibility and efficiency during construction.

Considering the Whole Program: Our approach to design bears in mind future packages and the long-term durability, safety, and maintainability of the Project. As literally the foundation of your future HSR, track bed design and construction has a fundamental impact on future train performance and rideability. We offer highly experienced Verification and Validation (V&V) personnel who have the experience and understanding to deliver quality that meets the exacting demands of HSR infrastructure.

ROW Acquisition: When comparing ROW requirements and property impacts as shown in the table below, one can easily see our dedication to limiting acquisition and reducing property impacts through lowering the HSR profile, optimizing roadway profiles, and applying steeper side slopes. Reduced ROW requirements improve your ability to complete acquisition ahead of schedule and minimize your risk related to late acquisition.

Safety: Our approach focused on providing durable and safe solutions. For examples, we reduced structure lengths, which results in smaller cranes/hoists and reduced safety risks, and eliminated elevated slab structures by designing SR-43 over the HSR alignment, improving highway safety, reducing maintenance cost, and lowering life-cycle cost.

Environment and Sustainability: One of our goals is to engineer an environmentally sound and sustainable Project that will be delivered on time.. We have devised solutions that reduce community and farmland impacts and eliminate the need for over 1.1 million tons of concrete and 27,000 tons of steel for a total reduction of 208,864 tons of CO_2.

The difference between the RFP design and DFS design for ROW requirements and property impacts results in considerable acreage and cost savings.

	RFP Design	DFS Design	Savings
Total Required ROW* (Estimated acres)	1404	1271	133
Estimated ROW Cost	$21,100,000	$19,100,000	$2,000,000
Buildings Demolition Estimate	105	81	24
Buildings Acquisition Cost (EST $100k/bldg)	$10,500,000	$8,100,000	$2,400,000
Demolition Cost ($10k/bldg)	$1,050,000	$810,000	$240,000
Total Cost	**$32,700,000**	**$28,100,000**	**$4,700,000**

*Includes 120 acres farmland

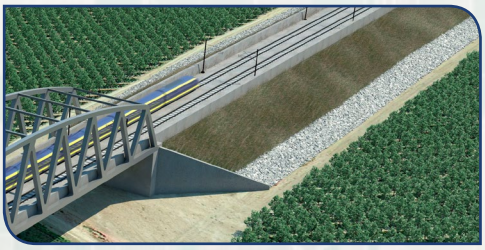
DESIGN SOLUTIONS AND INNOVATION

The core element behind every one of our design solutions is a focus on innovative thinking and implementation.

Thinking Safety and Quality into Every Turn

Approach: Designing SR-43 to cross over instead of under the HSR alignment.

Solution: Eliminates tunnel effect on the highway, minimizes the number of straddle bents, improves highway and future maintenance safety.



Designing for Maintainability and Sustainability

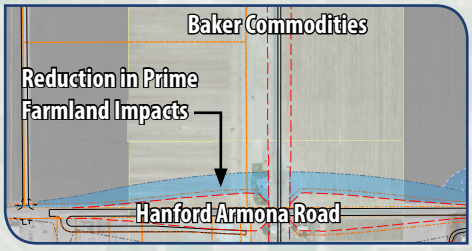
Approach: Converting a majority of the RFP's structures to embankment (ATC 2c and ATC 3).

Solution: Reduces lifetime maintenance costs, reduces concrete and steel materials, eliminates CO_2 emissions, promotes construction and future maintenance safety.

Reducing Community Impacts and Project Costs

Approach: Placing the Hanford Station at grade (ATC 17).

Solution: Reduces Project costs by $130M, eliminates visual impacts for the City, provides a more efficient design.



Caring for the Community

Approach: Orienting HSR on embankment and coordinating construction and facility relocation of Baker Commodities.

Solution: Maximizes schedule flexibility and construction efficiency, offers community-based solutions, establishes community relationships.

Improving Rideability

Approach: Reducing the number of vertical elements (grades and vertical curves) and lengthening the vertical curves in our design, as every action taken to smooth the HSR profile improves rider experience.

Solution: We tested our design using STREN, a state-of-the-art software application developed by Sener, which simulates and analyzes the progress of an HSR train (using similar characteristics to the HSR train that will most likely be used on the Project) along the alignment at speeds up to 250 mph on a given path under a series of design and constraint operation criteria. The program analyzed characteristics such as acceleration, deceleration, gravity, and travel times. We validated that our design improved the passenger experience by providing a smoother ride.

Construction Understanding and Approach

Our past experience on similar projects is the foundation for our success to safely build the Project on time with minimal impact to the public. Detailed further in Section 9.5.3, we bring HSR construction best practices alongside California construction experience where we have worked with the same local subcontractors, unions, community groups, regulatory agencies, cities, counties, and other major stakeholders.

Culture of Safety: During the past five years, we have received over 20 safety awards for our work in California alone. We believe that every incident is preventable. We empower every employee with stop-work authority to report unsafe conditions and provide our personnel the training and tools to ensure a safe and secure work environment. We integrate HSR-specific safety and security elements into all phases of the planning, design, testing, and eventual operation of the final HSR line.

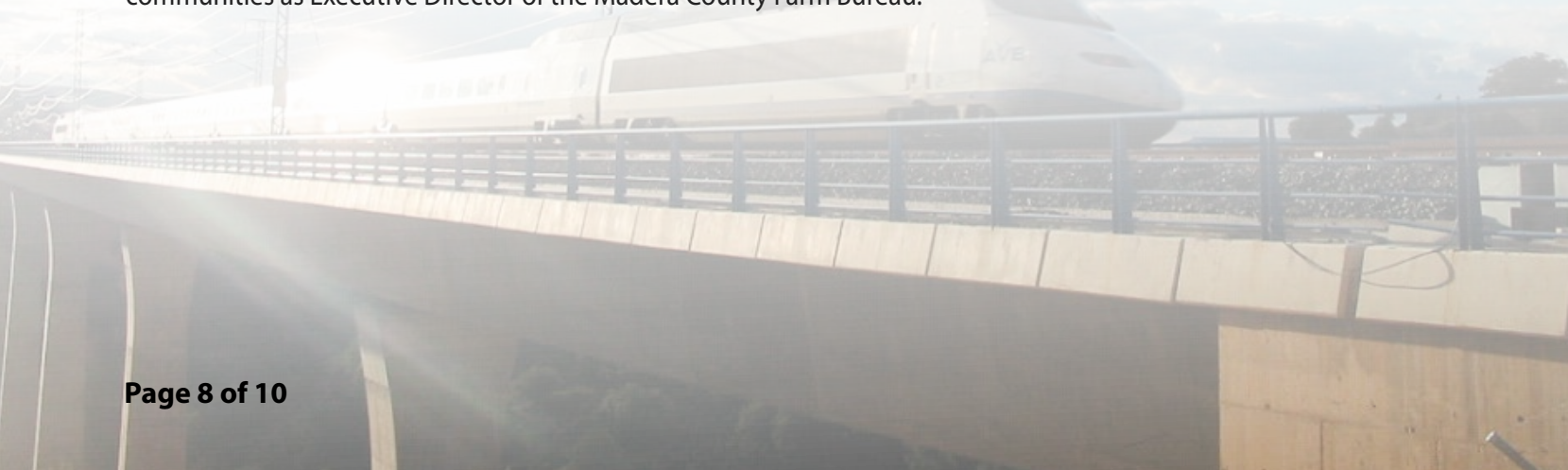
Effective and Reliable Quality: Our quality team reports independently of the construction organization to ensure quality is never compromised for production. All work will be guided by both the principles of ISO 9001 and our past success building HSR facilities and California transportation projects to the same specifications. We bring a depth of practical experience, lessons learned, and HSR understanding to every aspect of construction. This is critical for the Project because the civil infrastructure must fully integrate with the final rail and HSR systems components to ensure a safe, high-quality HSR facility.

Maximum Flexibility: We lowered the profile to maximize the use of embankments in lieu of viaduct structures to provide four distinct benefits to you during construction: 1) more flexibility to accommodate third-party delays because embankment is quicker to build, 2) reduced the risk of encountering unanticipated utilities or archaeological/cultural artefacts, 3) minimized subsidence risks because embankment provides for easier profile adjustments, and 4) minimized utility conflicts at 27 intersections.

Commitment to the Environment: We share your environmental protection commitments. We significantly reduce the amount of waste generated and maximize recycling and reuse by separating material on site and at recycling facilities. At every stage, trained environmental professionals with local knowledge identify and manage environmental risk and work in compliance with applicable regulations.

Coordination with Adjacent Contracts: Project Manager Lloyd Neal has a working relationship with the CP-1 Project Manager from past experience delivering major design-build projects together in California. We will share our schedule with the adjacent contracts and invite them to management meetings to plan our work. We will also provide HSR experts to support the Authority's future HSR rail and systems integration.

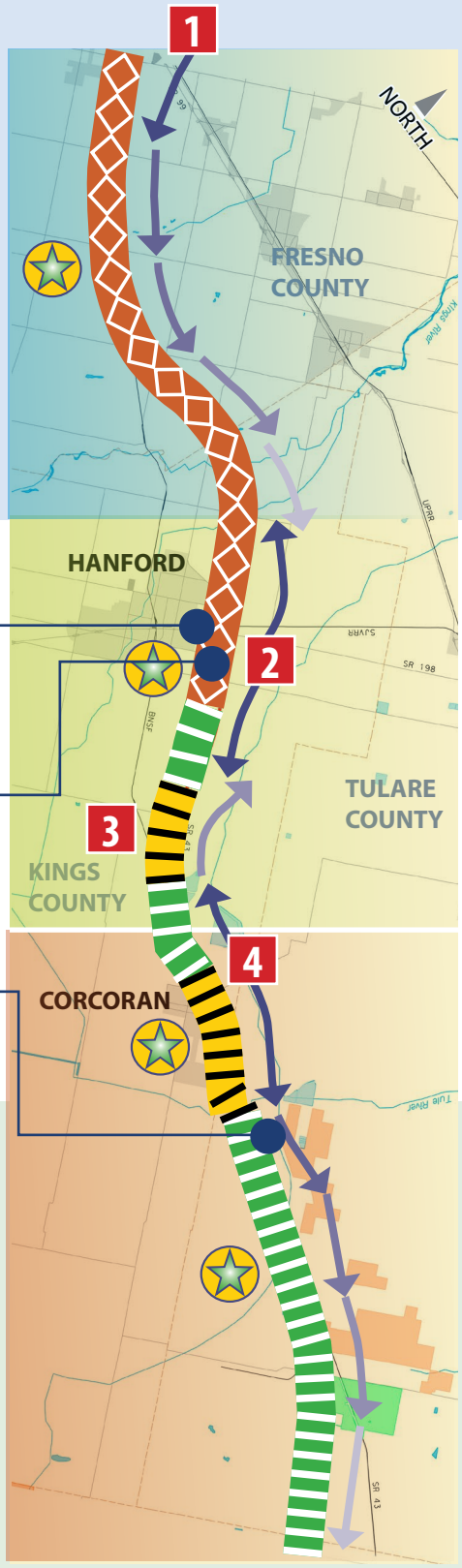
Support of Public Outreach: In support of the Authority's programmatic objectives and goals, our public involvement (PI) approach positions our team to be a first line of response to inform you of day-to-day project activities and educate the public on what they need to know. Our PI Manager, Julia Berry, brings relevant experience performing PI, outreach, and media relations in the Central Valley and with the local agricultural communities as Executive Director of the Madera County Farm Bureau.



MITIGATING TRAFFIC AND OTHER IMPACTS

Our approach to organizing and managing construction is focused on minimizing impacts to agricultural, commercial, and residential properties:

- **133** less acres impacted by reducing the Project footprint, which includes **120** acres of farmland.
- **8** different three-season crossings to allow farm equipment to pass under the HSR alignment and to provide continuity to property owners.
- **27** intersections with minimized utility impacts.
- Scheduled grade separation construction so that no **two** consecutive roadways within **2** miles are closed at any one time.



After discussions with Leprino Foods, the single largest user of the SJVRR rail line, we incorporated a shoofly to maintain operations, while realigning the rail line and building the SJVRR/SR-43 grade separation.

We oriented Baker Commodities' future rendering plant to the west of the HSR alignment. We provide for continual traffic flow across their property and still accommodate the main deadstock and rendered product on the west side of their property to significantly reduce the amount of truck traffic passing under the alignment.

We minimized impacts to the Hormel Property by keeping direct access to SR-43 from their facility. We include an overpass alternative as part of ATC 15a that can eliminate farmland take by shifting the SR-43 access road to south of Hesse Avenue and Highway 120.

STRATEGIC MATERIAL SOURCING, CONCEPT FOR MOBILIZATION, AND DELIVERY OF MATERIALS

We have met with several flood control and irrigation districts to identify the closest borrow pit sources adjacent to the HSR alignment. In addition to being cost-effective and schedule efficient, our approach minimizes impacts to the public and environment by shortening haul routes, lowering the total number of truck haul trips, and reducing the amount of construction traffic on local highways.

MAP LEGEND

Construction Means/Methods

- **Highway Trucks**
- **Off Highway Semi Double Bottoms**
- **Scrapers**
- **Flow from Borrow Sites/Hauling**

Material Sourcing

- **1 FMFCD Borrow Site***
- **2 KDWCD Borrow Site***
- **3 KDWCD Borrow Site***
- **4 CID Borrow Site***

- **Field Office**
- **Equipment/Material Storage**

* **We will explore other sources for materials post-award, including mutually beneficial partnerships with local landowners.**

Small Business Program & Community Benefits Agreement (CBA)

We are committed to meeting the goal of 30% SB participation and will implement a thorough and ongoing SB outreach program and performance plan. Expanded upon in Section 9.5.4, our Small Business and Outreach Coordinator (SBOC), John James, will continue leading our efforts to provide SB outreach opportunities and continuous support services. The Authority's SB Division will also have a direct line of communication with John when working with the community to achieve our SB participation goals and the successful implementation of the CBA.

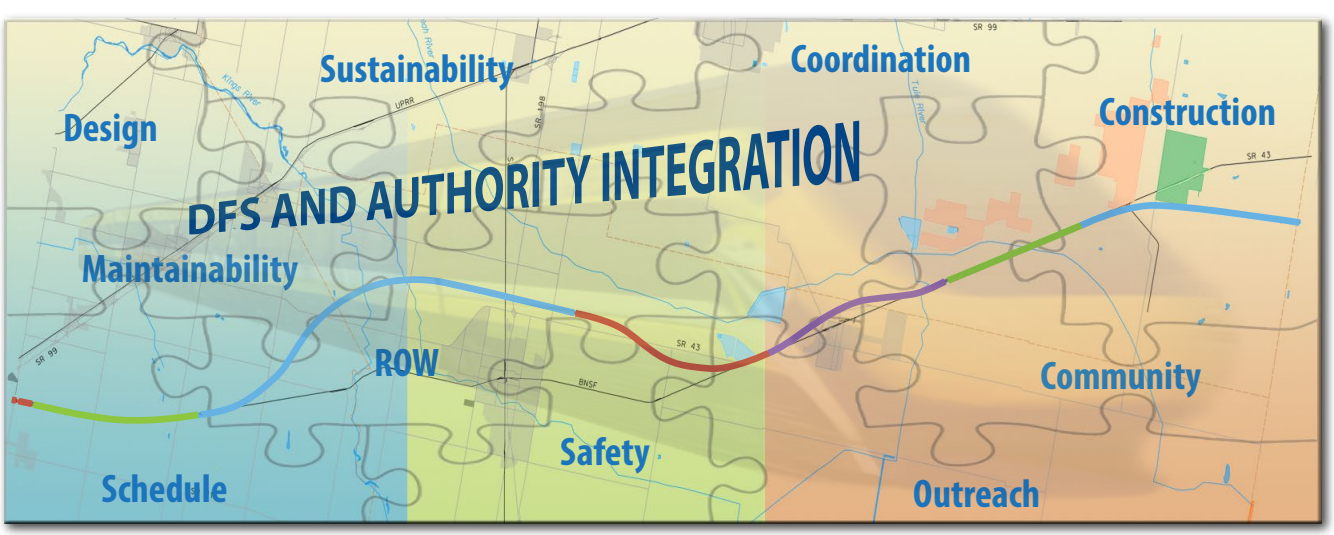
As part of the pre-bid phase, we have met all nine pre-award good faith efforts suggested by the Authority and have worked diligently to identify subcontracting opportunities and SBs equipped to deliver each. We have also conducted three separate SB contracting workshops, one each in Fresno, Hanford, and Corcoran, as well as numerous one-on-one meetings to determine capacity and discuss business opportunities with SBs. We will continue these efforts upon Notice of Award.

KEY FEATURES OF OUR SB PROGRAM AND COMMITMENT TO THE CBA:

- Our SB Contracting Opportunity Center will be the one-stop information center at our Project office.
- We will develop scalable work packages to provide maximum opportunities for SBs to participate in key roles on the Project.
- Our approach extends SB certification assistance, training, and educational seminars to help SBs.
- We have and will continue to explore opportunities with Cypress Mandela (a leader in construction workforce development training) to work with the Central Valley Work Force Investment Boards and CalVet to develop innovative training programs as part of our commitment to the National Targeted Hiring Initiative.

DFS AND THE AUTHORITY BUILDING CALIFORNIA'S FUTURE TOGETHER

We have brought together an approach and commitments that are focused on delivering the Project on time, on budget, and on point with the local community, area third parties, and your larger HSR Program. As you will see through the following technical proposal, we have the experience, dedication, and personnel to integrate seamlessly with you when fitting all of the pieces together for Project success.



Technical Proposal

Madrid-Levante High-Speed Rail Line, Madrid-Levante Spain

Madrid–Sevilla High-Speed Rail Line, Madrid-Sevilla, Spain

9.5.1 Project Management

I-595 Corridor Improvements Project, Broward County, Florida

9.5.1 Project Management

COMMITMENTS

- Achieve substantial completion within 980 working days after NTP.
- Provide a single point of accountability in Project Manager, Lloyd Neal.
- Commit key and added value personnel with HSR experience.
- Implement a PMP based on ISO principles.
- Fully integrate the Authority and third parties into our management system.
- Continue to include the Authority in our discussions with third parties.
- Co-locate design and construction leads with Authority staff in our Project office.
- Be prepared to work upon Notice of Award.
- Explore opportunities to optimize our schedule to meet your specific ROW needs.
- Implement our HSR verification, validation, and self-certification best practices in compliance with your Master Quality Plan.
- Provide HSR experts to support the Authority's future HSR rail and systems integration.

APPROACH

From California and around the globe, we bring together the **only team** that has designed and built verified and validated high-speed rail (HSR) and other major transportation projects in the Central Valley and throughout California. We have delivered 41 separate HSR projects over the past 25 years, so we have the hands-on knowledge of specific project demands. Project success depends on integration from the ground up—which is why we tailored our organization and management approach to fully integrate all disciplines from our team, the Authority, and third parties.

We will manage CP 2-3 (Project) with a proven Project Management Plan (PMP) used to deliver our other mega HSR projects in Europe and design-build projects in the U.S. Our management approach has been crafted around specific needs of the Project by strategically delineating responsibilities amongst our team to the individuals best suited to manage them.

We developed a local perspective through our pre-bid coordination and outreach to third parties, our past experience with local cities and agencies, and our commitment to the agricultural community. We will continue collaborating with you and these entities in the spirit of partnering to achieve common goals.

INNOVATIONS

- Our organization includes added value personnel to oversee critical areas of work to ensure accountability and performance in key project tasks, such as design-build coordination, ROW acquisition, and third party/railroad coordination.
- We organized the Project into three linear segments of similar scope and complexity to 1) more efficiently coordinate the review and permitting process, 2) enhance how we monitor and control our work, 3) respond quicker to needed actions, 4) optimize resources, and 5) integrate flexibility when working with third-party delays and ROW acquisition needs.
- We provided a CPM proposal schedule beyond Level 3 detail to validate our approach based on realistic assumptions.
- Our ATCs and other enhancements accelerate construction, reduce cost, mitigate subsidence risk, and build in schedule flexibility.
- Our approach minimizes impacts to farmers, residents, and the public by reducing ROW acquisition by 133 acres (including 120 less acres of farmland, of which 101 acres are prime farmland), and eliminating 56 parcels from the acquisition plan.

A. ORGANIZATION AND MANAGEMENT APPROACH

The foundational element of our organization and management approach is how we chose our team to best support the California High-Speed Rail Authority on the Project. The DFS Team brings a combination of verified and validated design-build of high-speed rail (HSR) experience and relevant construction expertise throughout the Central Valley and California. This combination of experience provides you with the confidence that we have the right people and the right approach to successfully deliver this Project.

Our Organizational Approach

The DFS Team organization chart (Figure 9.5.1-1) illustrates our overall "chain of accountability," and the primary reporting relationships (solid lines) and integration focused relationships (dashed lines) for each DFS team member. Developed specifically for the Project, our organizational structure builds upon known resource requirements for delivering 41 major HSR projects and design-build projects in California. Our structure speaks to what the Authority values most: clear lines of accountability and responsibility, clear and timely communication, a reporting structure that streamlines the submittal process, and an integrated team focused on risk mitigation and Project success.

This Page intentionally left blank

Printed on Recycled Paper

COMMITMENT

Confirmation of Key Personnel Commitment

DFS confirms that each of the five Key Personnel identified in our SOQ remain designated for assignment on the Project and will be made available to commence full-time work on the Project upon receipt of NTP.

- Key personnel
- RFP Required Personnel
- Reporting Relationships
- Integration-Focused Relationships/ Direct Coordination
- Added Value

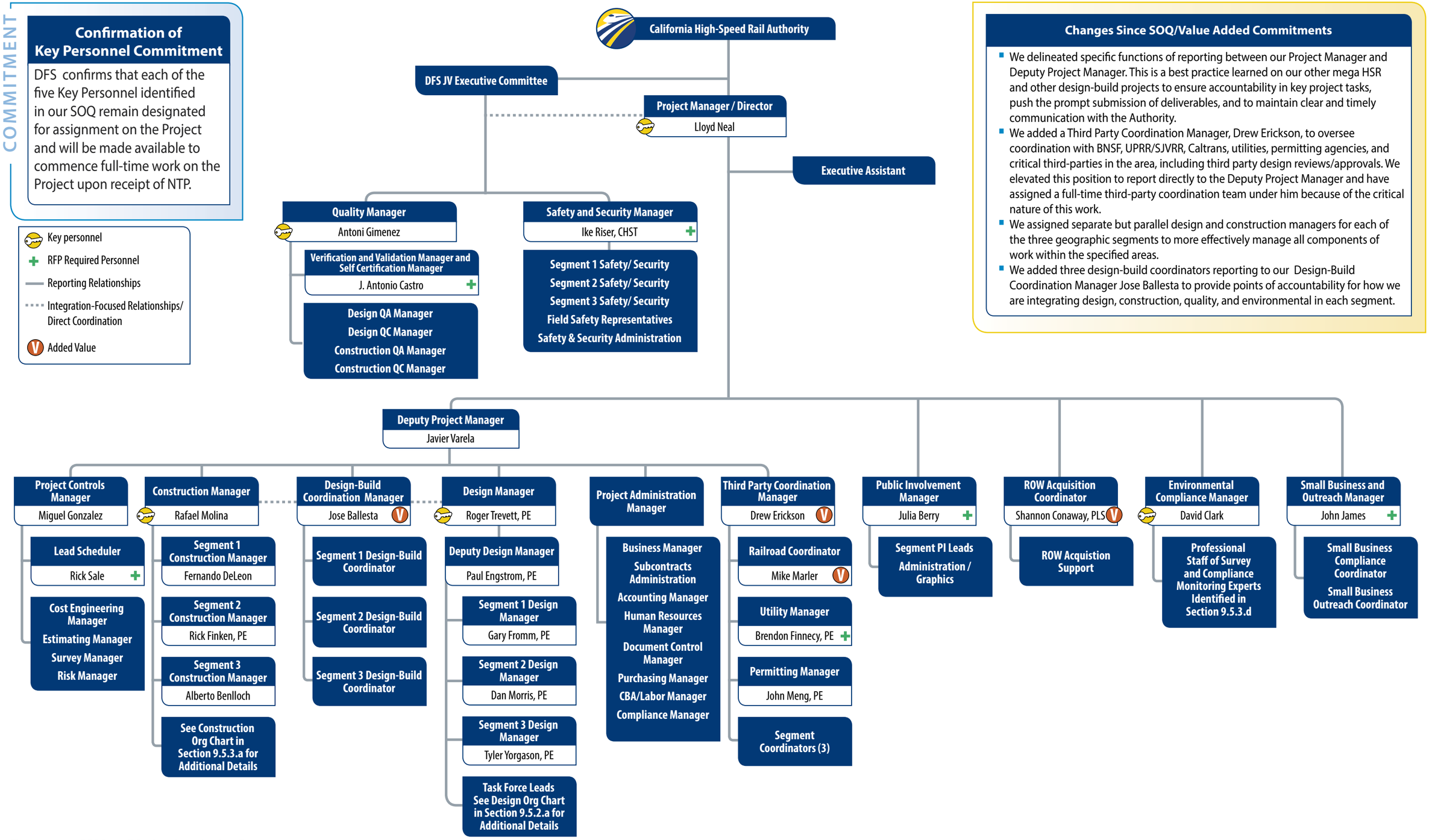


Figure 9.5.1-1 DFS Overall Project Organization Chart

Changes Since SOQ/Value Added Commitments

- We delineated specific functions of reporting between our Project Manager and Deputy Project Manager. This is a best practice learned on our other mega HSR and other design-build projects to ensure accountability in key project tasks, push the prompt submission of deliverables, and to maintain clear and timely communication with the Authority.
- We added a Third Party Coordination Manager, Drew Erickson, to oversee coordination with BNSF, UPRR/SJVRR, Caltrans, utilities, permitting agencies, and critical third-parties in the area, including third party design reviews/approvals. We elevated this position to report directly to the Deputy Project Manager and have assigned a full-time third-party coordination team under him because of the critical nature of this work.
- We assigned separate but parallel design and construction managers for each of the three geographic segments to more effectively manage all components of work within the specified areas.
- We added three design-build coordinators reporting to our Design-Build Coordination Manager Jose Ballesta to provide points of accountability for how we are integrating design, construction, quality, and environmental in each segment.

This Page intentionally left blank

Printed on Recycled Paper

Our Management Approach

The DFS Team's management approach centers on the following key elements that directly connect with what you value most:

- A proven Project Management Plan (PMP),
- Management commitments tailored to specific Project needs,
- Logically segmenting our work,
- Co-location and managing work from the right place,
- Integrating internal staff, the Authority, and third parties, and
- A commitment to partnering.

EXPERIENCE

MANAGING MEGA HSR DESIGN-BUILD PROJECT WITH OUR PROVEN PMP

We are proposing the same PMP used to deliver the $1.5 billion Figueres-Perpignan High-Speed Rail Project between France and Spain. The complex, 27.6-mile project featured several elements of construction similar to the Project, including design for 220 mph HSR, embankment construction, over 60 bridges, similar environmental constraints, and coordination with numerous jurisdictional authorities, including conformance to the HSR design and quality standards for both France and Spain.

A Proven Project Management Plan

From our experience, a proven and vetted PMP is the first step toward Project success. Our management approach hinges on a comparable plan and related management practices used on many of our successful HSR and design-build transportation projects in the U.S. and around the world. We implemented the core principles of this PMP on both the $1.5 billion Figueres-Perpignan HSR Project between Spain and France and the $1.2 billion I-595 Corridor Improvements Project in Florida—two design-build projects that were safely completed on-time and on-budget.

Our PMP is based on ISO and OHSAS principles, including ISO 9001 Quality Systems, ISO 14001 Environmental Management Systems, ISO 31000 Risk Management Principles and Guidelines, and OHSAS 18001 Occupational Health and Safety Management Systems. Our PMP defines the practices and procedures that govern day-to-day management and facilitates communication across the entire organization and within specific disciplines and locations. A preliminary PMP Outline is shown in Figure 9.5.1-2. The PMP ensures that the Project will be completed in a manner that:

- Complies with contract requirements,
- Promotes collaboration with the Authority,
- Facilitates stakeholder and community relations,
- Reinforces our commitment to safety,
- Achieves quality and sustainability,
- Integrates design, construction, environmental compliance, and verification and validation,
- Maximizes efficiency by minimizing duplicate efforts,
- Streamlines coordination, and
- Establishes and upholds interface procedures and protocols.

PROJECT MANAGEMENT PLAN OUTLINE

1. Introduction
2. CA HSR CP 2-3 Project Scope of Work
3. Organizational Structure, Key Personnel, Authorities, and Responsibilities
4. Administrative and Commercial Policies and Procedures
5. Information Technology
6. Project Controls
   a. Work Breakdown Structure
   b. Cost Management
   c. Schedule Management
   d. Documentation Management and Control
   e. Earned Value Management
   f. Reporting
7. Safety/Security Management
8. QA/QC Management during Design and Construction
9. Validation and Verification Program
10. Change Management
11. Configuration Management
12. Project and Systems Integration Management
13. Environmental Compliance Management
14. Communication and Community Outreach
15. Testing and Startup

Figure 9.5.1-2 Preliminary PMP Outline

Management Commitments Tailored to the Specific Project Needs

We understand what it takes to manage both politically-sensitive design-build projects in California and significant HSR projects that are one segment in a much larger program. We have delineated specific functions of reporting between Project Manager, Lloyd Neal, and Deputy Project Manager, Javier Varela to ensure accountability in key Project tasks and to maintain clear and timely communication with the Authority:

- As your single point of contact, Lloyd will report to you on all Project elements and will directly manage the most sensitive areas of work that require regular interface with the Authority. Lloyd has 40 years of industry experience and has managed several large-scale, politically-sensitive projects in California and throughout the U.S. This includes California's first major design-build transportation project (the $800 million San Joaquin Hills Corridor Project) and the state's first public agency-sponsored and managed design-build transportation project (the SR-22 Design-Build Project).
- As Deputy Project Manager, Javier will oversee the main operational and administrative components of the Project for three main reasons: 1) to increase efficiency and effectiveness of management at the top of our organization; 2) to maintain independence from safety, quality, environmental compliance, public involvement, and SB/DBE compliance; and 3) to ensure successful integration with the ultimate HSR program. Javier brings proven experience managing HSR projects in Spain that required critical interface with adjacent contracts and integration with the final rail and systems components, such as the South Guadarrama/Segovia to Valladolid HSR Project, which featured embankments, tunnels, major viaducts, trackwork, and successful HSR systems integration. Javier also brings added value in managing construction on a mega design-build project in the U.S.

Logically Segmenting our Work

EXPERIENCE

Logical segmentation is a best practice we have used on Dragados' $1.5B Figueres-Perpignan HSR and $1.2B I-595 Projects (mentioned above), as well as Flatiron's $803M Eastern Transportation Corridor in Orange County, Shimmick's $772M SCVTA Berryessa Extension in San Jose, and Jacobs $1.3B I-15 CORE project in Utah.

To achieve enhanced Project oversight and resource efficiency, we organized the alignment into three linear segments of similar scope and complexity as shown in Figure 9.5.1-3. Our organizational structure allows us to manage the segments individually. However, Design Manager, Roger Trevett and Construction Manager, Rafael Molina will integrate all three segments to provide continuity throughout the Project. Our three segments will permit more efficient coordination of reviews and permitting, greater ability to monitor and control work, quicker response times, optimal use of resources, and more flexibility to work around third-party delays and ROW acquisition needs—all of which mitigate schedule risk.

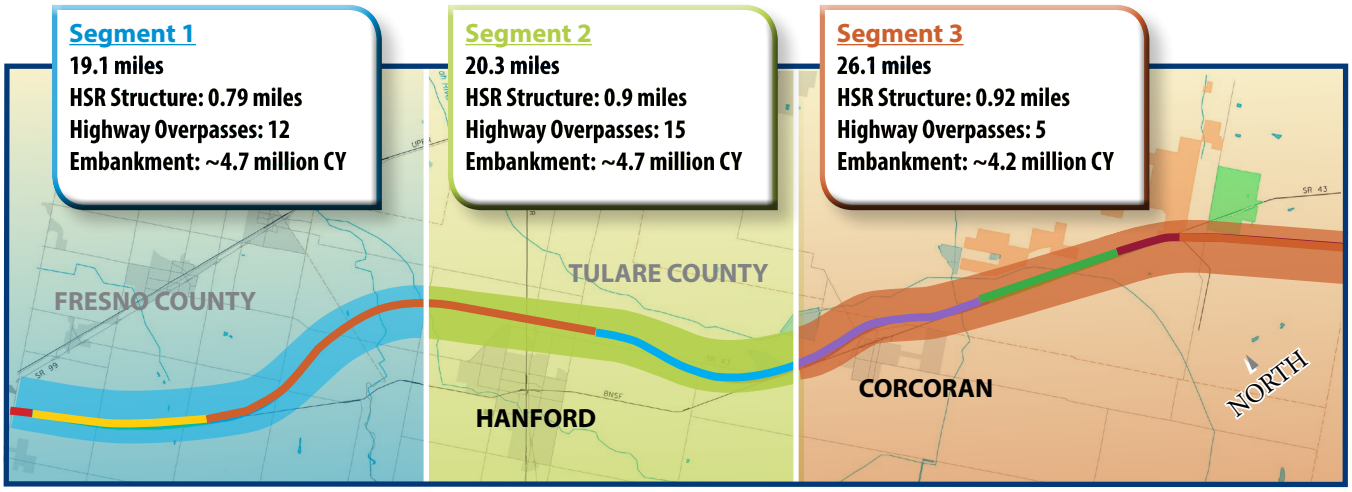


Figure 9.5.1-3 DFS Approach to Segmentation

Printed on Recycled Paper

Co-location and Managing Work from the Right Place

We will continue to co-locate our key design and construction leads to successfully manage the Project. Our general approach to where we will manage our work is shown in Figure 9.5.1-4. Our commitment to working from the right place will mitigate time consuming revisions through collaboration, enhance communication through face-to-face interaction, and will advance integration and accountability in key project tasks.

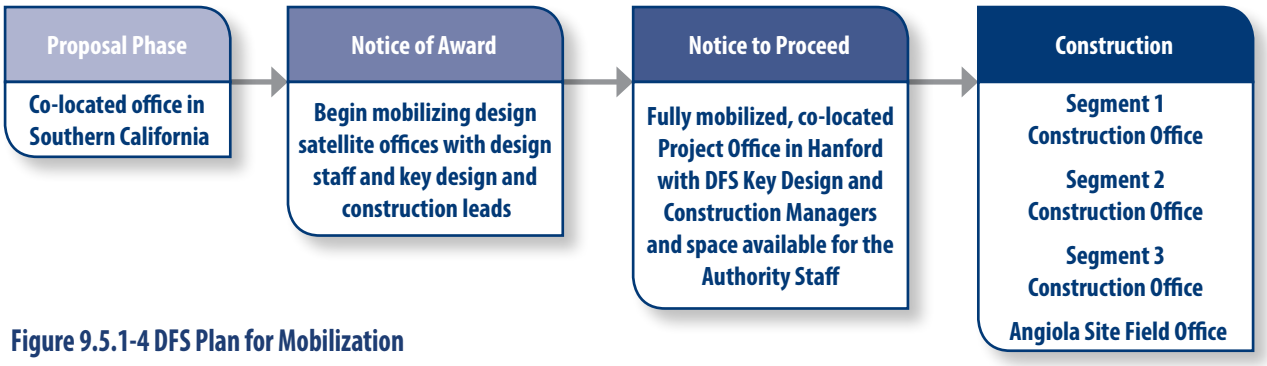


Figure 9.5.1-4 DFS Plan for Mobilization

Integrating Internal Staff, the Authority, and Third Parties

We will continue to collaborate with the Authority and major third parties similar to what we did during the pre-bid phase with Jorge Granados of the Authority in our meetings with third parties and project stakeholders. As proof of our commitment, to actively include the Authority staff and major third parties in our task forces and other meetings, Figure 9.5.1-5 shows our anticipated task forces, third-party integration meetings, and general management meeting and attendees.

COMMITMENT

Our Third Party Coordination Manager, Drew Erickson, will continue to involve you in our discussions with third parties as we work to understand third party concerns and integrate their needs into our design plans and construction.

We will conduct regular over-the-shoulder reviews so that you can offer immediate input on design concepts and provide direction prior to formal submittal of plans. Prior to all milestone submittals, we will hold regular interdisciplinary review meetings with individual task forces that focus on quality across disciplines and mitigates problems before they become issues.

Upon completing the design phase, selected design team members will co-locate to the construction field offices to oversee post-design services. With a thorough knowledge of the Project, our design team will resolve field design changes quickly, review shop drawings in person, and maintain as-built drawings in real time.

BEST PRACTICES

Formal constructability reviews and contractor input during design will enhance coordination between our design and construction teams, control quantity growth, and be invaluable for developing innovative solutions early in the design process to minimize delays associated with field design changes later in construction.

A Commitment to Partnering

Related to how we organize and integrate internal and external parties, we are committed to partnering in all directions: up to the Authority, side to side with third parties, and down to our subconsultants and subcontractors. Based on Section 50 of the General Provisions, we will conduct a two-day Post-Award Partnering Workshop within 60 days of NTP near the Authority's headquarters in Sacramento. We will also offer quarterly partnering meetings based on the Partnering Implementation Plan as a way to promote Project integration, communication, and understanding across all levels of the organization. Partnering is key to how we manage projects, and over the last 5 years, DFS Team members have received over 20 partnering awards for projects in California alone, including the prestigious Marvin M. Black Partnering Award several times.

Authority | DFS Team | Third Party Stakeholders

DFS Management Approach to Integrate Internal Team, Authority, and Third Parties	California High-Speed Rail Authority	Executive Committee	Project Management	Construction Management	Design Management	Quality/V&V Management	Safety Management	Environmental Compliance	Public Involvement	Railroad	Governmental Agencies	Utility Owners	Local Businesses	Other Contractors
Daily Communication														
Co-located Project Office	✓		✓	✓	✓	✓	✓	✓	✓					
Web-Based Document Control System	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Task Forces														
Drainage	✓			✓	✓			✓			✓			
Geotechnical	✓			✓	✓			✓			✓			
Rail/Roadway/Civil/MOT	✓			✓	✓			✓	✓	✓	✓			
Structures	✓			✓	✓			✓			✓			
Utilities	✓			✓	✓			✓	✓		✓	✓		
Weekly Meetings														
Construction Schedule	✓		✓	✓	✓	✓	✓	✓	✓	✓				✓
Design Status	✓			✓	✓	✓				✓	✓	✓		✓
Environmental/Permitting	✓		✓	✓	✓			✓			✓	✓		
Owner Progress Meeting	✓		✓	✓	✓	✓	✓	✓	✓					
Public Information/Stakeholder	✓			✓	✓				✓	✓	✓	✓	✓	
Quality	✓		✓	✓	✓	✓								
Safety	✓		✓	✓	✓		✓							
Weekly Distributions														
Construction Updates	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Design Updates	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Formal Risk Register/Resolution Status	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Weekly Look-Ahead Schedule	✓		✓	✓	✓	✓	✓	✓	✓					✓
Quarterly Meetings														
Formal Partnering	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Public Project Update Meeting	✓		✓	✓	✓			✓	✓		✓		✓	
Project Wide Safety	✓		✓	✓	✓		✓		✓					
Risk Workshops	✓	✓	✓	✓	✓		✓							

Figure 9.5.1-5 DFS Approach to Integrate Internal Staff, the Authority, and Third Parties

Printed on Recycled Paper

Related to this, resolving internal disputes follow the escalation procedures set forth in Section 51 of the General Provisions and aligns with how we resolve issues at the Project level per our DFS Team agreement. We empower and expect our staff to work together in the true spirit of partnership to resolve issues at the lowest possible level. However, if an agreement cannot be reached, the DFS Team will escalate the issue up the ladder in as expeditious manner as possible.

EXPERIENCE

Flatiron won the 2009 AGC of California Excellence in Partnering Award for the $239 million Sprinter Mainline Rail Transit Project. The 22-mile long project included five cast-in-place box girder bridges built adjacent to and over live traffic, passenger stations, trackwork, and systems work. The project required extensive partnering with Caltrans, BNSF, and other regulating agencies.

Ensuring Accountability and Performance in Key Project Tasks

DFS Project Manager, Lloyd Neal, will be the Authority's single point of accountability, reporting directly to the Authority and DFS's Executive Committee on all matters of the project. From the top down, Table 9.5.1-1 outlines how our organization and management approach ensures a point of accountability and performance-focused indicators for key project tasks.

EXPERIENCE

WORKING TOGETHER TO MAKE CONSTRUCTION A CULTURE OF PARTNERSHIP

Dragados' Executive VP of California, Eric Taylor and Flatiron's Western Region VP, Richard Grabinski were two of the founding members of the International Partnering Institute. Richard currently sits on the governing board of this well-respected organization.

Table 9.5.1-1 Ensuring Accountability and Performance in Key Project Tasks

Key Project Task	Point of Accountability	Performance-focused Indicators
Designing the Project	Design Manager – Roger Trevett, P.E.	Our commitment to implementing innovation, evident specifically with our ATCs and other design enhancements, is critical for designing a sustainable and maintainable HSR with reduced life-cycle costs. Our commitment will continue through the continuity of our task forces and our collaborative constructability and interdisciplinary review process.
Constructing the Project	Construction Manager – Rafael Molina	Segmenting our work allows concurrent work and builds in schedule flexibility, and our co-location approach enables us to have the right people in the right place to enhance communication and our understanding of the community we aim to serve. Instilling accountability-focused quality and safety (Section 9.5.1.c and 9.5.3.c) enables our construction teams to do the work once and to do it safely.
Providing a Safe Workplace and Quality Design and Construction	Safety and Security Manager – Ike Riser; Verification, Validation, and Self-Certification Manager – J. Antonio Castro; Quality Manager – Antoni Gimenez	By applying ISO and OHSAS standards, we have a separate accountability structure for all major quality and safety positions. We also provide quality continuity through our pre-bid task forces. Our design enhancements provide several safety benefits, and our team will implement the team's proven safety plans as part of our PMP that have resulted in numerous awards and other recognition.
ROW Acquisition	ROW Acquisition Coordinator – Shannon Conaway, PLS	Our design reduces ROW acquisition by 133 acres, including 120 less acres of farmland, and eliminates 56 parcels from the acquisition plan. Segmenting our work positions our construction team to mobilize directly when parcels become available. Our co-location approach integrates our ROW team alongside the Authority to initiate the ROW process immediately after NTP. We are prepared to begin work at Notice of Award to provide Project-specific ROW documentation at NTP to support the Authority's ROW efforts.
Cost and Schedule Controls	Project Controls Manager – Miguel Gonzalez; Lead Scheduler – Rick Sale	Advancing our ATCs and logically segmenting our work will help the Authority better control Project costs and allow construction to commence without the need for every parcel. Implementing the same PMP used on previous successful projects will provide a proven framework for tracking and reporting cost and schedule information to identify potential risks early.

Table 9.5.1-1 Ensuring Accountability and Performance in Key Project Tasks (continued)

Key Project Task	Point of Accountability	Performance-focused Indicators
3rd Party Coordination and Permits/ Approvals	Third Party Coordination Manager – Drew Erickson; Utility Manager – Brendon Finnecy, PE	Third-party integration is a critical piece to our management approach, and we will continue to meet early and often with those who have a stake in the Project. Third parties are included in our various task forces and management meetings throughout the Project. Our segmentation approach allows for a clearer understanding of segment-specific issues that will streamline the submittal process and enhance communication between third parties and the team.
Caring for the Community and Enhancing Public Perception	Public Involvement Manager – Julia Berry; Small Business Outreach Coordinator – John James	Detailed further in Section 9.5.4, we are presently organizing an extensive SB outreach effort that includes performance/job training for many of the local trades. We also will integrate a Project-specific public information campaign as outlined in Section 9.5.1.d and 9.5.3.f designed to inform the public of HSR benefits, opportunities and construction activities. We included Julia Berry as our Public Involvement Manager to leverage her past experience as Executive Director for the Madera County Farm Bureau to focus our team's efforts on the needs of the local agricultural communities.
Taking Care of the Environment	Environmental Compliance Manager – David Clark	Our proposed design reduces the overall Project footprint by 133 acres, thereby minimizing environmental impacts. We prioritize gathering and evaluating environmental documentation to present to the Authority at NTP. This will inform your position on the best and quickest course of action for environmental approvals.

Integrating Environmental, Design, and Construction Components

Based on our conversations with you and our past experience, we know that integrating our design, construction, and environmental components into one cohesive team is paramount to Project success. To accomplish this, we tailored our entire organizational and management approach (described above) with integration in mind, and we present a number of organizational and management-based commitments to ensure successful integration of our environmental, design, and construction teams.

Organizational Commitments to Integration

We have included Design-Build Coordination Manager, Jose Ballesta and three Segment Design-Build Coordinators as added value positions to provide the Authority a point of accountability when it comes to integrating our team. Leading this team, Jose's primary responsibility is to foster integration much in the same way he drove teamwork and collaboration on Dragados' I-595 Project in Florida.

In addition, our Environmental Compliance Manager, David Clark, will shift his environmental compliance responsibilities from Design Manager, Roger Trevett to Construction Manager, Rafael Molina upon completion of the design phase. This transition offers continuity for compliance and an environmental perspective as the Project transitions from design to construction.

BEST PRACTICES

DESIGN-BUILD COORDINATION MANAGER – JOSE BALLESTA

Jose Ballesta will provide direct communication and a vital role integrating our environmental, design, and construction teams. Jose performed this same role on Dragados' award-winning, $1.2 billion I-595 Corridor Improvements Project in Florida and the $363 million N-25 Waterford Bypass Cable-Stayed Bridge in Ireland.

Management Commitments to Integration

As shown earlier on Table 9.5.1-1, relevant members of our environmental compliance staff will attend task force meetings to inform the design and construction teams of all permit and environmental requirements before design is advanced or construction begins. Based on lessons learned from other mega design-build

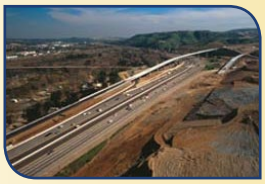
Printed on Recycled Paper

projects in California, such as the $803 million Eastern Transportation Corridor and the $772 million Silicon Valley Berryessa Transit Extension, early coordination is the most proactive way, from a scheduling and cost perspective, to integrate environmental commitments. Additionally, David will attend necessary integration meetings with regulatory agencies and major stakeholders to discuss means and methods to minimize potential environmental impacts to the Central Valley. From this, our formal constructability and interdisciplinary review process will incorporate all environmental related decisions in concert with construction and interdisciplinary input early in the design process.

EXPERIENCE

INTEGRATING ENVIRONMENTAL STAFF ON MEGA CALIFORNIA DESIGN-BUILD PROJECTS

As the largest design-build transportation project in California at the time of construction, Flatiron's $803 million Eastern Transportation Corridor Project included an $80 million environmental mitigation program that included development of a 214-acre site to create costal sage scrub wetland, a 50-acre wetland habitat, and 5 bridges and 26 culverts for wildlife crossings.



Our approach to co-location will also promote successful integration across disciplines. On-site environmental staff will work face-to-face with our design and construction leads. Co-location, along with how we segment our work, will support the development of interdisciplinary innovative solutions at segment level. Our Design-Build Coordinator will then integrate these solutions at a larger Project level. This same approach was used on the $803 million Eastern Transportation Corridor to open the project's major segment 14 months ahead of schedule.

Integrating Subconsultants and Subcontractors

DFS and Jacobs have already selected and integrated several key design subconsultants and subcontractors to begin work immediately upon NTP. This includes a number of Small Businesses (SB), Disabled Veteran Business Enterprises (DVBE), Disadvantaged Business Enterprises (DBE), and Microbusinesses (MB). We will continue to work upon Notice of Award toward our commitment to the 30% SB participation goal as detailed in Section 9.5.4.

For the DFS Team, successful integration begins at the selection process through clearly defining the deliverables, schedules, and payment terms based on our segments and how we organized our task forces for subconsultant and subcontractor participation. By logically segmenting the Project, we can better quantify segment needs and are better able to communicate how our subconsultants and subcontractors can engage by segment. Segmenting also allows us to provide smaller, more manageable design and construction subcontractor packages that we can scale to facilitate SB participation.

Prior to starting work, every subcontractor or subconsultant will be oriented on our management approach and organization structure (including our safety, environmental compliance, quality, and V&V plans) so that they know how they fit within the larger team. At the orientation, personnel will review the specific scope of work, schedule, and the expedited decision making and issue resolution process to align team expectations.

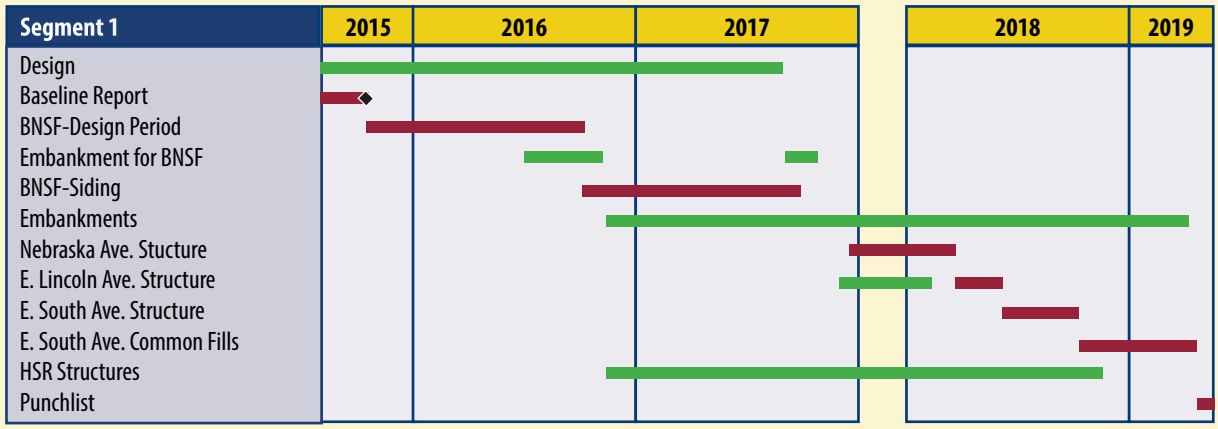
During the course of work, we will invite subcontractors/subconsultants to our weekly meetings to review the schedule, work zones, access considerations, RFIs, and Project changes. To enhance two-way, interactive dialogue, the subcontractor is invited to offer input and receive direction at the meetings.

B. ACHIEVING SUBSTANTIAL COMPLETION

Our team's approach and commitment to achieving Substantial Completion within 980 Working Days after NTP is founded upon confidence in an approach that builds in flexibility, mitigates Project risk, and further integrates design, construction, and environmental components. As described in Section 9.5.1.a, segmenting our work will streamline coordination and management by breaking this large Project into three distinct smaller projects of similar scope and complexity (shown below in Figure 9.3.1-6). While the entire Project will be designed and built from a single Critical Path Method (CPM) schedule, each segment will have dedicated design and construction managers and staff to fully support the work independent of the other segments.

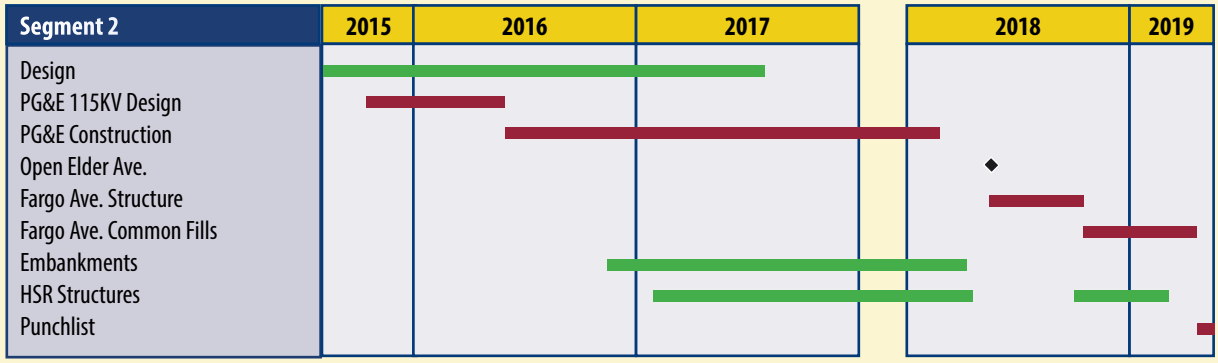
Segment 1

The critical path initially runs through the BNSF work in this segment. BNSF's design starts after approval of the DFS baseline report and lasts 12 months, based on the 12 month notification requirement prior to the start of work. BNSF then has 12 continuous months for the 3 areas of work. Once the BNSF work is complete, the critical path then shifts to completing the roadway overcrossings at Nebraska Ave., E. Lincoln Ave., and E. South Ave.



Segment 2

This work is controlled by the PG&E 115 KV transmission line. PG&E's design starts after approval of the DFS baseline report, and their work needs to be completed before we can open any of the grade separation structures to traffic in the area of the transmission line. Once the PG&E work is complete, we open Houston Ave., which then allows us to build the Hanford grade separation structure. We then place the last track embankment, and following the anticipated settlement period, we complete the prepared subgrade and final protective layer.



Segment 3

Based on the RFP ROW availability dates per Addendum 5, the work in this segment is not on the Project's critical path. However, this work can become critical if the ROW availability dates are pushed back or in the case of third party impacts.

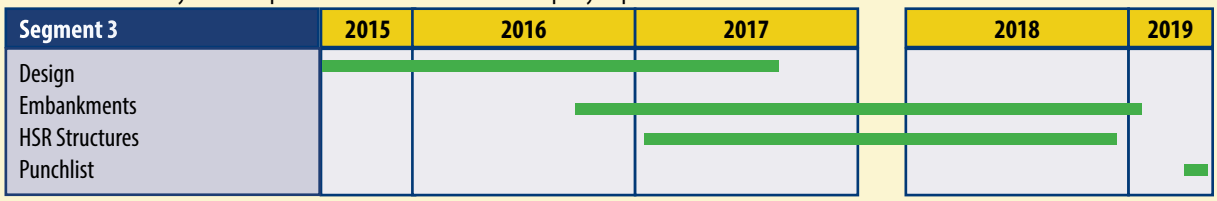


Figure 9.5.1-6 Overview of the DFS Team's Schedule by Segment

Printed on Recycled Paper

Based on realistic assumptions and current Project constraints the following presents our scheduling approach and commitments from the pre-bid phase through substantial completion.

Pre-Bid Phase Schedule Benefits

During the pre-bid phase, the DFS team has not only developed a Level 2 schedule (as required by the RFP and included at the end of this Section 9.5.1), but we also created a detailed CPM proposal schedule that is included in the 11x17 Plan Sheet Appendix. Our detailed schedule depicts how we will organize and manage design and construction, and upon Notice of Award, it will become the basis for developing the phased submittals outlined in the contract requirements.

INNOVATION

We enhanced the design to include embankment and retained fill in place of nearly 7 miles of viaduct. This innovation provides schedule flexibility to accommodate the specific needs of the Project as they arise or change over time in the following ways:

- Provides more flexibility to address subsidence issues and saves future costs associated with subsidence risks and mitigation measures.
- Provides more flexibility to optimize our construction plan to match the ROW acquisition schedule and needs.
- Provides more flexibility to accommodate third-party delays.

During the pre-bid phase, we advanced the design and are prepared to submit a design baseline report shortly after NTP. This will allow us to begin preparing design documents for third-party approval that will optimize our design schedule. Reflected in our schedule and shown in Table 9.5.1-2, we incorporated several Authority-approved Alternative Technical Concept (ATCs) that help us accelerate construction, directly reduce cost, and build in schedule flexibility.

Table 9.5.1-2 ATC Schedule Benefits

Innovation	Schedule Benefits
ATC 2: Lowers HSR Alignment at Cross Creek	• Shortens the construction schedule by up to 40 percent for work in this area. • Streamlines reviews and approvals with Kaweah Delta Conservation District in that we have already met and incorporated the District's input into our design.
ATC 3: Lower the HSR Alignment and Replaces Viaduct with Embankment in the Kings River Area	• Reduces the design schedule by maximizing embankment in lieu of viaduct. • Shortens the construction schedule for this work because embankments and retained fills are faster to build than the viaduct structures. • Eliminates subsurface schedule risks that may have occurred with viaduct foundation work. • Simplifies construction and reduces risk of delays due to minimizing the required specialized subcontractors and supplier trades.
ATC 15a: Reduced ROW Needs	• Reduces ROW acquisition at several HSR crossings from approximately 54 acres to 18 acres, which mitigates the associated acquisition schedule risk for these parcels. • Reduces the amount of coordination for approvals by Caltrans and Tulare County. • Accelerates design and construction by minimizing the total number of grade separations and overpasses.
ATC 17: Places Hanford Station At-grade	• Shortens the design and construction schedule by reducing the required HSR aerial structures and simplifying construction. • Allows for concurrent railroad and highway construction. • Reduces subsurface schedule risks by minimizing the amount of foundations for the smaller viaduct structure. • Enhances our ability to streamline third-party reviews and approvals because the design accommodates the City of Hanford's preferred design.

Notice of Award

Based on our team's experience delivering several other large design-build projects in California, we understand the importance of expediting the review and approval process with cities, counties, Caltrans, and other regulatory agencies. We are prepared to begin work on critical items and proceed with finalizing initial project and design management submittals upon Notice of Award. Described further in Section 9.5.2.a, our goal is to begin preparing design, long-lead permits, and supporting ROW acquisition documents as early as possible, so we can submit to the reviewing agencies immediately upon NTP. With the Authority's support, we will continue the coordination with major third parties established during the pre-bid phase to finalize permit and early work package action plans. Our commitment to early work with the Authority can accelerate the schedule and provide additional flexibility later in the Project.

COMMITMENT

Our first order of business is to meet with you regarding ROW documentation and explore opportunities to prioritize the acquisition schedule and optimize our plan for design and construction to accommodate your specific ROW needs.

Design

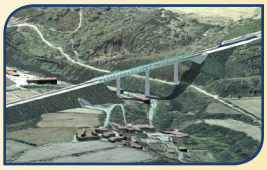
We have mirrored our design and construction organization around Segment Managers who will oversee all activities within their segments so we can better control our work to meet schedule. In scheduling the design, we have already identified the high-risk and long-lead items to prioritize the work. We also coordinated design in line with your ROW acquisition schedule and permit constraints to package the submittals for early work items and begin construction as soon as ROW becomes available. Our design submittals are packaged by both geographic location and discipline of work. We have scheduled the submittals to allow for early construction activities in several Project areas to maximize flexibility to meet your ROW acquisition needs.

Construction

Our schedule assumes that we will not start any work in a given area until the ROW is available per the dates in the RFP. As described further in Section 9.5.3, our approach to scheduling our construction is focused on reducing schedule risk and building in flexibility through applying the following key elements.

EXPERIENCE

DELIVERING MEGA DESIGN-BUILD HSR PROJECTS ON-TIME



- ✓ Dragados and Sener delivered design and construction of the $1.5 billion Figueres-Perpignan HSR Project on-time in only 36 months.
- ✓ Deputy Project Manager Javier Varela managed Dragados' Contracts 1 and 2 of the Segovia-Valladolid HSR Line that opened on time in 2008. The two contracts were part of several Dragados projects for the HSR line between Madrid and Valladolid totaling over $1 billion.

Maximizing embankment in lieu of viaduct structures: Through ATCs and other design enhancements, we have lowered the profile to replace nearly 7 miles of viaduct structures with embankments, while nearly maintaining the same quantity of borrow material needed in the RFP design. This provides the following schedule benefits:

- Provides more flexibility during construction because embankment is quicker to build.
- Reduces the risk of encountering unanticipated utilities or archaeological/cultural artifacts by minimizing the total number of bridge foundations on the Project.
- Minimizes subsidence risks because embankment provides for easier profile adjustments and more flexibility to address subsidence issues.

Printed on Recycled Paper

Reducing the Project footprint to minimize impacts from construction and associated schedule risk: Our reduced footprint minimizes utility relocations at 27 intersections along the Project alignment and reduces the amount of Maintenance of Traffic (MOT) in these areas. We reduce ROW by 133 acres, including 120 acres of farmland, and eliminate 56 parcels from the acquisition plan, supporting the Authority's ROW acquisition schedule.

COMMITMENT

As we have done with the City of Hanford, Caltrans, Baker Commodities, Kings River Conservation District (KRCD), Kings River Water Associtation (KRWA), U.S. Army Corps of Engineers (USACE), Central Valley Flood Protection Board, and others during the pre-bid phase, we will invite the Authority and applicable third parties to participate in our task forces and over-the-shoulder design reviews to eliminate time-consuming revisions and to enhance the overall design schedule.

Using precast elements to accelerate construction and minimize impacts: We standardized the design of precast box culverts for drainage facilities and wildlife crossings to mitigate procurement and delivery delays. Use of precast box culverts also minimizes impacts during construction by significantly reducing the amount of time needed for construction. We propose using precast girders for the HSR bridges over BNSF and will install the girders during off-hours to minimize impacts to freight operations. We anticipate that prefabricating structural components at local yards will provide approximately 50 percent time savings during construction as compared to the cast-in-place methods, as we eliminated the need for falsework/formwork operations at the Project site.

Strategic material sourcing and haul routes: We have met with several flood control and irrigation districts to identify the closest borrow pit sources adjacent to the alignment and to maximize large-capacity, off-highway hauling. We will also explore opportunities to form mutually beneficial partnerships with local landowners to obtain additional borrow material adjacent to the alignment. Obtaining materials locally and maximizing off-highway hauling will benefit the schedule by streamlining these operations and reducing the amount of construction traffic on the highways. This will shorten haul routes and lower the total number of truck trips, by increasing the capacity of each haul.

Analyzing and Incorporating Events that Impact the Project Schedule

As part of our pre-bid efforts, the DFS Team has already incorporated several events into our overall approach and schedule that could affect the Project schedule. We have met with several reviewing agencies, such as the USACE, KRCD, and KRWA, to discuss the requirements and constraints associated with our design. Based on these discussions, we chose not to implement ATCs 1d and 1e, as both ATCs would require a Major 408 Permit and presented unacceptable schedule risk. However, we confirmed that ATC 3 and our other design enhancements would only require a Minor 408 permit and will not lead to additional schedule risk as compared to the RFP design. As such we incorporated ATC 3 and other design enhancements into our proposal.

EXPERIENCE

COMPLETING CALIFORNIA MEGA DESIGN-BUILD PROJECTS AHEAD OF SCHEDULE

Flatiron delivered the $803 million Eastern Transportation Corridor Design-Build Project in almost 1 year ahead of schedule, with the major segment opening to traffic 14 months ahead of schedule.

Throughout the Project, our schedule monitoring system responds promptly to unanticipated events that may affect the Project schedule. If a problem is identified, we will perform an analysis of the operation to identify its source and impact. If the problem is severe enough to affect the Project's critical path, we will develop solutions and seek the Authority's concurrence on the recovery approach. Immediately upon identification of an impact to the schedule, the Segment Managers

COMMITMENT

Our goal is to meet with the Authority as early as possible following Notice of Award to begin exploring opportunities to optimize our construction plan and your ROW aquistion schedule

will report this information directly to our Construction Manager, Rafael Molina and Project Manager, Lloyd Neal who will provide direction to the Project Scheduler, Rick Sale to incorporate anticipated impacts in the Project schedule. All impacts will be tracked not only in our CPM Schedule, but also in the three-week look-ahead schedules that are distributed to DFS and Authority staff weekly and reviewed at the status meetings until the issue is resolved.

EXPERIENCE

COMPLETING DESIGN ON-TIME IN FAST PACED DESIGN-BUILD ENVRIONMENTS

Jacobs completed design on the I-15 CORE Project in Utah to allow construction to begin in some areas shortly after NTP. The project team completed the project in only 35 months, making it the fastest billion dollar public highway project ever built in the U.S.

Subcontractor Impacts

Our subcontractors are required to review and agree to the Project schedule. The terms of their subcontracts enable the DFS Team to take necessary action if a subcontractor fails to meet schedule performance requirements. We fully integrate subcontract activities into our schedule and reporting system, and all subcontractors are required to supply schedule information to our superintendents each week, which is then entered into the Project schedule. We code subcontractor activities in the schedule so their progress can be isolated and tracked. Any performance that is less than expected is communicated to the Segment Manager and responsible parties to expedite resolution.

Third-Party Impacts

We coordinate with third parties early and often to mitigate impacts from their activities by identifying and tracking potential issues as early as possible. Our approach is to work with the third party and the Authority to prepare early action plans and mitigate potential delays before the delays impact the Project schedule. However, in the case that they do impact our schedule, the activities requiring rescheduling will be corrected in a similar manner as those related to our subcontractors. We will meet with the third party and the Authority, review their constraints, and help develop a recovery plan that minimizes impacts to the Project's critical path. Additional details on our approach to managing third-party delays and unanticipated conditions is included in Section 9.5.3.a.

EXPERIENCE

Dragados worked closely with the owner and third parties on the award-winning $1.2 billion I-595 Corridor Improvement Design-Build project to overcome similar challenges as this project. For example, ROW was not available the first year of construction. Dragados partnered with the Florida Department of Transportation to sequence work to mitigate potential delays until ROW became available and the other issues resolved. The team segmented construction activities and strategically sequenced work to avoid delays caused by utility relocations that could have negatively impacted the project's critical path.

Communicating Schedule Information with the Authority

As part of our commitment to provide clear and timely communication with our partners, the DFS Team will meet with the Authority's representatives weekly to communicate schedule changes and coordinate future scheduling activities. As detailed in Section 9.5.1.a, we have and will continue to look for ways to include the Authority as an integrated team member and invite your staff to co-locate with our team, participate in task forces and constructability reviews, receive weekly updates and other Project distributions, attend the weekly management meetings, and contribute to quarterly partnering sessions and risk workshops. Through our thorough and ongoing commitment to include your staff in all levels of our organization, we will continually analyze schedule impacts together and communicate schedule information as part of both formal and informal means throughout the life of the Project.

Printed on Recycled Paper

Each month we will distribute to you an updated Project CPM schedule that we will formally review together in a monthly CPM schedule meeting. This meeting is key to convey important schedule information and for preparing plans for analyzing impacts. Topics will include the following:

- Activity start and finish dates,
- Updates on activity progress and schedule for in-progress activities,
- Discussion of delivery activities, and
- Review and corrective actions for all date constraints.

On a monthly basis following these meetings, we will distribute approved schedule updates and key interim updates to the DFS Management Team, the Authority, Caltrans, subcontractors, regulatory agencies and other Project stakeholders.

EXPERIENCE

When construction operations on Shimmick's 14-mile CO-803 San Fernando Valley Bus BRT Design-Build were halted for 3 weeks due to an EIR legal challenge, Shimmick and the owner partnered together to accelerate work and overcome challenges to still meet the original completion date.

Lead Scheduler Qualifications and Experience

Lead Scheduler: Rick Sale
Years of Experience: 33
Education/Registrations: BS, Civil Engineering, Oregon State University

As our Lead Scheduler, Rick Sale's qualifications and experience scheduling large design-build and other major infrastructure projects align directly with the RFP requirements as detailed in the Cost and Scheduling Controls Program and has developed detailed CPM schedules on over 50 large scale construction projects. Rick prepared our detailed schedule for this Proposal and will continue his work immediately upon contract award to ensure a smooth transition from the pre-bid through the design and construction phase.

Rick has 33 years of experience in construction planning, CPM scheduling, earned value analysis and schedule oversight. He has a long history of working collaboratively with designers, contractors, owner representatives, and third parties to schedule complex projects, perform time impact analyses, and help prepare mitigation plans to resolve delays and other impacts to the schedule. Rick's experience managing schedules for mega projects goes back nearly 30 years to his work on the Colburn-Machicura project in Chile and the Maccagua II Hydroelectric Power Plant in Venezuela, which totaled $750M in construction value and were two of the largest individual projects to date at that time.

Rick's rail transit experience includes his work as lead scheduler for the $120 million San Francisco MUNI New Maintenance Facility from 2005 to 2008, as well as his recent experience developing detailed CPM schedules for Dragados' major design-build proposals for various transit extensions in Southern California and the California HSR CP-1 project.

C. COMPLIANCE WITH AUTHORITY'S MASTER QUALITY PLAN

Based on our review of your Master Quality Plan, we understand the need for your quality management system (QMS) to guide not only the Project but also ensure compliance with the larger HSR program. For this reason, we are committed to seamlessly integrate our Project-specific approach built upon past HSR and California experience with your QMS. Our approach is based on ISO 9001 principles and organized to align with the elements of your Master Quality Plan (including the Verification, Validation, and Self-Certification Procedures) so that we can establish verified and validated commitments for all of our quality assurance (QA) and quality control (QC) efforts.

Noting examples throughout that illustrate the effectiveness of our approach, we are committed to:

- Defining and communicating quality objectives and responsibilities,
- Controlling both our work and the work of others, and
- Verifying and validating our work for self-certification.

EXPERIENCE

QUALITY PROGRAMS FOR HSR PROJECTS BASED ON ISO 9001 PRINCIPLES

Dragados delivered multiple contracts totaling nearly $1 billion to build 17.5 miles of HSR line through the Sierra de Guadarrama mountains in Spain. The Quality Assurance Plan followed ISO 9001 guidelines and was created in collaboration with the owner and their engineering consultant. We included an integrated information system to effectively manage the quality activities throughout design and construction.

Defining and Communicating Quality Objectives and Responsibilities

The most important and first step for a successful QMS is defining accountable-oriented responsibilities and communicating clear quality objectives, to the entire team.

Management Responsibility and Staffing (Element 1 of Authority's Master Quality Plan)

Our QMS and associated quality plans are founded foremost on an endorsement to implementing quality at all levels from our Project Manager, Lloyd Neal; Project Quality Manager, Antoni Gimenez; Verification and Validation (V&V) Manager, J. Antonio Castro; and our DFS Executive Committee.

COMMITMENT

Arranged around both our Project Quality Policy that quality is a team obligation built into every aspect of the Project and the alignment of our goals with yours, our QMS provides defined quality objectives and responsibilities concerning independent accountability to ensure compliance with the Authority's Master Quality Plan.

The Quality Management team is fully integrated with our design and construction organization but, this team reports independently of both design and construction. As shown on the organization chart in Section 9.5.1.a, our quality management team operates under the oversight of our Project Quality Manager, Antoni Gimenez, who reports directly to the DFS Executive Committee. To mitigate the influence of schedule, performance, or cost on our QMS, the Design Quality Manager and Construction Quality Manager will report directly to Antoni.

In addition to this independent oversight, independent design checks are performed by senior engineers that are located in offices other than those who originated the design, and that have equal or greater qualifications and experience. Similarly, construction quality is verified through independent checks by senior personnel who conduct work surveillance, inspection, testing, and auditing per our Quality Management Plan (QMP) (described below). As a tie to our Verification, Validation, and Self-Certification process, the checking and site engineers—who are independent from DFS and their subsidiaries and subcontractors—will conduct Verification, Validation, and Self-Certification activities to assess, evaluate, and certify design and construction.

Providing the Right Staff for Our QMS

The DFS Team's anticipated staffing needs for compliance with our QMS and verification and validation requirements of the contract include the full-time equivalents (FTEs) shown in Table 9.5.1-3.

Printed on Recycled Paper

A Documented QMS (Element 2 of the Authority's Master Quality Plan)

We anticipate submitting our QMP and associated quality plans within 60 days from NTP both to support each of the four levels of your QMS and to expedite design reviews. Figure 9.5.1-7 summarizes each QMP component. As part of our commitment to continually improve Project quality, we recognize that the QMP is a living document, and we will conduct and document an annual "lessons learned" program with the Authority, amending our procedures accordingly within our QMS.

We have designed our QMP to clearly direct our DFS Team members on policies, procedures, instructions, processes, and control of records in accordance with the Authority's Master Quality Plan. Each level of the QMP incorporates specific documentation methods for each of our quality activities.

Table 9.5.1-3 – DFS Staffing to fulfill the requirements of the Contract

Staff	FTE
Project Quality Manager (Antoni Gimenez)	1
Design Quality Manager	1
Construction Quality Manager	1
Quality Assurance Manager	1
Design QC Managers	4
Construction QC/Testing Supervisors	3
QC Inspectors	18
V&V Manager	1
V&V Engineer	3
V&V Support Staff	6

EXPERIENCE

On the $1.5 Billion Figueres-Perpignan HSR project between Figueres, Spain and Perpignan, France, Dragados and Sener worked together in similar roles to provide accurate and complete documentation to meet the verification and validation requirements of the contract. A comprehensive QMP with detailed documentation procedures was especially important for this project, because it required full compliance, verification, and validation with both the Spanish and French HSR systems.

Through all phases of design, procurement, and construction, we exercise oversight responsibility for all subcontractors, vendors, and suppliers. We require that each subcontractor and supplier maintain a QMS for their work, services, or supplies and provide us with their specific quality procedures for review and approval. Independent audits are performed to determine the acceptability of the QMP's individual plans, subconsultant/subcontractor plans, management procedures and processes, and quality documentation and records.

Training (Element 15 of the Authority's Master Quality Plan)

We are committed to training all Project personnel (including our subcontractor/subconsultants) on QMS objectives, responsibilities, accountability, and goals. Our training will be developed to complement the various components of our QMP and the Authority's overall Master Quality Plan.

DFS QMP PLAN COMPONENTS

Volume I – QMP

Overall QMP, Design Quality Management Plan (DQMP), Quality Organizational and Process Flow Charts and Construction Quality Management Plan (CQMP)

Volume II – Construction Quality, Assurance Inspection and Testing Plan

Construction Quality Assurance Inspection and Testing Plan; supplements to the CQMP

Volume III – Materials Control Schedule

Schedule for controlling materials, as well as the construction testing and inspection requirements

Volume IV – Document Management Plan

Procedures for controlling, tracking, and processing documents in our web-based document tracking system

Figure 9.5.1-7 DFS QMP Plan Components

Controlling Both Our Work and the Work of Others

From design and materials to subcontractors and construction, we will implement defined procedures to control our work and the work of others in a way that aligns with what you value most.

EXPERIENCE

The Ohio River East End Crossing $763M project will complete IH-265 across the Ohio River near Louisville, KY. DFS Design Quality Manager, Greg Creamer, led a team of 4 Design QA reviewers, geographically located with Jacobs' design team in 4 locations. To date they have processed over 890 Design packages by certifying that the design team followed the Design QA/QC Plan established at the beginning of the project and the project's Technical Provisions. In addition, the QA Team has certified over 150 Construction type submittals, such as shop drawings, fabrication plans, and other construction working drawings. Greg was also responsible for performing internal audits quarterly to verify the design team's adherence to the Design QA/QC Plan.

Design Control (Element 3 of the Authority's Master Quality Plan)

As described in Section 9.5.2, our Design Quality Management Plan (DQMP) details how we control our design and is a critical part of our overall QMS. We recognize that the quality of the Project begins with a quality design. Our approach to this considers your needs and requirements and works to prevent costly errors or omissions.

Our DQMP identifies responsibilities for design, development, and verification activities, and is based on long-established principles of checking every document by a qualified, second-set of eyes. The reviewer verifies compliance with requirements and documents possible errors. The Design Quality Manager performs audits to confirm that checks are being completed and rejects submittals that have not been properly reviewed. Once approved, the submittal is sent to the Design Manager, Roger Trevett for final approval. This independent review and confirmation process improves the quality of submittals, allows the Authority and agencies to focus on key issues, and reduces the potential for errors or omissions during construction.

Document Control (Element 4) and Quality Records (Element 13 of the Authority's Master Quality Plan)

We use ProjectWise, a document control system, to securely store and record all Project documents, including quality activities, tests, inspections, plans, reports, and correspondence (at a minimum). To advance work from Notice of Award to NTP, we have already developed the Project file system in ProjectWise based on your requirements. This will help us mobilize quickly once we receive NTP.

Purchasing (Element 5) and Production Identification and Traceability (Element 6 of the Authority's Master Quality Plan)

When soliciting bids for material supplies and services, we follow a similar process as outlined in your Master Quality Plan. The benefits of using a comparable process is a four-fold benefit for you. We can 1)reduce time-consuming reviews, 2)allow for a thorough evaluation and audit of any procurement source, 3)integrate both the Authority and our QMS with every purchase, and 4)confirm conformance, reliability, and satisfaction (i.e., validation and verification) at the time of purchase and/or delivery. We anticipate phasing our procurement process to match the Authority's process. We will include a pre-solicitation phase that clearly outlines procurement requirements and selection procedures, a solicitation and award phase that fairly evaluates the proposals/bids and selects the supplier/contractor per the solicitation (e.g., best value or lowest responsible bid), and a post-award phase that oversees the subcontractor/supplier's work or product.

Related to Element 5, we will also establish procedures for identifying and tracing all materials, parts, and equipment to be received, stored, and incorporated into our work. For example, all materials requiring Certificates of Compliance must have the certificates included with the shipment. Prior to being received, a quality team

Printed on Recycled Paper

representative will confirm that the material has been checked against the purchase order, lot/confirmation number, receiver, and Certificate of Compliance. This information is turned over to QC/Acceptance for verification. The material is then stored in designated areas and protected against vandalism and the elements.

Process Control (Element 7 of the Authority's Master Quality Plan)

The DFS Team will describe special process and control instructions for operations considered critical, high-value, or high-risk. This includes processes that DFS and the Authority use to monitor work and verify conformance with Project specifications. Examples include the special processes within the test plan portion of our QMS that will involve "hold points" for various elements of work, or the controls used to protect the public and/or private property while in our possession. Quality Manager, Antoni Gimenez will perform planned and systematic reviews and audits of processes and procedural compliance.

EXPERIENCE

Sener will lead the Project's V&V, warranty, and design support efforts. Sener is a transportation systems integration firm specializing in state-of-the-art HSR systems and has provided V&V and Self-Certification on more than 1,700 miles of HSR.

We will conduct meetings to review the contract requirements, approved shop drawings, and other submittal data before performing work. This includes review of the QC testing procedures to confirm that materials and equipment are built in conformance. We invite the Authority to attend these meetings alongside our QC staff, supervisors, and individuals performing the work.

Verifying and Validating our Work for Self-Certification

Our ultimate goal is the self-certification of every element of our work through a robust verification and validation process that encompasses all of our QA, QC, audits, inspections and testing. The following highlights areas of our verification and validation procedures that not only informs the larger self-certification process but adheres directly with your Master Quality Plan.

Inspection and Testing (Elements 8 through 10 of the Authority's Master Quality Plan)

We will use full-time, on-site inspectors and specialty technicians and certified, mobile laboratories to conduct and comply with Project sampling, testing, inspection, and monitoring requirements. Certified site inspectors will have the required experience to work in progress at any given time. Additionally, the original design engineers will visit the site on an as-needed basis to confirm construction is complying with the design intent.

Tests and inspections are conducted in accordance with Project requirements and referenced standards, and the Authority is advised of all such inspections. Tests that require certified technicians are performed by qualified individuals; and the certifications are provided to the Authority prior to testing. Full documentation is necessary for any required remote inspections. A review is conducted to conform each procedure and process to the Project's scope and standards, including frequency of testing, test standards, inspection checklists, and reporting distribution. QC/Acceptance/Inspectors must document their activities in daily reports.

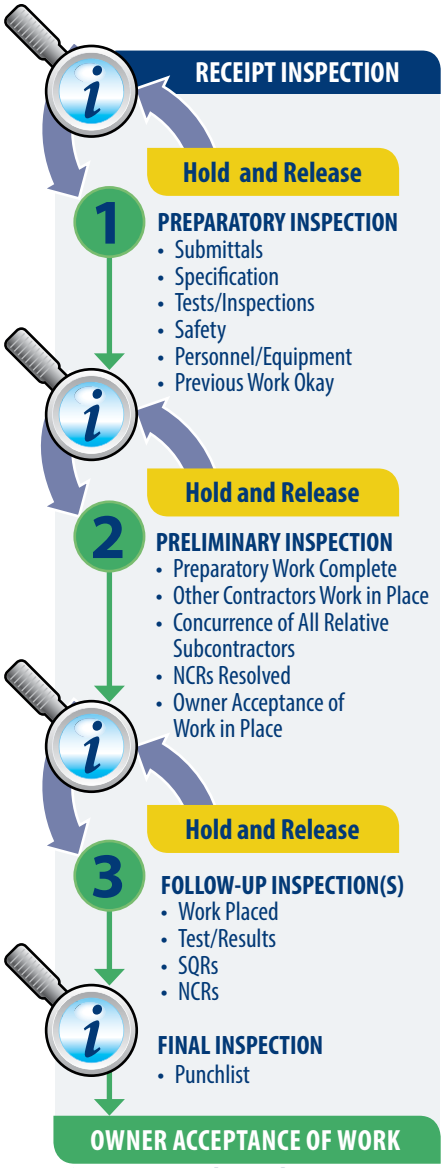


Figure 9.5.1-8 Three-Phase Inspection Program

We use a three-phase inspection program for each activity, as shown in Figure 9.5.1-8. Our program holds production accountable at the foreman level, enforcing quality accountability at all levels. The foreman signs off on inspection forms before the QC reviewer can sign off. The QC's final check notes the deficiencies that need to be corrected on a Quality Check Form that is given to the foreman, his supervisor, and Quality Manager, Antoni Gimenez.

Our Materials Testing Laboratory will be AMRL-certified, will comply with AASHTO testing procedures, and will be independent of the DFS Team. The lab will submit a copy of the independent, California-affiliated, AMRL-accredited certification to the Authority upon receipt. Our QC Inspector/Technician performs QC sampling and testing on site to verify that the placement processes provide work that conforms to Project requirements. Test results and documentation are immediately forwarded to the Construction Quality Manager for review. In accordance with our QMP, we will document the results of material production or placement on a daily basis. The Construction Quality Manager certifies all documents, verifying that the information is accurate and that all work complies with contract requirements.

Non-conformance (Element 11 of the Authority's Master Quality Plan)

Identifying, documenting, and resolving non-conformance is a critical to our QMS. As such our QMP is designed to prevent non-compliance and identify root causes, enabling us to change procedures, plans, or training to eliminate the conditions that led or contributed to non-conformance. Non-conformance reports (NCRs) are cross-referenced to inspection data sheets to pinpoint problems. Each NCR is logged and tracked from initial issue through completion and approval of corrective measures. When non-conformance is detected, corrective action is taken and results are reported to the Authority. We monitor recurring trends and report each to the Quality Manager, Antoni Gimenez who then reports them along with corrective measures to the DFS Executive Committee.

EXPERIENCE

For similar HSR projects that are part of a larger program, confirming that all work is designed and built as specified to fully integrate with adjacent contracts and the final rail and systems components is critical to overall program success. Our Quality Manager, Antoni Gimenez performed a comparable role on four separate HSR projects that included similar integration requirements. Antoni oversaw implementation of ISO 9001-compliant quality programs for the $1.5 billion Figueres-Perpignan project and three other projects totaling $548 million as part of the HSR line between Madrid and Barcelona that featured viaducts, embankment, overpasses, tunnels, stations, trackwork, and HSR systems integration.

Correction Actions (Element 12 of the Authority's Master Quality Plan)

Related to Element 11, our Project Quality Manager and Construction Quality Manager will evaluate and analyze all daily inspection summary reports, inspection data sheets, and NCRs for adverse trends and improvement opportunities. They will review work performance, procedural discrepancies, and potential programmatic breakdowns so that errors, inconsistencies, and other problems are detected and corrected immediately.

COMMITMENT

As further assurance that we take quality seriously, the DFS Executive Committee will audit the quality program every quarter, and upon evaluation, we will make changes to address any issues or recommendations from this independent committee

Quality Audits (Element 14 of the Authority's Master Quality Plan)

Ongoing audits of the QC/Acceptance Program are intended to both confirm that procedures are compliant and to detect and correct potential problems as early as possible. Surveillance spot checks, conducted by witnessing work in progress or holding interviews with personnel performing the work, also promote conformance and early detection. QA or other authorized and qualified personnel may perform surveillance.

Printed on Recycled Paper

The Quality Assurance Manager uses audit checklists to evaluate area-specific procedures and follow-up on any conditions previously reported. QC personnel that assist the Quality Manager, Antoni Gimenez in documenting construction surveillance and audits possess the required qualifications and relevant field inspection experience, education, and training. Audit results (including audit scope, basis, personnel contacted, formal findings, recommendations, and conclusions) are discussed in a post-audit meeting and summarized in a report. The audit reports are sent to the DFS Executive Committee, Authority, Project Manager, Project Quality Manager, Construction Manager, and Design Manager for further distribution as required.

EXPERIENCE

"...Thank you again for the proactive way you represent the JV's quality control efforts. Your management skill was reflected in the positive audit we concluded last week of the JV's work to date on the Fremont Central Park Subway project, and I suspect the success will continue on future audits."

-- Shawn Benedict, BART Assistant Resident Engineer regarding Shimmick's Quality Management Program on the Fremont Central Park Subway project in Northern California

The Quality Manager has the authority and responsibility to conduct inspections, surveillances, and audits of each subcontractors' work activities and internal QC processes, regardless of where the work is performed.

D. ENSURING EFFECTIVE COMMUNICATION

The following public involvement (PI) approach ensures effective communication through being your first line of response and a knowledge expert that informs the Authority of day-to-day Project activities and educates the public on what they need to know.

Public Involvement Approach and Commitments

The following four-step approach, which has already been initiated in the pre-bid phase, is committed to listening to local agencies, community stakeholders, and not least of all the public through, locally focused community involvement and minimizing impacts to businesses, residents, and traffic.

Step 1: Developing a Local Perspective

Effective communication relies on dialogue that understands the local perspective and addresses public and stakeholder concerns. We have already invited Jorge Granados to participate in meetings with 13 local agencies and community stakeholders during the pre-bid process to ask the questions, that are important to the local community.

EXPERIENCE

CONNECTING WITH THE AGRICULTURAL COMMUNITY

Working with the agricultural communities along the alignment is one of the critical functions on this Project. We have included Julia Berry as our Public Involvement Manager because of her relevant experience performing public involvement, outreach, and media relations in the Central Valley as Executive Director of the Madera County Farm Bureau. Julia will lead our team in continuing to understand their concerns and build mutually beneficial relationships.

Related to this a key Project component is outreach that encourages local workforce engagement. As described in Section 9.5.4, we have held three separate outreach events in the cities of Fresno, Hanford, and Corcoran to communicate Project details, present contracting opportunities, and introduce ourselves to the local subcontractors/subconsultants and community members. A second key Project component is building HSR in a way that minimizes impacts and supports the community both now and well into the future. A significant aspect to this component is knowing our audience and transparently communicating accurate information in real time.

We have already reached out to the following community members to better define our local understanding of the area and our PI approach:

- **City of Hanford:** We met with Hanford on two separate occasions to discuss station location for our ATC 17, future planning, potential impacts to traffic and the environment, potential borrow pit sources, preferred aesthetics for our design, and employing local residents and SB subcontractors.
- **Baker Commodities:** We met with Baker to tour their facility and discuss how we can minimize impacts and maintain their traffic during construction. We also provided design concepts that they can work with for their continuing operations to maintain zero downtime throughout the Project.
- **Leprino Foods:** After discussions with Leprino Foods, the single largest user of the SJVRR rail line, we decided to incorporate a shoofly to maintain their operations while we realign the SJVRR rail and build the SJVRR/SR-43 grade separation.
- **Caltrans:** We met with various Caltrans representatives to discuss our plans for placing SR-43 over the HSR alignment and we received positive responses about our design approach. We also incorporated input from Caltrans to accommodate their SR-43 and SR-198 ultimate design. Caltrans noted their preference to provide a grade separation at the SR-43/SJVRR crossing consistent with our ATC 17 design.

