cog
Council of Governments

sb

cta
County Transportation Authority

AGENDA
Board of Directors Metro Valley Study Session

September 14, 2023

Start Time: 9:20 AM

Location

San Bernardino County Transportation Authority
First Floor Lobby Board Room
1170 W. 3rd Street, San Bernardino, CA 92410

Board of Directors

Valley Representatives

Study Session Chair
Joe Baca, Jr., Supervisor
Fifth District

Study Session Vice-Chair
Eunice Ulloa, Mayor
City of Chino

Ray Marquez, Council Member
City of Chino Hills

Frank Navarro, Mayor
City of Colton

Acquanetta Warren, Mayor
City of Fontana

Sylvia Rodriguez-Robles, Council Member
City of Grand Terrace

Larry McCallon, Mayor
City of Highland

Rhodes "Dusty" Rigsby, Council Member
City of Loma Linda

John Dutrey, Mayor
City of Montclair

Alan Wapner, Council Member
City of Ontario

L. Dennis Michael, Mayor
City of Rancho Cucamonga

Paul Barich, Mayor Pro Tem
City of Redlands

Deborah Robertson, Mayor
City of Rialto

Helen Tran, Mayor
City of San Bernardino

Rudy Zuniga, Council Member
City of Upland

Bobby Duncan, Mayor Pro Tem
City of Yucaipa

Mountain/Desert Representatives

Daniel Ramos, Mayor Pro Tem
City of Adelanto

Art Bishop, Council Member
Town of Apple Valley

Vacant
City of Barstow

Rick Herrick, Council Member
City of Big Bear Lake

Rebekah Swanson, Council Member
City of Hesperia

Janet Jernigan, Mayor
City of Needles

Joel Klink, Council Member
City of Twentynine Palms

Debra Jones, Mayor
City of Victorville

Rick Denison, Mayor
Town of Yucca Valley

County Board of Supervisors

Paul Cook, *First District*

Jesse Armendarez, *Second District*

Dawn Rowe, *Third District*

Curt Hagman, *Fourth District*

Ex-Officio Member – Catalino Pining, Caltrans
Ray Wolfe, Executive Director
Julianna Tillquist, General Counsel

San Bernardino County Transportation Authority
San Bernardino Council of Governments

AGENDA

Board of Directors Metro Valley Study Session

September 14, 2023
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First Floor Lobby Board Room
1170 W. 3rd Street, San Bernardino, CA 92410

Items listed on the agenda are intended to give notice to members of the public of a general description of matters to be discussed or acted upon. The posting of the recommended actions does not indicate what action will be taken. The Board may take any action that it deems to be appropriate on the agenda item and is not limited in any way by the notice of the recommended action.

To obtain additional information on any items, please contact the staff person listed under each item. You are encouraged to obtain any clarifying information prior to the meeting to allow the Board to move expeditiously in its deliberations. Additional ***"Meeting Procedures"*** and agenda explanations are attached to the end of this agenda.

CALL TO ORDER

(Meeting Chaired by Joe Baca Jr.)

i. Pledge of Allegiance

ii. Attendance

iii. Announcements

iv. Agenda Notices/Modifications - Natalie Lopez

Possible Conflict of Interest Issues

Note agenda item contractors, subcontractors and agents which may require member abstentions due to conflict of interest and financial interests. Board Member abstentions shall be stated under this item for recordation on the appropriate item.

1. Information Relative to Possible Conflict of Interest Pg. 9

Note agenda items and contractors/subcontractors, which may require member abstentions due to possible conflicts of interest.

This item is prepared for review by Board of Directors and Committee Members.

INFORMATIONAL ITEMS

Items listed are receive and file items and are expected to be routine and non-controversial. Unlike the Consent Calendar, items listed as Informational Items do not require a vote.

2. Project Delivery Contract Change Orders to On-Going Contracts Pg. 10

Receive and file Change Order Report.
Presenter: Kristi Harris

This item is not scheduled for review by any other policy committee or technical advisory committee.

DISCUSSION ITEMS

Discussion - Project Delivery

3. Interstate 15 Corridor Freight and Express Lanes Construction and Maintenance Agreement for Mission Boulevard Overhead Crossing with Union Pacific Railroad and California Department of Transportation Pg. 17

That the following be reviewed and recommended for final approval by the Board of Directors, acting as the San Bernardino County Transportation Authority (SBCTA), at a regularly scheduled Board meeting:

Authorize the Executive Director, or his designee, to execute Agreement No. 23-1002940 between Union Pacific Railroad, California Department of Transportation, and SBCTA for defining roles, responsibilities, and funding for the construction and maintenance of the Interstate 15 Corridor Freight and Express Lanes Project at the Mission Boulevard Overhead in the amount of $153,000, subject to approval as to form by SBCTA General Counsel, or her designee.
Presenter: Sal Chavez

This item is not scheduled for review by any other policy committee or technical advisory committee. SBCTA General Counsel and Risk Manager have reviewed this item and the draft agreement.

4. Interstate 10 Corridor Freight and Express Lanes - Contract 2 Release Request for Proposals for Construction Management Services Pg. 104

That the following be reviewed and recommended for final approval by the Board of Directors, acting as the San Bernardino County Transportation Authority, at a regularly scheduled Board meeting:

Authorize the release of Request for Proposals No. 23-1002960 for Construction Management Services for the Interstate 10 Corridor Freight and Express Lanes Project – Contract 2.
Presenter: Khalid Bazmi

This item is not scheduled for review by any other policy committee or technical advisory committee. SBCTA General Counsel, Procurement Manager and Risk Manager have reviewed this item and the draft RFP.

Public Comment

Brief Comments from the General Public

Note: Public Comment will only be allowed on items listed on this agenda during this committee meeting. No public comment will be allowed on committee items placed on the Consent Agenda at the Board of Directors meeting. If an item has substantially changed after consideration during the committee meeting, the item will be placed on Discussion for Board and public comment will be allowed.

Comments from Board Members

Brief Comments from Board Members

ADJOURNMENT

Additional Information

The next Board of Directors Metro Valley Study Session is scheduled for October 12, 2023.

Meeting Procedures and Rules of Conduct

Meeting Procedures - The Ralph M. Brown Act is the state law which guarantees the public's right to attend and participate in meetings of local legislative bodies. These rules have been adopted by the Board of Directors in accordance with the Brown Act, Government Code 54950 et seq., and shall apply at all meetings of the Board of Directors and Policy Committees.

Accessibility - The meeting facility is accessible to persons with disabilities. If assistive listening devices or other auxiliary aids or services are needed in order to participate in the public meeting, requests should be made through the Clerk of the Board at least three (3) business days prior to the Board meeting. The Clerk can be reached by phone at (909) 884-8276 or via email at clerkoftheboard@gosbcta.com and office is located at 1170 W. 3rd Street, 2nd Floor, San Bernardino, CA.

Agendas – All agendas are posted at www.gosbcta.com/board/meetings-agendas/ at least 72 hours in advance of the meeting. Staff reports related to agenda items may be reviewed online at that web address. Agendas are also posted at 1170 W. 3rd Street, 1st Floor, San Bernardino at least 72 hours in advance of the meeting.

Agenda Actions – Items listed on both the "Consent Calendar" and "Discussion" contain recommended actions. The Board of Directors will generally consider items in the order listed on the agenda. However, items may be considered in any order. New agenda items can be added and action taken as provided in the Ralph M. Brown Act Government Code Sec. 54954.2(b).

Closed Session Agenda Items – Consideration of closed session items excludes members of the public. These items include issues related to personnel, pending litigation, labor negotiations and real estate negotiations. Prior to each closed session, the President of the Board or Committee Chair ("President") will announce the subject matter of the closed session. If reportable action is taken in closed session, the President shall report the action to the public at the conclusion of the closed session.