We know that our pre-bid efforts are just the beginning, and we are committed to meet with all impacted parties to discuss to specific needs as the Project unfolds.

Step 2: Establishing Target Audiences and Meaningful Approaches

To support the Authority's overall PI program, we will work with the Authority to identify area-specific target audiences and create messaging that resonates with the local public, local agencies, and community stakeholders.

EXPERIENCE

AWARD-WINNING PI PROGRAMS ON HIGH-PROFILE DESIGN-BUILD PROJECTS

Flatiron's I-35W Bridge Replacement project in Minneapolis received several awards for its PI program that focused on a transparent sharing of information with the public. The team used community open houses, a project website and webcams, weekly email updates, kiosks, a project hotline, visits to local schools, and other communication strategies to reach hundreds of thousands of people. The Project Manager led monthly public talks at the bridge site on Saturday mornings to describe the project status and answer project-related questions from the community.

The Local Public

The Project will have a significant effect on local residents and businesses, and the more we listen and respond to their concerns, the more we can build trust. Per Section 53.3 of the General Provisions, we will prepare a Business and Residential Impact Mitigation Plan that fits the individual needs of three very important audiences.

Residents: While our design reduces ROW acquisition and eliminates 56 parcels from the acquisition plan, several single-family and multi-family residences will still be purchased and removed. Each resident has a story, and through leveraging appropriate outreach techniques (see Step 3), we can meaningfully reach every affected resident. For residents not being displaced but that are within our construction areas, we have thoughtfully designed a traffic management approach and how we will manage our construction sites to minimize impacts and disruption to the public. Section 9.5.3.f details our approach and commitments to minimizing impacts to the public, including traffic management and ensuring public construction awareness.

Farmland/Businesses/Property Owners: Our proposed design reduces farmland take by 120 acres, which includes 101 acres of prime farmland. However, the Project will still affect farmland in the area. The DFS Team will establish one-on-one relationships, provide timely detour/closure information, facilitate monthly update

Printed on Recycled Paper

meetings, and regularly visit land owners to listen to their needs and inform them of vital traffic, detour, and access information. We want to partner with impacted owners to integrate mutually beneficial solutions, such as resolving access issues, maintaining access, and accommodating their operations both during construction and after Substantial Completion. We will also work to coordinate our construction work with the existing farming operations to minimize impacts during their harvest seasons.

Local Agencies and Community Stakeholders

Because the DFS Team has worked with all of the major local agencies and many of the community stakeholders on projects in the Central Valley and elsewhere in California, we know the value of having a tailored approach to communicating with each interested party. Detailed throughout our proposal, we plan to coordinate with Caltrans, utilities, irrigations districts, environmental agencies, and railroads, and Table 9.5.1-4 provides a specifics on how we will communicate with some of the major parties in the area.

Table 9.5.1-4 DFS's Approach to Communication

DFS's Approach to Communication	
Fresno County Kings County Tulare County City of Hanford City of Corcoran	• Provide an MOT/traffic engineer to work with the County/City and key stakeholders to efficiently facilitate traffic updates and detours/closures. • Communicate information through task force meetings and listen to their concerns and incorporate their input during the design phase. • Segment the Project to streamline communication efforts: Segment 1 only concerns Fresno County, Segment 2 only Hanford, and Segment 3 primarily concerns Corcoran and Tulare County. • Support the Authority in communicating to local mayors and other elected officials on Project status and constituent needs.
Key Stakeholders such as Baker Commodities, Hormel Foods, and Leprino Foods	• Continue to establish one-on one relationships with the owner's from efforts done during the pre-bid phase. • Provide timely detour/closure information and continue to work with the owner to minimize property impacts from efforts done during the pre-bid phase. • Facilitate monthly update meetings and regularly conduct one-on-one visits to ensure needs are being met.

Step 3: Crafting the Right Message and Applying the Right Methods

Based on Step 2, we will develop targeted messaging within Authority-approved parameters, Guided primarily by our Public Involvement Plan (PIP) to be submitted within 60 days following NTP. We will include a Project-specific Business and Residential Impact Mitigation Plan and a Crisis Communications Plan. The PIP will be developed in collaboration with the Authority and major stakeholders so that the larger team has the necessary input on the overall process.

In creating messaging that resonates and connects, we are committed to the following:

- We will update the PIP each year so that we can engage directly with businesses/residents/farmland similar to our owners along the corridor and other stakeholder representatives to find out what is working and what is not.
- We will provide monthly reports of previous and forecasted PIP activities and regular Project updates for the Authority's website to present a consistent message for the public.
- We will maintain day-to-day contact with affected residents, businesses, and farm owners to hear issues and respond accordingly.

COMMITMENTS

- Update PIP annually
- Regular Project updates
- Meaningful interaction with affected parties
- Strategic use of social media and the Project website
- Maintain day-to-day contact

- We will provide all required notifications per the Table of Notifications in Section 53 of the General Provisions in the three most common languages of the region, primarily English, Spanish, and Hmong.
- We will provide information and develop press releases and other messaging to support the Authority in informing the public of the larger programmatic goals. We will not meet with the media without direct authorization from the Authority.

We are prepared to support the Authority's communication approach by providing real-time communication and information over the duration of the Project. Beyond enhancing the general public perception of the Project, we realize that limiting impacts to traffic, access, and communities are of critical importance, and we will develop door notification language, neighborhood update agendas, and access maps showing existing and planned patron, delivery, and residential accesses during our construction periods. Detailed further in Section 9.5.3.f, our approach will manage construction in a way that minimizes public disruption.

Step 4: Tracking Contact and Follow-up

A successful PI approach relies on a thorough contact and the necessary follow up to solicit feedback. We will log all contact database with the public into our master PI database, and we will import this information monthly into the Authority's database. As a backup, we will have hard copies of all information on the standardized form that will be submitted for approval at the time of the PIP.

We will provide complaint/comment forms to businesses and residents along the alignment during and after major activities. As another touch point to understanding the local perspective, we will invite feedback on how we can further accommodate the public and other community stakeholders. We will respond to complaints within 5 days of receipt for non-emergency issues and within 24 hours for emergency issues, all the while coordinating our responses with the Authority and tracking contacts in our PI database.

Public Involvement Manager

Public Involvement Manager: Julia Berry
Years of Experience: 14
Education/Registrations: BS, Fruit Science, School of Agriculture, Cal Poly San Luis Obispo

Developing a local perspective and working with the agricultural communities along the alignment will be critical to measuring Project's success. Therefore, subject to the Authority's approval per Section 53.1.2.2 of the General Provisions, we propose Julia Berry as our team's Public Involvement Manager to lead our PI-related activities and implement the requirements of Section 53 of the General Provisions. Julia recently served as Executive Director of the Madera County Farm Bureau, where she oversaw public involvement, outreach, and media relations for this organization of agricultural producers and individuals dedicated to the support and preservation of agriculture in the Central Valley. Julia worked directly with the agricultural communities and the affiliated nationwide network of Farm Bureaus organized at the county, state, and national levels to protect, preserve, and promote agriculture and the American family farming and ranching way of life.

Julia brings the unique qualifications and experience to lead the DFS Team's efforts in working with the agricultural communities and engaging affected property owners in the design-build process. As a proponent for the agricultural communities, Julia is knowledgeable of their issues and concerns and can help communicate our goals to partner with them to build mutually beneficial relationships. Developing these relationships and receiving early stakeholder buy-in are key elements not only for the success of this Project but also to support your overall HSR program goals.

Julia's work also includes being the Government Affairs Director for the American Farmland Trust in Sacramento, and the Chief of Staff for California State Assembly District 26 (San Joaquin and Stanislaus Counties) under

Printed on Recycled Paper

Assemblymember Bill Berryhill. Her work with California politics as well as overseeing public relations campaigns for agricultural communities in the Central Valley gives her the community and political knowledge needed to oversee our PI efforts on this politically-sensitive project.

EXPERIENCE

As the Florida Dept. of Transportation's first P3 project and largest project at time of construction, the public information campaign on Dragados' $1.2 billion I-595 Corridor Improvements project was critically important to the project's success. Dragados' team posted up-to-date construction bulletins on the project website alerting the public of construction activities. They also provided responses to public inquiries within 24 hours.

Responsibilities and Placement in Organization

Reporting to the DFS Project Manager and interfacing directly with the Authority's PI staff. Julia's primary responsibilities are to manage day-to-day Project activities related to public involvement and implement the PIP. In addition to working with the agricultural communities as discussed above, her other responsibilities will involve managing the Public Notification process within the prescribed notification periods, ensuring our PI database is up to date, providing periodic updates for the community and Authority, organizing construction tours at the discretion of the Authority, and coordinating media relations with the Authority. Julia and the other PI staff will be co-located in the same offices as the DFS Team members to facilitate communication and "real time" transfer of information from the DFS Team and the Authority.

Public Involvement Personnel and Staffing Commitments

Based on our analysis of the Project, we anticipate that the staffing levels shown on Table 9.5.1-5 will be necessary to meet the Contract requirements and our PI commitments to local agencies, community stakeholders, and the public.

Table 9.5.1-5 DFS Anticipated PI Staffing Levels

Staff	FTE
Public Involvement Manager	1
Segment PI Support, Administration, Graphics, and IT	4

E. RISK REGISTER

The DFS Team's general approach to risk management has been refined through risk mitigation on a number of mega design-build and HSR projects. In short, our approach involves:

- **Identifying** by anticipating and locating sources of risks.
- **Analyzing** probable risks and opportunities, including impact on the Project in terms of safety, quality, environment, schedule, cost, and public/third-party concerns.
- **Mitigating** through implementing mitigation plans with the Project Manager and Authority approval.
- **Controlling** by updating and reporting the status of the mitigation plans and their effectiveness to DFS managers and the Authority each month.

We involve the Authority and key stakeholders as integral members of our risk management team, and we inform you of specific actions we take to identify, analyze, mitigate, and control risks. We will capture the risk information in a comprehensive risk register containing elements such as risk description, risk owner, pre-mitigation likelihood of consequences, date by which the risk will be mitigated, and risk status. We will hold monthly risk management meetings and will issue a monthly risk report that includes the minutes from these

meetings. The updated risk register will be attached to the report and distributed to DFS Team members, the Authority, and major third-parties.

Throughout the pre-bid phase, we have assembled task forces comprised of design, construction, and HSR experts to identify risks throughout the alignment and begin developing mitigation strategies. We worked closely with you in the one-on-one meetings and with several third parties to gain invaluable information to understand the key Project risks. Table 9.5.1-6 identifies our understanding of the 20 most significant risks on the Project, including their probability and severity using a scale of 1 to 5. We have also developed strategies to eliminate, mitigate, or manage these risks throughout the Project. Additional details on our design and construction innovations to eliminate or minimize risks are included in Sections 9.5.2 and 9.5.3.

Table 9.5.1-6 –Top 20 Project Risks and Mitigation Measures

Risk/Description	Probability	Severity	Approach to Eliminate or Reduce the Likelihood the Risk Will Occur or to Reduce the Impact to the Project if the Risk Does Occur
1. Worker Health and Safety: Maintain safety of DFS, Authority, subcontractor, and third-party workers during construction.	1	5	✓ Commit overall Project Safety and Security Manager, Ike Riser and three full-time segment safety managers, site safety supervisors, and administrative support. ✓ Include site-specific safety training and procedures, such as heat exhaustion, valley fever, snakebites, and construction in fog. ✓ Provide design enhancements to replace nearly 7 miles of bridges with embankments. Embankment construction poses less safety hazards and also provide for safer and cheaper future maintenance as opposed to high level bridges. ✓ Provide daily, weekly, and monthly safety meetings and on-site training to maintain a zero-incident culture. ✓ Implement safety incentive program to encourage employees to be proactive in maintaining a culture of safety with the goal of zero incidents.
2. Public Safety and Security: Maintain safety of public during construction, minimize environmental impacts, and ensure security of site.	1	5	✓ Commit overall Project Safety and Security Manager, Ike Riser and three full-time segment safety managers, site safety supervisors, and administrative support. ✓ Provide safer permanent facilities. One example is our ATC 2, which lowers the HSR profile and creates a grade separation for SR-43 to cross over the HSR alignment. This eliminates the tunnel effect and creates a safer roadway design. ✓ Initiate proactive and ongoing public outreach program to notify the public of construction activities and procedures.
3. Right-of-Entry (ROE): Delays in obtaining ROE delays the start of geotechnical and environmental surveys, utility verification, and other design surveys.	3	4	✓ Reduce the overall footprint by 133 acres and eliminate the need to acquire 56 parcels, thereby reducing the total area needed to gain ROE. ✓ Commit ROW Coordination Manager, Shannon Conaway and support team to support the authority in this task. ✓ Work with the Authority to prioritize the ROE schedule to identify the most important parcels based on environmental, design, utility, and early construction constraints.

Printed on Recycled Paper

Table 9.5.1-6 –Top 20 Project Risks and Mitigation Measures (continued)

Risk/Description	Probability	Severity	Approach to Eliminate or Reduce the Likelihood the Risk Will Occur or to Reduce the Impact to the Project if the Risk Does Occur
4. Right-of-Way (ROW) Acquisition Delays: Delays in ROW acquisition for any given parcel delays the start of construction and negatively impacts the overall schedule.	2	4	✓ Reduce the overall footprint by 133 acres and eliminate the need to acquire 56 parcels. ✓ Commit ROW Coordination Manager, Shannon Conaway and support team to support the authority in this task. ✓ Work with the Authority to prioritize, expedite, and work around the ROW acquisition process to match construction needs. ✓ Continue to build upon early coordination we already established during the pre-bid phase by meeting with a number of third parties directly affected by ROW and developing our schedule, design, and construction plan around the constraints identified in these meetings. ✓ Provide more flexibility by proposing embankment in lieu of nearly 7 miles of viaduct, since embankments are quicker to build. ✓ Provide alternative design concepts for the future Baker Commodities facility for the Authority to utilize during ROW negotiations so that construction designs are incorporated into the negotiation without delay to the permitting and construction operations.
5. Timely Utility Relocations: Impacts and delays to relocating utilities and other third party facilities negatively impacts the schedule.	3	4	✓ Assign personnel wholly committed to this effort. Working under our Third Party Coordination Manager, Drew Erickson; Utility Manager, Brandon Finnecy, PE will have a dedicated team devoted to managing our efforts to relocate utilities and third-party facilities and mitigate delay. ✓ Eliminate or minimize utility relocations at 27 intersections through reducing the Project's footprint and other design refinements. ✓ Prepare a detailed third-party facility identification and verification plan as an early work item with the goal to begin investigations immediately upon ROE. ✓ Prioritize relocation efforts of utilities on the critical path. ✓ Hold regular individual coordination meetings (in addition to the weekly global meetings) with each utility company to address their unique needs.
6. BNSF Railway Impacts: Impacts to operations; schedule risks involving impacts to ROW acquisition, traffic mitigation, and overall coordination.	3	5	✓ Assign full-time Railroad Coordination Manager, Mike Marler to work closely with the Authority and BNSF for permits/agreements. ✓ Mitigate impacts by using precast concrete girders in lieu of cast-in-place construction for work over BNSF. ✓ Establish early contact to begin coordinating critical issues shortly after NTP. ✓ Streamline coordination by segmenting the Project to include BNSF coordination only in Segments 1 and 3.
7. UPRR/SJVRR Impacts: Impacts to operations through the area; schedule risks involving impacts to traffic mitigation, ROW acquisition, and overall coordination of work.	3	5	✓ Assign full-time Railroad Coordination Manager Mike Marler to work closely with the Authority and UPRR/SJVRR for permits/agreements. ✓ Build upon the early coordination we have already established during the pre-bid phase to develop ATC 17 and continue minimizing impacts to SJVRR/UPRR. ✓ Provide a safer and more favorable permanent SJVRR/UPRR facility in this area with a grade crossing at SR-43 as part of our ATC 17. ✓ Streamline coordination by segmenting the Project to include UPRR/SJVRR coordination only in Segment 2.
8. Subsidence: Immediate or long-term risk of gradual caving in or sinking of the land.	5	1	✓ Incorporate ATCs and other design enhancements to replace approximately 7 miles of viaduct structures with embankment to provide for easier profile adjustments and more flexibility to address subsidence issues. ✓ Work with the Authority to monitor/provide seismic and geotechnical data throughout the alignment as the field data is realized.

Table 9.5.1-6 –Top 20 Project Risks and Mitigation Measures (continued)

Risk/Description	Probability	Severity	Approach to Eliminate or Reduce the Likelihood the Risk Will Occur or to Reduce the Impact to the Project if the Risk Does Occur
9. Third-Party Reviews and Approvals: The Project involves multiple reviewing agencies whose timely design reviews and approvals will be critical for meeting the schedule.	2	4	✓ Build upon Third Party Coordination Manager Drew Erickson's relationships established with several reviewing agencies during the pre-bid phase to ensure there are "no surprises" during final design. ✓ Leverage existing relationships with Caltrans and local cities, counties, and other regulatory agencies to streamline coordination efforts. ✓ Hold regular meetings to gather third-party input on design and coordinate utility requirements and scheduling, and also invite agencies to participate in over-the-shoulder reviews. ✓ Assign Utility Manager, Brendon Finnecy, PE to focus solely on coordinating relocations of utilities and third-party facilities. ✓ Prepared design options for the Hanford Station with both ATC 17 and ATC 5 that reduce the construction schedule and the visual impact of the future station by placing it at-grade. These options are preferred by the City of Hanford because they reduce the visual impacts of the station and guideway infrastructure.
10. Public and Political Support: Potential for negative perception from the local public, government bodies, taxpayers, and protest of the overall CA HSR Project.	1	2	✓ Developed ATCs and other design enhancements to significantly reduce cost and bring the Project under budget to benefit the Authority and tax payers. We will continue to value engineer and look for opportunities with the Authority to save money or enhance schedule upon NTP. ✓ Assign Julia Berry as PI Manager to use her extensive experience working with the Central Valley agricultural communities. ✓ Reduce the amount of farmland takes and minimize impacts to the public during construction by reducing the overall Project footprint and through constructionmethods and other strategies discussed in Section 9.5.3.f. ✓ Commence proactive and ongoing outreach to small businesses, DBEs, and local communities to provide opportunities to work on the Project.
11. Commodity Availability: Due to other major projects in the area, there may be issues with availability of materials such as embankment borrow, concrete, water, and steel needed for construction.	1	4	✓ Implement ATCs and other design innovations that reduce the overall quantities of long-lead risk items, such as concrete, rebar, falsework, steel truss, and piles. ✓ Lower the HSR profile to nearly maintain the same quantity of embankment fill as the RFP concept, while still replacing 7 miles of viaduct with embankments. ✓ Locate over 105 wells along the alignment and other water sources for purchase. ✓ Locate strategic borrow pits near the alignment to provide the needed dirt and minimize haul distances. ✓ Explore opportunities with local landowners to form mutually-beneficial partnerships to obtain additional borrow material adjacent to the alignment. ✓ Identify multiple suppliers for the major commodities required both locally and regionally in case of a shortfall. ✓ Prioritize design needs to order long-lead or high-risk commodities.
12. Labor Availability: Maintaining a pool of skilled and local labor.	1	4	✓ Identify workers available through the union halls to work on the Project. ✓ Leverage our internal pool of resources in California and throughout North America. ✓ Implement several training, apprenticeship, and work opportunities for the local workforce to develop trained workers for not only this Project but also future projects with the Authority and in the Central Valley. ✓ Identify opportunities to develop innovative training programs in collaboration with Cypress Mandela (a leader in California construction workforce development), the nine Central Valley Workforce Investment Boards, and the California Department of Veterans Affairs (CalVet).

Printed on Recycled Paper

Table 9.5.1-6 –Top 20 Project Risks and Mitigation Measures (continued)

Risk/Description	Probability	Severity	Approach to Eliminate or Reduce the Likelihood the Risk Will Occur or to Reduce the Impact to the Project if the Risk Does Occur
13. Environmental Impacts During Construction: Minimize present and future quality of water, air, and overall environment, including runoff to the local wells, rivers, creeks, ponds, and other water sources; mitigate fugitive dust and other emissions.	1	3	✓ Implement proven mitigation strategies as shown in Section 9.5.3.f. ✓ Reduce the overall Project footprint and implement other design enhancements to minimize impacts. ✓ Minimize the total amount of truck haul trips by significantly reducing the amount of concrete and steel required, while still maintaining nearly the same quantity of borrow material needed. ✓ Buiid upon the early coordination we have already established with numerous water authorities to mitigate or remove issues that could impact local water sources. ✓ Implement BMPs and SWPPP procedures specific to California's environmental regulations that we have used on our past successful Caltrans projects in the Central Valley and throughout the state. ✓ Mandate regular training for all employees on environmental regulations and procedures to minimize impacts.
14. Flood Control, River, Creek, and Irrigation Agency Approvals: Work requires permits and approvals from the KRCD, KRWA, USACE, Corcoran Irrigation District, Kaweah Delta Conservation District, and other agencies.	1	3	✓ Developed design drainage to protect the HSR from the 100-year flood across the entire alignment. ✓ Completed a HEC-RAS model to confirm that our refined design meets agency requirements. ✓ Buiid upon the early coordination we have already established with numerous water authorities to mitigate or remove issues that could impact local water sources. ✓ Met with several of these agencies regarding design and permit requirements to better analyze schedule risk. Based on these discussions, we decided not to implement any design changes that require a 408 Major Permit.
15. Caltrans Design Approvals: Coordinating timely design reviews and approvals with Caltrans.	2	4	✓ Meet Caltrans' preferred design to bring their roads over the HSR alignment in most locations. ✓ Build upon early coordination with Caltrans to share our ATC 17 and other design during the pre-bid phase to ensure there are "no surprises" upon contract award and to address any major issues as early as possible. ✓ Provide a grade separation for SR-43, SR-198, and SJVRR with this Project as part of ATC 17, which is a long-term objective of Caltrans and their preferred design. ✓ Leverage past successful relationships with Caltrans District 6 and understanding of design criteria, policies, and procedures. ✓ Provide a design that conforms to Caltrans design criteria and does not require any design exceptions.
16. Hazardous Materials: Risk of encountering, handling, and disposing of hazardous materials.	5	1	✓ Perform hazardous material survey prior to construction, including identification of areas with the highest potential for risk. ✓ Train all employees on identifying hazardous materials and procedures for notifying the appropriate individuals, as well as handling and disposing of all hazardous materials. ✓ Limit the potential for hazardous materials being brought on to the Project.
17. Drought Conditions Continue to Impact Water Supply: Impacts to the supply of on-site water availability.	1	3	✓ Locate 105 wells within the ROW alignment and adjacent areas, as well as other sources to purchase water to accommodate the Project's needs. ✓ Develop contingency plans to purchase required water from outside sources. ✓ Continue exploring opportunities with irrigation districts to determine water availability and backup sources based on our preliminary pre-bid discussions.

Table 9.5.1-6 –Top 20 Project Risks and Mitigation Measures (continued)

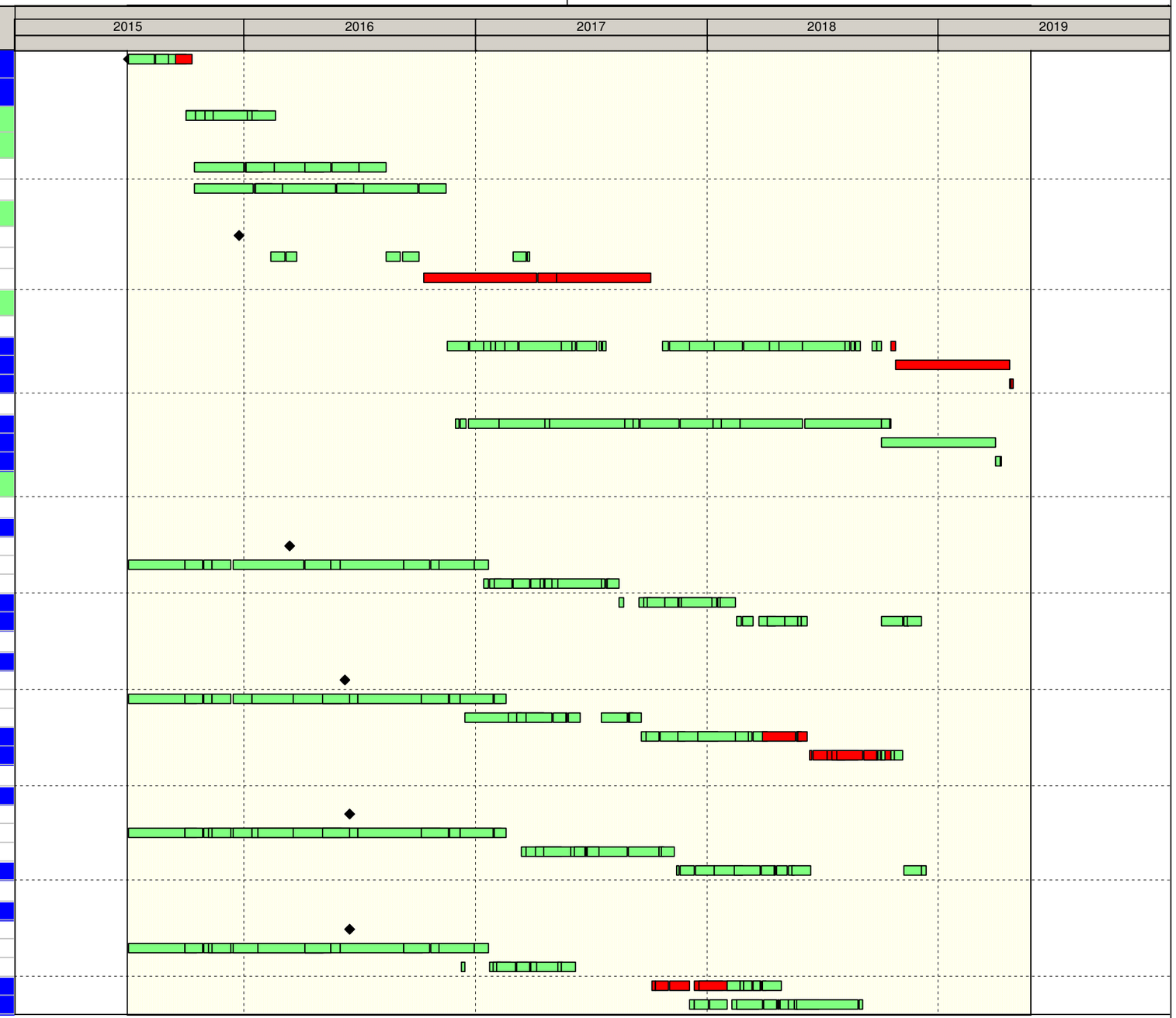
Risk/Description	Probability	Severity	Approach to Eliminate or Reduce the Likelihood the Risk Will Occur or to Reduce the Impact to the Project if the Risk Does Occur
18. Access and Continued Operations of Businesses and Farms: Maintaining mobility and accessibility for agricultural and commercial properties during construction.	5	1	✓ Reduce the overall farmland take by 120 acres, which includes 101 acres of prime farmland, significantly minimizing associated impacts to businesses and farms. ✓ Provide a MOT concept and schedule work to not close more than one adjacent grade crossing within 2 miles at any given time. ✓ Develop eight different three-season crossing locations that allow current property owners to cross under the HSR alignment on parcels needing continuity for farmland equipment. ✓ Build upon past coordination with Baker Commodities and develop a plan to allow for continual traffic flow across their property and reduce the amount of truck traffic required to pass under the HSR at the facility. ✓ Realign Hesse Avenue (Avenue 120) at the Hormel property to both minimize farmland impacts and eliminate construction impacts at Avenue 112 and Avenue 128, while providing a long-term HSR crossing and improved access to SR-43. ✓ Develop an overpass alternative as part of ATC15a that maintains direct access to SR-43 and eliminate farmland take at the Hormel property.
19. Working in Flood Zone Areas: Risk of a flood that could impact construction, schedule, safety, and environment.	1	3	✓ Develop mitigation strategies for work in flood plains that includes immediately stopping work and preparing the site when major storms are imminent. ✓ Train all employees on pre-emergency planning to allow for immediate implementation of mitigation procedures. ✓ Establish evacuation routes and communicate these routes to employees as part of their regular safety training in the case of unexpected flash floods.
20. Future HSR Integration: The CP 2-3 contract must fully integrate with CP 1 and future contracts, including rail and HSR systems components.	1	5	✓ Include Sener as a key team member to work with the Authority to ensure HSR integration with future contracts. Sener has performed similar roles on more than 1,700 miles of HSR and has more than 2,500 employees worldwide. ✓ Assign skilled design and construction staff with experience in integrating HSR trackwork and systems with civil infrastructure, including Deputy Project Manager, Javier Varela; Construction Manager, Rafael Molina; Quality Manager, Antoni Gimenez; V&V Manager, J. Antonio Castro; and HSR Rail Integration Lead, Alvaro Rojo. ✓ Include other contractors in our weekly status meetings and look-ahead schedule distributions. ✓ Make DFS HSR integration staff available for participation in future HSR rail and systems task forces and other meetings.

Printed on Recycled Paper

Level 2 Schedule

Level 2 Schedule

	OD	Start	Finish
Project	73	07/01/15	10/09/15
Management Segment 1	999	07/01/15	04/29/19
Geotech Testing & Lab	95	10/01/15	02/19/16
Design (to Start work)	285	10/13/15	11/14/16
BNSF(Utitlies & Earthwork)	218	10/13/15	08/11/16
Track Embankment	285	10/13/15	11/14/16
BNSF Sidings	465	12/24/15	10/04/17
ROW Available	0	12/24/15	12/24/15
Contractor Utilities and Earthwork	281	02/12/16	03/27/17
BNSF	360	10/10/16	10/04/17
Earthwork	638	11/17/16	04/29/19
Group 1	638	11/17/16	04/29/19
Embankments	487	11/17/16	10/25/18
Surcharge	180	10/26/18	04/23/19
Subgrade & AC	4	04/24/19	04/29/19
Group 2	617	11/29/16	04/10/19
Embankments	475	11/29/16	10/17/18
Surcharge	180	10/04/18	04/01/19
Subgrade & AC	7	04/02/19	04/10/19
Grade Separation Structures	901	07/01/15	12/12/18
Group 1	896	07/01/15	12/05/18
Elkhorn	554	07/01/15	08/14/17
ROW	0	03/13/16	03/13/16
Design	390	07/01/15	01/20/17
Structure	152	01/13/17	08/14/17
S. Fowler	133	08/15/17	02/15/18
E. Davis	209	02/16/18	12/05/18
Group 2	875	07/01/15	11/06/18
E. Adams	580	07/01/15	09/19/17
ROW	0	06/08/16	06/08/16
Design	428	07/01/15	02/17/17
Structure	199	12/15/16	09/19/17
E. Lincoln	188	09/20/17	06/08/18
E. South	107	06/11/18	11/06/18
Group 3	901	07/01/15	12/12/18
E. Floral	617	07/01/15	11/09/17
ROW	0	06/16/16	06/16/16
Design	428	07/01/15	02/17/17
Structure	173	03/14/17	11/09/17
E. Manning	283	11/13/17	12/12/18
Group 4	830	07/01/15	09/04/18
E. Clovis	505	07/01/15	06/06/17
ROW	0	06/16/16	06/16/16
Design	408	07/01/15	01/20/17
Structure	129	12/08/16	06/06/17
Nebraska	147	10/05/17	04/27/18
E. Mountain	196	12/05/17	09/04/18

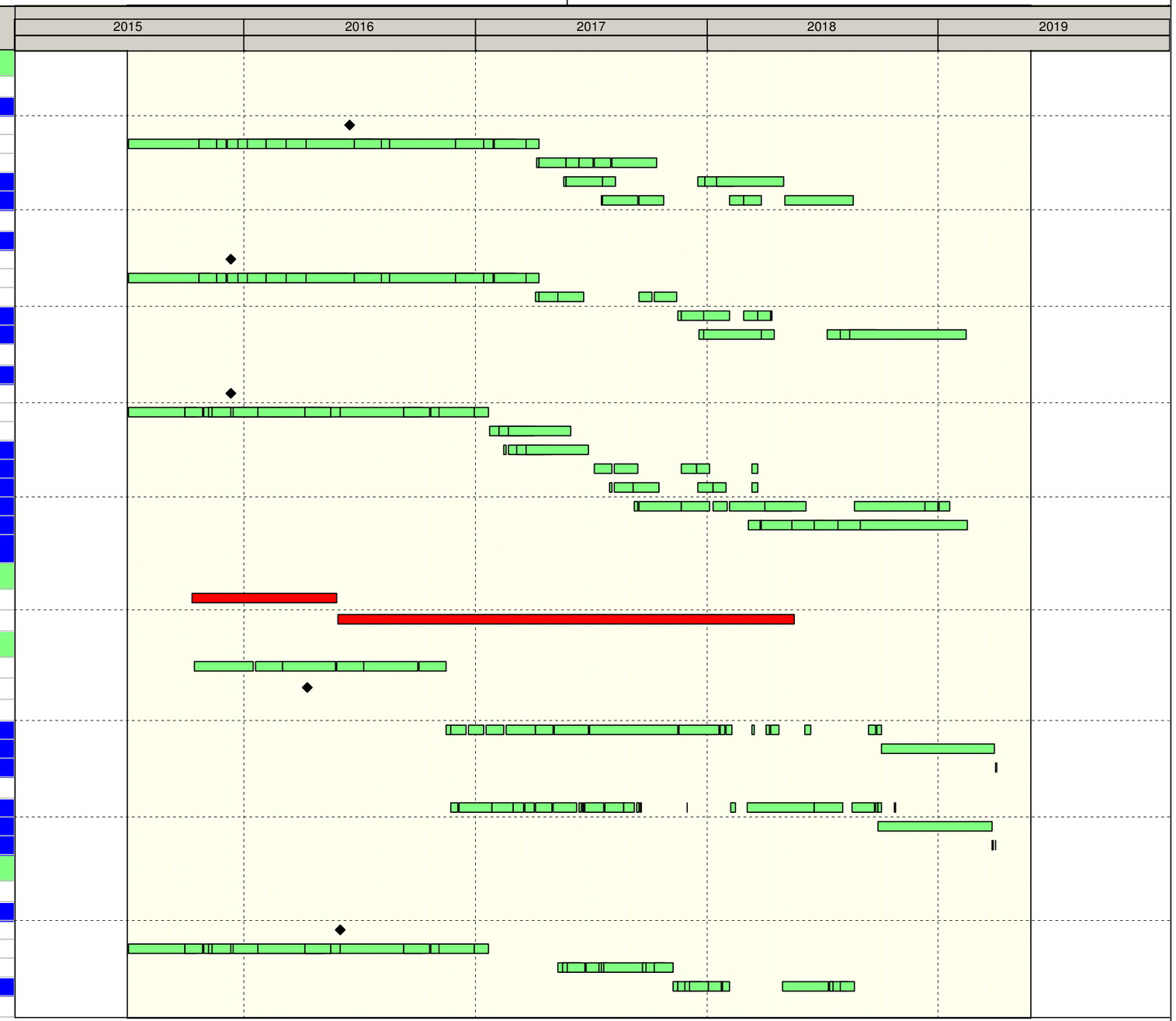


Actual Work
Remaining Work
Critical Remaining Work
Milestone

California High-Speed Rail Program
Construction Package 2-3
RFP No.: 13-57

Level 2 Schedule

	OD	Start	Finish
HSR Structures	948	07/01/15	02/15/19
Group 1	819	07/01/15	08/20/18
H-1, Conejo	598	07/01/15	10/13/17
ROW	0	06/16/16	06/16/16
Design	464	07/01/15	04/10/17
Structure	133	04/07/17	10/13/17
H-3, BNSF	239	05/19/17	05/02/18
H-4, Peach	275	07/18/17	08/20/18
Group 2	947	07/01/15	02/14/19
H-11, 9th Ave.	620	07/01/15	11/14/17
ROW	0	12/11/15	12/11/15
Design	464	07/01/15	04/10/17
Structure	157	04/04/17	11/14/17
H-12, Cairo St.	108	11/15/17	04/13/18
H-13, Kings River	290	12/19/17	02/14/19
Group 3	948	07/01/15	02/15/19
H-14, Box Culvert	500	07/01/15	05/30/17
ROW	0	12/11/15	12/11/15
Design	408	07/01/15	01/20/17
Structure	90	01/23/17	05/30/17
H-9, Access Road	95	02/13/17	06/27/17
H-5, SR-43 Truss	186	07/06/17	03/22/18
H-7, Cole Slough	168	07/31/17	03/21/18
H-10, Dutch John Cut	356	09/08/17	01/18/19
H-2, BNSF	239	03/07/18	02/15/19
Management Segment 2	988	07/01/15	04/12/19
PG&E (115 KV Transmission)	952	10/10/15	05/18/18
Design	230	10/10/15	05/26/16
Move 115KV(Elder>Jackson)	722	05/27/16	05/18/18
Earthwork	907	10/13/15	04/03/19
Design	275	10/13/15	11/14/16
ROW	0	04/09/16	04/09/16
Group 1	622	11/15/16	04/03/19
Embankments	472	11/15/16	10/02/18
Surcharge	180	10/03/18	03/31/19
Subgrade & AC	3	04/01/19	04/03/19
Group 2	615	11/22/16	04/01/19
Embankments	485	11/22/16	10/26/18
Surcharge	180	09/28/18	03/26/19
Subgrade & AC	4	03/27/19	04/01/19
Grade Separation Structures	988	07/01/15	04/12/19
Group 1	821	07/01/15	08/22/18
Dover	615	07/01/15	11/07/17
ROW Available	0	06/01/16	06/01/16
Design	408	07/01/15	01/20/17
Structure	129	05/11/17	11/07/17
Excelsior	206	11/08/17	08/22/18
Group 2	965	07/01/15	03/12/19

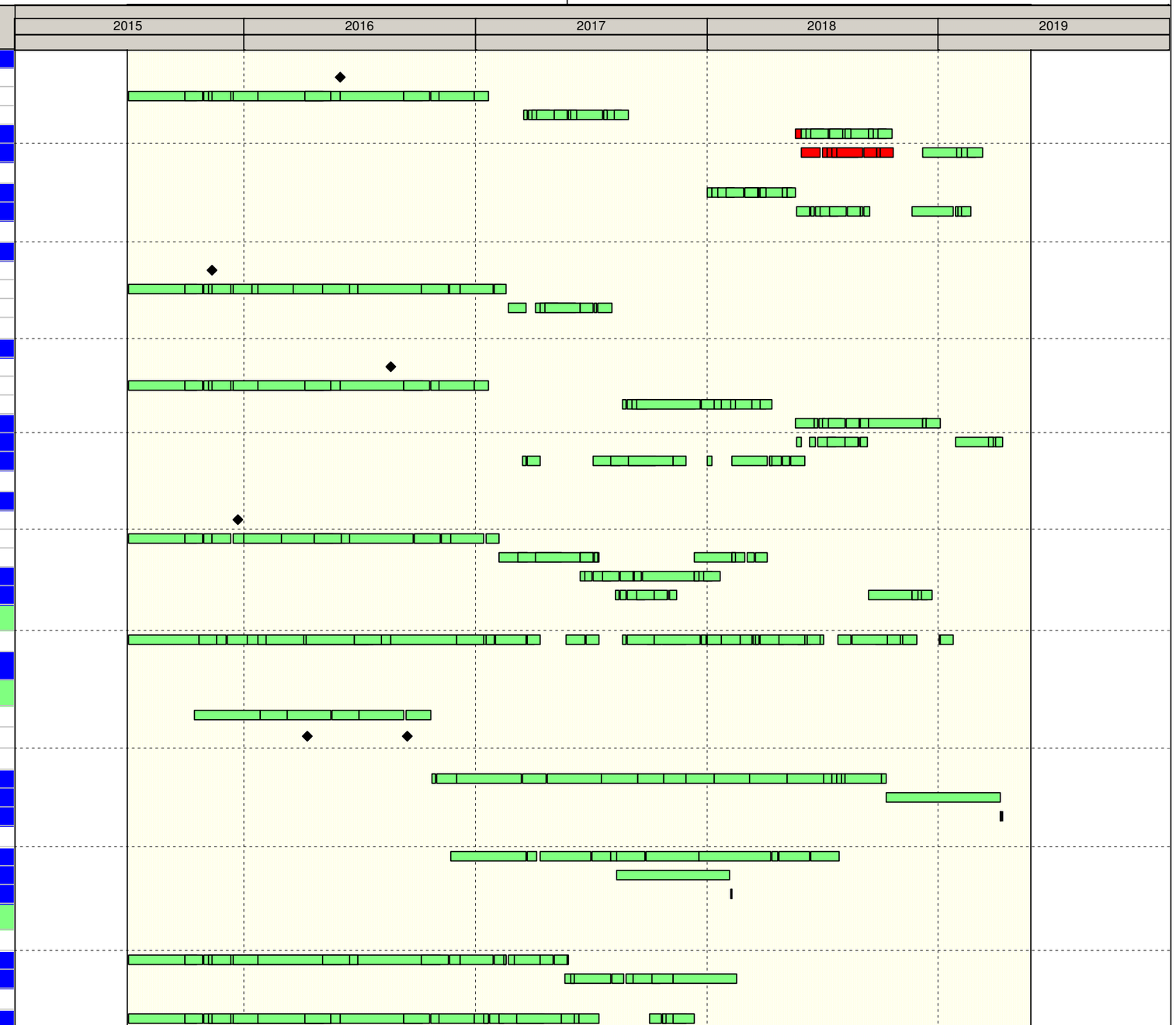


Actual Work
Remaining Work
Critical Remaining Work
Milestone

California High-Speed Rail Program
Construction Package 2-3
RFP No.: 13-57

Level 2 Schedule

	OD	Start	Finish
Elder	565	07/01/15	08/29/17
ROW Available	0	06/01/16	06/01/16
Design	408	07/01/15	01/20/17
Structure	118	03/17/17	08/29/17
Flint	110	05/21/18	10/19/18
Fargo	205	05/30/18	03/12/19
Group 3	298	01/02/18	02/21/19
Idaho Ave.	100	01/02/18	05/21/18
Jackson	198	05/22/18	02/21/19
Group 4	548	07/01/15	08/04/17
SR43 Over SJVRR	548	07/01/15	08/04/17
ROW Available	0	11/11/15	11/11/15
Design	428	07/01/15	02/17/17
Structure	119	02/21/17	08/04/17
Group 5	988	07/01/15	04/12/19
Houston	728	07/01/15	04/13/18
ROW Available	0	08/20/16	08/20/16
Design	408	07/01/15	01/20/17
Structure	170	08/21/17	04/13/18
Hanford	164	05/21/18	01/03/19
Iona Ave.	234	05/22/18	04/12/19
SR-43 (K-7)	319	03/15/17	06/04/18
Group 6	908	07/01/15	12/21/18
SR-43 (K-8)	723	07/01/15	04/06/18
ROW Available	0	12/21/15	12/21/15
Design	419	07/01/15	02/06/17
Structure	304	02/07/17	04/06/18
Kansas	158	06/15/17	01/22/18
Kent	358	08/09/17	12/21/18
HSR Structures	933	07/01/15	01/25/19
Group 1	933	07/01/15	01/25/19
Management Segment 3	988	07/01/15	04/12/19
Earthwork	914	10/13/15	04/12/19
Design	260	10/13/15	10/21/16
ROW	159	04/09/16	09/15/16
Group 1	645	10/24/16	04/12/19
Embankments	493	10/24/16	10/10/18
Surcharge	180	10/11/18	04/08/19
Subgrade & AC	4	04/09/19	04/12/19
Group 2	439	11/22/16	07/27/18
Embankments	421	11/22/16	07/27/18
Surcharge	180	08/11/17	02/06/18
Subgrade & AC	3	02/07/18	02/09/18
Structures	962	07/01/15	03/07/19
Group 1	688	07/01/15	02/16/18
Poplar	498	07/01/15	05/26/17
SR43 (C2-3002+00)	195	05/22/17	02/16/18
Group 2	737	07/01/15	04/26/18
Nevada Ave.	640	07/01/15	12/12/17

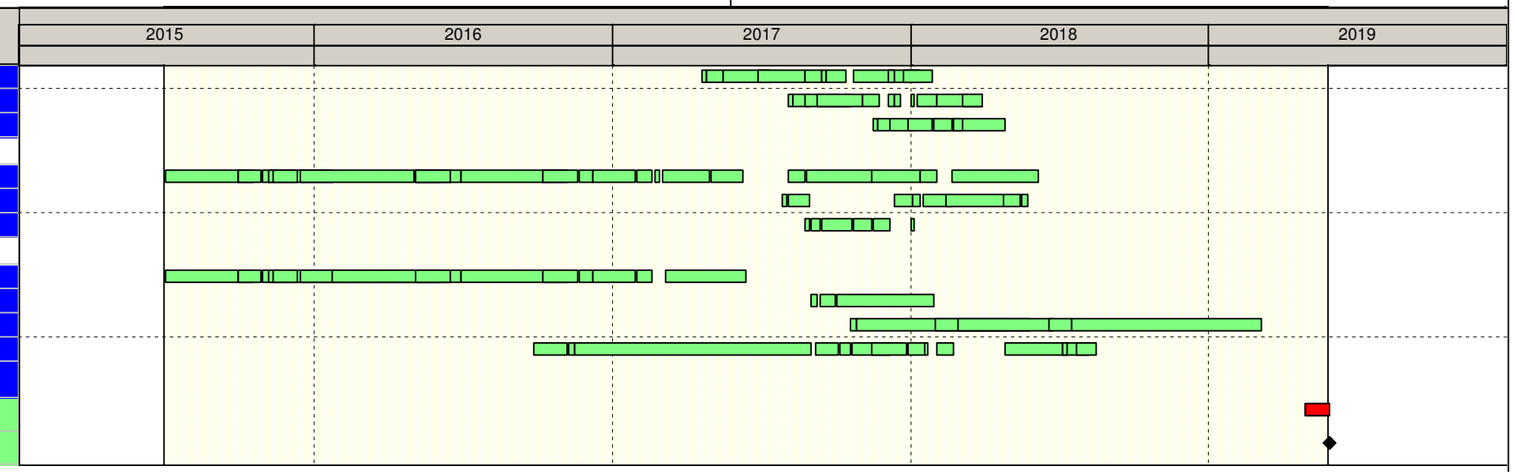


Actual Work
Remaining Work
Critical Remaining Work
Milestone

California High-Speed Rail Program
Construction Package 2-3
RFP No.: 13-57

Level 2 Schedule

.	OD	Start	Finish
Hesse	203	04/19/17	01/26/18
Avenue 88	172	08/03/17	03/30/18
J22	117	11/15/17	04/26/18
Group 3	765	07/01/15	06/05/18
Stoil Spur	765	07/01/15	06/05/18
Tule	215	07/27/17	05/23/18
Stoil Truss	97	08/24/17	01/05/18
Group 4	962	07/01/15	03/07/19
Deer Creek	510	07/01/15	06/13/17
SR-137 (Whitley)	100	09/01/17	01/29/18
BNSF Staddle Bent	361	10/19/17	03/07/19
Corcoran	494	09/26/16	08/16/18
Completion	21	04/30/19	05/28/19
Punchlist	20	04/30/19	05/28/19
Complete	0	05/28/19	05/28/19



Actual Work
Remaining Work
Critical Remaining Work
Milestone

California High-Speed Rail Program
Construction Package 2-3
RFP No.: 13-57

Madrid–Sevilla High-Speed Rail Line, Madrid-Sevilla, Spain

9.5.2 Design and Design Oversight

I-15 Corridor Expansion (CORE), Utah County, Utah

9.5.2 Design and Design Oversight

COMMITMENTS

- Full design mobilization at Notice to Proceed (NTP)
- Seek lower life-cycle costs
- Reduce greenhouse gases created during construction
- Reduce safety risks throughout design
- Listen to stakeholders and partner with the Authority to address concerns
- Provide an aesthetically pleasing design
- Expedite design to support meeting substantial completion within 980 days
- Protect the rail from the 100-year flood
- Provide a horizontal and vertical alignment that improves ridership and future operation
- Provide thorough design quality reviews by qualified experts
- Reduce project impacts on farmlands, Right-of-Way (ROW), visual, community, utility relocations, and building demolition

APPROACH

By evaluating the Final Environmental Documents, attending various public meetings, meeting with numerous area stakeholders, and evaluating the RFP design for potential improvements and risks, we have crafted an approach to design and oversight that understands your potential concerns, and we have developed solutions for addressing each. Our approach includes the following key elements:

- **Immediate mobilization of our entire design team at NTP**: We provide continuity from the pre-bid stage by using proposal team members working from their home offices to eliminate unnecessary relocation and save costs. There will be no learning curve, and we are ready to start work immediately. This allows us to begin delivering design documents shortly after NTP.
- **Design advancement during the pre-bid stage:** We have already advanced the engineering and are prepared to submit a design baseline report shortly after NTP. This allows us to begin preparing design documents for third-party approval early in the schedule.
- **Continued coordination with approving agencies:** During the pre-bid stage, we have met with agencies such as United States Army Corps of Engineers (USACE), Central Valley Flood Protection Board, and a number of irrigation districts to understand their requirements. We prepared our design and schedule based on that knowledge and commitment to lower potential third-party schedule risks.
- **Schedule flexibility:** There are a multitude of long-lead approvals and permits required prior to starting construction. We will quickly and aggressively pursue long-lead approvals and permits, providing you a design that maximizes the schedule's flexibility during construction.
- **Considering the whole system:** We have designed the Project bearing in mind future packages. For example, our at-grade station design (ATC 17) provides you with significant savings when building the future station and platforms.
- **Provide HSR Experienced V&V Personnel:** CP 2-3 (Project) is literally the foundation of your future High Speed Rail (HSR). The way the track bed is designed and constructed has a fundamental impact on future train performance and rideability. We offer highly experienced Verification and Validation (V&V) personnel who have the experience, expertise, and understanding to deliver a quality design that meets the exacting demands of HSR infrastructure.
- **ROW Acquisition:** We are committed to and have already reduced ROW needs through our design. Reduced ROW requirements improves your ability to complete acquisition ahead of schedule and minimizes your risk related to late acquisition. We also offer a team of ROW professionals who can assist you in expediting the acquisition process.
- **Safety:** We will focus on reducing safety risks throughout our effort, including during design. For example we reduced structure lengths, which results in smaller cranes/hoists and reduced safety risks.
- **Environmental:** We will provide you an accelerated environmental re-examination schedule related to design elements outside of the Project footprint.

INNOVATION

- Our design reduces ROW acquisition by up to 133 acres, including 120 acres of farmland, and eliminates 56 parcels from the acquisition plan.
- Our design places the Hanford station (ATC 17) at-grade to minimize visual impacts.
- In order to reduce subsidence impacts, improve durability and maintainability, reduce lifecycle costs, and reduce greenhouse gasses, we modified the design to decrease the size of structures and replaced structures with embankment (ATC 2, 3, and 17).
- Our design improves the grade separation design and results in eliminating utility relocations at 27 of the 32 intersections.
- We modeled the refined design using proprietary HSR software STREN to demonstrate that our design results in improved rideability and operational performance.

A. DESIGN STAFF MOBILIZATION

Completing the Project on or ahead of schedule is critical for building public support and demonstrating that the Authority will deliver CP 2-3 on time. In support of your values for prompt mobilization and a design that reduces environmental and schedule constraints, the DFS Team offers the following approach and commitments for mobilizing our design staff during the first 180 days from NTP.

Early and Rapid Mobilization: Continuity from the Pre-bid Stage

Over 100 members of our pre-bid design team will continue working on the project after we are selected. This reduces start-up time and cost associated with learning about the Project.

We have already started working. Selecting DFS means that you have a jump on many early action items. We already completed an engineering survey of the rail alignment that meets the contract requirements. We have advanced our design to 30%, and we are ready to move to 60% in preparation for third-party coordination. The effort already initiated offers DFS and the Authority a 3-month schedule advantage, which will allow us to analyze and mitigate various schedule and environmental risks.

We mobilize quickly and hit the ground running at NTP. Upon NTP, we will mobilize our entire design team. We will begin with key managers and their teams to work on early action items such as the Design Baseline Report, environmental re-examinations, and the USACE Section 408 Minor Permit at Kings River. Figure 9.5.2-1 shows our design organization and identifies the key design managers and staff mobilized well within the first 180 days.

EXPERIENCE

BELLEVUE BRAIDS DESIGN-BUILD, BELLEVUE, WASHINGTON

In the pre-bid phase, we worked closely with the contractor to create aggressive, yet feasible design and construction schedules. This advanced planning allowed us to quickly mobilize the design team into a highly-productive group as soon as we were selected. The first preliminary design package was submitted for review within 2 months of NTP, and the first Released for Construction plans were issued 2 months later, never once sacrificing the quality process.

Weekly construction schedule coordination provided ample opportunity to verify that the design schedule continued to support the construction schedule at all times. Each discipline task lead was responsible for reporting weekly on the status of their deliverables to confirm that the work stayed on schedule. The process proved to be so effective that when the design-build contractor requested we advance the NE 10th Street Bridge design 6 months ahead of the original schedule, we were able to calculate staffing needs and find additional staff to complete the work on time.

In December 2009, WSDOT awarded the project. By May 2012 (2.5 years later), WSDOT cut the ribbon, marking the opening of the new ramps 7 months ahead of schedule.

Design Office Location

We will use multi-office execution to complete the design just as we did during the pre-bid stage. However, the design will be centrally managed at our Project office near the alignment where the design management and segment/task force leads will be co-located with DFS. This approach provides more efficient mobilization, because we can start at NTP without having to relocate the entire design team to one office. We frequently use this approach on design-build projects to expedite design.

We use ProjectWise for document management and file sharing between design offices. Our entire design team knows ProjectWise from work on the I-15 CORE Design-Build and Ohio River Bridges Design-Build, as well as during this Project's pre-bid stage where we used 11 different offices. To aid early and rapid mobilization, we have already developed the Project file system in ProjectWise based on Authority requirements.

Printed on Recycled Paper

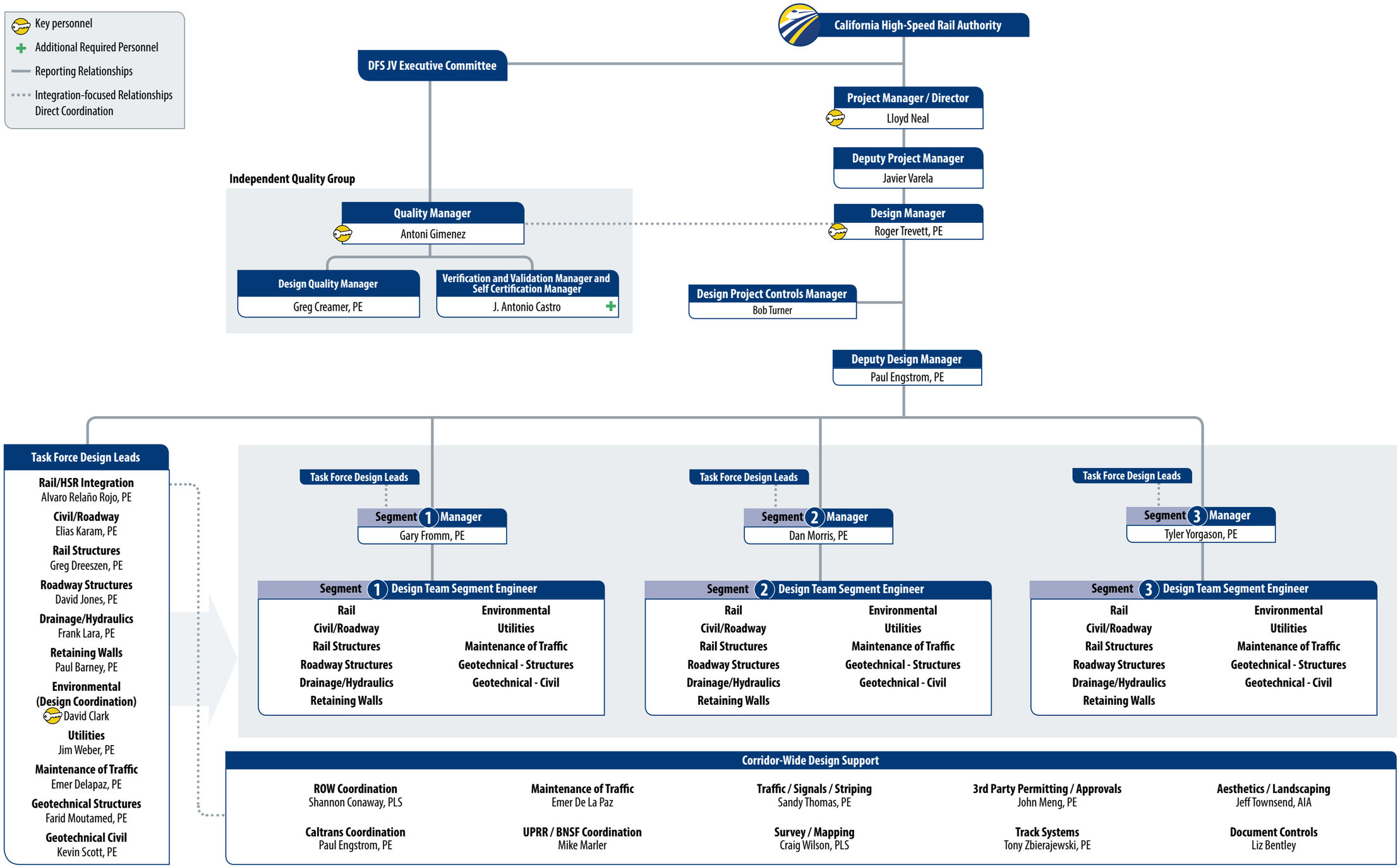


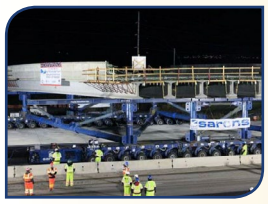
Figure 9.5.2-1 – Design Organization Chart

Analysis of Design Progress and Field Activities within the First 180 Days Following NTP.

Figure 9.5.2-2 – Analysis of Design Progress and Field Activities within the First 180 Days Following NTP.

Printed on Recycled Paper

EXPERIENCE



On the I-15 CORE Design-Build, hundreds of users from multiple companies used ProjectWise to work collaboratively from the co-located project office or remotely. With so many users in so many different locations, version control was a major concern. With ProjectWise, users would receive updated existing and proposed references as well as resource and CADD standard updates automatically and instantaneously. This ensured that every user was displaying all profiles, alignments, and text the same way. Additionally, ProjectWise tracks every change to a base file by documenting who changed it and what time it was changed. If a user accidentally deleted or modified a file, everyone had the ability to recover the correct document. With ProjectWise, the prime designer is able to enforce corridor-wide standards while ensuring that everyone is using the most current information. This improves the quality of work and minimizes the need for rework.

Early Focus on Long-lead Approvals and Permits

We will mobilize our entire design team at NTP to prepare submittals for plan approvals and permits so that we can reduce and eliminate the potential schedule impacts from permit delays. One example of a need for early approval is the USACE Section 408 Minor Permit and Conditional Letter of Map Revisions (CLOMR) at Kings River. The ROW in this area is available early in the schedule; however, the permits will take some time to complete. To address this, one of our first design tasks will be to prepare and submit the required documents for approval.

Our focus on long-lead approvals allows us to start construction as soon as ROW is available, which improves our ability to deliver on time.

Analysis of Design Progress and Field Activities within the First 180 Days Following NTP

Figure 9.5.2-2 on the previous page provides a complete analysis for design progress and the field activities that will be completed within 180 days.

Proactive Communication and Coordination with Area Stakeholders

To minimize delays in approvals and permits, we initiated a proactive campaign to work with critical stakeholders, including approval and permitting agencies, during the pre-bid phase. Taking this approach has helped us identify major concerns and plan our work and coordination efforts accordingly. For example, BNSF coordination needs to start immediately upon NTP as it can take up to two years to obtain their approval and begin construction. To address this, upon NTP and with the Authority's approval, we will expedite coordination with these stakeholders and begin working with additional stakeholders, such as BNSF, SJVRR, KRCD, CVFPB, USACE, PG&E, and other agencies.

We also recognize that irrigation districts, counties (Kings, Tulare, and Fresno County), and other local agencies will require coordination and approval for improvements to their facilities. We will use the same proactive coordination strategy. We will partner with these agencies to address their concerns and make sure that our proposed design satisfies their requirements.

We offer to support the Authority's public outreach to all stakeholders. We will proactively communicate and coordinate with the Authority to provide area stakeholders, such as Kings County, Fresno County, Tulare County, City of Corcoran, and City of Hanford up-to-date project information. This will keep stakeholders aware of upcoming construction activities that may affect their constituents and allows them to proactively notify us about potential issues.

Table 9.5.2-1 on the following page demonstrates how we applied this approach during the proposal stage.

Table 9.5.2-1 – Stakeholders we already met during the pre-bid phase

Stakeholder	Discussion and Design Decisions
Kings River Conservation District (KRCD)	• We held two meetings with KRCD to discuss how our ATC impacts their facilities. KRCD informed us they would not maintain proposed levee improvements, which would require a USACE Section 408 Major Permit. • We decided to use ATC 3 to avoid levee impacts and schedule risks associated with a Section 408 Major Permit. • We gave KRCD confidence that we understood their constraints and that the Kings River can be full year-round, confirming that we would plan construction accordingly.
Kings River Water Association (KRWA)	• We were informed that irrigation water releases may occur at any time of the year. • From our meeting, we devised an approach to construct during the flood season and permit on a bi-weekly basis. We coordinate permits with KRWA so they can provide us notice of pending releases. • We gave KRWA confidence that we understood their constraints and that the Kings River can be full year-round, confirming that we would plan construction accordingly.
Central Valley Flood Protection Board (CVFPB)	• We discussed processing USACE Section 408 Minor Permit and for a CLOMR/LOMR to understand the process and timing. • We confirmed that our design meets 100-year flow rates in the flood zone and that the depth of flow may not increase more than 0.1 ft.
US Army Corp of Engineers (USACE)	• We discussed permit processing and timing for a Section 408 Minor/Major permitting. USACE explained that our ATC 1 options would require a Section 408 Major Permit because KRCD is unwilling to accept maintenance responsibility for our design. • We confirmed that placing additional piers in the waterway would require a Section 408 Minor Permit. • We decided to not touch the levees because of schedule risk associated with a Section 408 Major Permit.
City of Hanford	• We shared our ATC 17 design, which places the Hanford station at-grade and provides for a grade-separation for SJVRR/SR-43. • Hanford strongly supports ATC 17 in connection with their future plans and how the design better blends the Project into the City. We also understood that they want to convert the existing at-grade crossing of SJVRR/SR-43 to a grade-separation.
Kaweah Delta Irrigation District	• We met to discuss the work involving Cross Creek and to confirm that lowering the elevation in this area per our ATC 2 is compliant with their requirements. • Clearance requirements over the levees are not 16 ft. (as shown in the original RFP drawings), and we have designed clearance in the area based on District requirements.
Baker Commodities	• We learned that Baker wants to maintain continuous operations, provide for utilities and trucks to cross the HSR alignment at minimal slope, and minimize farmland take. • We continue to work with Baker to develop options to minimize impacts, including relocating their facilities to the west. This would decrease farmland acreage and eliminate trucks from crossing the HSR alignment.
Caltrans	• We shared our proposed design revisions at multiple locations, including ATC 2 and ATC 17. • Caltrans supported our design to place SR-43 over the HSR alignment where feasible to eliminate traffic safety concerns.
Leprino Foods	• We began early coordination with Leprino because they are the most active user of the SJVRR track, moving outbound freight across the HSR alignment before taking rail cars out on the UPRR mainline. • Our ATC 17 anticipates implementing a shoofly for the SJVRR during construction to ensure continuous rail movement for the Leprino Foods outbound cheese products.

Printed on Recycled Paper

B. DESIGN FOR MAJOR PROJECT ELEMENTS, PRINCIPLES, ATCS, AND AESTHETICS

Intended Design for Major Project Elements

Civil Works

Beginning during the pre-bid phase, we set out to establish the final HSR track and area roadway profiles. What came from this effort was a series of civil design refinements. Our work was driven to create an efficient and cost-effective HSR profile. The key elements of our design advancement and refinements are described below.

Base Mapping

A sustainable, durable, and maintainable design requires a solid base. We completed aerial topography and photography for a 1,500-foot-wide corridor along the entire 65-mile alignment. We mapped area topography to the same accuracy specified for final design to benefit the Authority in two ways. First, we have refined our design (and, more importantly, the HSR track profile) using accurate and final base mapping. Second, because we have already completed mapping, we can transition directly to the Baseline Design Report (30% submittal), saving 3 months on the Project schedule.

Drainage Refinements

We have identified drainage to be the primary control point for the HSR profile. Drainage design is controlled by three elements: 1) existing upstream/downstream drainage structures crossing BNSF, 2) topography, and 3) the design criteria. Our approach to drainage is described below.

Culverts

Our design maintains existing BNSF structures in place, except in isolated cases where the BNSF railway is being relocated. In these areas, we will relocate the drainage to lower points on the topography in order to prevent upstream ponding. We used a similar approach to address the HSR alignment's topography, where in many cases the RFP design did not capture drainage at topographic low points that can lead to drainage concerns and require the HSR track profile to be higher than necessary. We relocated drainage crossings at the low points, resulting in the lowest possible elevation that would also capture all drainage and meet flood plain and design criteria requirements.

The next challenge was determining the type of culvert to use. Design criteria require 6 ft. of cover as measured from the outside of the drainage feature to the top of the rail. Round pipe necessitates a sleeve, where minimum cover is measured from the outside of that sleeve. As shown on Figure 9.5.2-3, a box culvert is not sleeved, which decreases the distance between the culvert invert and the top of the rail. Box culverts are also more efficient for drainage and require less maintenance as compared to a round pipe. For this reason, we selected box culverts for all drainage structures crossing the HSR alignment. This approach will benefit the Authority by lowering HSR track elevation, reducing embankment costs, increasing maintainability, and decreasing the permanent construction footprint.

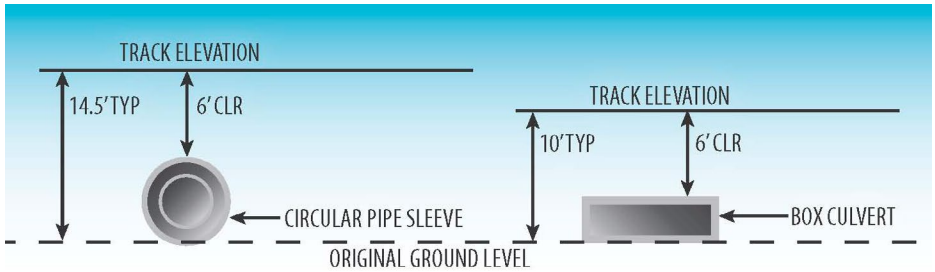


Figure 9.5.2-3 We use box culverts instead of circular pipe to lower the track height, which in turn reduces Project costs and ROW requirements.

Flood Zones

Numerous flood zones cross the HSR alignment, namely at the Kings River Complex, Cross Creek, Tule River, and Deer Creek. We studied floodplain impacts at each crossing to determine how our design would impact the depth of flow and meet FEMA requirements. We prepared a proposed condition HEC-RAS analysis, followed by an iterative drainage analysis that added culverts and drainage crossings into the model until it met FEMA requirements. Our drainage analysis concluded that our design will meet FEMA requirement to limit depth of flow increases to less than 0.1 ft.

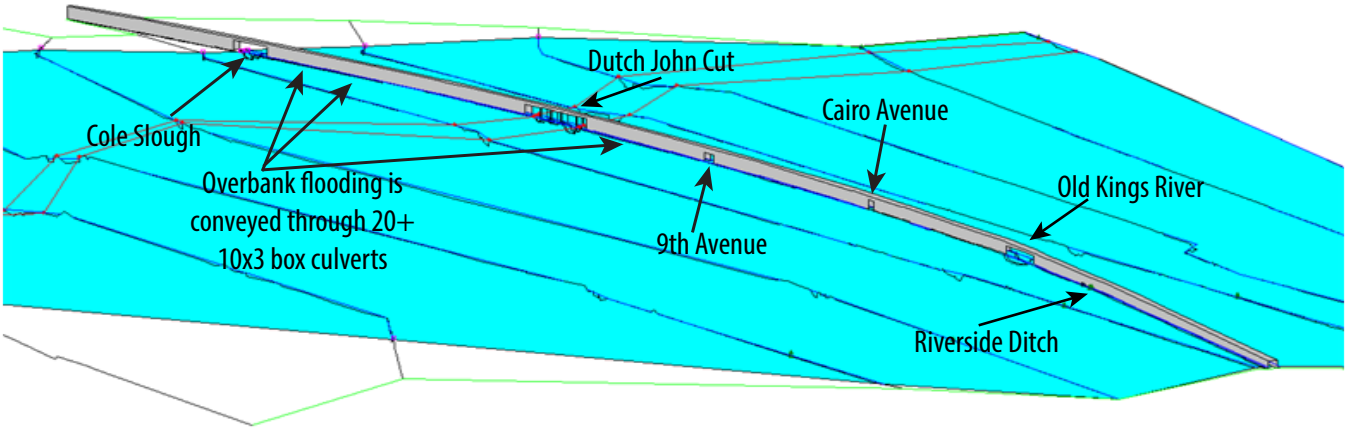


Figure 9.5.2-4 – The DFS completed a HEC-RAS model (shown above) of our proposed embankment in the floodzone. The model confirms that our design meets CVFPB and FEMA requirements by limiting the increase in flow depth to less than 0.1-ft.

Levees

The Kings River Complex includes three USACE Project levees that are maintained by KRCD. We proposed ATC 1 to improve the Project levees at HSR crossings. However, in talking with KRCD, CVFPB, and USACE, we learned that impacting the levees would trigger a Section 408 Major Permit (a significant schedule impact/risk). Furthermore, KRCD would expect the Authority to be responsible for maintaining the levees. As a result, we propose to use ATC 3 to reduce schedule risk and prevent transferring levee maintenance risk to the Authority.

Drainage Basins

The RFP design includes numerous detention/retention basins (maintained by our design) throughout the alignment. To supplement the RFP basins, we designed the track-side to provide for infiltration/treatment of minor drainage events and to act as a sediment basin for larger storms. The sediment basin also helps reduce ongoing maintenance for the culverts. Our approach will benefit the Authority by reducing maintenance costs associated with cleaning sediment out of culverts and through preventing culverts from being clogged during a major storm.

HSR Alignment Refinements

Though horizontal changes were considered, changes were ultimately not developed to avoid altering acquisition requirements, necessitating additional environmental clearances, and causing permit delays as compared to the RFP. However, using new topography and our refined drainage design, the DFS Team significantly improved the HSR vertical alignment as follows:

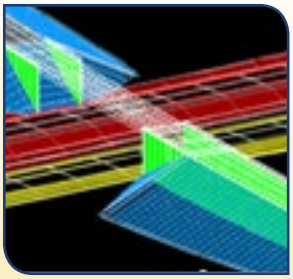
- **Replaced viaduct with embankment.** Subsidence in the Central Valley is a major issue. In our experience on other mega HSR projects, we have learned that using embankment instead of viaduct reduces subsidence impacts by allowing the owner to adjust the ballast to address subsidence. For this reason, and to reduce

Printed on Recycled Paper

life-cycle costs, we replaced nearly seven miles of viaduct with embankment. The other advantage is that the refined design minimizes the use of concrete, steel, wood, and water.

- **Lowered the profile where possible to reduce embankment.** Our refined design reduces embankment requirements, which minimizes the carbon footprint and the number of trucks required for construction. Our lowered profile also reduces impacts on existing traffic and total construction cost.

BEST PRACTICE



3D MODELING

Using InRoads, we developed an intelligent 3D geometric model of the rail alignment and grade separations. We used the model to determine the effect that modifying the alignment has on ROW, wall heights, and adjacent features along the corridor. As a result, we improved the ride-ability of the rail alignment, reduced the required ROW, amount of embankment, and the quantity of retaining walls.

- **Incorporated an at-grade station.** Under ATC 17 (the preferred option for the City of Hanford), we propose an at-grade station in Hanford that saves $130 million in initial construction cost and over $13 million in future station construction cost. Lowering the HSR profile, especially at the Hanford station, greatly minimizes visual impacts.
- **Reduced settlement.** Our design includes smaller embankments that contribute to reductions in the total load transferred from the new infrastructure to the ground and expected settlements.
- **Reduced required ROW.** A lower profile and refined side slopes on grade separations result in less ROW requirements and farmland take.
- **Improved constructability of future HSR track and railway systems.** Maximizing the amount of at-grade rail improves constructability of the future rail and provides easier integration between railway systems and the ancillary facilities located at ground level close to the main line (e.g. interlocking houses or traction power substations) that require access to the track level.
- **Reduced the number of vertical elements (grades and vertical curves).** We created long stretches of constant slope for flexibility when placing future turnouts and crossovers. As an example, we eliminated all vertical changes between Kings River and Cross Creek. Every action taken to smooth the HSR profile improves rider experience as the vertical acceleration values and overall number of changes in its vertical profile design are reduced.

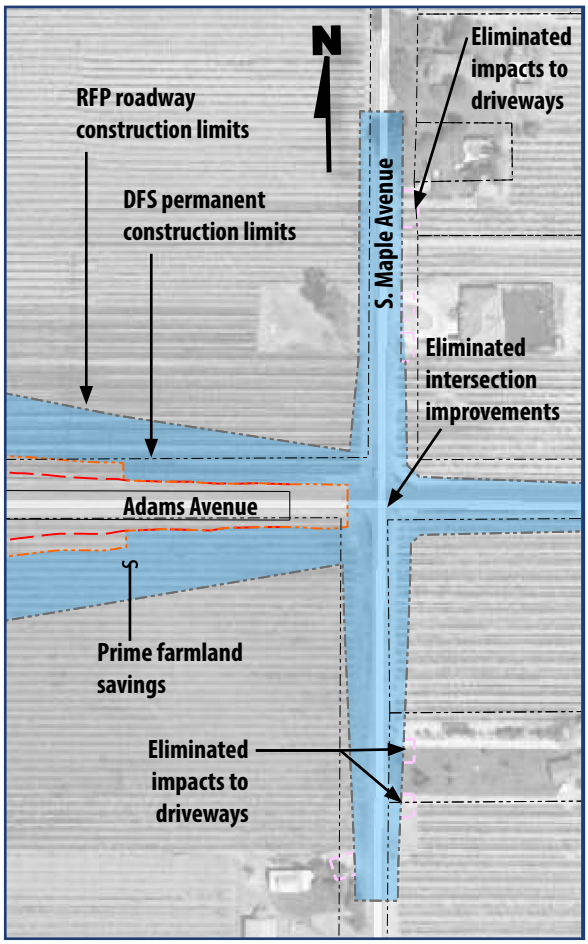
BEST PRACTICE

We have lengthened vertical curves to provide passengers with a smoother ride. We validated that our design improved the rider experience by simulating a HSR train run using STREN, a state-of-the-art application developed by Sener. This software analyzed the progress of a HSR train (using similar characteristics to the HSR train that will most likely be used on the Project) along the alignment at speeds up to 250 mph on a given path under a series of design and constraint operation criteria. The program analyzed characteristics such as acceleration, deceleration, gravity and travel times. We found that our design matches the operational performance of the RFP design and provides a smoother ride for passengers.

Roadway Design Refinements

Lowering the HSR profile also allows for lower roadway overheads. Using our refined HSR profile, we set the new clearance envelopes and crossings as the control point for the roadway profile. We determined the roadway classifications based on local and state documents, and we applied applicable design criteria, Caltrans standards for state highways, and local standards for local roadways to refine the profiles. In most cases, we lowered the

roadway crossings and reduced the length of roadway improvements. This resulted in eliminating the need for intersection improvements and traffic impacts during construction. Figure 9.5.2-5 depicts an example where our design eliminated the need for intersection improvements at Adams Avenue and South Maple Avenue. Further discussed in Section 9.5.2.d, we also refined embankment side slopes to reduce ROW takes and impacts on prime farmland.



9.5.2-5 Roadway Design Refinements for the Adams Avenue and South Maple Avenue Intersection

Utility Refinements

After reviewing the Composite Utility Plans in conjunction with the Utility Conflict summaries, we identified the costliest utility conflicts to be irrigation canals and overhead power lines. We revised canal alignments to minimize the need for realignments and to fit the canals to our revised design. Adjusting the canals reduced the length of the realignment, the number of new canals structures, and the easements/ ROW demands for the canals.

Overhead power line relocation will be a significant Project cost, especially when relocating the lines and towers near Hanford. The RFP design is particularly challenging in this area because the HSR alignment would be on viaduct, which demands that power lines be relocated to maintain the minimum allowable distance between the lines and a structure. In lowering the profile and placing the HSR alignment on embankment, we expect to significantly decrease the number of tower relocations.

Geotechnical Refinements

Our geotechnical team reviewed and used the RFP's preliminary geotechnical information to inform our understanding of slope stability, maximum embankment heights, over-excavation, foundation design, and pavement design. As an example Figure 9.5.2-6 shows how we developed a comprehensive geotechnical analysis that set criteria for the entire corridor. The geotechnical matrix will be updated after additional geotechnical borings are analyzed, and the final recommendations will become a part of our design criteria.

RFP Plan Sheet:	Beginning Station	Ending Station	Existing Subsurface Info	Max Grade Differential to Top of Rail (ft)	Min Grade Differential to Top of Rail (ft)	Depth to Top of Prepared Subgrade (ft)	Excludes prepared Subgrade		Prepared Subgrade Thickness (in)	Estimated Settlement from Proposal Data (in)		Estimated Settlement from GBR-B (in)		Estimated Time R		Existing Structures based on Google Earth	Areas of Potential Old Fill, Based on 1998 Google and USGS Topo	Other issues	Comments
							Max Embankment Thickness (ft)	Min Embankment Thickness (ft)		Maximum	Minimum	Maximum	Minimum	Proposal Data	GBR				
CB1867	2930+00	2986+00	S0188CPT, S0065R, S0066R, S0190CPT	28	12	3.3	24	8	14	5.5	2	4	1.5	90-120	180-210				Canal at 2940 and Ditch at 2957 - Remove existing levee prior to placi fill.
Flood Plain Design for Embankmen																			
CB1868	2986+00	3042+00	S0067R, S0191CPT, S0192CPT, S0193CPT, S0194CPT	48	24	3.3	44	20	14	8.5	5	5.5	3.5	40-60	90-120		Tule River Flood area from 3026 3043	well near 3032, Potential RR contamination of ballast/subballast, assume 18 inch min. Assume embankment also contaminated, depth up to 4 ft. below subballast.	Popular may need mitigation of utilities, Tule River - Remove existi levee prior to placing fill.
CB1869																			
CB1301																			
CB1302																			
CB1303	3208+00	3264+00	S0069AR, S0204CPT	14.5	9	3.3	10	5	14	2.5	1.5	1.5	1	45-60	90-120		RR sidings and train loading facility	Potential RR contamination of ballast/subballast, assume 18 inch min. Assume embankment also contaminated, depth up to 4 ft. below subballast.	Avenue 112 may need mitigation o utilities, Canal at 3227 - Remove existing levee prior to placing fill.

Flood Plain Design for Embankments, Figure 10-5

14	7	1.5	5	1	120-150	210-240	

Segment P

farm field to 2997,orchard to 3002, Hwy 43 to 3011, RR Embankment to 3022, Undeveloped land to 3030, possible old fill from 3025 to 3030, farm field to 3042

farm field to 3047, dairy farm to 3071, dairy ponds to 3090, orchad to 3096

dairy buildings and ponds

Orchard to 3133, farm field to 3152

Figure 9.5.2-6 Geotechnical Design Criteria Matrix Example

Printed on Recycled Paper

The goal of the foundation design was to optimize the size of the foundations to complement our bridge structure refinements noted earlier. To accomplish this, we performed a preliminary geotechnical analysis for the structure foundations which included evaluation of steel piling, precast concrete piling and cast-in-drilled-hole (CIDH) shaft foundations. Pile types and sizes were developed in consultation with the Project team and concrete foundations were selected to improve durability as many of the soils are considered corrosive. The foundations were evaluated for service and strength loads, seismic effects, liquefaction potential, and downdrag depending on the construction sequencing of the embankment and structures. The geotechnical model was developed for each bridge (and when information was available at each support location) and the driven piles were analyzed using the FHWA program DRIVEN; the drilled shafts were analyzed using DFSAP, SHAFT and LPILE. Our preliminary foundation designs went through an independent design check to improve our reliability on the foundation types and depths chosen.

Fixed Structures

After setting the profile for the HSR and the area roadways, we then refined and optimized the structures design.

HSR Bridge and Viaduct Structure Refinements

Our ATCs and refined design replaces approximately seven miles of HSR structures with embankment. We used this approach to reduce life-cycle costs, minimize the impact of subsidence, and improve durability and maintainability. Our refinements also limited the length of individual bridges to a range of 60 to 1440 ft. in length. This led to most of the alignment being ballasted track, which provides the Authority more flexibility for addressing subsidence. Reducing the number of structures also allowed us to focus more energy on refining the design of the remaining structures.

Our initial focus for HSR bridges was to reduce span lengths and eliminate steel truss bridges (wherever possible) because longer spans are more costly to build and maintain. Long spans, notably those at the Kings River Complex and Cross Creek, are also inherently less safe to construct as each requires larger cranes and hoists. Because of this, we developed ATC 8 to add piers in the rivers and to shorten the bridge spans. Figure 9.5.2-7 provides a comparison of the RFP design to the DFS design at Dutch John Cut.

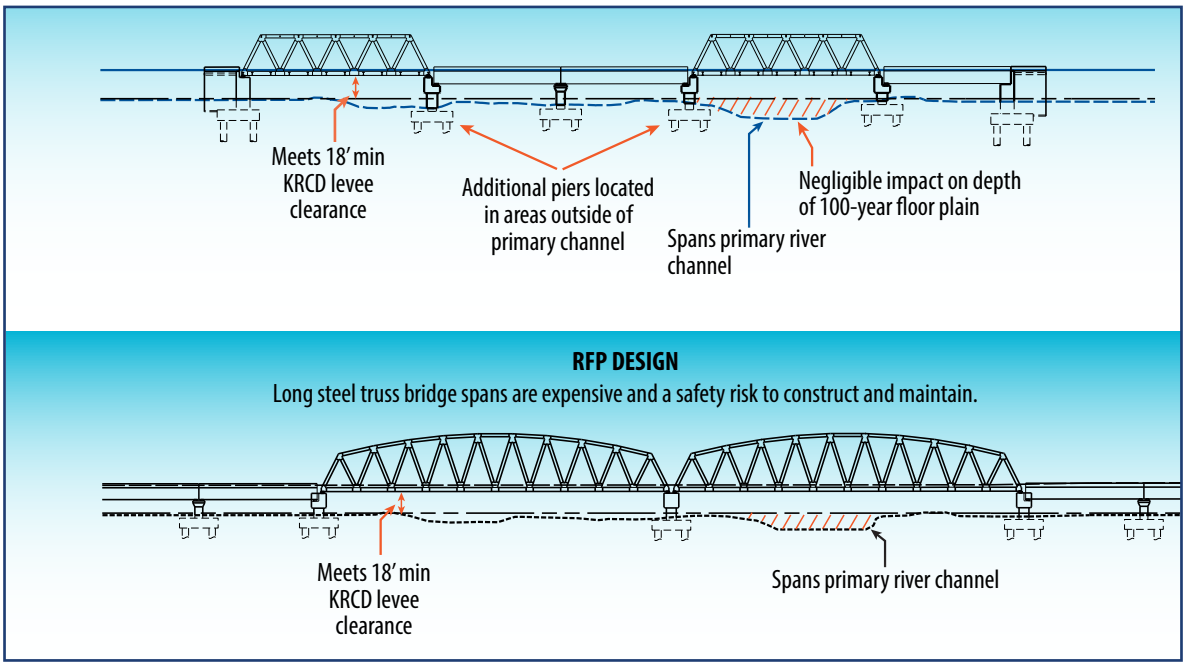


Figure 9.5.2-7 Dutch John Cut: Shorter structures are safer to construct and less costly to maintain.

For the other HSR structures, we propose structure types that are specifically selected according to site constraints, span length, and method of construction. Railway bridge structures will be cast-in-place concrete, PC/PS girders, and steel truss with span layouts optimized for efficiency and economy. This will allow for a balanced structure with fill, span lengths, and method of construction. Each is designed in accordance with Project design criteria and to account for multi-span efficiency, strategic column fixity, and geometry to reduce the structure length and associated foundations. The frames are smartly arranged and designed to take full advantage of the structure's thermal unit length limit of 330 ft. This significantly decreases the need for rail expansion joints at structures. All HSR structures are designed to meet Rail and Structure Interaction criteria intended to provide for a safe and comfortable ride for HSR passengers. The remaining viaduct structures include portions of each of the Conejo Avenue Viaduct, Corcoran Viaduct, and Deer Creek Viaduct. The structures will use traditional cast-in-place construction with individual spans ranging from 100 to 120 ft. to maximize repeatability.

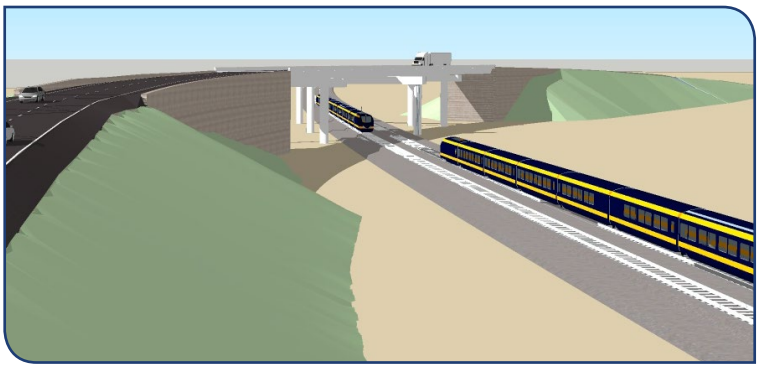
EXPERIENCE

Mitigating Settlement Issues on Major HSR Projects through Embankment Design
DFS Team members Dragados and Sener replaced viaduct structures with embankment on the $1.5 billion HSR Project between Figueres, Spain and Perpignan, France to mitigate settlement issues. The design team refined the original design to shorten the Muga Viaduct and provide a 90-ft. high embankment in an area with a high risk of settlement due to subsurface caverns. We used this experience to address subsidence risks on CP 2-3 where lengthening foundations below the 1,000+ ft. subsidence depth is not feasible due to costs and constructability. Therefore, we maximized embankment to reduce both upfront project costs for construction, and long-term maintenance costs associated with subsidence-related profile adjustments that are more easily and cost-effectively managed through ballast track placed on embankment.

The viaduct frames and pier column heights and capacities were evaluated for temperature movement, HSR train braking, and seismic loading and rail structure interaction requirements. The majority of the viaduct structures are supported on single-column bents that are 8 and 9 ft. in diameter or two column bents that are 7 ft. in diameter. The foundations for the HSR structures consist of precast piling, CIDH shaft groups, and CIDH monoshafts based on structure demand, site constraints, and soil conditions at each structure location. The abutments are founded on smaller CIDH shafts or on driven precast concrete piling. The HSR substructures and foundations require a design to resist large lateral and vertical loading and our foundations are optimized by incorporating the structure frame fixity.

Elevated Slab Structure Refinements

The straddle bent structures are primary non-standard complex structures used when the HSR alignment crosses a roadway or railway line at a very high skew angle. The RFP design proposes an elevated slab structure across SR-43



DFS Proposed Design - Elevated SR-43

RFP Proposed Design - Elevated HSR

Figure 9.5.2-8 Our design improves highway safety

Printed on Recycled Paper

and BNSF railway at several locations resulting in a tunnel effect on the SR-43. Figure 9.5.2-8 shows we eliminated the elevated slab structures in two of these locations by designing SR 43 over the HSR. This design is preferred by Caltrans and improves highway safety, reduces maintenance cost, and lowers life-cycle cost. We also eliminated a significant portion of the elevated slab structures by optimizing the span configurations and geometry of the approach structures on each end.

Truss Refinements

The remaining steel truss structures have been designed specifically for the Project. As an example, the HSR truss bridge deck and floor beam system is not only governed by usual strength and service verifications, but also by dynamic response, so that unacceptable vertical accelerations are avoided. We have designed the trusses for repeatability, using only two truss configurations to streamline fabrication and the erection of the structures. Using the same structure length also allows use of the same bearings in each location to simplify maintenance needs for each structure.

Roadway Bridge Refinements

Our refined design minimizes roadway structures by eliminating spans and optimizing structure types. The key to our design is reducing span lengths as much as possible, while maintaining clearance envelopes for each facility that is crossed, and providing additional access for third-party bridge maintenance. As shown on Figure 9.5.2-9, we have oriented the HSR fence line just outside of the clearance envelope and provided a 10-foot-wide maintenance access road outside of the fence. We also provide gated access to the HSR on each side of every roadway bridge.

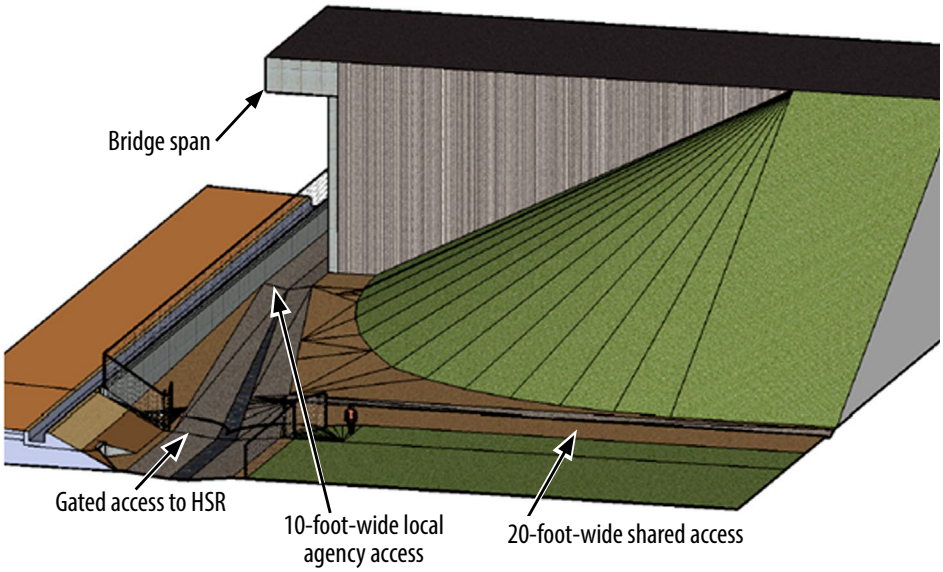


Figure 9.5.2-9 Roadway Bridge Refinements Model

The advantage to our design:

- Improves maintainability by allowing access for local agencies to maintain the structure. The shorter bridge spans also reduce future maintenance cost so as to not burden the limited budgets that local agencies have in their capital improvement programs.
- Enhances access to HSR ROW by providing access nearly every mile, compared to the RFP requirement to provide access every 2.5 miles. More frequent access tied to existing roadway crossings improves access for Authority maintenance and emergency vehicles.

To facilitate the construction schedule and verify quality commitments, a majority of our roadway structures will use precast, prestressed concrete girders, which are high-strength and high-quality products prefabricated in a controlled facility. Additionally, precast girders can be erected on site, eliminating the use of falsework and minimizing impacts to roadways and the HSR. Many of the span layouts were optimized by eliminating spans that resulted in reduced substructure demands and foundations. The roadway bridges are designed to include

a proposed abutment type that significantly reduces the foundation demands. By constructing end bents with MSE walls behind the columns, the lateral loads applied to the abutment are further reduced and the amount of piling minimized. Lastly, our structure spans and girder selection have been designed for optimal repeatability so that less variation exists between structures.

Retaining Wall Refinements

Retaining walls are required to avoid impacts in certain areas; however, our refined HSR track profile typically reduces both the height of any required wall along the alignment and the impact to adjacent properties and required ROW. Where a wall is unavoidable, we will implement best practices to protect your investment. Where high embankments are proposed, we will implement 2 stage construction methods for retaining walls as appropriate to ensure the aesthetic facing is unaffected by settlement. We will integrate the required drainage system to preserve the embankment and ensure containment of fines. Additionally, we will include provisions to protect the walls from any stray current caused by the traction power system.

Approach and Commitments to Sustainability, Durability, Maintainability, and Reduced Life-Cycle Costs

Our HSR experience has demonstrated that HSR structures have higher life-cycle costs, are less durable, and more expensive to maintain than HSR on embankment. Therefore, our approach is to refine the design by replacing viaduct with embankment where feasible. This reduces the carbon footprint of the project as construction materials are a key driver in CO_2 production during construction. We reduced the length of structures to maximize the use of ballasted track as this will improve your ability to adjust the rail for subsidence or settlement issues. As a result of this approach, our design offers the following advantages related to sustainability, durability, maintainability, and reduced life-cycle costs:

- We have incorporated high design-strength concrete into our structural designs. Additionally, we have specified the use of precast concrete piling instead of steel piling so that the foundations will be less susceptible to corrosion. Our structures are also designed with continuous frames, creating efficient bridges that reduce the number of bearings that need to be inspected.
- Demonstrating a structural reduction area from RFP design to DFS design, Table 9.5.2-2 shows maintenance cost saving based on an average annual cost of $1 per square foot over a 100-year design life.
- As detailed in Table 9.5.2-2, a reduction in quantities provides a significant amount of material savings. This in turn leads to a more sustainable design based on the amount of CO_2 savings realized during construction.
- The RFP design collects drainage at the center of the cross-section; however, this is difficult to maintain and presents potential safety concerns related to ponding. We propose to collect drainage at the outside of the structure, which is standard practice for HSR in Europe and is much easier to maintain, our design will also prevent ballast dust from clogging the inlet and eliminate ponding.

Table 9.5.2-2 Our refined design saves the Authority $185 million and reduces CO_2 production by 208,864 tons.

Structure Category	RFP Design	RFP Design - Maintenance cost	DFS Design	DFS Design Maintenance cost	Maintenance cost savings
Viaduct	2,434,109 SF	$243 M	680,971 SF	$68 M	$175 M
Steel Truss	150,792 SF	$15 M	51,212 SF	$5 M	$10 M
				TOTAL SAVINGS	**$185 M**

Material	RFP Design	RFP Design CO_2 production	DFS Design	DFS Design CO_2 production	CO_2 Reduction
Concrete	1,515,994 tons	258,211 tons	334,991 tons	57,057 tons	-201,154 tons
Steel	38,947 tons	25,715 tons	10,983 tons	7,251 tons	-18,464 tons
Embankment	34,827,975 tons	419,395 tons	35,721,000 tons	430,148 tons	10,753 tons
				Total CO_2 Reduction	**-208,864 tons**

Printed on Recycled Paper

Alternative Technical Concepts (ATCs)

We developed and presented 26 potential ATCs during the pre-bid phase. After discussion with the Authority and other Project stakeholders, several ATCs were determined to be value engineering ideas, and some ideas were eliminated because of associated risks, such as environmental concerns not understood until after discussion with the Authority and other permitting agencies. We ultimately gained approval to use 12 of our 13 ATCs in the proposal. After evaluating overlapping ATCs, our proposal incorporated five of the approved ATCs for a total estimated cost savings of over $291 million. A few of our ATCs have backup ATCs as contingencies. The table below summarizes our approved ATCs and each ATC's inherent benefit for the Authority. Enclosed at the end of this Volume, are the Authority's ATC approval letters along with copies of our ATCs.

We have met all conditions required by the Authority for incorporating these ATCs into our proposal. This includes meeting with Baker Commodities pre-bid to obtain their approval of our preliminary conceptual drawings for ATC 17.

We are committed to enhancing these concepts through to final design, and our team will continue to investigate and implement new technologies and pursue innovations that will benefit this Project and also future HSR projects and the overall HSR program.

Table 9.5.2-3 Benefits of Our ATCs

		Impact on Design									
ATC	Description	Cost Savings	Schedule Savings	Safer Construction	Improved Constructability	Lower maintenance cost	Greater Sustainability	Less impact on community	Reduced ROW Needs	Approved	Used
1d	Lower the profile at Kings River at place HSR on embankment across floodzone	$88M	x	x	x	x	x	x	-	x	No
1e	Lower the profile at Kings River and keep HSR on viaduct	$9M	-	-	x	-	-	x	-	x	No
2c	Lower profile at Cross Creek	$43M	x	x	x	x	x	x	-	x	Yes
3	Replace viaduct with sloped embankment in the Kings River Complex floodplain	$79M	x	x	x	x	x	-	-	x	Yes
4	Relocate Hanford Station to the south	$115M	x	x	x	x	x	-	-	x	No
5	Relocate Hanford Station to the North	$115M	x	x	x	x	x	-	-	x	No
8a	Add 3 piers in Dutch John Cut and 1 pier in Kings River	$8M	-	x	x	-	-	-	-	x	No
8b	Add 1 pier in Cole Slough, 4 piers in Dutch John Cut, and 4 piers in Kings River	$21M	-	x	x	-	-	-	-	x	Yes
8d	Add 2 bents in Tule River floodway	$1M	-	x	x	-	-	-	-	x	Yes
15a	Eliminate 2 grade seps. in Segment P	$17M	x	x	x	x	x	x	x	x	Yes
15b	Eliminate 1 grade sep. in Segment P	$7M	x	x	x	x	x	x	x	x	No
17	Place Hanford Station at grade	$130M	x	x	x	x	x	x	-	x	Yes

Proposed Aesthetic Treatments

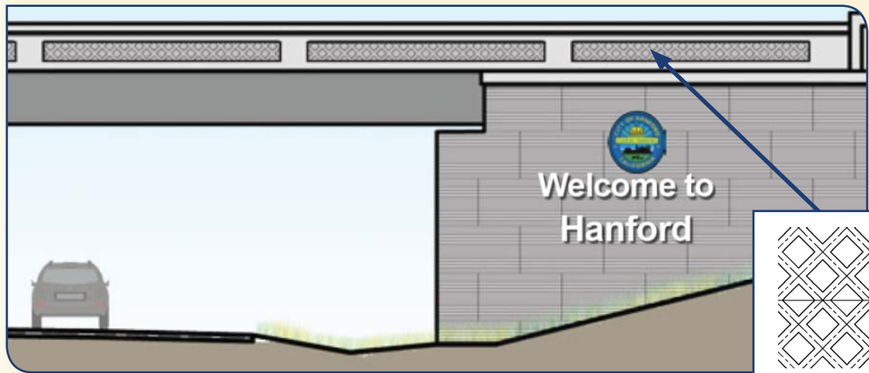
Our approach is to create a collaborative effort between designers and stakeholders to develop an acceptable aesthetic design and mitigate visual impacts to the rural communities. The aesthetic concepts will be integrated into the design and detailing of structures. Our goal is to blend the HSR facilities with the community context by

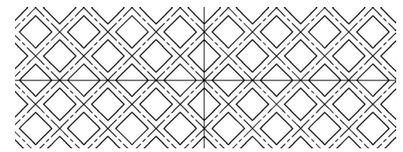
This Page intentionally left blank

Printed on Recycled Paper

Our Approach and Commitment to Aesthetic Features

Our approach and commitment to Project aesthetics is to blend the HSR design into the community by matching the aesthetic of existing structures in the Project area. Conceptual engineering drawings and isometric views highlighting proposed aesthetic treatments are included in the Appendices.





Diamond formliner pattern on barrier rails in high visibility areas.

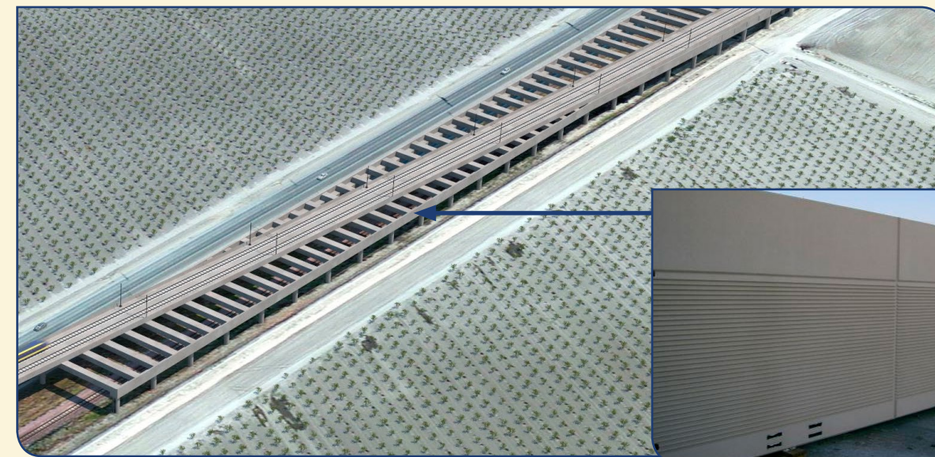
Sine wave formliner section

HSR Bridges

We will incorporate patterns and colors to blend structures into the surrounding areas and provide opportunities for third-party enhancements for structures in high visibility areas.

HSR Elevated Slab Structures

The unique complex structures provide an opportunity for the structure form to create a pleasing aesthetic. The structures will use neat lines and well-proportioned elements.



Sample elevated slab structure

Horizontal and vertical banding will be used to break up larger concrete surfaces such as the parapet shown here.

HSR Truss Bridges

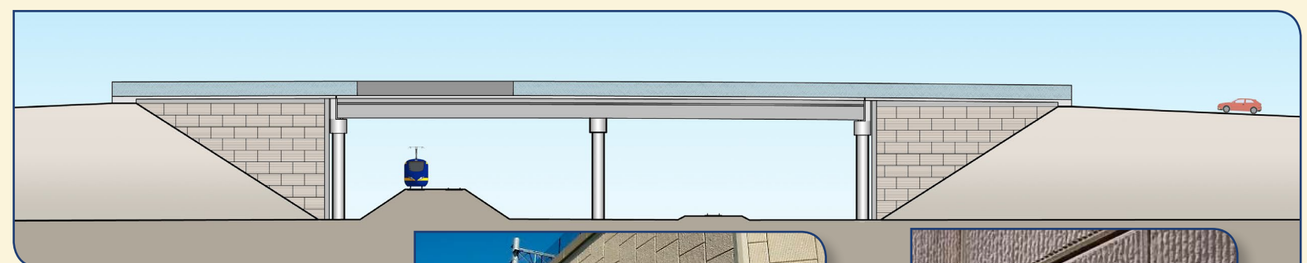
The HSR truss bridges will use their structural form to serve as the aesthetic. The steel will be painted with durable paint systems with colors that complement the surrounding rural areas.

Truss structure at Cole Slough in the Kings River Complex

The landscaping will use low-height plantings and native grasses that act as a transition between the bridge and native rural landscape. Riprap is provided at the toe of slope within floodplain.

Roadway Bridges

Our design blends the roadway overcrossings into their surroundings and uses the colors and patterns inspired by earthen tones found throughout the Central Valley.



Sample roadway overcrossing of the HSR trackway

Example of a tall retaining wall with texture and colors similar to that planned for the roadway overcrossings.

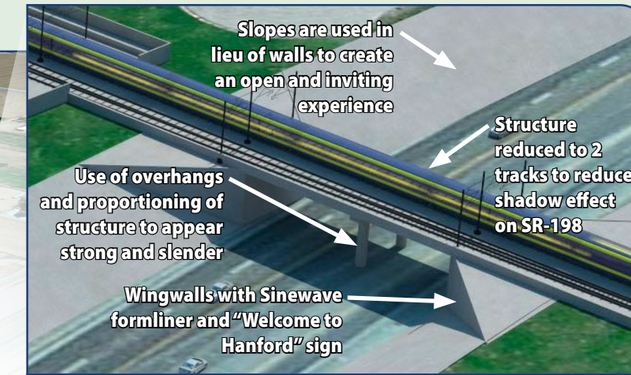
Example of a fractured fin formliner to be used in rural areas.

Figure 9.5.2-10 - Aesthetic Treatments

Intended Design for the Foundation Substructure and Superstructure for the Hanford Area and Cross Creek

Hanford Aerial Structures and Station Support Structures

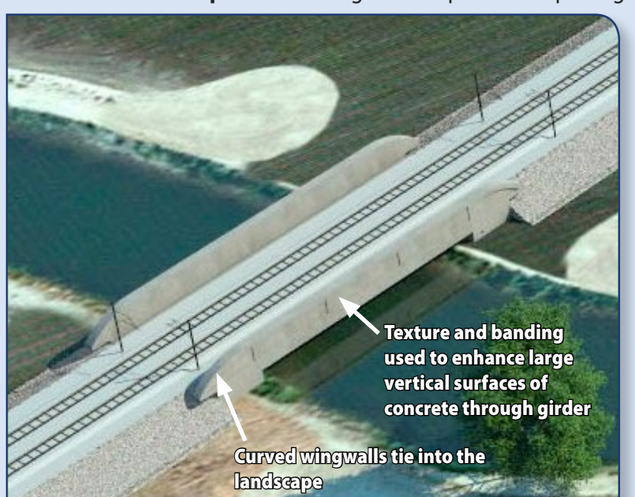
Hanford Station DFS Proposal: Placing the station at-grade lowers life-cycle cost, reduces construction cost for the future station, and virtually eliminates visual impacts.



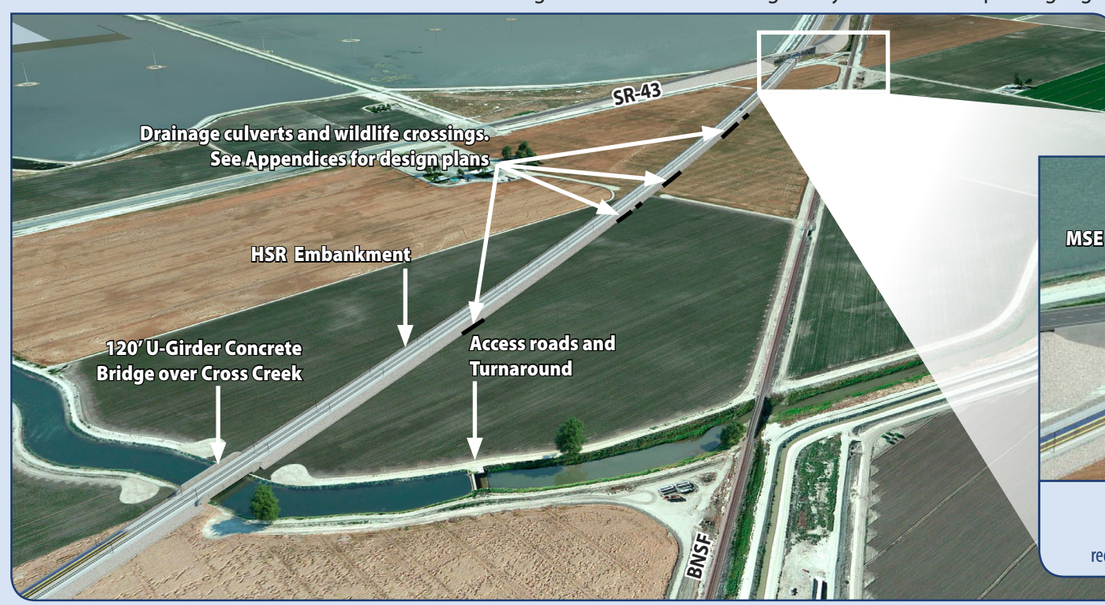
SR-198 Undercrossing:
The structure will meet the city of Hanford's desire to match the aesthetic of the nearby structures of the SR-43 and SR-198 interchange.

Cross Creek Viaduct

Cross Creek DFS Proposal: Lowering the HSR profile and placing it on embankment better blends the HSR into the surrounding area while also reducing life-cycle cost and improving highway safety.



Bridge over Cross Creek:
The single span concrete U-Girder bridge uses preferred construction materials and minimizes maintenance costs.



SR-43 over HSR:
Box Girder Highway Bridge over HSR improves safety and reduces maintenance of HSR Structure. Caltrans prefers this configuration.

Figure 9.5.2-11 Intended Design for the Foundation Substructure and Superstructure for the Hanford Area and Cross Creek.

Printed on Recycled Paper

marching aesthetic designs of existing structures in the project area. We have significantly reduced the number of structures, however the remaining aerial structures will be designed in accordance with the "Aesthetics Manual for Non-Station Sturctures" and exhibit appropriate proportional relationships of height, width and thickness that convey slenderness, strength and durability to the public.

Our designs will incorporate regional consistency while also addressing unique community requirements, such as the structures in the vicinity of the City of Hanford. Initial meetings with the City have confirmed that they would like new structures to complement the recently constructed SR-43 and SH-198 interchange. The result will consist of simple, low-maintenance structural elements that fit harmoniously within the surrounding visual landscape. We are committed to incorporating textures and patterns into the structural elements in high visibility areas while using a simple aesthetic in more rural, less visible areas. The majority of the construction is in rural areas and we will work to complement the existing terrain and vegetation. Figure 9.5.2-10 (page 46) provides a sample of the aesthetic to be applied to typical structures along the corridor.

C. INTENDED DESIGN FOR THE FOUNDATION, SUBSTRUCTURE, AND SUPERSTRUCTURE

1. Hanford Aerial Structures and Stations Support Structures (ATC 17)

Our proposed design of ATC 17 for the future Hanford station constructs the HSR facility at-grade on embankment with ballasted track on the remaining smaller structures. These structures include crossings over Grangeville Blvd., the SJVRR facility, and SR-198. Each of these bridges is designed to minimize the structure depth to reduce visual impact and minimize vertical grade differences. Each of these structures will incorporate the use of overhangs and textures and banding on extensive flat surfaces to create shadow lines to improve the perceived proportions of a HSR structures. Visual impacts are reduced, the station is more accessible for users, and the future station construction costs will be lower because the future platforms will be at-grade. The structures will use well-proportioned elements and clean horizontal and vertical lines to project a simple, low maintenance aesthetic. Figure 9.5.2-11 (page 47) shows the reduced visual impact of our design.

The structures will be constructed using high strength concrete and detailed to minimize required maintenance over the life of the structure, including the use of proven deck drainage details and robust wall drainage systems. Careful detailing will protect the bearings and expansion joints to extend the life of these elements. Placing the station on embankment also reduces carbon emissions during construction, improves durability, lowers life-cycle costs, and is more easily maintained since the at-grade rail is more accessible than the elevated option.

As a result of lowering the HSR profile, the railway tracks (owned by UPRR and operated by SJVRR) will be lowered into an open cut with retaining walls only at constrained locations. A single-span, cast-in-place, post-tensioned, box girder bridge supporting five tracks will span over the UPRR ROW and will be supported on a drilled shaft foundation. The box girder bridge will have overhangs and sloped exterior girders to improve the visual impact. Embedded cantilever retaining walls are used where required to protect adjacent properties or facilities. The retaining walls and abutment walls will have an architectural concrete facing. The open cut lowering of the SJVRR will extend west toward Vista Avenue, creating a new grade separation for SR-43 and the SJVRR rail crossing. The roadway profile will be unaffected as SR-43 will remain at roughly the existing elevation. The three-span-precast-concrete-I-girder bridge will be supported on two-column bents located outside of the UPRR ROW and founded on CIDH shafts. The structure will have integral abutments on steel piling, which reduces the maintenance to expansion joints and bearings. The structure will also make allowance for future SR-43 widening.

By lowering the HSR profile and modifying the location of the turnouts and storage track locations for the Hanford station, we reduce the SR-198 crossing to a two-span bridge carrying the two mainline tracks. The structure uses both full height concrete abutments and side-by-side, precast, prestressed, concrete, box beams supported on a two-column bent located in the median of SR-198. The bent support will use round columns and a rectangular bent cap proportioned to create a visually balanced structure.

2. Structures over SR 43 and BNSF near the Tule River

We have reduced the length of the SR-43/BNSF Viaduct by 2653 ft. and eliminated 182,000 square feet of elevated slab structure over SR-43. Reducing this structure and maximizing embankment improves sustainability by reducing construction materials, improves your ability to address subsidence and settlement concerns in this area, and lowers construction and maintenance costs. The concrete structures will utilize consistent span lengths and columns sizes to achieve a visual rhythm. The structures will use overhangs and angled girder sides and soffits creating a deep shadow and reduces the perceived girder depth. Parapets with textures and horizontal banding will be used to break up the large flat surfaces and create visual harmony with the surrounding rural setting.

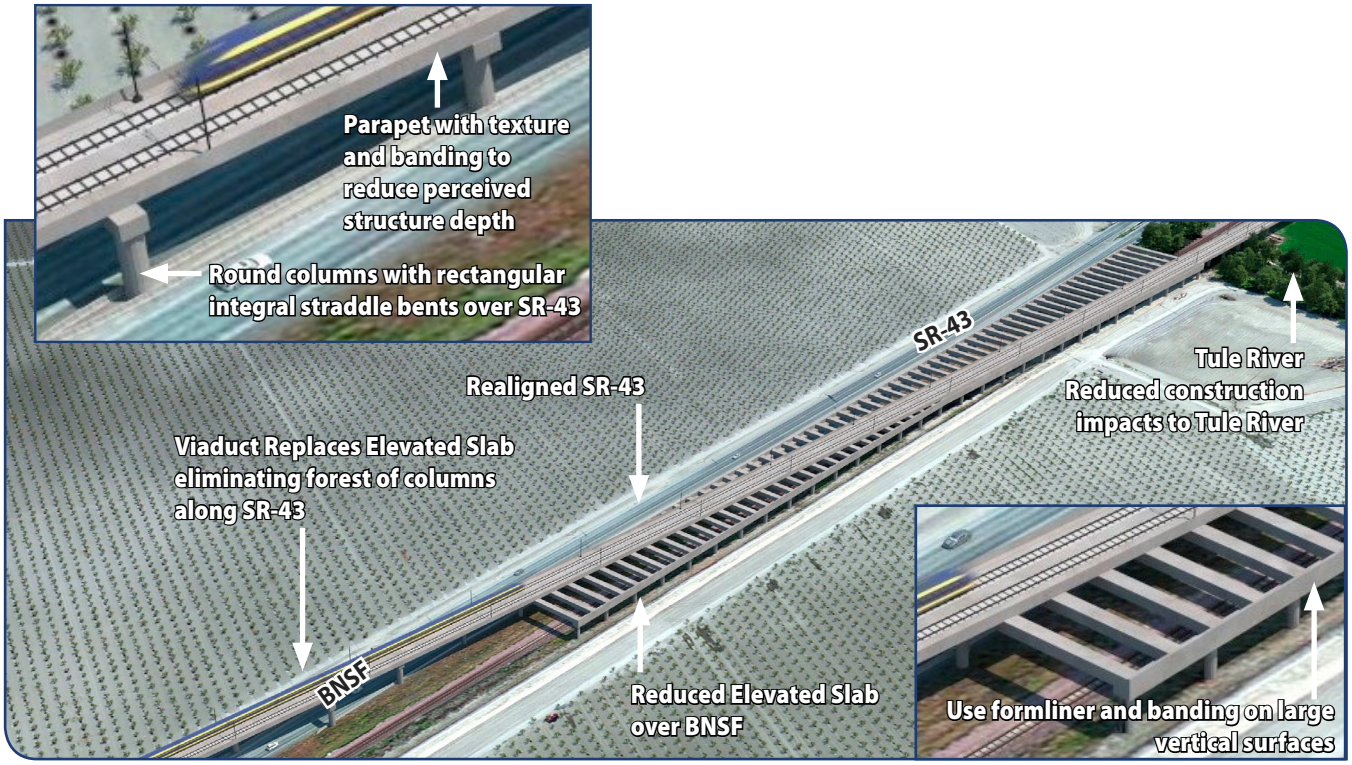


Figure 9.5.2-12 Refinement of structures over SR-43 and BNSF near Tule River reduces life-cycle cost and improves highway safety along the corridor

The remaining viaduct on the north end consists of 940 feet of a concrete cast-in-place box girder superstructure supported on single and two-column bents outside of the realigned SR 43. The straddle bents will be aesthetically compatible with the superstructure. Integral bent caps are used to reduce the structure depth and maintain clearance over the roadway. The round columns will be founded on CIDH shafts that minimize disruption to traffic and maintain efficiency with the adjacent structures. Using continuous frame construction, we will reduce the number of joints. Utilizing fixed bearings will reduce the maintenance over the life of the structure and improve passenger comfort.

Printed on Recycled Paper

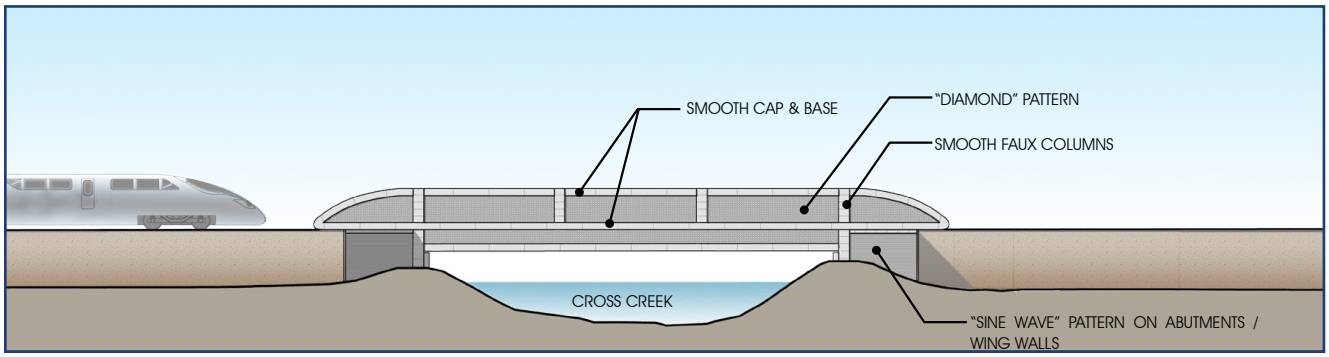
The reduced elevated slab structure is a transverse girder system with a cast-in-place deck. Our analysis allowed us to reduce the number of columns and foundations. We also eliminated a number of extra columns in the transition areas by taking advantage of cast-in-place overhangs.

The five-span transition structure over Tule River will be constructed using side-by-side, precast, concrete, box girders with cast-in-place deck slab to facilitate direct fixation construction and supported on two-column bents with CIDH shaft foundations. The bents will be precast adjacent to the site and hoisted into place. Eliminating the group shafts and pile cap will significantly reduce the construction footprint within Tule River, and the precast elements will reduce required falsework.

3. Cross Creek Viaduct (ATC 2)

Implementation of ATC 2 eliminates the Cross Creek Viaduct by inverting the SR-43 crossing so that the roadway crosses over the HSR tracks. By lowering the HSR profile and placing the tracks on embankment, a significantly smaller structure is required to span Cross Creek. This refined design substantially reduces concrete viaduct, which improves sustainability, durability, and lowers life-cycle costs. Concrete structures replace the steel structures from the RFP, reducing the maintenance over the life of the structures.

To address Cross Creek hydraulic requirements, our post-tensioned, concrete, U-girder bridge design provides the minimum 4 ft. freeboard to the 100-year water surface elevation. The sides of the girder will be vertical and have patterns inlaid in the concrete, reducing the perceived depth of the structure and creating a simple structure form. Additional wall end treatments will be used to tie the structure down into the surrounding landscape. Aesthetic features of the Cross Creek structure are shown on Figure 9.5.2-11 (page 47) and Figure 9.5.2-13.



Firu8re 9.5.2-13 Concrete structure provides reduces cost, maintenance, and visual impact of bridge over Cross Creek.

We also recognized an opportunity to improve traffic safety by elevating SR-43 over HSR to eliminate the tunnel effect created by placing the HSR structure over the highway. Our SR-43 design accommodates the existing highway configuration and includes provisions for future improvements and widening. The bridge will be a curved, post-tensioned, concrete, box girder bridge with straddle bents to span the HSR alignment and provisions for a future precast structure to eliminate falsework and minimize future impacts to HSR service. The straddle bents will have neat rectangular lines with well-proportioned round columns. The tall end bent abutments and bents will be founded on CIDH shafts. The embankment will be supported by tall MSE walls. The visual impact to the public is significantly reduced by the reconfiguration of the crossing. Preliminary construction phasing plans are provided in Appendices to demonstrate the feasibility of the future improvements.

D. SETTING THE ALIGNMENT AND PROVIDING ROW CAPABILITIES

Approach and Commitment to Setting the Alignment

Based on the ROW acquisition plan and an assumed NTP date of July 1, 2015, the final parcel group is acquired with just over 32 months remaining in the construction schedule before reaching substantial completion. We also understand the value of minimizing the number of acquisitions and impacts on private property wherever possible. As such, we are committed to limiting acquisition and property impacts where we can throughout the Project alignment. To do this, we have lowered the HSR profile, optimized roadway profiles, and applied steeper side slopes. As a result, we have reduced ROW needs by up to 133 acres, which includes 120 acres of farmland, and saved 56 parcels from having to be acquired. Our approach also saves approximately $4.7 million in acquisition costs, improves the acquisition schedule, and in many cases eliminates full property takes. Figures 9.5.2-14 and 15 (pages 52 and 53) provide an overview of our approach, and Table 9.5.2-4 compares ROW requirements and property impacts from our proposed design against the RFP design.

EXPERIENCE

HIGHLY RELEVANT ROW EXPERIENCE: Jacobs is the Program Management Organization for Sempra Energy's Pipeline Safety Enhancement Plan, an approximately $2.5 billion project to replace and upgrade hundreds of miles of natural gas pipelines and to replace and automate hundreds of mainline valves throughout Central and Southern California. Jacobs' staff of surveyors supports ROW acquisition for the entire program by providing appraisal exhibits, legal descriptions, and final exhibit maps for temporary constructions easements, acquisition parcels, and permanent easements.

Capability to Collaborate with and/or Provide ROW Services

We offer a team of ROW professionals who have the experience and capabilities from various multi-billion dollar design-build projects to assist you in expediting the ROW acquisition process. Jacobs has a long history of ROW acquisition experience with Caltrans, other state DOTs, and other agencies such as Sempra Energy. We can provide support for Project ROW efforts including:

- Developing appraisal mapping of the affected properties for a ROW Agent or Appraiser to document general information and to initiate the appraisal process.
- Preparing metes and bounds legal descriptions and graphic exhibits for the purpose of describing the property as specified by the Authority. The legal description will be prepared based on a field survey of the subject tract of land affected.
- Providing survey monuments to mark newly acquired ROW and prepare Records of Survey, filing each with the County Agency to legally document the ROW configuration and affected properties.

E. DESIGN CONFIGURATION MANAGEMENT AND QUALITY CONTROL

Design Configuration Management

We initiate our design by providing a Design Baseline Report for the Authority to review and approve prior to progressing the design. This document is used as the basis for identifying, tracking, and informing the Authority about design changes. We simultaneously develop our Verification and Validation (V&V) plan, which includes a Requirements Management (RM) tool to document the Contract requirements and how our design addresses those requirements. These two documents set the basis for design over the remainder of the Contract.

The RM tool will specify how we will adhere to the Contract's technical requirements, maintain accountability, and meet Authority and stakeholder expectations. The RM process identifies, analyzes and prioritizes all

Printed on Recycled Paper

Our Approach to ROW Impacts: As shown below, we reduce the total ROW requirements and farmland impacts by lowering the HSR profile, optimizing roadway profiles, and refining roadway cross-sections.

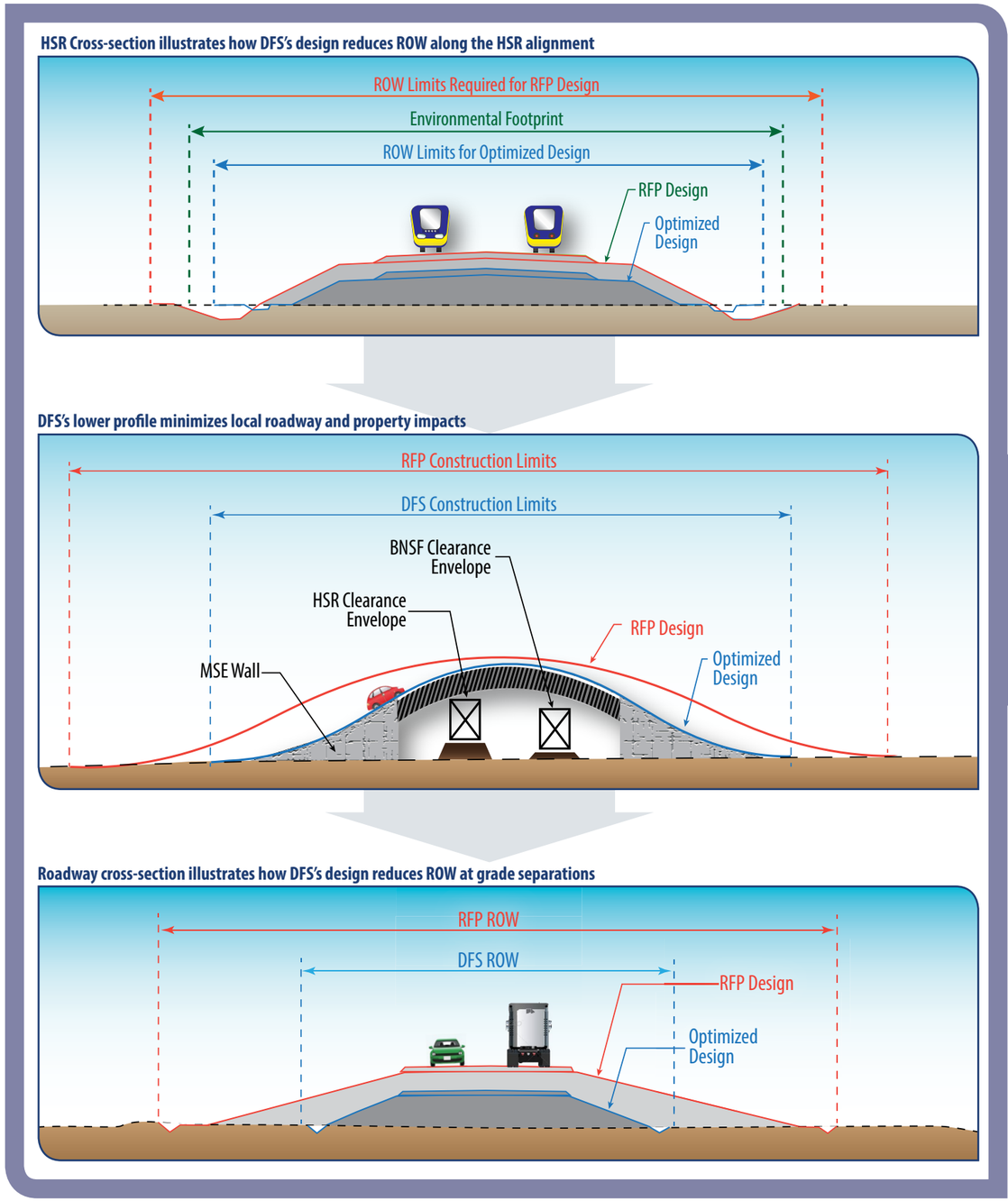


Figure 9.5.2-14 - DFS Design Reduces ROW and Minimizes Local Roadway and Property Impacts

DFS's design reduces ROW at grade separations

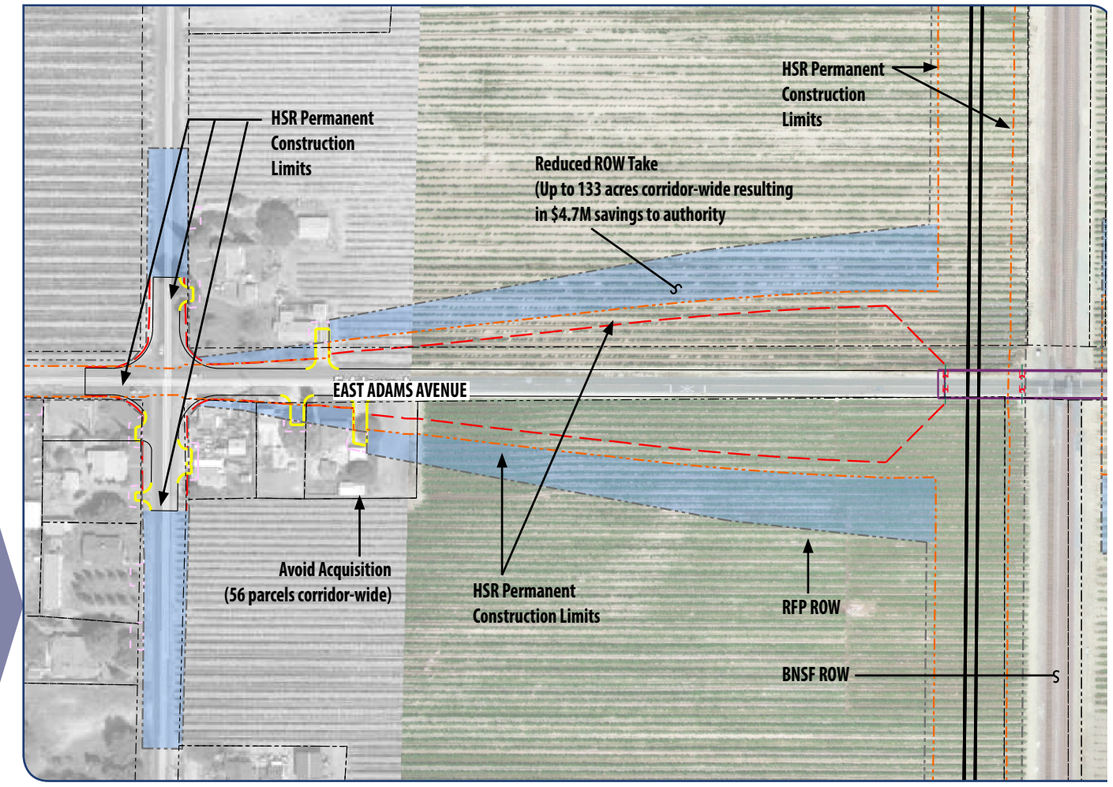


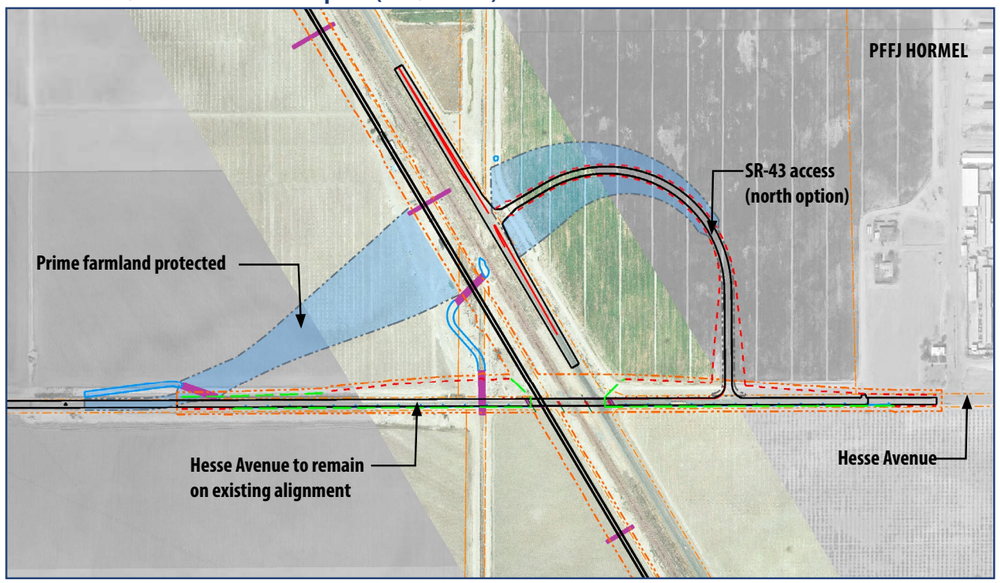
Table 9.5.2-4 - The difference between the RFP design and DFS design for ROW requirements and property impacts results in considerable acreage and cost savings.

	RFP Design	DFS Design	Savings
Total Required ROW (Estimated acres)	1404	1271	133*
Estimated ROW Cost	$21,100,000	$19,100,000	$2,000,000
Buildings Demolition Estimate	105	81	24
Buildings Acquisition Cost (EST $100k/bldg)	$10,500,000	$8,100,000	$2,400,000
Demolition Cost ($10k/bldg)	$1,050,000	$810,000	$240,000
Total Cost	**$32,700,000**	**$28,100,000**	**$4,700,000**

*Includes 120 acres farmland

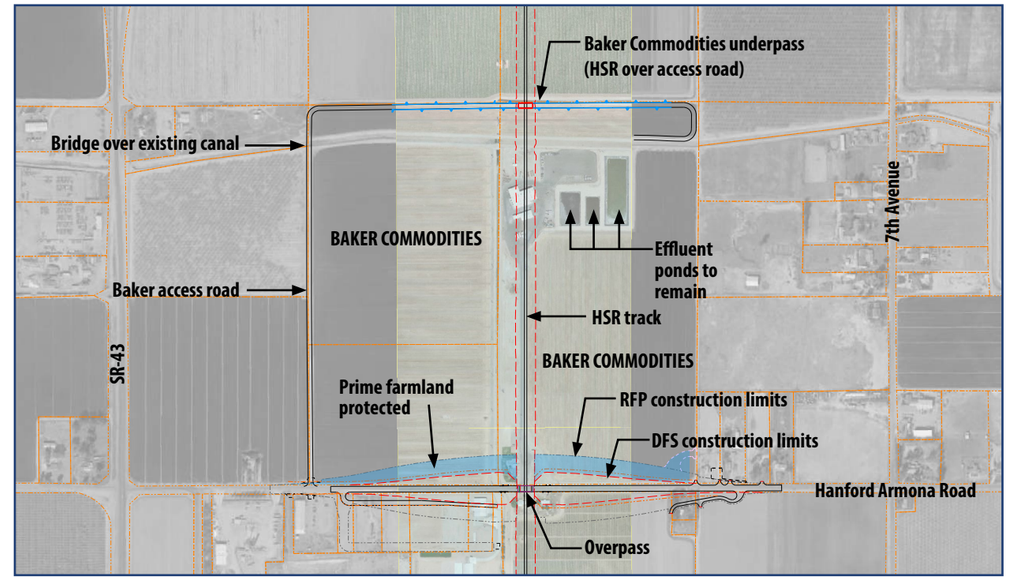
Our Approach to ROW Impacts: We minimize ROW, operations impacts, and farmland take on Baker Commodities, PFFJ/Hormel, and Hanford/Corcoran area residents

Hesse Avenue / Avenue 120 - North Option (PFFJ/Hormel)



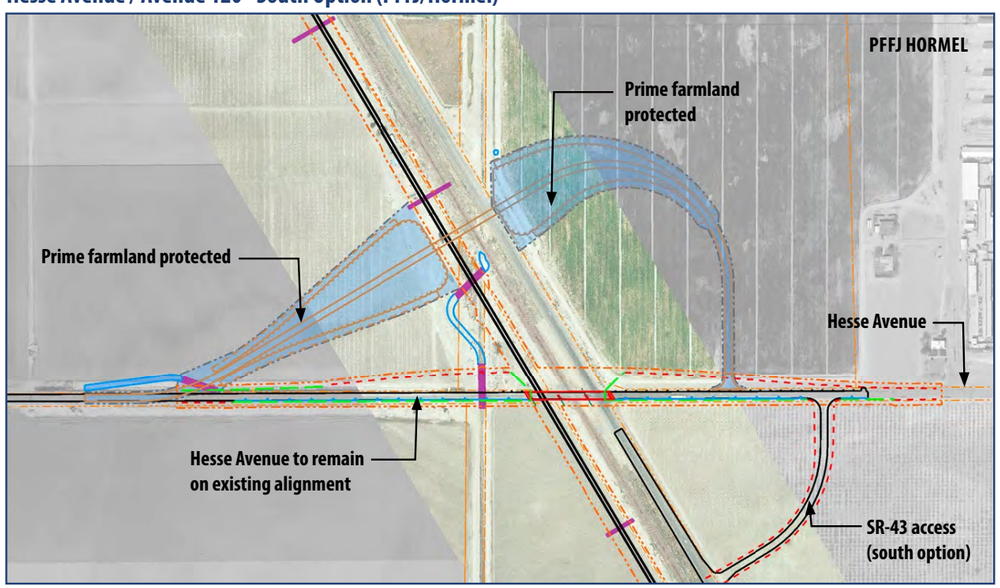
PFFJ/Hormel Proposed Design: Our proposed design includes providing an overpass along the existing Hesse Ave. alignment and an at-grade ramp to connect Hesse Ave to SR-43. As shown above, our design reduces the amount of property impacted at the PFFJ/Hormel property, which reduces impacts on their feedlot and effluent pond operations.

Baker Commodities



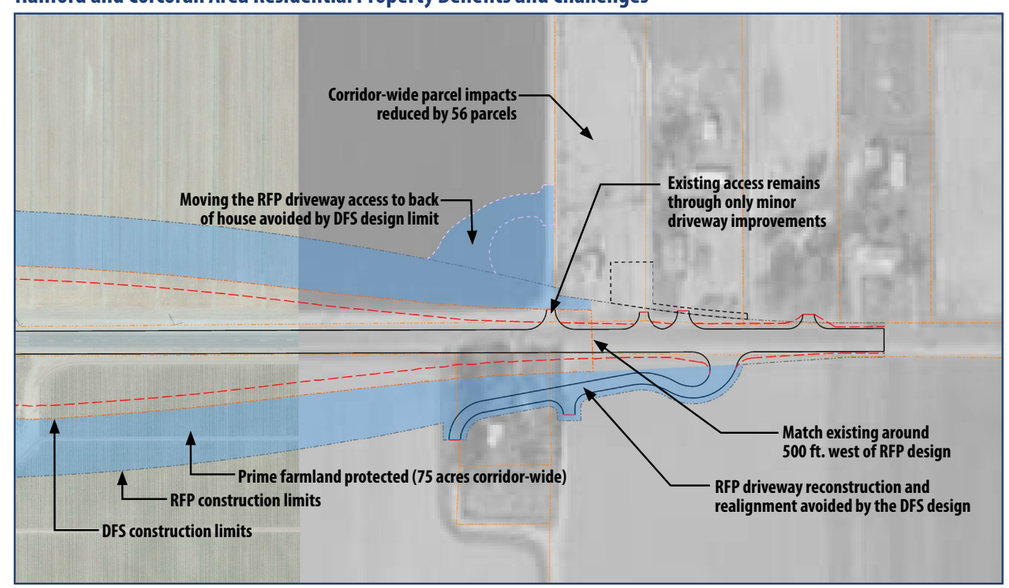
Baker Commodities: We worked hand-in-hand with Baker Commodities to develop solutions that prevent impacts on their operations. We achieve this by providing minimally sloped, all-season driveable access during and after construction and minimizing property take from their parcels.

Hesse Avenue / Avenue 120 - South Option (PFFJ/Hormel)



PFFJ/Hormel Alternative: As an alternative to our proposed design, relocating the SR-43 access to the south completely eliminate impacts on the PFFJ/Hormel property. We will explore this option with you after selection.

Hanford and Corcoran Area Residential Property Benefits and Challenges



Hanford/Corcoran Area: Our refined design reduces farmland take, eliminates driveway reconstruction in many areas, and reduces the number of impacted parcels by 56 properties.

Figure 9.5.2-15 ROW Impacts

Printed on Recycled Paper

requirements, documents, plans, and procedures. The process also assists in managing and communicating changes to relevant Project stakeholders. We will coordinate the Design Quality process with the V&V process by using our RM tool to document and advise the engineering, quality, and V&V team regarding the applicable design criteria for each element of the Project. As design decisions and recommendations are made, we update and share the RM tool with design team to inform them of changes and to assure that the revisions are incorporated into the design documents.

To create a well-structured document that is flexible enough to incorporate changes as the Project advances, we will develop a Requirements Verification Traceability Matrix (RVTM) that lists each Contract requirement and cross-reference the requirement to the source, design (verification), and the test (validation) documents. As each requirement is documented, its bi-directional traceability will be recorded. Each requirement will be traced back to a parent/source requirement in a baseline document or will identify the requirement as self-derived and seek concurrence on this from the next higher-level requirement sources. Tracing requirements to the lowest possible level ensure that each requirement meets the Project objectives. Conversely, lower-level requirements that are not traceable to higher-level requirements serve as alerts to potential overdesign.

EXPERIENCE

OHIO RIVER BRIDGES - EAST END CROSSING

This $763M Public-Private Partnership project will complete IH-265 across the Ohio River near Louisville, KY. DFS Design Quality Manager, Greg Creamer, led a team of four QA reviewers, geographically located with our Design Team in four locations. To date, we have processed over 890 Design packages by certifying that the Design Team has followed the Design QA/QC Plan established at the beginning of the project and the project's Technical Provisions. In addition, the QA Team has certified over 150 Construction type submittals, such as shop drawings, fabrication plans, and other construction working drawings. Greg also performed internal audits quarterly to verify the design team's adherence to the Design QA/QC Plan.

DFS will develop and implement a comprehensive design management process that defines how the technical Contract requirements are integrated into the final design. The process will be applied to infrastructure engineering disciplines and associated design elements, such as:

- General design criteria and requirements ,
- Civil site design,
- Structural design,
- Utilities,
- Safety and security design criteria,
- Intrusion protection,
- Drainage,
- Seismic design,
- Geotechnical design,
- Grounding and bonding, and
- Corrosion control.

The design management process will also document the design processes utilized and verify that the final design meets the technical Contract requirements. This process will determine and manage:

- How alternative design solutions are defined, described, and selected,
- How the design evolves to the required level of detail, along with a complete description of the design solution,
- How the design will be verified and validated,
- How reliability and safety issues are handled throughout the design life-cycle, and
- What is the definition of the baseline policy between different design phases.

Compliance with technical Contract requirements will be demonstrated using the RVTM, while compliance with critical requirements will be demonstrated using the Certifiable Items List (CIL).

Design Quality Management Plan

Our Design Quality Management Plan (DQMP) ensures that design elements provided in the Authority's design criteria and directive drawings are not compromised. Our DQMP has been developed based on Jacobs' long-standing QC/QA practices and follows the Authority's Master Quality Plan. Our approach also meets the requirements specified in the Grant/Cooperative Agreements. Our DQMP includes the following:

- **Procedures:** Describes the quality organization and personnel responsibilities, establishes Quality Control (QC) criteria and check levels, and schedules when QC will occur.
- **Work Instructions:** Establishes specific QC criteria, including checklists to check against. This section provides for a Quality Assurance (QA) process that describes criteria and how audits will be conducted.
- **Quality Record Policy:** Describes the document management requirements for quality checks and audits.

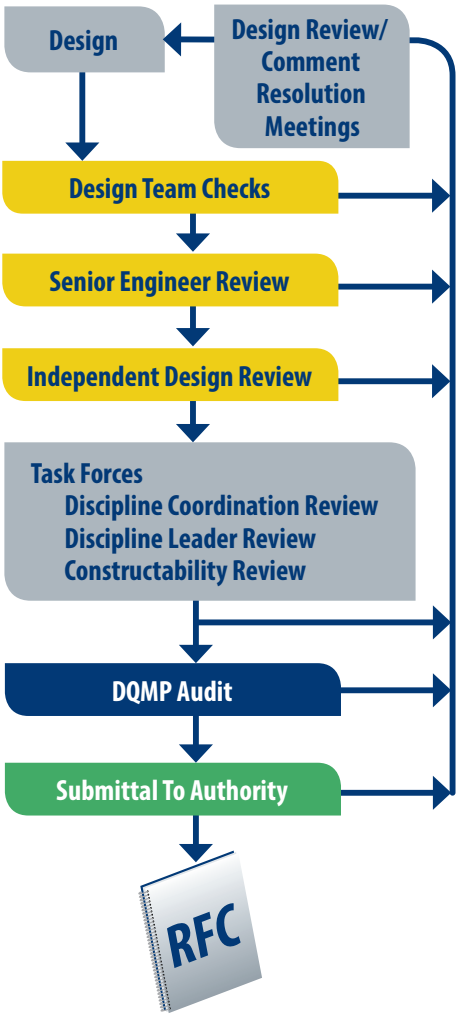


Figure 9.5.2-16 Design Quality Management Flow chart

To adhere to the criteria established in the DQMP, we check design processes, including the application of engineering principles, calculations, drafting and preparation of documents. DQMP procedures cover all portions of the permanent design, as well as specialized erection equipment and working drawing reviews. Figure 9.5.2-16 summarizes the DQMP procedures. We will not begin construction on a given feature until the design documents have been through the Release for Construction process. Our DQMP encompasses the following:

- Identification and organization of key personnel, roles and responsibilities,
- Formal review process, including technical, oversight, and constructability reviews, to make sure the overall objectives, design criteria, and OC Project requirements are met,
- QC and design checks to validate design document review and processing, including plans, specifications, and calculations,
- Training the design team on DQMP and QC processes,
- QA audits of every submittal by the Design Quality Manager, Greg Creamer, PE to ensure compliance with the QMP, and
- Provision for QA audits by the Authority.

Prior to initiating design, the DQMP will be submitted with our QMP within 60 days of NTP to the Authority. At each stage of design, we perform a comprehensive design check and review of plans and specifications.

Design QC Program

Our goals are to execute flawless work that exceeds your expectations and delivers superior value to you. Our design QC program is a defined, auditable process that offers the results you need.

Printed on Recycled Paper

The crux of our quality program is that we assign an independent, qualified "second set of eyes" to perform QC checks on every deliverable. We also scale our QC checks dependent on the deliverable stage so as to focus our QC on critical elements of the deliverable. To achieve this, we develop a detailed Quality Check Matrix that assigns QC levels to each deliverable.

Figure 9.5.2-17 describes the three levels of QC that will be provided for all deliverables. The level of QC is determined based on the deliverable type. For example, a 30% package will receive a Level 2 - Peer review to confirm that the concept is reasonable and based on a spot check appears to be without error. In contrast, the RFC package will be subjected to a Level 1 - Check that includes a 100% check by a qualified second-set of eyes to confirm that all information is correct. Finally, a Level 3 - Authorization Check is performed on every deliverable to confirm that the quality process was followed before submitting to the Authority.

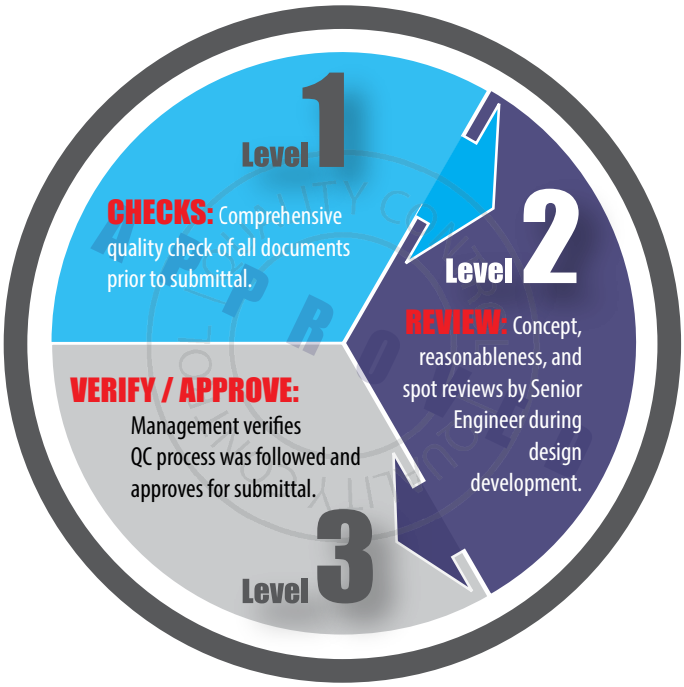


Figure 9.5.2-17 Tiered QC Design Program ensures every deliverable has been thoroughly reviewed.

Verification, Validation and Self-Certification Manager Qualifications and Experience

Our V&V Manger, J. Antonio Castro, is a V&V Specialist with more than 15 years of professional experience in Project Management and Systems Engineering activities. His expert and proven knowledge with all verification and validation management in railway systems design integration and coordination for both passenger and freight networks during all stages of a project's life cycle makes him the ideal candidate for this important project role.

V&V and Self-Certification Manager: J. Antonio Castro
Years of Experience: 15
Education/Registrations: MSc Telecommunications Engineering, Universitat Politècnica de Cataluya, Engineering PhD Candidate and Research Assistant

Level of Authority, Placement in Organization, and Percentage of Time Committed

J. Antonio reports directly to the Quality Manager, Antoni Gimenez and works closely with Project Manager Lloyd Neal, Design Manager, Roger Trevett, and with Design Quality Manager, Greg Creamer, and is 100% committed to this Project.

The V&V Manager has authority to stop any design deliverable to be submitted to the Authority if the contents or scope does not fulfill the required Technical and Non-Technical Contract Requirements, including interface addressing or design guidelines.

Role and Responsibilities for Both Implementation and Compliance with the Authority's V&V and Self-Certification Procedure

J. Antonio Castro's responsibilities include:

- Developing the V&V Plan in close relationship with the Quality Assurance and Control (QA/QC)Manager. He will lead the requirements and design management activities, both for Technical and Non-Technical Contract Requirements demonstrating compliance using a Requirements Verification and Traceability Matrix (RVTM),

- Implementing a comprehensive Interface Management Methodology and Process to integrate design between adjacent contracts, third parties, and other entities in cooperation with the Authority,
- Verifying that the work is being designed and executed in a way that facilities and subsystems are being accommodated without functional or physical constraints,

EXPERIENCE

PAST V&V EXPERIENCE

- **HSR Line Section in the Mediterranean Corridor between Murcia and Almeria - Spain ($1.26 Billion).** V&V for metrics for preliminary and detailed design in a 6.2 miles section for passenger and freight trains, with a maximum speed of 155 MPH. The project includes two long railway bridges and a large tunnel with a total length of 74.5 miles.
- **HSR Line between Sevilla and Huelva - Spain ($521 Million).** Providing detailed design V&V for a 59 miles HSR line. Scope of work also included project management consultancy, coordination and supervision of detailed design : track superstructure, electrification, and systems.
- **HSR Facilities, Madrid Central and Chamartin Railway Stations; Spain ($909 Million).** V&V Manager for the Feasibility Study. The contract also required a team of consultants providing expert advice for the Design stage.
- **Barcelona Metro Line 9 ($8 Billion).** Requirements Management (about 4000 requirements verified and validated), Interface Coordination, Testing Coordination, V&V for the longest Driverless Metro Line in Europe.

- Developing and coordinating the Change Control Management Process to describe how requirements, design, implementation and test baselines are established and updated, and
- Coordinating the ICE/ISE activities during design and construction for every Contract submittal with regard to the Technical Contract Requirements, as required for Self-Certification Procedures. He will collect the review results and be responsible to implement them into the corresponding submittals to achieve the final SONO or Approval from the Authority.

Design Changes

Through the duration of the design process, we will implement a Change Management tool to track, manage, and control changes or deviations from the baseline configuration. This tool is important for documenting changes and to confirm that the changes meet Contract requirements and certification requirements identified in the CIL. Each change will be reviewed against the design criteria, including the Safety and Security criteria. Through the change management tool we will document the changes, list the affected design criteria or contract requirements, and state how the design changes meet the criteria/contract requirements. Qualified personnel will review the changes and confirm that requirements are met.

Safety and Security

DFS is committed to the safety and well-being of its personnel as well as the third-parties employees, contractors, emergency responders, and the public. With this in mind, our approach to design ensures that the Authority's safety and security design criteria are met or exceeded and is focused on the following objectives:

- Maximize the safety and security of the public, property and environment,
- Prevent and minimize work-related risks associated with construction, operation and maintenance, and
- Prevention or minimization of damage to infrastructure and interruptions in service.

Each submittal is reviewed by the Design Quality Manager and the V&V Manager to confirm that we are meeting the safety and security requirements (Design Criteria Chapter 32) and our own objectives. Throughout the design we will proactively design for safety and security by using the following techniques:

- Replace dangerous articles, substances or systems work with non-dangerous or less dangerous articles, substances or systems;
- Combat risks at source, during design stage;

Printed on Recycled Paper

- Engage in safety planning beginning with the design phase through construction, project closeout, and the warranty period;
- Provide appropriate intrusion barriers and security fencing to prevent train to train, train to vehicle, train to pedestrian, and/or train to animal conflict;
- Layout the project site and staging with security in mind to prevent unauthorized access and intrusion;
- Inspect site to identify potential locations for intrusion, verify signage and adequate lighting;
- Identify, assess and monitor critical locations throughout the Project for installation of a CCTV video monitoring system to deter and prevent crimes, prevent attacks, monitor assets and record video recordings of the Project; and
- Maintain wildlife movement corridors that avoid safety risks by designing wildlife corridor undercrossings, wildlife fencing and wildlife artificial dens.

Our approach to supporting the Safety and Security Certification Program (described in Section 9.5.3.c) is to verify that identified safety and security requirements have been met, and to provide evidence that the Project is safe and secure for future revenue service. Each safety and security certifiable element will be considered safety and security certified when the V&V process is successfully completed.

F. COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

Integrating Our Commitments from NTP

A critical component of our approach is to quickly and efficiently integrate with your team through planning, coordinating, and actively participating in the Environmental Transfer Workshop. Because of the need to "hit the ground running" at NTP, we commit to meeting with the Authority within 30 days of NTP, pending that you are prepared to deliver the necessary environmental materials at that time. Our goal to meet 30 days earlier than required will advance schedule flexibility and initiate the process of geospatial data transfer. Both of these items are for developing our Environmental Compliance Plan (ECP) and responding to any foreseen and unforeseen Project change. Not only will our Environmental Compliance Manager, David Clark, and lead regulatory specialist attend this and other environmental meetings listed in your Environmental Compliance Manual, but we propose that our Construction Management and Design Management personnel also be involved as a way to educate our design and construction teams on the environmental process.

Developing a Robust Environmental Compliance Plan

In parallel with planning the Environmental Transfer Workshop, we will develop our interim ECP for preliminary field investigation in accordance with your Environmental Compliance Manual. To be delivered within 90 days of NTP (30 days ahead of your requirements), our draft ECP will outline our approach to implementing compliance for all Project phases, starting with design and moving through Final Acceptance. Through our ECP, we will also describe means and methods to support your larger program goals and the CEQA, NEPA, and governmental agency commitments involved in operations and future HSR phases.

The kit fox habitat in the Central Valley must be taken into account.

Our ECP incorporates the Mitigation Monitoring and Enforcement Plan into a comprehensive environmental commitment database that tracks all mitigation measures and permit requirements from the Final Environmental Documents, Section 106 MOA, Section 7 USFWS Biological Opinion, Section 404 Clean Water Act (CWA), state

environmental agencies, and other state, regional, and local entities. The database can be cross-referenced and queried for site-specific, project-wide, long-lead, short-lead, and sensitive resource items. Our database and associated commitments will be color coded and "hot linked" (described below) to the Environmental Footprint Map, Regulated Resources Map, and the Environmental Constrained Footprint, all of which will be readily available to our designers and incorporated into their plan sets. In addition, all required permits will be accessible via a matrix describing terms and conditions, responsible party, and how each stipulation and the overall permitting process integrates with our design schedule and compliance program.

Our ECP includes straightforward tools to manage compliance activities, such as environmental compliance checklists and schedules, as well as a document control system to consolidate permits, specifications, environmentally sensitive areas, Contract requirements, and maps in a single location.

Beyond the deliverables noted above, additional ECP deliverables will include:

- An enhanced and updated version of the environmental commitments database, which will become an integrated Environmental Commitments Tracking Tool,
- An Incident Reporting/Corrective Action Plan, and
- Reporting protocols for monthly status reports, upcoming environmental compliance activities, ECP compliance, on-going Project activities, and permit tracking matrices.

Successfully preparing and implementing these deliverables will help us track Project compliance with all environmental commitments and positions us to quickly and fully respond to any design changes not contemplated by the Final Environmental Documents and Governmental Approval.

Leveraging Technology to Ensure Adherence and Compliance

We will leverage integrative technology to verify both adherence to environmental commitments and compliance with all applicable standards during our work. Our ECP will be "hot linked" with the Authority's Environmental Mitigation Management and Assessment (EMMA) web portal system so that we can verify in real time that all environmental mitigation measures per the Final Environmental Documents and Governmental Approvals are cross-referenced correctly on construction plans and are readily accessible to our designers, field management staff, and construction monitors. We work with web-based portal systems for assessment and compliance tracking and very familiar with electronic reporting technologies.

Our approach to adherence during preliminary design, preconstruction surveys, and construction includes the use of iPads or field laptops provided to our staff. Our electronic reporting systems provides:

- Automated imports of field assessment data,
- Online administration for program managers/staffing roles and time-line assignments,
- Online findings from field surveys,
- Mobile applications,
- Corrective action implementation, audit, and tracking,
- Customizable user interfaces and reporting,
- Automated email notifications and task management, and
- Integration with document management systems.

Verifying compliance using electronic reporting methods is critical for projects of this size and complexity. As just one benefit to you, the system will confirm that auditable compliance records are always available for reporting to the Authority and regulatory agencies.

Printed on Recycled Paper

Responding to Unforeseen Design Changes

As a key component of our approach, we commit and are prepared to rapidly initiate and aggressively pursue the Re-Examination process to respond to any unforeseen environmental or design changes. As our first step, we will work to reduce impacts as compared to the RFP design wherever possible. For example, the RFP design appears to impact areas outside of the environmental footprint, which would require an Environmental Re-Examination. The RFP design also appears to lead to an increase in prime farmland take, which may elevate the Re-Examination to a Supplemental EIS. Our proposed design reduces total farmland by 120 acres as compared to the RFP design. We have also evaluated our design during the pre-bid phase, and it does not appear to impact additional environmental resources in the area. As such, we anticipate that the process would not elevate beyond a standard Environmental Re-Examination, nor require additional permits by resource agencies beyond those described earlier (e.g. the USACE Section 408 minor permit for ATC 3).

Based on changes already anticipated, you can see the value in a first step that minimizes and eliminates unforeseen environmental design changes. However, as the Project's evolves, more site specific information will become available through advanced planning studies and field assessments. If at this time design changes are necessary, our plan shifts to a proactive and integrative approach centered on quick resolution, integrative thinking, and full transparency.

- Environmental and design staff will work together to recommend suitable avoidance and/or minimization measures to the Authority.
- We will document of the advantages and disadvantages of the design change, and its potential impact on the Final Environmental Documents and Governmental Approvals, advising the Authority of each critical item along the way.
- Based on the Authority's decision to move forward, we will mobilize field staff and conduct appropriate environmental studies within 1 to 2 weeks, and prepare technical memorandums describing potential impacts and mitigation measures that match the intent of the Final Environmental Documents and Governmental Approvals.
- We will seek CEQA/NEPA approval from the Authority and FRA.

As a commitment to you, we will verify that every step in the design change and approval process is thoroughly documented and auditable to protect the public's interests and to meet all local, state, and federal commitments. We plan to coordinate with you to evaluate every impact throughout the Project to determine what surveying and monitoring is required along with additional mitigation measures to incorporate into our design and construction efforts.

This Page intentionally left blank

Printed on Recycled Paper

Madrid–Segovia High-Speed Rail Line, Madrid-Segovia, Spain

9.5.3 Construction and Construction Oversight

Golden Gate Bridge Seismic Retrofit Phases 2a and 3, San Francisco, CA

9.5.3 Construction and Construction Oversight

COMMITMENTS

- Achieve substantial completion within 980 working days of Notice to Proceed (NTP).
- Deliver a safe project with the goal of zero incidents.
- Integrate construction staff during design to plan the work and mitigate issues early.
- Commit construction staff who have managed High Speed Rail (HSR) and California design-build projects.
- Explore opportunities to optimize construction to meet your right-of-way (ROW) needs.
- Continue early stakeholder involvement and continued partnering throughout construction.
- Implement means and methods that provide more flexibility to accommodate third-party and other delays.
- Recruit workers from the local communities.
- Commit professional environmental staff with local knowledge.
- Partner with agricultural communities and other community stakeholders to minimize impacts during construction.

APPROACH

This is not a standard transportation project—it is an HSR project with specific demands that we know how to handle and are prepared to meet. Our approach to construction is based on the successful delivery of 41 separate HSR projects over the last 25 years. We bring a depth of practical experience, lessons learned, and understanding of HSR systems to every aspect of construction. This includes ensuring safety and security not only during construction, but into all phases of the planning, design, testing, and eventual operation of the final HSR line. This is critically important on CP 2-3 (Project) since the civil infrastructure must fully integrate with the final rail and HSR systems components to ensure a safe, high quality permanent HSR facility.

We also bring local experience as some of California's top transportation contractors to continue working with the same local subcontractors, unions, community groups, regulatory agencies, cities, counties, utilities, and other major stakeholders throughout construction. Our expertise gives us the unique know-how to ensure sufficient labor is available to build the work, comply with all environmental regulations, partner with utilities and third parties, and manage our construction sites to minimize impacts to the public.

INNOVATIONS

- We have logically segmented our work to enhance operational efficiency and streamline coordination efforts.
- We source materials locally and maximize off-highway hauling to minimize impacts to the public and the environment by shortening our haul routes, lowering the total number of truck haul trips, and reducing the amount of construction traffic on highways.
- We developed a detailed Critical Path Method (CPM) schedule to validate our approach to construction and provide schedule and cost confidence.
- We lowered the profile to maximize the use of embankments in lieu of viaduct structures to provide four distinct benefits to you: 1) more flexibility because embankment is quicker to build; 2) reduced risk of encountering unanticipated utilities or archaeological/cultural artefacts; 3) minimized subsidence risks because embankment provides for easier profile adjustments; and 4) minimized utility conflicts at 27 intersections.
- Our approach to maintenance of traffic (MOT) ensures mobility and accessibility for agricultural, commercial, and residential properties by accommodating the specific needs of community stakeholders through innovations and schedule commitments.

A. ORGANIZING AND MANAGING CONSTRUCTION

The Project requires a specialized approach to organizing and managing construction due to its sheer magnitude and the need to meet specific HSR demands and to fully integrate with CP-1 and future contracts. We have successfully built HSR projects valued at over $1 billion in Europe, such as the $1.5 billion Figueres-Perpignan Project between Spain and France, $1.3 billion Madrid-Segovia-Valladolid Project in Spain, and the $2.3 billion Poceirao-Caia Project in Portugal. These projects were all part of a larger HSR program that required building the civil infrastructure per HSR specifications and successfully integrated the rail and systems components. We also bring the added benefit of successfully delivering over $250 million worth of projects in the Central Valley, over $3 billion worth of design-build projects in California, and 10 projects with individual contract values in excess of $1 billion across North America. We have incorporated the proven strategies and lessons learned from these projects into our approach to organizing and managing construction of this Project to ensure timely substantial completion.

Construction Organization

The DFS Team has organized our construction team, shown in Figure 9.5.3-1, to address the Project's key elements and to create clear lines of responsibility, accountability, and authority. Our organization brings together HSR construction experts with some of California's premier design-build managers and a large local workforce.

Approach to Managing Construction

Our approach to organizing and managing construction is based on a thorough understanding of the Contract requirements for construction and a detailed analysis of the Project's main challenges. We emphasize safety as the most important element in our construction approach with a goal to achieve zero incidents (See Section 9.5.3.c. for further details). As presented on Figure 9.5.3-2 (Page 65) and under the subsections to follow, in addition to this goal, our construction management approach and commitments to ensure timely substantial completion include the following:

EXPERIENCE

DELIVERING MEGA DESIGN-BUILD HSR PROJECTS ON-TIME:

Dragados completed design and construction of the $1.5 billion HSR rail line from Figueres, Spain to Perpignan, France on time in only 36 months. This mega project included 27.6 miles of 220 mph HSR and addressed considerable environmental and geological challenges. We also integrated all trades and complied with the HSR standards for design, construction, and operation for both Spain and France.

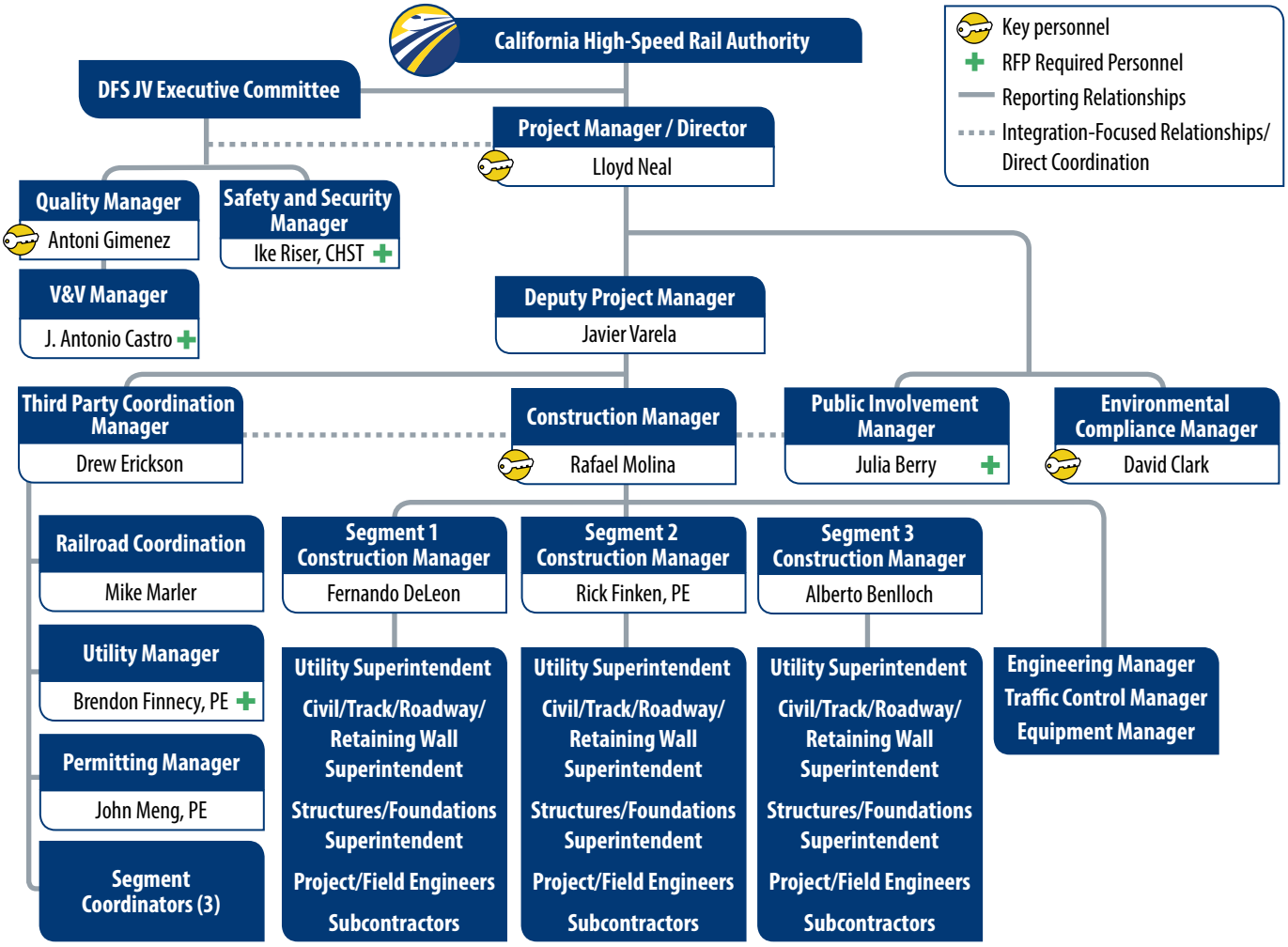


Figure 9.5.3-1 DFS Team's Construction Organization

Printed on Recycled Paper

- Early construction involvement to plan the work,
- Building partnerships through early stakeholder involvement,
- Implementing a credible and realistic CPM schedule that commits to completing the Project within 980 working days,
- Segmenting our work to enhance operations and streamline coordination,
- Strategically orienting our material sourcing and haul routes, and
- Embracing efficient and reliable construction quality management.

EXPERIENCE

HSR EXPERIENCE + MEGA U.S. DESIGN-BUILD:

Construction Manager Rafael Molina has managed construction of both a major HSR project in Europe (Northeast-Northwest Corridor HSR in Galicia, Spain) and a mega design-build project in the U.S. over $1 billion (I-595 Corridor Improvements Project in Florida). This unique combination of experience sets our team apart and gives us the experience necessary to safely construct high-quality work on time.

COMMITMENT

PLANNING THE WORK WITH EARLY STAKEHOLDER INVOLVEMENT:

The DFS Team has met with the following stakeholders in preparing our plan for organizing and managing construction:

- City of Hanford
- Baker Commodities
- Kings River Conservation District
- Kings River Water Association
- US Army Corps of Engineers
- Central Valley Flood Protection Board
- Tulare Lake Drainage District
- Cross Creek Flood Control District
- Corcoran Irrigation District
- Kaweah Delta Conservation District
- Caltrans
- Leprino Food (the largest user of SJVRR)

Early Construction Involvement

Our approach to organizing and managing construction starts well before actual operations begin ramping up. During the pre-bid phase, our construction team worked closely with specialists from all of the Project's main disciplines to develop an approach that is credible and realistic. Construction Manager Rafael Molina and our three Construction Segment Managers will be assigned to the Project on Day 1 to continue working in task forces and planning the construction operations. This approach eliminates the construction team's learning curve and allows our team to mitigate potential constructability issues, optimize means and methods, and continue to resolve other challenges before ever stepping foot in the field.

Building Partnerships through Early Stakeholder Involvement

Third-party stakeholders' involvement and buy-in is critical to achieving timely substantial completion. We have worked closely with the Authority in the one-on-one meetings and have met with several third parties to address some of their main concerns. As discussed throughout our proposal, we have made several commitments to the Authority and third parties to minimize impacts during construction and ensure timely substantial completion (see Sections 9.5.1.d, 9.5.2.a, 9.5.2.d, 9.5.3.e, and 9.5.3.f).

Implementing a Credible and Realistic CPM Schedule

As detailed in Section 9.5.1.b, we have developed a detailed CPM schedule in addition to the Level 2 requirement. We were able to best match the design deliverables to facilitate early construction activities, based on the right of entry (ROE) and ROW constraints. This detail also validates our construction approach to provide schedule and cost confidence, as we were able to accommodate potential resource and schedule constraints.

Our schedule assumes that we will not start any work in a given area until the ROW is available per the dates in the RFP, although we understand that certain parcels will likely be available before the last date. We have identified opportunities to prioritize certain ROW acquisitions to provide more efficiency during construction, and we will work with the Authority upon Notice of Award to optimize the schedule and provide additional schedule flexibility.

Segmenting Our Work to Enhance Operations and Streamline Coordination

We have divided construction management operations into three geographic segments as shown on Figure 9.5.3-2. This is a best practice that we have used in our other large HSR and design-build projects, such as the $1.5 billion Figueres-Perpignan HSR Project (mentioned above) and the $803 million Eastern Transportation Corridor. We have committed individual managers and crews to each segment in order to better control quality, monitor the work, enforce safety, and manage construction to meet our schedule. Construction Manager Rafael Molina will manage work across all segments to coordinate and allocate shared resources appropriately.

EXPERIENCE

OPTIMIZED SEGMENTATION TO DELIVER MEGA DESIGN-BUILD TRANSPORTATION PROJECTS IN CALIFORNIA

DFS Team member Flatiron organized and managed the $803 million, 25.4-mile Eastern Transportation Corridor in Southern California by splitting the work into four geographical segments and assigning specialized management and crews to each segment. This method resulted in early completion of the toll road's major segment, which opened to traffic 14 months ahead of schedule.

To illustrate the project's massiveness, at its peak there were more than 2,500 people working. The team moved 67 million cubic yards of earthwork, placed 450,000 cubic yards of structural concrete, paved 140 lane miles, placed 1.5 million tons of asphalt concrete, and built 1.7 million square feet of structures. They obtained over 1,000 permits, relocated 150 major utilities, and processed hundreds of multiple-agency design approvals.

Strategically Orienting Our Material Sourcing and Haul Routes

Our anticipated material source locations and haul routes are shown in Figure 9.5.3-2. We will source materials locally, reduce potential environmental impacts, and work closely with local agencies in tandem with the Authority. DFS has already met with several flood control and irrigation districts to identify the closest borrow pit sources adjacent to the HSR alignment to maximize off-highway hauling. We have also tested these sources to verify the borrow pits are compliant with material requirements. We will explore opportunities to form mutually beneficial partnerships with local landowners to obtain additional borrow material adjacent to the alignment in return for building irrigation detention basins or other similar work on their land. In addition to being cost-effective and schedule efficient, maximizing off-highway hauling will benefit the public and minimize environmental impacts by reducing the amount of construction traffic on the highways. Our approach will also shorten haul routes and reduce the total number of truck trips by being able to increase the capacity of each haul.

In addition to locating suitable borrow sites, we have identified over 105 existing wells in, or near, ROW limits as potential water sources for the Project. We also met with several irrigation districts throughout the alignment to identify available water for purchase.

We provide specific details on our approach and commitments to managing construction to minimize impacts and disruption to the public in Section 9.5.3.f.

EXPERIENCE

SUCCESSFUL MATERIAL SOURCING IN THE CENTRAL VALLEY

DFS Team member Flatiron imported over 1,000,000 cubic yards of soil to construct embankments on the recently completed, 10-mile reconstruction of Highway 198 in Hanford, just east of the Project. Flatiron executed separate agreements with both the Kings County Irrigation District and Lakeside Irrigation Water District to obtain the borrow material. Flatiron used a combination of scrapers, off road trucks, and highway trucks to excavate and enlarge two irrigation detention basins, while at the same time, obtain borrow material to construct the required embankments.

Printed on Recycled Paper

BEST PRACTICES

DFS selected the limits of these three segments to provide the most efficient and effective approach to managing construction. In addition to the operational benefits of being able to manage the three segments as individual projects, each with a similar scope, this division also streamlines the coordination efforts with third parties and facilitates management of trucking operations to maximize schedule flexibility.