Public Testimony on an Item – Members of the public are afforded an opportunity to speak on any listed item, except Board agenda items that were previously considered at a Policy Committee meeting where there was an opportunity for public comment. Individuals in attendance at SBCTA who desire to speak on an item may complete and turn in a "Request to Speak" form, specifying each item an individual wishes to speak on. Individuals may also indicate their desire to speak on an agenda item when the President asks for public comment. When recognized by the President, speakers should be prepared to step forward and announce their name for the record. In the interest of facilitating the business of the Board, speakers are limited to three (3) minutes on each item. Additionally, a twelve (12) minute limitation is established for the total amount of time any one individual may address the Board at any one meeting. The President or a majority of the Board may establish a different time limit as appropriate, and parties to agenda items shall not be subject to the time limitations. Any individual who wishes to share written information with the Board may provide copies to the Clerk of the Board for distribution. Information provided as public testimony is not read into the record by the Clerk.

Consent Calendar items can be pulled at Board member request and will be brought up individually at the specified time in the agenda. Any consent item that is pulled for discussion shall be treated as a discussion item, allowing further public comment on those items.

Agenda Times – The Board is concerned that discussion take place in a timely and efficient manner. Agendas may be prepared with estimated times for categorical areas and certain topics to be discussed. These times may vary according to the length of presentation and amount of resulting discussion on agenda items.

Public Comment – An opportunity is also provided for members of the public to speak on any subject within the Board's jurisdiction. Matters raised under "Public Comment" will not be acted upon at that meeting. See, "Public Testimony on an Item," above.

Disruptive or Prohibited Conduct – If any meeting of the Board is willfully disrupted by a person or by a group of persons so as to render the orderly conduct of the meeting impossible, the President may recess the meeting or order the person, group or groups of person willfully disrupting the meeting to leave the meeting or to be removed from the meeting. Disruptive or prohibited conduct includes without limitation addressing the Board without first being recognized, not addressing the subject before the Board, repetitiously addressing the same subject, failing to relinquish the podium when requested to do so, bringing into the meeting any type of object that could be used as a weapon, including without limitation sticks affixed to signs, or otherwise preventing the Board from conducting its meeting in an orderly manner.

Your cooperation is appreciated!

General Practices for Conducting Meetings

of

Board of Directors and Policy Committees

Attendance.

- The President of the Board or Chair of a Policy Committee (Chair) has the option of taking attendance by Roll Call. If attendance is taken by Roll Call, the Clerk of the Board will call out by jurisdiction or supervisorial district. The Member or Alternate will respond by stating his/her name.
- A Member/Alternate who arrives after attendance is taken shall announce his/her name prior to voting on any item.
- A Member/Alternate who wishes to leave the meeting after attendance is taken but before remaining items are voted on shall announce his/her name and that he/she is leaving the meeting.

Basic Agenda Item Discussion.

- The Chair announces the agenda item number and states the subject.
- The Chair calls upon the appropriate staff member or Board Member to report on the item.
- The Chair asks members of the Board/Committee if they have any questions or comments on the item. General discussion ensues.
- The Chair calls for public comment based on "Request to Speak" forms which may be submitted.
- Following public comment, the Chair announces that public comment is closed and asks if there is any further discussion by members of the Board/Committee.
- The Chair calls for a motion from members of the Board/Committee. Upon a motion, the Chair announces the name of the member who makes the motion. Motions require a second by a member of the Board/Committee. Upon a second, the Chair announces the name of the Member who made the second, and the vote is taken.
- The "aye" votes in favor of the motion shall be made collectively. Any Member who wishes to oppose or abstain from voting on the motion shall individually and orally state the Member's "nay" vote or abstention. Members present who do not individually and orally state their "nay" vote or abstention shall be deemed, and reported to the public, to have voted "aye" on the motion.
- Votes at teleconferenced meetings shall be by roll call, pursuant to the Brown Act, or, at any meeting, upon the demand of five official representatives present or at the discretion of the presiding officer.

The Vote as specified in the SBCTA Administrative Code and SANBAG Bylaws.

- Each Member of the Board of Directors shall have one vote. In the absence of the official representative, the Alternate shall be entitled to vote. (Note that Alternates may vote only at meetings of the Board of Directors, Metro Valley Study Session and Mountain/Desert Policy Committee.)

Amendment or Substitute Motion.

- Occasionally a Board Member offers a substitute motion before the vote on a previous motion. In instances where there is a motion and a second, the Chair shall ask the maker of the original motion if he or she would like to amend the motion to include the substitution or withdraw the motion on the floor. If the maker of the original motion does not want to amend or withdraw, the substitute motion is voted upon first, and if it fails, then the original motion is considered.
- Occasionally, a motion dies for lack of a second.

Call for the Question.

- At times, a Member of the Board/Committee may "Call for the Question."
- Upon a "Call for the Question," the Chair may order that the debate stop or may allow for limited further comment to provide clarity on the proceedings.
- Alternatively, and at the Chair's discretion, the Chair may call for a vote of the Board/Committee to determine whether or not debate is stopped.
- The Chair re-states the motion before the Board/Committee and calls for the vote on the item.

The Chair.

- At all times, meetings are conducted in accordance with the Chair's direction.
- These general practices provide guidelines for orderly conduct.
- From time to time, circumstances may require deviation from general practice (but not from the Brown Act or agency policy).
- Deviation from general practice is at the discretion of the Chair.

Courtesy and Decorum.

- These general practices provide for business of the Board/Committee to be conducted efficiently, fairly and with full participation.
- It is the responsibility of the Chair and Members to maintain common courtesy and decorum.

Adopted By SANBAG Board of Directors January 2008
Revised March 2014
Revised May 4, 2016
Revised June 7, 2023

Minute Action

AGENDA ITEM: 1

Date: September 14, 2023

Subject:
Information Relative to Possible Conflict of Interest

Recommendation:
Note agenda items and contractors/subcontractors, which may require member abstentions due to possible conflicts of interest.

Background:
In accordance with California Government Code 84308, members of the SBCTA Board may not participate in any action concerning a contract where they have received a campaign contribution of more than $250 in the prior twelve months from an entity or individual, except for the initial award of a competitively bid public works contract. This agenda contains recommendations for action relative to the following contractors:

Consent/Discussion Calendar Items

Item No.	Contract No.	Principals & Agents	Subcontractors
3	23-1002940	Union Pacific Railroad *Kenneth Tom*	Benesch
	23-1002940	California Department of Transportation	None

Financial Impact:
This item has no direct impact on the budget.

Reviewed By:
This item is prepared for review by Board of Directors and Committee Members.

Responsible Staff:
Kristi Harris, Director of Project Delivery

Approved
Board of Directors Metro Valley Study Session
Date: September 14, 2023

Witnessed By:

Entity: San Bernardino Council of Governments, San Bernardino County Transportation Authority

Minute Action

AGENDA ITEM: 2

Date: September 14, 2023

Subject:
Project Delivery Contract Change Orders to On-Going Contracts

Recommendation:
Receive and file Change Order Report.

Background:
San Bernardino County Transportation Authority (SBCTA) Department of Project Delivery has 15 on-going construction contracts, of which six have had Construction Change Orders (CCO) approved since the last reporting to the Board of Directors Metro Valley Study Session on August 10, 2023. The CCOs are listed below:

A. Contract No. 19-1002181 with Granite Construction Company, for Archibald Avenue Improvements Project at State Route (SR) 60: There are no newly executed CCOs since last report.

B. Contract No. 19-1002078 with Guy F. Atkinson Construction, LLC, for the SR 210 Lane Addition, Base Line Interchange and Pavement Rehabilitation Project:

1) CCO 75: Drainage system 79 revisions at Plunge Creek. (-$148,785.01)

2) CCO 76: Bid item quantity adjustments. ($186,952.30)\

3) CCO 76.1: Bid item quantity adjustments. ($373,908.10)

4) CCO 87.1: Guard rail differing site resolution. ($111,757.10)

5) CCO 94.1: Add modular joint seal cover plates. ($8,613.02)

C. Contract No. 19-1002196 with Security Paving Company, Inc., for Central Avenue Improvements Project at SR 60: There are no newly executed CCOs since last report.