DFS Construction Team Combines HSR and DB Construction Experts with Some of California's Leading Construction Managers

Construction Manager, Rafael Molina

- 24 years of experience and the unique qualifications of having managed construction of both a major HSR project in Europe and a mega design-build project in the U.S. over $1B (Northeast-Northwest Corridor HSR in Galicia, Spain and I-595 Corridor Improvements Project in Florida)

Segment 1 Manager, Fernando De Leon

- 24 years of California construction experience.
- Deputy Project Manager on $772M Silicon Valley Berryessa DB Transit Extension.
- Managed construction on $82M Golden Gate Bridge Seismic Retrofit Phase III and $1.4B San Francisco-Oakland Bay Bridge East Span Skyway.

Segment 2 Manager, Rick Finken, PE

- 30 years of California construction experience.
- Project Manager on the $203M I-5 "Gateway" Widening in Buena Park.
- DB experience includes $803M Eastern Transportation Corridor and $800M San Joaquin Hills Corridor Projects in Orange County.

Segment 3 Manager, Alberto Benlloch

- 29 years of construction experience.
- Current PM on Dragados/ Flatiron's $498M Calaveras Dam Project in Sunol, CA, which includes over 3.5 million CY of earthwork.

MAP LEGEND

Construction Means/Methods

- Highway Trucks
- Off Highway Semi Double Bottoms
- Scrapers
- Flow from Borrow Sites/Hauling

Material Sourcing

- 1 FMFCD Borrow Site*
- 2 KDWCD Borrow Site*
- 3 KDWCD Borrow Site*
- 4 CID Borrow Site*
- Field Office
- Equipment/Material Storage

* We will explore other sources for materials post-award, including mutually beneficial partnerships with local landowners.

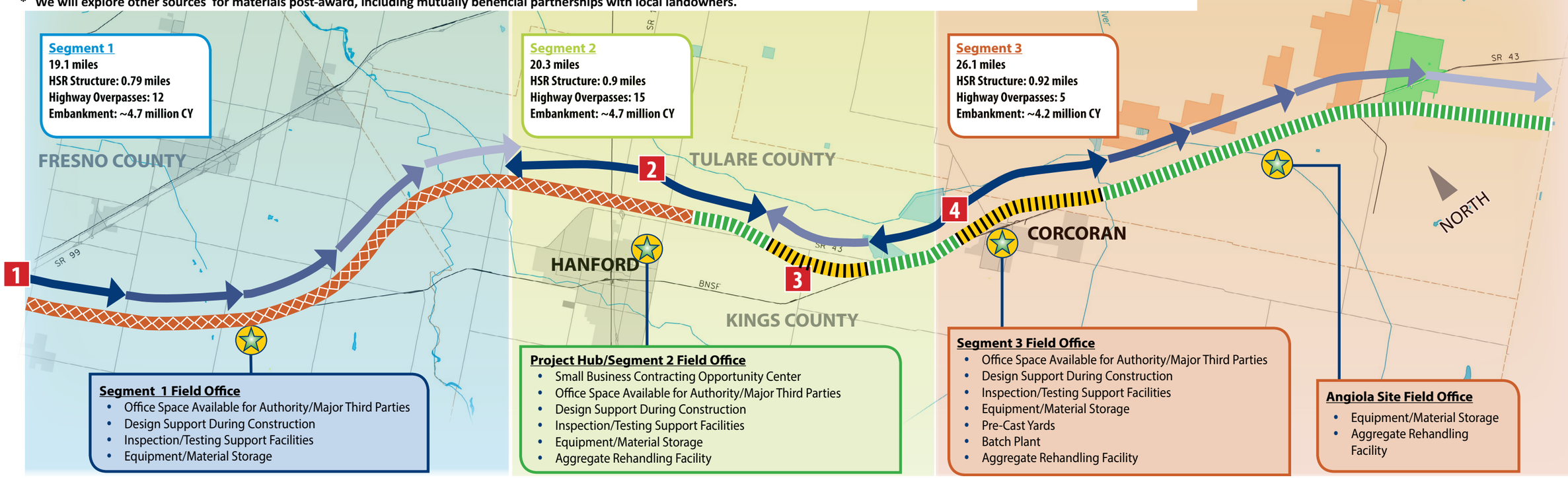


Figure 9.5.3-2 DFS Segmentation, Material Sourcing, Haul Routes, and Construction Organization

Printed on Recycled Paper

This page intentionally left blank.

Embracing Efficient and Reliable Construction Quality Management

Construction quality begins with a thorough understanding of the Project's requirements. We will hold pre-activity meetings for every task to make sure the employees in charge of the work completely understand the requirements to match the Authority's expectations. The foreman or responsible field engineer, Quality Assurance (QA)/Quality Control (QC) staff and Authority representatives will attend these meetings. Once specific requirements are agreed upon, they are reviewed in depth with the appropriate foreman or project engineer and QA staff. Pre-activity meetings also cover safety, access and staging, construction work plans, materials testing and sampling, inclement weather plans, inspection checklists and hold points, and the Authority's quality requirements.

We will use full-time, on-site inspectors and specialty technicians and a certified, mobile laboratory to conduct and comply with project sampling, testing, inspection, and monitoring requirements. Certified site inspectors will have the experience required to address the types of work in progress at any given time. Additionally, the original design engineers will visit the site on an as-needed basis to make sure construction complies with the design intent. Additional details on our approach and commitments to ensure compliance with the Authority's Master Quality Plan are included in Section 9.5.1.c.

Methods to Achieve the Flexibility Necessary to Accommodate Third-Party Delays or Unanticipated Conditions

We have optimized the design and selected our construction means and methods to provide flexibility to accommodate third-party delays or unanticipated conditions during construction. We lowered the profile to maximize the use of embankments in lieu of viaduct structures, while still maintaining roughly the same quantity of borrow material needed. This offers the following construction benefits:

- Provides more flexibility during construction because embankment is quicker to build.
- Reduces the risk of encountering unanticipated utilities or archaeological/cultural artifacts by minimizing the amount of subsurface work.
- Minimizes subsidence risks because embankment provides for easier profile adjustments and more flexibility to address subsidence issues.
- Reduces the footprint and minimizes utility conflicts and associated third-party delay risk at 27 of the intersections along the HSR alignment.

EXPERIENCE

DFS PROJECT MANAGER LLOYD NEAL'S EXPERTISE WORKING WITH OWNERS TO ACHIEVE SCHEDULE FLEXIBILITY TO DELIVER PROJECTS ON TIME

The SR-22 Design-Build Project in Orange County was a politically-sensitive project and the first design-build project for the Owner (OCTA). The project was initially delayed three months due to seismic design criteria changes that occurred during design of the project's 38 bridges. Lloyd worked with the team to re-sequence the design deliverables and with Caltrans to revise the staging plans. Once design and construction was successfully re-sequenced for on-time delivery, Lloyd worked with the primary stakeholders to equitably resolve the issues associated with the delay and subsequent re-sequencing.

Managing Third-Party Delays or Unanticipated Conditions

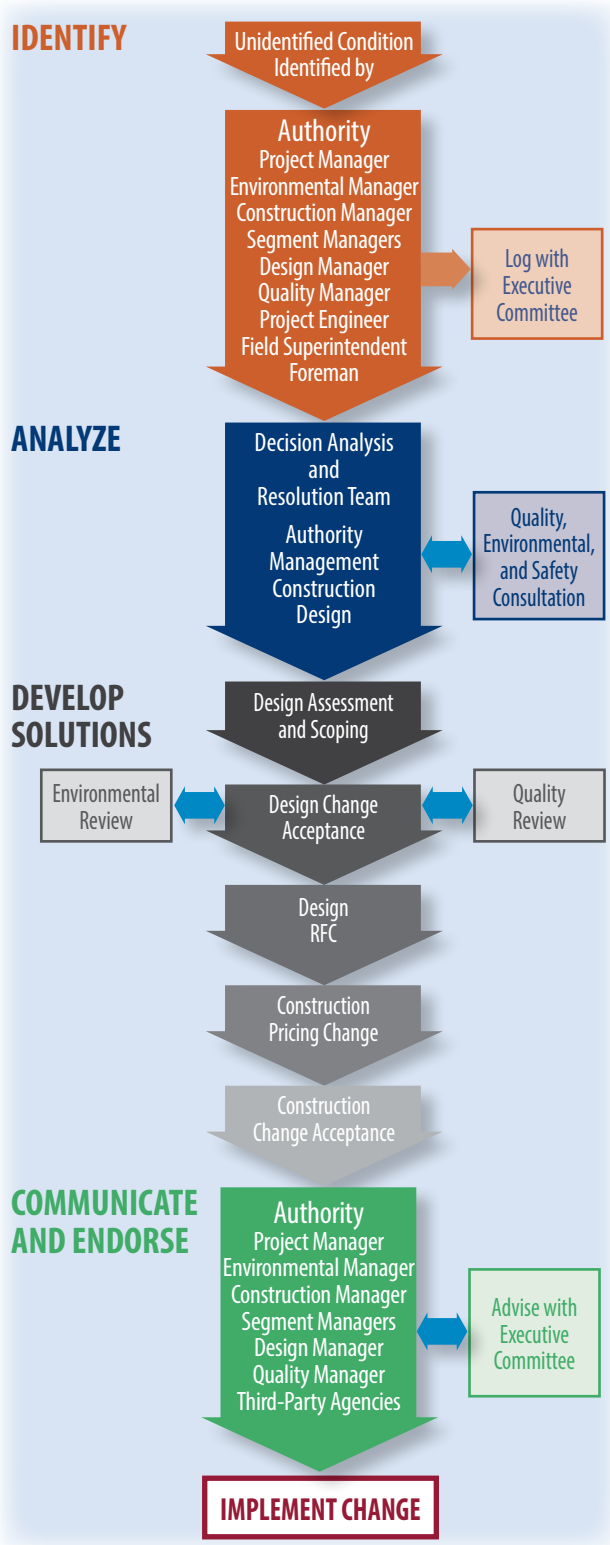
Identifying potential third-party delays or unanticipated conditions early is critical. The earlier we identify issues, the greater the range of solutions. To accomplish this, DFS will task our three Design-Build Coordinators and Constructing Segment Managers with attending the task force and weekly status meetings to monitor design and field events corridor-wide. We will track all identified issues on our Project Risk Register and will review with the Authority and relevant third parties each month.

As part of the pre-bid process, the DFS Team has highlighted areas that have the greatest potential for encountering third-party delays or unanticipated conditions. We have included these and our approach to

mitigate or help manage each as part of the "Top 20 Risks" discussion detailed in Section 9.5.1.e. Upon contract award, these areas and additional areas of concern will be transferred to the Project Risk Register that will be reviewed regularly with the Authority and relevant third parties.

We will work with you to develop contingency plans early for areas that present higher risks of delays. For example, to mitigate ROE and ROW delays in a certain area, we have the ability and can work with the Authority to modify our means and methods of hauling material around the area to accommodate those delays.

Figure 9.5.3-3 Approach to Managing Unanticipated Conditions During Construction



Third-Party Delays

The DFS Team has fully integrated third-party activities into our schedule and reporting system. Any anticipated delays are identified early and reported as part of our weekly schedule meetings. Early identification allows us to work closely with the Authority to develop a solution together. If potential delay issues arise, we will immediately meet with the third party and Authority, review their constraints, and help develop a recovery plan that minimizes negative schedule impacts.

In the case that an event impacts the Project's critical path, we employ processes we have used on past projects of similar size and complexity to achieve the flexibility necessary within the confines of the contract. We will explore the following options with you, shown in order of priority, to accommodate delays.

1. Re-sequence activities to allow concurrent work in other areas, if possible (i.e., fast-tracking).

EXPERIENCE

PARTNERING TOGETHER WITH OWNERS TO OVERCOME THIRD PARTY DELAYS

Dragados' $1.2 billion I-595 Project in Florida required coordination with numerous third-party agencies and municipalities who delayed construction early in the project. The project team was able to recover this lost time through formal partnering and working together toward common goals. For example, agency reviews were streamlined from 28 to 21 days and daily workshops were implemented to enhance communication amongst all parties. Dragados opened the project on time in March 2014, in the words of FDOT Project Manager Paul Lampley:

"We delivered it on the same day we said we would five years earlier. It really shows this model works. Florida DOT is very proud of this project."

Printed on Recycled Paper

2. Focus available resources on those activities that are impacting the critical path to gain time for the follow-on work to proceed.
3. Extend work schedules or perform additional shift work.
4. Increase resources on activities that show less than expected progress.
5. Change means and methods (i.e., going from off-highway hauling of materials to on-highway hauling).

Unanticipated Conditions

We will develop a Project-specific management policy with you to accommodate and address unanticipated conditions during construction. When an unanticipated condition is identified, Project Manager, Lloyd Neal will assign and manage it through a five-stage process as illustrated on Figure 9.5.3-3.

Professional Staffing Levels

Construction Manager, Rafael Molina will lead our team's mobilization efforts for construction starting at NTP. This will also ensure that we are mobilized and ready to start work immediately for early work items such as field surveys, utilities, and clearing and grubbing, once required ROE and ROW is obtained.

Figure 9.5.3-4 shows the anticipated professional staffing levels over the life of the Project. As shown, we plan to have approximately 50 personnel assigned to the Project upon NTP to oversee design and to mobilize construction.

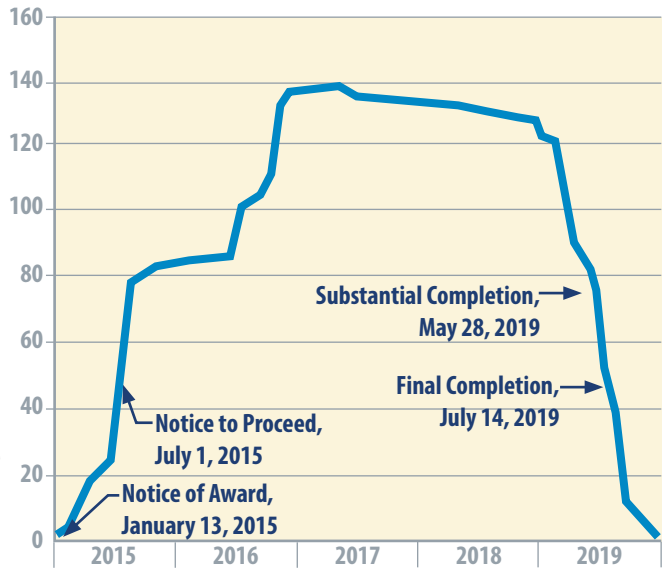


Figure 9.5.3-4 Anticipated Professional Staffing Levels

Long-Lead Construction Materials

The DFS Team has significantly minimized risks related to delays by reducing the total amount of long-lead construction materials needed through our innovative design. Table 9.5.3-1 lists the long-lead construction materials needed on the Project and the total percentage of material that has been reduced because of our design.

Our approach to procuring construction materials to mitigate delays, especially for long-lead items, includes the following key elements.

- Identify major materials and long-lead times for critical items.
- Utilize existing database of vendors and suppliers developed from past projects in the area to identify local vendors (including small businesses) and verify their supply history and capabilities.
- Prioritize design of long-lead items and submit purchase orders immediately upon issuance of applicable Released For Construction (RFC) drawings.

Table 9.5.3-1 Required Long-Lead Construction Materials and DFS Total Percent Reduction in Amount Needed

Project	Total % Reduction
Concrete and Rebar (PC & CIP)	75%
Truss steel	65%
Pre-cast girders	45%
Pre-cast box culverts	(30%)*
Expansion joints & bearings	60%
Foundation materials	70%
Embankment/borrow material	(2.5%)**

**We standardized the design of all box culverts to be 10 ft. by 3 ft. or 10 ft. by 5ft. across the entire Project to mitigate delays. We will coordinate the delivery of box culverts per our schedule to meet construction needs. We also met with several pre-cast suppliers across the state to confirm the feasibility of supplying the project demands.*

***We lowered the HSR profile to eliminate approximately 7 miles of viaducts in lieu of embankments, while nearly maintaining the same embankment quantities as the RFP design.*

- Acquire major materials, such as concrete and aggregates, through redundant blank purchase orders with several vendors to guarantee prices, confirm on-time deliveries, and minimize any possibility of shortages.
- Identify potential vendors and suppliers outside of the Project's vicinity with capabilities to deliver to the site as a contingency to mitigate potential local material shortages.

Other Infrastructure Projects Valued in Excess of $100 Million

Table 9.5.3-2 shows a list of other infrastructure projects values in excess of $100 million that key members of our team are committed to as of the date of our proposal submission.

B. ENSURING AVAILABILITY OF TRADESMEN

Table 9.5.3-2 Infrastructure Projects Valued in Excess of $100 Million

Project	Team Member	Value	Anticipated Completion
Calaveras Dam Replacement Project, Sunol, CA	Dragados / Flatiron	$497 million	10/2018
SR-99 Alaskan Way Viaduct Replacement Project, Seattle, WA	Dragados	$1.4 billion	12/2015
Presidio Parkway, San Francisco, CA	Flatiron	$270 million	05/2015
BART Oakland Airport Connector, Oakland, CA	Flatiron	$361 million	11/2014
VTA Berryessa Extension, San Jose, CA	Shimmick	$772 million	05/2016
Gerald Desmond Bridge Replacement Project, Long Beach, CA	Shimmick	$650 million	07/2016
Transbay Transit Center – Concrete Package, San Francisco, CA	Shimmick	$112 million	09/2015
710 Freeway Reconstruction, Los Angeles, CA	Shimmick	$103 million	07/2015

The DFS Team has extensive experience in the Central Valley and has provided skilled tradesmen to some of the largest transportation projects in California. DFS is strategically structured with firms that maintain a core group of craft and field supervisors with the training and expertise required to build the Project. Our team members are signatory to local and statewide union agreements, participate in recognized apprenticeship training programs, and work with local organizations to continually develop a workforce of qualified tradesmen.

Approach to Ensuring Tradesmen Availability

We will continuously track and forecast the labor resources required throughout the Project's duration. Our schedule will incorporate the estimated craft labor hours for our work and show the labor resource needs. We will use this tool to forecast labor needs for both self-performed and subcontracted work. We will communicate with our subcontractors and the unions to ensure that they have the capacity to deliver the labor necessary to provide the work on time.

Our proactive approach involves collaboration with local resources, such as the cities of Fresno, Hanford, Corcoran, Visalia, and Bakersfield, and other entities concerned with growing local employment opportunities or transitioning out-of-work residents into the construction trade. In addition to reaching out to local governments, DFS will continue our partnerships with building and construction trade unions, California Labor Federation, the Central Valley Work Force Investment Boards (Central California Workforce Alliance), and other community-based organizations.

COMMITMENT

We will recruit and hire workers from local communities near the Project and provide opportunities for disadvantaged workers. We also implement the required programs and employ experienced personnel at all levels to successfully complete the work and meet project requirements.

Printed on Recycled Paper

We will participate in, and actively endorse, union apprenticeship and journeymen programs. These training programs offer value to the local workforce as well as the Authority in regards to future projects. To complement these programs, DFS aims to provide life skills and technical training in pre-apprentice programs that promote positive life changes, teach multi-trade expertise, and bridge career change to empower a diverse socioeconomic community.

INNOVATION

We have and will continue to explore opportunities with Cypress Mandela (a leader in construction workforce development training) to work with the Central Valley Work Force Investment Boards and California Department of Veteran Affairs (CalVet) to develop innovative training programs as part of our commitment to ensuring the availability of tradesmen.

Approach to Ensure Sufficient Labor Forces if a Shortfall of Tradesmen Occurs

DFS Team members have over 1,000 craft personnel available in California and will implement a multi-faceted approach to fill these positions using the following methods:

- We identified several local unions that have the personnel needed for the Project (see Table 9.5.3-4).
- We identified numerous local Construction and Construction personnel agencies to assist our construction effort.
- We will have an on-site worker resource center to provide information for people interested in working on the Project.
- We will partner with the local farming communities for potential craft labor, coordinated with the agricultural off-season unemployment.
- We will subcontract out portions of the work to local subcontractors who have an established labor force.
- We will hold hiring events for local tradesmen in Kings, Tulare, and Fresno counties.
- We will implement target hiring processes previously used on similar rail and large-scale design-build projects, such as the BART Oakland Airport Connector, to keep our labor pool filled with skilled and experienced personnel.
- We have the ability to pull labor forces from projects in other counties and states as necessary.

EXPERIENCE

APPRENTICESHIP AND LOCAL HIRING

The Flatiron-led design-build team for BART's Oakland Airport Connector delivered the work on-time with a force of 19.2% apprentices and 34.4% local labor.

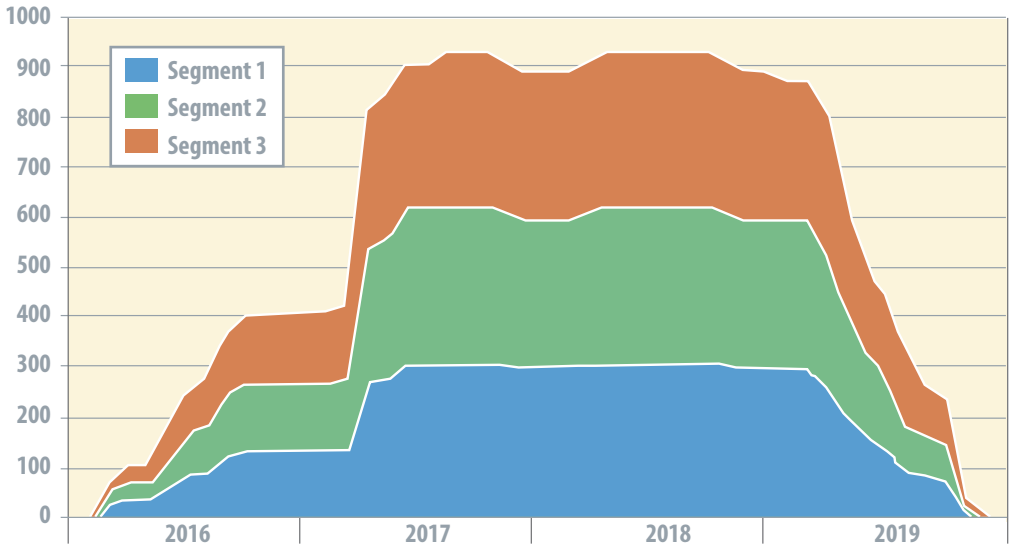


Figure 9.5.3-5 - Anticipated Tradesmen for Each Segment

Timeline Analysis of Work Fronts and Required Tradesmen

Per our approach to segmenting the Project, we will manage all construction on three primary fronts, organized as independent geographical segments under the direct supervision of individual segment managers. Our past experience and an in-depth analysis of the Project scope of work and schedule have given us a reliable estimate to the amount of workers needed throughout construction. Figure 9.5.3-5 shows a timeline analysis of the number of tradesmen anticipated for each of the three segments, including both self-performed and subcontracted work.

Analysis of Employed Trades

During construction, the Project will face critical demand for skilled trades, including personnel experienced in HSR, earthwork, civil works, utilities, grade separations, and a complex array of structures. We anticipate using union labor for its expertise and to prevent disruption. Working with the Central California Workforce Alliance, we expect the Authority's Community Benefits Agreement to be a key mechanism for securing trained construction workers. Table 9.5.3-4 identifies the required trades, the anticipated number of workers required for the Project during peak construction, and the local union resources available for the Project.

Table 9.5.3-4 - Anticipated Required Workers During Peak Construction

Employed Trade	Anticipated # Workers for Peak Construction	Available Union Workers for the Project
Carpenters	250	✓ Carpenters Local 701 : approximately 900 members ✓ Carpenters Local 1109: approximately 500 members ✓ Carpenters Local 9083: approximately 300 members
Operating Engineers	210	✓ Operating Engineers Local 3 District 50: approximately 2000 members
Ironworkers	120	✓ Ironworkers Local 155: approximately 370 members
Teamsters	46	✓ Teamsters Local 431: approximately 2500 members
Laborers/Apprentices	300	✓ Laborers Local 294: (Fresno, Madera, Kings and Tulare counties) : approximately 1,000 members / 80 Apprentices

Compliance with the Authority's Community Benefits Agreement

The DFS Team is committed to complying with your Community Benefits Agreement to promote employment opportunities throughout the Project. We are also dedicated to develop career opportunities within our team and for our subcontractors and increase the utilization of small businesses and disadvantaged workers participating in the Project.

This Project provides a tremendous opportunity to develop local employment personnel and businesses that can benefit from working on the Project. With a goal to increase employment opportunities in

EXPERIENCE

- **Calaveras Dam Project, Sunol, CA:** Dragados and Flatiron are signatories to a PLA that requires use of apprentices to provide craft labor for this $497 million project in Northern California. The project team is working with several approved apprenticeship programs to employ apprentices on the project consistent with the ratios contained in the apprenticeship program's standards as approved by the State of California.
- **Mid-City/Exposition LRT Project, Los Angeles, CA:** Flatiron's Local Jobs Program delivered 30% worker hours from the local community with underserved and disadvantaged population.
- **BART Oakland Airport Connector, Oakland, CA:** Flatiron employed 19.2% apprentices and 34.4% local labor. Flatiron partnered with the ACE Mentorship Program to provide high school students with exposure to the project and to increase their awareness of engineering and construction as a career choice.
- **Kicking Horse Canyon, Phase 2, Golden, British Columbia:** Flatiron provided training for the local workforce in Canada to become rock truck operators. This was accomplished through mentoring novice operators from the forestry industry and assisting them to gain the experience needed to safely perform the work. These newly trained employees, the majority of whom were women, became qualified operators and were valuable to the project's labor force.

Printed on Recycled Paper

the Central Valley that pay prevailing wages, we recognize our role in creating an economic boost to for the local workforce. We have and will continue to actively diversify our workforce to represent the minorities, women, veterans, and other underserved populations in the area. We know that the efforts to ensure National Targeted Hiring Initiative Requirements are ongoing and demand a focused recruiting effort to meet the minimum 30% National Targeted Worker hours of all Project work hours with a minimum 10% of the National Targeted Worker hours comprised of Disadvantaged Worker hours.

Workforce Utilization and Training

We will also integrate the local underutilized and disadvantaged workforce into our team by ensuring that on-the-job training is available to all personnel and through the local union apprenticeship programs. A strong future workforce in the Central Valley requires us to train and develop the local workers for construction and other industry opportunities after the Project is completed. With the goal of increasing Project diversity, we have and will continue to actively recruit employees from underserved and disadvantaged populations.

Our approach provides local employees with new skills that they can use to find employment after the Project is completed. For example, training workers how to survey, operate equipment and construct concrete structures provides long-lasting benefits for the local community. Local workers then have the experience to work on upcoming HSR sections, future Caltrans jobs and other local projects.

C. INTEGRATING SAFETY AND SECURITY

When it comes to safety and security, the foundational element of our approach is to care for people rather than just policy. Although not the only indicator, we take pride in the recognition we have received in protecting our personnel, emergency responders, and the public.

Our commitment is to fully integrate safety and security into all phases of the planning, design, construction, testing, and eventual operation of the final HSR line. The DFS Team will adopt the Safety and Security Program objectives in Section 26 of the General Provisions and will implement each into our Project-specific safety approach.

Approach and Commitments to Safety and Security

We believe every incident is preventable, and at its most basic levels, our approach is to:

- Achieve zero incidents,
- Empower every employee with stop-work authority to report unsafe conditions,
- Provide all employees the training and tools to ensure a safe and secure work environment, and
- Re-evaluate our goals on a quarterly basis to assess continual improvement and improve training.

These goals, along with regular updates, will be communicated to all Project personnel, including our subconsultants/subcontractors. We will work with you and other involved agencies to create a Project safety partnering charter, signed by all parties, that commits to a common goal of championing safety and security in all that we do. As part of our overall plan, we will provide the following deliverables per the requirements of Section 26 of the General Provisions:

- Site-Specific Management Plan (SSMP),
- Site-Specific Health and Safety Plan (SSHASP),
- Site-Specific Security Plan (SSSP),
- Safety and Security Certification Program (SSCP),
- Site-Specific Hazard Analysis (SiSHA) Reports and Site-Specific Threat/Vulnerability Assessment (SiSTVA),

- A Monthly report of safety/security performance to the Authority and DFS Project Management and Executive Committee,
- Communication protocol with the Authority to coordinate safety and security measures, and
- An Emergency Response Plan, including emergency vehicle access, and a Crisis Management Plan.

Based on our core principles and the listed deliverables, our approach begins at design, demands a thorough commitment during construction, and completes safety and security certification.

Safety and Security Begins at Design

We have been thinking about safety and security from day 1. During the pre-bid phase and through design completion, we have and will continue to integrate critical decisions, with support from our construction team, to significantly reduce safety and security risks to our workers and the public during construction and future operations/maintenance. To this end, our designers have incorporated the following principles of prevention:

- Implement HSR-specific alignment safety elements that prevent potential incidents and protect the public and wildlife.
- Stage the Project site to prevent unauthorized access and intrusion and identify potential locations for intrusion and verify signage and adequate lighting.
- Assess critical locations for Closed Caption Television (CCTV) video monitors to deter crimes and attacks, monitor assets, and record Project progress.
- Design corridor undercrossings, fencing, and artificial dens for safe wildlife movement.
- Mitigate floodplain impacts by sizing drainage appropriately and protecting embankments and viaducts near the main river locations.
- Adhere to current seismic codes to protect structural integrity of viaducts and structures.

Our design also incorporates a number of HSR-specific items that were part of our Figueres-Perpignan, Madrid-Segovia-Valladolid, and other complex HSR projects. We anticipate continuity with subsequent construction packages and will work to reduce risks associated with security breaches and vulnerabilities by incorporating:

INNOVATIONS

- We replaced 7 miles of viaduct with embankment, which reduces safety hazards compared to bridge construction and is safer and easier to maintain.
- We provide a safer permanent facility with ATC 17 by providing a grade separation at SR-43 and SJVRR, a long term Caltrans objective
- ATC 2 creates a grade separation for SR-43 to cross over the HSR to eliminate the tunnel effect from the straddle bents shown in the RFP design.

RECENT DFS SAFETY RECOGNITION

EXPERIENCE

- 2013 First Place AGC San Diego Construction Safety Excellence Award
- 2013 ACG of California First Place for Safety Excellence
- 2013 AGC of California High Hazard Safety Award for Golden Gate Bridge Seismic Retrofit
- 2013 United Contractors R.E.A.L safety award in 500,000+ Man hour category
- 2013 AGC National Construction Safety Excellence Award
- 2012 First Place AGC Safety Excellence Award, Highway Division, Over 1 Million Hours Category
- 2012 Safety Award for Yadkin River Bridge
- 2012 AGC of Utah Platinum Safety Award
- 2012 AGC Safety Award, Safety on a High Hazard Project for Point Bonita Lighthouse Pedestrian Bridge
- 2011 AGC of California Excellence in Safety Award, Heavy Civil Contractor Over One Million Hours Category
- 2011 Safety Award for Achieving over 2.5 million work hours without a lost-time incident on Calaveras Dam Project
- 2011 AGC of Utah Platinum Safety Award
- 2011 United Contractors Safety Award (Safety Program)
- 2011 AGC Safety Award in the Heavy/Highway Division
- 2011 1st Place Safety Award for Unique Safety Application on Dumbarton Bridge Retrofit
- 2011 1st place in 500,000+ man-hour category for EUCA safety award
- 2010 National Railroad Construction and Maintenance Association (NRC) Silver Award for Safe Contractor of the Year
- 2010 U.S. Army Corps of Engineers' Safety Award for Civil Works on the Portugues Dam
- 2010 Liberty Mutual Gold Safety Award for Lincoln Bypass Project

Printed on Recycled Paper

- Access restriction fencing,
- Controlled access,
- Intrusion protection barriers between shared transportation corridors to limit risk caused by the train's HSR velocity,
- Structure pier protection walls, guardrails, and barriers, and
- Concrete barriers to protect fill or trench walls from adjacent traffic.

EXPERIENCE

ZERO LOST-TIME INCIDENTS ON MAJOR PROJECTS IN CALIFORNIA

- Dragados and Flatiron received the Water System Improvement Project (WSIP) Safety Award from SFPUC to recognize achieving 2.5 million work hours without a lost-time incident on the Calaveras Dam Replacement Project in Sunol.
- Flatiron achieved over 3.5 million work hours without a lost-time incident on the Exposition LRT Project in Los Angeles.
- Shimmick reached over 4.3 million work hours without a lost-time incident on the Metro Gold Line Eastside Extension Project in Pasadena.

A Thorough Commitment during Construction

Our comprehensive, Project-specific SSMP will conform to the Authority's SSMP and will be submitted for review within 60 days following NTP. The SSMP will identify how the team will manage construction SSHASPs and SSSPs. As part of our SSMP, the DFS Team will develop SSHASPs and SSSPs for each distinct and unique work site in direct relationship to Project development, phasing, and the tasks at hand. The key elements of our approach to safety and security are summarized in Table 9.5.3-5.

Table 9.5.3-5 -Approach to Safety and Security

Safety and Security Item	DFS Actions
Planning	✓ Develop a comprehensive program and task-specific safety and security plan per our Job Hazard Analyses. ✓ Plan work to prevent hazards, incidents, injury, illness, damage, and loss of production time. ✓ Incorporate safety, incident prevention, and security breach prevention into every employee task. ✓ Identify equipment and resource requirements for the site and each job task. ✓ Prepare plans for maintaining pedestrian access and traffic, using traffic control and detours. ✓ Plan and coordinate activities around freight and rail operations with BNSF and UPRR/SJVRR. ✓ Meet on a weekly basis (construction supervisory team) to update the 3-week look ahead schedules. ✓ Discuss well in advance tasks and safety requirements for equipment, trucking, labor, and materials.
Job Hazard Analyses (JHAs)	✓ Develop a JHA to guide every operation to identify risks and potential hazards, formulate a mitigation plan, conduct tool analysis, assess access, and address additional hazards.
Daily Risk Assessments (DRAs)	✓ Develop DRAs under job-specific guidelines for each workday to be reviewed by field personnel at the start of each shift. DRAs detail anticipated hazards and mitigations to maintain a safe work environment.
Weekly Toolbox Meetings	✓ Conduct weekly tool-box safety meetings with crews to teach and/or reinforce safety-related topics. For example, the daily pre-shift briefing may focus on safety considerations for the day's activities, whereas the tool-box safety meeting may instruct the crew on the details of OSHA's requirements for trench excavation. ✓ Routinely review tools, incident and near-miss reports, best practices, and top five safety hazards, as needed.
Daily Tailgate Meetings	✓ Conduct daily safety meetings before starting each shift to review JHAs and daily risk assessments for each element of work for that day.
Screening	✓ Take a proactive loss control approach. ✓ Require all employment candidates to pass a pre-employment substance abuse screening. ✓ Require new employees to participate in a Project safety orientation.
Safety and Security Training	✓ Implement formal training that covers procedures for Cal OSHA, operators, and emergency response and evacuation; the SSMP, SSSP, and SSHASP; and procedures for project specific safety hazards. ✓ Train workers on theft and vandalism deterrence and its impact on the Project schedule and budget ✓ Inform workers of disciplinary action procedures. ✓ Conduct frequent supervisory training at all levels to maintain and improve safety management skills.
Safety Inspections/ Tours/ Audits	✓ Partner with Cal OSHA for regular inspections and audits of construction sites along the alignment. ✓ Daily inspect sites and correct safety issues immediately with field personnel. ✓ Inspect sites to identify locations for intrusion and verify signage and adequate lighting. ✓ Perform regular audits of the Safety and Security Program and provide corrective actions, if needed.

Table 9.5.3-5 -Approach to Safety and Security

Safety and Security Item	DFS Actions
Subcontractor Safety	✓ Provide subcontractors all safety documents and require compliance with our Safety and Security Program. ✓ Require subcontractors to attend Project-specific safety orientation prior to starting work and to participate in weekly and general Project safety meetings, accident reporting, and near-miss reporting. ✓ Require vendors with on-site personnel to comply with our Safety and Security Program.
Personal Protective Equipment (PPE)	✓ Require all employees and subcontractors to follow task-specific PPE requirements. ✓ Provide appropriate PPEs to employees and Project guests.
Executive Safety Committee	✓ Assign executive management to review and audit the Safety and Security Program; review and analyze safety issues, trends, and mitigation measures; and conduct post-incident analysis and corrective and mitigation actions.
Communication	✓ Work closely with the Authority to promote the Safety and Security Program. ✓ Develop communication protocols with local law enforcement agencies. ✓ Communicate regularly via e-mail and posted communications among team members.
Corrective Actions	✓ Maintain a system for prompt detection and correction of unsafe or unhealthy practices and conditions. ✓ Take necessary steps to confirm site security is restored immediately upon any findings.
Reporting	✓ Develop a reporting procedure for identifying all work-related injuries and incidents per Cal OSHA requirements. ✓ Submit monthly safety performance reports that include incidents of injury or property damage, injury rates, incident investigation results, Center for Advanced Public Safety (CAPs), communication and training efforts, and summary of safety activities.
Compliance	✓ Comply with all FRA safety regulations, state and local laws, and industry standards. ✓ Obtain permits required by the Cal OSHA to be kept on site. ✓ Identify hazardous chemicals on site with regard to environment, disposal, and employee safety.

Safety and Security Certification

As part of our commitment to design and construct a safe and secure HSR, we are responsible for safety and security certification activities associated with our work. In conformance with General Provisions Section 26.3.2, Figure 9.5.3-6 summarizes the main elements of our SSCP. The primary objective of certification is to verify that all guidelines and requirements have been met and the Project is safe for operation per FRA and FTA requirements. We will apply a structured approach to establish safety and security design requirements based on hazard and vulnerabilities analysis and applicable codes, standards, and criteria much in the same way we did on Figueres-

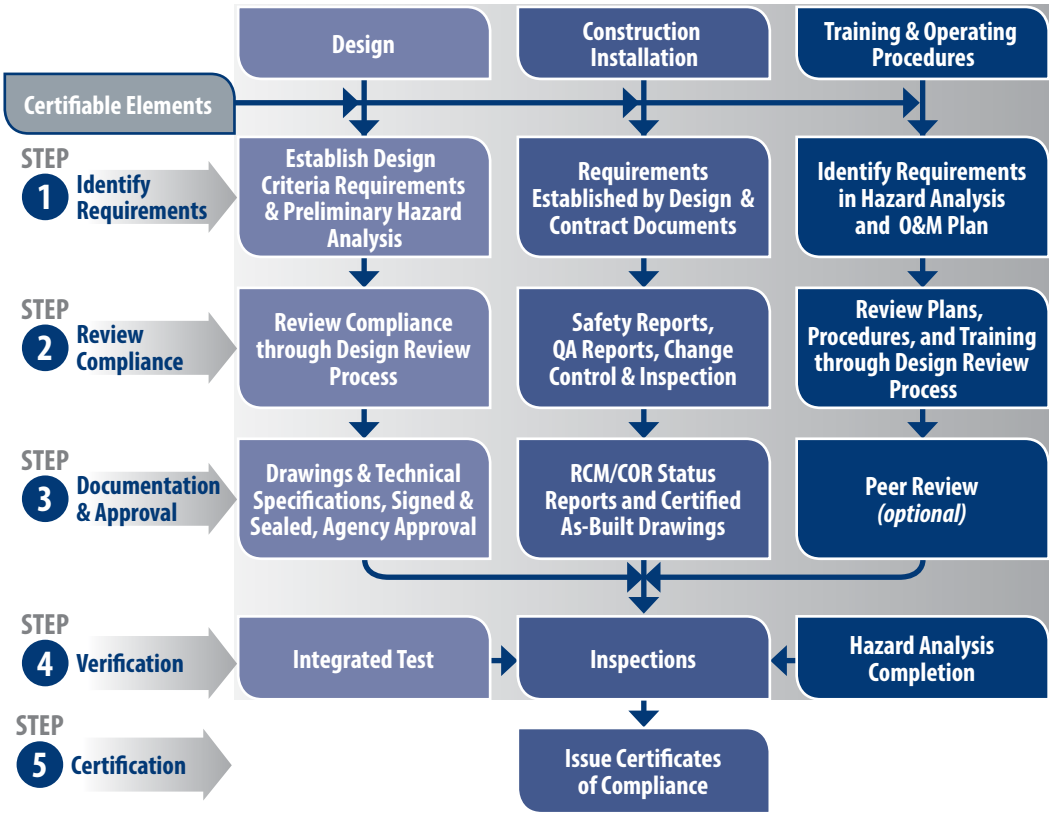


Figure 9.5.3-6 -Main Elements of DFS SSCP

Printed on Recycled Paper

Perpignan, Madrid-Segovia-Valladolid and other complex HSR projects. The plan also verifies that required safety and security certification documents are maintained at each stage of the Project and that all rail system criteria, design, procurement, construction, facilities, systems equipment, procedures, plans, and training programs are analyzed and reviewed for compliance with safety requirements and certified prior to revenue service.

Qualifications and Experience of Our Safety and Security Manager

Safety and Security Manager, Ike Riser, CHST, brings over 35 years of experience maintaining and overseeing construction safety, health, and security and meets all of the Authority's minimum qualification requirements in Section 26 of the General Provisions. For the past eight years, Ike has been Shimmick's Safety Director, where he oversees seven safety managers, jobsite safety, fleet safety, training, worker's compensation, general liability, loss prevention, incident investigations, daily job site audits and inspections, and the daily safe operations of all company jobsites.

Ike has managed safety and security on several large transportation projects throughout California, including rail transit and design-build projects. A summary of Ike's relevant qualifications and experience is shown in Table 9.5.3-6.

Table 9.5.3-6 Ike Riser Relevant Qualifications and Experience

Relevant Training/Registrations	Representative Project Experience
✓ 35 Years of Experience ✓ Construction Health & Safety Technician (CHST) ✓ FRA Roadway Worker Protection ✓ Certified OSHA Outreach Trainer – OSHA 30/10 hour Certified OSHA 500 Construction 30/10 hour Instructor ✓ Safety Trained Supervisor (STS) ✓ Certified Safety Professional (CSP) Candidate ✓ Construction Risk and Insurance Specialist (CRIS) ✓ Registered Safety Professional (UCSD) ✓ AGC California, Safety Professional of the Year 2012 ✓ Certified First Aid, CPR/AED Instructor ✓ Accident Investigation Techniques (Zurich) ✓ EM385 Certification (UCSD) ✓ HazWoper 40 Hour Safety Trained ✓ Fundamentals of Rigging/Train the Trainer (UCSD) ✓ Synthetic Lifting Products Training ✓ Flagger Instructor (SFSSA) ✓ Traffic Control Supervisor (SFSSA) ✓ Respiratory Protection and Fit Testing ✓ High Voltage Electrical Safety (UCSD) ✓ Electrical Standards-OSHA 3095 (UCSD) ✓ Trenching and Excavation Competency ✓ Confined Space Awareness (BDCC) ✓ Drug/Alcohol Awareness (BDCC)	**VTA Berryessa BART Extension Design-Build ($772M):** Extension of the light rail transit system 20 miles south from Fremont to San Jose that included at-grade, trench, and aerial sections and traversed three cities and many densely populated areas. **Sonoma Marin Area Transit Rail (SMART) CP-4 ($69M):** Design-build rail transit system on over 42 miles of existing active rail corridor. **Gerald Desmond Bridge Replacement Project ($650M):** Major cable-stayed bridge at the Port of Long Beach that rises more than 200 feet over the water. **BART Warm Springs Extension ($128M):** 2.1 miles of ground improvement, shoring, and cut and cover tunnels, as well as vent structures, electrical work, and environmental restoration. **West Dublin/Pleasanton BART Station ($52M):** Design-build contract for a new BART station between the active tracks of the BART mainline and in the median of Interstate 580. **Golden Gate Bridge Seismic Retrofit Phase 2 ($155M) and Phase 3A ($82M):** Seismic retrofit of South Approach Structures (Phase 2) and the North Pylon and Anchorage Housing (Phase 3A). **SFMTA Third Street LRT, Multiple Contracts ($61M):** Two separate contracts to extend SFMTA's light rail transit.

Responsibilities and Placement in Organization

Ike reports directly to the DFS Executive Committee to maintain the independence of our safety organization from our production teams. However, he will work closely with Project Manager, Lloyd Neal; Deputy Project Manager, Javier Varela; and Construction Manager, Rafael Molina in the daily implementation of our Safety and Security Program. Ike's general responsibilities include:

- Developing the comprehensive SSHASP, in conjunction with Project and Construction Management teams,
- Implementing safety audits and inspections, reporting any findings to the auditee, and reporting performance to the Project Manager, DFS Executive Committee, and Authority,
- Coordinating safety activities with the Authority and third parties,
- Setting standards for safety orientations to acquaint employees with Project conditions, safe work practices, and procedures,
- Conducting Project safety inspections and monitoring compliance with applicable requirements,
- Providing safety training and information regarding emergency response to employees, and
- Developing and administering the Project's safety incentive program.

Analysis and Staffing Levels Required to Meet Contract Requirements

Based on our experience on similar projects locally and nationwide, we analyzed the anticipated number of personnel that will be working on the project and the safety needs to meet the requirements of the contract and to support our project-specific safety goals mentioned above. We anticipate that the staffing levels shown on Table 9.5.3-7 will be necessary to meet the Contract requirements and our overall commitment to integrating safety and security through every aspect of our work.

Table 9.5.3-7 -Safety and Security Staffing Levels

Staff	FTE
Safety and Security Manager	1
Segment Safety and Security Supervisors	3
Shift Site Safety and Security Supervisors	2
Safety and Security Administration	1
Training	1
Security Personnel	3
Safety and Security Certification Engineer	1

D. EFFECTIVELY ADDRESSING AND RESOLVING ENVIRONMENTAL AND COMPLIANCE ISSUES

Built upon work already initiated in the design phase (see Section 9.5.2.f), our approach to effectively addressing and resolving environmental and compliance issues during construction and in the field starts by having an expert staff. Based on our commitment of providing the staff you need, we provide an approach that incorporates our Environmental Compliance Plan (ECP) as an active part of how we manage our work, address and resolve issues during construction and in the field, and complete additional work to confirm environmental compliance over the life of the Project.

A Commitment to Staffing

We believe that when it comes to the environment, our approach is only as strong as the people leading it. Under the direction of our Environmental Compliance Manager, David Clark, we provide a flexible and scalable staffing structure with a deep bench of specialists, field management staff, and monitors for all environmental resources required on the Project, including biological, soil, water, air, cultural, and paleontological. The DFS Team commits to provide the professional staff of survey and compliance monitoring experts with local knowledge as identified in the Environmental Compliance Manual and shown in the commitment box on the next page.

EXPERIENCE

ENVIRONMENTAL COMPLIANCE MANAGER, DAVID CLARK

David has more than 35 years of CEQA/NEPA environmental management and oversight experience in all stages of major transportation projects, including work in the Central Valley. He served as the overall program manager for the $1.2 billion Thomas Roads Improvement Program in Bakersfield, which included program-wide compliance for 14 separate highway projects. As part of his work, David developed the mitigation strategy and program development for conserving habitat for the San Joaquin kit fox, blunt-nosed leopard lizard, and other sensitive species.

Printed on Recycled Paper

Addressing Environmental Issues that May Arise During Construction

COMMITMENT

As part of our commitment to effectively address environmental issues that may arise during construction and for resolving unexpected compliance issues, the DFS Team commits to provide the following staff with local knowledge of species, cultural, and paleontological: Compliance Team Leaders, Geographic Information System (GIS) Specialist, Regulatory Specialists (Water and Special-Status Species), Cultural Resource Compliance Manager, Principal Investigator Archeologist, Principal Architectural Historian, Project Biologist, Project Botanist, Project Paleontologist, Qualified Stormwater Pollution Prevention Plan Developer (QSD), Qualified Stormwater Pollution Prevention Plan Practitioner (QSP), Water Quality Engineers, as well as construction monitors to ensure that biological, paleontological, archeological, Native American, and other natural resources are protected during construction.

Effectively addressing environmental issues during construction demands a system that incorporates established standards and program-wide requirements with a commitment to take compliance seriously. The DFS Team will implement our environmental management program based on ISO 14001 principles. Governed by your Environmental Compliance Manual, our system and associated ECP includes policies and procedures, organizational structure, staffing and responsibilities, milestones, schedule, and resources devoted to achieving the Project's environmental commitments. The ECP will include an environmental commitments database that tracks the implementation of mitigation measures, environmental commitments, BMPs, and design features. Through applying our ECP, our staff can anticipate potential problems, develop "what if?" scenarios and standard protocols, and provide updated environmental survey plans and data set plans. The ECP is a "living document" that will continue to evolve as new information becomes available from the 62% of parcels yet to be surveyed, additional surveys completed for archeological resources (3,200 acres), surveys completed for biological resources (4,000 acres), and monitoring operations during construction. Our ECP provides four primary functions:

- Strategies to navigate constraints and provide acceptable compliance methods,
- A blueprint on how we will implement and document our own compliance program,
- A forum for DFS and the Authority to develop solutions to environmental constraints early, and
- Evidence that we understand the environmental requirements of the Project and can successfully implement a compliance program.

Environmental Compliance Manager, David Clark, will detail and track the significant environmental aspects and associated objectives and targets as described and required by the Authority's Environmental Compliance Manual and Mitigation Monitoring Enforcement Plan (MMEP). He will lead the environmental compliance team in performing all inspections for compliance and documentation as specified in the individual environmental specifications sections, the Contract, and any inspections prompted by approved work plans, studies, permit approvals, and submittals. The required inspections, frequencies, and reporting formats will be summarized in our environmental commitments database.

As part of our program, construction work plans and hold points will include the specific environmental requirements pertinent to that work. We will perform and document daily environmental inspections while the work is being performed. Our monitors train the Project personnel to verify that the DFS Team and other Project staff are complying with the environmental requirements identified in the ECP. The monitors will provide the performance records of the environmental work and activities related to the compliance requirements and will inform both our team and the Authority of our

EXPERIENCE

ENVIRONMENTAL MITIGATION IN SENSITIVE AREAS

Dragados' $363 million N-25 Waterford Bypass built a major cable-stayed bridge over the Suir River in Ireland, which is considered a Special Conservation Area. Because this designation affords the area the highest environmental protection under Irish and European law, ecologists carried out extensive surveys of the proposed route and surrounding area prior to construction. The findings of these surveys were used to develop an ecological design for the entire project.

environmental compliance status. All Environmental Inspection Reports will be reviewed by David (and/or his environmental discipline leads) and will include the following:

- A summary of environmental compliance activities and significant environmental events, including any design driven changes that may trigger the Environmental Re-Examination process,
- Project photographs,
- Non-compliance, minor problems, and incidents, including a Corrective Action Report/Preventative Action Report that has been reviewed by the DFS Management Team and approved by the Authority, and
- Any updates to the environmental commitments database.

Resolving Unexpected Compliance Issues that May Arise in the Field

While in the field, our field management staff has the responsibility to direct construction equipment away from environmentally sensitive areas or wildlife exclusion zones. Our staff also has the authority to stop work if construction encounters unanticipated sensitive resources (e.g., buried paleontological or archaeological sites, biological threatened and endangered species, or wetlands.) Our staff is directed to use the approved communication protocols to inform our Segment Managers, Construction Manager, Rafael Molina and Environmental Compliance Manager, David Clark. As the sole point of contact for all environmental issues, David will contact the Authority's Environmental Manager and Project Manager.

EXPERIENCE

ACCOMODATING UNEXPECTED FIELD DISCOVERIES

Shimmick encountered some of the earliest discovered human remains in California on the Transbay Transit Center, Below Grade Concrete Package Project in San Francisco. Upon discovery, work was immediately stopped and reported to Project Management and Owner representatives. Shimmick's team then took the following steps.

1. Immediately stopped work within 150 ft. of the remains.
2. Assigned 24-hour site security.
3. Provided additional lighting at the site.
4. Controlled access to and from site.
5. Provided equipment for Project Archaeologists, Native American (Most Likely Descendent), and Owner staff.

Remains were removed by Project Archaeologists with oversight from the Most Likely Descendent. The process took approximately 1 month, and to avoid delays to the critical path, Shimmick focused on other areas of the project until the site was clear.

The Project crosses areas of known biological, cultural, and paleontological resources that are well documented in the Final Environmental Documents, but the corridor also includes many unsurveyed parcels. As such, it is probable that "undiscovered" sensitive resources (both surface and subsurface) could be discovered and adversely impacted. As part of our commitment, the DFS Team will provide a team of specialists who can address these unexpected field situations that may arise. We will work with you to develop strategies to mitigate impacts to resources and the Project's schedule, similar to how DFS Team member Shimmick worked on the Transbay Transit Center, Below Grade Concrete Package Project in San Francisco.

Our specialists are trained and have the responsibility to halt work as required by the MMEP (i.e., CUL-MM #18) and to re-direct construction equipment away from any unexpected or newly discovered sensitive resource. After proper notification following established communication protocols, our specialists will begin documenting the "newly discovered find." Our first level guidance comes from mitigation measures and commitments as described in the Final Environmental Documents, Section 106 MOA, Section 7 USFWS Biological Opinion, Section 404 and 401 CWA, USACE permits, and other federal, state and local regulations as identified in the MMEP/MMRP. This information will be transmitted electronically to David and the Authority's Environmental Manager to provide the information needed for the Authority to begin notifying and coordinating with the responsible resource and regulatory agencies.

Printed on Recycled Paper

If an unexpected compliance issue is identified in the field, our field management staffs will document the site using their company provided iPads/Laptops (pre-loaded with environmental compliance management software, checklists, GIS coordinates, and environmental survey maps). They will document the "find" by completing checklists and pre-designed forms that assist with describing the incident, taking photographs of any resource, and marking GPS coordinates. All information will be sent electronically from the field to David, our Construction/Project Management team, and the Authority's Environmental Manager and Construction Manager. To minimize impacts to the construction schedule, our Construction Segment Manager will re-position equipment and re-mobilize work crews to another area of the segment. We will provide training to all our construction managers on how to handle situations involving unanticipated environmental issues that may arise in the field.

Our team of environmental specialists are available to offer potential solutions or remedies that can be discussed with the Authority and resource/regulatory agencies. Based upon direction from the Authority's Environmental Manager and after their initial communication with the resource/regulatory agencies, the DFS Team can prepare technical memorandums documenting the resource parameters for agency use and approval, or we can begin the process of preparing the Three-Step Environmental Re-Examination forms. We can also complete all necessary CEQA/NEPA technical support studies (if directed), and develop avoidance, minimization, and/or mitigation measures.

Completing Additional Work to Ensure Environmental Compliance

While we have worked extensively throughout the pre-bid phase to address and resolve issues before the issue becomes a problem, we are prepared and have the experience to:

- Identify the need for and complete additional work as necessary to revise, supplement, or amend the Final Environmental Documents or Governmental Approvals, and
- Obtain additional CEQA/NEPA review and documentation and/or supplemental or amended Governmental Approvals.

EXPERIENCE

ENVIRONMENTAL COMPLIANCE ON MEGA CALIFORNIA DESIGN-BUILD PROJECTS

On Flatiron's $803 million Eastern Transportation Corridor Project, the major earthwork operations accommodated an extensive owner archaeological resource recovery program. Flatiron safely removed 30,000 prehistoric specimens, including camel, mammoth, mastodon, and dinosaur remains dating back over 100 million years. The $80 million environmental mitigation program included the development of a 214-acre site to create coastal sage scrub and a 50-acre wetland habitat. Flatiron also constructed five wildlife bridges for large animal crossing and 26 culverts for small animal crossing.

Revising, Supplementing, or Amending the Final Environmental Documents or Governmental Approvals

Our ECP establishes standardized incident reporting and corrective action planning, which when complemented by pre-construction surveys and training protocols, serves to minimize the need for any substantial supplemental approvals. Typically, the incident reporting and the corrective action planning is sufficient in terms of supplemental documentation. As described in 9.5.2.f, our ECP will be "hot linked" with the Authority's Environmental Mitigation Management and Assessment (EMMA) web portal system in real time, so that Authority staff can quickly notify the affected agencies to obtain a timely compliance-response, which will further minimize any need for substantive supplemental approvals. The reporting structure will act as a forum for "supplementing" the NEPA/CEQA document and is an administrative action.

Based on direction from the Authority's Environmental Manager, DFS's qualified environmental technical specialists will prepare Technical Memorandums/Assessments documenting the initial discovery. Often times, this is all that is needed to comply with CEQA/NEPA requirements. The DFS Team has the technical and Central Valley experience to provide whatever support the Authority requires, including coordinating and participating

in meetings with SHPO (Section 106), USFWS (Section 7), CDFW (Section 2081 ITP), and USACE (Section 404 and 408). These technical assessments and agency coordination meetings can be completed without initiating the Environmental Re-Examination process.

If after the Authority's consultation with the resource/regulatory agencies, it is determined that the discovery warrants a design variation to either avoid, minimize, or mitigate impacts to any newly discovered resource, the DFS Team can immediately proceed by implementing the Three-step Environmental Re-Examination Process. We realize that the 15% plans (developed for ROW and the Final Environmental Documents) may create project construction issues that require multiple Re-Examinations to be approved in order to accommodate a change to the planned/approved design that is beyond the environmental footprint. These changes could create parcel-specific impacts to additional properties in the corridor that were not identified in the Final Environmental Documents. However, our design saves 133 acres and over 56 parcels from being impacted and reduces associated potential environmental impacts.

Obtaining Additional CEQA/NEPA Review or Supplemental/Amended Governmental Approvals

For any change that precludes or inhibits construction as planned or approved, we are required to complete the Environmental Re-Examination process by re-assessing the proposed design change with the approved Final Environmental Documents or Supplemental or Amended Governmental Approvals. To do this the DFS Team will complete the following three steps:

Step 1: We will complete all reconnaissance-level environmental assessments of the proposed design variation, complete the CEQA/NEPA Preliminary Re-Examination forms and prepare a Design Variation Package for the Authority (CEQA Lead Agency) and FRA (NEPA Lead Agency) to review. If the design variation involves new information or changed circumstances, and the Preliminary Re-Examination Evaluation identifies potential environmental impacts that were not previously analyzed in the Final Environmental Documents, the DFS Team will initiate Step 2 upon direction from the Authority.

Step 2: We will conduct a more detailed environmental analysis and site surveys applying the same methodology used for the Final Environmental Document and permit requirements. The analysis will address the context, setting, and severity of Project impacts in relation to the Final Environmental Documents, CEQA findings, NEPA ROD, and permit requirements. It will also describe avoidance, minimization, and/or mitigation measures, as well as the cumulative assessment of impacts on the resource.

Step 3: We will prepare three-step determination forms based upon the analysis of Step 2, which includes CEQA, NEPA, and permit determination and conclusions. These forms document both the Authority's determination on whether a Supplemental or Subsequent EIR is required and FRA's determination on whether a Supplemental EIS is required. In addition, the Authority, in consultation with the FRA, will make a determination whether any permit modification is needed as a result of the proposed design variation. Upon approval, the environmental analysis, conclusions, and required mitigation measures (the updated MMEP/MMRP, Architectural Treatment Plan, and Built Environment Treatment Plan) will become part of the Project documents.

The Authority has already laid the groundwork to minimize the need for supplemental approvals by developing good relationships with many regulatory agencies and having programmatic agreements, MOAs, and Master Permits. These agreements establish a framework on how to address unexpected field issues, in part so as to avoid the need for supplemental approvals. Our Team will provide the remaining data gaps and Project documentation, and we will incorporate this into our overall management approach as part of our commitment to meet the Project's environmental commitments.

Printed on Recycled Paper

E. RELOCATING UTILITIES AND THIRD-PARTY FACILITIES

Based on our conversations with you and multiple utilities and third parties during the pre-bid phase, we know how critical our partnering efforts are to ease scheduling constraints, streamline the identification and resolution process, and eliminate and/or minimize utility and third-party impacts. While a number of our ATCs and other design refinements reduce and/or eliminate impacts on utilities and third-party facilities, the Project will result in unavoidable conflicts with public and private utilities and third-party facilities. These include public facilities owned by the cities of Hanford and Corcoran and Caltrans District 6, as well as private facilities owned by Southern California Edison (SCE), Pacific Gas and Electric Company (PG&E), AT&T, Comcast, Verizon Communications, Level 3 Communications, Consolidated Irrigation District, Fresno Irrigation District, Lakeside Irrigation District, Corcoran Irrigation District, and Sempra Energy.

Built upon lessons learned and past success on mega HSR and local Caltrans projects, we have developed a six-step approach to proactively address utility and third-party facility relocations.

Step 1: A Pre-Bid Focus on Reducing Impacts

During the pre-bid phase, we focused our design and construction approach on eliminating relocations and/or minimizing impacts wherever possible. For example, we have optimized the fill slopes and vertical alignments at roadway grade separations to reduce the overall footprint by approximately 133 acres and eliminated several utility and canal relocations. We also minimized utility impacts at 27 intersections along the HSR alignment. The reduced footprint of the fills will allow for city/county/state maintenance access along the toe of grade separation slopes. Utilities will be relocated into these areas and underneath the HSR embankment. This will permanently relocate utilities prior to bridge and fill construction and will eliminate the need for temporary relocations during bridge construction, which reduces costs and mitigates schedule risk. We are committed to continue to look for ways from Notice of Award through construction to reduce additional impacts.

Step 2: Early Recognition of the Critical Path During the first 360 Days

As listed in Table 9.5.3-7, we identified the utilities and third-party facilities on the critical path for the first 360 days following NTP. The utility agreements for various agencies did not specify third-party design or construction durations, so we made assumptions based on our team members' previous experience working with many of these agencies. With the exception of the utilities identified below, these assumptions resulted in durations that do not impact critical path activities within the first 360 days. However, other utilities or third-party facilities can become critical if reasonable durations for design, review, permitting, and construction cannot be obtained early in the Contract.

Table 9.5.3-7 Critical Path Utilities within the First 360 Days

Facility	Size	DFS Segment	Begin	End	Conflict Action
PG&E Electric Transmission Line	115 and 230KV	1	831+00	831+00	Transverse relocation outside of future HSR Traction Power Supply System (TPSS) and provide a vertical adjustment to clear vertical clearance envelope.
PG&E Electric Transmission Line	70 KV	1	1350+00	1350+00	Relocate transmission line around grade separation and adjust vertical clearance.
PG&E Electric Transmission Line	115KV	2	1747+00	2180+00	Relocate transmission lines running parallel to the HSR alignment in areas where the lines conflict directly with HSR ROW or vertically with grade separations and HSR facilities.
PG&E Electric Transmission Line	115KV	3	2730+00	2748+00	Relocate transmission lines running parallel to the HSR alignment in areas where the lines conflict directly with HSR ROW or vertically with grade separations and HSR facilities.
PG&E Electric Transmission Line	115KV	3	2998+00	2998+00	Relocate transmission lines running parallel to the HSR alignment in areas where the lines conflict directly with HSR ROW or vertically with grade separations and HSR facilities.

EXPERIENCE

BART OAKLAND AIRPORT CONNECTOR DESIGN-BUILD

- Under the leadership of DFS Utility Manager, Brendon Finnecy, Flatiron relocated PG&E, Verizon fiber optic, AT&T telephone and fiber optic, XO communications, and Comcast lines into a single joint trench around and under the proposed BART-OAC tunnel. Work was completed without temporary relocations ahead of and out of the way of BART tunnel construction. The project required a Longitudinal Encroachment Exception from Caltrans, Caltrans encroachment permit, and other easements and permits.
- Brendon's utility team worked with the structures design team and East Bay Municipal Utility District to re-design footings to avoid relocations, including 2500 linear ft. of 42-in. trunk sewer that ran parallel to the alignment. The team also worked with PG&E, the District, and AT&T to avoid relocations of a 16-in. steel waterline, 4-in. gas line, 24-in. gas transmission line, and AT&T fiber optic lines by accurately locating these utilities pre-design, and adjusting footing types and dimensions.

Step 3: Early Identification and Verification

Our utility coordination team, led by Utility Manager Brendon Finnecy, will prepare a Third-Party Facility Identification and Verification Plan for submittal to the Authority shortly after NTP. By focusing on this plan as an early work item, we can identify the critical utility task orders and prioritize each appropriately. The basic steps of the plan entail the following components:

- Cross-reference current utility records in the Project limits to identify possible conflicts.
- Provide verification maps to each utility owner detailing existing/anticipated utilities and support facilities in the Project area and obtain updated maps from each utility. We will submit, through the Authority, a request to positively locate each utility's facility (via a field survey and pothole plan).
- Prepare and submit a field survey and pothole plan to each jurisdictional authority (e.g., the City of Hanford, Caltrans, and BNSF).
- Obtain encroachment and traffic control permits from the applicable jurisdictional authority.
- Conduct field meetings with utility representatives and pothole identified facilities following Underground Service Alert (USA) policies. DFS's utility coordination team will investigate utilities marked by USA not identified in the available records. We will notify the Authority of this work.
- Survey the locations, heights, and depths (as applicable) of power poles, utility boxes, water services, and underground facilities.

BEST PRACTICES

We will create specific work plans for major areas of the Project and submit to relevant third parties for review and approval. For example, we will prioritize the specific work plans for Fresno and Tulare counties, the cities of Hanford and Corcoran, and Caltrans, so we can begin the field surveys early since several of these utilities are in public easements.

EXPERIENCE

SUCCESSFUL COLLABORATION WITH UTILITIES AND THIRD PARTIES ON THE ORANGE LINE BRT DESIGN-BUILD

"Throughout the project, the Shimmick staff understood and worked very well with the multiple third party agencies involved with the project and used a very successful team approach to third party management." - Roger F. Dames, PE, Deputy Executive Officer / Project Manager, LACMTA

Identified and verified utilities that do not conflict with the Project will be protected in place. The remaining overhead facilities will be identified with appropriate signage, and the remaining underground utilities will be potholed at designated intervals and marked with highly visible above ground utility markers.

Step 4: Proactive Communication and Coordination

Shortly after NTP and concurrent with Step 3, our utility coordination team and the applicable designers will begin holding regular individual coordination meetings with the Authority and each affected utility or third party. These meetings are in addition to the weekly global update meetings. Figure 9.5.3-7 illustrates our general

Printed on Recycled Paper

approach to managing utility conflicts, but we know that every agreement and memorandum of understanding (MOU) is unique. To accommodate this, we will initiate a collaborative approach toward design, relocation, inspection, and acceptance developed in accordance with the specific utility agreement. The affected utility/third-party representative will have the opportunity to voice their specific requirements, concerns, alignment preferences, and preliminary design needs.

Regardless of who is responsible for relocation, we will provide a preliminary relocation exhibit for each affected utility that includes field investigation information, the location of the proposed HSR facilities in plan and profile, and the proposed relocated location of the affected utility or third-party facility. Once the concept relocation is accepted by the facility owner, the Authority, and the DFS Team, the responsible party for the design will proceed.

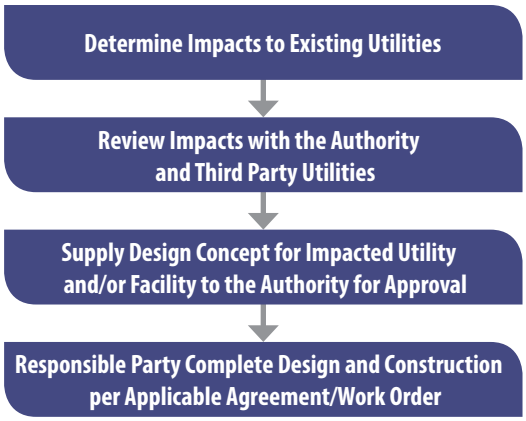


Figure 9.5.3-7: The DFS Team's general approach to managing utility and third-party facility conflicts

As part of Step 4, we are committed to working closely with utility owners to inform affected customers and adjacent property owners of the timing and duration of scheduled outages for tie-overs, in addition to work that will affect local traffic patterns or create noise during off-peak hours. The DFS Team will provide weekly updates to the Authority and affected property owners on schedule developments, design and permit approvals, and construction activities. To minimize redesign and reduce the potential for construction conflicts, we will also conduct weekly design coordination and review meetings to continue a dialogue with utility owners.

Step 5: Accommodating the Needs of Impacted Owners

Our commitment is that no service interruptions will occur without first notifying the affected utility customers through coordination with each of the utility companies. Additionally, we have identified and, in some cases, already met with a number of major property owners, utilities, and third parties to discuss their needs and concerns.

Caltrans: As an integral part of the Project, Caltrans primary concern will be how traffic is impacted and how Project quality complies with their design and construction standards for relocations within State ROW and with future ultimate build-out of their facilities. We will comply with their ROW manual with regards to relocating utilities, including longitudinal encroachment exceptions.

Hanford and Corcoran: Each city's primary concerns around utilities and third-party facilities are the preservation of their water and sewer service, MOT, and the coordination with planned city expansion.

INNOVATION

MINIMIZING UTILITY RELOCATIONS WITH ATC 15A

We have re-aligned the Avenue 120 grade separation over the HSR/BNSF/SR-43 crossing, providing a pavement overlay on Avenue 120 between SR-43 and Road 24 to improve the usability of the existing road. This design enhancement has eliminated over 15 individual utility relocations.

Irrigation Districts: We met with several irrigation districts and other related agencies, such as Kings River Conservation District, Kings River Water Association, Tulare Lake Drainage District, Cross Creek Flood Control District, Corcoran Irrigation District, and Kaweah Delta Conservation District to discuss the Project and work to understand their needs and constraints. As just one example in our meeting with Kaweah Delta Conservation District, we confirmed their clearance requirements over the levees and designed our ATC 2 to be compliant with their requirements in the Cross Creek area.

BNSF and SJVRR/UPRR: We have included Railroad Coordinator, Mike Marler, as an added value member of our team for his experience working with UPRR, BNSF, and local, state, and federal agencies throughout California. His coordinated experience with the respective railroad bridge design teams to review the design criteria and

assumptions will expedite feedback to assure the design conforms to the UPRR and BNSF guidelines. This approach, coupled with our focus on securing railroad approvals early in the process, will provide increased schedule flexibility and further endear the Authority with these railroads for upcoming HSR phases. We will prepare a separate construction report for each of the railroads that outlines the planned construction process and addresses access, equipment, track windows, construction durations, flagging needs, clearances, and other pertinent information.

California Public Utilities Commission (CPUC): Upon contract award, utility relocations and work with BNSF and SJVRR that require CPUC review and approval will be identified and prioritized to mitigate delays. We will prepare the required submittals for the Authority and CPUC concurrently to expedite reviews and approvals.

Step 6: Relocating Utilities and Third-Party Facilities

During the pre-bid phase, our utility coordination team developed a detailed matrix of known utilities and potential conflict mitigation. The Project will require four basic types of utility relocations:

- Existing longitudinal utilities within HSR ROW will be relocated outside HSR ROW.
- Existing transverse utilities, whether overhead or underground, will be relocated in casing underneath HSR embankment or viaduct with the exception of 30 kv power and greater transmission lines.
- Existing transverse power transmission lines over 30 kv will be relocated aerially across the HSR alignment in accordance with HSR/CPUC and NEC requirements.
- Existing transverse utilities that meet the HSR separation requirements will be exposed and encased in place via approved methods without disrupting the affected utility.

All relocations will follow HSR design criteria and applicable government and third-party standards. Access to utilities crossing HSR ROW will be provided outside the ROW and will include markers, cathodic test stations, and shut-off valves, as appropriate. We will prioritize obtaining easements, agreements, and encroachment permits by coordinating with each owner as they relocate their utilities.

For relocation of canals, we will coordinate with the respective irrigation district and other related agencies for all work and will implement construction means and methods to minimize impacts. Canal box culverts constructed within existing alignments will be scheduled during non-use periods, and we will use precast boxes to minimize construction durations. Shoring, staged construction, and earth diversions will be used to passively divert canal flows when necessary. Pumped canal bypasses will only be used as a last option.

BEST PRACTICES

Electric, telecom, fiber optic, and cable television facilities will be located within a joint trench when crossing the HSR ROW at several grade separations. This is a best practice learned on past projects that will limit the number of HSR crossings.

Organization and Staffing Levels

Utility Manager, Brendon Finnecy, PE will oversee the coordination and relocation efforts for all utilities and third-party facilities. Brendon reports directly to our Third Party Coordination Manager, Drew Erickson, to ensure accountability and quicker resolution of concerns from a third-party perspective. Both Brendon and Drew worked together during the pre-bid phase both to initiate our third-party coordination efforts with third parties and prepare our proposal and estimate. We are also committing a full-time staff to support Brendon, that includes:

- Three personnel to coordinate PG&E relocations,

EXPERIENCE

PRESIDIO PARKWAY P3/ DESIGN-BUILD

Under Utility Manager, Brendon Finnecy's leadership, Flatiron coordinated relocations with five different utility agencies, as well as permitting for relocations within the Presidio Trust and Caltrans ROW. Brendon held regular meetings with utility companies and land owner to resolve outstanding design issues.

Printed on Recycled Paper

- Six personnel to participate in design development and third-party coordination, and
- Three field investigation teams that will conduct survey, potholing, and record documentation in each segment. Our investigation team is scalable to respond to schedule acceleration needs.

We have staffed our organization to match the complexities of the project and the numerous risks that must be managed. In addition to Brendon and Drew, we have also assigned Railroad Coordination Manager, Mike Marler to deal exclusively with railroad issues, as discussed above.

Experience and Qualifications of Utility Manager

A licensed professional engineer in California, Brendon has 10 years of experience in a similar role on several major design-build and other projects in California, as shown in Table 9.5.3-8. Whether it is Caltrans, BNSF, UPRR, or any other public or private utility/third party, Brendon knows how to partner with utilities and third parties to eliminate or minimize impacts and to manage and coordinate any necessary relocations.

Lead Scheduler: Brendon Finnecy, PE
Years of Experience: 10
Education/Registrations:

- BS, Civil Engineering, Cal Poly San Luis Obispo
- CA PE#788845
- Safety Trained Supervisor

Table 9.5.3-8 Experience and Qualifications of DFS Utility Manager, Brendon Finnecy

Project/Role	Relevant Experience
Presidio Parkway Design-Build/P3, San Francisco, CA ***Utility Manager***	✓ Managed utility coordination with five different utility agencies and oversaw permitting for relocations within the Presidio Trust and Caltrans ROW. ✓ Participated in design reviews to ensure constructability and compliance with utility owner and Caltrans specifications.
Oakland Airport Connector Design-Build, Oakland, CA ***Utility Manager***	✓ Coordinated design and construction efforts for the relocation of utilities with 10 different agencies. ✓ Coordinated permitting for work within UPRR, City of Oakland, Port of Oakland, BART, and Caltrans ROW. ✓ Authored, submitted, and received a Longitudinal Encroachment Exception from Caltrans for work in SH-61 and I-880, which required signatures from all four District 4 department heads and approval from Caltrans ROW department head.
West Conveyance Pipeline, Hesperia, CA ***Project Manager***	✓ Obtained encroachment permits from Caltrans and BNSF for jack and bore operations under their facilities, as well as with the cities of Victorville and Hesperia.
SR-92 Widening Design-Build, Lehi, Utah ***Utility Manager***	✓ Coordinated with U.S. Bureau of Reclamation for the permitting, relocation, and inspection of 1,700 linear ft. of a 72-in. water line and with Provo River Water Users Association for 750 linear ft. of a 13- in. steel water transmission line. ✓ Obtained permits and coordinated with UDOT for staged, open-cut construction across SR-92 in three locations.
I-5 Reconstruction Project, Buena Park, CA ***Utility Manager***	✓ Coordinated with UPRR for construction of utilities within their ROW and with the City of Buena Park Utility Department for relocation of their water/sewer lines. ✓ Oversaw efforts to ensure utility relocations were completed before freeway bridge demolition.
SR-22 Widening Design-Build Project, Garden Grove, CA ***Field Engineer***	✓ Obtained construction permit from the Orange County Flood Control District for reconstruction of flood channels crossing SR-22. ✓ Assisted in procuring construction permits for the relocation of the Orange County Sanitation District and City of Garden Grove sewer lines.
The Commons Development, Chino Hills, CA ***Utility Manager***	✓ Obtained encroachment and construction permits from Caltrans for utility construction across State ROW; from the San Bernardino Flood Control District for construction of a tie-in to a flood control channel; and within two cities for construction of water and storm drain lines.

F. MANAGING CONSTRUCTION SITES TO MINIMIZE IMPACT AND DISRUPTION TO THE PUBLIC

Our general approach to managing our construction sites to minimize impacts and disruption to the public is organized as follows:

- **We Identify** sensitive areas along the HSR alignment and construction activities that impact or may impact the public. We also engage the Authority and major stakeholders to help locate these areas and document their concerns or complaints.
- **We Analyze** the potential impacts and compile information to determine the cause and extent of the impacts, as well as potential solutions.
- **We Respond** by implementing specific mitigation and communication strategies to minimize impact and disruption to the public.
- **We Control** risks by monitoring and reporting on the effectiveness any proposed mitigation and by providing additional information on current and emerging impacts.
- **We Improve** our plan continuously by working closely with the Authority and major third parties throughout the Project to minimize impact to the public.

One of our primary tools to minimize impact to the public is a proactive and ongoing public involvement program that quickly and effectively communicates potential issues to the Authority, the public, local agencies, and community stakeholders. Details on our team's approach to public relations and communication with Project stakeholders is discussed in Section 9.5.1.d.

Pre-Bid Focus on Minimizing Impacts

Throughout the pre-bid phase, we have developed our design and plan for construction to better manage our construction sites in a way that minimizes impacts and disruption to the public. For example, we identified borrow pit sources near the HSR alignment and maximized the amount of off-highway hauling. This reduces both construction traffic on the highways and public and environmental impacts by shortening haul routes and decreasing the total number of truck trips by increasing the capacity of each haul. We also designed an at-grade Hanford station under our ATC 17 to reduce overall construction schedule and minimize visual impacts from the station, which is prefered by the City of Hanford. Additional details on other innovations that minimize impacts are provided in Section 9.5.2.b, 9.5.2.d, and 9.5.3.a.

Main Elements and Commitments of the Traffic Management Plan

The main elements of the DFS Team's Traffic Management Plan (TMP) are shown on Figure 9.5.3-8. The TMP addresses changes to the local street environment, directs traffic flow, and provides physical improvements where necessary. Our plan will be implemented through a variety of traffic control strategies that will delineate diversion routes and assist drivers in avoiding construction areas. Our TMP recognizes the critical importance of the

EXPERIENCE

WE HAVE DONE THIS BEFORE IN THE SAME AREA WITH THE SAME STAKEHOLDERS

On the SR-198 Widening in Hanford, DFS Team member Flatiron shifted traffic to one side of the highway while working on the other side to enhance safety by completely separating traffic from the work and to expedite the schedule. We will use a similar approach on this Project for the work along SR-198, replicating Flatiron's and Caltrans' successes. We have already spoken with Caltrans District 6 personnel together with Jorge Granados from the Authority to ensure that we have incorporated their design and MOT requirements into our proposal.

Printed on Recycled Paper

public information component during implementation, especially given the number of people, businesses, and jurisdictions within the Project area.

Our first priority is to plan all work during the design phase to minimize inconveniences through innovative design and strategic planning. Throughout the pre-bid phase, our MOT design and construction leads have developed several traffic management solutions and commitments to minimize impacts to agricultural, commercial, and residential properties.

- We advanced the MOT drawings (provided in the Appendix) at the grade separations to better understand accessibility and mobility constraints, accurately price our work, and determine schedule impacts.
- We scheduled construction of grade separations so that no two consecutive roadways within 2 miles are closed at any one time.
- Our design incorporated eight different three-season crossings to allow farmland equipment to pass under the HSR alignment, which will provide continuity to current property owners.
- Our ATC 17 provides a much safer permanent grade separation for SR-43 and the SJVRR railway, which is preferred by the City of Hanford, SJVRR, and Caltrans and is part of the future plans for the ultimate SR-43 design.
- We minimized impacts to the Hormel Property by keeping direct access to SR-43 from their facility. We developed an overpass alternative as part of ATC 15a that can eliminate farmland take at the Hormel property by shifting the SR-43 access road to the south side of Hesse Avenue and Highway 120.
- We developed a plan for Baker Commodities that orients the future rendering plant to the west of the HSR alignment. Our design allows for continual traffic flow across their property, while keeping the main deadstock and rendered product

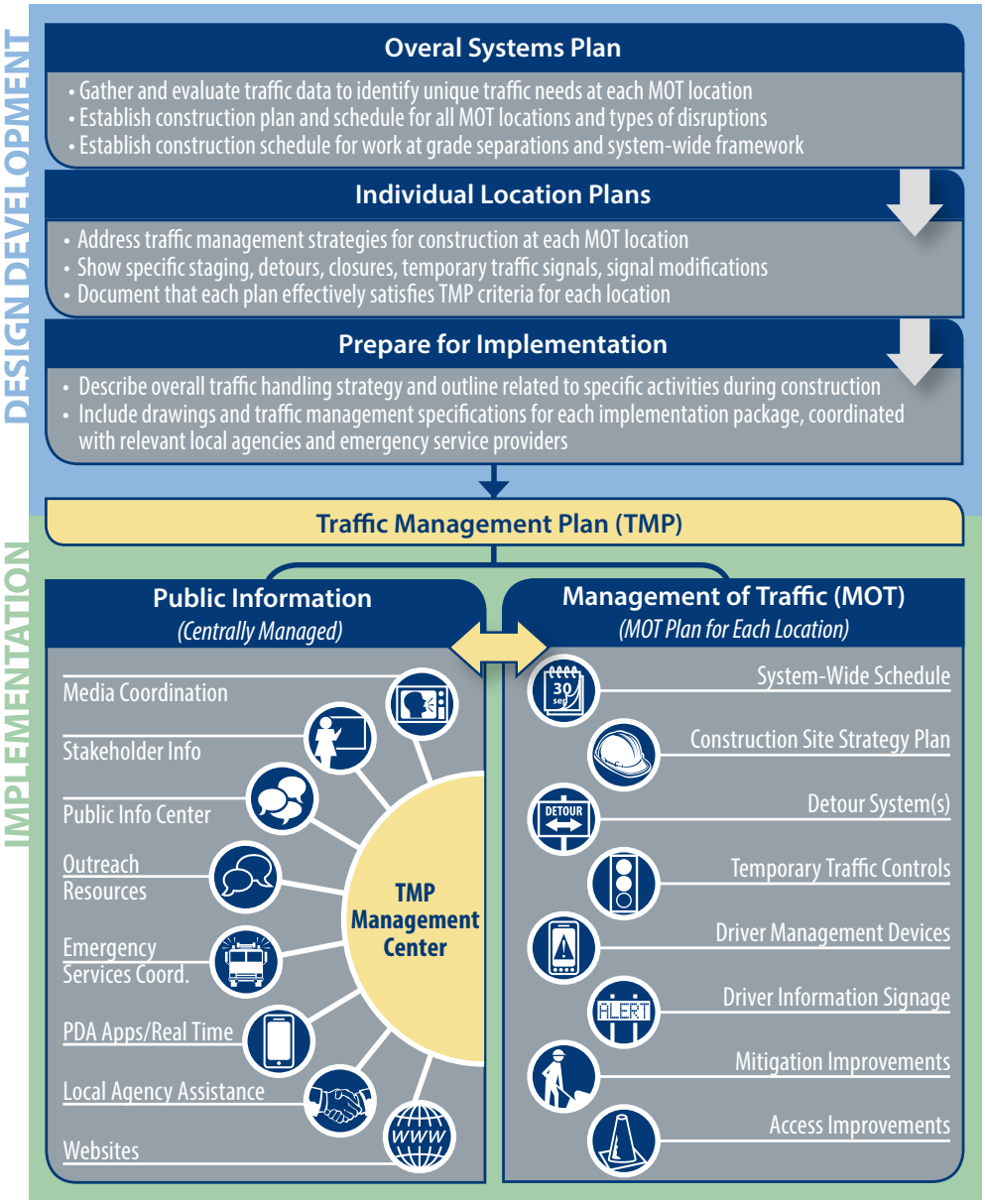


Figure 9.5.3-8 DFS Team's Traffic Management Plan (TMP)

on the west side of the HSR alignment. This will significantly reduce the amount of truck traffic required to pass under the alignment at their facility and maintain their required access to SR-43 for rendered product to move north to their Kerman facility at reasonably level grades for their trucking operations.

We will continue to work with the Authority and impacted stakeholders upon NTP to further advance our TMP and develop additional strategies and procedures to mitigate impacts on mobility and accessibility and to maintain public safety.

MOT Approach

To demonstrate our overall approach to traffic management, we have shown an example of our approach to detour traffic management in Figure 9.5.3-9. This is representative of our approach along the entire HSR alignment. For additional details on our Traffic Handling Plans approach, please see our Traffic Handling Plans plans in the 11x17 Appendix.

EXPERIENCE

SAFE MOT ON MEGA-DESIGN-BUILD PROJECTS

Dragados' $1.2 billion I-595 Corridor Improvement Project accommodated daily traffic volumes of 180,000 vehicles. Dragados minimized impacts to the public by maintaining the same number of lanes available during construction and the original 65 mph speed limit through the various construction phases, and maximized work during off-peak hours. Up-to-date construction bulletins were posted on the project website alerting the public to closures and new diversion routes.

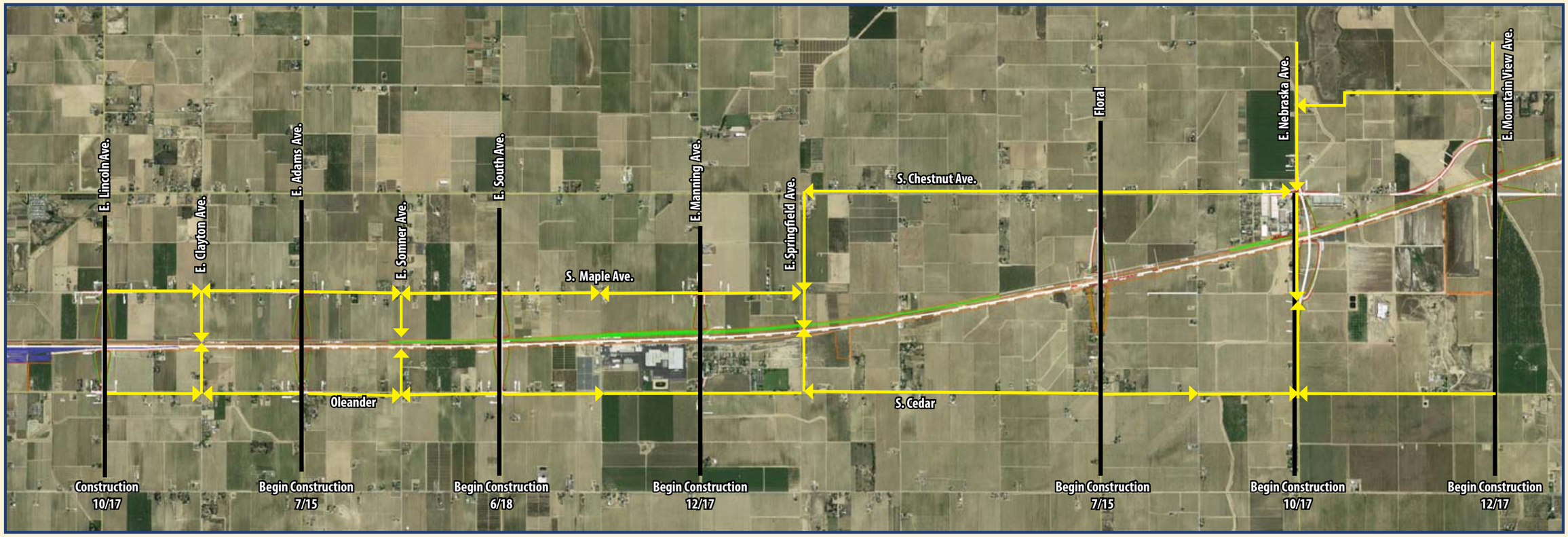
Ensuring Public Construction Awareness

As described in 9.5.1.d, to ensure the public is aware of construction work, we will develop a contract-specific Public Involvement Plan (PIP) for all construction-related activities. The main elements of our approach to ensuring public construction awareness include the following commitments:

- We will work closely with the Authority and major stakeholders in developing and implementing the PIP for construction-related notifications through weekly task force meetings, MOT planning meetings, construction schedule meetings, three-week look-ahead distributions, and other regular meetings.
- We will submit to the Authority for approval our Business and Residential Impact Mitigation Plan within 60 days of NTP, as part of our detailed PIP.
- We will work with Caltrans and the cities of Fresno, Hanford, and Corcoran to provide construction advisories and current construction-related traffic information to the public.
- We will update the PIP at least annually, working directly with businesses and residents and other stakeholders' representatives to ensure the public is aware of our construction activities.
- We will provide monthly reports of activities undertaken to notify the public of construction impacts for the past month and forecast known activities for the following month.
- We will assess the effectiveness of notifying the public with the Authority's communication team each month and update the plan if any course corrections are needed.
- We will provide full-time public involvement staff to communicate construction-related impacts directly from the construction team to the Authority and the public.
- We will maintain day-to-day contact with the affected Project area residents, businesses, and commuters related to ongoing construction operations.
- We will receive and address all questions or comments by residents, businesses, commuters, or other members of the public, while elevating topics of a sensitive nature to the appropriate Authority staff so they can respond accordingly.

Printed on Recycled Paper

MOT: Maintaining traffic flow across BNSF is one of the more challenging aspects of MOT on CP 2-3. Our approach is to keep existing crossings open throughout construction wherever possible and to minimize detour distances. This exhibit demonstrates how this approach works in the F1 and M areas of Segment 1



LEGEND
Detour
New Grade Separation

Stage 1: Detour traffic away from new grade separations and towards existing BNSF crossings. Maintain existing crossings at Clayton, Somner, Springfield, and Nebraska until adjacent grade separations are complete. Construct grade separations at Adams, South, Manning, Floral, and Mountain View.

Stage 2: Complete construction of new grade separations and open for traffic. Detour traffic away from crossings that are to be removed and towards new grade separations. Cul-de-sac existing crossings at Clayton, Somner, Springfield.

Stage 3: Construct grade separation at Nebraska.

Figure 9.5.3-9 DFS Approach to MOT

This page intentionally left blank.

- We will provide all required notifications per the Table of Notifications in the General Provisions in the three most common languages of the region, primarily English, Spanish, and Hmong.
- We will disseminate monthly project reports through the Project website and other mediums.
- We will develop a comprehensive Emergency Communications Plan with protocols for responding to unanticipated events and with roles/responsibilities for DFS and the Authority.
- We will update look-ahead schedules for the Authority and major third parties to use in Project communications.

EXPERIENCE

ENSURING PUBLIC CONSTRUCTION AWARENESS IN THE CENTRAL VALLEY

On the SR-99 widening project in Selma, DFS team member Flatiron partnered with Caltrans, the CHP, and the cities of Kingsburg and Selma to hold public information meetings to assure that residents and businesses were aware of the changing traffic patterns and the progress of the project. Daily, CHP would announce any lane closures or detours on local news channels, and the project website was updated frequently to provide up-to-date information to the various stakeholders.

Approach to Using the Media and other Communication Tools

We will write public notices for radio, broadcast, cable television, and the Authority's website to notify the public of inconveniences caused by the Project. We will provide monthly project updates for dissemination on the Project website, print outlets, and for broadcasting on local radio and television. We also intend to use, with the approval of the Authority, the following communication tools:

- Public Information Office open Monday-Friday, 8:00am to 5:00 pm,
- Concise and timely Project messages and fact sheets,
- Community updates/neighborhood boards;
- Door notifications,
- Access maps,
- Notifications of changes to access,
- Construction tours (if requested by the Authority),
- Press conference support to help cover major events,
- Media relations kits,
- Website announcements and updates;
- E-mail blasts,
- Social Media outreach that includes monitored and strategic postings on Facebook, Twitter, etc.,
- Construction kiosks that maintain signage that lists businesses or traffic zones impacted by construction,
- QuickMap (or equal software, as requested by the Authority) to notify the public of planned traffic disruptions, and
- Assistance with planning and implementation of special events, such as groundbreaking or other major milestone achievements.

EXPERIENCE

SAN FERNANDO VALLEY BUS RAPID TRANSIT, METRO ORANGE LINE DESIGN-BUILD

DFS Team member Shimmick's 14-mile project included design and construction through various communities and coordination with residential, commercial, and agricultural private property owners. Shimmick worked with private homes, apartments, churches, synagogues, schools, a community college, businesses, parks, public open spaces, and a farm. The project team established regular community meetings and notified the communities through a project website, emails, signage, and flyers.

We understand that ongoing media relations campaigns are managed by the Authority, and we will not meet with the media without direct authorization from the Authority. We will provide information and develop press releases and other communication pieces for you to keep the public informed.

Mitigating Impacts to the Public

As discussed above, we will communicate all potential impacts to the public as part of our comprehensive PIP. An overview of our approach and commitments to managing our construction sites in a manner that minimizes impacts to major stakeholders and the traveling public is summarized in Table 9.5.3-9.

Table 9.5.3-9: Mitigating Impacts to the Public

Impact	Mitigation Strategies
Dust	✓ Utilize Best Management Practices (BMPs) from past successful Caltrans projects in the area to control dust and reduce potential for valley fever impacts. ✓ Provide water and dust palliatives for dust control. ✓ Cover smaller stockpiles or small disturbed soil areas. ✓ Already Identified over 105 existing wells in or near the ROW limits as potential water sources and met with several irrigation districts throughout the area to identify other water available for purchase. ✓ Maintain construction entrances and haul roads regularly and limit construction vehicle speeds. ✓ Limit construction site access points and require their use for all construction traffic. ✓ Explore opportunities to use recycled concrete and AC for haul routes near sensitive receptors.
Water	✓ Implement BMPs for stormwater runoff and enforce Caltrans Stormwater Pollution Prevention Plans (SWPPP) procedures that we have used on other projects throughout California. ✓ Prioritize drainage ditch construction to capture runoff before moving embankment fill. ✓ Provide pump-arounds/temporary bypasses to maintain continuous water flow in existing canals, irrigation districts, and streambeds. ✓ Use shoring, staged construction, and earth diversions to passively divert canal flows and pumped canal bypasses, when necessary. ✓ Analyze and report on water quality impacts throughout the project and provide these reports to the Authority and irrigation districts.
Fumes	✓ Limit equipment idling per California regulations. ✓ Use an integrated strategy to train our employees on identification, communication, and reporting of noxious or hazardous fumes. ✓ Maintain equipment regularly per Project requirements. ✓ Increase use of off-highway, large capacity hauling trucks to reduce the number of truck trips. ✓ Significantly reduce the total number of truck haul trips by minimizing the amount of steel and concrete needed, while nearly maintaining the same quantity of borrow material. ✓ Substantially reduced the amount of steel required by maximizing embankment over viaducts and, therefore, minimizing the associated toxic fumes from welding and soldering.
Light	✓ Maintain public notice of work, coordination, and communication with cities, residences, and affected third-parties. ✓ Work closely with environmental agencies to minimize lighting impacts to plant and wildlife in the Project area. ✓ Minimize nighttime construction. ✓ Place lights/light plants strategically and directed away from residences. ✓ Avoid working around neighborhoods at night when possible and minimize durations when needed.
Sound/ Vibration	✓ Utilize noise and vibration monitoring devices, as needed. ✓ Use baffled generators and temporary noise shields when necessary. ✓ Maintain large equipment regularly and include sound dampeners when possible. ✓ Avoid working around neighborhoods at night when possible and minimize durations when needed. ✓ Provide temporary noise abatement barriers where necessary.
Other Emissions	✓ Train personnel on identification, communication, and reporting protocols for encountering methane, hydrocarbons, asbestos, lead paint, radon, and other hazardous materials. ✓ Minimized potential for encountering methane at dairies or hazardous materials from our reduced construction footprint. ✓ Coordinate with BNSF and UPRR for work in their areas because of higher potential for encountering hazardous materials. ✓ Fully cover hazmat loads and follow all Cal/OSHA and other California environmental regulations for transporting and disposal of hazardous materials.

Printed on Recycled Paper

Atocha High Speed Rail Station, Madrid, Spain

9.5.4 Small Business Program and Community Benefits Agreement

Sprinter Mainline Commuter Rail, North San Diego County, CA

9.5.4 Small Business Program & Community Benefits Agreement

COMMITMENTS

- Commit to the 30% SB participation goal.
- Maintain a proactive and continuous SB Performance Plan.
- Include SB Contracting Opportunity Center.
- Provide technical, management, and administrative support to increase SB success.
- Include our SB team directly under the DFS Project Manager at the very top of our Project organization.
- Provide executive oversight and audit of the SB Performance Plan.
- Distribute performance surveys to SBs to gauge program success and share results with the Authority.
- Make pre-bid contractual commitments to SB Firms.

APPROACH

Our primary goal is to provide Small Businesses (SB), Disabled Veteran Business Enterprises (DVBE), Disadvantaged Business Enterprises (DBE) and Microbusinesses (MB), (hereafter referred to as SBs) the maximum opportunity to compete for, and participate in, the project's contracting and procurement opportunities. Together, the DFS Team's Small Business and Outreach Coordinator (SBOC), John James, and our highly experienced SB team will provide SB outreach opportunities and continuous support services. The Authority's SB Division will also have a direct line of communication with John as a sign of our commitment to working with you and the community to achieve SB participation goals and the successful implementation of the Community Benefits Agreement (CBA).

We have met all nine pre-award good faith efforts suggested by the Authority and have worked diligently to identify subcontracting opportunities and SBs equipped to deliver each. We have led three separate SB contracting workshops, one each in Fresno, Hanford, and Corcoran, as well as numerous one-on-one meetings to determine capacity and discuss business opportunities for SBs. We will continue these efforts upon Notice of Award as part of our commitment to the 30% SB participation goal.

INNOVATIONS

- SB Contracting Opportunity Center is the one-stop information center at our Project office in Hanford.
- Scalable work packages to provide maximum opportunities for SBs to participate in key roles on the Project.
- SB certification assistance, training, and educational seminars to help SBs succeed.
- Our project-specific mentoring program is based on our SB team's past success with similar programs in California.
- We have and will continue to explore opportunities with Cypress Mandela (a leader in construction workforce development training) to work with the nine Central Valley Work Force Investment Boards and CalVet to develop innovative training programs as part of our commitment to the National Targeted Hiring Initiative (NTHI).

A. KEY ELEMENTS OF THE DFS OUTREACH PROGRAM

Our Small Business Outreach Program and Performance Plan will be thorough and ongoing, providing immediate and long-term opportunities to the broadest range of individuals and small companies throughout the Central Valley and California. Our SB Outreach Program will open commerce in all directions to SBs, non-SBs, and community members who provide related services and supplies. James Transportation Group (JTG), a certified DBE, is leading the DFS SB team, and John James, President of JTG, will oversee our implementation and compliance with the Authority's SB Program as our Small Business and Outreach Coordinator (SBOC).

The DFS Team will set up a one-stop shop SB Contracting Opportunity Center for SBs seeking information or pursuing work. The Center will be located at our Project Office in Hanford and will be open 5 days a week during normal business hours. The Center will have a current Project schedule, bidding schedules, and bid package information. In addition to bid-specific outreach events, the Center will host workshops and one-on-one sessions with SBs (as needed) to familiarize each with DFS subcontracting requirements. Staff will coordinate walkthroughs/site visits and arrange meetings based on upcoming bid work.

COMMITMENT

A key element of our SB Program and evidence of the DFS Team's long-term commitment to meeting the SB participation goal is establishing our HSR CP 2-3 SB Contracting Opportunity Center.

Securing SB participation is only part of our goal. The real effort is providing the technical, management, and administrative support to increase SB success. This is where our program differentiates itself from the standard offerings. We help SBs overcome a number of limitations and barriers by providing assistance in obtaining SB friendly capital through business loans, equipment leasing, and support for meeting insurance and bonding requirements.

Our SB Performance Plan will include a list of work categories and activities that are continually updated throughout the Project. Our general approach is implemented in the following three ways: 1) Identifying SB opportunities, and verifying SB performance 2) Engaging in ongoing SB outreach, and 3) Implementing training and robust management support (discussed in Section C). Working closely with your SB Liaison Officer, we will engage SBs in all aspects of the Project from Notice of Award through construction. Our plan provides an overview of our subcontractor procurement activities to date and post-award plans for meeting the 30 % participation goal, inclusive of the Authority's 10% DBE and 3% DVBE participation goals.

COMMITMENT

Our approach to subcontracting the work includes preparing scalable work packages to provide maximum opportunities for SBs to participate in key roles on the Project.

Identifying SB Opportunities and Verifying SB Performance

We have worked diligently during the pre-bid phase to identity both subcontracting opportunities and the SBs equipped to deliver on these opportunities. We will continue this same effort upon Notice of Award. We track all SB participation areas and SBs available to perform in a matrix of identified SB opportunities. This is a living document that will evolve throughout the Project.

COMMITMENT

We will provide the performance survey analysis results from the SBs to you as part of our commitment.

On a monthly basis, we will prepare a SB Subcontractor Participation Form to verify actual dollars paid and the percentage of work performed against the SB subcontract commitment plan. Additionally, we will have developed a reporting format for first-tier subcontractors to report dollars paid to each SB on the Project. We will also distribute a brief monthly statement to each SB requesting payment verification received over the past 30 days. Each of these reports will assist our SB team in evaluating progress toward meeting the overall SB participation goal.

Additionally, we will develop, distribute, and analyze performance surveys to be completed by each SB that has worked on the Project. Compiling these evaluations on an ongoing basis will confirm contract goals are being met and allow us to gauge program success, identify areas for improvement, and gather new ideas for involving SBs.

Ongoing Outreach: Pre and Post-Award Subcontractor Procurement Activities

We have met all nine pre-award good faith efforts suggested by the Authority, including attendance at pre-bid meetings, scope of work identification, advertising, written bid requests, solicitation follow up, good faith negotiations, performance of other bidders, SB assistance, and utilization of local outreach services. We have performed similar efforts on other projects in California and throughout the U.S. to achieve the DBE participation goals and provide opportunities for the local communities where we work. As shown on Figure 9.5.4-1, we held three separate Small Business Contracting Opportunity workshops in these major cities along the Project alignment.

EXPERIENCE

DFS Team members have built hundreds of projects in California over the past 20 years, many with DBE participation requirements, including $250 million worth of Caltrans projects in the Central Valley.

Printed on Recycled Paper

August 4, 2014 - Hanford, CA

In meeting with the local SBs, their questions for our team centered on scopes and type of work available, need for professional services support, and additional information on the anticipated start of work and durations.

August 11, 2014 - Fresno, CA

Several DBE truckers attended this event, so the majority of our discussions were centered around the types of trucks needed, fueling locations, borrow sites, and disposal sites.

August 18, 2014 - Corcoran, CA

The questions and concerns from the SBs and other community members were primarily about the impacts of the CBA, NTHI, bonding and insurance requirements, and payment requirements/time frames.

Figure 9.5.4-1: Small Business Contracting Opportunity Workshops

In addition to these workshops, our pre-award outreach activities have included the following, all of which will be continued post-award:

- We developed a flexible, credible, and innovative SB Program that is fully compliant with your SB Program goals and the best management practices of 49 CFR 26.
- We leveraged the DFS Team's vast HSR and local experience to identify SBs specific to each solicitation or Project need.
- We worked closely with our managers to structure subcontracting packages into economically feasible units so that SBs can compete fairly.
- We negotiated in good faith by holding one-on-one meetings with SBs to determine capacity and discuss business opportunities.
- We published the Project's RFI responses, Project updates, SB opportunities, and events through the DFS Team's website at http://dragados-flatiron-shimmick.com
- We identified numerous subcontractor work categories and supplier opportunities for SBs to focus on as they evaluated the Project.

Our outreach efforts will continue post-award with the following subcontractor procurement activities:

- We will maintain a strong and visible presence in the Central Valley with field offices in Fresno, Hanford, and Corcoran.
- We will train a viable SB workforce that encourages personnel to achieve new levels of expertise and enables SBs to compete successfully in the market.
- We will actively support, inform, and monitor DFS managers and staff to ensure SB requirements and procurement strategies are met.
- We will liaise between SBs and DFS managers to address solicitations, contracts, SB plans, purchase orders, and acquisition issues.
- We will assist SBs in obtaining bonding, lines of credit, insurance, and certification at DFS subcontractor networking events.
- We will provide technical assistance and workshops related to safety, construction management, site supervision, and Project reporting (amongst others).

COMMITMENT

DFS POLICY STATEMENT

The Dragados/Flatiron/Shimmick Joint Venture will implement a SB Performance Plan that will operate at all times in full compliance with the requirements of the Title VI of the Civil Rights Act of 1964, 49 CFR Part 26, including 49 CFR Part 26.53(e) pertaining to design-build projects, and state and federal laws and regulations. We ensure Equal Opportunity to all people and businesses, regardless of race, color, or national origin.

- We will submit monthly progress reports on SB utilization to the Authority.
- We will verify timely SB payments in conformance with relevant guidelines.

Direct Marketing/Outreach to Identify SB Contractors

We are committed to supporting SBs through mentoring and training and have already contacted more than 500 SBs during the pre-bid phase. To engage the SB community effectively, we will continue our outreach efforts directly in the community through regularly scheduled networking events, training and educational events, and attendance at seminars, table fairs, industry forums, and other community meetings routinely attended by SBs.

EXPERIENCE

DRAGADOS USA – I-595 Corridor Improvements Project; Broward County, FL

Dragados USA was awarded the 2013 Disadvantaged Business Enterprise Utilization Achievement Award for an outstanding effort in exceeding the 8.1% DBE Participation goal by achieving over 12% DBE Participation.

FLATIRON – Sprinter Mainline; Oceanside, CA

Flatiron achieved 12.17% actual DBE participation on this 22-mile passenger rail project, exceeding the 11% goal.

SHIMMICK – Geneva Historic Car Enclosure Design-Build; San Francisco, CA

Shimmick not only successful met the participation goals but also achieved 98.7% local subcontractor participation. This was all the more innovative because local participation was not required by the contract.

JACOBS – SFPUC; San Francisco, CA

First Phase of Program Management Contract

SBE % GOAL	SBE % ACHIEVED
Year 1 – 40%	✓ Year 1 – 40%
Year 2 – 43%	✓ Year 2 – 57%
Year 3 – 46%	✓ Year 3 – 62%
Year 4 – 49%	✓ Year 4 – 55%

B. SMALL BUSINESS AND OUTREACH COORDINATOR (SBOC)

Led by SBOC John James, JTG, a certified DBE, is leading the DFS SB team in implementing our SB Performance Plan and complying with the Authority's SB Program.

Qualifications and Experience

John has over 20 years of experience and has provided SB outreach, support services, contractor monitoring, and reporting to Caltrans and other large public works agencies in California on large, highly visible transportation projects. Presented in the call-out box on the next page, his experience on some of the largest transportation and design-build projects in California is evidence of his expertise in SB coordination and outreach. John worked closely with the design-build contractors on the SR-125 Toll Road and Gap Connector and SR-22 HOV Design-Build projects in Southern California to achieve DBE goals. Together, these projects totaled over $1 billion and resulted in over $100 million in contracts awarded to SBs.

Printed on Recycled Paper

Role and Responsibilities

As the SBOC, John will be the point of contact for the SB Program. He will coordinate assignments and work tasks in conjunction with DFS Project Manager Lloyd Neal. John will provide oversight of SB Program progress and will be responsible for providing direction, technical assistance, and SB management oversight.

EXPERIENCE

JOHN'S REPRESENTATIVE PROJECT EXPERIENCE

- Los Angeles Redline Subway ($5.1 billion)
- Transbay Transit Center ($4.0 billion)
- SR-22 HOV Lane Design-Build project (California's first public agency-sponsored and managed design-build project) ($400 million)
- SR-125 Road/Publicly Funded Design-Build project ($1.25 billion)

Working with Lloyd and our Design and Construction Segment Managers, John will conduct Project-specific outreach to SBs, provide plans and specifications suitable for preparing bids, coordinate site visits and Project walkthroughs, and maintain records of outreach activities and SB certification. His responsibilities will also include analyzing Project schedules and tasks to identify additional opportunities for SB participation. He will work with DFS managers to prepare economically feasible bid plans and packages, identify certified SBs for identified opportunities, and verify that SBs are receiving the necessary materials to be able to respond to bid opportunities in a timely manner.

Level of Authority, Placement in Organization, and Percentage of Time Committed

John is 100% committed to the Project to perform his role leading the DFS SB Team. As shown in Figure 9.5.4-2, the DFS Team's level of commitment to providing SBs with a maximum opportunity to participate in the Project is demonstrated through our organizational structure. John reports directly to Lloyd, showing our commitment to meeting the SB requirements at the very top of our organization. Under Lloyd's direction, John has the authority to lead the SB Program, including SB outreach efforts and reporting to DFS and the Authority concerning performance.

On a monthly basis, Lloyd and John will evaluate the SB participation against the Performance Plan and make any changes to continue our commitment to achieve the 30% participation goal. The DFS Executive Committee will audit our performance each quarter to confirm effectiveness. The Authority's SB Division will also have a direct line of communication to John as part of our commitment to working with you and the local community to achieve SB participation goals and for the successful implementation of the Community Benefits Agreement.

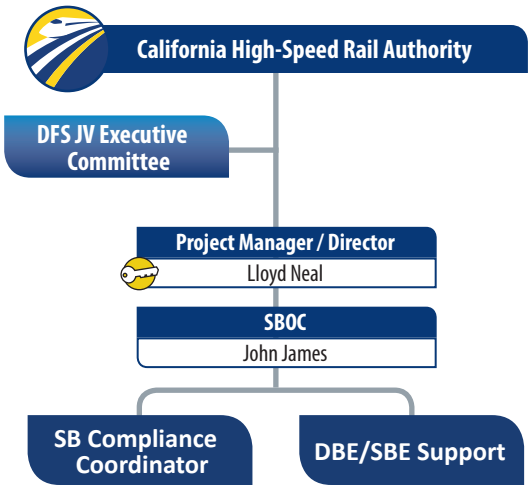


Figure 9.5.4-2: SB Organization Chart

C. INNOVATION FOR SMALL BUSINESS ASSISTANCE

We will work with potential SBs on details of their bid estimates and will negotiate in good faith to identify portions of the work that they can perform. The discussions will also help us determine the ability of potential SBs to provide the necessary bonding, insurance, and/or lines of credit necessary for working capital. We will coordinate and encourage potential SBs to attend a Project job walkthrough with the construction management team. We will also encourage SB bidders to have at least one meeting with the construction team to discuss bid specifics so that the SB fully understand the work and Project schedule.

Our efforts are geared toward providing technical assistance in obtaining necessary bonding, insurance, and lines of credit/working capital that often limit SB participation. We will explore the following ways to assist SBs to overcome limitations and barriers for participation.

- For financial assistance, our team encourages participation in the Small Business Administration Short Term Lending Program (http://www.sba.gov/loanprograms).
- For bonding assistance, we encourage participation in the Small Business Administration Surety Bond Guarantee (SBG) Program (http://www.sba.gov/surety-bonds).
- We will continue to work with small business bonding companies in California to support our SB program.
- We will offer technical assistance and implement information and communications programs on contracting procedures and specific contract opportunities.
- We will assist SBs to develop their capabilities to use emerging technology and conduct business through electronic media.

We will also assist SBs by:

- Facilitating mentor/protégé programs in which established contractors assist smaller firms with business development assistance,
- Unbundling contracts (i.e., breaking large contracts into multiple smaller contracts) to encourage SBs to bid or quote on subcontracts), and
- Facilitating and supporting project partnership opportunities among SB firms.

Additional innovations that are part of our approach to assist and support SBs are shown in Table 9.5.4-1.

Table 9.5.4-1 Innovations and Commitments for SB Assistance

Innovations	Commitments
Small Business Contracting Opportunity Center (SBCOC): We will set up a one-stop place for SBs seeking information or pursuing work.	✓ Maintain an on-site and online registry of all SB and non-SB contractors that want to bid on Project contracts, which will be readily accessible to DFS managers. ✓ Disseminate information on current and upcoming solicitations to registered SBs and publicly advertise each. ✓ Host pre-bid meetings for Project solicitations. ✓ Facilitate Project walkthroughs and meetings with DFS managers. ✓ Provide SB certification assistance, training, and other educational seminars, capacity building, and utilization information. ✓ Provide assistance with SB lending programs, including those administered by minority-owned banks. ✓ Coordinate Center efforts with nine county workforce development agencies in the Central Valley. ✓ Coordinate SB needs for compliance with the NTHI.
A Project Ready Program: Our approach ensures that SBs committed to the Project are fully prepared to begin work and have the knowledge and resources needed for success.	✓ Require SBs to attend Project status meetings 60 days prior to commencing work to familiarize themselves with Project and segment managers, Project status and schedule, and other businesses working on the Project. ✓ Assist SBs in identifying and securing the equipment and personnel needed to successfully fulfill their contracts and provides the SBs with equipment leasing and working capital contacts. ✓ Hold working sessions to cover subcontracts, bonding, and insurance requirements. ✓ Hold workshops on construction safety, management, scheduling, change orders, billing/invoice formats and requirements, certified payroll, NTHI, and all required and appropriate reporting forms.

Printed on Recycled Paper

Table 9.5.4-1 Innovations and Commitments for SB Assistance

Innovations	Commitments
Assistance with SB Certification	✓ Coordinate with Caltrans and DFS to provide support and remove unknowns for SBs in the certification process. ✓ Provide SB certification assistance and DBE application assistance.
Mentoring programs led by JTG's core team member Algerine McCray	✓ While serving as the Deputy Director of Civil Rights for Caltrans, Algerine created the Mentor-Protégé program for S/DBEs in California. The key elements of this program will serve as the foundation for exploring opportunities to implement a Project-specific mentoring program for the Project.

D. SBs WITH CONTRACTUAL COMMITMENTS

The DFS Team has committed to the following SBEs, DBEs, and DVBEs as integral members of our team in the following meaningful roles and percentages of work. Upon Notice of Award, we will continue our efforts in making contractual commitments to additional firms as part of our commitment to the 30% SB participation goal.

Once design is complete and the final subcontracting packages and solicitations are completed based on final quantities, we can best award subcontracts to SBs based on actual scopes of work that align with Project needs and SB capabilities. As discussed above, our SB Performance Plan will include a detailed list of opportunities for SBs with actual dollar values awarded that will be continuously updated throughout the Project.

Table 9.5.4-2 Preliminary List of SBs with Contractual Commitments

Firm	Scope of Work	Anticipated % of Work
James Transportation Group	Small Business and Outreach Coordinator	<1%
Mountain Pacific, Inc.	Shoring and falsework design and calculations	<1%
Rupert Construction Supply	Pipe supply	<1%
DeWalt Corporation	Surveying	<1%
Alert-O-Lite Inc.	Traffic control	<1%
Bradley Tanks, Inc.	Holding tanks	<1%
MJ Avila Company, Inc.	Clear and grub	<1%
USC Supply	Pipe supply	<1%

E. IMPLEMENTING THE COMMUNITY BENEFITS AGREEMENT

The Project provides a significant opportunity to meet SB and employment goals through the CBA and NTIH programs. With a goal to increase employment opportunities in the Central Valley that pay prevailing wages, we recognize our role we have in creating an economic boost for the local workforce. We have and will continue to actively diversify our workforce to represent the minorities, women, veterans, and other under served populations in the area. We understand that efforts to ensure NTHI requirements are ongoing and demand a focused recruiting effort to meet the minimum 30% National Targeted Worker hours for all Project work hours, with a minimum 10% of the National Targeted Worker hours comprised of Disadvantaged Worker hours.

To meet these hourly requirements, we will integrate the local under utilized and disadvantaged workforce into our team and ensure that on-the-job training is available to all personnel and through the local union apprenticeship programs. We will assign a Jobs Coordinator to implement and administrate all contract requirements. Our approach provides local employees with new skills that they can use to find future employment after the Project. For example, training workers how to survey, operate equipment, and construct concrete structures instills a valuable experience for working on upcoming HSR sections, future Caltrans jobs, and other projects.

We expect the union hiring hall call process to be successful in engaging a high percentage of NTHI workers. However, relative to SBs, a critical element will be having access to sufficient NTHI qualified personnel to perform the contracted services in a timely manner. We also recognize that not all workers will be able to perform project-specific work. To mitigate these issues, we are working with regional workforce investment boards as a back-up source to confirm a sufficient pool of NTHI workers.

As part of our back-up plan, we have also engaged the Cypress Mandela Training Center in Oakland, California, to train qualified NTHI workers to increase the NTHI worker pool. Our plan is to help coordinate the Center with the Fresno Regional Workforce Investment Boards to have workers ready and able to work when needed. The Center offers a 16-week, pre-apprenticeship program for Bay Area men and women over 18 years of age. Training is both hands-on and classroom oriented to prepare students for skilled trade jobs that are relevant to today's construction industry. The Center's Pre-Apprenticeship Program has received national awards for its 85 to 90 percent placement rate achievements. We will continue exploring opportunities to build off the Center's success and bring its training protocol to the Central Valley to benefit this Project and future projects in the area.

Printed on Recycled Paper

Alternative Technical Concepts (ATCs)

Figueres-Perpignan High-Speed Rail Line, Figueres, Spain to Perpignan, France

Alternative Technical Concepts (ATCs)

Enclosed in this section are the California High-Speed Rail Authority ATC approval letters, and the DFS team's submitted ATCs we intend to use on the CP 2-3 project. We developed and presented 26 potential ATCs during the pre-bid phase. After discussion with the Authority and other Project stakeholders, several ATCs were determined to be value engineering ideas, and some ideas were eliminated because of associated risks, such as environmental concerns not understood until after discussion with the Authority and other permitting agencies. We ultimately gained approval to use 12 of our 13 ATCs in the proposal. After evaluating overlapping ATCs, our proposal incorporated five of the approved ATCs for a total estimated cost savings of over $291 million. A few of our ATCs have backup ATCs as contingencies. The table below summarizes our approved ATCs and each ATC's inherent benefit for the Authority.

We have met all conditions required by the Authority for incorporating these ATCs into our proposal. This includes meeting with Baker Commodities pre-bid to obtain their approval of our preliminary conceptual drawings for ATC 17.

We are committed to enhancing these concepts through to final design, and our team will continue to investigate and implement new technologies and pursue innovations that will benefit this Project and also future HSR projects and the overall HSR program.

ATCs Benefits Table

		Impact on Design									
ATC	Description	Cost Savings	Schedule Savings	Safer Construction	Improved Constructability	Lower maintenance cost	Greater Sustainability	Less impact on community	Reduced ROW Needs	Approved	Incorporated into Proposal
1d	Lower the profile at Kings River and place HSR on embankment across floodzone	$88M	x	x	x	x	x	x	-	x	No
1e	Lower the profile at Kings River and keep HSR on viaduct	$9M	-	-	x	-	-	x	-	x	No
2c	Lower profile at Cross Creek	$43M	x	x	x	x	x	x	-	x	Yes
3	Replace viaduct with sloped embankment in the Kings River Complex floodplain	$79M	x	x	x	x	x	-	-	x	Yes
4	Relocate Hanford Station to the south	$115M	x	x	x	x	x	-	-	x	No
5	Relocate Hanford Station to the North	$115M	x	x	x	x	x	-	-	x	No
8a	Add 3 piers in Dutch John Cut and 1 pier in Kings River	$8M	-	x	x	-	-	-	-	x	No
8b	Add 1 pier in Cole Slough, 4 piers in Dutch John Cut, and 4 piers in Kings River	$21M	-	x	x	-	-	-	-	x	Yes
8d	Add 2 bents in Tule River floodway	$1M	-	x	x	-	-	-	-	x	Yes
15a	Eliminate 2 grade seps. in Segment P	$17M	x	x	x	x	x	x	x	x	Yes
15b	Eliminate 1 grade sep. in Segment P	$7M	x	x	x	x	x	x	x	x	No
17	Place Hanford Station at grade	$130M	x	x	x	x	x	x	-	x	Yes

CALIFORNIA
High-Speed Rail Authority

BOARD MEMBERS

Dan Richard
CHAIR

Thomas Richards
VICE CHAIR

Jim Hartnett
VICE CHAIR

Richard Frank

Patrick
W. Henning, Sr.

Katherine
Perez-Estolano

Michael Rossi

Lynn Schenk

Thea Selby

Jeff Morales
CHIEF EXECUTIVE OFFICER

EDMUND G. BROWN JR.
GOVERNOR

June 23, 2014

Mr. Chad Mathes
Dragados/Flatiron/Shimmick
3200 Park Center Drive, Suite 600
Costa Mesa, CA 92626

Subject: Request for Proposals (RFP) No.: HSR 13-57, **Alternative Technical Concepts (ATC)**

Dear Mr. Mathes:

The California High-Speed Rail Authority (Authority) has commenced evaluation of the ATCs submitted by Dragados/Flatiron/Shimmick (Proposer) on June 10 and 12, 2014. As provided in ITP Section 6.15.3 the Authority may request additional information and/or schedule a one-on-one meeting in order to better understand the details of an ATC prior to making a determination whether or not the ATC will be approved .

The Authority has identified the following requests for clarification and information regarding Proposer's ATC 2:

1. ATC 2 – Lower HSR Alignment at Cross Creek. Please provide the following additional information, discussions, plan or provisions:
    a. Provide access connections to SR-43 and Frontage Roads connections to Figure 1 configuration
    b. Provide more details to SR-43, specially plans and profiles
    c. Future accommodation of SR 43 (can it be done now with-in R/W area available) and inside existing environmental footprint.
    d. Levee access shown on Figure 1, but not on plan/profile
    e. Turn around – will they impact creek, and out of direction travel associated with turn around.
    f. Provide typical sections of the RR alignment, and RR vs local/state roads.
    g. Provide hydraulic report supporting cross flows.
    h. Resubmit new anticipated savings taking into consideration items a to d

Please revise your ATC 2 submittal by providing the information identified above and re-submitting on the date and time stated below.

Please note that the Authority has not completed its review of the ATC and, accordingly, reserves the right to issue further communications posing additional questions and/or requesting additional clarifications or materials.

The Authority asks that responses and/or clarifying materials be delivered by Proposer to the Authority no later than 12:00 p.m. PST on June 30, 2014 at the following address:

California High-Speed Rail Authority
Attention: Rebecca Harnagel, P.E.
Program Management
770 L Street, Suite 800
Sacramento, CA 95814
Email address: CP23@hsr.ca.gov

If you have questions you may call our office at (916) 324-1541 or email us at CP23@hsr.ca.gov.

Sincerely,

[redacted]

Rebecca Harnagel, P.E.
Program Management

CALIFORNIA
High-Speed Rail Authority

BOARD MEMBERS

Dan Richard
CHAIR

Thomas Richards
VICE CHAIR

Jim Hartnett
VICE CHAIR

Richard Frank

Patrick
W. Henning, Sr.

Katherine
Perez-Estolano

Michael Rossi

Lynn Schenk

Thea Selby

Jeff Morales
CHIEF EXECUTIVE OFFICER

EDMUND G. BROWN JR.
GOVERNOR

July 7, 2014

Mr. Chad Mathes
Dragados/Flatiron/Shimmick
3200 Park Center Drive, Suite 600
Costa Mesa, CA 92626

Subject: Request for Proposals (RFP) No.: HSR 13-57, Alternative Technical Concepts (ATCs)

Dear Mr. Mathes:

The California High-Speed Rail Authority (Authority) has completed its evaluation of the ATCs listed on Attachment 1 hereto that were submitted by Dragados/Flatiron/Shimmick (Proposer) on June 10 and 12, 2014. The Authority's determination, in accordance with Section 6.15.5 of the Instructions to Proposers is as follows:

ATC Nos. 1d, 1e, 2, 3, 4, 5, 8a, 8b, 8d, 15a and 15b are acceptable for inclusion in the Proposal. ATC No. 17 is not acceptable in its present form but may be acceptable upon the satisfaction, in the Authority's sole discretion, of certain identified conditions which must be met or clarifications or modifications that must be made.

The conditions that must be met include the following:

1. Proposer shall provide a conceptual plan showing Baker Commodities traffic circulation under the Proposer's proposed embankment. Currently, the viaduct allowed circulation under the viaduct that would severed if embankment is constructed as shown. The Authority asks that responses and/or clarifying materials be delivered by Proposer to the Authority no later than 12:00 p.m. PST on July 14, 2014 at the following address:

California High-Speed Rail Authority
Attention: Rebecca Harnagel, P.E.
Program Management
770 L Street, Suite 800
Sacramento, CA 95814
Email address: CP23@hsr.ca.gov

Failure to comply with this deadline may result in the completion of the Authority's final review of ATC's without regard to such materials.

ATC No. 18 does not qualify as an ATC and may not be included in the Proposal.

Proposer is reminded that, in accordance with the RFP Documents, Proposer is responsible for and bears the schedule and cost risk associated with implementing an ATC including (a) any further environmental evaluation of the Project, (b) obtaining any third party approvals (including Governmental Approvals and Supplemental or Amended Governmental Approvals), and (c) the acquisition of any additional temporary and/or permanent Right of Way (ROW). Proposer is not entitled to a Change Order for time or money as a result of (i) Site conditions (i.e. Hazardous Materials, Differing Site Conditions, geotechnical issues, Utilities, etc.) on such additional ROW, or (ii) any delay, inability or cost associated with the acquisition of ROW required to implement the ATC. Moreover, Proposer shall reimburse the Authority for any costs it incurs as a result of the implementation of an ATC, including costs associated with the acquisition of additional ROW and the performance of additional Utility Work, Environmental Re-Examination Process(es) and costs to acquire any required CEQA/NEPA approvals or other Governmental Approvals and/or Supplemental or Amended Governmental Approvals.

Nothing in this letter modifies or alters the terms of the RFP, including the Authority's reserved rights thereunder, and such terms shall remain in full force and effect.

If you have questions you may call our office at (916) 324-1541 or email us at CP23@hsr.ca.gov.

Sincerely,

[redacted]

Diana Gomez, P.E., PMP
California High-Speed Rail Authority
Central Valley Director
Chair, Evaluation Selection Committee

Attachment

ATTACHMENT 1

Dragados/Flatiron/Shimmick		
ATC No.	Description	Determination
1d	Lower HSR Alignment at Kings River Complex, Modify Levee Maintenance Roadway Alignments, and Embankment in the Floodplain	Yes
1e	Lower HSR Alignment at Kings River Complex, Modify Levee Maintenance Roadway Alignments	Yes
2	Lower HSR Alignment at Cross Creek	Yes
3	Replace Viaduct with Sloped Embankment in Kings River Complex Floodplain	Yes
4	Relocate Hanford Station South of RFP location and Place at Grade	Yes
5	Relocate Hanford Station South of RFP location and Place at Grade	Yes
8a	Place Piers in the Floodway of the Dutch John Cut and Kings River Crossings	Yes
8b	Place piers in the floodway of Kings River Complex	Yes
8d	Place Additional Piers in the Floodway of Tule River	Yes
15a	Realign Avenue 120 Grade Separation over HSR/BNSF/SR-43 and Eliminate Proposed Grade Separation Crossings at Avenue 128 and Avenue 112	Yes
15b	Realign Avenue 112 Grade Separation over HSR/BNSF/SR-43 and Eliminate Proposed Grade Separation Crossings at Avenue 128 and Avenue 120	Yes
17	Place Hanford Station at Grade	Subject to conditions
18	Limited Notice to Proceed (LNTP)	No

CALIFORNIA
High-Speed Rail Authority

BOARD MEMBERS

Dan Richard
CHAIR

Thomas Richards
VICE CHAIR

Jim Hartnett
VICE CHAIR

Richard Frank

Patrick
W. Henning, Sr.

Katherine
Perez-Estolano

Michael Rossi

Lynn Schenk

Thea Selby

Jeff Morales
CHIEF EXECUTIVE OFFICER

EDMUND G. BROWN JR.
GOVERNOR

August 6, 2014

Mr. Chad Mathes
Dragados/Flatiron/Shimmick
3200 Park Center Drive, Suite 600
Costa Mesa, CA 92626

Subject: Request for Proposals (RFP) No.: HSR 13-57, **Alternative Technical Concepts (ATCs Supplemental)**

Dear Mr. Mathes:

The California High-Speed Rail Authority (Authority) has completed its re-evaluation of the ATC No. 17 listed on Attachment 1R, dated August 4, 2014 hereto that were resubmitted by Dragados/Flatiron/Shimmick (Proposer) on July 14, 2014. This correspondence shall serve to supplement our previous response dated July 7, 2014.

ATC No. 17 as resubmitted is acceptable for inclusion in the Proposal. The Proposer is reminded to obtain Baker Commodities approval of its conceptual drawings before incorporating in its proposal.

Proposer is reminded that, in accordance with the RFP Documents, Proposer is responsible for and bears the schedule and cost risk associated with implementing an ATC including (a) any further environmental evaluation of the Project, (b) obtaining any third party approvals (including Governmental Approvals and Supplemental or Amended Governmental Approvals), and (c) the acquisition of any additional temporary and/or permanent Right of Way (ROW). Proposer is not entitled to a Change Order for time or money as a result of (i) Site conditions (i.e. Hazardous Materials, Differing Site Conditions, geotechnical issues, Utilities, etc.) on such additional ROW, or (ii) any delay, inability or cost associated with the acquisition of ROW required to implement the ATC. Moreover, Proposer shall reimburse the Authority for any costs it incurs as a result of the implementation of an ATC, including costs associated with the acquisition of additional ROW and the performance of additional Utility Work, Environmental Re-Examination Process(es) and costs to acquire any required CEQA/NEPA approvals or other Governmental Approvals and/or Supplemental or Amended Governmental Approvals.

Nothing in this letter modifies or alters the terms of the RFP, including the Authority's reserved rights thereunder, and such terms shall remain in full force and effect.

If you have questions you may call our office at (916) 324-1541 or email us at CP23@hsr.ca.gov.

Sincerely,

[redacted]

Diana Gomez, P.E., PMP
California High-Speed Rail Authority
Central Valley Director
Chair, Evaluation Selection Committee

Enclosure: Attachment 1R

Alternative Technical Concept 2

Lower HSR alignment at Cross Creek

ALTERNATIVE TECHNICAL CONCEPT 2

Lower HSR Alignment at Cross Creek

California High-Speed Rail Project
RFP No.: HSR 13-57 - Design-Build for Construction Package 2-3

June 6, 2014

04/02/2014 - RFP No.: HSR13-57

CONFIDENTIAL ATC

Submitted by **DFS** Dragados | Flatiron | Shimmick

Dragados/Flatiron/Shimmick (DFS) Joint Venture is pleased to submit Alternative Technical Concept (ATC) 2 for consideration by the California High-Speed Rail Authority (Authority) for implementation into the Construction Package 2-3. The ATC concept meets or exceeds the Request for Proposals (RFP) design. The following summary provides detailed information as required in Section 6.15.4 of the Instructions to Proposers.

ALTERNATIVE TECHNICAL CONCEPT (ATC) 2
Lower HSR Alignment at Cross Creek

DESCRIPTION

ATC 2 proposes to lower the elevation of the HSR alignment across Cross Creek, from Station 2420+31 to Station 2588+18, as shown in **Exhibit A**. ATC 2 places the HSR on embankment across the floodplain as permitted by the RFP drawings. The RFP drawings include a note that states "*embankment or an alternative structure may be provided subject to approval of appropriate agencies. Safe passage of flood flows and wildlife must be maintained*". Therefore it is assumed embankment in the floodzone is considered a design refinement and is permissible regardless of ATC 2 approval.

This is an ATC because the RFP design shows a 16-foot clearance between the bridge soffit and private levees at Cross Creek, whereas ATC 2 provides minimum 4-foot freeboard to the 100-year water surface elevation (WSE). ATC 2 meets or exceeds the design requirements by providing levee and HSR maintenance access on each side of the high-speed rail, meeting the minimum freeboard requirements, and meeting drainage and wildlife crossing criteria. ATC 2 does not adversely impact irrigation canals.

Design Details

ATC 2 provides 4-foot clearance between the bridge soffit and the 100-year WSE, as compared to the RFP design that provides 16-foot clearance between the bridge soffit and the private levee at Cross Creek, as shown on the Conceptual Plans (15% Design Plans) provided as part of the RFP. This ATC proposes to lower the HSR to a level that maintains a minimum 4-foot clearance between the bridge soffit and the 100-year WSE in accordance with Section 2.3.2.3 (Levee Systems and Channel Maintenance) of the Floodplain Impact Report and Section 3.2.3 (Minimum Recommended High-Speed Train Soffit Elevation) of the Hydrology, Hydraulics, and Drainage Report. See proposed vertical alignment and crossings in attached **Exhibit A**.

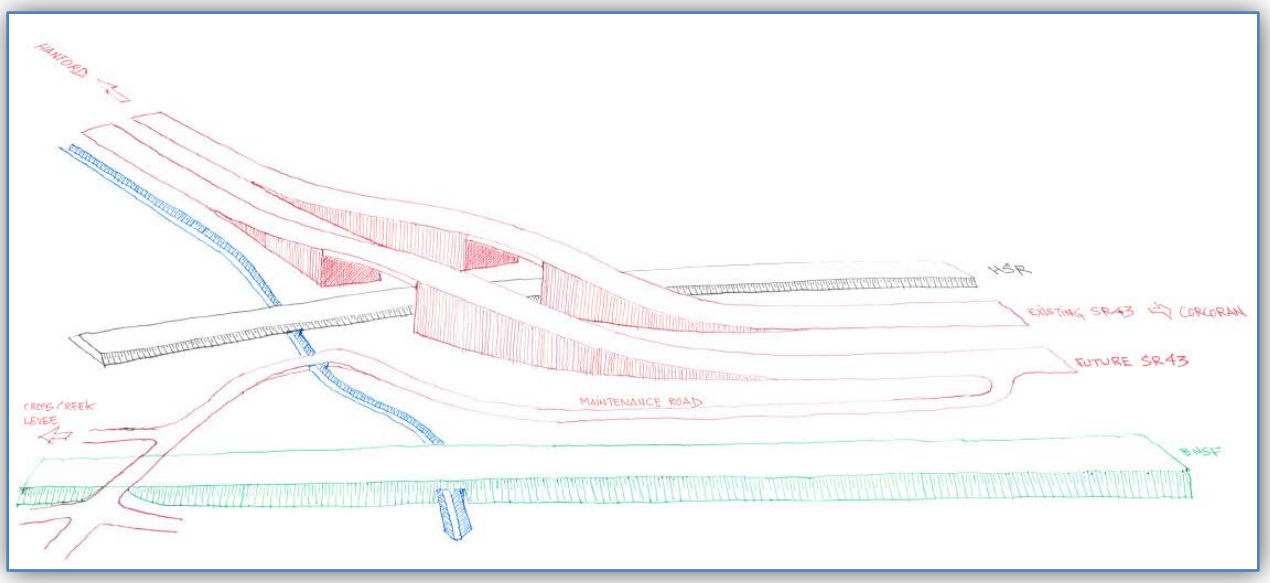
In meeting with the Cross Creek Flood Control District (CCFCD), we have learned that the levees are not maintained by CCFCD and are not USACE certified levees. Cross Creek is a natural channel that carries waters of the State of California and the United States. As such, the levee is assumed to fail in a 100-year storm. To address the potential for levee failure at the HSR alignment, ATC 2 hardens the levee at the HSR alignment by incorporating the bridge abutment into the levee.

Kaweah Delta Water Conservation District (KDWCD) manages the levee for flood control purposes and we understand that KDWCD wants to minimize obstructions to water flow and provide access to the

levees on both sides. KDWCD also looks to ensure they have the ability to access the channel, both for channel maintenance and for access under structures like the HSR crossing, SR-43 crossing and the BNSF crossing. For maintenance access, ATC 2 maintains the existing levee roads access on the east side of HSR and provides turnarounds adjacent to the HSR ROW. Access to the west side of the levees is achieved by existing unpaved roads. Figure 1 below shows the access road connection to SR-43.

ATC 2 addresses another concern regarding SR-43 crossing at the HSR. The RFP design includes numerous straddle bents across SR-43. The straddle bents create a tunnel effect on SR-43, which Caltrans does not favor. ATC 2 lowers the HSR profile and creates a grade separation for SR-43 to cross over the HSR. This eliminates the tunnel effect and creates a safer roadway design. Figure 1 also shows the ultimate condition of the SR-43/HSR crossing and the proposed levee access road. Note that ATC 2 includes construction of the SR-43 structure over HSR for the existing condition as the schedule for widening SR-43 in this area is unknown and constructing the future structure now will create a "bridge to nowhere".

Figure 1: Ultimate SR-43/HSR crossing and levee access roads configuration



This ATC also places the HSR on sloped embankment across the Cross Creek Floodplain. As noted, the RFP design permits this approach, therefore we are considering this as a design refinement regardless of the approval of ATC 2. Exhibit A shows the required drainage and wildlife structures for reference only so that you can consider the full impact of approving ATC 2.

USAGE

ATC 2 limits are from Station 2420+31 to Station 2588+18. The ATC lowers the structure height across Cross Creek. ATC 2 also raises the vertical alignments of SR 43 at Station 2433+00 to go over the HSR alignment. In addition, turnarounds will be provided at the ends of the levee roadways.

Environmental Compliance

This design variation includes the construction of a truss structures over Cross Creek so aquatic resources and natural wildlife attributes within the riverine systems would continue to be preserved. The levee will be improved by ATC 2 as the bridge abutments will be incorporated into a hardened levee section, thus eliminating maintenance concerns under the HSR structures at the levees.

Maintenance access will be provided using alternative routes that have equal or better accessibility. The RFP design limits clearance for the levees, whereas the ATC 2 design provides unlimited height for maintenance vehicles. Therefore, this is an improvement on the RFP design.

Other benefits of this design variation include a lower profile that **reduces/eliminates visual intrusions** as compared to elevated structures crossing flat agricultural lands. ATC 2 provides a profile view similar to the typical rural railroads such as the nearby BNSF line that is on embankment. Some of the culverts under the embankment could be sized to allow farming equipment to easily pass through unimpeded thus preserving existing farming connections and operations. As discussed with the Authority during recent ATC meetings, three season farm access crossings may be utilized to facilitate farmland connectivity, where required. In addition, traffic on SR-43 would be better protected from flooding as the roadway will be elevated over the HSR. Therefore, emergency access is improved.

ATC 2 proposes to build embankment over the Cross Creek floodplain rather than on an elevated viaduct. The proposed embankment would be built with underlying culverts to allow the unimpeded passage of potential floodwaters and to function as wildlife crossings and preserve natural wildlife linkages. In addition, wildlife can pass under the truss structures allowing additional access across the HSR alignment. The proposed embankment would be built on existing agricultural fields and not on natural habitat. The RFP design impacts a very small portion of the Tulare Lakebed Mitigation Site at its western edge. The Tulare Lakebed Mitigation Site has a conservation easement as mitigation for the Lake Kaweah Enlargement Project. Although ATC 2 impacts the Tulare Lakebed Mitigation Site, the ATC restricts or reduces the footprint with embankment and retaining walls, and thus minimizes impacts to the mitigation site as much as possible. This is in accordance with the requirements of the Corcoran Irrigation District, who manages the Mitigation Site, and prefers the reduced impact to their pond capacity as a result of this ATC.

Our team is currently identifying sufficient imported borrow to convert to an embankment. The Corcoran Irrigation District has currently identified three cells of their Mitigation Ponds as potential borrow sites of approximately 8 million cubic yards for the Project and another 7 million cubic yards in

their Reservoir No. 1 site, which is located immediately east of the Mitigation Ponds. This will eliminate the risk of locating imported borrow for the HSR embankment in the ATC area and beyond.

Additional design refinements could be incorporated into the ATC as needed or required from the Authority, Kaweah Delta Water Conservation District and the regulatory agencies.

ATC 2 is not generally consistent with the Final EIR/EIS or the approved preliminary LEDPA. This ATC would constitute a minor variation and would require an environmental re-examination process to amend the Final EIR/EIS. The ATC would require preparation of supporting technical memoranda requiring approval from the Authority and regulatory agencies. If approved to move forward, the Preliminary LEDPA would be amended subject to Signatory Agency approval per the NEPA/404/408 MOU. If approved, ATC 2 would require that the conservation easement be modified to accommodate the HSR improvements.

SCHEDULE REVISIONS

ATC 2 will not adversely impact the overall project schedule and may have potential schedule reduction. Potential schedule concerns are limited to the environmental/design approvals and permits. The DFS team will be proactive to address these concerns very early in the overall project and are not expected to impact the design and construction progress in other areas.

The construction schedule is anticipated to be **reduced by up to 40%** due to the reduction in structures. Further, reducing structures lengths improves construction safety, which has an indirect impact on the construction schedule.

Schedule impacts and mitigations, where applicable, are identified below:

Design Phase Schedule Impacts

- **Viaduct Design:** The **design time will be reduced by several months** in this section since a structural design for the viaduct will be eliminated.
- **Environmental Re-examination:** Environmental re-examination and preparation of supporting technical memos with approvals from the Authority and regulatory agencies may take several months. However, necessary approvals may be obtained within the schedule parameters if the technical memoranda are prepared and submitted early in the process. This ATC may require an amendment to the NEPA/404/408 (Minor) MOU for the Program requiring that the signatory agencies agree on the proposed changes. However, the design refinements provide benefits through cost reductions, access enhancements, performance improvements, and minimize maintenance concerns without jeopardizing or impacting wildlife values and linkages. Again, if the process is started early, the amendment to LEDPA for this section of the alignment could be accomplished within schedule parameters. We will prepare this submittal early in the design process and plan construction to avoid this area until much later in the Project. We anticipate obtaining these approvals within 12-18

months, which will have **no impact on the overall project schedule** due to our segmented design/construction approach.

- **Local Agency Approvals:** The permitting and design approval schedule of this section may be slightly lengthened due to obtaining conceptual and final approvals from Kings County, Central Valley Flood Protection Board (CVFPB), and other agencies such as local irrigation companies. We will prepare this submittal early in the design process and plan construction to avoid this area until much later in the Project. We anticipate obtaining these approvals within 6-12 months, which will have **no impact on the overall project schedule**.
- **CLOMR Requirements:** The Conditional Letter of Map Revision (CLOMR) will have to be issued prior to placing fill in the floodplain. This is the same for other areas on the alignment and is not expected to adversely impact the overall schedule. We will prepare this submittal early in the design process and plan construction to avoid this area until much later in the Project. Based on typical processing times we anticipate obtaining the CLOMR within 12-18 months; which will have n**o impact on the overall project schedule**.

Construction Schedule Impacts

- **Embankment is Faster to Construct:** Embankment construction will be faster than either viaduct or retained earth construction. Sufficient embankment borrow pits have been identified in the exact location of ATC 2 and can provide enough import material to account for the embankment necessary. This concept provides an estimated total **construction time savings of 40%** versus building the RFP concept.
- **Reduced Subsurface Schedule Risks:** Embankment construction eliminates the risk of subsurface problems that may occur with piles for the Viaduct structure.
- **Embankment Simplifies Construction Risk:** Less subcontractors and supplier trades will be required, reducing delay risks through issues with the supply chain.
- **Embankment Construction Increases SBE Contracting Opportunities:** Numerous identified small business enterprises in the area can perform embankment construction work to help meet the overall 30% SBE goals on the Project.

COST INCREASES OR DECREASES

The DFS team estimates significant savings in construction cost due to lowering HSR profile, eliminating elevated viaduct structures, and replacing them with sloped and/or retained embankment. The **cost savings is estimated to be $43 million** associated with the implementation of this ATC, as detailed in Table 1 on the following page. In addition, long term maintenance costs will be reduced as embankment profile adjustments are easier to maintain on ballasted track especially in subsidence zones.

Table 1: ATC 2 Construction Cost Comparison

RFP DESIGN		ATC 2 DESIGN	
Retained Fill & Earthwork	$16,000,000	Retained Fill & Earthwork	$53,000,000
Rail/Road Structures	$96,000,000	Rail/Road Structures	$16,000,000
TOTAL	$112,000,000		$69,000,000
ATC 2 TOTAL SAVINGS			**$43,000,000**

DEVIATIONS

The RFP design indicates a minimum clearance of 16-feet between the top of levee at Cross Creek to the bridge soffit. The purpose of this clearance is to provide adequate clearance for maintenance vehicles to access levees, yet alternative access can be provided to allow KDWCD the ability to maintain their levee and flood channel facilities. In lieu of a 16-foot clearance, ATC 2 provides maintenance access using alternative routes that are equal to or provide better accessibility for KDWCD maintenance vehicles and equipment. The RFP design limits clearance to between the levee and HSR, whereas the ATC 2 design provides **unlimited height** for maintenance vehicles and provides **flexibility for future levee** improvements such as increasing the levee height. Therefore, this is an improvement on the RFP design.

JUSTIFICATION

ATC 2 provides accessibility to the levee that meets or exceeds the existing condition while providing a more economical alternative that also reduces the visual impacts of the HSR in this area. ATC 2 **reduces capital costs** and **addresses accessibility** to the levee that meets or exceeds the existing condition. This concept meets or exceeds the RFP by **reducing the overall schedule and cost** of the Project, and meets RFP performance requirements. In addition, the carbon footprint of the Project will be significantly reduced through this ATC due to the **substantial reduction in materials**.

CONSTRUCTION AND SAFETY IMPACTS

Vehicular/Rail Traffic

- No adverse impact to rail/vehicular traffic is expected.

Rail Operations

- No adverse impact to rail operations is expected.

Community Impact

- No adverse community impacts are expected.

Maintenance

- Eliminating the viaducts also reduces regular inspection and maintenance costs typically incurred by viaduct structures.
- Culvert maintenance will be required, however maintenance is expected to be minimal and is only necessary for clearing debris and/or removing sediment (if any) from the culverts. The

culvert maintenance is similar to maintenance required at other sections of the alignment. This maintenance cost is expected to be substantially lower than the viaduct maintenance costs. Therefore, approving ATC 2 will reduce the Authority's long term maintenance costs.

Safety

- ATC 2 improves construction and long term safety for the HSR and on SR-43.
- Viaduct construction includes three of the most frequent construction violations: scaffolds/aerial lifts, falls, and cranes/hoists. By reducing/eliminating viaduct construction, it creates a safer environment for construction workers and inspectors.
- Post construction safety is also enhanced. For example, the viaduct would require regular inspection and maintenance, which places inspectors in a potentially dangerous condition where they could fall up to 30+ feet. Placing the HSR on embankment eliminates this potential fall condition.
- Fire and life safety is also improved by having the rail and guideway accessible from ground as opposed to accessing the structure from ladders.

ROW

Proposed ROW limits have not been released at the time of preparation of this ATC. The design includes installing a sloped embankment for the entire length; retaining walls or retained fill will be used in areas with right-of -way constraints. Therefore, we do not anticipate that additional right-of-way will be required.

THIRD-PARTY APPROVALS

Several third-party approvals will be necessary for ATC 2. Coordination with these agencies is required with the RFP design as well; therefore we do not anticipate additional impacts. We will seek approval and/or input from the following third-party agencies:

- Kings County: A portion of the ATC is in Kings County; therefore we will seek their input and approval as required.
- Kaweah Delta Water Conservation District (KDWCD): KDWCD manages the levee for flood control purposes and their input into levee access and water flow will be sought for design approval.
- Central Valley Flood Protection Board (CVFPB): CVFPB is the coordinating agency for the CLOMR with FEMA. We will submit the CLOMR/LOMR to CVFPD, who will then process the CLOMR/LOMR with FEMA.
- Federal Emergency Management Agency: FEMA is the final approver for the CLOMR/LOMR.
- Environmental Process: ATC 2 may require the contractor to provide environmental re-examination process per Section 42.5, Book I, Part B.2 General Provisions including NEPA/404/408 Integration MOU process requiring signatory agency approvals.

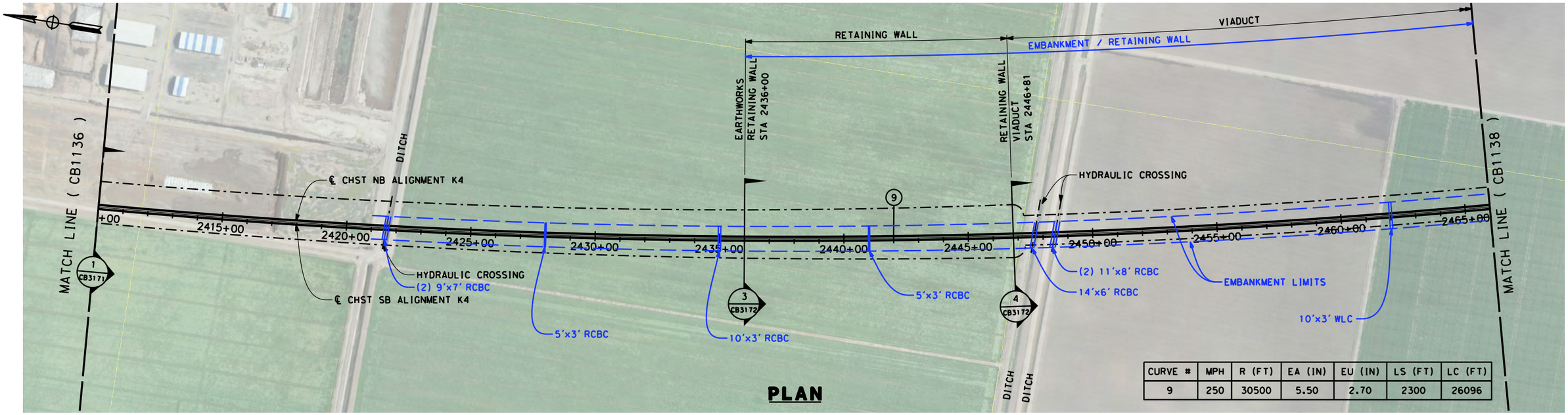
RISKS

We have identified minimal risks related to ATC 2. Table 2 details potential risks and possible mitigation for addressing those risks.

Table 2: Risk/Mitigation Table

POTENTIAL RISK	PROPOSED MITIGATION
Levee damage from rodents at hardened levee section	Levee hardening will extend to a depth where rodent impacts will be avoided.
Levee access is restricted	Levee access turnaround areas will be provided and access roads will be maintained to allow for access along the Cross Creek levees both upstream and downstream from the HSR alignment.
Limited ability to increase the levee height to protect from larger floods	CVFPD recently clarified that the design is only required to meet the 100-year flood.
Nature of flood risk is changed	ATC 2 design provides adequate culverts to pass the 100-year flood. The culverts are located at low points along the floodplain and are spaced to maintain an approximate sheet flow condition. The flood depth will not be increased by more than 0.1 feet.
HSR embankment erosion during flooding	Provide rip-rap protection on embankment located in the floodplain.
Debris blocks flow through culverts during a storm	Culverts will be adequately sized as required by the design criteria.
Approval agencies require designing culverts for a larger flow rates	CVFPD indicated that we are only required to design culverts for a 100-year flow, however additional culverts may be added or small bridge sections may be added to address any change in flow rates or design requirements.
Farmland access is reduced	Three season access crossings will be situated in appropriate locations to facilitate farmland utilization, as required.
Permitting and environmental re-examination time impacts on the project schedule	Project segmentation during both design and construction will allow work to progress outside of the ATC 2 impacted areas. ATC 2 impacts less than 2 miles of the approximately 65 miles of work, less than 3% of the overall project, therefore design and construction potential delay impacts can be offset with proper planning at the forefront and accelerated construction methods on the back end.
Future construction of SR43 widening could impact future rail service.	Final design plans would provide sufficient detail to facilitate construction of a future SR43 widening and minimize impacts to future HSR operations.

EXHIBIT A



CURVE #	MPH	R (FT)	EA (IN)	EU (IN)	LS (FT)	LC (FT)
9	250	30500	5.50	2.70	2300	26096

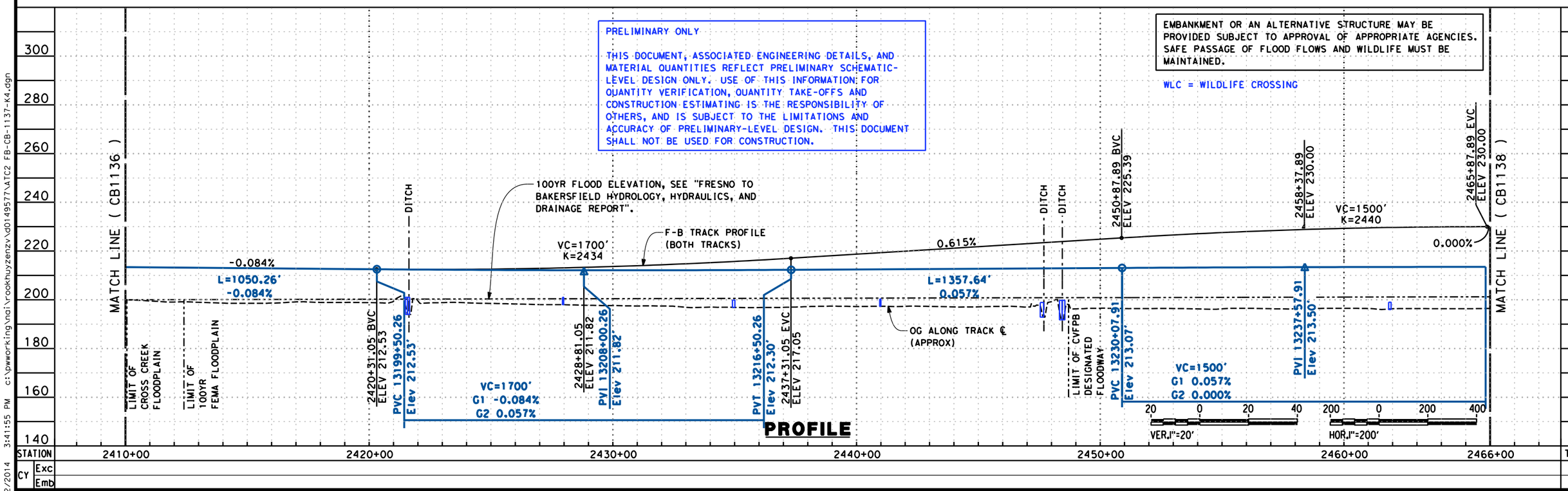
PLAN

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

EMBANKMENT OR AN ALTERNATIVE STRUCTURE MAY BE PROVIDED SUBJECT TO APPROVAL OF APPROPRIATE AGENCIES. SAFE PASSAGE OF FLOOD FLOWS AND WILDLIFE MUST BE MAINTAINED.

WLC = WILDLIFE CROSSING



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/19/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

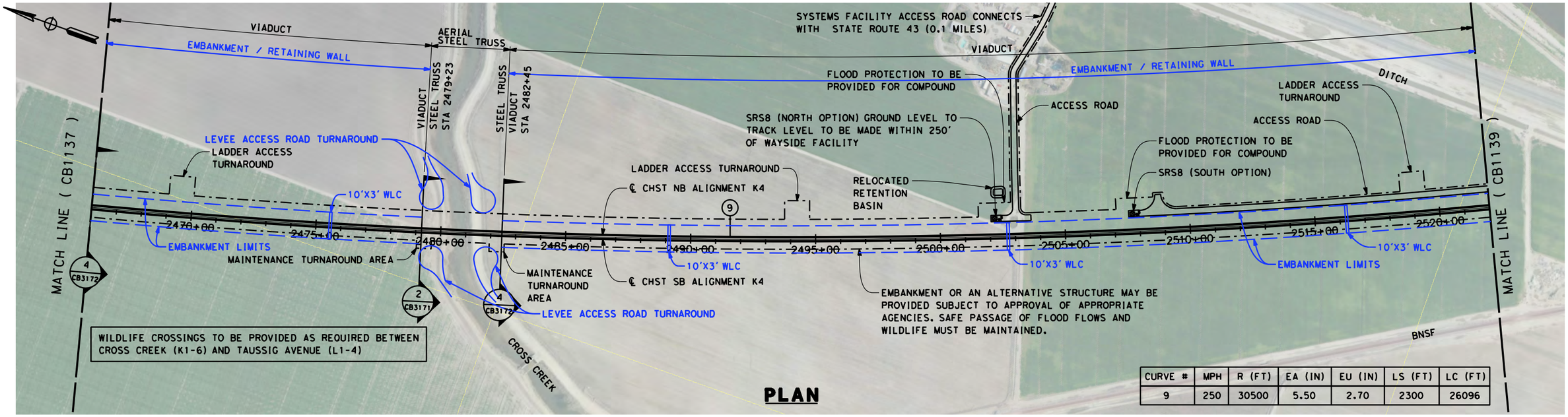
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
KAWEAH SUBSECTION
ALIGNMENT K4
STA. 2410+00 TO 2466+00
PLAN AND PROFILE

EXHIBIT A
ATC 2

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1137
SCALE AS SHOWN
SHEET NO. 8 OF 15

rookhuyzenzv 6/2/2014 3:41:55 PM c:\pwworking\nai\rookhuyzenzv\d0149577\ATC2 FB-CB-1137-K4.dgn



CURVE #	MPH	R (FT)	EA (IN)	EU (IN)	LS (FT)	LC (FT)
9	250	30500	5.50	2.70	2300	26096

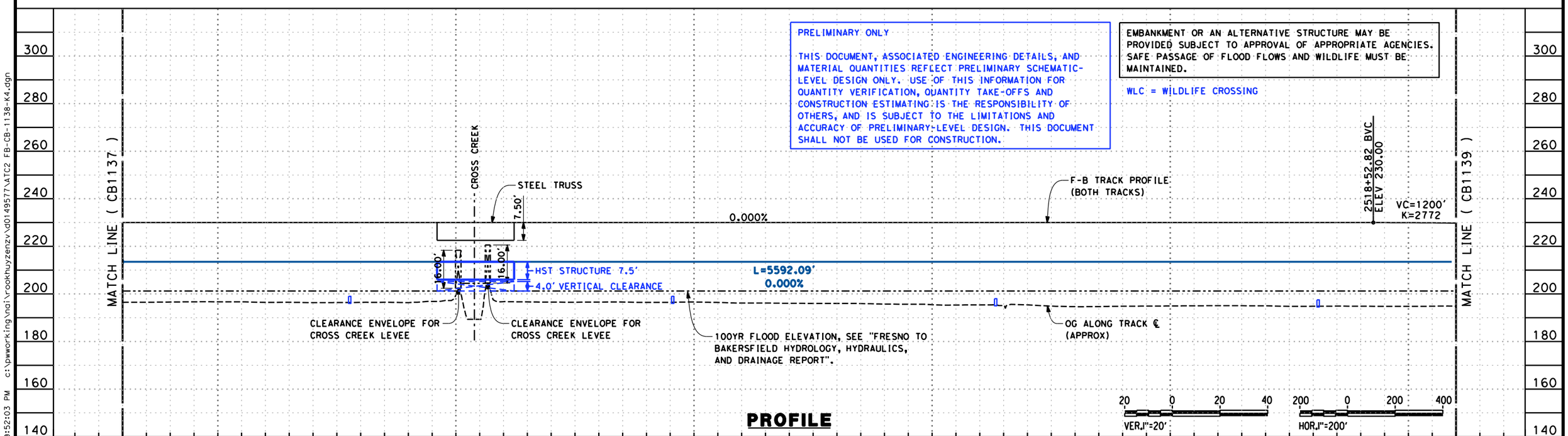
PLAN

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

EMBANKMENT OR AN ALTERNATIVE STRUCTURE MAY BE PROVIDED SUBJECT TO APPROVAL OF APPROPRIATE AGENCIES. SAFE PASSAGE OF FLOOD FLOWS AND WILDLIFE MUST BE MAINTAINED.

WLC = WILDLIFE CROSSING



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/19/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

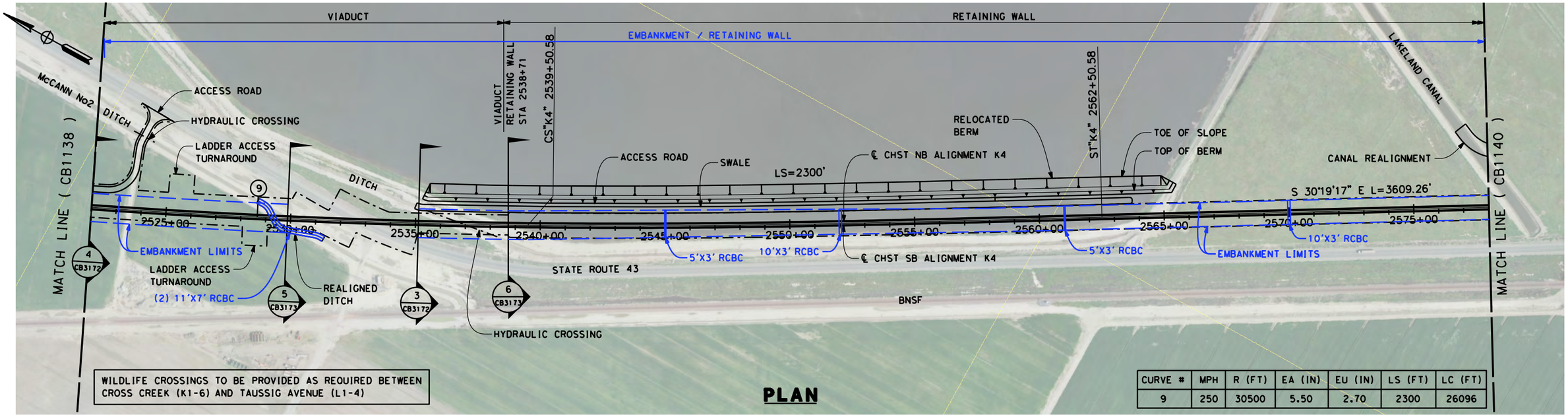
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
KAWEAH SUBSECTION
ALIGNMENT K4
STA. 2466+00 TO 2522+00
PLAN AND PROFILE

EXHIBIT A
ATC 2

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1138
SCALE AS SHOWN
SHEET NO. 9 OF 13

rookhuyzenzv 6/2/2014 9:52:03 PM c:\pwworking\nai\rookhuyzenzv\d0149577\ATC2 FB-CB-1138-K4.dgn



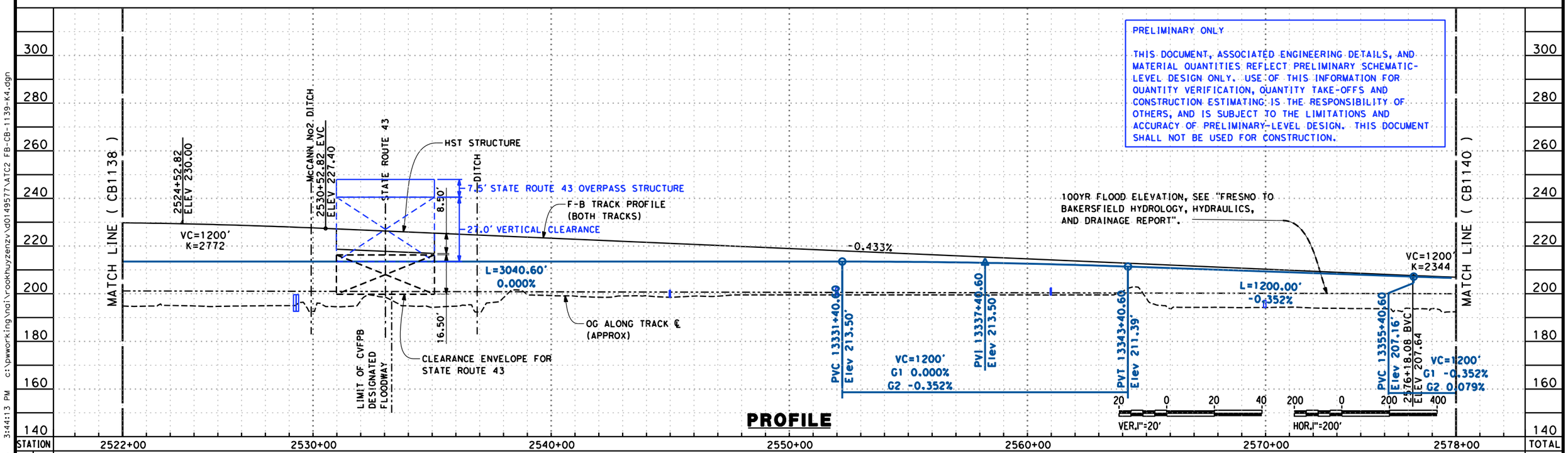
WILDLIFE CROSSINGS TO BE PROVIDED AS REQUIRED BETWEEN CROSS CREEK (K1-6) AND TAUSSIG AVENUE (L1-4)

PLAN

CURVE #	MPH	R (FT)	EA (IN)	EU (IN)	LS (FT)	LC (FT)
9	250	30500	5.50	2.70	2300	26096

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/19/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

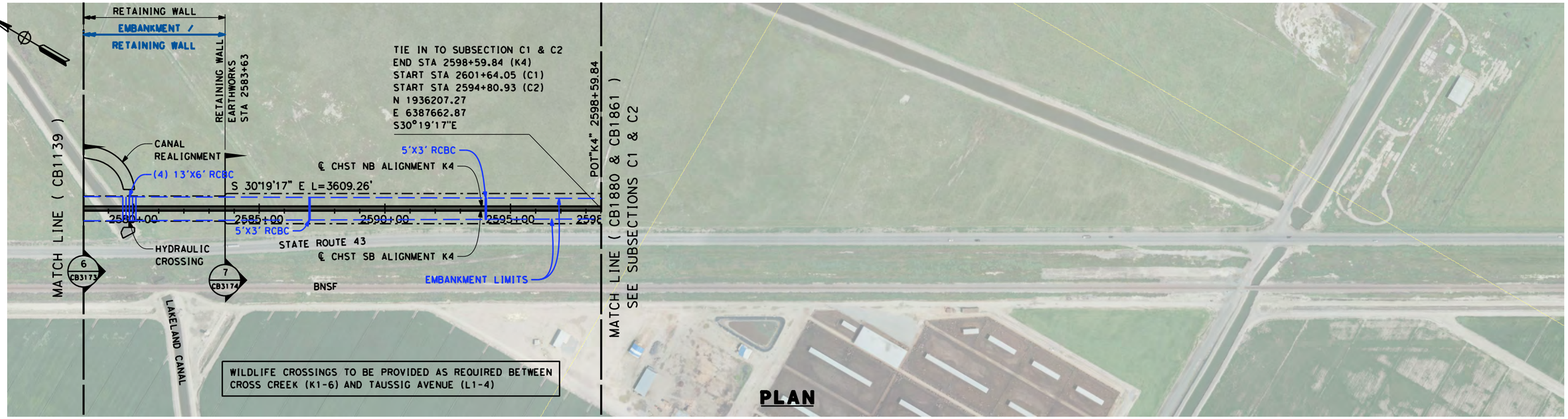
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
KAWEAH SUBSECTION
ALIGNMENT K4
STA. 2522+00 TO 2578+00
PLAN AND PROFILE

EXHIBIT A
ATC 2

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1139
SCALE AS SHOWN
SHEET NO. 10 OF 15

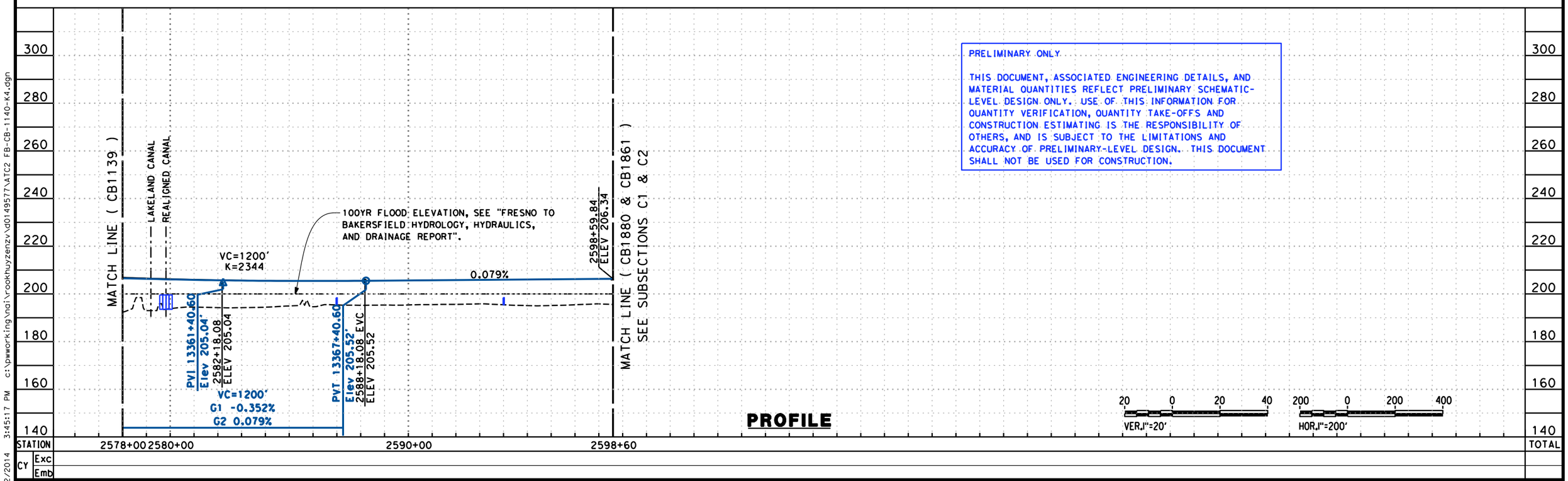
rookhuyzenzv 6/2/2014 3:44:13 PM c:\pwworking\nai\rookhuyzenzv\d0149577\ATC2 FB-CB-1139-K4.dgn



PLAN

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/19/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

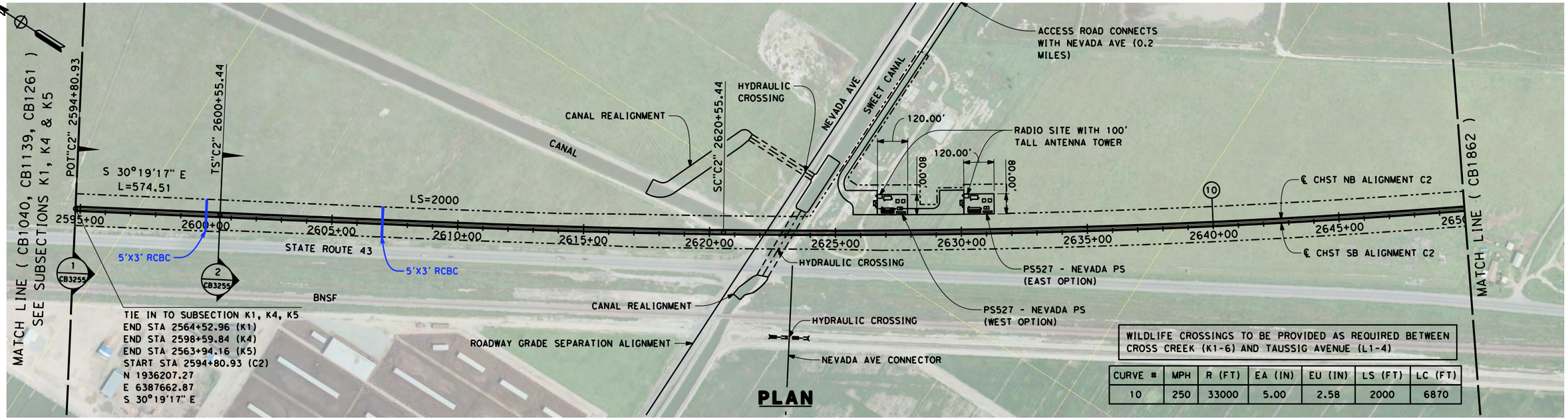
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
KAWEAH SUBSECTION
ALIGNMENT K4
STA. 2578+00 TO 2598+60
PLAN AND PROFILE

EXHIBIT A
ATC 2

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1140
SCALE AS SHOWN
SHEET NO. 11 OF 15

rookhuyzenzv 6/2/2014 3:45:17 PM c:\pwworking\nai\rookhuyzenzv\d0149577\ATC2 FB-CB-1140-K4.dgn

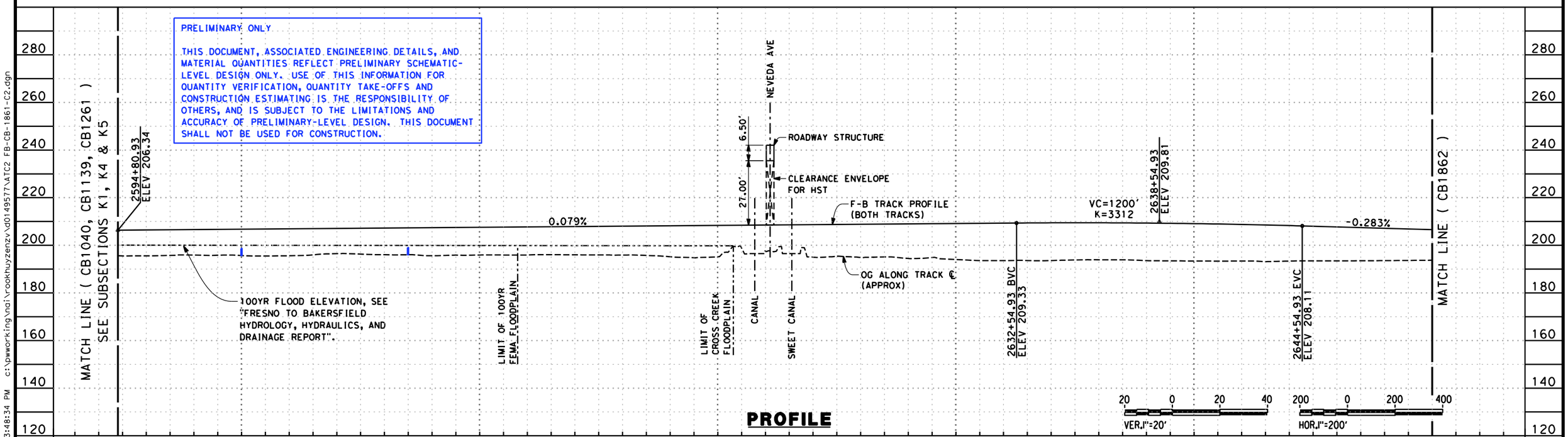


WILDLIFE CROSSINGS TO BE PROVIDED AS REQUIRED BETWEEN CROSS CREEK (K1-6) AND TAUSSIG AVENUE (L1-4)

CURVE #	MPH	R (FT)	EA (IN)	EU (IN)	LS (FT)	LC (FT)
10	250	33000	5.00	2.58	2000	6870

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
CORORAN BYPASS SUBSECTION
ALIGNMENT C2
STA 2594+81 TO 2650+00
PLAN AND PROFILE

EXHIBIT A
ATC 2

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1861
SCALE AS SHOWN
SHEET NO. 2 OF 16

rookhuyzenzv 6/2/2014 3:48:34 PM c:\pwworking\nai\rookhuyzenzv\d0149577\ATC2 FB-CB-1861-C2.dgn

Alternative Technical Concept 3

Replace viaduct with Sloped Embankment in the Kings River Complex floodplain

ALTERNATIVE TECHNICAL CONCEPT 3

Replace Viaduct with Sloped Embankment in Kings River Complex Floodplain

California High-Speed Rail Project
RFP No.: HSR 13-57 - Design-Build for Construction Package 2-3

June 6, 2014

04/02/2014 - RFP No.: HSR13-57

CONFIDENTIAL ATC

Submitted by DFS Dragados | Flatiron | Shimmick

Dragados/Flatiron/Shimmick Joint Venture (DFS) is pleased to submit Alternative Technical Concept (ATC) 3 for consideration by the California High-Speed Rail Authority (Authority) for implementation into the Construction Package 2-3. The ATC concept meets or exceeds the Request for Proposals (RFP) design. The following summary provides detailed information as required in Section 6.15.4 of the Instructions to Proposers.