D. Contract No. 17-1001678 with Griffith Company, for Interstate 215 (I-215) Segment 1 and 3 Landscape Replacement Project: There are no newly executed CCOs since last report.

E. Contract No. 17-1001614 with Diversified Landscape Company, for I-215 Segment 2 Landscape Replacement Project: There are no newly executed CCOs since last report.

F. Contract No. 19-1002026 with Diversified Landscape Company, for the I-215 Segments 1, 2 and 3 Establish Existing Planting (EEP) Project: There are no newly executed CCOs since last report.

G. Contract No. 17-1001599 with Lane-Security Paving Joint Venture, for Interstate 10 (I-10) Corridor Contract 1 Design Build Contract:

1) CCO 78.1: Additional work required to meet new California Department of Transportation (Caltrans) standards. ($1,309,205)

2) CCO 83.1: Additional work required to mitigate schedule impacts to the project. ($132,012)

3) CCO 108: Add grate at drainage outlet. ($11,300)

4) CCO 109: Resolution of a Relevant Action Event and addition of slab replacement per Caltrans direction. ($5,299,700)

5) CCO 110: Additional work required per agreement with property owner to resolve construction impacts. ($2,393)

6) CCO 111: Additional work required to secure Monte Vista Water District facility and provide access. ($4,725)

7) CCO 112: Additional work required to dispose treated wood waste. ($7,384)

8) CCO 113: Additional work required per Metropolitan Water District guidelines. ($71,356)

9) CCO 114: Additional work required per Caltrans direction. ($146,307)

H. Contract 18-1001967 with C.A. Rasmussen, Inc., for US 395 Phase I Widening Project: There are no newly executed CCOs since last report.

I. Contract 16-1001461 with Pulice Construction, Inc., for Monte Vista Avenue Grade Separation Project: There are no newly executed CCOs since last report.

J. Contract No. 18-1001966 with Traylor-Granite Joint Venture, for Mount Vernon Avenue Viaduct Project Design Build: There are no newly executed CCOs since last report.

K. Contract No. 20-1002290 with SEMA Construction, Inc., for I-10 University Street Interchange Improvements Project: There are no newly executed CCOs since last report.

L. Contract No. 21-1002620 with Ortiz Enterprises, Inc., for I-10 Alabama Street Improvement Project:

1) CCO 9.1: Revised irrigation to add water meter connections. ($120,000)

M. Contract No. 22-1002784 with Security Paving Company, Inc., for I-10 Cedar Avenue Improvement Project:

1) CCO 10: Cap the mainline irrigation line at four locations. ($25,753.43)

2) CCO 12: Increase diameter of soil nails from four inch to six inch. ($315,739.30)

3) CCO 14: Drainage system eight revisions. ($35,142.74)

4) CCO 16: Removal and disposal of buried man-made objects encountered during excavation. ($30,000)

N. Contract 19-1002073 with Mariposa Landscapes, Inc., for SR 210 Pepper Avenue Establish Existing Planting Project:

1) CCO 2: Install kangaroo rat fencing at the Pepper Avenue eastbound exit ramp. ($5,086)

O. Contract No. 22-1002780 with Skanska USA Civil West California District Inc., for North 1st Avenue Bridge Over BNSF Project:

1) CCO 11: Soil nail revisions. ($322,300)

Financial Impact:
This item imposes no financial impact, as all CCOs are within previously approved contingency amounts under: Task No. 0830 Interchange Projects and Task No. 0820 Freeway Projects, Sub-Task No. 0887 SR 210 Lane Addition, Sub-Task No. 0895 I-10 Alabama Street Improvement Project, Sub-Task No. 0823 I-10 Corridor Contract 1, Sub-Task No. 0811 North 1st Avenue Bridge Over BNSF Project, Sub-Task No. 0883 SR 210 Pepper Avenue Establish Existing Planting (EEP), and Sub-Task No. 0897 I-10 Cedar Avenue Improvement Project.

Reviewed By:
This item is not scheduled for review by any other policy committee or technical advisory committee.

Responsible Staff:
Kristi Harris, Director of Project Delivery

Project Delivery Contracts
Executed Change Orders

Number	Description	Amount
Archibald Avenue Improvements Project at SR 60 (19-1002181)		
	CCO Total	$1,723,232.91
	Approved Contingency	$2,122,333.00
	Remaining Contingency	$399,100.09
SR 210 Lane Addition, Base Line Interchange and Pavement Rehabilitation (19-1002078)		
Number	Description	Amount
75	Drainage system 79 revisions at Plunge Creek.	($148,785.01)
76	Bid item quantity adjustments.	$186,952.30
76.1	Bid item quantity adjustments.	$373,908.10
87.1	Guard rail differing site resolution.	$111,757.10
94.1	Add modular joint seal cover plates.	$8,613.02
	CCO Total	$27,253,696.82
	Approved Contingency	$34,927,790.07
	Remaining Contingency	$7,674,093.25
Central Avenue Improvements Project at SR 60 (19-1002196)		
	CCO Total	$689,953.91
	Approved Contingency	$2,912,039.00
	Remaining Contingency	$2,222,085.09
I-215 Segments 1 & 3 Landscape Replacement Project (17-1001678)		
	CCO Total	$422,073.52
	Approved Contingency	$812,748.38
	Remaining Contingency	$390,674.86
I-215 Segment 2 Landscape Replacement Project (17-1001614)		
	CCO Total	$362,649.23
	Approved Contingency	$502,203.56
	Remaining Contingency	$139,554.33
I-215 Segments 1, 2 & 3 Establish Existing Planting (19-1002026)		
	CCO Total	$20,000.00
	Approved Contingency	$1,451,300.00
	Remaining Contingency	$1,431,300.00

Project Delivery Contracts Executed Change Orders		
Number	**Description**	**Amount**
I-10 Corridor Contract 1 (17-1001599)		
Number	Description	Amount
78.1	Additional work required to meet new Caltrans standards.	$1,309,205.00
83.1	Additional work required to mitigate schedule impacts to the project.	$132,012.00
108	Add grate at drainage outlet.	$11,300.00
109	Resolution of a Relevant Action Event (REN) and addition of slab replacement per Caltrans direction.	$5,299,700.00
110	Additional work required per agreement with property owner to resolve construction impacts.	$2,393.00
111	Additional work required to secure Monte Vista Water District facility and provide access.	$4,725.00
112	Additional work required to dispose treated wood waste.	$7,384.00
113	Additional work required per Metropolitan Water District guidelines.	$71,356.00
114	Additional work required per Caltrans direction.	$146,307.00
	CCO Total	$24,554,653.08
	Approved Contingency	$51,369,000.00
	Remaining Contingency	$26,814,346.92

Project Delivery Contracts Executed Change Orders		
Number	**Description**	**Amount**
US 395 Phase 1 Widening Project (18-1001967)		
	CCO Total	$2,194,906.95
	Approved Contingency	$8,741,611.75
	Remaining Contingency	$6,546,704.80
Monte Vista Avenue Grade Separation (16-1001461)		
	CCO Total	$869,302.95
	Approved Contingency	$2,498,958.60
	Remaining Contingency	$1,629,655.65
Mount Vernon Avenue Viaduct (18-1001966)		
	CCO Total	$5,011,396.71
	Approved Contingency	$17,230,000.00
	Remaining Contingency	$12,218,603.29
I-10 University Street Interchange Improvement Project (20-1002290)		
	CCO Total	$1,287,988.96
	Approved Contingency	$1,500,590.00
	Remaining Contingency	$212,601.04