ALTERNATIVE TECHNICAL CONCEPT (ATC) 3
Replace Viaduct with Sloped Embankment in Kings River Complex Floodplain

DESCRIPTION

ATC 3 proposes to replace the elevated viaduct sections crossing the Kings River Complex Floodplain, from Station 1489+27 to Station 1593+34, with sloped embankment along with installing culverts to convey floodplain flows under the High Speed Rail (HSR) guideway. This is an ATC because the RFP design does not allow placement of embankment in the Kings River Complex Floodplain. The ATC meets or exceeds the design requirements by providing proposed roadway, access, river, irrigation, drainage, and wildlife crossings.

Design Details

This ATC maintains the same HSR vertical alignment shown in the RFP drawings. The aerial steel truss structures crossing Cole Slough, Dutch John Cut, Kings River Old Channel, Riverside Ditch, and SR-43 will remain as proposed in the RFP drawings. The HSR will cross over 9th Avenue and Cairo Avenue as shown in the RFP design. This ATC does not affect the canal realignment at Station 1445+97.

Regarding drainage, the vast majority of the Kings River Complex Floodplain flow remains in the existing channels and will be unaffected by this ATC. Runoff from the FEMA 100-year flow does not enter the floodplain until the depth exceeds the existing levee elevation of 272.00. The FEMA 100-year water surface elevation is 270.6 and this elevation is used in calculating the box culvert sizes resulting in a conservative design. Runoff that exceeds the levee elevation of 272.00 and enters the floodplain will be conveyed under the HSR guideway in thirteen - 10-foot x 3-foot reinforced concrete box culverts equally spaced in five of the existing lowest ground elevations along the rail alignment. The lowest elevations considered for culvert placement produced a minimum flow depth of 1.39 feet in the culvert. The thirteen - 10-foot x 3-foot box culverts will also provide access for wildlife crossings and are intended to meet the Wildlife Movement Corridor criteria described in the environmental documents. The ATC design also maintains a minimum of 2-feet of freeboard between the bottom of subballast and the 100-year WSE.

See **Exhibit A** for plan sheets showing culvert locations, embankment limits, and cross-section details.

See **Exhibit B** for flow and depth calculations, which demonstrate that the box culverts are designed to convey between 30 cfs and 79 cfs, depending on the elevation of the water surface generated by the 100-year flow.

CONFIDENTIAL

USAGE

ATC 3 limits are from Station 1489+27 to Station 1593+34, which coincides with the limits of the Kings River Complex Floodplain. The ATC replaces elevated viaduct structures with sloped and/or retained fill across the Kings River Complex Floodplain and utilizes reinforced concrete box culverts to convey floodplain flows under the HSR guideway. The design includes thirteen – 10-foot x 3-foot reinforced concrete box culverts for floodplain drainage and wildlife linkage.

ENVIRONMENTAL COMPLIANCE

The approved Preferred Alternative identified as the Preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) proposes to cross over the Kings River Complex (Cole Slough, Dutch John Cut, and the Kings River) and FEMA designated floodplain (Zone A) having 100-year modeled flows of 19,900 cfs. The Preferred Alternative would span the width of the floodplain with 2.08 miles (11,680 feet) of elevated structures and 0.51 miles (2,700 feet) of embankment (Final EIR/EIS, Section 3.8 Hydrology and Water Resources, Table 3.8-10). Four segments of the elevated structures would be steel truss structures at the Cole Slough, Dutch John Cut, Kings River Channel, and Riverside Ditch. The 2,700-foot long embankment would have hydraulic crossings within the remaining floodplain for flood passage and wildlife linkages. Pursuant to the Memorandum of Understanding (MOU) between the California High-Speed Rail Authority (Authority), Federal Railroad Administration (FRA), U.S. Army Corps of Engineers (USACE), and U.S. Environmental Protection Agency (EPA) the design of the Kings River Complex was modified from a "mixed at-grade and bridge structure over the seasonal riverine features and now includes a viaduct spanning the entire area from the north bank of the Dutch John Cut to the south bank of the Kings River" (Checkpoint C Summary Report November 2013).

ATC 3 proposes to build the approved alignment over the Kings River Complex on embankment rather than on an elevated viaduct. The proposed embankment would be built with underlying culverts to allow the unimpeded passage of potential floodwaters and to function as wildlife crossings and preserve natural wildlife linkages. The proposed embankment would be built on existing agricultural fields and not on natural habitat; which would be more compatible with the 2,700-foot long embankment already approved. This design variation still includes the construction of truss structures over Cole Slough, Dutch John Cut, Kings River Channel, and Riverside Ditch so aquatic resources and natural wildlife attributes within the riverine systems would continue to be preserved.

Other benefits of this design variation include less visual intrusions from elevated structures crossing flat agricultural lands, providing a profile view similar to the typical rural railroads such as the nearby BNSF line that is on embankment. Some of the culverts under the embankment could be sized to allow farming equipment to easily pass through unimpeded thus preserving existing farming connections and operations. Three season farm access crossings may be utilized to facilitate farmland connectivity, where required. In addition, traffic would continue to use existing roadways without modifications since the culverts could be sized to allow two-way passage of vehicles.

CONFIDENTIAL

The proposed ATC 3 is not generally consistent with the Final EIR/EIS or the approved preliminary LEDPA; however, it does meet the intent of allowing unimpeded flows of flood waters and preserves wildlife attributes and wildlife linkages. This ATC would constitute a Variation and would at the very least undergo an environmental re-evaluation process to amend the Final EIR/EIS. The ATC would require preparation of supporting technical memoranda requiring approval from the Authority and regulatory agencies. If approved to move forward, the Preliminary LEDPA would be amended subject to Signatory Agency approval per the NEPA/404/408 MOU.

SCHEDULE REVISIONS

ATC 3 will not adversely impact the overall project schedule and may have potential schedule reduction. Potential schedule concerns are limited to the environmental/design approvals and permits. The DFS team will be proactive to address these concerns very early in the overall project and are not expected to impact the design and construction progress in other areas.

The construction schedule is anticipated to be reduced by up to 40% due to the reduction in structures. Further, reducing structures lengths improves construction safety, which has an indirect impact on the construction schedule.

Schedule impacts and mitigations, where applicable, are identified below:

Design Phase Schedule Impacts

- **Viaduct Design:** The design time will be reduced by several months in this section since a structural design for the viaduct will be eliminated.
- **Environmental Re-examination:** Environmental re-examination and preparation of supporting technical memos with approvals from the Authority and regulatory agencies may take several months. However, necessary approvals may be obtained within the schedule parameters if the technical memoranda are prepared and submitted early in the process. This ATC may require an amendment to the NEPA/404/408 MOU for California High Speed Train (HST) Program requiring that the signatory agencies agree on the proposed changes. Again, if the process is started early enough the amendment to LEDPA for this section of the alignment could be accomplished within schedule parameters. We will prepare this submittal early in the design process and plan construction to avoid this area until much later in the Project. By segmenting the project design and construction, we can plan for the time required to work through the environmental re-examination and permitting process. We anticipate obtaining these approvals within 18 months, which will have no impact on the overall project schedule.
- **Local Agency Approvals:** The permitting and design approval schedule of this section may be slightly lengthened due to obtaining conceptual and final approvals from Fresno County, Kings County, and Central Valley Flood Protection Board (CVFPB). Kings River Conservation District (KRCD) will be consulted; however we do not anticipate that their approval is necessary. We will prepare this submittal early in the design process and plan construction

CONFIDENTIAL

to avoid this area until much later in the Project. We anticipate obtaining these approvals within 18 months, which will have no impact on the overall project schedule.

- **CLOMR Requirements:** The Conditional Letter of Map Revision (CLOMR) will have to be issued prior to placing fill in the floodplain. This is the same for other areas on the alignment and is not expected to adversely impact the overall schedule. We will prepare this submittal early in the design process and plan construction to avoid this area until much later in the Project. Based on typical processing times we anticipate obtaining the CLOMR within 18 months; which will have no impact on the overall project schedule.

Construction Schedule Impacts

- **Embankment is Faster to Construct:** Embankment construction will be faster than either viaduct or retained earth construction. With an estimated total time saving of 40% versus building the RFP concept.
- **Reduced Subsurface Schedule Risks:** Embankment construction eliminates the risk of subsurface problems that may occur with piles for the Viaduct structure.
- **Embankment Simplifies Construction Risk:** Less subcontractors and supplier trades will be required, this reduces interfaces within the supply chain and increases certainty of schedule
- **Project Segmentation Allows Planning for Permitting and Environmental Re-Examination:** With the project Segmented by our design and construction operations, our team can plan for the upfront permitting requirements and environmental re-examination without any negative impacts to the overall schedule. By working outside of the roughly two mile work area encompassed in ATC 3, we will have 97% of the overall project available to work on that is not impacted by any of the design, permitting or environmental re-examination required for ATC 3.

COST INCREASES OR DECREASES

The DFS team estimates significant savings in construction cost due to eliminating elevated viaduct structures and replacing them with sloped and/or retained embankment. The cost savings associated with the implementation of this ATC are estimated at nearly $80 million, as detailed in Table 1 below. In addition, long term maintenance costs will be reduced as embankment profile adjustments are easier to maintain on ballasted track especially in subsidence zones.

Table 1: ATC 3 Construction Cost Comparison

RFP DESIGN			ATC 3 DESIGN		
Embankment/Excavation	$	5,500,000	Embankment/Excavation	$	21,000,000
Rail/Road Structures	$	105,000,000	Rail/Road Structures	$	3,500,000
Miscellaneous	$	500,000	Drainage/Wildlife	$	6,000,000
			Misc.	$	1,500,000
TOTAL	$	111,000,000		$	32,000,000
ATC 3 TOTAL SAVINGS					**$79,000,000**

CONFIDENTIAL

DEVIATIONS

No deviations from standards are required for ATC 3.

JUSTIFICATION

The objective of this ATC is to meet the RFP intent of providing drainage and wildlife crossings along with access crossings, as required, for the HSR crossing in the Kings River Complex while providing a more economical alternative that also reduces the overall project schedule. The RFP design of constructing steel truss structures at the Kings River Complex channel crossings will remain as planned and will not be changed by this ATC. This ATC replaces the elevated viaduct crossing the floodplain with sloped and/or retained embankment for supporting the HSR guideway and includes thirteen 10-foot x 3-foot reinforced concrete box culverts for conveying floodplain flows through the embankment and providing wildlife crossings. ATC 3 reduces capital costs and will address potential concerns of the KRCD by providing accessibility to the levee that meets or exceeds the existing condition. The size of the culverts can be increased to allow farming equipment or vehicles to pass through unimpeded thereby preserving existing farming connections and operations. This concept meets or exceeds the RFP by reducing the overall schedule and cost of the Project, and meets RFP performance requirements.

In addition, the carbon footprint of the Project will be significantly reduced through this ATC.

CONSTRUCTION AND SAFETY IMPACTS

Vehicular/Rail Traffic

- No adverse impact to rail/vehicular traffic is expected.

Rail Operations

- No adverse impact to rail operations is expected.

Community Impact

- No adverse community impacts are expected.

Maintenance

- Eliminating the viaducts also reduces regular inspection and maintenance costs typically incurred by viaduct structures.
- Culvert maintenance will be required, however maintenance is expected to be minimal and is only necessary for clearing debris and/or removing sediment (if any) from the culverts. The culvert maintenance is similar to maintenance required at other sections of the alignment. This maintenance cost is expected to be substantially lower than the viaduct maintenance costs. Therefore, approving ATC 3 will reduce the Authority's long term maintenance costs.

CONFIDENTIAL

Safety

- ATC 3 improves construction and long term safety for the HSR.
- Viaduct construction includes three of the most frequent construction violations: scaffolds/aerial lifts, falls, and cranes/hoists. By reducing/eliminating viaduct construction, it creates a safer environment for construction workers and inspectors.
- The embankment, while simplifying construction, reduces the number of subcontractors and supplier trades required. This reduces interfaces within the supply chain resulting in a decrease to the potential for unsafe activities.
- Post construction safety is also enhanced. For example, the viaduct would require regular inspection and maintenance, which places inspectors in a potentially dangerous condition where they could fall up to 30+ feet. Placing the HSR on embankment eliminates this potential fall condition.
- Fire and life safety is also improved by having the rail and guideway accessible from ground as opposed to accessing the structure from ladders.

ROW

Proposed ROW limits have not been released at the time of preparation of this ATC. The design includes installing a sloped embankment for the entire length; retaining walls will be used in areas with right-of - way constraints. Therefore, we do not anticipate that additional right-of-way will be required.

THIRD-PARTY APPROVALS

Several third-party approvals will be necessary for ATC 3. Coordination with these agencies is required with the RFP design as well; therefore we do not anticipate additional impacts. We will seek approval and/or input from the following third-party agencies:

- Kings County – A portion of the ATC is in Kings County; therefore we will seek their input and approval as required.
- Fresno County – A portion of the ATC is in Fresno County; therefore we will seek their input and approval as required.
- Central Valley Flood Protection Board (CVFPB) – CVFPB is the coordinating agency for the CLOMR with FEMA. We will prepare the CLOMR and submit to them for concurrence and processing through FEMA. We will also prepare the LOMR and submit it to CVFPB for concurrence and processing with FEMA. The CLOMR is required with the RFP design as well.
- Kings River Conservancy District (KRCD) – Though KRCD is not an approving agency for impacts in the floodplain, we will consider their input on the final design.
- Federal Emergency Management Agency – FEMA is the final approver for the CLOMR/LOMR.
- Environmental Process: ATC 3 may require the contractor to provide environmental re-examination process per Section 42.5, Book I, Part B.2 General Provisions including NEPA/404/408 Integration MOU process requiring signatory agency approvals.

RISKS

We have identified minimal risks related to ATC 3. Table 2 on the following page details potential risks and possible mitigation for addressing those risks.

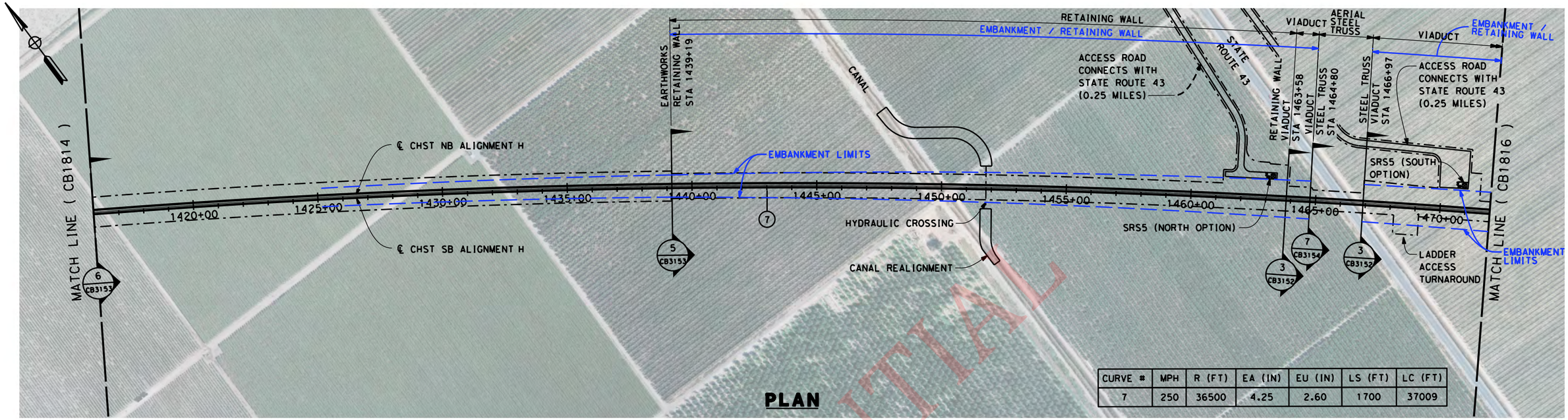
CONFIDENTIAL

Table 2. Risk/Mitigation Table

POTENTIAL RISK	PROPOSED MITIGATION
Nature of flood risk is changed	The proposed design includes adequate culverts to pass the 100-year flood. The culverts are located at low points along the floodplain and are spaced to maintain an approximate sheet flow condition. The flood depth will not be increased by more than 0.1 feet.
Embankment erosion during flooding	Provide rip-rap protection on embankment located in the floodplain.
Debris blocks flow through culverts during a storm	Culverts will be sized with a 50% clogging factor as required by the design criteria.
Approval agencies require designing culverts for a larger storm, such as the 200-year storm	Additional culverts may be added or small bridge sections may be added to accommodate greater flow requirements.
Farmland access is reduced	Three season access crossings will be situated in appropriate locations to facilitate farmland utilization, as required.
Permitting and environmental re-examination time impacts on the project schedule	Project segmentation during both design and construction will allow work to progress outside of the ATC 3 impacted areas. ATC 3 impacts less than 2 miles of the approximately 65 miles of work, less than 3% of the overall project, therefore design and construction potential delay impacts can be offset with proper planning at the forefront and accelerated construction methods on the back end.

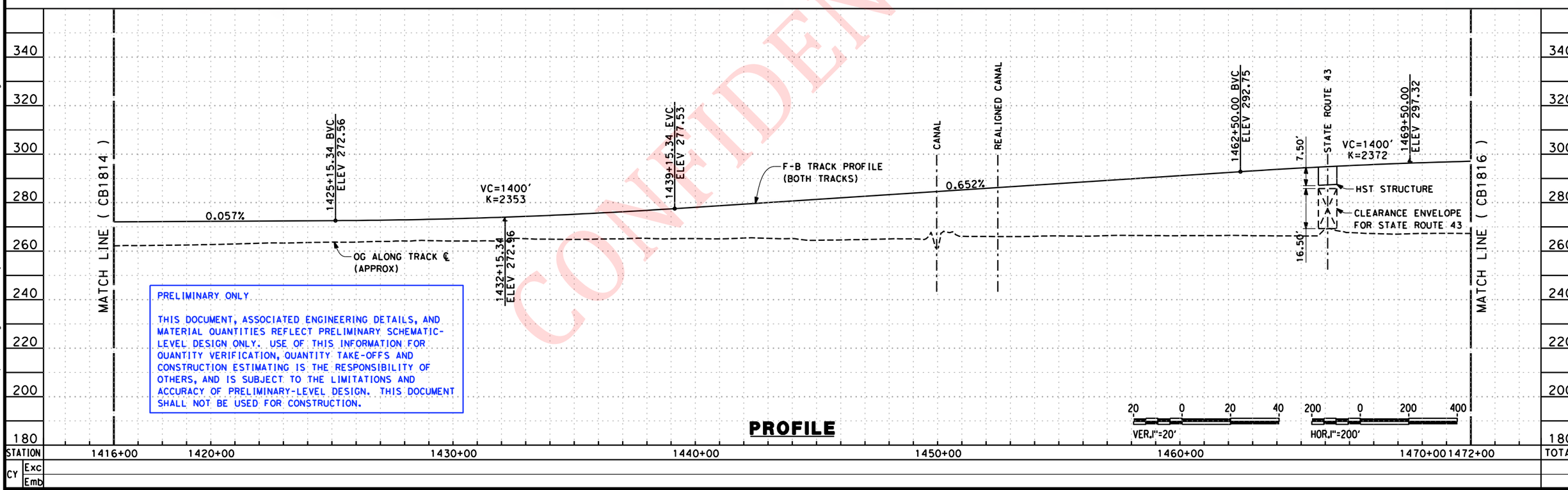
CONFIDENTIAL

EXHIBIT A



CURVE #	MPH	R (FT)	EA (IN)	EU (IN)	LS (FT)	LC (FT)
7	250	36500	4.25	2.60	1700	37009

PLAN



PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

PROFILE

CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY C. KONOPA
DRAWN BY C. KONOPA
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

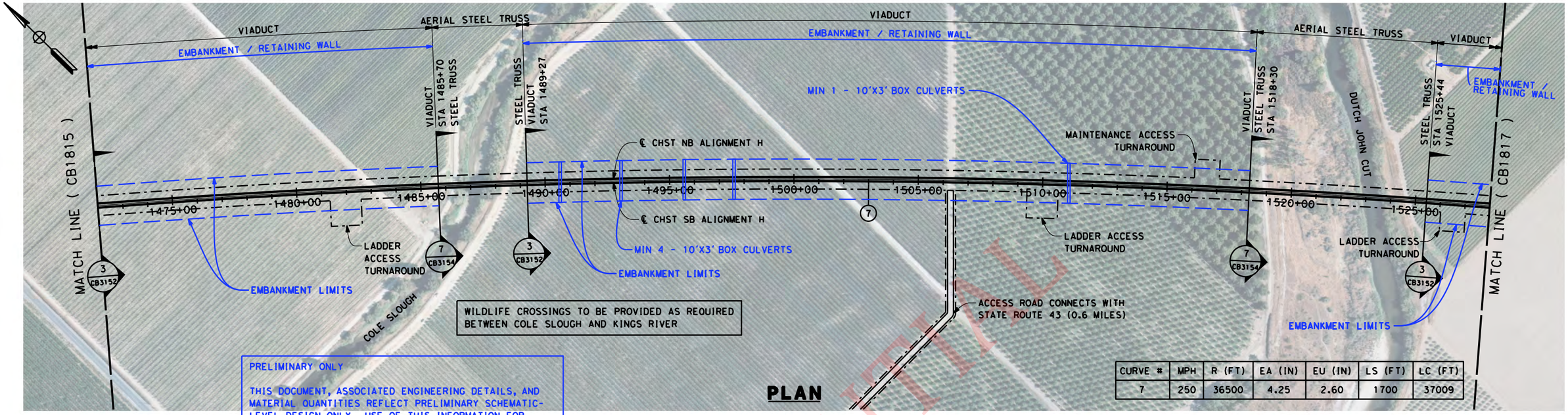
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1416+00 TO 1472+00
PLAN AND PROFILE

EXHIBIT A
ATC 3

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1815
SCALE AS SHOWN
SHEET NO. 9 OF 31

rookhuyzenzv 5/22/2014 11:45:18 AM c:\pwworking\nai\rookhuyzenzv\d0150078\FB-CB-1815-H ATC3.dgn

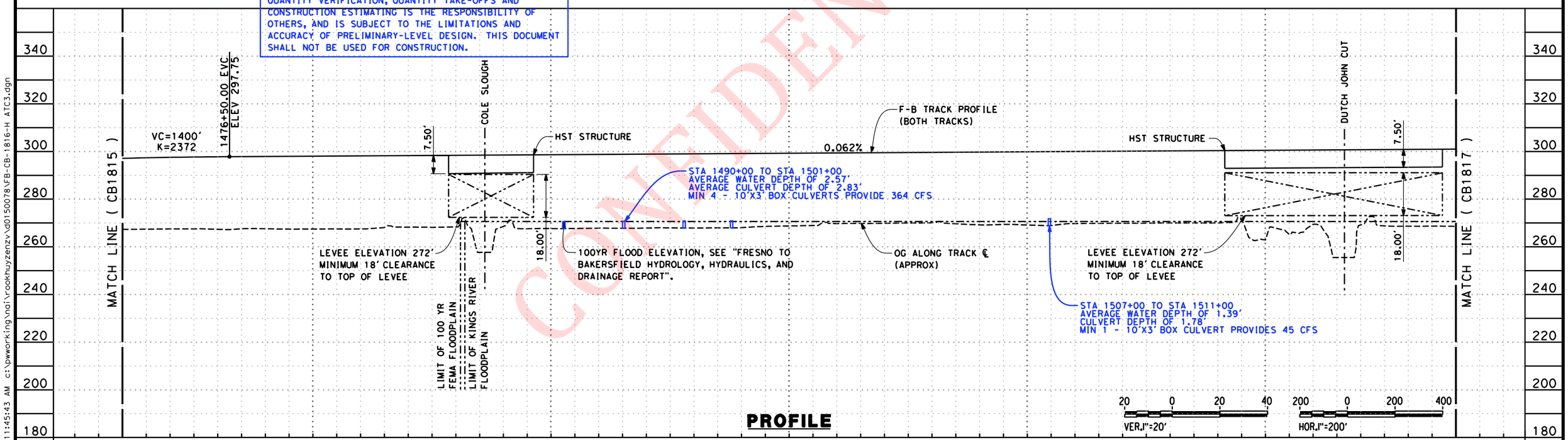


CURVE #	MPH	R (FT)	EA (IN)	EU (IN)	LS (FT)	LC (FT)
7	250	36500	4.25	2.60	1700	37009

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

CONFIDENTIAL



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY C. KONOPA
DRAWN BY C. KONOPA
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

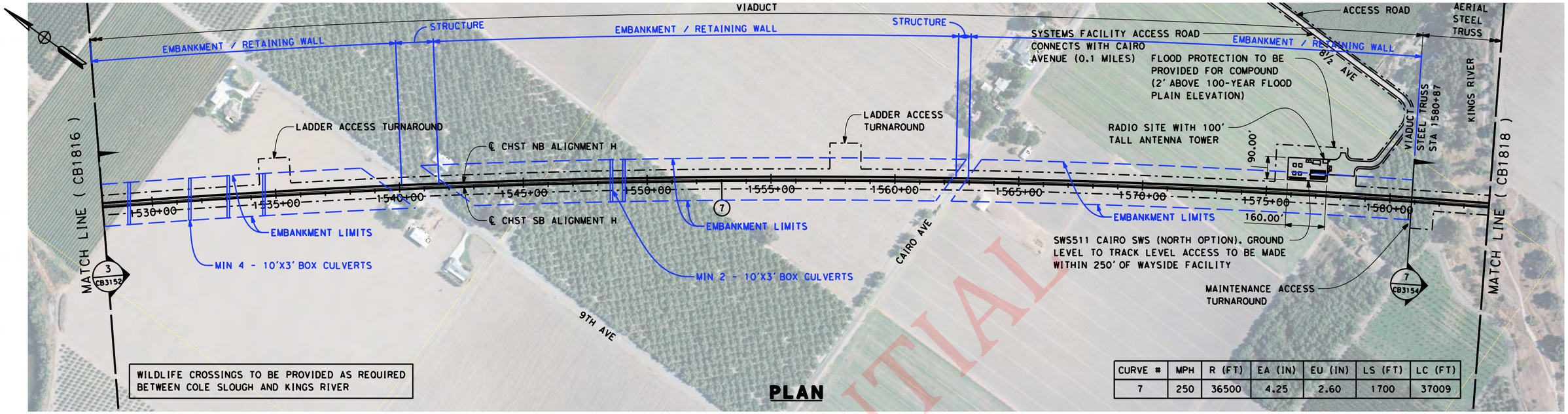
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1472+00 TO 1528+00
PLAN AND PROFILE

EXHIBIT A
ATC 3

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1816
SCALE AS SHOWN
SHEET NO. 10 OF 31

rookhuyzenzv 5/22/2014 11:45:43 AM c:\pwworking\nai\rookhuyzenzv\d0150078\FB-CB-1816-H ATC3.dgn



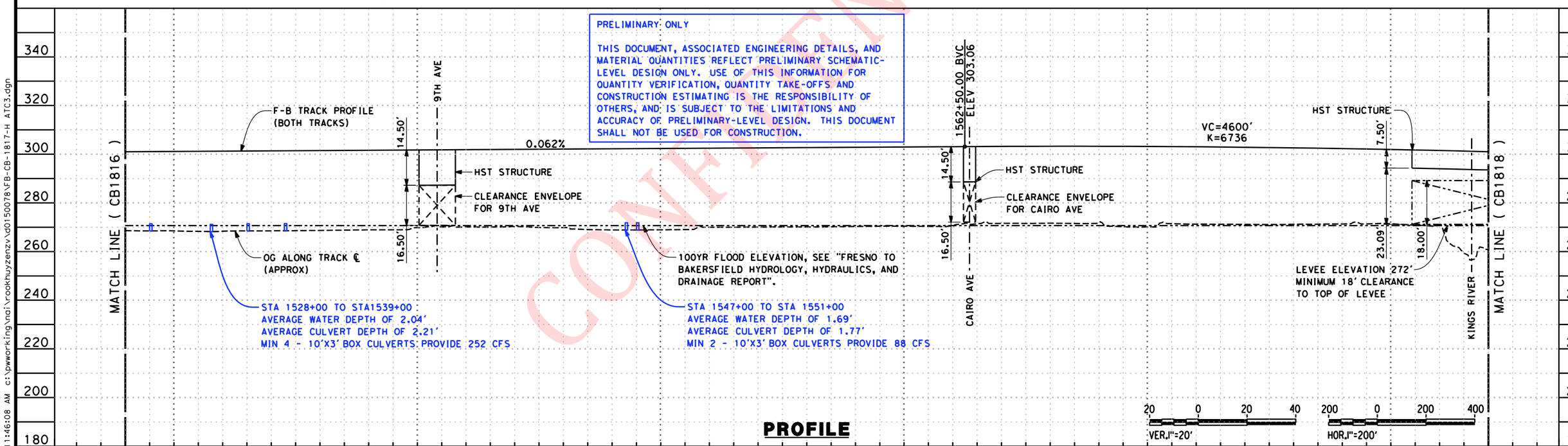
WILDLIFE CROSSINGS TO BE PROVIDED AS REQUIRED BETWEEN COLE SLOUGH AND KINGS RIVER

CURVE #	MPH	R (FT)	EA (IN)	EU (IN)	LS (FT)	LC (FT)
7	250	36500	4.25	2.60	1700	37009

PLAN

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY C. KONOPA
DRAWN BY C. KONOPA
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

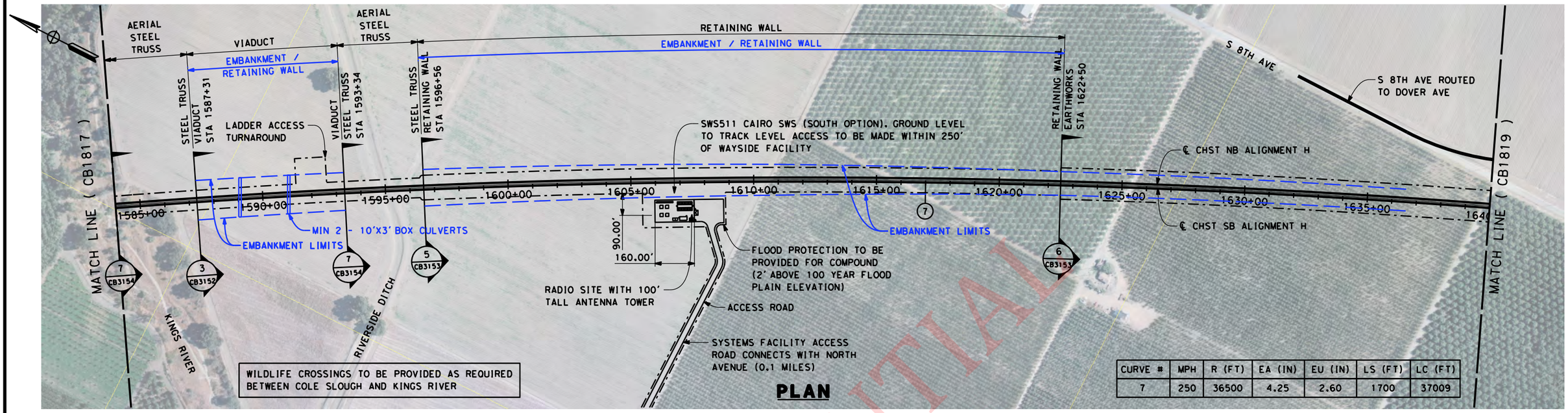
CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA.1528+00 TO 1584+00
PLAN AND PROFILE

EXHIBIT A
ATC 3

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1817
SCALE AS SHOWN
SHEET NO. 11 OF 31

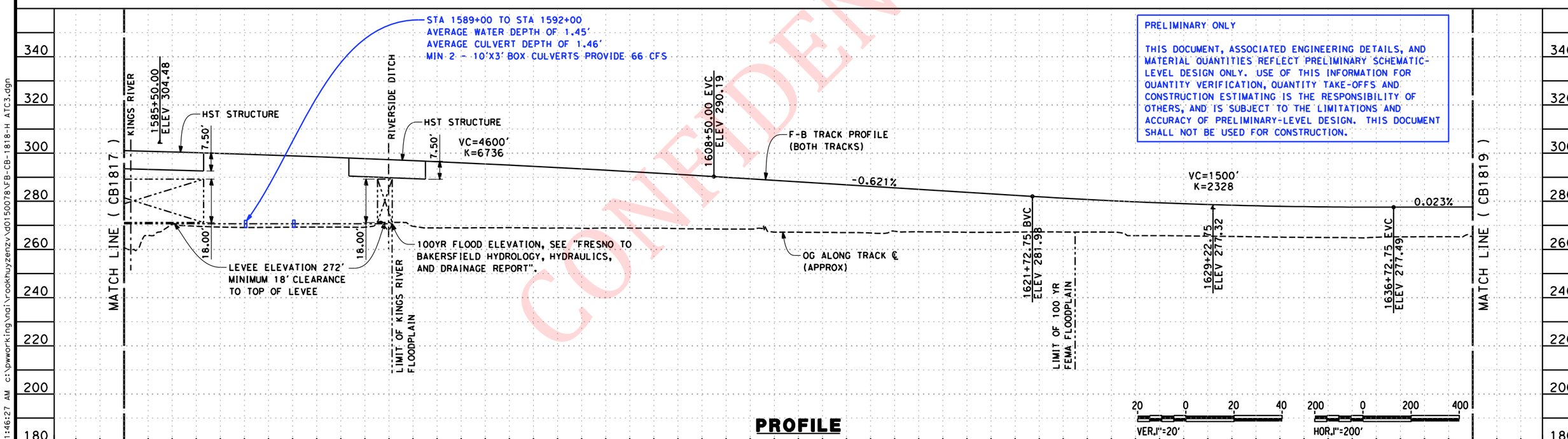
CONFIDENTIAL

rookhuyzenzv 5/22/2014 11:46:08 AM c:\pwworking\ngi\rookhuyzenzv\d0150078\FB-CB-1817-H ATC3.dgn



CURVE #	MPH	R (FT)	EA (IN)	EU (IN)	LS (FT)	LC (FT)
7	250	36500	4.25	2.60	1700	37009

PLAN



PROFILE

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY C. KONOPA
DRAWN BY C. KONOPA
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1584+00 TO 1640+00
PLAN AND PROFILE

EXHIBIT A
ATC 3

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1818
SCALE AS SHOWN
SHEET NO. 12 OF 31

rookhuyzenzv 5/22/2014 11:46:27 AM c:\pwworking\ngi\rookhuyzenzv\d0150078\FB-CB-1818-H ATC3.dgn

Alternative Technical Concept 8b

Add 1 pier in Cole Slough, 4 piers in Dutch John Cut, and 4 piers in Kings River

ALTERNATIVE TECHNICAL CONCEPT 8b

Place piers in the floodway of Kings River Complex

California High-Speed Rail Project
RFP No.: HSR 13-57 - Design-Build for Construction Package 2-3

June / /, 2014

04/02/2014 - RFP No.: HSR13-57

CONFIDENTIAL ATC

Submitted by **DFS** Dragados | Flatiron | Shimmick

Dragados/Flatiron/Shimmick Joint Venture is pleased to submit Alternative Technical Concept (ATC) 8b for consideration by the California High-Speed Rail Authority (Authority) for implementation into the Construction Package 2-3. The ATC concept meets or exceeds the Request for Proposals (RFP) design. The following summary provides detailed information as required in Section 6.15.4 of the Instructions to Proposers.

ALTERNATIVE TECHNICAL CONCEPT (ATC) 8b
Place Piers in the Floodway of Kings River Complex

DESCRIPTION

ATC 8b proposes to place additional piers within the floodway across the Kings River Complex, specifically at Cole Slough, Dutch John Cut, and the Kings River. The RFP plans shows a large truss spanning Cole Slough with no piers located in the floodway. The RFP plans show one pier placed in the floodway at both Dutch John Cut and Kings River to support long span truss bridges. By placing additional piers in the floodways, ATC 8b reduces the bridge spans, resulting in a much smaller superstructure. This is an ATC because the RFP design shows no piers at Cole Slough and one pier at both Dutch John Cut and Kings River; whereas, we propose to include one pier the Cole Slough floodway, five piers in Dutch John Cut floodway, and four piers Kings River floodway. ATC 8b meets or exceeds the design requirements by limiting the increase of depth flow to less than 0.10-foot. This is achieved by placing the additional piers outside of the main channel flow as shown in Figure 1 on the following page. The pier configuration will consist of similar construction as shown in the RFP drawings and will be located and aligned to minimize impacts to the flow of each waterway. ATC 8b does not affect access to the USACE levee located on both sides of the Cole Slough and on the north side of Dutch John Cut.

Design Details

At Cole Slough, an additional pier will be placed in the south overbank areas within the floodway; however piers would not be introduced within the main channel of Cole Slough. The piers will have similar details to those shown in the RFP reference documents in Section RM.B.01, page SV2262. The truss span will be reduced from a 357-foot span to two spans of 182-foot. The concrete viaduct will be extended to make up the difference in length of structure. The north pier will be located outside of the Federal Levee and access road. The center truss pier will be located inside the south levee, but on top of the overbank area. The south truss pier will be located outside of the south levee. The final design of the truss will accommodate clearance and access requirements for each access road.

Exhibit A provides details of the revised pier locations and demonstrates the reduced size of the superstructure at Cole Slough.

At Dutch John Cut, four additional piers will be located in the overbank areas within the floodway; however piers would not be introduced within the main channel of Dutch John Cut. The piers will have similar details to that shown in the RFP reference documents in Section RM.B.01, pages SV2265 and

CONFIDENTIAL

SV2266. The 357-foot truss span will be replaced with a concrete viaduct and a single, reduced span truss. The viaduct construction will continue from the north up to the main channel. A 182-foot long truss span will span the main channel of Dutch John Cut, followed by a viaduct structure. The total truss structure shown in the RFP is reduced by 532-foot and replaced with a more cost effective and lower maintenance structure type. The north Federal Levee and access road remains accessible. The design can be adjusted to accommodate additional clearance as required.

Exhibit B provides details of the revised pier locations and demonstrates the reduced size of the superstructure at Dutch John Cut.

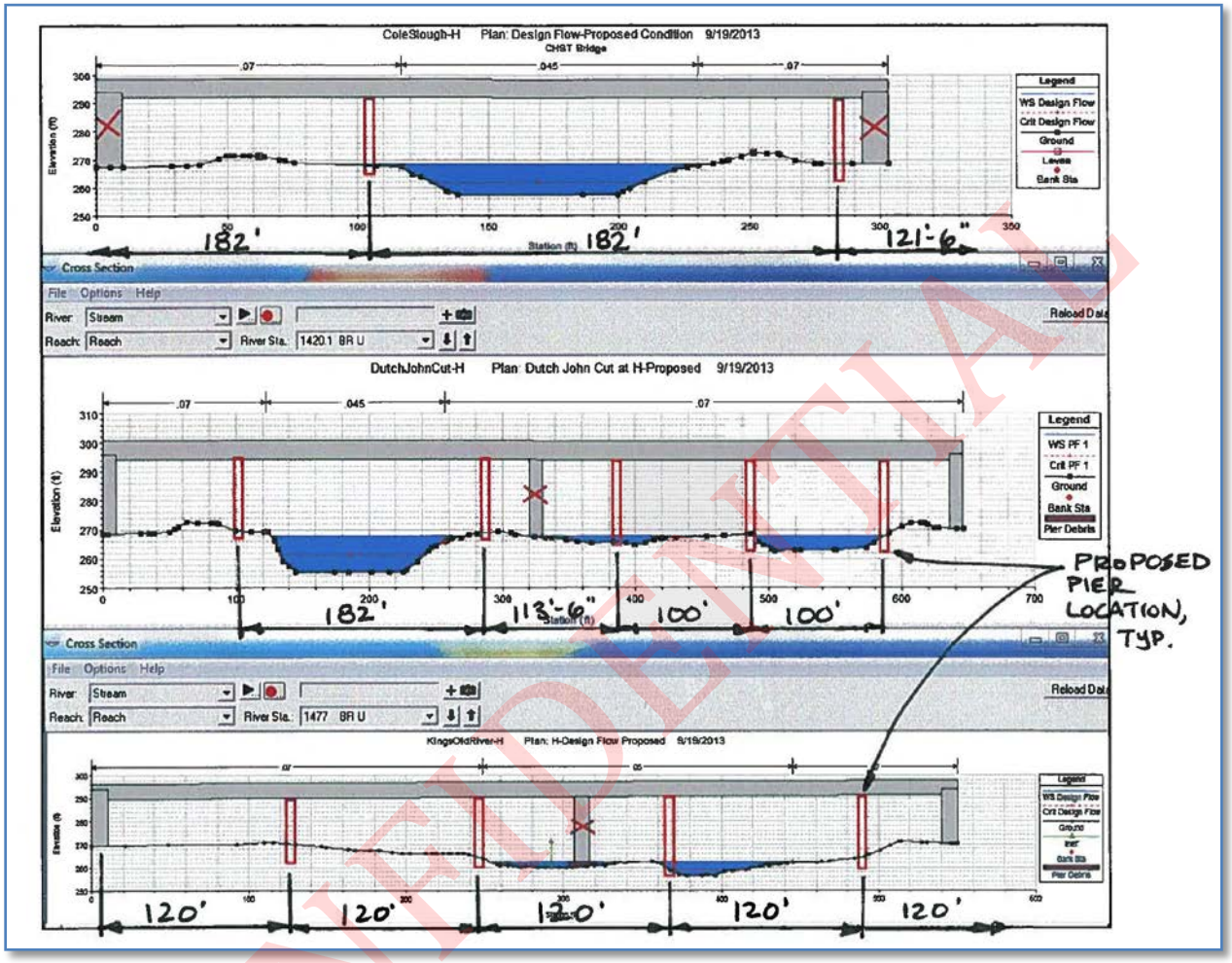
At Kings River crossing, three additional piers will be located within the main channel similar to what is currently shown on the RFP reference documents in Section RM.B.01, pages SV2271 and SV2272. The truss spans will be replaced with a concrete viaduct structure. There are no levee access roads located at Kings River crossing; however the design will accommodate a local access crossing.

Exhibit C provides details of the revised pier locations and demonstrates the reduced size of the superstructure at Kings River.

Each crossing will be designed to limit the rise from the USACE O&M flow. The Cole Slough and Dutch John Cut will be limited to a maximum rise in water surface elevation (WSE) of no greater than 0.10-foot. Kings River crossing will be designed to limit the rise in the WSE to 0.13-foot to match the design shown in the *Permitting Phase 1 Proposed Preliminary Design U.S. Army Corps of Engineers 408 Determination for Kings River Complex (USACE 408 Determination)*. The impacts to the floodways for the O&M flow and placement of the piers relative to the flood level are shown in Figure 1 on the following page. As noted in the *USACE 408 Determination*, the impact of all the structures on the FEMA 100-year flow for Kings River Complex has a negligible impact on the WSE of 0. 10 foot.

CONFIDENTIAL

Figure 1: Additional Piers Located Outside of Main Channel Flow



USAGE

ATC 8b is limited to providing additional piers in Cole Slough (Station 1485+59.80 to Station 1486+16.80) as shown in **Exhibit A**, Dutch John Cut (Station 1518+19.80 to Station 1525+33.80) as shown in **Exhibit B,** and Kings River (Station 1581+16.80 to Station 1587+60.80) as shown in **Exhibit C**. The additional piers reduce the span lengths and oversize of the structures that cross these two floodways.

ENVIRONMENTAL COMPLIANCE

The approved Preferred Alternative identified as the Preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) proposes to cross over Kings River Complex (Cole Slough, Dutch John Cut, and Kings River) and FEMA designated floodplain (Zone A) having 100-year modeled flows of 19,900 cfs. The Preferred Alternative would span the width of the floodplain with 2.08 miles (11,680 feet) of elevated structures and 0.51 miles (2,700 feet) of embankment (Final EIR/EIS, Section

CONFIDENTIAL

3.8 Hydrology and Water Resources, Table 3.8-10). Four segments of the elevated structures would be steel truss structures at Cole Slough, Dutch John Cut, Kings River Channel, and Riverside Ditch.

In the Fresno to Bakersfield Section Checkpoint Summary Report (November 2013), the Authority, in consultation, with USACE minimized the direct and indirect impacts to waters of the U.S. by minimizing the number of piers in regulated waters. The analysis included considerations of a no fill (e.g., no piers) alternative and concluded that this alternative was logistically complex and cost prohibitive. The selection of the LEDPA was based only on 15% design plans with minimal placement of piers (1 set) within the floodways. ATC 8b reduces the span lengths of the truss bridges by introducing one additional pier in Cole Slough, four additional piers in Dutch John Cut, and three additional piers in Kings River. ATC 8b represents a **significant cost reduction and refinement** of the approved design plans. The introduction of piers into the floodways increases the direct-permanent impacts by only 785 square feet (i.e. 157 square feet in Cole Slough, 392 square feet in Dutch Cut, and 236 square feet in Kings River) but **significantly decreases the cost** of the truss bridges by nearly $ 21 million. ATC 8b meets the definition of a *practicable alternative* because it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes (30 CFR 230.2[q]).

ATC 8b is not generally consistent with the Final EIR/EIS or the approved preliminary LEDPA; however, it does meet the intent of minimizing the impacts to jurisdictional waters and balances practicality of introducing additional piers to reduce the bridge truss span length; therefore lowering the costs of construction significantly. This ATC would constitute a variation and would at the very least undergo an environmental re-evaluation process to amend the Final EIR/EIS. The additional piers would not be located within any sensitive areas (Wetlands, etc.) that have not been cleared bt the Final EIR/EIS. The ATC design would reduce the visual impacts of the RFP truss design by utilizing a lower profile for the crossings. The ATC would require preparation of supporting technical memoranda requiring approval from the Authority and regulatory agencies. If approved to move forward, the Preliminary LEDPA would be amended subject to Signatory Agency approval per the NEPA/404/408 MOU. The use of additional piers in the floodways would require a Section 404 permit modification. A 408 minor permit will also be prepared and submitted through KRCD, CVFPD, and USACE.

Schedule Revisions

ATC 8b will not impact the overall project schedule. Potential schedule concerns are limited to the environmental/design approvals and permits. The DFS team will be proactive to address these concerns very early in the overall project and are not expected to impact the design and construction progress in other areas.

CONFIDENTIAL

Schedule impacts and mitigations, where applicable, are identified below:

Design Phase Schedule Impacts

- **Structure Design:** The design time will not be negatively impacted by the replacement of truss structure with viaduct structure or from addition of piers within the floodway.
- **Environmental Re-examination:** Environmental re-examination and preparation of supporting technical memos with approvals from the Authority and regulatory agencies may take several months; however, necessary approvals may be obtained within the schedule parameters if the technical memoranda are prepared and submitted early in the process. This ATC will require an amendment to the NEPA/404/408 MOU for California High-Speed Rail Program (Program) requiring that the signatory agencies agree on the proposed changes. We will prepare this submittal early in the design process and plan construction to avoid this area until much later in the Project. We anticipate obtaining these approvals within 12-24 months; which will have no impact on the overall project schedule.
- **Local Agency Approvals:** The permitting and design approval schedule of this section may be slightly lengthened due to obtaining conceptual and final approvals from Kings County, Kings River Conservation District (KRCD), and Central Valley Flood Protection Board (CVFPB). We will prepare this submittal early in the design process and plan construction to avoid this area until much later in the Project. We anticipate obtaining these approvals within 12-18 months; which will have no impact on the overall project schedule.
- **CLOMR Requirements:** The Conditional Letter of Map Revision (CLOMR) will have to be issued prior to placing fill in the floodplain. This is the same for other areas on the alignment and is not expected to adversely impact the overall schedule. We will prepare this submittal early in the design process and plan construction to avoid this area until much later in the Project. Based on typical processing times we anticipate obtaining the CLOMR within 12-18 months; which will have no impact on the overall project schedule.

Construction Schedule Impacts

- **Aerial Structure Construction:** No significant change in construction duration anticipated.

<u>COST INCREASES OR DECREASES</u>

The DFS team estimates c**onstruction cost savings of nearly $21 million** by reducing the span length of the truss bridges and replacing them with typical viaduct spans, as detailed in Table 1 on the following page. The foundation size for each truss is also reduced due to the smaller spans. While there are additional piers to construct, they are smaller in size than the substructures required to support longer span truss bridges.

CONFIDENTIAL

Table 1: ATC 8b Construction Cost Comparison

RFP DESIGN		ATC 8b DESIGN	
Truss Structures	$ 48,420,000	Truss Structures	$ 14,500,000
Concrete Viaduct Structures	80,000	Concrete Viaduct Structures	13,250,000
TOTAL	$ 48,500,000		$ 27,750,000
ATC 8b TOTAL SAVINGS			**$20,750,000**

In addition to the construction cost savings, long term maintenance costs will be reduced by shortening the truss spans and constructing typical concrete viaduct sections. The implementation of ATC 8b will require less maintenance and inspection over the life of the structures due to the following items:

- Reduced Fracture Critical Member Inspection
- Reduced Paint system inspection (if not weathering steel)
- Reduction in repainting of structure
- Reduction in large bearings for truss bridges

DEVIATIONS

No deviations from standards are required for ATC 8b.

JUSTIFICATION

We understand that the intent of the RFP design is to minimize increase of the flow depth in the flood zone. In discussions with USACE during our ATC Third Party meeting on June 2, 2014, we understand that they will support adding piers in the floodway as long as the flow depth is not increased by more than 0.1 foot. In the same meeting, KRCD and CVFPB also indicated that they would accept additional piers in the floodway and would require that the piers are not located in the main channel flow. ATC 8b proposes to meet the conditions of USACE, KRCD, and CVFPB as stated above.

The adjacent bridges upstream and downstream of the HSR crossings, specifically the SR-43 and BNSF crossings, consist of bridges with multiple piers within the floodway as well. The bridge inspection reports for the existing structures have been reviewed and there are negligible scour effects from the locations of the existing piers.

Regarding impact on the environment, ATC 8b would not substantially change the construction footprint and therefore would have a negligible impact on the environment. Visual impact would be improved as the superstructure will be substantially smaller and less visually intrusive.

DFS team concluded that implementation of this ATC would have a negligible impact, less than 0.1-foot increase, on the 100-year water surface at each crossing as noted above. A complete analysis of the flood impacts will be prepared prior to implementing ATC 8b in the final design.

CONFIDENTIAL

Construction and Safety Impacts

- **Concrete Viaduct is Safer to Construct:** By reducing the truss length to be constructed, the amount of steel erection and assembly is reduced. The reduction of truss span lengths would reduce the height of structures; thus also improving construction safety.
- **Concrete Viaduct is Safer to Inspect:** The required inspection for concrete structures is less frequent than required for steel structures with fracture critical members (FCM). In addition, steel bridge inspections typically have longer durations and access to inspect is a greater challenge than with concrete structures.
- **Project Segmentation Allows Planning for Permitting and Environmental Re-Examination:** With the project segmented by our design and construction operations, our team can plan for the upfront permitting requirements and environmental re-examination without any negative overall schedule impact. By working outside of the approximately 3 mile work area encompassed in ATC 8b, we will have 97% of the overall project available to work on that is not impacted by any of the design, permitting or environmental re-examination required for ATC 8b.
- **Vehicular/Rail Traffic:** No adverse impact to rail/vehicular traffic is expected.
- **Rail Operations:** No adverse impact to rail operations is expected.
- **Community Impact:** No adverse community impacts are expected.
- **Maintenance:** No adverse maintenance impacts are expected.

ROW

No additional ROW is required to implement ATC 8b.

THIRD-PARTY APPROVALS

Several third-party approvals will be necessary for ATC 8b. Coordination with these agencies is required with the RFP design as well; therefore we do not anticipate additional impacts. We will seek approval and/or input from the following third-party agencies:

- Kings County: ATC 8b is located within Kings County; therefore we will seek their input and approval as required.
- Kings River Conservancy District (KRCD): As this ATC places additional piers in the floodway and closer to the KRCD maintained levees, KRCD will be consulted and we will seek their input and approval as may be required.
- Federal Emergency Management Agency: FEMA is the final approving agency for the CLOMR/LOMR.
- Environmental Process: ATC 8b may require the contractor to provide environmental re-examination process per Section 42.5, Book I, Part B.2 General Provisions including NEPA/404/408 Integration MOU process requiring signatory agency approvals.

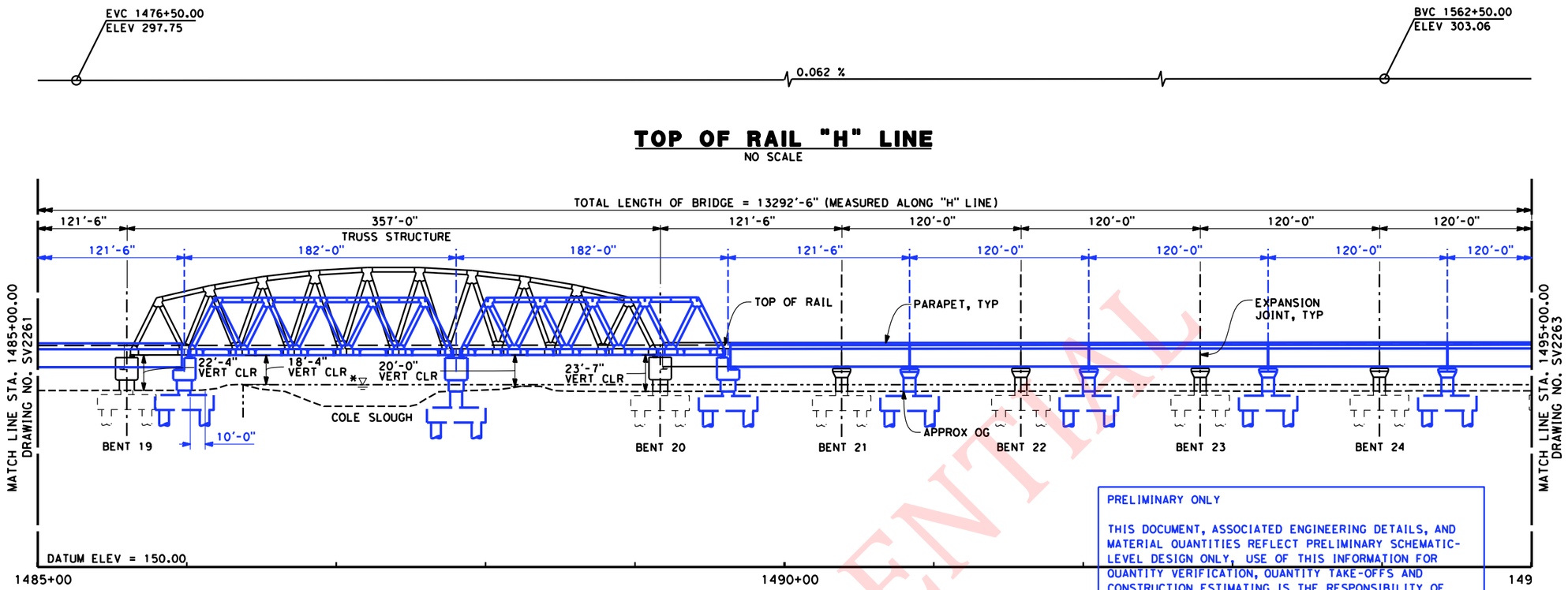
CONFIDENTIAL

RISKS

POTENTIAL RISK	PROPOSED MITIGATION
Increased sedimentation due to decreased velocity near the piers	The piers are located well outside of the main channel flow. Therefore we do not expect impacts on the channel velocity.
Additional scour at locations of piers within overbank areas of floodways.	Scour calculations shall be prepared. Locate additional piers to have least impact on hydraulics. Design the structures to account for the potential scour depth as required by the design criteria. Provide scour protection such as rip-rap protection.
Debris blocks flow across the structures during a storm	The piers are located well outside of the main channel flow and the depth of flow at the piers is minimal. Therefore we expect minimal debris impacts.
Environmental Analysis and Permitting Delays Approval for the design and construction to begin in the Kings River Crossing area	Third party input will be sought upfront and well in advance of the work pushing onto the critical path for the project schedule. The schedule permitting and approval impacts will be built into the overall project schedule to account for the anticipated durations required to gain approval of the revised designs.

CONFIDENTIAL

EXHIBIT A



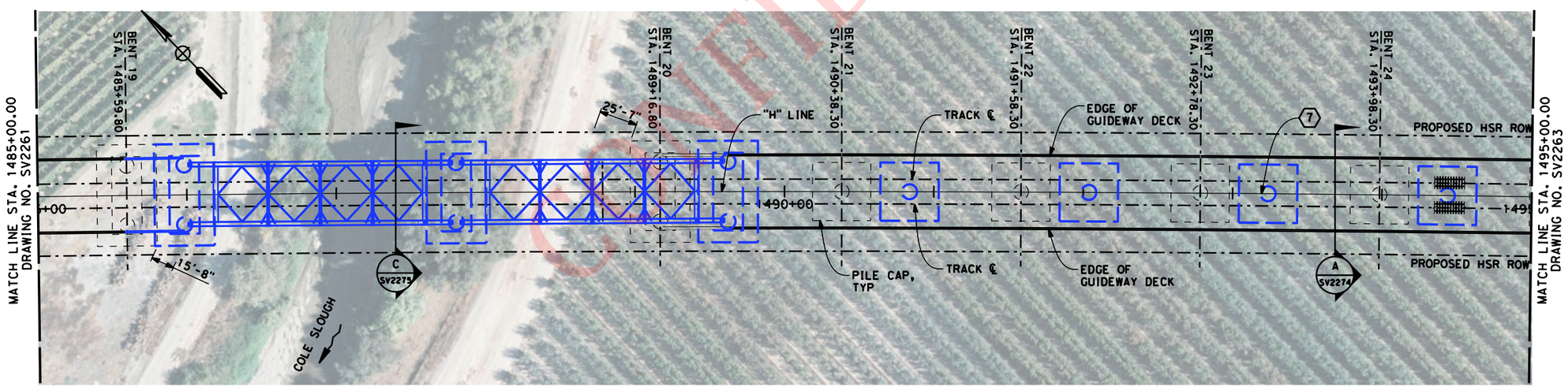
ELEVATION

SCALE 1" = 40'

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

CONFIDENTIAL



PLAN

SCALE 1" = 40'

NOTES

1. NOT ALL PILES SHOWN
2. PILE LENGTH TO BE DETERMINED
3. SUPERSTRUCTURE CONSTRUCTION, UON
   SIMPLE SPANS - MSS OR FLPM
   CONTINUOUS SPANS - BCC - PRECAST IN-SITU
   STEEL TRUSS - INSITU, SLID OR LAUNCHED
   ELEVATED SLABS - PC BEAM AND INSITU SLAB
4. UTILITY LOCATIONS TO BE DETERMINED
5. ACCESS STAIRWAYS ARE PROVIDED AT SYSTEMS SITES (APPROX. 2.5 MILE INTERVALS). LADDER ACCESS TO VIADUCTS IS PROVIDED AT 2500 FT INTERVALS WITH ACCESS ROAD AND TURNING CIRCLE WHERE NECESSARY.

LEGEND:

(1) STRUCTURE APPROACH SLAB

(2) RETAINING WALL

* ESTIMATED 100-YEAR FLOOD ELEVATION, SEE "FRESNO TO BAKERSFIELD CORRIDOR HYDROLOGY, HYDRAULICS AND DRAINAGE 15% DRAFT REPORT".

CURVE DATA

(7)

R = 36500.00'
Δ = 58° 05' 38.8"
T = 20271.5'
L = 37008.6'

40 0 40 80
1"=40'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. DOBMEIER
DRAWN BY A. PRICE
CHECKED BY G. DREESZEN
IN CHARGE R. TREVETT
DATE 05/29/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

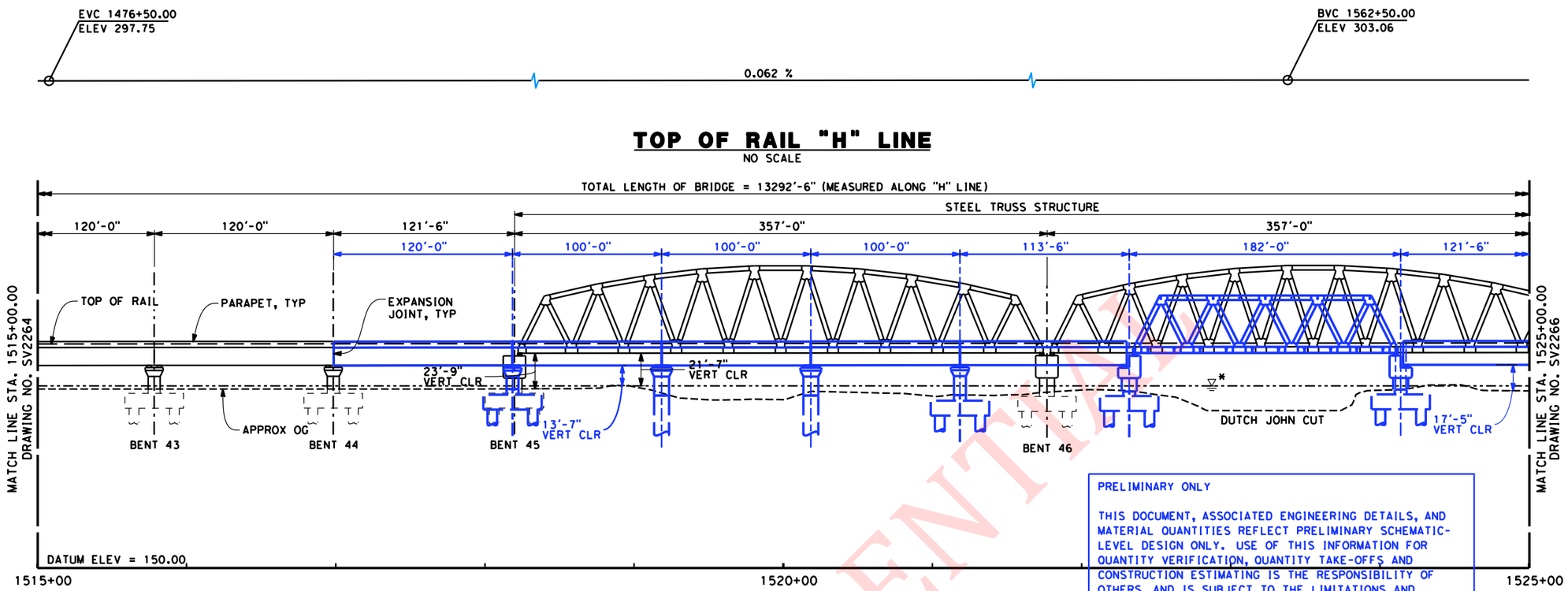
CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
KINGS RIVER VIADUCT
PLAN AND ELEVATION

EXHIBIT A
ATC 8b

CONTRACT NO. HSR 06-0003
DRAWING NO. SV2262
SCALE AS SHOWN
SHEET NO. 5 OF 18

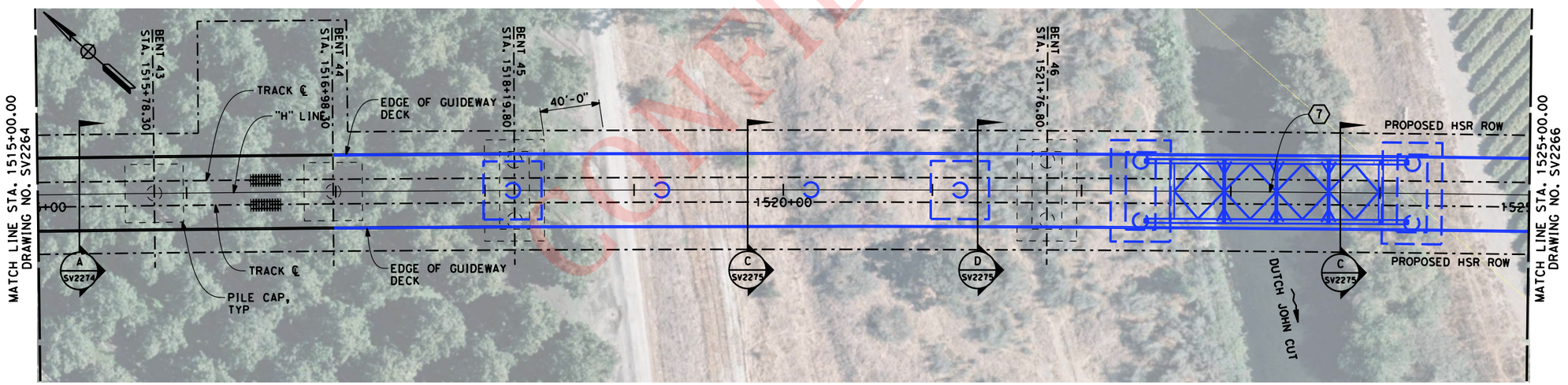
priceaj 6/9/2014 3:23:07 PM c:\pwworking\nai\priceajd0150803\FB-SV-2262-H.dgn

EXHIBIT B



ELEVATION

SCALE 1" = 40'



PLAN

SCALE 1" = 40'

NOTES

1. NOT ALL PILES SHOWN
2. PILE LENGTH TO BE DETERMINED
3. SUPERSTRUCTURE CONSTRUCTION, UON
   SIMPLE SPANS - MSS OR FLPM
   CONTINUOUS SPANS - BCC - PRECAST IN-SITU
   STEEL TRUSS - INSITU, SLID OR LAUNCHED
   ELEVATED SLABS - PC BEAM AND INSITU SLAB
4. UTILITY LOCATIONS TO BE DETERMINED
5. ACCESS STAIRWAYS ARE PROVIDED AT SYSTEMS SITES (APPROX. 2.5 MILE INTERVALS). LADDER ACCESS TO VIADUCTS IS PROVIDED AT 2500 FT INTERVALS WITH ACCESS ROAD AND TURNING CIRCLE WHERE NECESSARY.

LEGEND:

1. STRUCTURE APPROACH SLAB
2. RETAINING WALL

* ESTIMATED 100-YEAR FLOOD ELEVATION, SEE "FRESNO TO BAKERSFIELD CORRIDOR HYDROLOGY, HYDRAULICS AND DRAINAGE 15% DRAFT REPORT".

CURVE DATA

7

R = 36500.00'
Δ = 58° 05' 38.8"
T = 20271.5'
L = 37008.6'

40 0 40 80
1"=40'

CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. DOBMEIER
DRAWN BY A. PRICE
CHECKED BY G. DREESZEN
IN CHARGE R. TREVETT
DATE 05/29/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

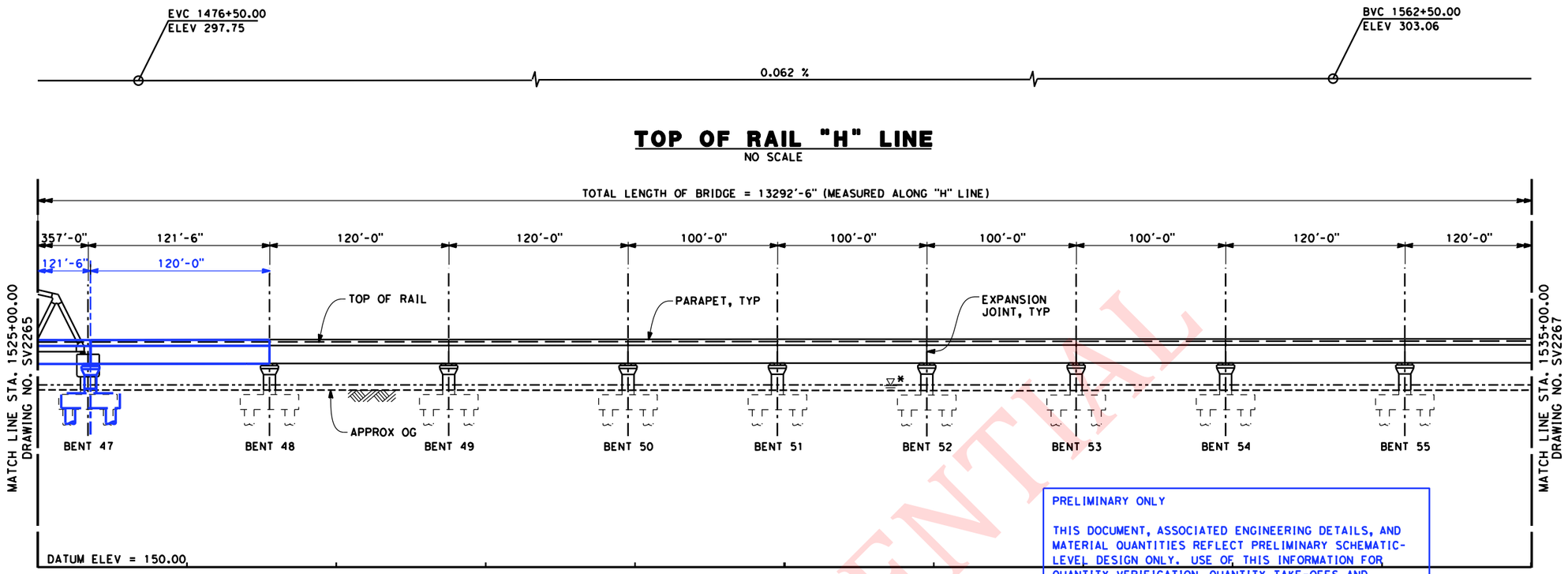
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
KINGS RIVER VIADUCT
PLAN AND ELEVATION

EXHIBIT B
ATC 8b

CONTRACT NO. HSR 06-0003
DRAWING NO. SV2265
SCALE AS SHOWN
SHEET NO. 8 OF 18

priceaj 6/3/2014 2:43:07 PM c:\pwworking\nai\priceaj\d0150803\FB-SV-2265-H.dgn



ELEVATION

SCALE 1" = 40'

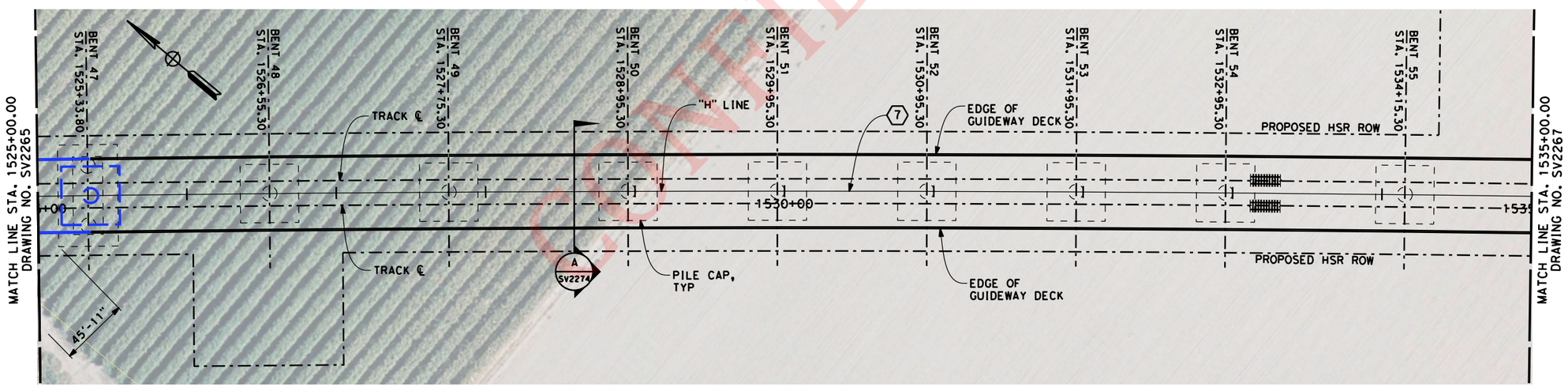
PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

CONFIDENTIAL

NOTES

1. NOT ALL PILES SHOWN
2. PILE LENGTH TO BE DETERMINED
3. SUPERSTRUCTURE CONSTRUCTION, UON
   SIMPLE SPANS - MSS OR FLPM
   CONTINUOUS SPANS - BCC - PRECAST IN-SITU
   STEEL TRUSS - INSITU, SLID OR LAUNCHED
   ELEVATED SLABS - PC BEAM AND INSITU SLAB
4. UTILITY LOCATIONS TO BE DETERMINED
5. ACCESS STAIRWAYS ARE PROVIDED AT SYSTEMS SITES (APPROX. 2.5 MILE INTERVALS). LADDER ACCESS TO VIADUCTS IS PROVIDED AT 2500 FT INTERVALS WITH ACCESS ROAD AND TURNING CIRCLE WHERE NECESSARY.



PLAN

SCALE 1" = 40'

LEGEND:

1. STRUCTURE APPROACH SLAB
2. RETAINING WALL

* ESTIMATED 100-YEAR FLOOD ELEVATION, SEE "FRESNO TO BAKERSFIELD CORRIDOR HYDROLOGY, HYDRAULICS AND DRAINAGE 15% DRAFT REPORT".

CURVE DATA

7

R = 36500.00'
Δ = 58° 05' 38.8"
T = 20271.5'
L = 37008.6'

40 0 40 80
1"=40'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. DOBMEIER
DRAWN BY A. PRICE
CHECKED BY G. DREESZEN
IN CHARGE R. TREVETT
DATE 05/29/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

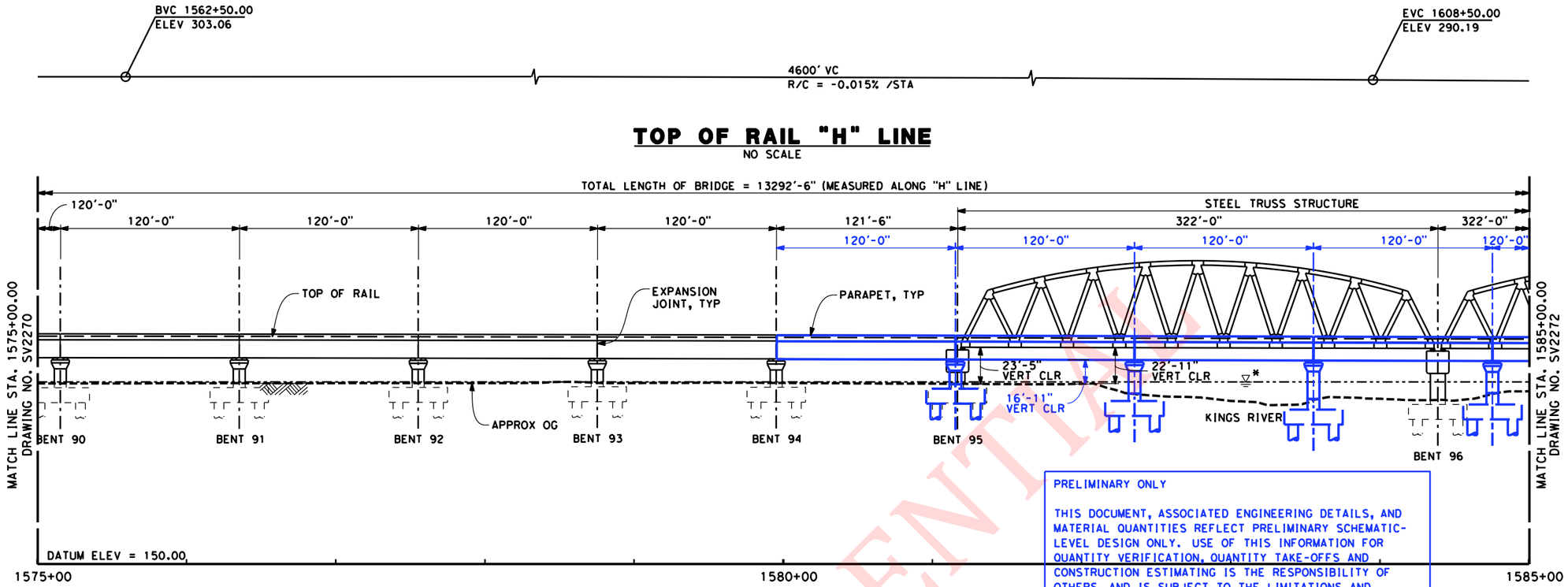
CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
KINGS RIVER VIADUCT
PLAN AND ELEVATION

EXHIBIT B
ATC 8b

CONTRACT NO. HSR 06-0003
DRAWING NO. SV2266
SCALE AS SHOWN
SHEET NO. 9 OF 18

priceaj 6/3/2014 10:39:52 AM c:\pwworking\nai\priceajd0150803\FB-SV-2266-H.dgn

EXHIBIT C



PRELIMINARY ONLY

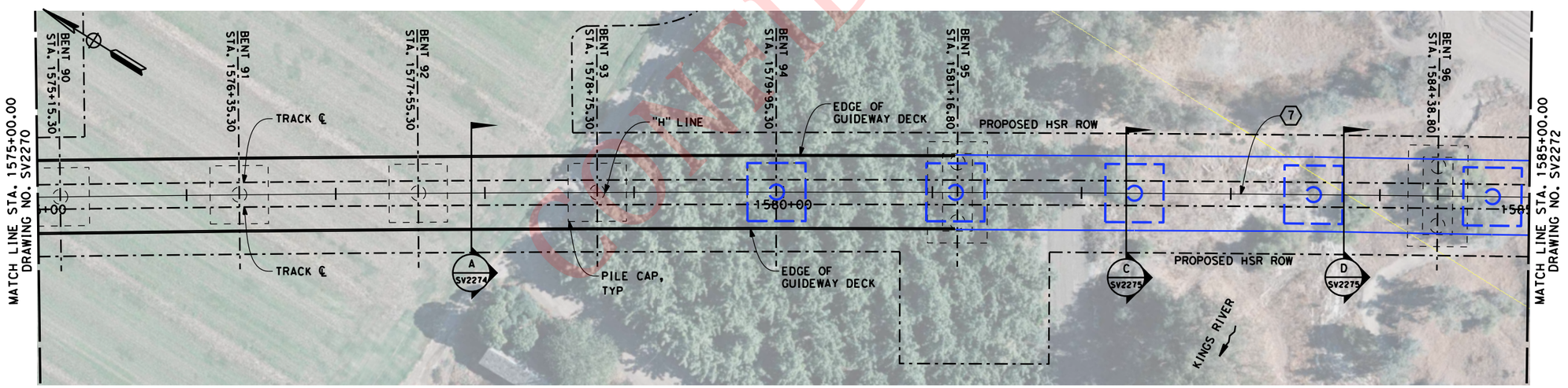
THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

ELEVATION

SCALE 1" = 40'

NOTES

1. NOT ALL PILES SHOWN
2. PILE LENGTH TO BE DETERMINED
3. SUPERSTRUCTURE CONSTRUCTION, UON
   - SIMPLE SPANS - MSS OR FLPM
   - CONTINUOUS SPANS - BCC - PRECAST IN-SITU
   - STEEL TRUSS - INSITU, SLID OR LAUNCHED
   - ELEVATED SLABS - PC BEAM AND INSITU SLAB
4. UTILITY LOCATIONS TO BE DETERMINED
5. ACCESS STAIRWAYS ARE PROVIDED AT SYSTEMS SITES (APPROX. 2.5 MILE INTERVALS). LADDER ACCESS TO VIADUCTS IS PROVIDED AT 2500 FT INTERVALS WITH ACCESS ROAD AND TURNING CIRCLE WHERE NECESSARY.



PLAN

SCALE 1" = 40'

LEGEND:

1. STRUCTURE APPROACH SLAB
2. RETAINING WALL

* ESTIMATED 100-YEAR FLOOD ELEVATION, SEE "FRESNO TO BAKERSFIELD CORRIDOR HYDROLOGY, HYDRAULICS AND DRAINAGE 15% DRAFT REPORT".

CURVE DATA

(7)

R = 36500.00'
Δ = 58° 05' 38.8"
T = 20271.5'
L = 37008.6'

40 0 40 80
1"=40'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. DOBMEIER
DRAWN BY A. PRICE
CHECKED BY G. DREESZEN
IN CHARGE R. TREVETT
DATE 05/29/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

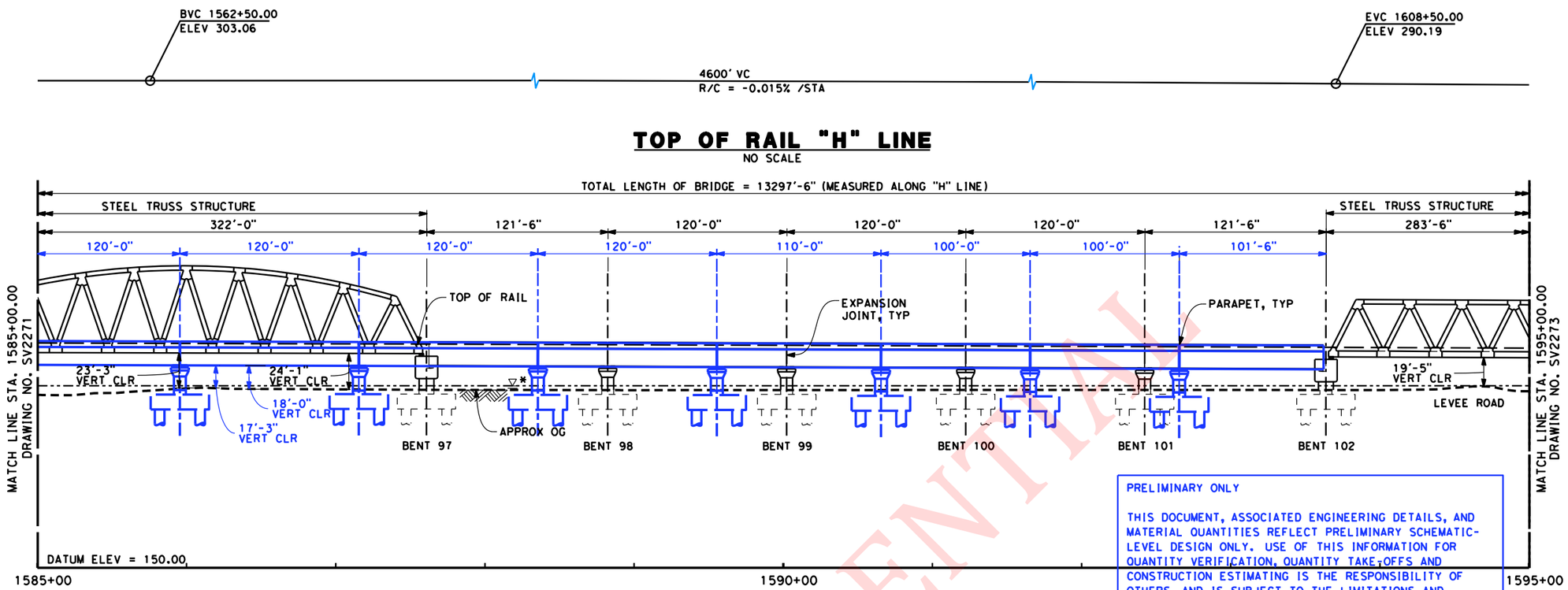
CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
KINGS RIVER VIADUCT
PLAN AND ELEVATION

EXHIBIT C
ATC 8b

CONTRACT NO. HSR 06-0003
DRAWING NO. SV2271
SCALE AS SHOWN
SHEET NO. 14 OF 18

CONFIDENTIAL

priceaj 6/9/2014 3:29:08 PM c:\pwworking\nai\priceaj\d0150803\FB-SV-2271-H.dgn



PRELIMINARY ONLY

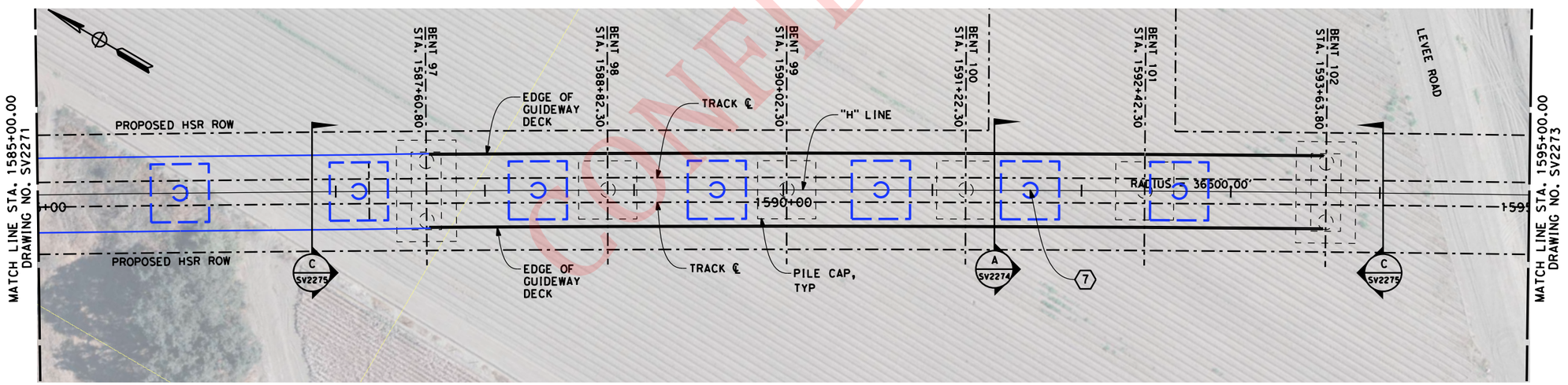
THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

ELEVATION

SCALE 1" = 40'

NOTES

1. NOT ALL PILES SHOWN
2. PILE LENGTH TO BE DETERMINED
3. SUPERSTRUCTURE CONSTRUCTION, UON
   SIMPLE SPANS - MSS OR FLPM
   CONTINUOUS SPANS - BCC - PRECAST IN-SITU
   STEEL TRUSS - INSITU, SLID OR LAUNCHED
   ELEVATED SLABS - PC BEAM AND INSITU SLAB
4. UTILITY LOCATIONS TO BE DETERMINED
5. ACCESS STAIRWAYS ARE PROVIDED AT SYSTEMS SITES (APPROX. 2.5 MILE INTERVALS). LADDER ACCESS TO VIADUCTS IS PROVIDED AT 2500 FT INTERVALS WITH ACCESS ROAD AND TURNING CIRCLE WHERE NECESSARY.