Project Delivery Contracts
Executed Change Orders

Number	Description	Amount
I-10 Alabama Street Improvement Project (21-1002620)		
Number	Description	Amount
9.1	Revised irrigation to add water meter connections.	$120,000.00
	CCO Total	$654,201.61
	Approved Contingency	$1,338,886.33
	Remaining Contingency	$684,684.72
I-10 Cedar Avenue Improvement Project (22-1002784)		
Number	Description	Amount
10	Cap the mainline irrigation line at four locations.	$25,753.43
12	Increase diameter of soil nails from 4 inch to 6 inch.	$315,739.30
14	Drainage system 8 revisions.	$35,142.74
16	Removal and disposal of buried man-made objects encountered during excavation.	$30,000.00
	CCO Total	$729,401.75
	Approved Contingency	$8,098,400.00
	Remaining Contingency	$7,368,998.25
SR 210 Pepper Avenue Establish Existing Planting (19-1002073)		
Number	Description	Amount
2	Install kangaroo rat fencing at the Pepper Avenue eastbound exit ramp.	$5,086.00
	CCO Total	$15,086.00
	Approved Contingency	$31,244.80
	Remaining Contingency	$16,158.80
North 1st Avenue Bridge Over BNSF Project (22-1002780)		
Number	Description	Amount
11	Soil nail revisions.	$322,300.00
	CCO Total	$514,928.62
	Approved Contingency	$3,561,922.00
	Remaining Contingency	$3,046,993.38

Minute Action

AGENDA ITEM: 3

Date: September 14, 2023

Subject:
Interstate 15 Corridor Freight and Express Lanes Construction and Maintenance Agreement for Mission Boulevard Overhead Crossing with Union Pacific Railroad and California Department of Transportation

Recommendation:
That the following be reviewed and recommended for final approval by the Board of Directors, acting as the San Bernardino County Transportation Authority (SBCTA), at a regularly scheduled Board meeting:

Authorize the Executive Director, or his designee, to execute Agreement No. 23-1002940 between Union Pacific Railroad, California Department of Transportation, and SBCTA for defining roles, responsibilities, and funding for the construction and maintenance of the Interstate 15 Corridor Freight and Express Lanes Project at the Mission Boulevard Overhead in the amount of $153,000, subject to approval as to form by SBCTA General Counsel, or her designee.

Background:
The Interstate 15 (I-15) Corridor Freight and Express Lanes Project (Project) will add auxiliary lanes to improve freight corridor movement and will add one to two express lanes in each direction on the I-15 from 0.3 miles south of Cantu-Galleano Ranch Road to Duncan Canyon Road. The Environmental Document for the Project was approved in December 2018. The Project will be delivered in multiple construction packages. The first construction package, known as the I-15 Corridor Freight and Express Lanes Project – Contract 1 (Contract 1), will also add auxiliary lanes at select locations in order to improve freight movement and reduce traffic congestion. Construction packages for portions north of Foothill Boulevard to Duncan Canyon Road will be developed in the future based on funding considerations. Final design work for Contract 1 is ongoing with current activities consisting of structure design and developing Plans, Specifications, and Estimates.

This item covers one of the three railroad construction and maintenance (C&M) agreements where the I-15 traverses three railroad crossings with infrastructure used by either the Southern California Regional Rail Authority or the Union Pacific Railroad (UPRR). Two of these C&M agreements include California Department of Transportation (Caltrans) as a party since Caltrans operates and maintains the I-15.

C&M Agreement No. 23-1002940 is a three-party agreement with UPRR, Caltrans, and SBCTA for defining roles, responsibilities, and funding for the C&M of the Mission Boulevard Overhead crossing located in the City of Eastvale and the City of Jurupa Valley. In this agreement, SBCTA performs all project and/or structure work at the UPRR rail line, Caltrans maintains said roadway and bridge improvement, and SBCTA pays for actual costs for UPRR construction support and other UPRR expenses defined within the agreement at an estimated cost of $153,000.

Currently, the C&M agreement is in final review by all agencies. The C&M agreement assumes the construction work at the Mission Boulevard Overhead will be performed through temporary railroad closures (curfews) and railroad flagging. UPRR would not commit to a guaranteed

number of curfews due to the high volumes of train cars into and out of the nearby automobile offloading facility. The contractor will have approximately three years to complete the I-15 Project. Staff has estimated that approximately 55 curfews will allow for the construction work at Mission Boulevard to be completed which will be outlined in the Project construction contract. If UPRR does not grant the estimated number of work curfews, then a contract change order will be warranted.

With the execution of this agreement and the two others currently under development in September 2023, the Right-of-Way Certification can be approved by Caltrans so the Project can meet the planned schedule milestone of Ready-to-List.

Staff is recommending that the SBCTA Board of Directors, authorize the Executive Director, or his designee, to execute C&M Agreement No. 23-1002940, subject to approval as to form by SBCTA General Counsel, or her designee, in order to preserve the project schedule.

Financial Impact:
This item is consistent with the Fiscal Year 2023/2024 Budget for Task 0820, Freeway Projects, Sub-Task 0831, I-15 Corridor Express Lanes Improvements Contract 1.

Reviewed By:
This item is not scheduled for review by any other policy committee or technical advisory committee. SBCTA General Counsel and Risk Manager have reviewed this item and the draft agreement.

Responsible Staff:
Sal Chavez, Project Delivery Manager

Contract Summary Sheet

General Contract Information

Contract No: 23-1002940 Amendment No.:

Contract Class: Payable Department: Project Delivery

Vendor No.: 02269 Vendor Name: Union Pacific Railroad

Description: I-15 Corridor Construction and Maintenance Agreement for the Mission Blvd OH

List Any Related Contract Nos.:

Dollar Amount					
Original Contract	$	153,000.00	Original Contingency	$	-
Prior Amendments	$	-	Prior Amendments	$	-
Prior Contingency Released	$	-	Prior Contingency Released (-)	$	-
Current Amendment	$	-	Current Amendment	$	-
Total/Revised Contract Value	**$**	**153,000.00**	**Total Contingency Value**	**$**	**-**
			Total Dollar Authority (Contract Value and Contingency)	**$**	**153,000.00**

Contract Authorization

Board of Directors Date: 10/04/2023 Committee Item #

Contract Management (Internal Purposes Only)

Capital Project Contracts Sole Source? N/A No Budget Adjustment

Local Construction N/A

Accounts Payable

Estimated Start Date: 10/04/2023 Expiration Date: 12/31/2039 Revised Expiration Date:

NHS: Yes QMP/QAP: Yes Prevailing Wage: N/A

	Fund	Prog	Task	Sub-Task	Object	Revenue	PA Level	Revenue Code Name	Total Contract Funding: $ 153,000.00	Total Contingency: $ -
GL:	4110	40	0820	0831	53702	41100000	650	MSI Fwy	153,000.00	-
GL:										-
GL:									-	-
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GL:									-	-
GL:									-	-

David Tan
Project Manager (Print Name)

Kristi Harris
Task Manager (Print Name)

Additional Notes:
Total Contract Amount $153,000.00 (Work @$150,000.00; Grant of Right @$3,000.00).

Attachment: CSS 23-1002940 UPRR and Caltrans [Revision 3] (9679 : I-15 Corridor Freight & Express Lanes C&M Agreements with UPRR &

08-SBd-15 PM 0.0-12.2
08-Riv-15 PM 49.8-52.3
EA 08-0R801 PID 0820000075 DOT No. 906381W
RMP 0043.88
Alhambra Subdivision

CONSTRUCTION AND MAINTENANCE AGREEMENT
INTERSTATE-15 CORRIDOR FREIGHT AND EXPRESS LANES
AT THE MISSION BOULEVARD OVERHEAD (I-15 OH) PROJECT

THIS AGREEMENT, ("Agreement") made and entered into as of the_____day of _____, 2023, by and between **UNION PACIFIC RAILROAD COMPANY**, a Delaware corporation to be addressed at 1400 Douglas Street, MS1690, Omaha, Nebraska 68179-1690 ("**Railroad**"), the **STATE OF CALIFORNIA, acting by and through its Department of Transportation** to be addressed at 1120 N Street, MS 37, Sacramento, California 95814 ("**State**"), and **SAN BERNARDINO COUNTY TRANSPORTATION AUTHORITY** ("**SBCTA**")**,** a California public agency. Collectively referred to herein as the **"PARTIES"**.