PLAN

SCALE 1" = 40'

LEGEND:

1. STRUCTURE APPROACH SLAB
2. RETAINING WALL

* ESTIMATED 100-YEAR FLOOD ELEVATION, SEE "FRESNO TO BAKERSFIELD CORRIDOR HYDROLOGY, HYDRAULICS AND DRAINAGE 15% DRAFT REPORT".

CURVE DATA

7

R = 36500.00'
Δ = 58° 05' 38.8"
T = 20271.5'
L = 37008.6'

40 0 40 80
1"=40'

CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. DOBMEIER
DRAWN BY A. PRICE
CHECKED BY G. DREESZEN
IN CHARGE R. TREVETT
DATE 05/29/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
KINGS RIVER VIADUCT
PLAN AND ELEVATION

EXHIBIT C
ATC 8b

CONTRACT NO. HSR 06-0003
DRAWING NO. SV2272
SCALE AS SHOWN
SHEET NO. 15 OF 18

priceaj 6/2/2014 4:40:39 PM c:\pwworking\nai\priceaj\d0150803\FB-SV-2272-H.dgn

Alternative Technical Concept 8d

Add 2 bents in Tule River floodway

ALTERNATIVE TECHNICAL CONCEPT 8d

Place Additional Piers in the Floodway of Tule River

California High-Speed Rail Project
RFP No.: HSR 13-57 - Design-Build for Construction Package 2-3

June 11, 2014

04/02/2014 - RFP No.: HSR13-57

CONFIDENTIAL ATC

Submitted by **DFS** Dragados | Flatiron | Shimmick

Dragados/Flatiron/Shimmick Joint Venture is pleased to submit Alternative Technical Concept (ATC) 8d for consideration by the California High-Speed Rail Authority (Authority) for implementation into the Construction Package 2-3. The ATC concept meets or exceeds the Request for Proposals (RFP) design. The following summary provides detailed information as required in Section 6.15.4 of the Instructions to Proposers.

ALTERNATIVE TECHNICAL CONCEPT (ATC) 8d
Place Additional Piers in the Floodway Of Tule River

DESCRIPTION

ATC 8d proposes to place additional piers within the floodway of Tule River at the location identified below. The RFP plans show concrete viaduct with one pier placed in the main channel at Tule River and is located approximately 35 feet downstream of the BNSF trestle bridge. By introducing three additional piers, ATC 8d **reduces the bridge spans**, resulting in a much smaller superstructure construction. This is an ATC because the RFP design shows only one pier in the Tule River, whereas we propose to include four piers in Tule River floodway. ATC 8d will meet or exceed the design requirements by limiting depth of flow increases to less than 0.10-foot. The pier configuration will consist of columns supported on either drilled shafts or footings with piles and will be designed to minimize impacts to the flow of the waterway.

Design Details

The Tule River crossing has a pier and footing in the main channel as shown in the RFP reference documents in Section RM.B.01, page SV2495 with standard 120-foot long concrete viaduct spans. ATC 8d proposes placing multiple piers within the river to reduce the span lengths to 50 feet. This allows for precast concrete girder construction and eliminates the need for falsework in the standing water of the Tule River. The proposed piers will be constructed using methods that will reduce construction impacts to the river, such as Type II drilled shafts or driven piles. The number of piers proposed in this ATC is fewer than the existing piers supporting the BNSF trestle and the SR-43 bridges. The area of construction impact to the channel will be less than or equal to that shown in the RFP plans. Trestle construction also eliminates or greatly reduces the need for temporary structures within the waterway, such as causeway, cofferdams, and falsework. There are no levee access roads located at the Tule River crossing; however the design can accommodate a local access crossing.

Exhibit A provides details of the revised pier locations and shows the reduced size of the superstructure at Tule River.

The crossing will be designed to limit the rise from the FEMA 100-year water surface elevation (WSE) to no greater than 0.10 foot.

CONFIDENTIAL

USAGE

ATC 8d is limited to providing additional piers in Tule River (Station 3029+21.53 to Station 3031+71.53) in Alignment section K4 as shown in **Exhibit A .** The additional piers reduce the span lengths and size of the structure that crosses this floodway.

ENVIRONMENTAL COMPLIANCE

The approved Preferred Alternative identified as the Preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) proposes elevate the HSR over SR-43, BNSF, and Tule River. The FEIS and RFP design of the Tule River crossing includes one pier in the center of the main river channel. The purpose of ATC 8d is to reduce the span lengths over Tule River by designing three additional piers (four total) in Tule River and eliminating falsework and shoring from within the waterway. ATC 8d also represents a cost reduction and refinement of the approved design plans. Although introducting the piers into the floodways increases the direct-permanent impacts by only 157 square feet, but we save $750,000 by eliminating the crossings. ATC 8d meets the definition of a *practicable alternative* because it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes (30 CFR 230.2[q]).

ATC 8d is not generally consistent with the Final EIR/EIS; however, it does meet the intent of minimizing the impacts to jurisdictional waters but balances practicality of introducing additional piers to reduce the bridge span lengths; therefore lowering the costs of construction significantly without causing significant post-construction impact. During construction, the RFP design is likely to cause significant impact on the river and environmental resources due to the cofferdams that would be required for constructing the pier. ATC 8d will allow for drilled shaft/driven pile construction, which will not require cofferdamns. As a result, this will lessen construction impacts to the surrounding area.

This ATC may constitute a variation and may undergo an environmental re-evaluation process to amend the Final EIR/EIS. The additional piers would not be located within any sensitive areas (Wetlands, etc.) that have not been approved. The ATC may require preparation of supporting technical memoranda requiring approval from the Authority and regulatory agencies. If approved to move forward, the Preliminary LEDPA may be amended subject to Signatory Agency approval per the NEPA/404/408 MOU. The use of additional piers in the floodways would require a Section 404 permit modification.

SCHEDULE REVISIONS

ATC 8d will not impact the overall project schedule. Potential schedule concerns are limited to the environmental/design approvals and permits. The DFS team will be proactive to address these concerns very early in the overall project and are not expected to impact the design and construction progress in other areas.

CONFIDENTIAL

Schedule impacts and mitigations, where applicable, are identified below:

Design Phase Schedule Impacts

- **Structure Design:** The design time will not be negatively impacted by the replacement of aerial structure types.
- **Environmental Re-examination:** Environmental re-examination and preparation of supporting technical memos with approvals from the Authority and regulatory agencies may take several months. However, necessary approvals may be obtained within the schedule parameters if the technical memoranda are prepared and submitted early in the process. This ATC may require an amendment to the NEPA/404/408 MOU for California High-Speed Rail Program (Program) requiring that the signatory agencies agree on the proposed changes.We will prepare this submittal early in the design process and plan construction to avoid this area until much later in the Project. We anticipate obtaining these approvals within 12-24 months, which will have no impact on the overall project schedule.
- **Local Agency Approvals:** The permitting and design approval schedule of this section may be slightly lengthened due to obtaining conceptual and final approvals from USACE, CDFW, and Central Valley Flood Protection Board (CVFPB). We will prepare this submittal early in the design process and plan construction to avoid this area until much later in the Project. We anticipate obtaining these approvals within 12-18 months, which will have no impact on the overall project schedule.
- **CLOMR Requirements:** We anticipate that the Conditional Letter of Map Revision (CLOMR) is required for this ATC as well as for the RFP design; therefore ATC 8d will not have an adverseimpact on the overall project schedule.

Construction Schedule Impacts

- **Aerial Structure Construction:** Trestle construction in Tule River is expected to be two months earlier than conventional span construction.

<u>Cost Increases or Decreases</u>

By reducing the span length of the bridge, the DFS team estimates **construction cost savings of $750,000,** as shown in Table 1 on the following page. The foundation size for the crossing is also reduced due to the smaller spans. While there are additional piers to construct, they are smaller in size than required to support the longer span bridges. Trestle bridge construction will significantly reduce the need for temporary structures within the river, such as falsework and cofferdams.

CONFIDENTIAL

Table 1: ATC 8d Construction Cost Comparison

RFP DESIGN		ATC 8d DESIGN	
Concrete Viaduct Structures	$ 2,900,000	Concrete Viaduct Structures	$ 0
		Concrete Box Girder Structures	$ 2,150,000
TOTAL	$ 2,900,000		$ 750,000
ATC 8d TOTAL SAVINGS			**$750,000**

DEVIATIONS

No deviations from standards are required for ATC 8d.

JUSTIFICATION

We understand that the intent of the RFP design is to minimize the increase of the flow depth in the flood zone. In our discussions with the CVFPB during our ATC Third Party meeting on June 2, 2014, we understand that they will support adding piers in the floodway as long as the flow depth is not increased by more than 0.1 foot. ATC 8d proposes to meet the conditions of CVFPB stated above.

The adjacent bridges upstream of the HSR crossing, specifically the SR-43 and BNSF crossings, consist of trestle bridges with multiple piers within the floodway as well. The existing structures have been reviewed and there appears to be negligible scour effects from the locations of the existing piers.

Regarding impact on the environment, ATC 8d would not substantially change the construction footprint and therefore would have a negligible impact on the environment. The visual impact however would be improved as the superstructure will be substantially smaller and less visually intrusive.

Implementation of this ATC would have a negligible impact, less than 0.1 foot increase, on the 100-year water surface at each crossing noted above. A complete analysis of the flood impacts will be prepared prior to implementing ATC 8d in final design.

CONSTRUCTION AND SAFETY IMPACTS

- **Project Segmentation Allows Planning for Permitting and Environmental Re-Examination:** With the project segmented by our design and construction operations, our team can plan for the upfront permitting requirements and environmental re-examination without any negative overall schedule impact. By working outside of the small work area encompassed in ATC 8d, we will have the majority of the overall project available to work on that is not impacted by any of the design, permitting or environmental re-examination required for ATC 8d.
- **Vehicular/Rail Traffic:** No adverse impact to rail/vehicular traffic is expected.
- **Rail Operations:** No adverse impact to rail operations is expected.

CONFIDENTIAL

- **Community Impact:** No adverse community impacts are expected.
- **Maintenance:** No adverse maintenance impacts are expected.

ROW

No additional ROW is required to implement ATC 8d.

THIRD-PARTY APPROVALS

Several third-party approvals will be necessary for ATC 8d. Coordination with these agencies is required with the RFP design as well; therefore we do not anticipate additional impacts. We will seek approval and/or input from the following third-party agencies:

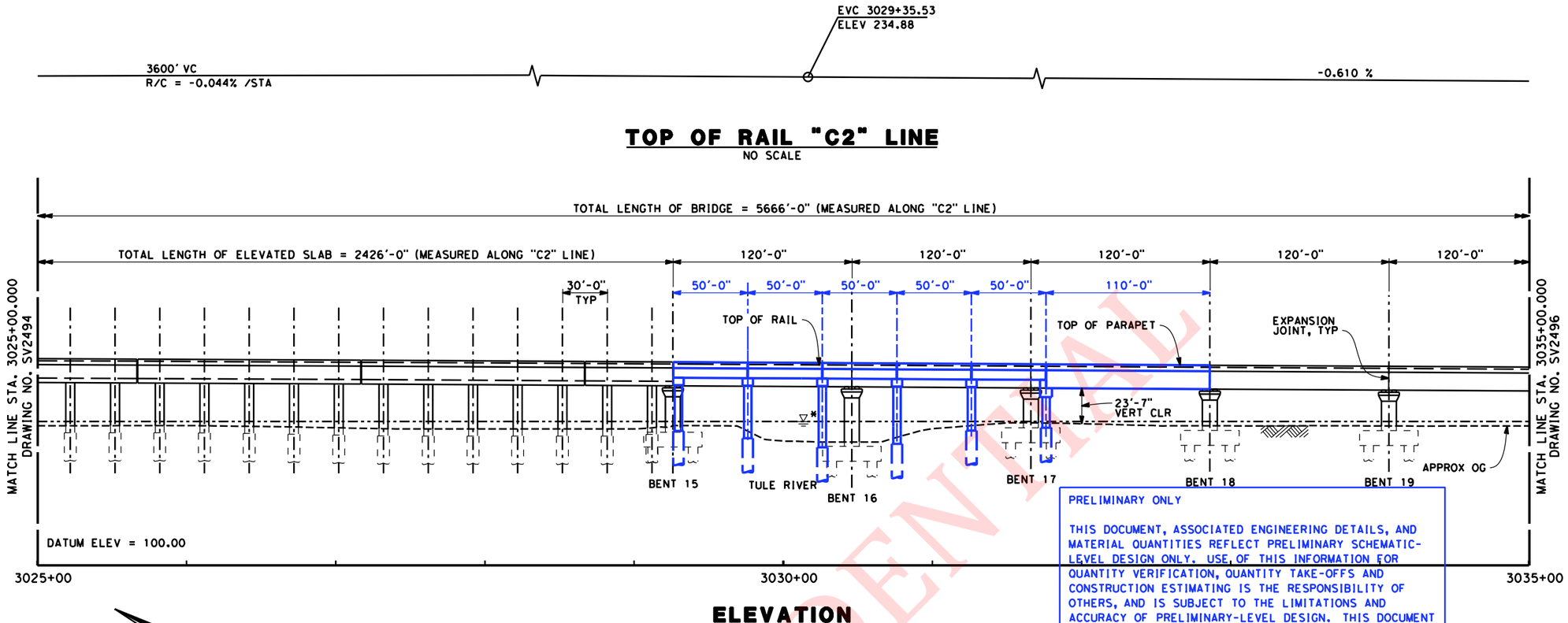
- Tulare County: ATC 8d is located within Tulare County; therefore we will seek their input and approval as required.
- Central Valley Flood Protection Board (CVFPB): CVFPB is the coordinating agency for the CLOMR with FEMA. We will submit the CLOMR/LOMR to CVFPD, who will then process the CLOMR/LOMR with FEMA.
- Federal Emergency Management Agency: FEMA is the final approving agency for the CLOMR/LOMR.
- Environmental Process: ATC 8d may require the contractor to provide environmental re-examination process per Section 42.5, Book I, Part B.2 General Provisions including NEPA/404/408 Integration MOU process requiring signatory agency approvals.

RISKS

POTENTIAL RISK	PROPOSED MITIGATION
Additional permitting evaluation and review time required	Design and construction schedules will incorporate the additional time required for permitting and approvals, avoiding critical path schedule impacts
Additional scour at locations of piers within overbank areas of floodways	Locate additional piers to have the least impact on hydraulics. Provide scour protection such as rip-rap protection. Design the structures to account for the potential scour depth as required by the design criteria.

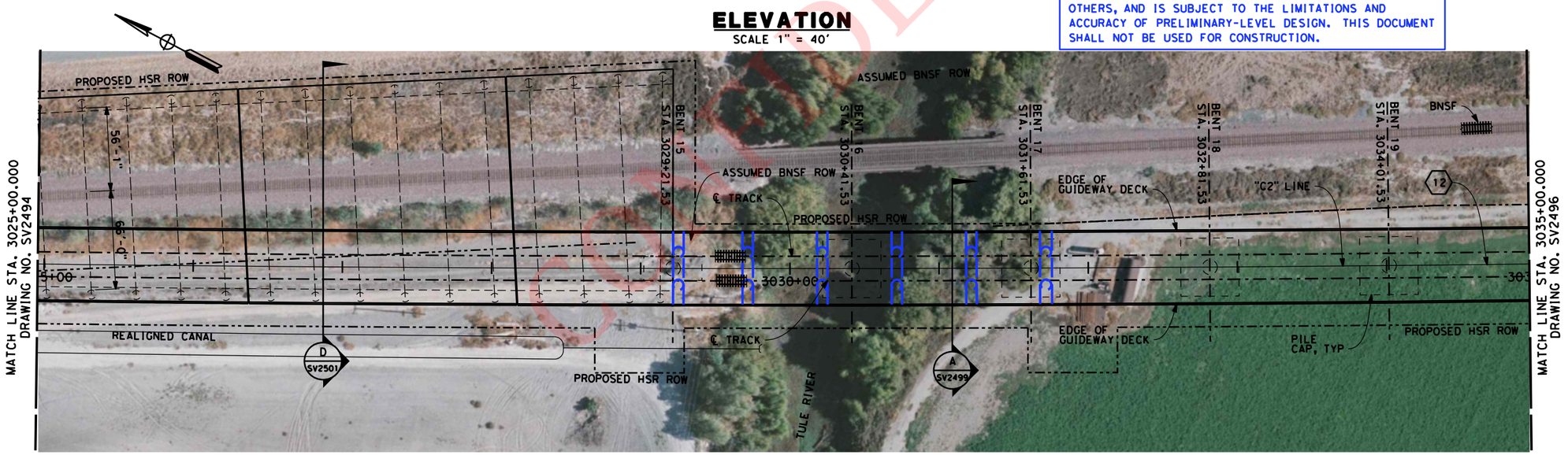
CONFIDENTIAL

EXHIBIT A



ELEVATION

SCALE 1" = 40'



PLAN

SCALE 1" = 40'

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

PRELIMINARY

NOTES

1. NOT ALL PILES SHOWN
2. PILE LENGTH TO BE DETERMINED
3. SUPERSTRUCTURE CONSTRUCTION, UON
   - SIMPLE SPANS - MSS OR FLPM
   - CONTINUOUS SPANS - BCC - PRECAST IN-SITU
   - STEEL TRUSS - INSITU, SLID OR LAUNCHED
   - ELEVATED SLABS - PC BEAM AND INSITU SLAB
4. UTILITY LOCATIONS TO BE DETERMINED
5. ACCESS STAIRWAYS ARE PROVIDED AT SYSTEMS SITES (APPROX. 2.5 MILE INTERVALS). LADDER ACCESS TO VIADUCTS IS PROVIDED AT 2500 FT INTERVALS WITH ACCESS ROAD AND TURNING CIRCLE WHERE NECESSARY.

LEGEND:

1. STRUCTURE APPROACH SLAB
2. RETAINING WALL

* ESTIMATED 100-YEAR FLOOD ELEVATION, SEE "FRESNO TO BAKERSFIELD CORRIDOR HYDROLOGY, HYDRAULICS AND DRAINAGE 15% DRAFT REPORT".

CURVE DATA

(12)

R = 41000.00'
Δ = 01° 14' 39.4"
T = 1846.0'
L = 9734.5'

40 0 40 80
1"=40'

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. DOBMEIER
DRAWN BY A. PRICE
CHECKED BY G. DREESZEN
IN CHARGE R. TREVETT
DATE 05/29/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
CORCORAN BYPASS SUBSECTION
ALIGNMENT C2
STATE ROUTE 43 BNSF VIADUCT
PLAN AND ELEVATION

EXHIBIT A
ATC 8d

CONTRACT NO. HSR 06-0003
DRAWING NO. SV2495
SCALE AS SHOWN
SHEET NO. 6 OF 11

priceaj 6/6/2014 11:03:53 AM c:\pwworking\nai\priceaj\d0151258\FB-SV-2495-C2.dgn

Alternative Technical Concept 15a

Eliminate 2 grade separations in Segment P

ALTERNATIVE TECHNICAL CONCEPT 15a

Realign Avenue 120 Grade Separation over HSR/BNSF/SR-43 and Eliminate Proposed Grade-Separated Crossings at Avenue 128 and Avenue 112

California High-Speed Rail Project
RFP No.: HSR 13-57 - Design-Build for Construction Package 2-3

June 11, 2014

04/02/2014 - RFP No.: HSR13-57

CONFIDENTIAL ATC

Submitted by **DFS** Dragados | Flatiron | Shimmick

Dragados/Flatiron/Shimmick Joint Venture is pleased to submit ATC 15a for consideration by the California High-Speed Rail Authority for implementation into the Construction Package 2-3. The ATC concept is equal to or better than the RFP design. The following section provides detailed information as required in Section 6.15.4 of the Instructions to Proposers.

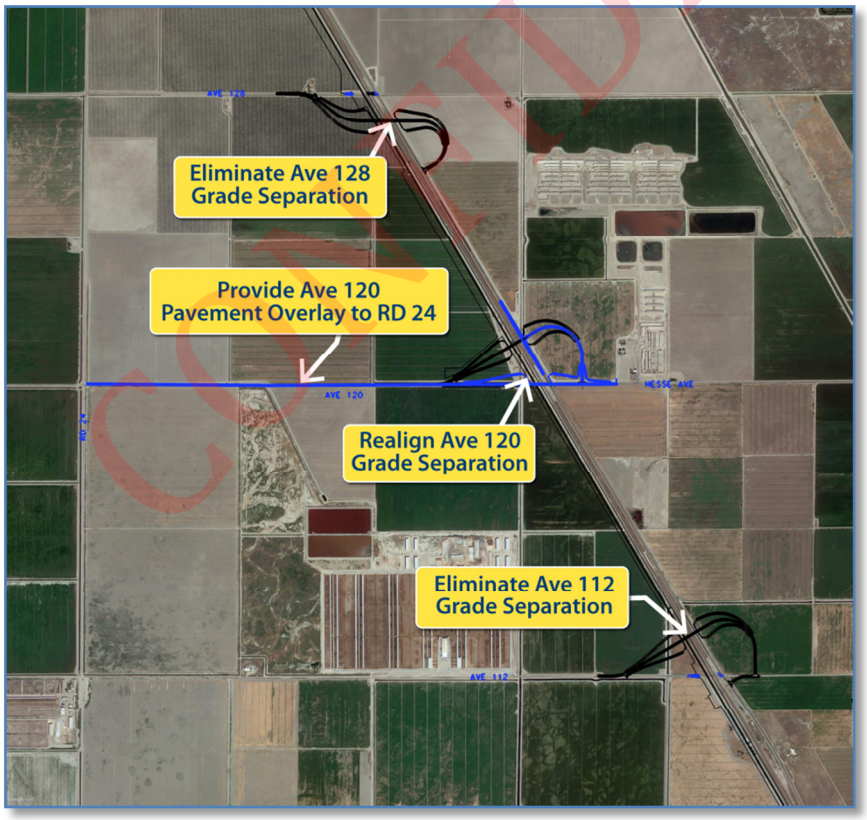
ALTERNATIVE TECHNICAL CONCEPT (ATC) 15a

Realign Avenue 120 Grade Separation over HSR/BNSF/SR-43 and Eliminate Proposed Grade-Separated Crossings at Avenue 128 and Avenue 112

DESCRIPTION

ATC 15a proposes to realign the Avenue 120 grade separation over HSR/BNSF/SR-43 crossing, providing a pavement overlay on Avenue 120 between SR-43 and Road 24 to improve the usability of the existing road, and eliminating grade separations at Avenue 128 and Avenue 112 as shown on Figure 1 below. This is an ATC because it provides an alternate route for local traffic to access SR 43 other than what is shown in the 15% design documents. The ATC meets or exceeds the design requirements by providing a design that has less impact on the local farming community, while still meeting the needs of the local population.

Figure 1: ATC 15a Improvements Map



CONFIDENTIAL

Design Details

This ATC exceeds the original requirements as it offers a sensible and strategic alternative for HSR crossings in this location. ATC 15a includes better geometry for Avenue 120 by allowing traffic to continue along the existing route without making a 90 degree turn. Additionally it proposes to rehabilitate approximately 2 miles of Avenue 120 between the HSR crossing and Road 24 by providing new AC overlay to existing pavement to improve riding surface. The pavement rehabilitation is critical as site visits have shown that area roadways are in poor/inaccessible condition. As a result, we understand that area users, most notably dairy operations at Avenue 120/Road 16, Avenue 112/ Road 24, and Avenue 112/Road 32 travel several miles north on Road 24 to Avenue 36 to access SR-43, as opposed to taking a more direct route. ATC 15a addresses this issue by providing an all-weather, paved, and shorter access route for nearby dairy operations.

This ATC as well as the RFP design also allow all traffic to access SR-43 from the west side, removing the potential conflict with BNSF. Additionally, this ATC proposes that the new intersection with SR-43 uses Caltrans standard Public Road Intersection geometry as well as provides left and right turn refuges.

ATC 15a also eliminates grade separations at Avenue 128 and Avenue 112. Constructing these grade separations when not warranted does not benefit the community but rather increases construction and maintenance costs for Tulare County. Furthermore, the grade separations would be connected to roads that are in poor/inaccessible condition, thus creating the appearance of a “bridge to nowhere”. Approval of ATC 15a also provides the benefit of reducing the impact of the HSR on nearby agricultural lands. It is important to note that the approval of ATC 15a does not preclude the remaining grade separations proposed in the RFP design from being constructed by Tulare County or the Authority at a later date when they are warranted.

See **Exhibits A, B, and C** of details showing the revised grade separations.

See **Exhibit D** of details showing the overall improvements to the local roadway network and circulation.

USAGE

ATC 15a is located in Segment P (approximate RFP Track Station 3100+00 to Station 3250+00) and comprised of modifications to Avenue 112, Avenue 120, and Avenue 128. The ATC seeks to reduce the impact of HSR grade separated crossings on the local farming community, while providing safer, all-weather access to traffic between SR-43 and Avenue 120.

ENVIRONMENTAL COMPLIANCE

ATC 15a is consistent with the environmental document as it reduces impacts shown in the FEIS and a variation is likely not required.

SCHEDULE REVISIONS

ATC 15a will likely reduce the project schedule. This will be determined on whether grade separations are constructed concurrently or sequentially and the parcel acquisition process. It will not increase

CONFIDENTIAL

construction duration within the schedule as each typical grade separation is expected to typically take approximately four to six months. Potential schedule concerns are limited to the design approvals and permits. The DFS team will be proactive to address these concerns very early in the overall project and are not expected to impact the design and construction progress in other areas.

Schedule impacts and mitigations, where applicable, are identified below:

Design and Construction Schedule Impacts

- **Reduced design schedule:** Fewer grade separations will need to be designed and constructed if ATC 15a is approved. This will reduce the number of approvals needed from Caltrans and Tulare County and expedite the overall design and construction schedules
- **Reduced construction schedule:** Fewer grade separations will need to be constructed if ATC 15a is approved. This will expedite the construction schedule for work in Segment P by reducing the amount of overpasses constructed.

COST INCREASES OR DECREASES

The DFS team estimates significant savings in construction cost due to eliminating two grade separations. The estimated cost savings of more than $17 million would be a result of the implementing this ATC, as detailed in Table 1 below. In addition, long term maintenance costs will be reduced by eliminating grade separations.

Table 1: ATC 15a Construction Cost Comparison

RFP DESIGN		ATC 15a DESIGN	
Avenue 128 Grade Separation	$ 10,640,000	Avenue 128 Cul De Sac	$ 40,000
Avenue 120 Grade Separation	$ 8,755,000	Avenue 120 Grade Separation & Roadway Improvements	$ 10,820,000
Avenue 112 Grade Separation	$ 8,755,000	Avenue 112 Cul De Sac	$ 40,000
TOTAL	$ 28,150,000		$ 10,900,000
ATC 15a TOTAL SAVINGS			**$17,250,000**

DEVIATIONS

No deviations from standards are required for ATC 15a.

JUSTIFICATION

The purpose of this ATC is to reduce construction/maintenance costs and ROW impacts to affected farmlands. The ATC will reduce ROW acquisition at these three HSR crossings from approximately 54 acres to 18 acres. Avenues 112, 120, and 128 are all under-utilized and under-developed rural county farm roads with traffic counts not exceeding 500 DHV. Avenue 128 operates on the west side of the BNSF railroad tracks and dead ends at existing SR 43. The design speed for all three roadways is no more than 45 mph, with an expected Level of Service of no better than LOS D. The future

CONFIDENTIAL

roadway design is anticipated as a rural collector, two-lane road with less than 2-foot shoulders that are used mainly for farming operations. Future development or major changes in land use are not expected in the next 20 years.

This ATC proposes to eliminate HSR crossings at Avenues 112 and 128 and modify the proposed Avenue 120 crossing. This Project and other HSR projects have proposals to eliminate roadway crossings up and down the proposed HSR tracks so it is not unusual to close some roadways while providing grade separations for other roadway crossings. These three crossings are currently a mile apart; which provides three crossings within two miles. One HSR crossing for all three roadways will be sufficient to serve the community and the surrounding farms. ATC 15a provides alternate routes for Avenues 128 and 112 to access SR 43 through Avenue 120 and the existing network of local roads.

The elimination of two grade-separated crossings will mean savings of more than $17 million in structure and roadway construction as well as ROW acquisition costs. It will also mean cost savings in maintenance and operations costs by eliminating the Avenues.

The proposed ATC 15a will benefit the Authority by providing a reduction in ROW acquisition, reduced impacts to farmlands and the environment as well as it will improve relations with affected community members.

CONSTRUCTION AND SAFETY IMPACTS

Vehicular/Rail Traffic

- No adverse impact to rail/vehicular traffic is expected. Potential construction and safety impacts are reduced by the reduction of two RFP overpasses.

Rail Operations

- No adverse impact to rail operations is expected.

Community Impact

- No adverse community impacts are expected.

Maintenance

- No adverse maintenance impacts are expected. Future overpass maintenance is reduced by eliminating two overpasses. Avenue 120 maintenance is reduced by improving the existing road for approximately 2 miles with an asphalt overlay.

Safety

- No adverse safety impacts are expected.

ROW

Proposed ROW limits have not been released at the time of preparation of this ATC. However, we anticipate that ATC 15a will reduce the ROW acquisition by 36 acres.

CONFIDENTIAL

THIRD-PARTY APPROVALS

Third-party approvals will be necessary for ATC 15a. Coordination with these agencies is required with the RFP design as well; therefore we do not anticipate additional impacts. We will seek approval and/or input from the following third-party agencies:

- Tulare County: A portion of the ATC is in Tulare County; therefore we will seek their input and approval as required.
- Caltrans: The proposed ATC 15a spans SR-43 as well as improves an intersection with the local roadway; therefore we will seek their input and approval as required.
- BNSF: The proposed grade separation spans over the BNSF railway in ATC 15a and the RFP design. No additional coordination than is already anticipated per the RFP will be needed.

RISKS

We have identified minimal risks related to ATC 15a. Table 2 below details potential risks and possible mitigation for addressing those risks.

Table 2: Risk/Mitigation Table

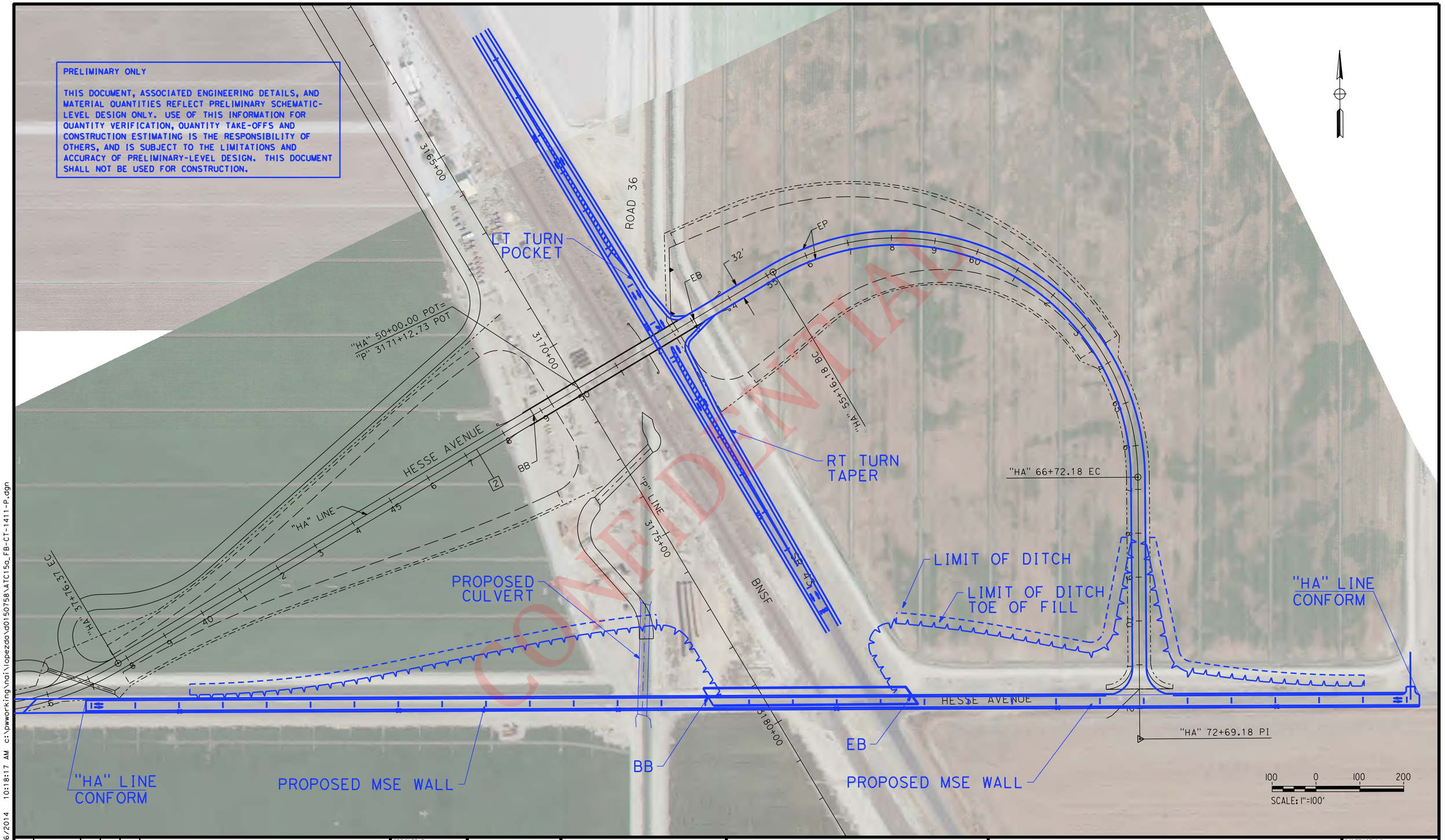
POTENTIAL RISK	PROPOSED MITIGATION
Tulare County approval	The design is intended to modify the traffic circulation proposed in the RFP to reflect traffic demand and road conditions. We will provide a traffic analysis to demonstrate that the design meets Tulare County traffic needs for the next 20 years.
Tulare County approval delays	We will discuss this concept with Tulare County very early in the design schedule to gain their conceptual approval. Project segmentation during both design and construction will allow work to progress outside of the ATC 15a impacted areas. ATC 15a does not affect construction along the HSR alignment, therefore design and construction potential delay impacts can be offset with proper planning at the forefront and accelerated construction methods on the back end.

CONFIDENTIAL

EXHIBIT A

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



CONFIDENTIAL

6/6/2014 10:18:17 AM c:\pwworking\nai\lopezda\d0150758\ATC15a_FB-CT-1411-P.dgn

lopezda

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY XXX
DRAWN BY XXX
CHECKED BY XXX
IN CHARGE XXX
DATE XX/XX/XX

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
PIXLEY SUBSECTION
ALIGNMENT P
GRADE SEPARATION LAYOUT
HESSE AVE

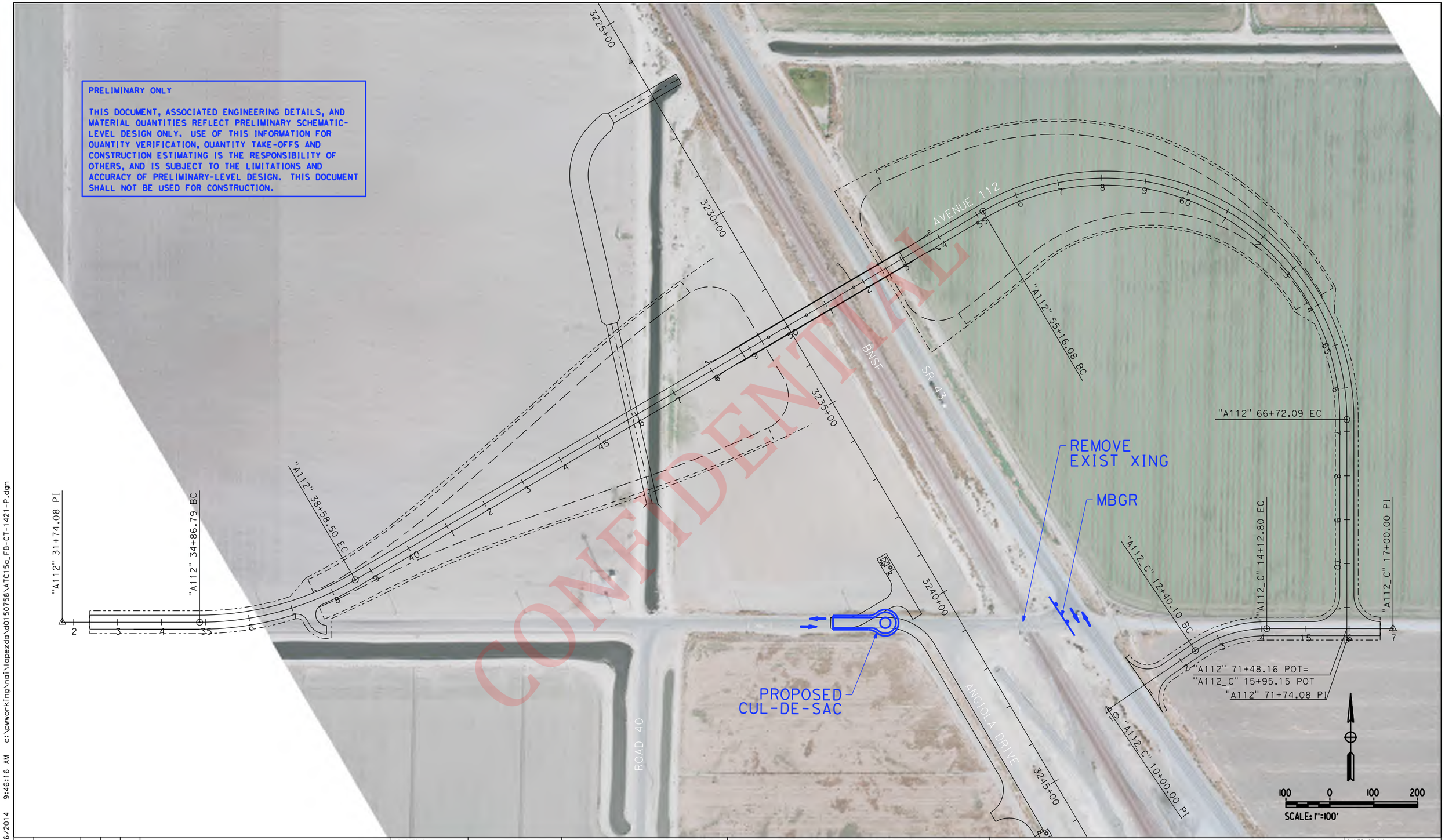
ATC 15A
EXHIBIT A

CONTRACT NO.
DRAWING NO. XXXXXX
SCALE
SHEET NO. XX OF XX

EXHIBIT B

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



CONFIDENTIAL

6/6/2014 9:46:16 AM c:\pwworking\nai\lopezda\d0150758\ATC15a_FB-CT-1421-P.dgn lopezda

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY XXX
DRAWN BY XXX
CHECKED BY XXX
IN CHARGE XXX
DATE XX/XX/XX

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

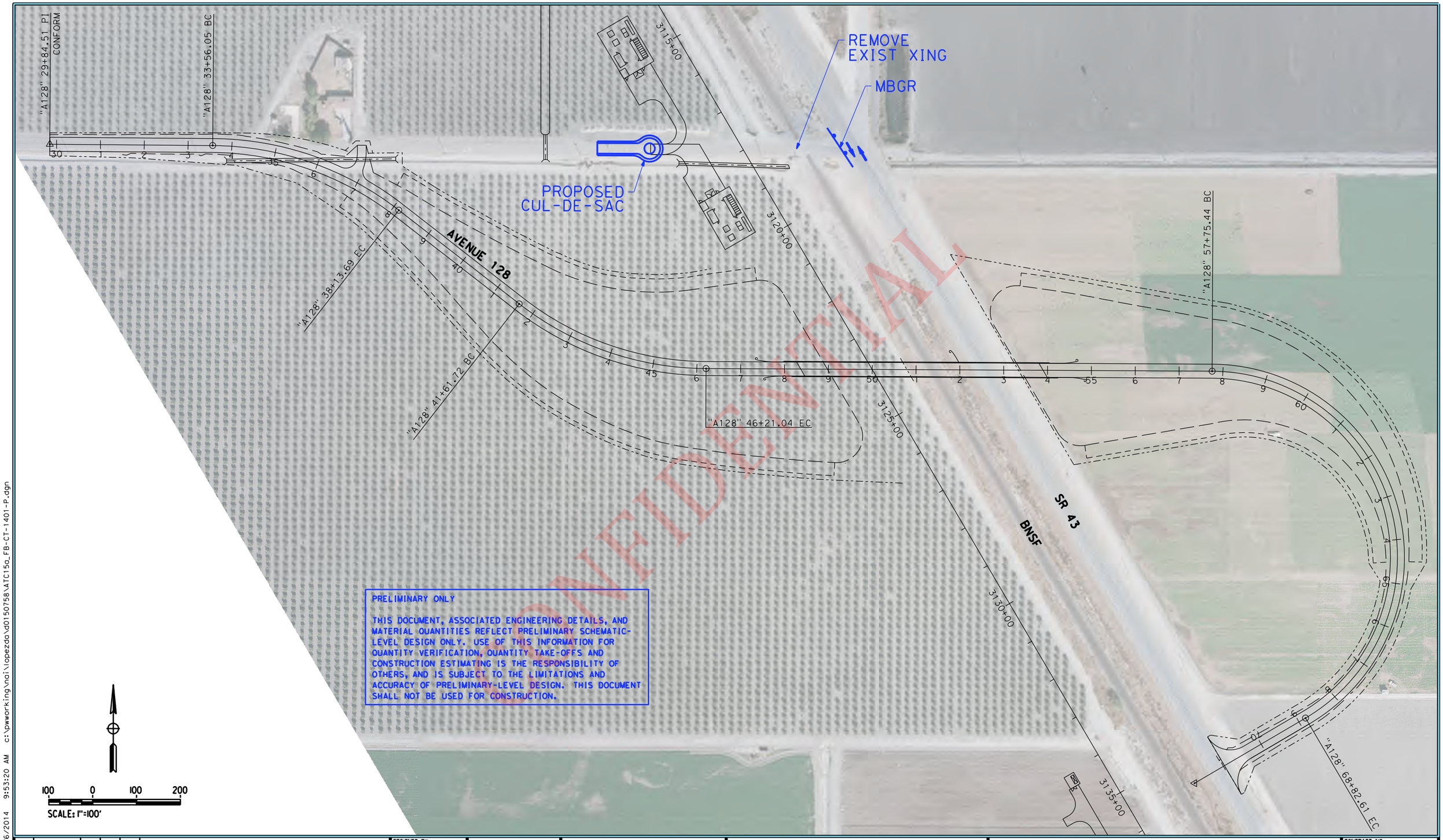
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
PIXLEY SUBSECTION
ALIGNMENT P
GRADE SEPARATION LAYOUT
AVE 112

ATC 15A
EXHIBIT B

CONTRACT NO.
DRAWING NO. XXXXXX
SCALE
SHEET NO. XX OF XX

EXHIBIT C



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY XXX
DRAWN BY XXX
CHECKED BY XXX
IN CHARGE XXX
DATE XX/XX/XX

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

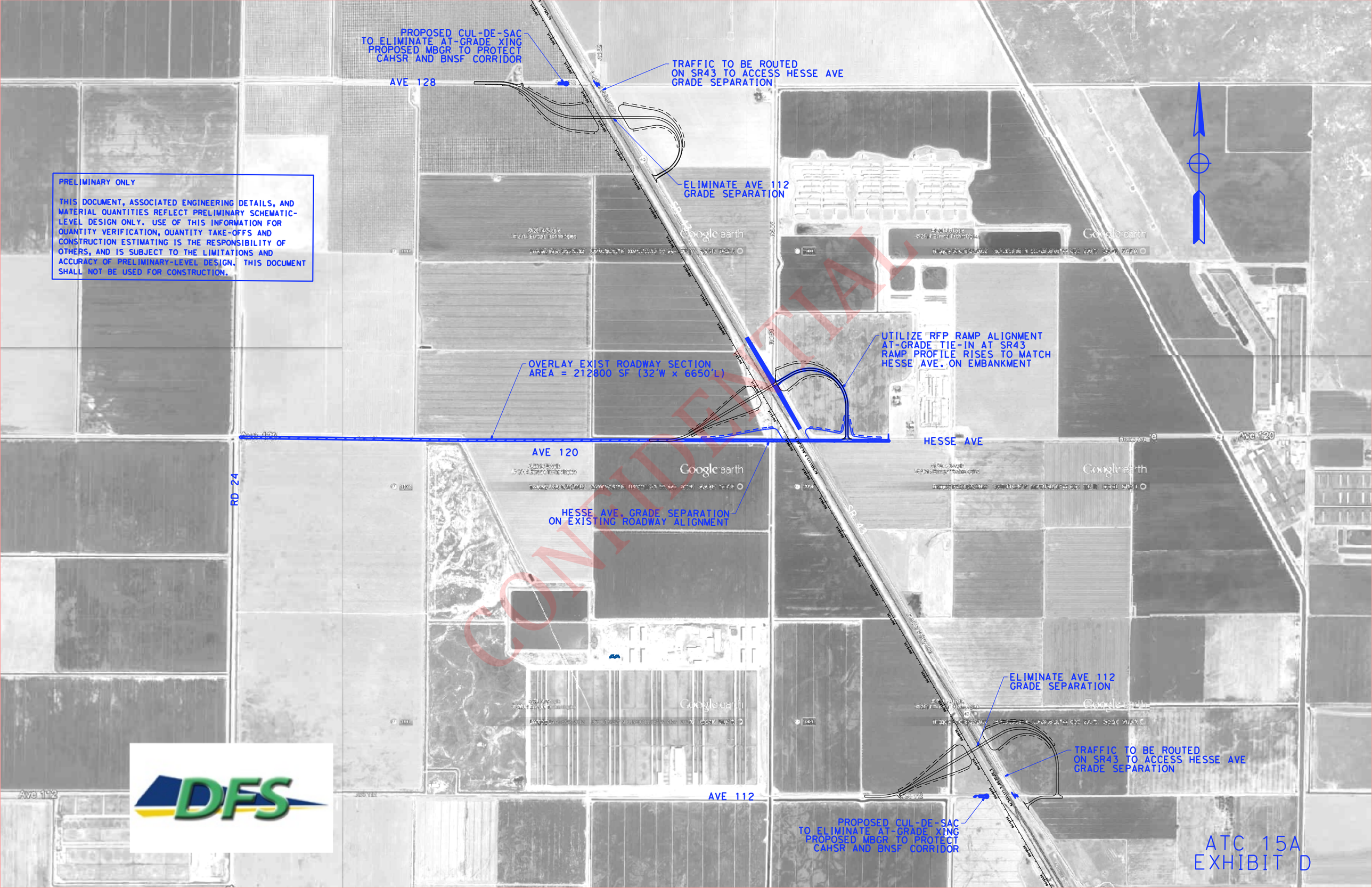
CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
PIXLEY SUBSECTION
ALIGNMENT P
GRADE SEPARATION LAYOUT
AVE 128

ATC 15A
EXHIBIT C

CONTRACT NO.
DRAWING NO. XXXXXX
SCALE
SHEET NO. XX OF XX

6/6/2014 9:53:20 AM c:\pwworking\nai\lopezda\d0150758\ATC15a_FB-CT-1401-P.dgn
lopezda

EXHIBIT D



ATC 15A
EXHIBIT D

Alternative Technical Concept 17

Place Hanford Station at grade

ALTERNATIVE TECHNICAL CONCEPT 17

Place Hanford Station At Grade

California High-Speed Rail Project
RFP No.: HSR 13-57 - Design-Build for Construction Package 2-3

June 11, 2014

04/02/2014 - RFP No.: HSR13-57

CONFIDENTIAL ATC

Submitted by **DFS** Dragados | Flatiron | Shimmick

Dragados/Flatiron/Shimmick Joint Venture is pleased to submit ATC 17 for consideration by the California High-Speed Rail Authority for implementation into the Construction Package 2-3. The ATC concept is equal to or better than the RFP design. The following section provides detailed information as required in Section 6.15.4 of the Instructions to Proposers.

ALTERNATIVE TECHNICAL CONCEPT (ATC) 17
Place Hanford Station At Grade

DESCRIPTION

ATC 17 proposes to construct the **HSR alignment at grade at the Hanford Station** location as opposed to on viaduct. This is an ATC because it alters the vertical profile of the HSR, adjusts vertical realignment of the SJVRR, and adjusts vertical realignment of SR-198. This ATC meets or exceeds the design requirements by providing long and short term cost savings, reducing visual impacts to area residents, reducing the design and construction schedule, and meeting the local agencies' request to relocate the station to the south of the SJVRR.

Design Details

The RFP drawings indicate that the future Hanford Station will be an aerial structure with Station platforms about 50 feet above the ground, enclosed by an 80-foot tall station building. The RFP station is located just to the north of the SR-43 and SR-198 Interchange. This will require a 5-track viaduct structure to cross over SJVRR and SR-198.

This ATC proposes to place the future station platforms and crossovers at grade and in the same location as the RFP. Locating the station at grade eliminates the large aerial structure, reduces the viaduct structure to crossing only at SR-198, requires the SJVRR to be reconstructed either over or under the HSR facility, and requires SR-198 to be depressed from the existing interchange east approximately one mile. Relocating SJVRR provides substantial benefit to the community as it eliminates an at grade crossing on SR-43 and provides significant improvements to traffic safety at that location. Please refer to Exhibit A for details.

An at grade location will provide more flexibility for the architectural design of the station in terms of blending in with the surroundings and reducing visual impacts to residents in the area.

Please refer to the following exhibits for additional design details:

- **Exhibit A** shows revised viaduct and new at grade station profile.
- **Exhibit B** shows the full impact of ATC 17 on other facilities such as the SJVRR and SR-198. This exhibit also shows a potential alternate station building location that addresses the concerns of the City of Hanford during a third-party meeting on June 4, 2014, such as accommodating a future Costco.
- **Exhibit C** shows the proposed vertical realignment of SJVRR either over or under SR-43 and the HSR.

CONFIDENTIAL

- **Exhibit D** shows the proposed vertical realignment of SR-198 under the HSR.
- **Exhibit E** provides a comparison between the RFP and the proposed ATC 17 station building to demonstrate the reduced visual impact of an at grade station as opposed to an elevated station.

USAGE

This ATC will construct the future Hanford Station at grade in its current RFP location, Station Range of 1942+35 to 1956+45, instead of elevated on viaduct at nearly 50 feet above the ground.

ENVIRONMENTAL COMPLIANCE

ATC 17 lowers the HSR profile onto embankment and retaining walls, reduces and eliminates the size and amount of aerial structures, and places the future station at grade. The change in profile and use of embankments/retaining walls would have direct and permanent impacts by requiring an additional acreage within the right-of-way to be converted from agricultural and residential uses to a transportation purpose. In addition, the use of embankments/retaining walls would sever local circulation requiring use of cul de sac streets. With the current RFP design of the elevated profile, land under the aerial structures could still be farmed and local circulation would be retained. Note that the right-of-way acquisition plan does not precisely depict parcels that will be acquired, therefore we cannot accurately determine if additional properties will need to be acquired at this time.

ATC 17 provides many positive benefits. By lowering the vertical profile of the HSR alignment to at grade, ATC 17 improves the overall visual quality of the area. Area residents are more accustomed to passing trains located at grade and not on 50-foot elevated structures. The lowered profile helps the HSR system to blend in with its surroundings. An additional benefit associated with ATC 17 is the flexibility in the architectural design with an at grade station and adjacent parking area. The construction of high platforms and associated structures are inherently more expensive to design and construct.

Any modification from a higher to lower HSR profile within the right-of-way would not result in changes to the LEDPA requiring interagency coordination with the Authority, USACE, SHPO, and other agencies. ATC 17 will require an environmental re-examination with supporting technical memoranda to assist the Authority in approving a design variation. The environmental re-examination may require 12 months to complete. No new permits or permit modifications will be needed.

SCHEDULE REVISIONS

ATC 17 will not adversely impact the overall project schedule and may have potential schedule reduction. There are no potential schedule concerns related to the environmental/design approvals and permits.

The construction schedule duration for the RFP section of the viaduct will be significantly reduced due to viaduct replacement. We anticipate some of these substantial schedule reductions to be offset by staged highway and railroad construction.

CONFIDENTIAL

Schedule impacts and mitigations, where applicable, are identified as follows:

Design Phase Schedule Impacts

- **Viaduct Design:** The design time for HSR aerial structures will be significantly reduced.
- **Environmental Re-examination:** Environmental re-examination and preparation of supporting technical memos with approvals from the Authority and regulatory agencies may take several months. However, necessary approvals may be obtained within the schedule parameters if the technical memoranda are prepared and submitted early in the process. We will prepare this submittal early in the design process and plan construction to avoid this area until much later in the Project. We anticipate obtaining these approvals within 12 months, which will have no impact on the overall project schedule due to our segmented design/construction approach.
- **Local Agency Approvals:** The permitting and design approval schedule of this section may be slightly lengthened due to obtaining conceptual and final approvals from SJVRR, Caltrans, Kings County, and the City of Hanford, as well as input from the City of Visalia and Baker Commodities. We will prepare these submittals early in the design process and plan construction to avoid this area until much later in the Project. We anticipate obtaining these approvals within 12-18 months, which will have no impact on the overall project schedule.

Construction Schedule Impacts

- **Reduction of HSR Aerial Structures:** Viaduct construction will be replaced by at grade construction and single span HSR structures. Most of this construction can take place concurrently with the required railroad and highway improvements. **Reduced Subsurface Schedule Risks:** Reduced viaduct width will slightly reduce risk of subsurface problems through considerable reduction of piled foundations for the viaduct structure.
- **Staged Construction of SR-43 and SR-198:** Improvements to these highways will be optimally designed and planned to reduce impacts to traffic and the schedule.
- **SJVRR Grade Separation:** The grade separations will be coordinated with HSR and roadway construction. The majority of railroad construction will be done concurrently.

COST INCREASES OR DECREASES

The DFS team estimates **savings of approximately $107 million** in construction costs due to relocating the station and placing it at grade as shown in Table 1 below.

Table 1: ATC 17 Construction Cost Comparison

RFP DESIGN		ATC 17 DESIGN	
Elevated Station, 5-track wide elevated viaduct and Platforms	$ 189,000,000	AT Grade Station, 2-track wide viaduct, realignment of SR 198 and SVJRR	$ 74,000,000
ATC 17 TOTAL SAVINGS			**$115,000,000**

CONFIDENTIAL

ATC 17 will also provide maintenance savings of approximately $1.7 million based on the maintenance cost difference between an elevated and at grade station (estimated at $150,000 per year over 30 years).

Additionally, the construction costs of the future station are expected to be reduced by nearly $13 million in current dollars.

➢ **In total, ATC 17 represents nearly $130 million in savings to the Authority**.

DEVIATIONS

No deviations from standards are required for ATC 17.

JUSTIFICATION

The objective of this ATC is to relocate the Hanford station from an aerial station on viaduct to an at grade station at or in close proximity to the RFP proposed location. This ATC also includes savings in construction time and costs as well as provide the Authority with the following benefits:

- Less visual impacts both in terms of the station and the size and height of the HSR viaduct (See Exhibit E – Station Size Comparison).
- Equivalent access to SR-43, Visalia, and Hanford without interference from an at grade crossing at SJVRR.
- Better/easier movement of passengers within future station.
- Platforms and station building are easier to evacuate in the event of an emergency.
- A significant reduction in life cycle cost realized through both the construction phase as well as Operation & Maintenance.
- The proposed location of ATC 17 can be easily integrated into the future urban development of the City of Hanford, allowing for new commercial, industrial, and residential opportunities.
- During our June 4, 2014 ATC meeting, the City of Hanford expressed an interest in the ATC 17 at grade station location and provided favorable feedback about their future City growth plans ATC 17 at-grade station location could readily address the concerns of the City's future growth such as traffic flow, utilities and connection to other City services, resulting in favorable resident support.

CONSTRUCTION AND SAFETY IMPACTS

Vehicular/Rail Traffic

- Vehicle and rail traffic is anticipated to be improved by ATC 17. Currently, SJVRR crosses SR-43 at-grade, whereas ATC 17 provides a grade separation for SJVRR at SR-43. The grade separation eliminates a potential safety concern and potential traffic concerns on SR-43 and the SR-198 off-ramps.

CONFIDENTIAL

Rail Operations

- HSR rail operations are expected to improve with ATC 17. Eliminating the viaduct and grade changes reduces the cost of HSR operations, particularly with express trains that are bypassing the Hanford station.

Community Impact

- The at-grade station is expected to cause far less visual impact as compared to the RFP design.

Maintenance

- Maintenance cost for the station area is expected to be reduced by $150k per year.

Safety

- ATC 17 improves construction and long term safety for the HSR.
- Viaduct construction includes three of the most frequent construction violations: scaffolds/aerial lifts, falls, and cranes/hoists. By reducing/eliminating viaduct construction, it creates a safer environment for construction workers and inspectors.
- Post construction safety is also enhanced because future station structure construction will not be an elevated structure.

ROW

Proposed ROW limits were not released at the time of preparation of this ATC. The basis of ROW design will use the Authority's proposed ROW limits for the RFP station. This ATC will use equivalent ROW to the RFP design.

Retaining walls will be used in areas with right-of -way constraints. ROW shown on the drawings is estimated and will be refined as design is developed. We do not anticipate that the proposed ATC 17 will require additional right-of-way when compared to the RFP design.

THIRD-PARTY APPROVALS

Third-parties will provide input for concurrence on ATC 17. Coordination with these agencies is required with the RFP design as well; therefore we do not anticipate additional impacts. We will seek approval and/or input from the following third-party agencies:

- Kings County: The proposed station location for ATC 17 is still within Kings County; therefore we will seek their input on the station location.
- City of Hanford: We met with the City of Hanford on June 4, 2014 regarding ATC 17. They indicated that placing the station at grade is preferable as compared to the elevated station. We will seek final approval and input from the City of Hanford as required.
- City of Visalia: The proposed ATC 17 station location does not change access to the City of Visalia as compared to the RFP design. Vehicles will still travel approximately 20 miles along existing thoroughfares to get to the Hanford Station.
- Caltrans: The proposed ATC 17 station location requires improvements on SR-198 while removing a conflict with SR-43. We will seek Caltrans approval for these improvements.
- SJVRR: The proposed ATC 17 station location requires a grade separation with the Cross Valley Railroad. We will coordinate with SJVRR to determine their requirements and preferences to expedite the approval process. This coordination and approval process will include discussions

CONFIDENTIAL

on the required shoofly, utility relocations, and any modifications needed for the Helena Chemical spur track.

- Baker Commodities: With the construction impacts for the current Baker Commodities facility and property, we anticipate coordinating closely with Baker Commodities during the design preparation to account for design needs and construction staging to ensure 100% operational time for their facility.

RISKS

We have identified potential risks related to ATC 17. Table 2 below details potential risks and possible mitigation for addressing those risks.

Table 2: Risk/Mitigation Table

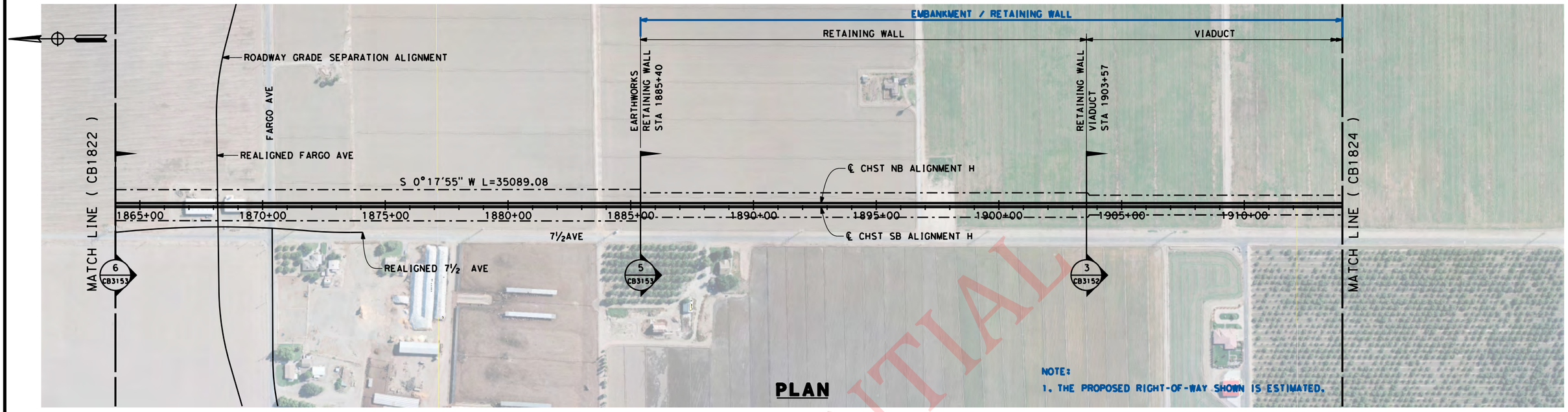
POTENTIAL RISK	PROPOSED MITIGATION
New ROW affecting new Parcels	The proposed ATC may affect different ROW than is proposed in the RFP; however it will likely affect the same owners as the RFP. The Authority may have to negotiate with new landowners and reach agreements as necessary to construct the station. DFS will coordinate with the Authority on ROW acquisition to minimize schedule impacts
Third Party Approvals	The proposed ATC 17 station location may require revisions to agreements with local agencies (City of Hanford, SJVRR, Caltrans, etc.). These agencies will need to be involved with the new ATC station concept and new agreements will need to be reached along with proper and timely permitting with the appropriate third parties.
Proposed station siting is in proximity to SR-198, SR-43 and the SJVRR rail line	The risk of being located between the SJVRR to the north and SR-198 to the south can be mitigated by providing future access design that accounts for station access via walking, biking, car, bus or train transportation options.
The revised station differs from the current RFP design and does not fit into the current General Plan for the City of Hanford	In discussions with the City of Hanford, they indicated that they would prefer the ATC 17 station siting between SJVRR and SR-198 to account for future Hanford growth and connection to existing power, sewer, water, gas and other City facilities and services. The City of Hanford is currently in the process of updating their General Plan and can incorporate the station location into their planning process.
Permitting delays associated with SJVRR realignment and Caltrans realignments	The Project will be segmented and scheduled to account for permitting, design, and construction time required to prepare for the ATC 17 design concept. This scope of work will be scheduled early in the planning process and late in the construction process to account for 18-24 months of permitting required from NTP.
Adequate station access on the south side of the SJVRR (Potential alternative station)	The City of Hanford shared that they are planning to realign Lacey Boulevard to accommodate a future Costco side on the west side of SR-43. The realignment of Lacey Boulevard will provide better

CONFIDENTIAL

POTENTIAL RISK	PROPOSED MITIGATION
	access to the future Hanford Station. In the interim condition, access to the station will be provided either from the existing Lacey Boulevard or from a new access point at SR-43.
Adequate station access on the south side of SJVRR (RFP station location)	Access to the station on the north side of the SJVRR matches the RFP design; therefore no adverse impacts are anticipated with this ATC. However, constructing a grade separation for SJVRR improves access to the RFP station location.
Existing roadways are not able to handle increased traffic to the station area	SR-43 and connecting arterial roads could be planned and designed for future upgrades when the station is constructed. Designing for the future upgrade would allow for proper planning to take place before the station is built. Not upgrading the surrounding roadways for the future station during the Project would provide no increased risk to the Project or the City of Hanford.

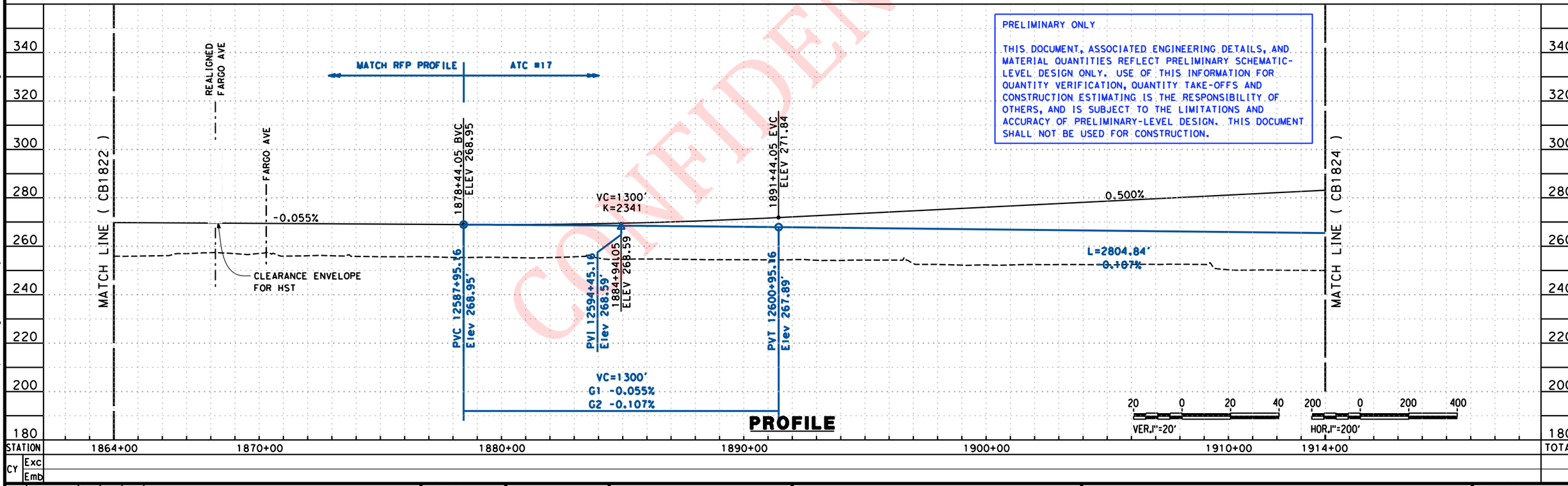
CONFIDENTIAL

EXHIBIT A



PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/16/14

RECORD SET 15% DESIGN SUBMISSION
-
NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

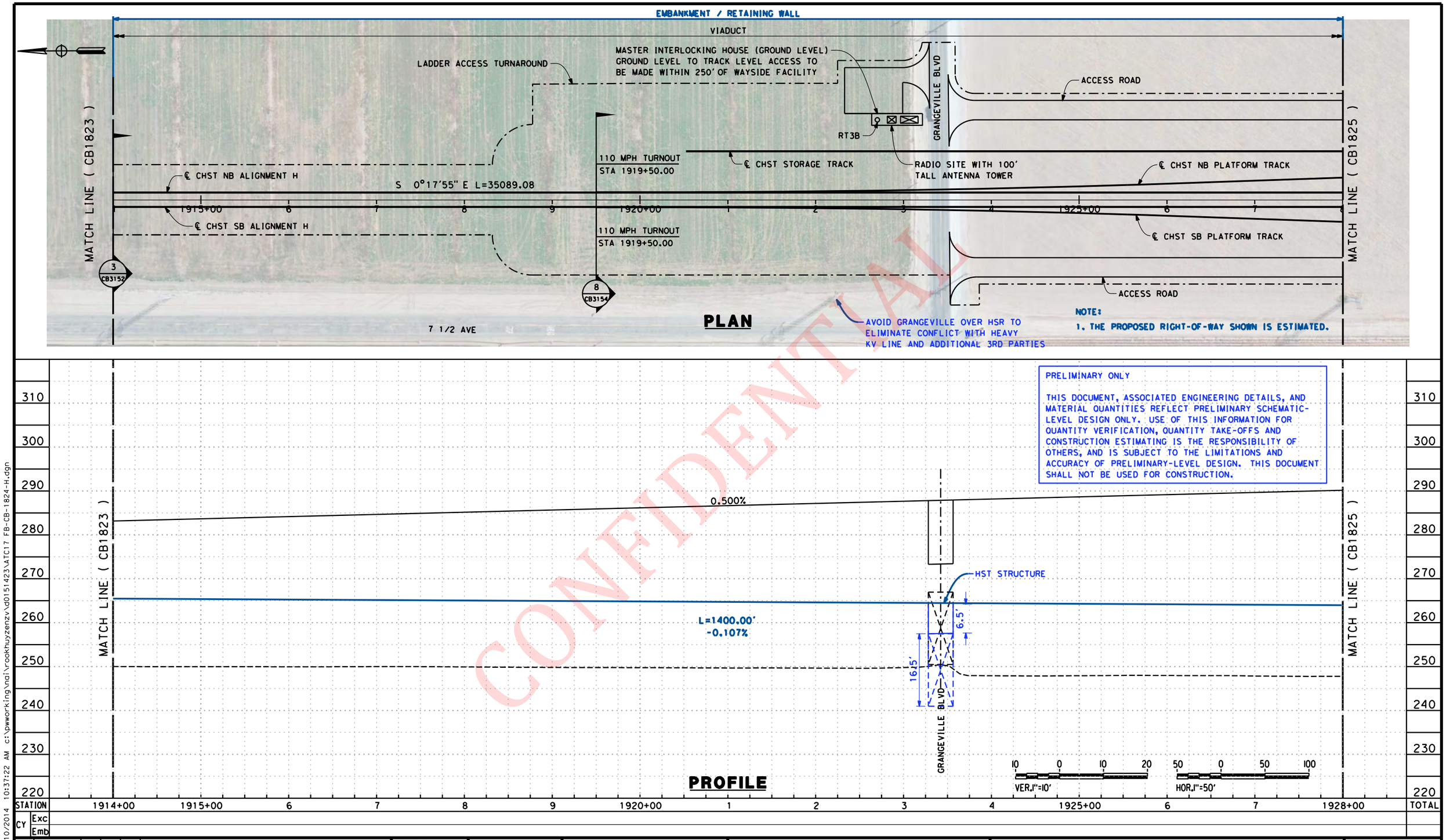
CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1864+00 TO 1914+00
PLAN AND PROFILE

ATC 17
EXHIBIT A

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1823
SCALE AS SHOWN
SHEET NO. 17 OF 31

CONFIDENTIAL

rookhuyzenzv 6/11/2014 7:44:58 AM c:\pwworking\nai\rookhuyzenzv\d0151423\ATC17 FB-CB-1823-H.dgn



PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/16/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

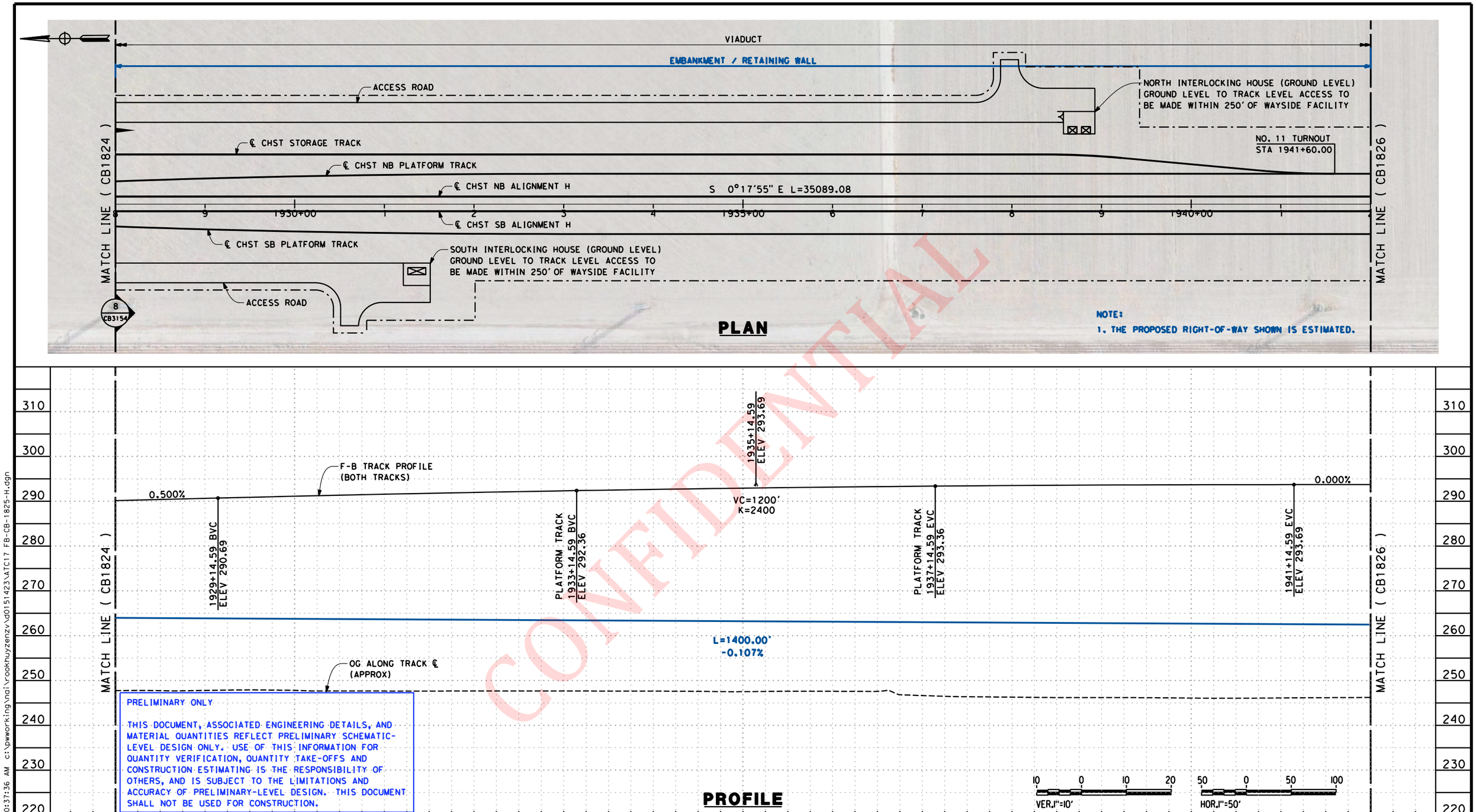
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1914+00 TO 1928+00
PLAN AND PROFILE

ATC 17
EXHIBIT A

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1824
SCALE AS SHOWN
SHEET NO. 18 OF 31

rookhuyzenzv 6/10/2014 10:37:22 AM c:\pwworking\nai\rookhuyzenzv\d0151423\ATC17 FB-CB-1824-H.dgn



CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/16/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

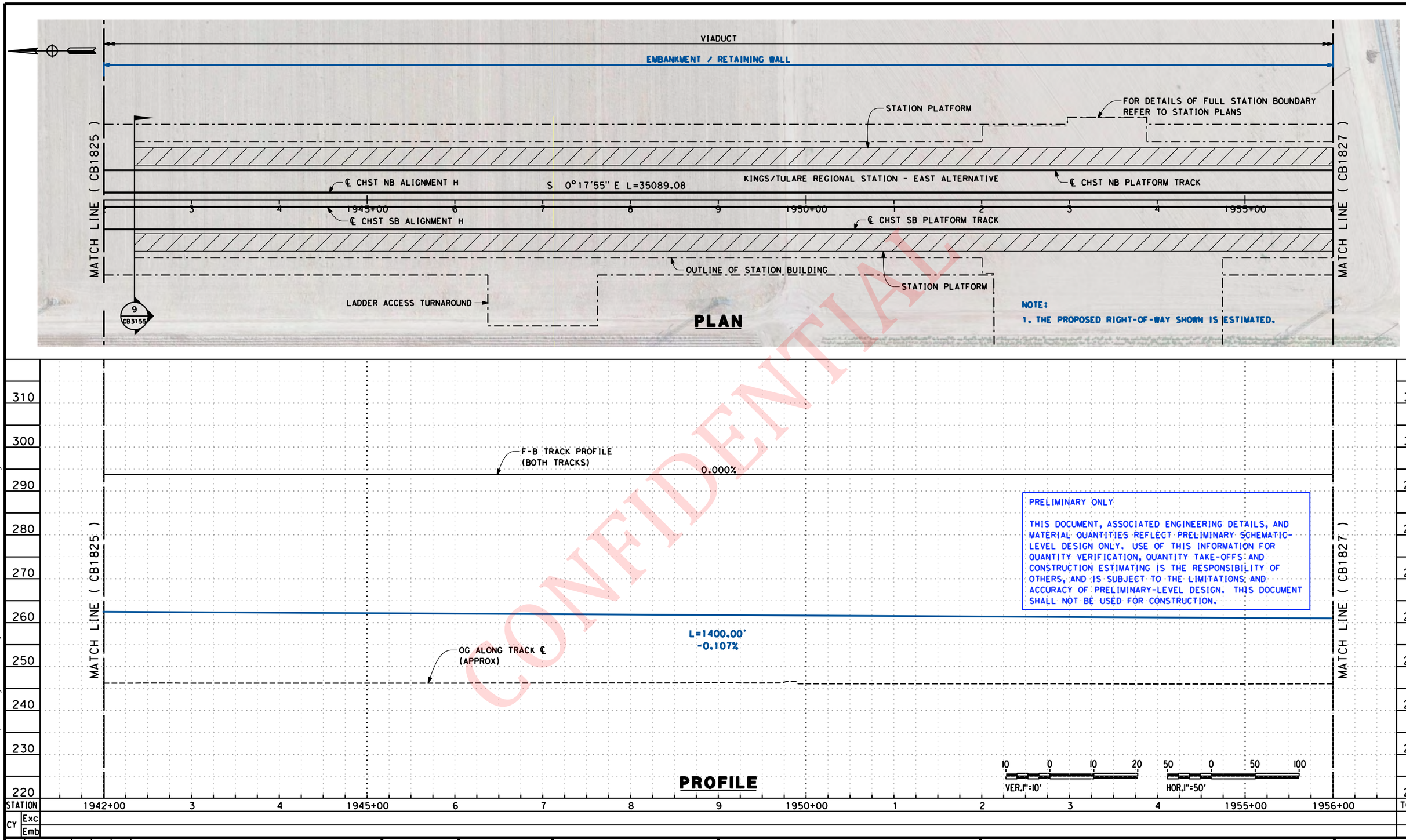
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1928+00 TO 1942+00
PLAN AND PROFILE

ATC 17
EXHIBIT A

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1825
SCALE AS SHOWN
SHEET NO. 19 OF 31

rookhuyzenzv 6/10/2014 10:37:36 AM c:\pwworking\nai\rookhuyzenzv\d0151423\ATC17 FB-CB-1825-H.dgn



CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

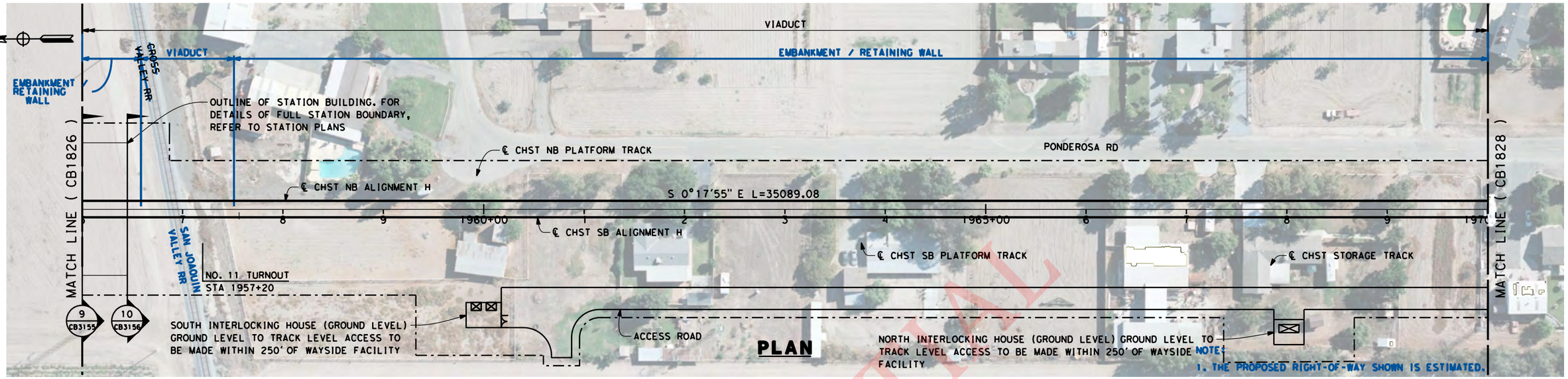
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1942+00 TO 1956+00
PLAN AND PROFILE

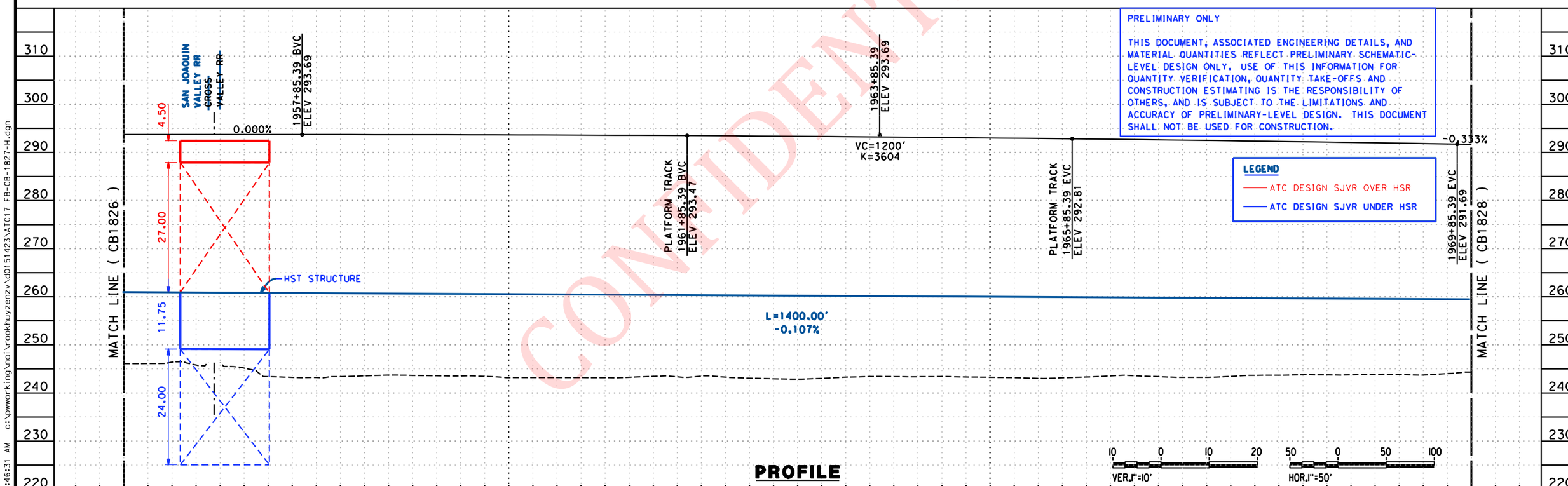
ATC 17
EXHIBIT A

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1826
SCALE AS SHOWN
SHEET NO. 20 OF 31

rookhuyzenzv 6/10/2014 10:37:46 AM c:\pwworking\nai\rookhuyzenzv\d0151423\ATC17 FB-CB-1826-H.dgn



PLAN



PROFILE

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

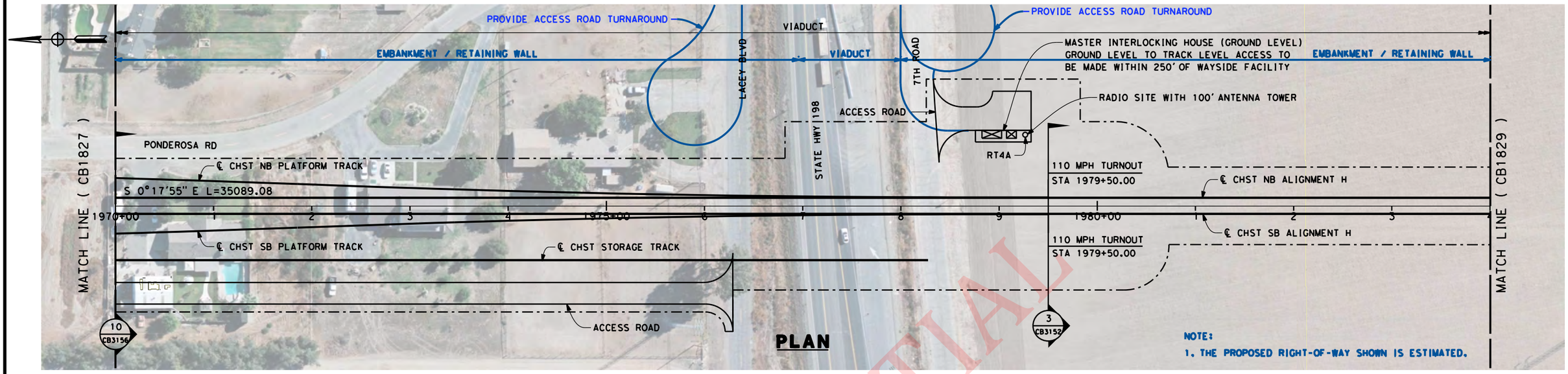
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

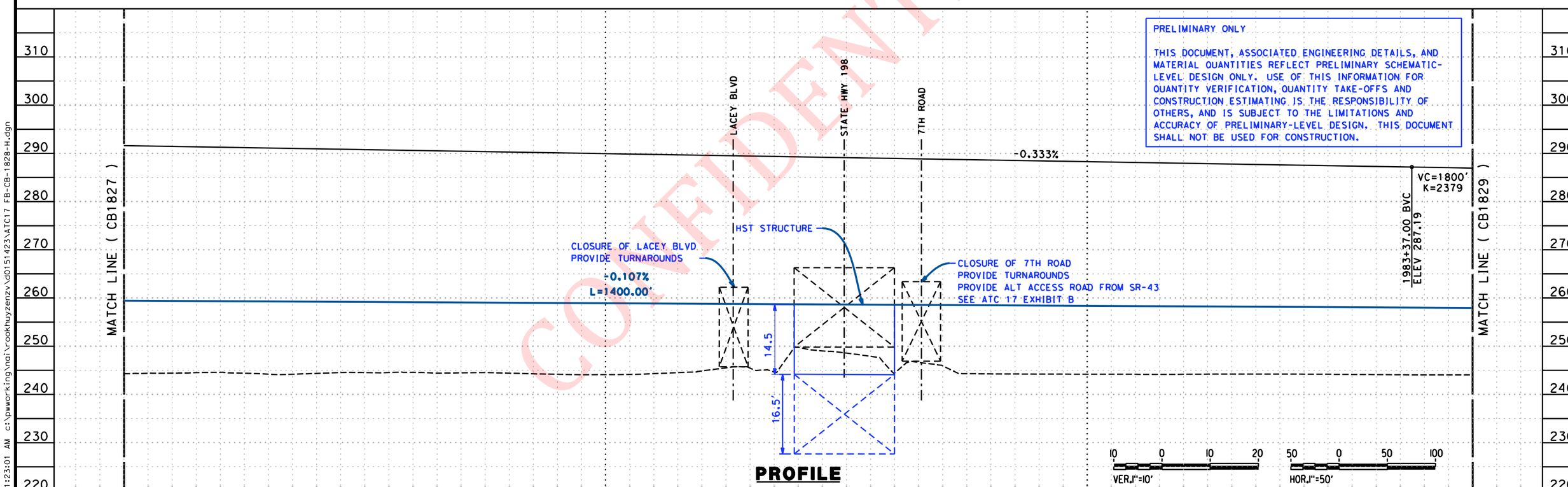
CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1956+00 TO 1970+00
PLAN AND PROFILE

ATC 17
EXHIBIT A

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1827
SCALE AS SHOWN
SHEET NO. 21 OF 31

rookhuyzenzv 6/11/2014 7:46:31 AM c:\pwworking\ngi\rookhuyzenzv\d0151423\ATC17 FB-CB-1827-H.dgn





CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION
-
NOT FOR CONSTRUCTION

DFS

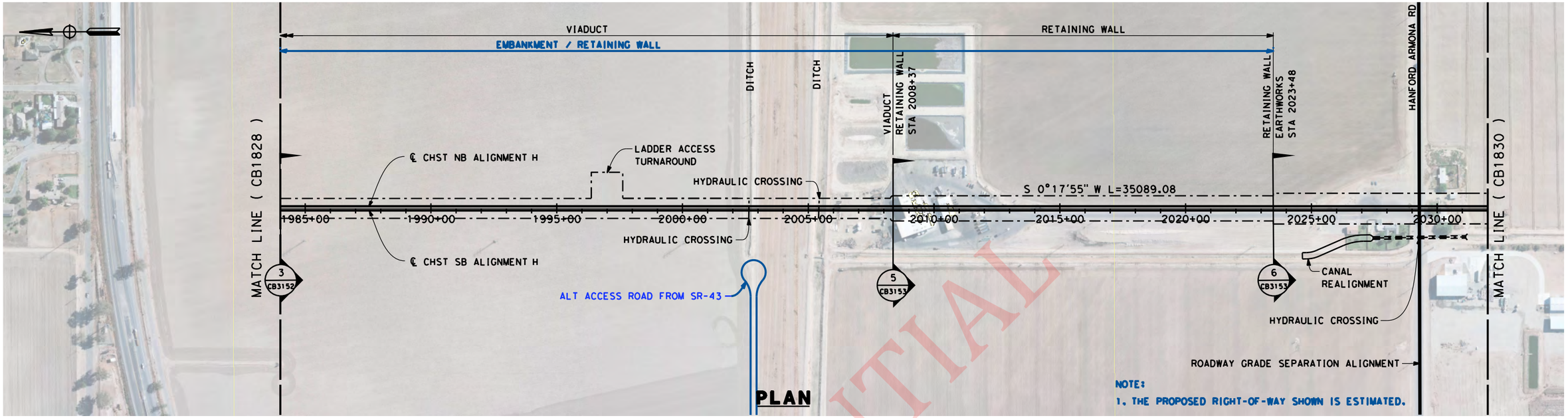
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1970+00 TO 1984+00
PLAN AND PROFILE

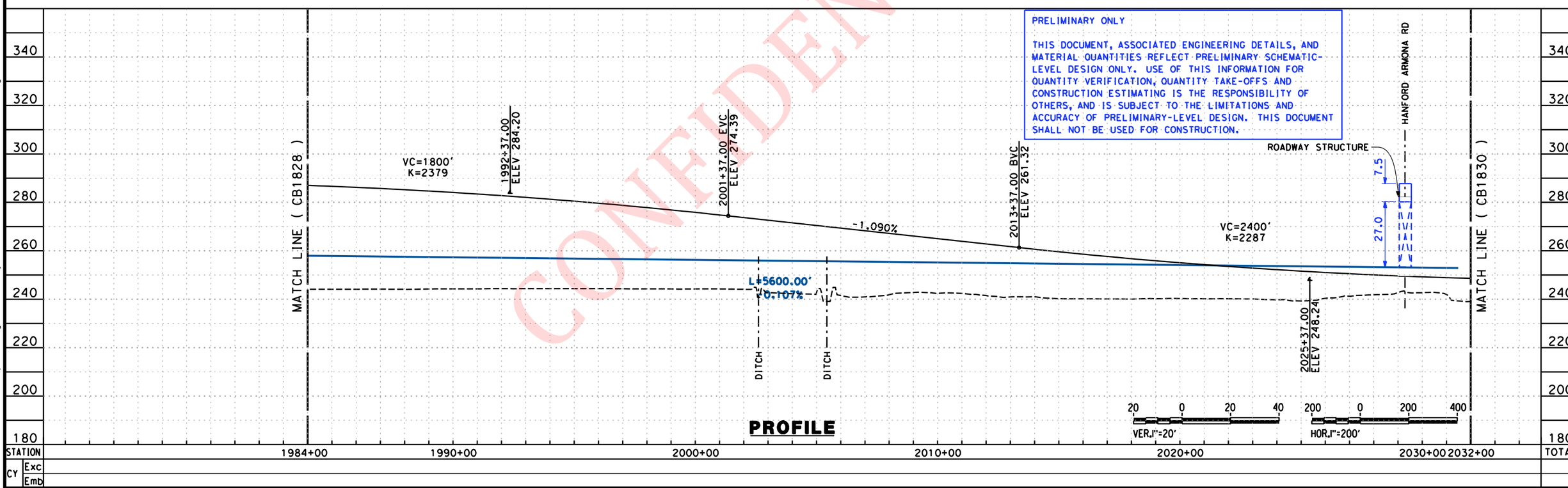
ATC 17
EXHIBIT A

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1828
SCALE AS SHOWN
SHEET NO. 22 OF 31

rookhuyzenzv 6/10/2014 11:23:01 AM c:\pwworking\nai\rookhuyzenzv\d0151423\ATC17 FB-CB-1828-H.dgn



PLAN



PROFILE

CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION
-
NOT FOR CONSTRUCTION

DFS

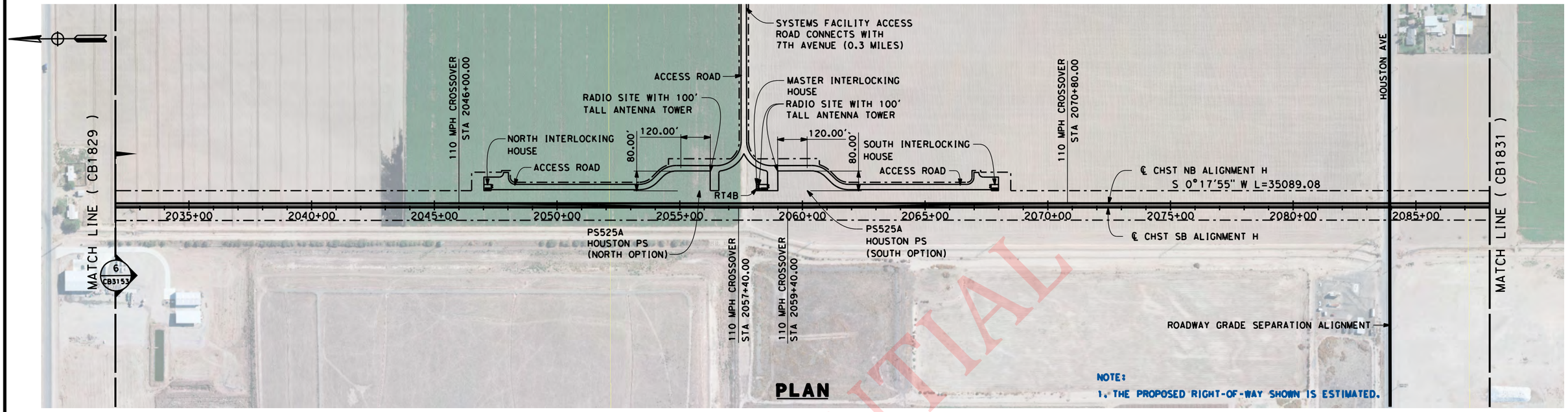
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1984+00 TO 2032+00
PLAN AND PROFILE

ATC 17
EXHIBIT A

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1829
SCALE AS SHOWN
SHEET NO. 23 OF 31

rookhuyzenzv 6/10/2014 11:21:44 AM c:\pwworking\nai\rookhuyzenzv\d0151423\ATC17 FB-CB-1829-H.dgn

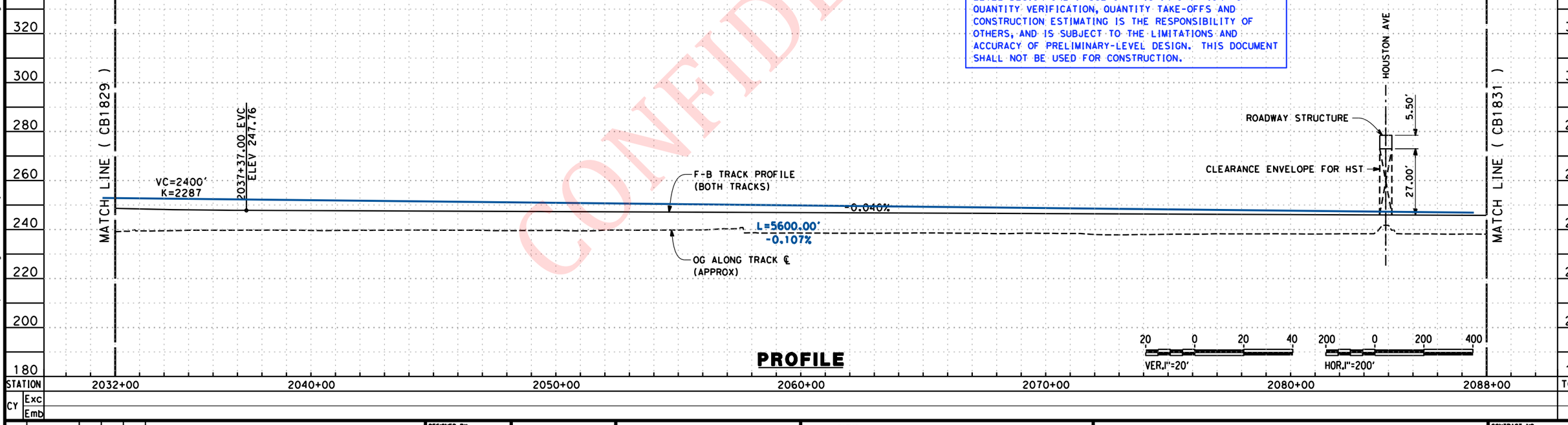


PLAN

CONFIDENTIAL

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



PROFILE

STATION	2032+00	2040+00	2050+00	2060+00	2070+00	2080+00	2088+00	TOTAL
CY Exc								
CY Emb								

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 2032+00 TO 2088+00
PLAN AND PROFILE

ATC 17 EXHIBIT A

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1830
SCALE AS SHOWN
SHEET NO. 24 OF 31

rookhuyzenzv 6/10/2014 10:39:13 AM c:\pwworking\nai\rookhuyzenzv\d0151423\ATC17 FB-CB-1830-H.dgn

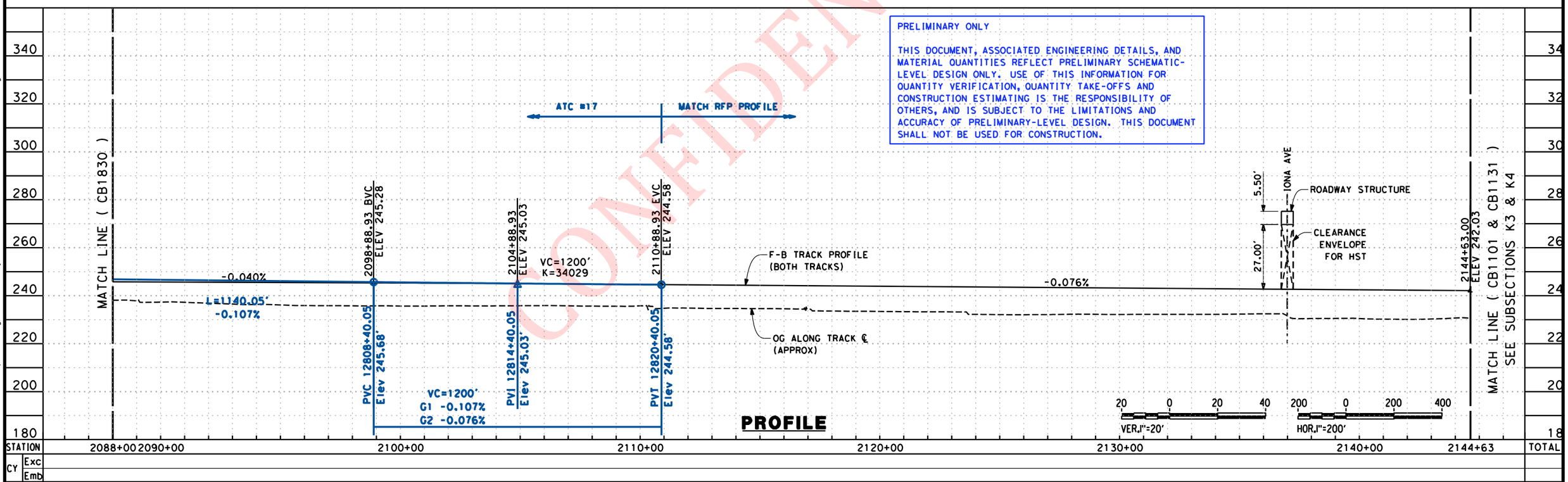
PLAN

NOTE:
1. THE PROPOSED RIGHT-OF-WAY SHOWN IS ESTIMATED.

CONFIDENTIAL

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 2088+00 TO 2144+63
PLAN AND PROFILE

ATC 17
EXHIBIT A

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1831
SCALE AS SHOWN
SHEET NO. 25 OF 31

6/10/2014 10:40:17 AM c:\pwworking\nai\rookhuyzenzv\d0151423\ATC17 FB-CB-1831-H.dgn
rookhuyzenzv

EXHIBIT B

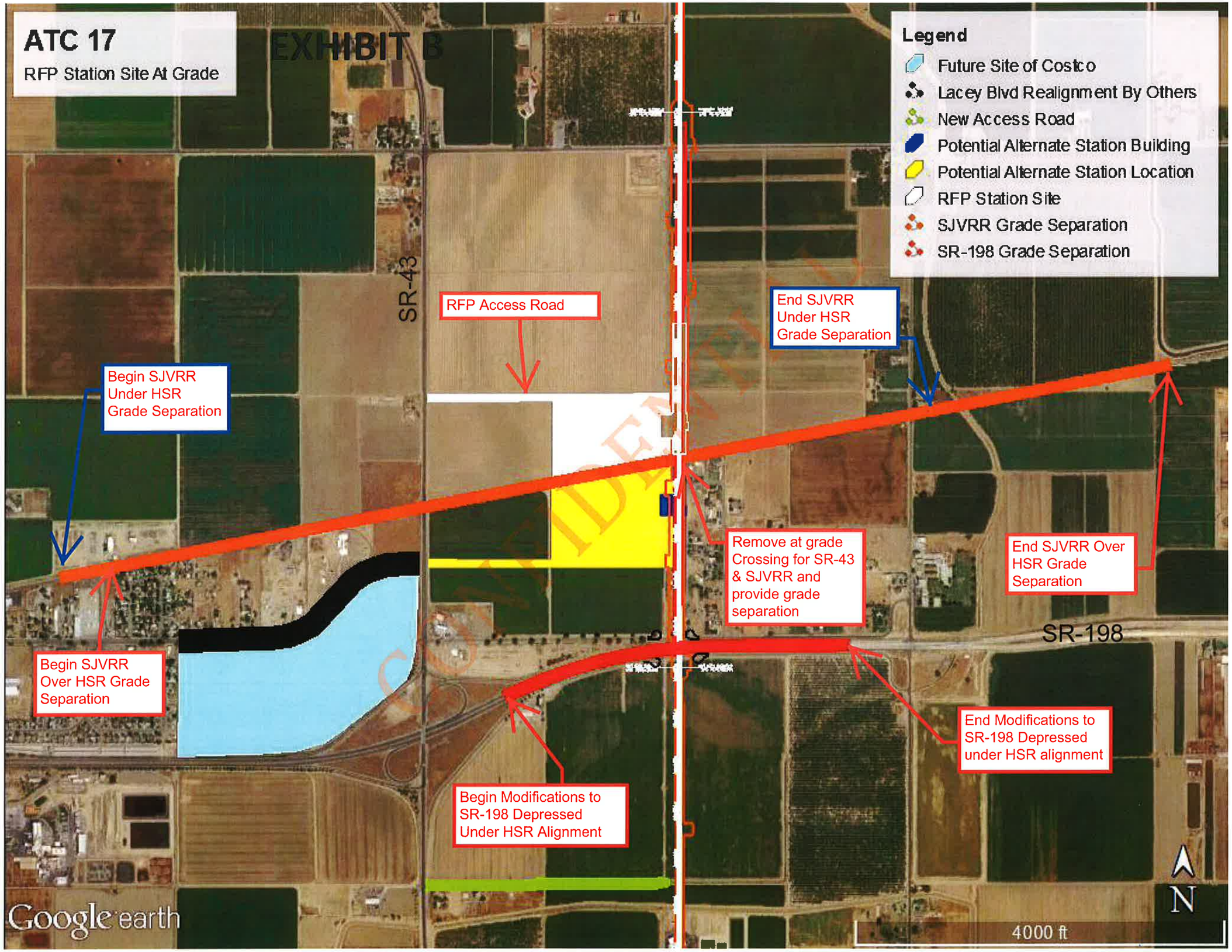
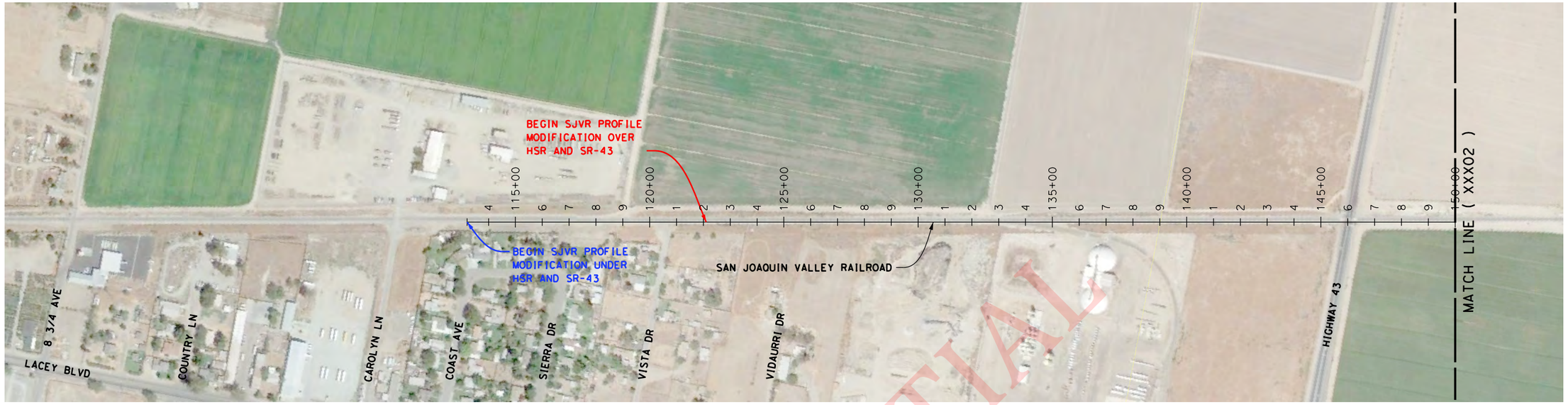

ATC 17
RFP Station Site At Grade
EXHIBIT B
Legend
Future Site of Costco
Lacey Blvd Realignment By Others
New Access Road
Potential Alternate Station Building
Potential Alternate Station Location
RFP Station Site
SJVRR Grade Separation
SR-198 Grade Separation
SR-43
RFP Access Road
End SJVRR Under HSR Grade Separation
Begin SJVRR Under HSR Grade Separation
Remove at grade Crossing for SR-43 & SJVRR and provide grade separation
End SJVRR Over HSR Grade Separation
SR-198
Begin SJVRR Over HSR Grade Separation
End Modifications to SR-198 Depressed under HSR alignment
Begin Modifications to SR-198 Depressed Under HSR Alignment
Google earth
N
4000 ft

EXHIBIT I



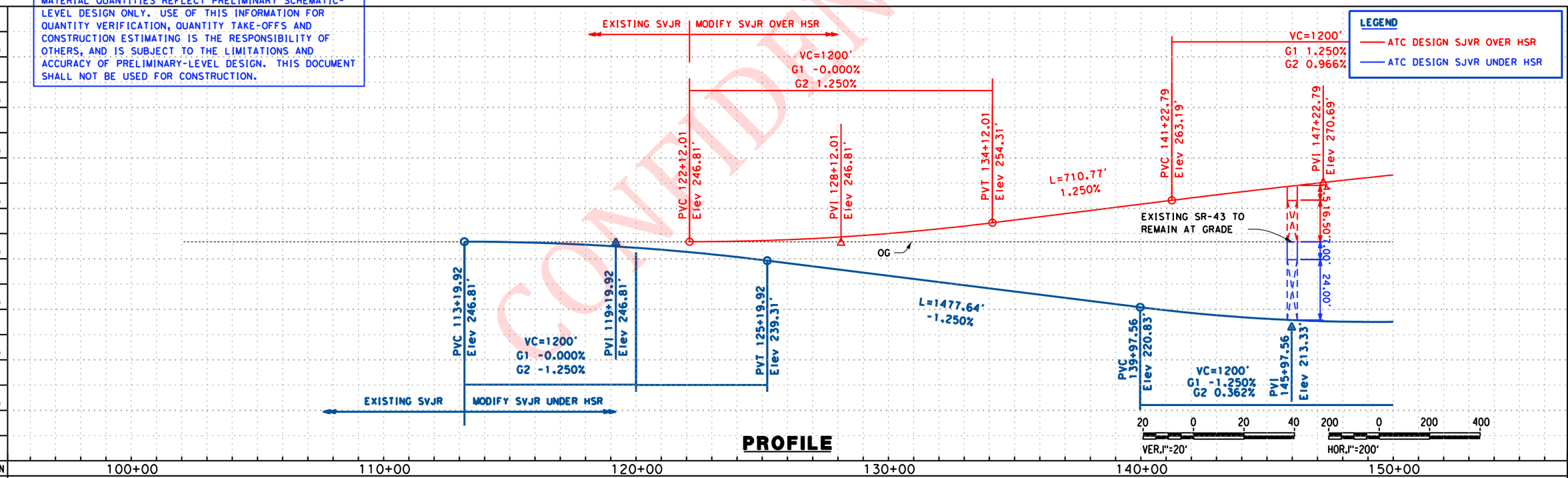
PLAN

NOTE:
1. THE PROPOSED RIGHT-OF-WAY SHOWN IS ESTIMATED.

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

CONFIDENTIAL



LEGEND
- ATC DESIGN SJVR OVER HSR
- ATC DESIGN SJVR UNDER HSR

PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/16/14

RECORD SET 15% DESIGN SUBMISSION
-
NOT FOR CONSTRUCTION

DFS

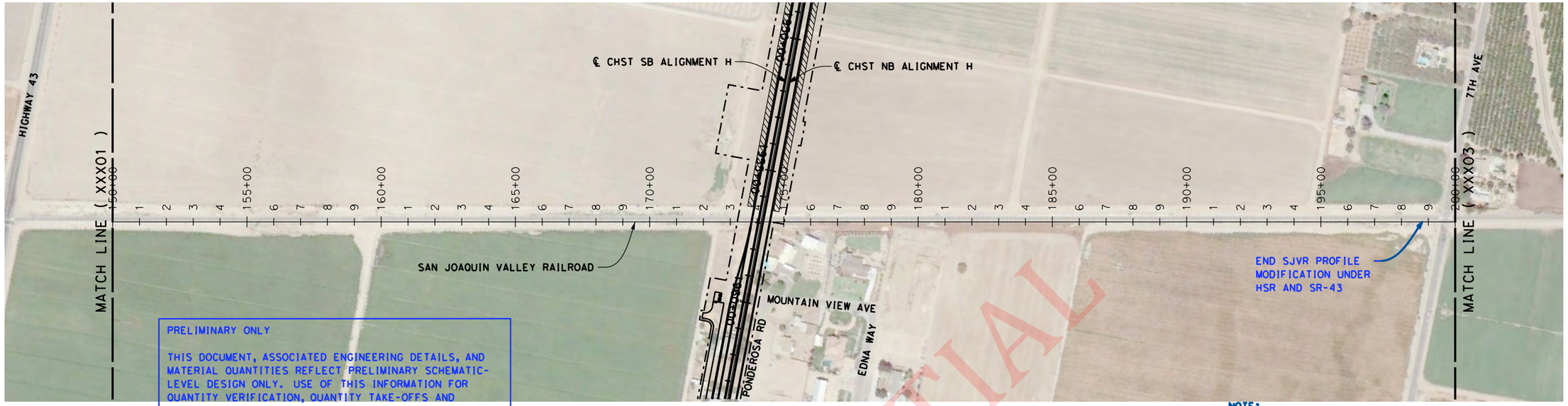
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT SJVR
STA. 113+20 TO 150+00
PLAN AND PROFILE

ATC 17
EXHIBIT C

CONTRACT NO. HSR 06-0003
DRAWING NO. XX
SCALE AS SHOWN
SHEET NO. 01 OF 03

c:\pwworking\nai\kiddbp\d0151423\ATC17 Exhibit C Sheet 1.dgn
6/10/2014 9:31:33 PM
KiddBP



PRELIMINARY ONLY

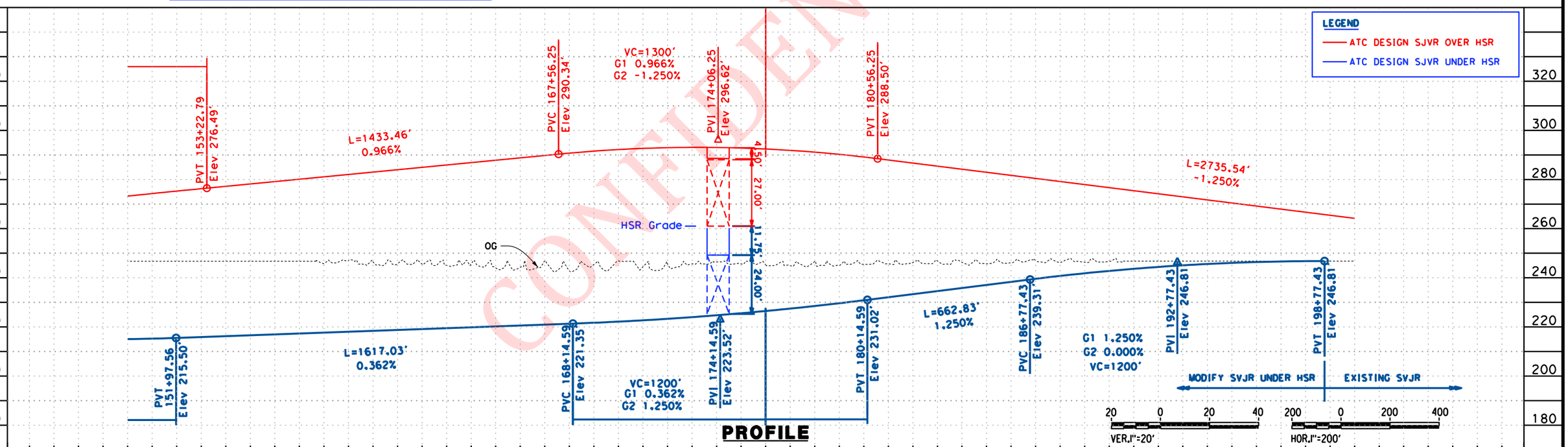
THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

PLAN

NOTE:

1. THE PROPOSED RIGHT-OF-WAY SHOWN IS ESTIMATED.

CONFIDENTIAL



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/16/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

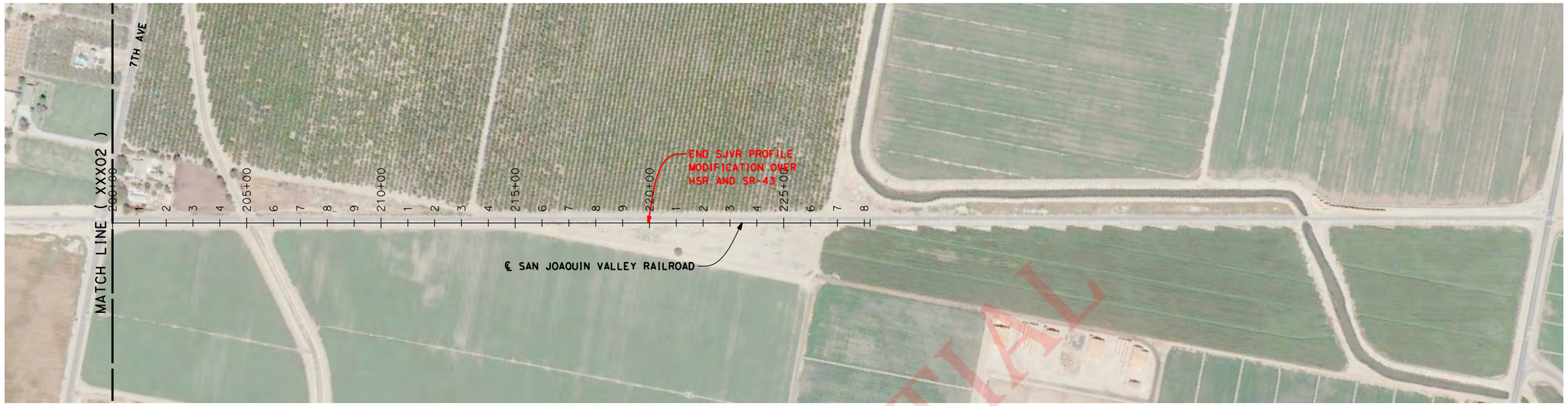
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT SJVR
STA. 150+00 TO 200+00
PLAN AND PROFILE

ATC 17
EXHIBIT C

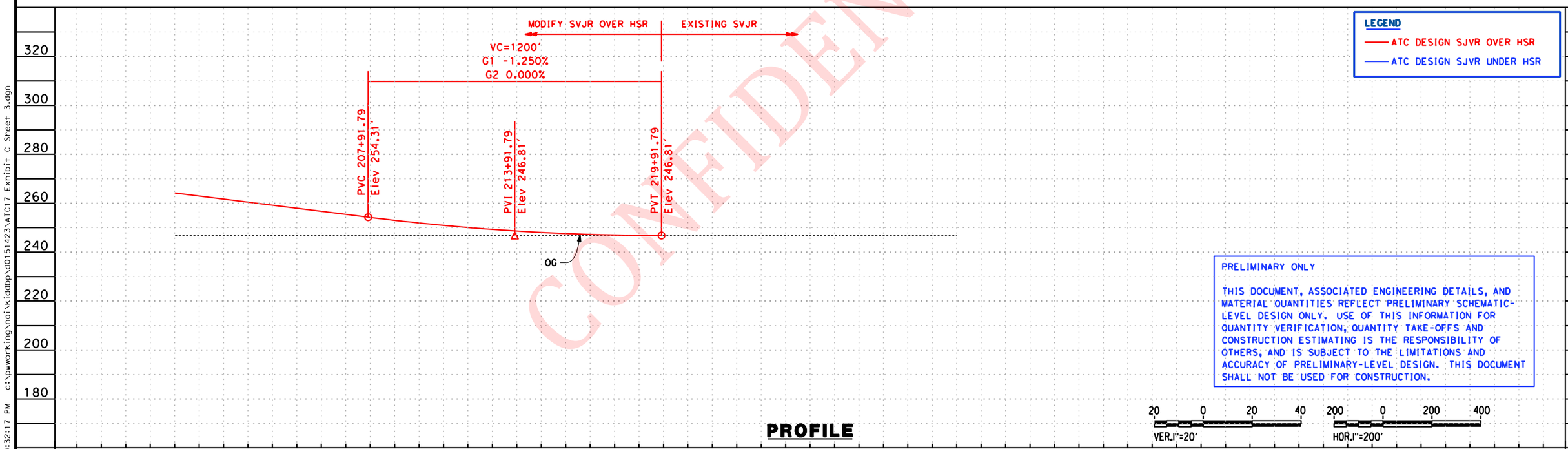
CONTRACT NO. HSR 06-0003
DRAWING NO. XX
SCALE AS SHOWN
SHEET NO. 02 OF 03

6/10/2014 9:31:44 PM c:\pwworking\nai\kiddbp\d0151423\ATC17 Exhibit C Sheet 2.dgn
KiddBP



PLAN

NOTE:
1. THE PROPOSED RIGHT-OF-WAY SHOWN IS ESTIMATED.



PROFILE

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/16/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

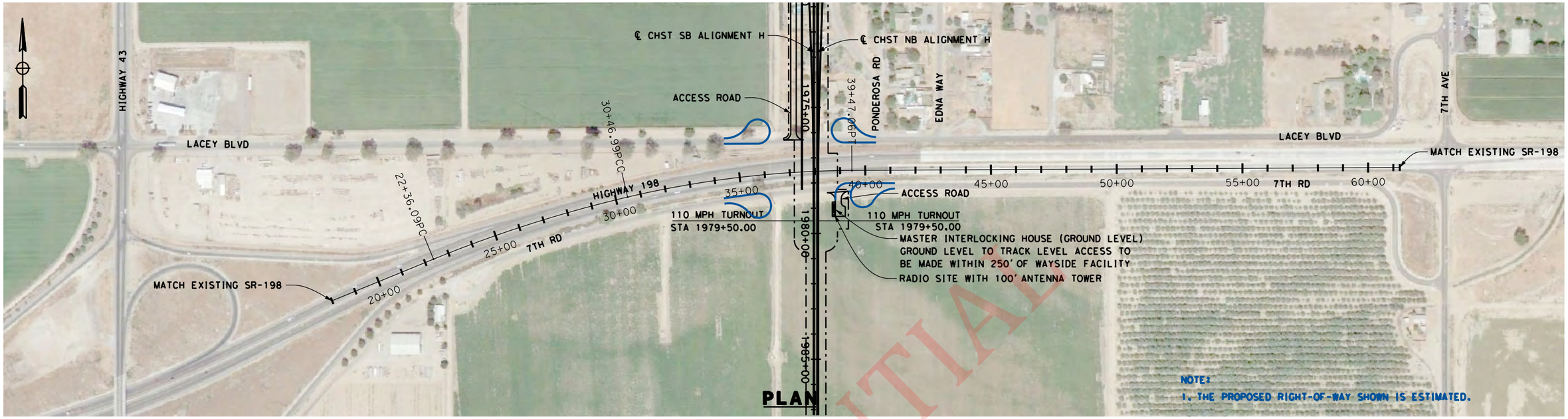
CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT SJVR
STA. 200+00 TO 228+22
PLAN AND PROFILE

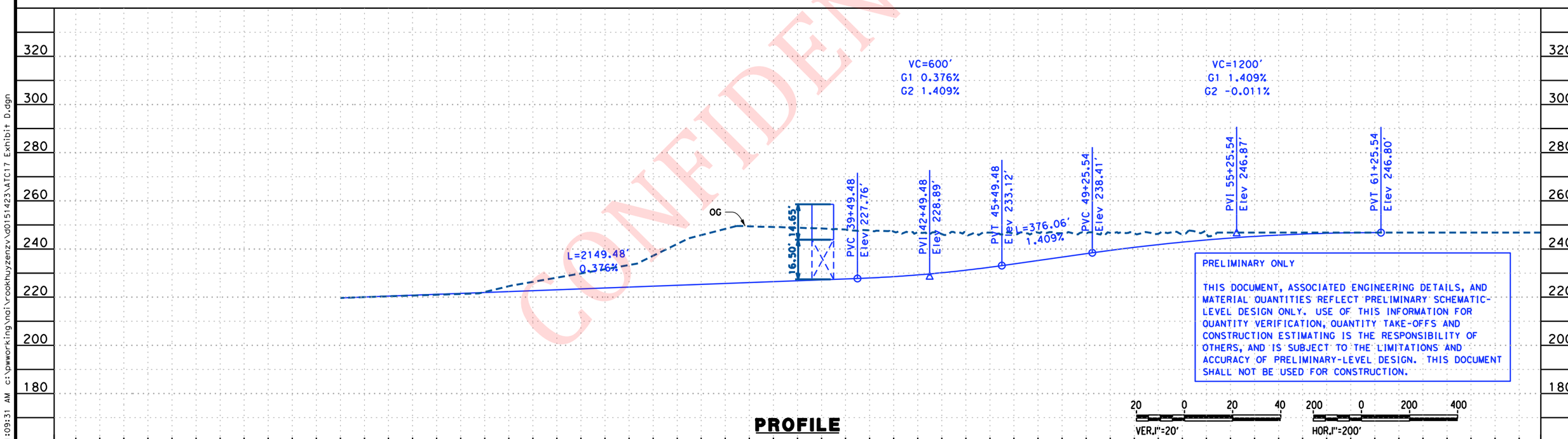
ATC 17
EXHIBIT C

CONTRACT NO. HSR 06-0003
DRAWING NO. XX
SCALE AS SHOWN
SHEET NO. 03 OF 03

6/10/2014 9:32:17 PM c:\pwworking\nai\kiddbp\d0151423\ATC17 Exhibit C Sheet 3.dgn
KiddBP

EXHIBIT 5





CONFIDENTIAL

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/16/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT SR-198
STA. 18+65 TO 56+27
PLAN AND PROFILE

ATC 17
EXHIBIT D

CONTRACT NO. HSR 06-0003
DRAWING NO. XX
SCALE AS SHOWN
SHEET NO. 01 OF 01

rookhuyzenzv 6/10/2014 11:09:31 AM c:\pwworking\nai\rookhuyzenzv\d0151423\ATC17 Exhibit D.dgn

EXHIBIT E

Exhibit E – Station Size Comparison

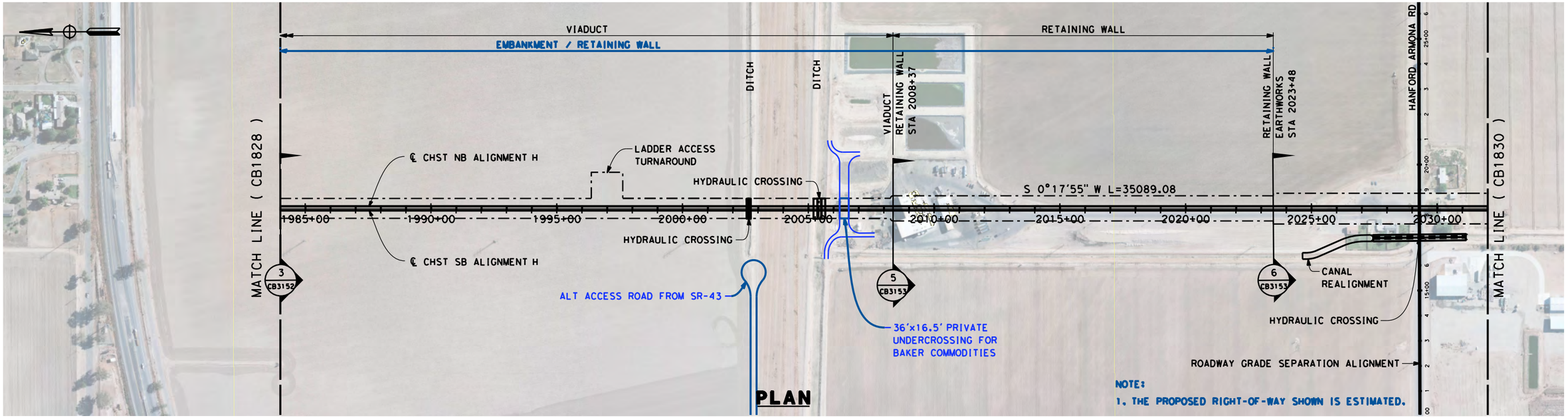
Proposed ATC 17 Station Concept

RFP Design – Examples of an Elevated Station

CONFIDENTIAL

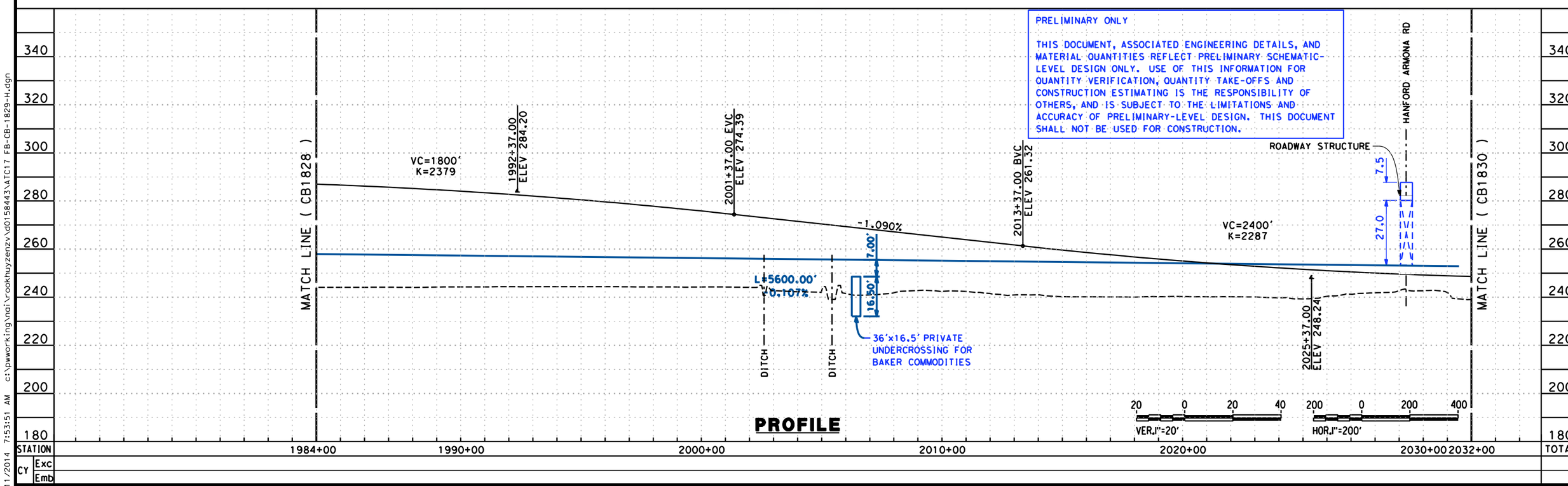
EXHIBIT F

(Submitted as part of the approved ATC as a separate submittal in response to the Authority's initial clarification request)



PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION
-
NOT FOR CONSTRUCTION

DFS

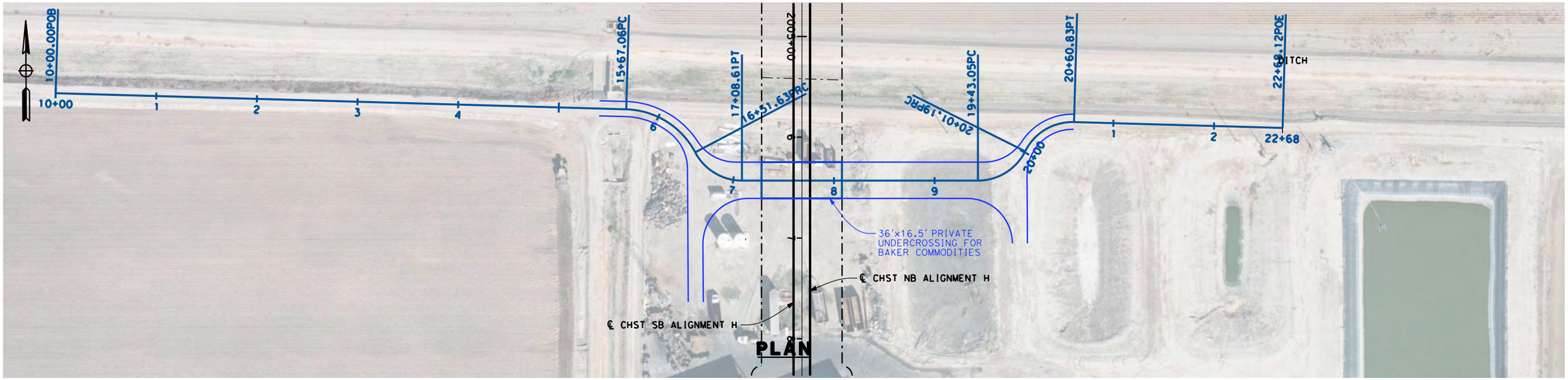
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

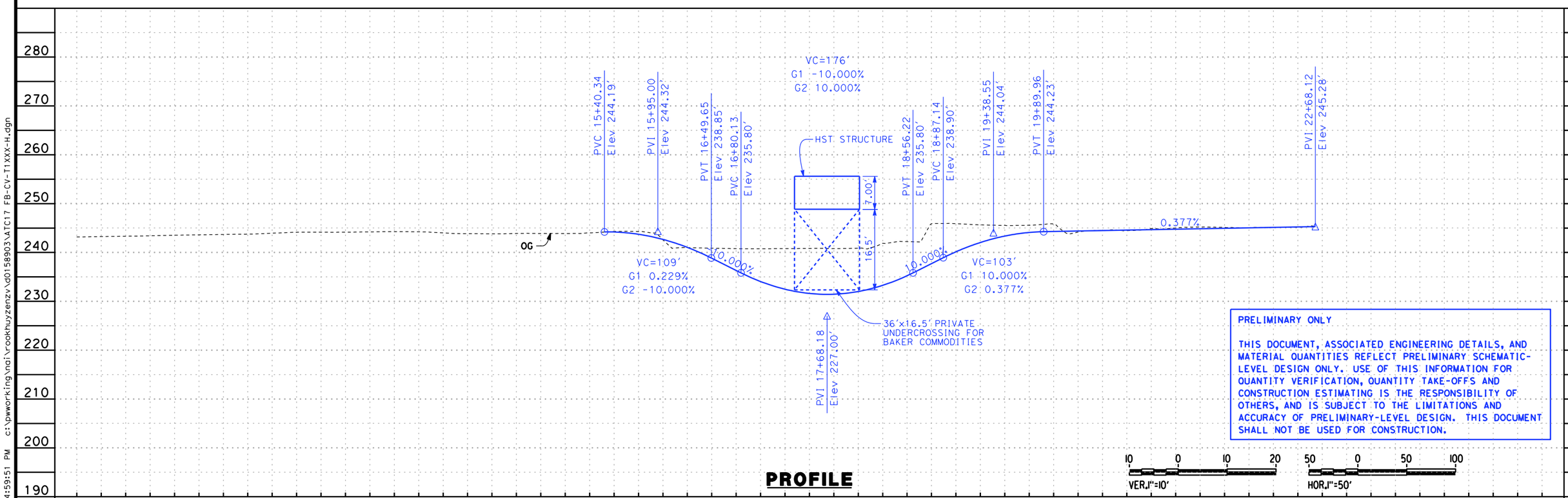
CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1984+00 TO 2032+00
PLAN AND PROFILE

ATC 17
EXHIBIT 1

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1829
SCALE AS SHOWN
SHEET NO. 23 OF 31

rookhuyzenzv 7/11/2014 7:53:51 AM c:\pwworking\nai\rookhuyzenzv\d0158443\ATC17 FB-CB-1829-H.dgn





REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 7/11/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

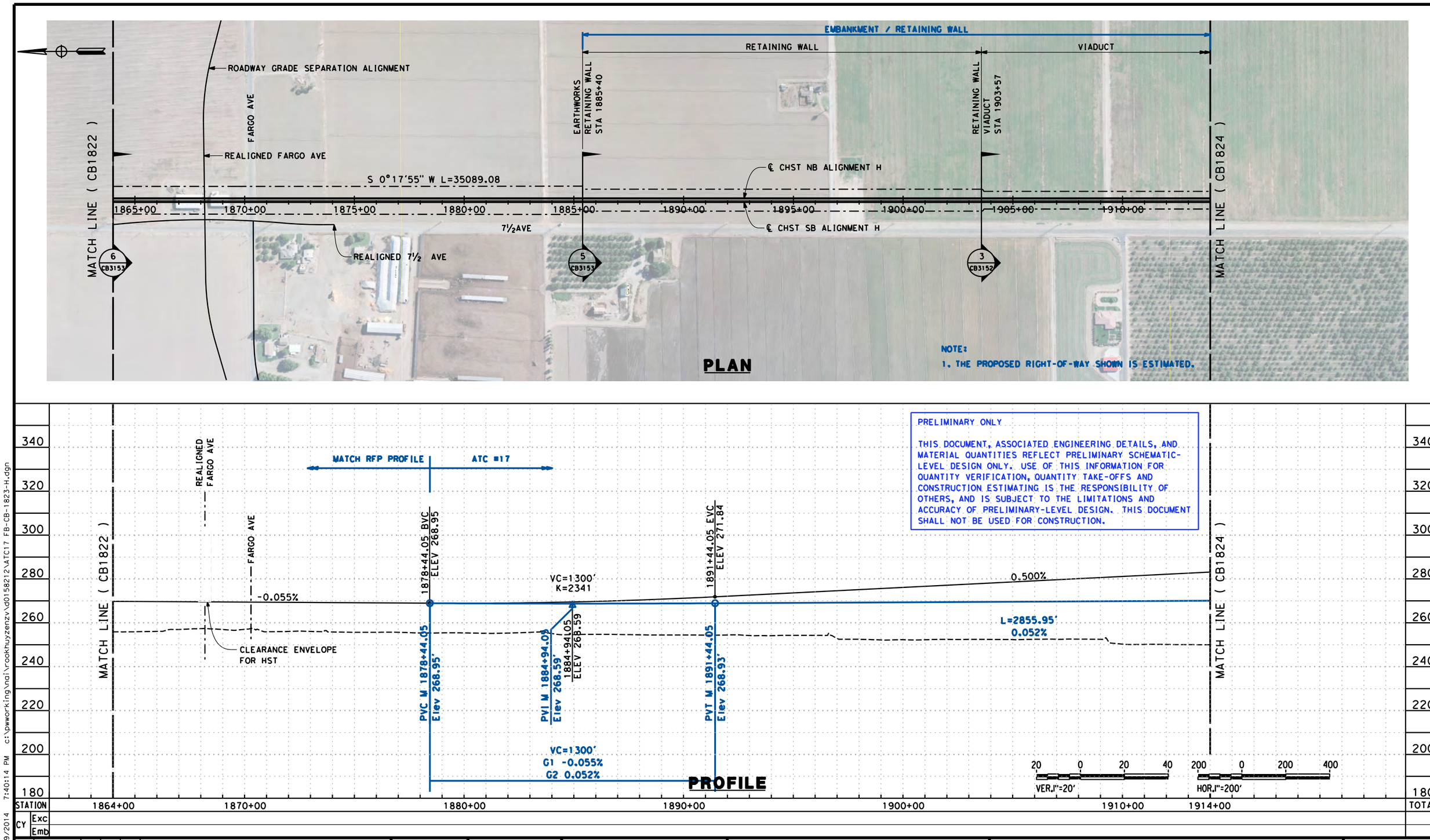
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
BAKER COMMODITIES
PRIVATE UNDERPASS
PLAN AND PROFILE

ATC 17
EXHIBIT 2

CONTRACT NO. HSR 06-0003
DRAWING NO. CT1XXX
SCALE AS SHOWN
SHEET NO. X OF XX

rookhuyzenzv 7/10/2014 4:59:51 PM c:\pwworking\nai\rookhuyzenzv\d0158903\ATC17 FB-CV-T1XXX-H.dgn



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 7/11/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

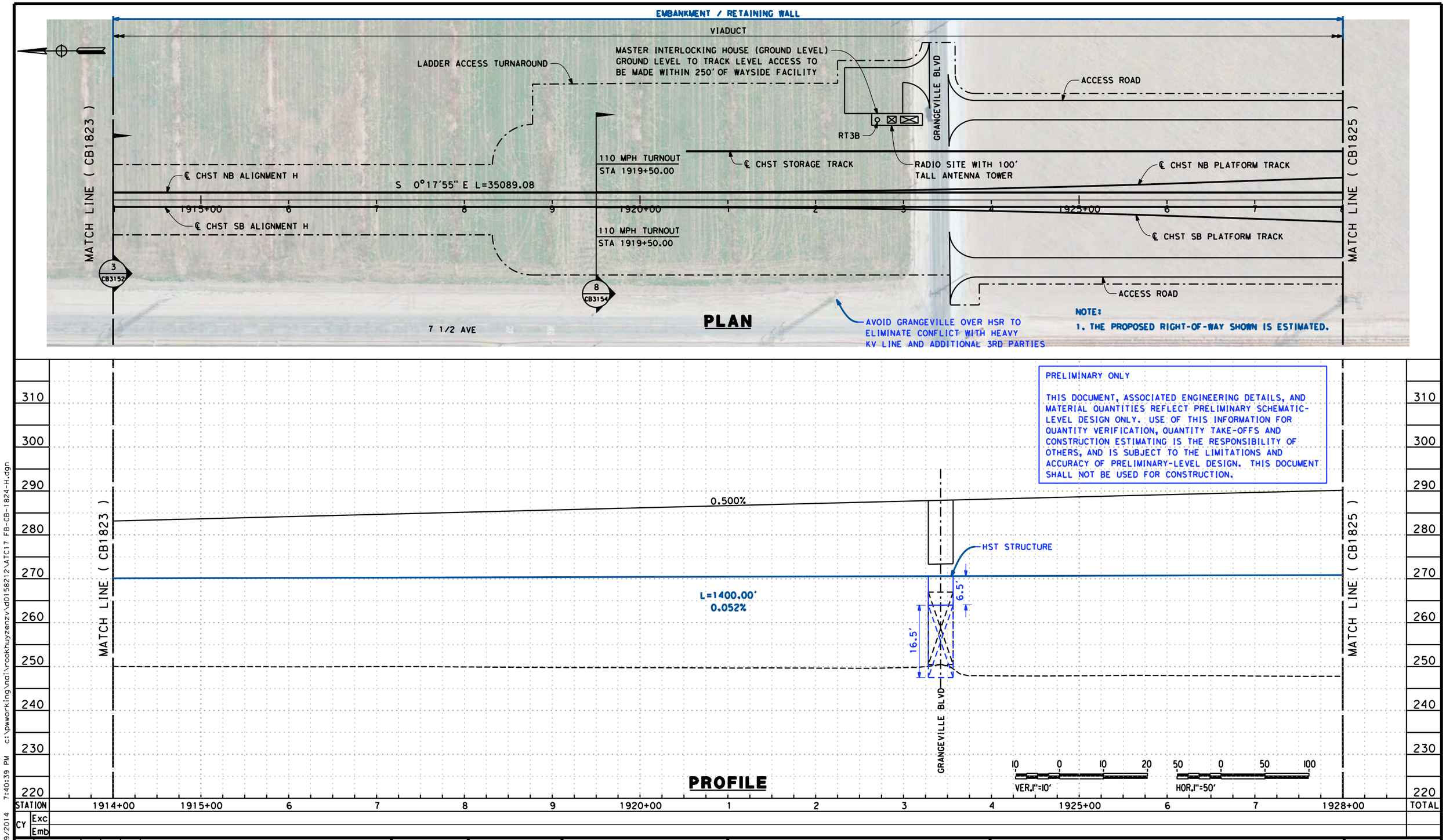
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1864+00 TO 1914+00
PLAN AND PROFILE

ATC 17
EXHIBIT 3

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1823
SCALE AS SHOWN
SHEET NO. 17 OF 31

rookhuyzenzv 7/9/2014 7:40:14 PM c:\pwworking\nai\rookhuyzenzv\d0158212\ATC17 FB-CB-1823-H.dgn



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/16/14

RECORD SET 15% DESIGN SUBMISSION
-
NOT FOR CONSTRUCTION

DFS

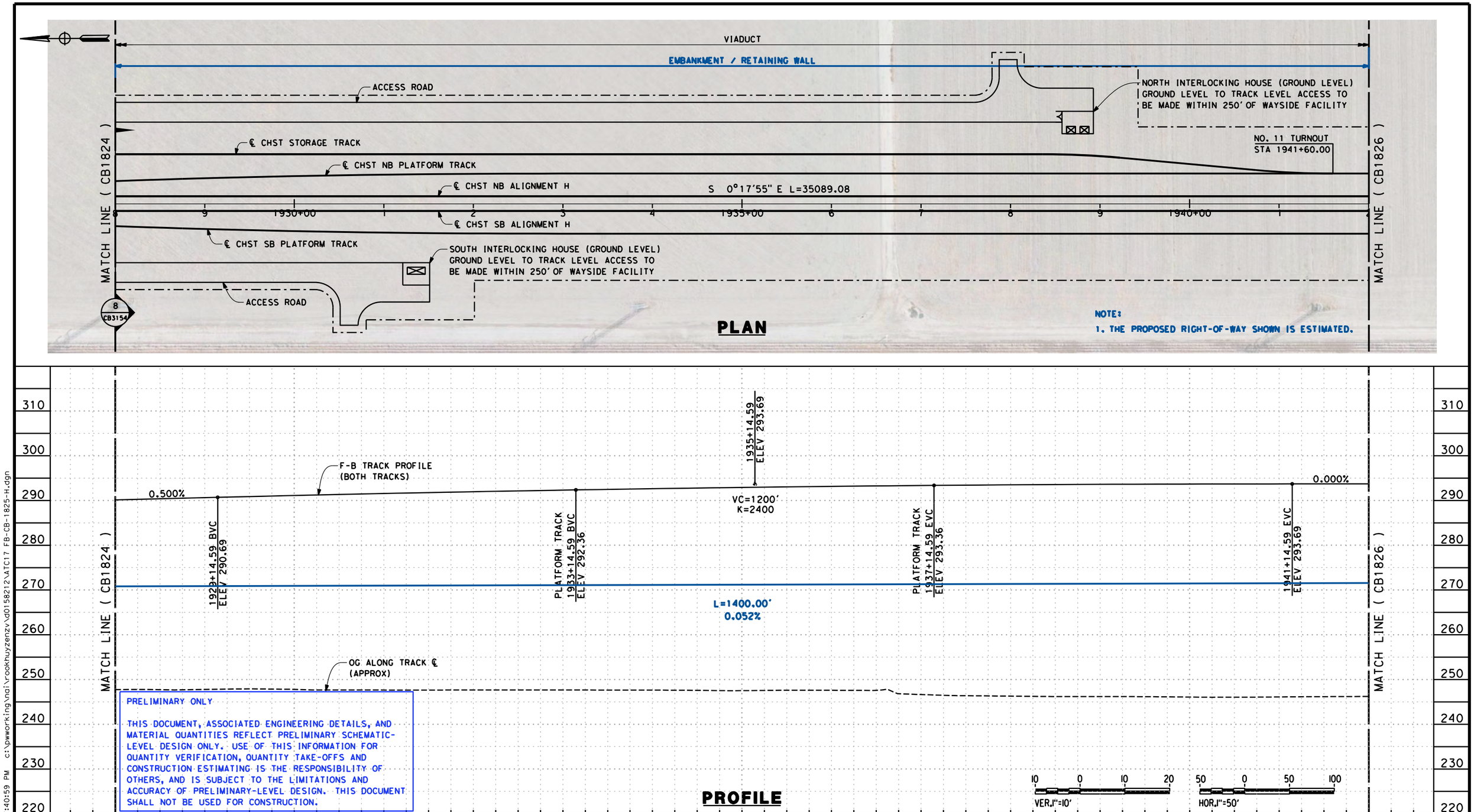
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1914+00 TO 1928+00
PLAN AND PROFILE

ATC 17
EXHIBIT 3

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1824
SCALE AS SHOWN
SHEET NO. 18 OF 31

rookhuyzenzv 7/9/2014 7:40:39 PM c:\pwworking\nai\rookhuyzenzv\d0158212\ATC17 FB-CB-1824-H.dgn



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/16/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

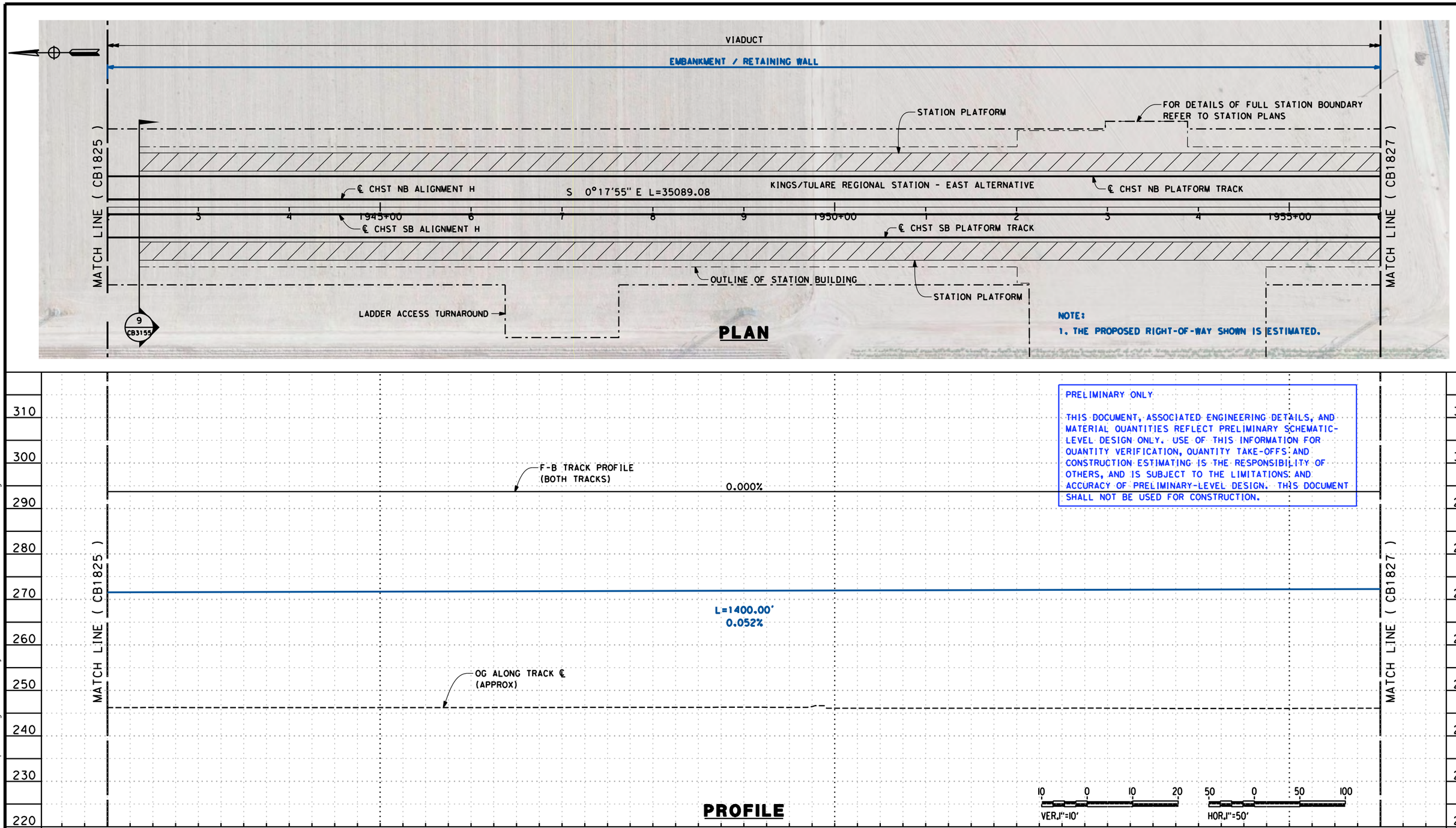
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1928+00 TO 1942+00
PLAN AND PROFILE

ATC 17
EXHIBIT 3

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1825
SCALE AS SHOWN
SHEET NO. 19 OF 31

rookhuyzenzv 7/9/2014 7:40:59 PM c:\pwworking\ngi\rookhuyzenzv\d0158212\ATC17 FB-CB-1825-H.dgn



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

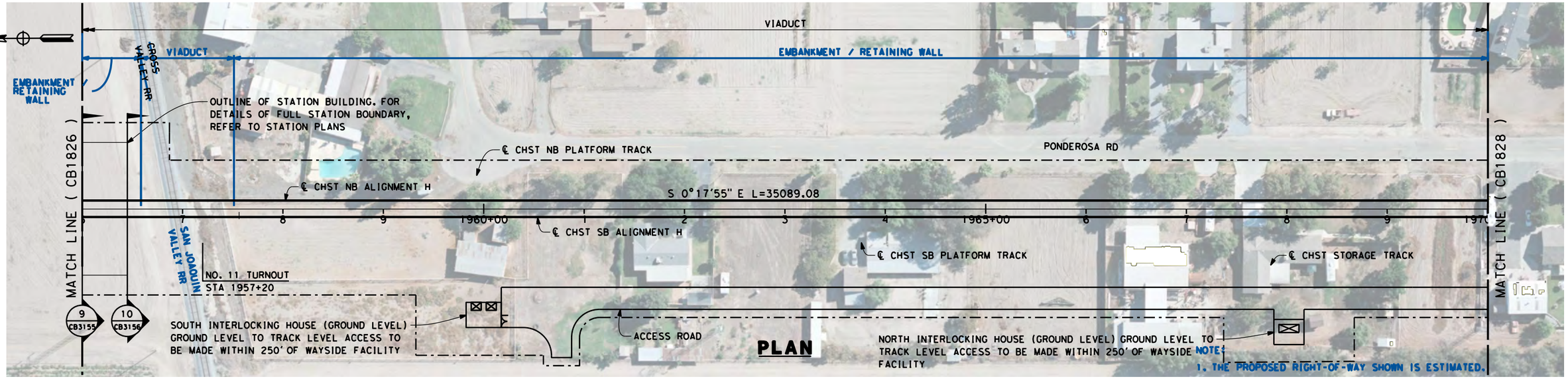
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1942+00 TO 1956+00
PLAN AND PROFILE

ATC 17
EXHIBIT 3

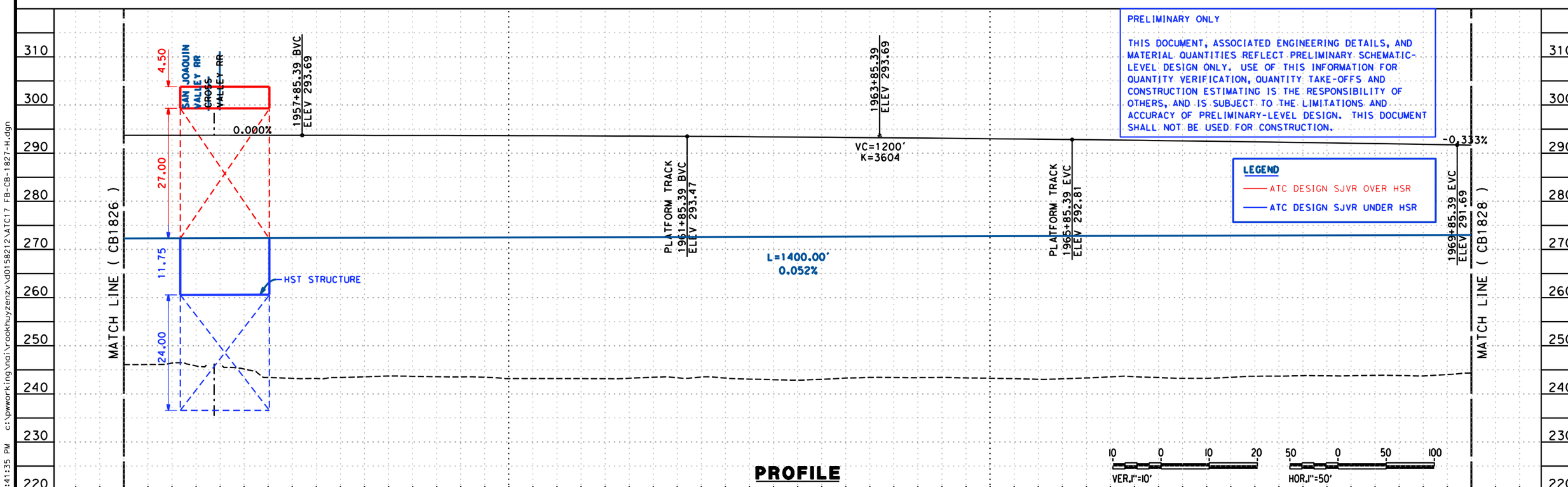
CONTRACT NO. HSR 06-0003
DRAWING NO. CB1826
SCALE AS SHOWN
SHEET NO. 20 OF 31

rookhuyzenzv 7/9/2014 7:41:18 PM c:\pwworking\nai\rookhuyzenzv\d0158212\ATC17 FB-CB-1826-H.dgn



PLAN

NOTE:
1. THE PROPOSED RIGHT-OF-WAY SHOWN IS ESTIMATED.



PROFILE

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

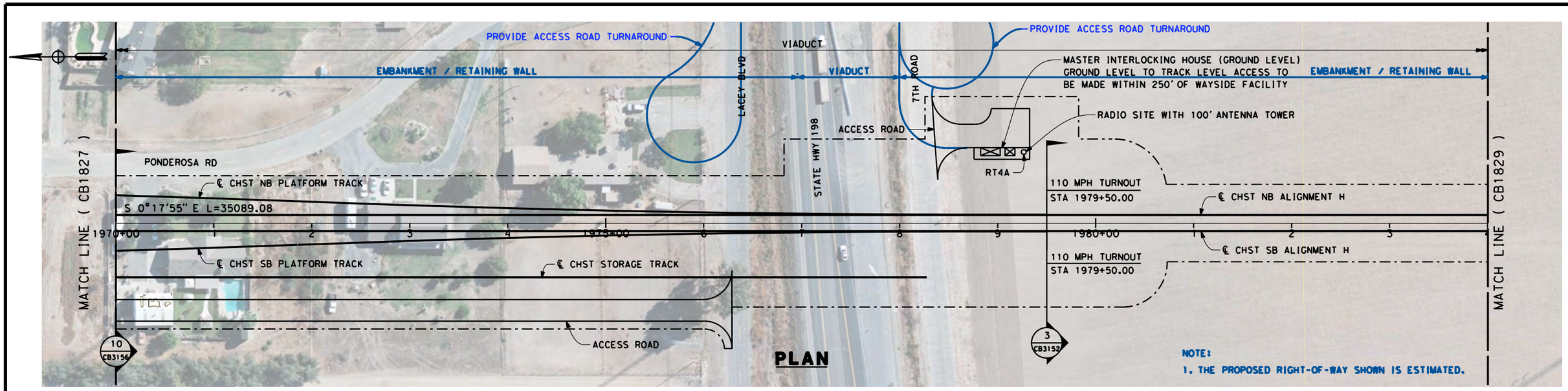
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1956+00 TO 1970+00
PLAN AND PROFILE

ATC 17
EXHIBIT 3

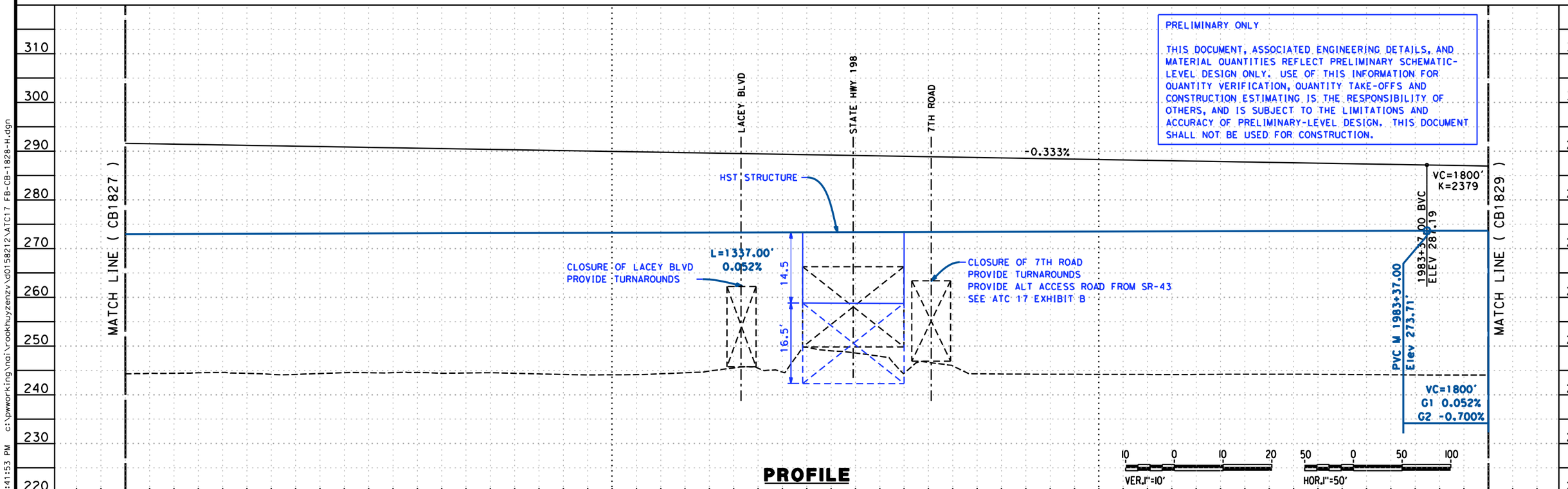
CONTRACT NO. HSR 06-0003
DRAWING NO. CB1827
SCALE AS SHOWN
SHEET NO. 21 OF 31

c:\pwworking\nai\rookhuyzenzv\d0158212\ATC17 FB-CB-1827-H.dgn 7:41:35 PM 7/9/2014 rookhuyzenzv



PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION
-
NOT FOR CONSTRUCTION

DFS

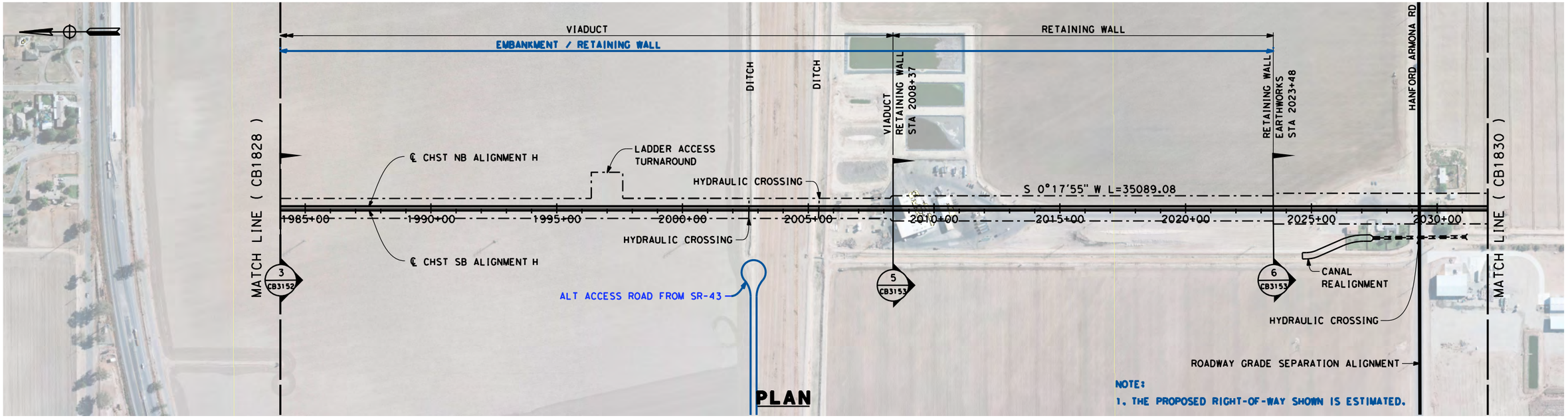
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1970+00 TO 1984+00
PLAN AND PROFILE

ATC 17
EXHIBIT 3

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1828
SCALE AS SHOWN
SHEET NO. 22 OF 31

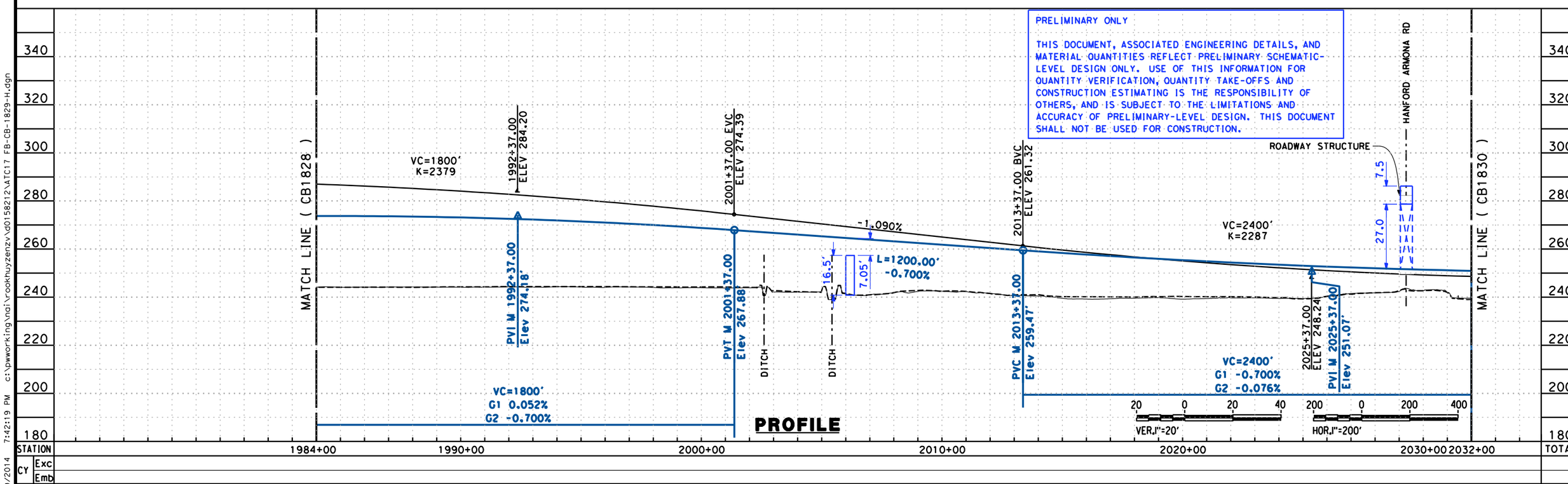
rookhuyzenzv 7/9/2014 7:41:53 PM c:\pwworking\nai\rookhuyzenzv\d0158212\ATC17 FB-CB-1828-H.dgn



PLAN

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION
-
NOT FOR CONSTRUCTION

DFS

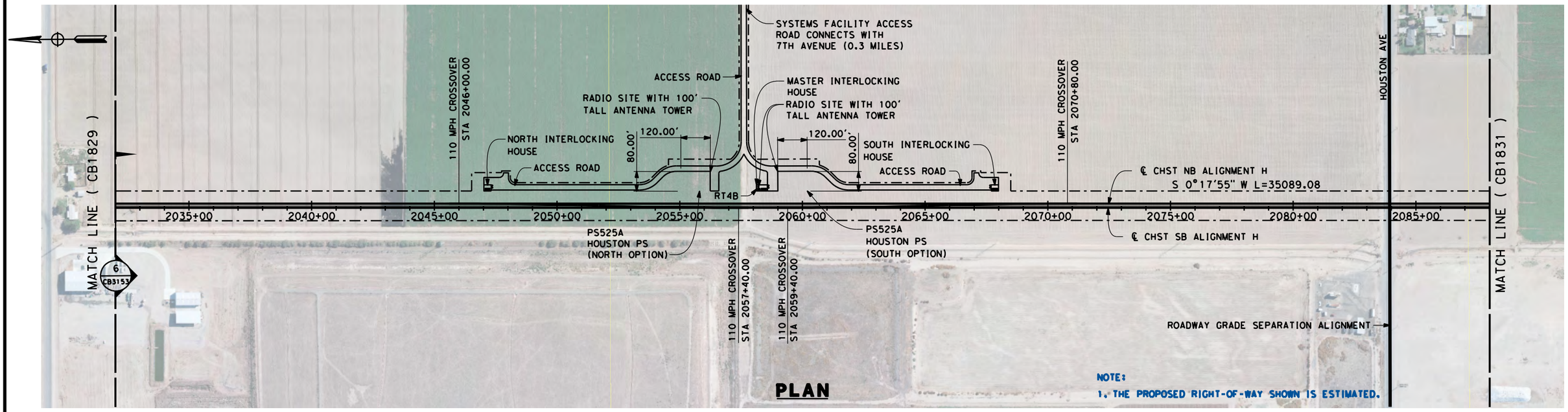
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 1984+00 TO 2032+00
PLAN AND PROFILE

ATC 17
EXHIBIT 3

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1829
SCALE AS SHOWN
SHEET NO. 23 OF 31

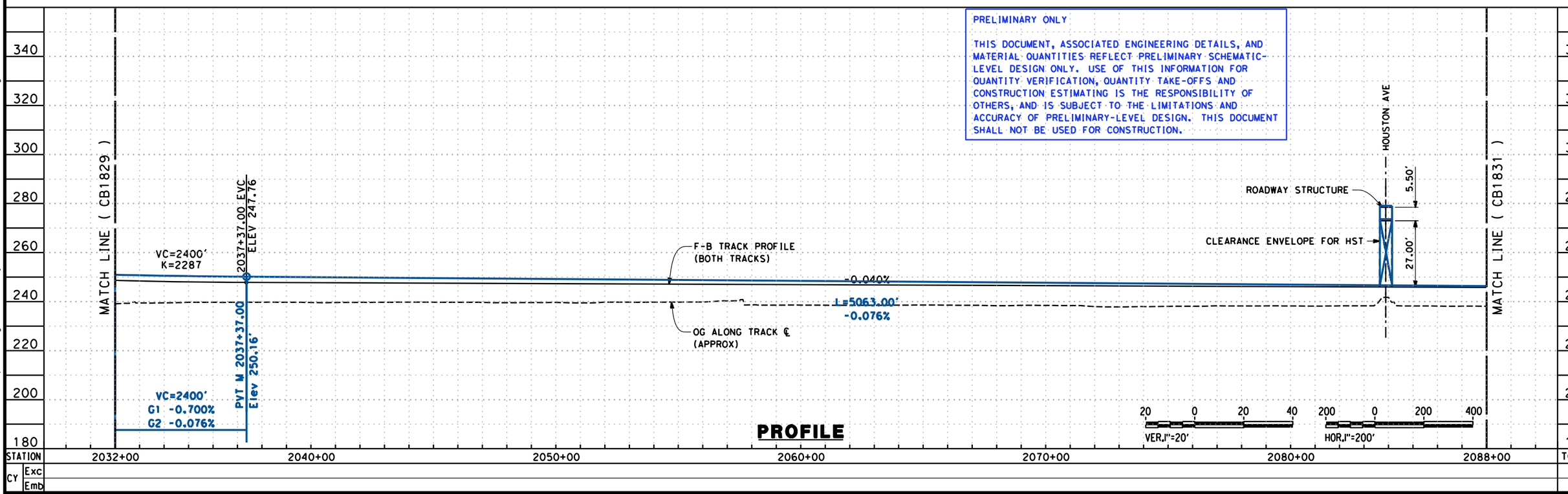
rookhuyzenzv 7/9/2014 7:42:19 PM c:\pwworking\nai\rookhuyzenzv\d0158212\ATC17 FB-CB-1829-H.dgn



PLAN

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION - NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 2032+00 TO 2088+00
PLAN AND PROFILE

ATC 17 EXHIBIT 3

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1830
SCALE AS SHOWN
SHEET NO. 24 OF 31

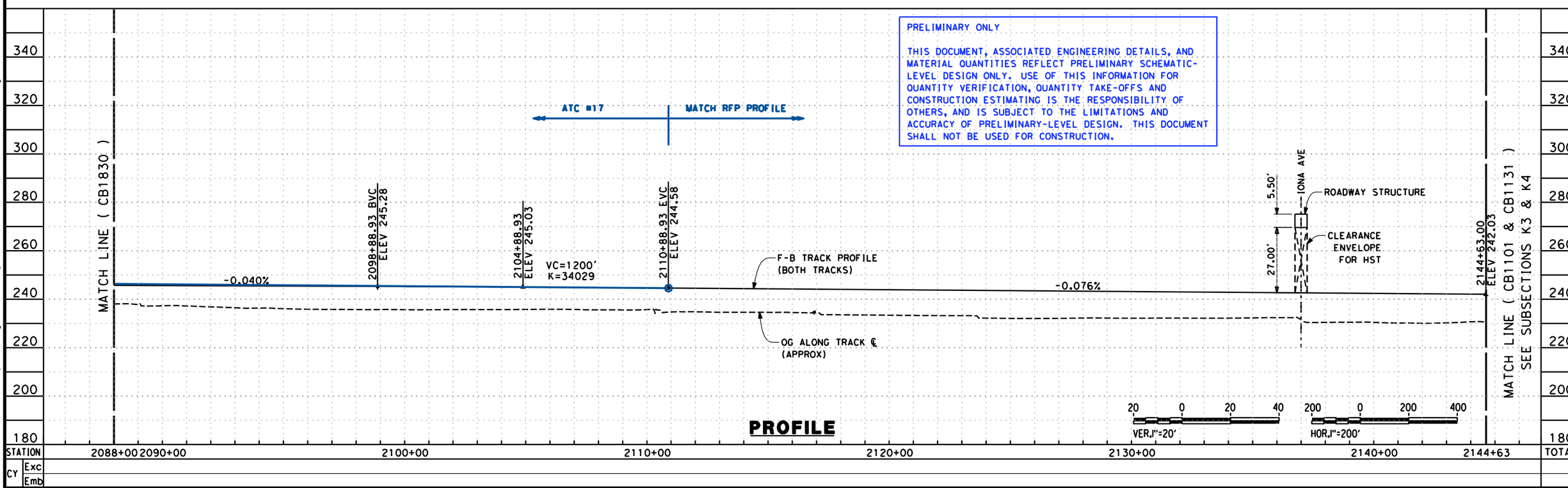
rookhuyzenzv 7/9/2014 7:42:45 PM c:\pwworking\nai\rookhuyzenzv\d0158212\ATC17 FB-CB-1830-H.dgn

NOTE:
1. THE PROPOSED RIGHT-OF-WAY SHOWN IS ESTIMATED.

PLAN

PRELIMINARY ONLY

THIS DOCUMENT, ASSOCIATED ENGINEERING DETAILS, AND MATERIAL QUANTITIES REFLECT PRELIMINARY SCHEMATIC-LEVEL DESIGN ONLY. USE OF THIS INFORMATION FOR QUANTITY VERIFICATION, QUANTITY TAKE-OFFS AND CONSTRUCTION ESTIMATING IS THE RESPONSIBILITY OF OTHERS, AND IS SUBJECT TO THE LIMITATIONS AND ACCURACY OF PRELIMINARY-LEVEL DESIGN. THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION.



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ROJO
DRAWN BY Z. ROOKHUYZEN
CHECKED BY E. KARAM
IN CHARGE R. TREVETT
DATE 5/21/14

RECORD SET 15% DESIGN SUBMISSION
-
NOT FOR CONSTRUCTION

DFS

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
HANFORD SUBSECTION
ALIGNMENT H
STA. 2088+00 TO 2144+63
PLAN AND PROFILE

ATC 17
EXHIBIT 3

CONTRACT NO. HSR 06-0003
DRAWING NO. CB1831
SCALE AS SHOWN
SHEET NO. 25 OF 31

rookhuyzenzv 7/9/2014 7:43:09 PM c:\pwworking\nai\rookhuyzenzv\d0158212\ATC17 FB-CB-1831-H.dgn