RECITALS:

A. On May 22, 1973, the Southern Pacific Transportation Company and the Department of Public Works entered into an agreement covering the construction and maintenance of five overpasses known as Vina Vista Overheads in San Bernardino County, California. Today, the present parties of the 1973 Agreement are the Union Pacific Railroad Company (Railroad), formerly known as the Southern Pacific Transportation Company and the State of California, by and through its Department of Transportation, formerly known as the Department of Public Works.

B. On March 27, 2008, State and Railroad entered into an agreement to reconstruct and rehabilitate the existing Interstate 15, to add lanes in the center of the existing Interstate 15 freeway. The 1973 and 2008 agreements are hereinafter referenced, in this Agreement as the "Original Agreement".

C. SBCTA and State now propose to construct Express Lanes, including tolled facilities, in both directions of Interstate 15 (I-15) (the "Project") including the I-15 Vina Vista Overhead, herein referred to as the "Structure". SBCTA will execute and oversee the construction of the Project.

D. The individual responsibilities of SBCTA are set forth in Sections 7 and 13 of this agreement. The individual responsibilities of the State are set forth in Section 11 of this agreement.

E. The general location of the Structure is shown on the Survey Print marked **Exhibit A**. The type, size and location prints of the Structure are marked **Exhibit A-1,** with each exhibit attached hereto and hereby made a part hereof.

F. The proposed Structure work referred to as the "New Crossing Area" in the **Exhibit A** Survey Print is within existing rights granted by Railroad in the Original Agreement, referred to as the "Original Agreement Area" in the **Exhibit A** Survey Print and no additional aerial easement rights from the Railroad are required. The New Crossing Area and Existing Crossing Area, together, are referred to as the "Crossing Area".

G. The parties now desire to set forth herein their understanding and agreement relating to the construction, reconstruction, replacement, use, maintenance and repair of Structure and State's payment for and use of the Project Parcels.

AGREEMENT:

NOW, THEREFORE, it is mutually agreed by and between the parties hereto as follows:

Section 1. LIST OF EXHIBTIS

The exhibits below are attached hereto and hereby made a part hereof:

Exhibit A	Survey Print
Exhibit A-1	Structure's General Type, Size and Profile
Exhibit B	General Terms and Conditions
Exhibit C	Railroad Cost Estimate
Exhibit D	Railroad Coordination Requirements
Exhibit E	Contractor's Right of Entry Agreement
Exhibit F	Railroad Guidelines for Temporary Shoring

Section 2. EXHIBITS B AND D

The general terms and conditions marked **Exhibit B**, and the Railroad's Coordination Requirements marked **Exhibit D**, are attached hereto and hereby made a part hereof.

Section 3. RAILROAD GRANTS RIGHT

For and in consideration of the sum of **THREE THOUSAND DOLLARS ($3,000.00)**, to be paid by SBCTA to Railroad upon the execution and delivery of this Agreement and in further consideration of State's and SBCTA's agreement to perform and comply with the terms of this Agreement, Railroad hereby grants to State and SBCTA the right to construct, maintain and repair the Structure over and across the Crossing Area shown on **Exhibit A.**

Section 4. DEFINITION OF CONTRACTOR

For purposes of this Agreement the term "Contractor" shall mean the contractor or contractors hired by SBCTA to perform any Project work on any portion of Railroad's property and shall also include the Contractor'ssubcontractors and the Contractor's and subcontractor's respective employees, officers and agents, and others acting under its or their authority.

Section 5. CONTRACTOR'S RIGHT OF ENTRY AGREEMENT - INSURANCE

A. Prior to Contractor performing any work within the Crossing Area involving the Project, and any subsequent maintenance or repair work, the State shall require the Contractor to:

- execute the Railroad's then current Contractor's Right of Entry Agreement (Ex. E)
- obtain the then current insurance required in the Contractor's Right of Entry Agreement; and
- provide such insurance policies, certificates, binders and/or endorsements to the Railroad.

Railroad's current Contractor's Right of Entry Agreement is marked **Exhibit E** and is incorporated by reference as though fully set forth herein. SBCTA confirms that the Contractor will be required to execute such form of agreement and obtain the required insurance before commencing any work on any Railroad property. Under no circumstances will the Contractor be allowed on the Railroad's property without first executing the Railroad's Contractor's Right of Entry Agreement and obtaining the insurance set forth therein and also providing to the Railroad the insurance policies, binders, certificates and/or endorsements described therein.

B. All insurance correspondence, binders, policies, certificates and/or endorsements shall be sent to:

Manager - Contracts
Union Pacific Railroad Company Real Estate Department
1400 Douglas Street, Mail Stop 1690
Omaha, NE 68179-1690
UP Project No. 0463380

C. SBCTA is self-insured and will maintain self-insured status during the performance of the work associated with the Project. If SBCTA's own employees will be performing any of the Project work, SBCTA shall self-insure all or a portion of the insurance coverage as allowed pursuant to SBCTA's Insurance Rules and agrees to indemnify Railroad against any and all claims arising out of the work performed on the Project by SBCTA Employees. SBCTA shall not indemnify Railroad for claims by SBCTA Employees that arise out of negligent acts or willful misconduct by Railroad, its officials, directors, officers, employees, and agents.

Section 6. **FEDERAL AID POLICY GUIDE**

If SBCTA will be receiving any federal funding for the Project the current rules, regulations and provisions of the Federal Aid Policy Guide as contained in 23 CFR 140, Subpart I and 23 CFR 646, Subparts A and B are incorporated into this Agreement by reference.

Section 7. WORK TO BE PERFORMED BY RAILROAD; BILLING SENT TO SBCTA; SBCTA 'S PAYMENT OF BILLS

A. Railroad Work and Operation oversight to be performed during the Project by Railroad, at the sole cost and expense to the SBCTA, is described in Railroad's Cost Estimates dated March 27, 2023, marked **Exhibit C**, and is incorporated by reference as though fully set forth herein. (the "Estimate"). As set forth in the Estimate, the Railroad's estimated cost for the Railroad's work associated with the Project is One Hundred Fifty Thousand dollars ($150,000.00).

B. Railroad, if it so elects, may recalculate and update the Estimate submitted to SBCTA in the event the SBCTA does not commence construction on the portion of the Project located on the Railroad's property within 12 months from the date of the execution of this Agreement.

C. SBCTA cannot reimburse Railroad for any costs incurred outside the scope of work described herein or occurring prior to the effective date of this Agreement.

D. Railroad shall send progressive billing to SBCTA during the Project, and final billing to SBCTA within one hundred eighty (180) days after receiving written notice from SBCTA that all Project work affecting Railroad's property has been completed.

E. SBCTA shall reimburse Railroad for all undisputed invoices within 45 business days of receiving Railroad's invoiced charges.

Section 8. WORK PERFORMED BY SBCTA

A. SBCTA, as a Project expense and at no cost to Railroad, shall perform all Project and/or Structure work including, without limitation, other applicable work, all of which shall be performed in compliance with the Plans and Minimum Requirements and described and defined in Section 10, and in a good and workmanlike manner and prosecuted diligently to conclusion. The use of Railroad's property by SBCTA and/or its Contractor (as defined herein) shall be limited to the identified existing area designated on **Exhibit A** defined and shall be subject to Railroad's notification requirements and the terms and conditions of this Agreement and exhibits hereto.

B. SBCTA or the Contractor will be responsible for securing the required flagging services from one of Railroad's approved vendors in accordance with Railroad's policy and procedures for flagging found on Railroad's website at UP: Real Estate and Utility Specifications.

C. SBCTA, as a project expense and at no cost to Railroad, shall complete or cause to complete all Project-related construction activities within four (4) years of the Effective Date of this Agreement.

Section 9. NO PROJECT EXPENSES TO BE BORNE BY RAILROAD

SBCTA agrees that no Project costs and expenses are to be borne by Railroad. In addition, Railroad is not required to contribute any funding for the Project.

Section 10. PLANS

A. SBCTA, at its expense, shall prepare, or cause to be prepared by others, the detailed plans and specifications and submit such plans and specifications to Railroad, for prior review and approval. The plans and specifications shall include all Roadway layout specifications, cross sections and elevations, associated drainage, and other appurtenances.

B. The final one hundred percent (100%) completed plans that are approved in writing by Railroad's Assistant Vice President Engineering–Design, or its authorized representative, are hereinafter referred to as the "Plans". The Plans are hereby made a part of this Agreement by reference.

C. No changes in the Plans shall be made unless Railroad has consented to such changes in writing.

D. Railroad's review and approval of the Plans will in no way relieve the SBCTA or the Contractor from their responsibilities, obligations and/or liabilities under this Agreement, and will be given with the understanding that Railroad makes no representations or warranty as to the validity, accuracy, legal compliance or completeness of the Plans and that any reliance by the SBCTA or Contractor on the Plans is at the risk of the SBCTA and Contractor.

Section 11. MAINTENANCE AND REPAIR OF STRUCTURE AND OF ROADWAY LOCATED ON THE STRUCTURE

Upon acceptance of the project, State, at its expense, shall maintain, repair, reconstruct, and/or replace or cause to be maintained, repaired, reconstructed and/or replaced the entire Structure including without limitation, all fire damage and homeless removal, graffiti removal, or painting involving the Structure in a safe, clean, sturdy and sound condition. If any inspection, maintenance, repairs, reconstruction or replacement of the Structure requires State or its contractor (as defined in Section 5) to enter upon and use any portion of Railroad property, or if such work could jeopardize the safety of railroad personnel and equipment beneath the Structure, such as, but not limited to falling concrete or other debris, State shall require Contractor to execute Railroad's then-current form of Contractor's Right of Entry Agreement to provide Railroad the insurance policies, binders, certificates, and endorsements that are required in the Contractor's Right of Entry Agreement prior to commencing such work. State shall also pay Railroad for its use of any Railroad property for which it does not at such time already hold easement or other access rights and all project-related railroad support costs.

Section 12. NON-RAILROAD IMPROVEMENTS

A. Submittal of plans and specifications for protecting, encasing, reinforcing, relocation, replacing, removing and abandoning in place all non- Railroad owned facilities (the "Non-Railroad Facilities") affected by the Project including, without limitation, utilities, fiber optics, pipelines, wirelines, communication lines and fences is required under Section 10. The Non-Railroad Facilities plans and specifications shall comply with Railroad's standard specifications and requirements, including, without limitation, American Railway Engineering and Maintenance-of-Way Association ("AREMA") standards and guidelines. Railroad has no obligation to supply additional land for any Non-Railroad Facilities and does not waive its right to assert preemption defenses, challenge the right-to-take, or pursue compensation in any condemnation action, regardless if the submitted Non-Railroad Facilities plans and specifications comply with Railroad's standard specifications and requirements. Railroad has no obligation to permit any Non-Railroad Facilities to be abandoned in place or relocated on Railroad's property.

B. Upon Railroad's approval of submitted Non-Railroad Facilities plans and specifications, Railroad will attempt to incorporate them into new agreements or supplements of existing agreements with Non-Railroad Facilities owners or operators. Railroad may use its standard terms and conditions, including, without limitation, its standard license fee and administrative charges when requiring supplements or new agreements for Non-Railroad Facilities. Non-Railroad Facilities work shall not commence before a supplement or new agreement has been fully executed by Railroad and the Non-Railroad Facilities owner or operator, or before Railroad, SBCTA and STATE mutually agree in writing to (i) deem the approved Non- Railroad Facilities plans and specifications to be Plans pursuant to Section 12B, (ii) deem the Non-Railroad Facilities part of the Structure, and (iii) supplement this Agreement with terms and conditions covering the Non-Railroad Facilities.

Section 13. NO CLAIMS BY SBCTA

Notwithstanding any other provisions of this Agreement, SBCTA shall not make any claim against Railroad for any damages related to any and all work delays which arise in whole or in part from accommodating or performing train operations including, without limitation, train schedule changes and/or increased train operations by Railroad.

Section 14. EFFECTIVE DATE; TERM; TERMINATION

A. This Agreement shall become effective as of the date first herein written, or the date work commences on the Project, whichever is earlier, and shall continue in full force and effect for as long as the Structure remains on Railroad's property.

B. Railroad, if it so elects, may terminate this Agreement effective upon delivery of written notice to SBCTA in the event SBCTA does not commence construction on the portion of the Project located on Railroad's property within twenty-four (24) months from the date of this Agreement, or from the date that Railroad has executed this Agreement and returned it to SBCTA and STATE for its execution, whichever is applicable.

C. If the Agreement is terminated as provided above, or for any other reason, SBCTA shall pay to Railroad all actual costs incurred by Railroad in connection with the Project up to the date of termination, including, without limitation, all actual costs incurred by Railroad in connection with reviewing any preliminary or final Project Plans.

Section 15. CONDITIONS TO BE MET BEFORE SBCTA CAN COMMENCE WORK

A. Neither SBCTA nor the Contractor may commence any work within the Crossing Area or on any other Railroad property until:

(i) Railroad, SBCTA and State have executed this Agreement.

(ii) Railroad has provided to SBCTA Railroad's written approval of the Plans.

(iii) SBCTA and State have obtained all necessary governmental permits, zoning clearances and approvals including without limitation, those from the California Public Utilities Commission.

(iv) Each Contractor has executed Railroad's Contractor's Right of Entry Agreement and has obtained and/or provided to Railroad the insurance policies, certificates, binders, and/or endorsements required under the Contractor's Right of Entry Agreement.

(v) Each Contractor has given the advance notice(s) required under the Contractor's Right of Entry Agreement to Railroad Representative named in the Contractor's Right of Entry Agreement.

B. The insurance coverage set forth in the Right of Entry Agreement shall remain in full force and effect by each Contractor during the performance of said work upon and adjacent to Railroad's property and thereafter until the Contractor removes all tools, equipment and materials from Railroad property and cleans up the premises to a presentable condition satisfactory to Railroad.

C. SBCTA and each Contractor shall give the advance notice described in the Right of Entry Agreement to Railroad's authorized representative before commencing any Project work on railroad's property and shall observe Railroad's rules and regulations with respect thereto. All work on Railroad's property shall be done at such times and in such manner so as not to interfere with or endanger the operations of the Railroad.

Section 16. FUTURE PROJECTS

Future projects involving substantial maintenance, repair, reconstruction, renewal and/or demolition of the Roadway shall not commence until Railroad and STATE agree on the plans for such future projects, cost allocations, right of entry terms and conditions and temporary construction rights, terms and conditions.

Section 17. ASSIGNMENT; SUCCESSORS AND ASSIGNS

A. This Agreement shall not be assigned without the prior written consent of the Parties.

B. Subject to the provisions of Paragraph A above, this Agreement shall inure to the benefit of and be binding upon the successors and assigns of Railroad, SBCTA and State.

Section 18. TERMINATION OF ORIGINAL AGREEMENT

Upon the completion of the Roadway, the Original Agreement, if any, shall terminate and the terms and conditions of this Agreement shall govern the use, maintenance and repair of the Roadway and Crossing Area.

Section 19. SPECIAL PROVISIONS PERTAINING TO AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 ("BUY AMERICA")

Railroad acknowledges that if this Agreement is for a federal-aid project, all portions of these projects whether performed by SBCTA or Railroad shall be performed in compliance with 23 CFR 635.410 and 23 USC 313 as amended by Section 1518 of P.L. 112-141 Buy America Requirements. Railroad shall maintain documentation/certification of all products of iron, steel, or a coating of steel that are incorporated into the Project for a period of three (3) years after completion of all obligations under this Agreement. Within a reasonable time after SBCTA or State's request, Railroad shall make such records available for SBCTA and/or State's audit during Railroad's regular business hours in its home office.

Section 20. INDEMNITY

A. As permitted under the law, SBCTA agrees to indemnify and hold harmless Railroad and agrees to repair or pay for any damage proximately caused by reason of the uses authorized by this Agreement and associated easements, licenses, rights of way or right of entry agreements.

B. The provisions of this Section 20 shall survive the completion of any work performed by SBCTA or the termination of expiration of this Agreement. In no event shall this Section or any other provision of this Agreement be deemed to limit any liability SBCTA may have to Railroad by statute or under common law.

Section 21. TIME IS OF THE ESSENCE

Time is of the essence in this Agreement and the Parties agree to execute all documents and proceed with due diligence to complete all covenants and conditions.

Section 22. EXECUTION

This Agreement may be executed in two counterparts and by the parties hereto in separate counterparts, each of which when so executed shall be deemed to be an original and all of which taken together shall constitute one and the same agreement.

Signatures on following page

IN WITNESS WHEREOF, the parties have caused this Agreement to be duly executed in triplicate as of the date first herein written.

UNION PACIFIC RAILROAD COMPANY
(Federal Tax ID #94-6001323)

By: _____

Printed Name: _____

Title: _____

SBCTA's signatures on following page

SAN BERNARDINO COUNTY TRANSPORTATION AUTHORITY (SBCTA)

By:_____

Printed Name: Raymond W. Wolfe

Title: Executive Director

APPROVED AS TO FORM:

By:_____

Printed Name: Juanda L. Daniel

Title: SBCTA Assistant General Counsel

The State of California of California's signatures on following page

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

By:_____ TIAIRA T. MOERING
Chief, Office of Railroad and Utility Relocations
Division of Right of Way and Land Surveys

APPROVED AS TO FORM AND PROCEDURES:

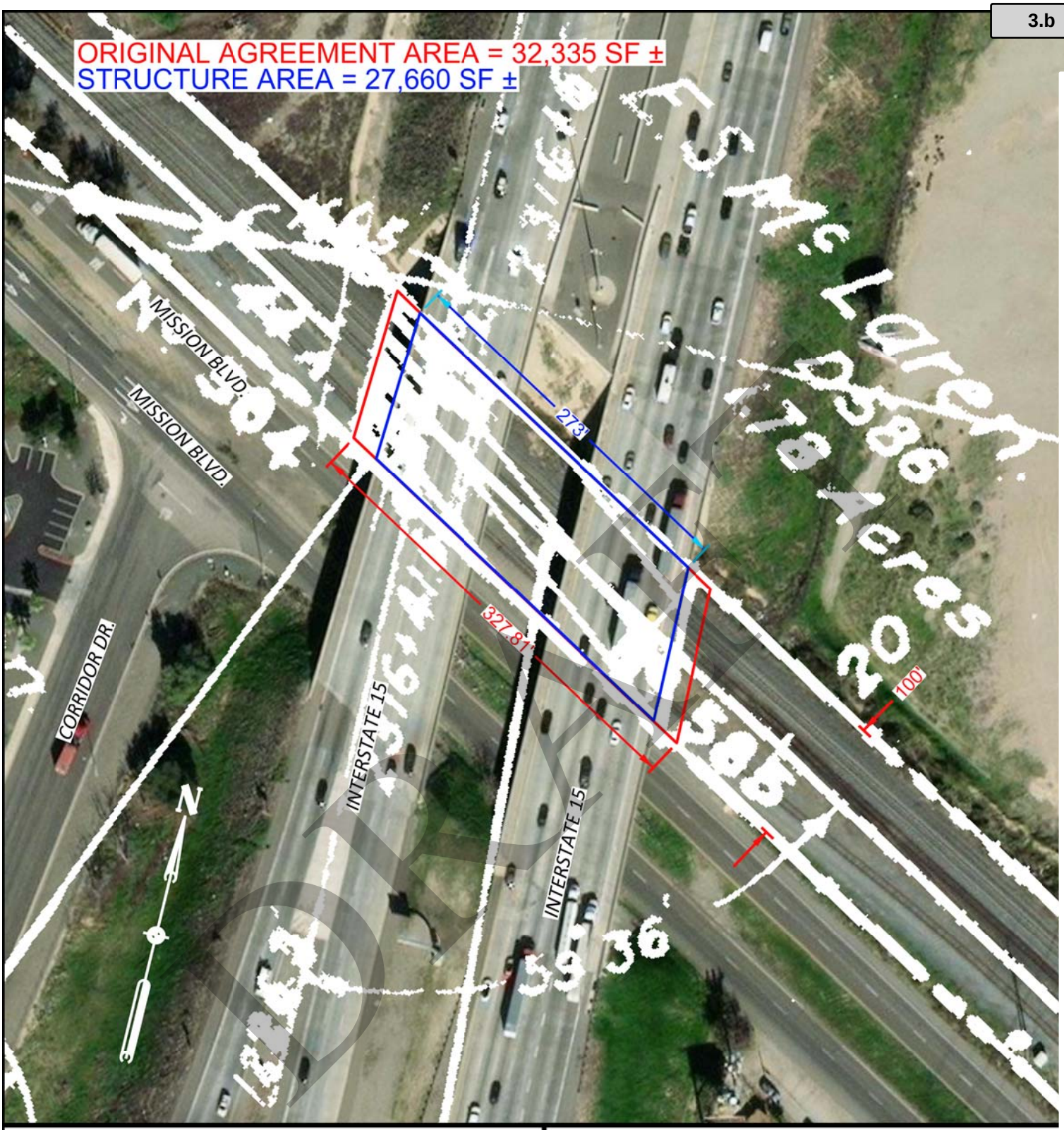
By: _____
Attorney

Recommended for Approval:

By:_____GINA PIPPENGER
HQ Railroad Liaison
Division of Right of Way and Land Surveys

EXHIBIT A

Survey Print



LEGEND:

ORIGINAL AGREEMENT AREA

STRUCTURE AREA

UPRRCO. R/W OUTLINED

NOTE: BEFORE YOU BEGIN ANY WORK, SEE AGREEMENT FOR FIBER OPTIC PROVISIONS.

EXHIBIT "A"

UNION PACIFIC RAILROAD COMPAN

MIRA LOMA, RIVERSIDE COUNTY, CA

M.P. 43.88 - LOS ANGELES SUB.

MAP LASL CA V-6 / 14

SCALE: 1" = 100'

OFFICE OF REAL ESTATE

OMAHA, NEBRASKA DATE: 8/16/2023

RRM FILE: 07527-24

CADD FILENAME	0752724.DGN
SCAN FILENAME	0752724_CAV06014.TIF

EXHIBIT A-1

Structure's General Type, Size and Profile

REDACTED –SSI

EXHIBIT B

PUBLIC HIGHWAY OVERPASS AGREEMENT

EXHIBIT B
TO
PUBLIC HIGHWAY OVERPASS AGREEMENT

SECTION 1 - CONDITIONS AND COVENANTS

A. The Railroad makes no covenant or warranty of title for quiet possession or against encumbrances. The Political Body shall not use or permit use of the Crossing Area for any purposes other than those described in this Agreement. Without limiting the foregoing, the Political Body shall not use or permit use of the Crossing Area for railroad purposes, or for gas, oil or gasoline pipe lines. Any lines constructed on the Railroad's property by or under authority of the Political Body for the purpose of conveying electric power or communications incidental to the Political Body's use of the property for highway purposes shall be constructed in accordance with specifications and requirements of the Railroad, and in such manner as not adversely to affect communication or signal lines of the Railroad or its licensees now or hereafter located upon said property. No nonparty shall be admitted by the Political Body to use or occupy any part of the Railroad's property without the Railroad's written consent. Nothing herein shall obligate the Railroad to give such consent.

B. The Railroad reserves the right to cross the Crossing Area with such railroad tracks as may be required for its convenience or purposes.

C. The right hereby granted is subject to any existing encumbrances and rights (whether public or private), recorded or unrecorded, and also to any renewals thereof. The Political Body shall not damage, destroy or interfere with the property or rights of nonparties in, upon or relating to the Railroad's property, unless the Political Body at its own expense settles with and obtains releases from such nonparties.

D. The Railroad reserves the right to use and to grant to others the right to use the Crossing Area for any purpose not inconsistent with the right hereby granted, including, but not by way of limitation, the right to construct, reconstruct, maintain, operate, repair, alter, renew and replace tracks, facilities and appurtenances on the property and the right to cross the Crossing Area with all kinds of equipment. The Railroad further reserves the right to attach signal, communication or power lines to the Structure, provided that such attachments shall comply with Political Body's specifications and will not interfere with the Political Body's use of the Crossing Area.

E. So far as it lawfully may do so, the Political Body will assume, bear and pay all taxes and assessments of whatsoever nature or kind (whether general, local or

special) levied or assessed upon or against the Crossing Area, excepting taxes levied upon and against the property as a component part of the Railroad's operating property.

F. If any property or rights other than the right hereby granted are necessary for the construction, maintenance and use of the Structure and its appurtenances, or for the performance of any work in connection with the Project, the Political Body will acquire all such other property and rights at its own expense and without expense to the Railroad.

SECTION 2 - CONSTRUCTION OF STRUCTURE

A. The Political Body, at its expense, will apply for and obtain all public authority required by law, ordinance, rule or regulation for the Project, and will furnish the Railroad upon request with satisfactory evidence that such authority has been obtained.

B. Except as may be otherwise specifically provided herein, the Political Body, at its expense, will furnish all necessary labor, material and equipment, and shall construct and complete the Structure and all appurtenances thereof. The appurtenances shall include, without limitation, all necessary and proper drainage facilities, guard rails or barriers, and right of way fences between the Structure and the railroad tracks. Upon completion of the Project, the Political Body shall remove from the Railroad's property all temporary structures and false work, and will leave the Crossing Area in a condition satisfactory to the Railroad.

C. All construction work of the Political Body upon the Railroad's property (including, but not limited to, construction of the Structure and all appurtenances and all related and incidental work) shall be performed and completed in a manner satisfactory to the Assistant Vice President Engineering-Design of the Railroad or his authorized representative and in compliance with the Plans, the Railroad's Coordination Requirements set forth in **Exhibit D** and other guidelines furnished by the Railroad.

D. All construction work of the Political Body shall be performed diligently and completed within a reasonable time. No part of the Project shall be suspended, discontinued or unduly delayed without the Railroad's written consent, and subject to such reasonable conditions as the Railroad may specify. It is understood that the Railroad's tracks at and in the vicinity of the work will be in constant or frequent use during progress of the work and that movement or stoppage of trains, engines or cars may cause delays in the work of the Political Body. The Political Body hereby assumes the risk of any such delays and agrees that no claims for damages on account of any delay shall be made against the Railroad by the Political Body and/or the Contractor.

SECTION 3 - INJURY AND DAMAGE TO PROPERTY

If the Political Body, in the performance of any work contemplated by this Agreement or by the failure to do or perform anything for which the Political Body is responsible under the provisions of this Agreement, shall injure, damage or destroy any property of the Railroad or of any other person lawfully occupying or using the property of the Railroad, such property shall be replaced or repaired by the Political Body at the Political Body's own expense, or by the Railroad at the expense of the Political Body, and to the satisfaction of the Railroad's Assistant Vice President Engineering-Design.

SECTION 4 - RAILROAD MAY USE CONTRACTORS TO PERFORM WORK

The Railroad may contract for the performance of any of its work by other than railroad forces. The Railroad shall notify the Political Body of the contract price within ninety (90) days after it is awarded. Unless the Railroad's work is to be performed on a fixed price basis, the Political Body shall reimburse the Railroad for the amount of the contract.

SECTION 5 - MAINTENANCE AND REPAIRS

A. The Political Body, at its expense, shall maintain, repair and renew, or cause to be maintained, repaired and renewed, the entire Structure, including, but not limited to, the superstructure, substructure, piers, abutments, walls, approaches and all backfill, grading and drainage required by reason of the Structure, as well as all graffiti removal or overpainting involving the Structure.

B. The Railroad, at its expense, will maintain, repair and renew, or cause to be maintained, repaired and renewed, the rails, ties, ballast and communication and signal facilities owned by the Railroad beneath the Structure.

SECTION 6 - SAFETY MEASURES; PROTECTION OF RAILROAD COMPANY OPERATIONS

It is understood and recognized that safety and continuity of the Railroad's operations and communications are of the utmost importance; and in order that the same may be adequately safeguarded, protected and assured, and in order that accidents may be prevented and avoided, it is agreed with respect to all of said work of the Political Body that the work will be performed in a safe manner and in conformity with the following standards:

A. **Definitions**. All references in this Agreement to the Political Body shall also include the Contractor and their respective officers, agents and employees, and others acting under its or their authority; and all references in this Agreement to

work of the Political Body shall include work both within and outside of the Railroad's property.

B. **Entry on to Railroad's Property by Political Body**. If the Political Body's employees need to enter Railroad's property in order to perform an inspection of the Structure, minor maintenance or other activities, the Political Body shall first provide at least ten (10) working days advance notice to the Railroad Representative. With respect to such entry on to Railroad's property, the Political Body, to the extent permitted by law, agrees to release, defend and indemnify the Railroad from and against any loss, damage, injury, liability, claim, cost or expense incurred by any person including, without limitation, the Political Body's employees, or damage to any property or equipment (collectively the "Loss") that arises from the presence or activities of Political Body's employees on Railroad's property, except to the extent that any Loss is caused by the sole direct negligence of Railroad.

C. **Flagging**.

(i) If the Political Body's employees need to enter Railroad's property as provided in Paragraph B above, the Political Body agrees to notify the Railroad Representative at least thirty (30) working days in advance of proposed performance of any work by Political Body in which any person or equipment will be within twenty-five (25) feet of any track, or will be near enough to any track that any equipment extension (such as, but not limited to, a crane boom) will reach to within twenty-five (25) feet of any track. No work of any kind shall be performed, and no person, equipment, machinery, tool(s), material(s), vehicle(s), or thing(s) shall be located, operated, placed, or stored within twenty-five (25) feet of any of Railroad's track(s) at any time, for any reason, unless and until a Railroad flagman is provided to watch for trains. Upon receipt of such thirty (30) day notice, the Railroad Representative will determine and inform Political Body whether a flagman need be present and whether Political Body needs to implement any special protective or safety measures. If flagging or other special protective or safety measures are performed by Railroad, Railroad will bill Political Body for such expenses incurred by Railroad. If Railroad performs any flagging, or other special protective or safety measures are performed by Railroad, Political Body agrees that Political Body is not relieved of any of its responsibilities or liabilities set forth in this Agreement.

(ii) The rate of pay per hour for each flagman will be the prevailing hourly rate in effect for an eight-hour day for the class of flagmen used during regularly assigned hours and overtime in accordance with Labor Agreements and Schedules in effect at the time the work is performed. In addition to the cost of such labor, a composite charge for vacation, holiday, health and welfare, supplemental sickness, Railroad Retirement and unemployment compensation,

supplemental pension, Employees Liability and Property Damage and Administration will be included, computed on actual payroll. The composite charge will be the prevailing composite charge in effect at the time the work is performed. One and one-half times the current hourly rate is paid for overtime, Saturdays and Sundays, and two and one-half times current hourly rate for holidays. Wage rates are subject to change, at any time, by law or by agreement between Railroad and its employees, and may be retroactive as a result of negotiations or a ruling of an authorized governmental agency. Additional charges on labor are also subject to change. If the wage rate or additional charges are changed, Political Body shall pay on the basis of the new rates and charges.

(iii) Reimbursement to Railroad will be required covering the full eight-hour day during which any flagman is furnished, unless the flagman can be assigned to other Railroad work during a portion of such day, in which event reimbursement will not be required for the portion of the day during which the flagman is engaged in other Railroad work. Reimbursement will also be required for any day not actually worked by the flagman following the flagman's assignment to work on the project for which Railroad is required to pay the flagman and which could not reasonably be avoided by Railroad by assignment of such flagman to other work, even though Political Body may not be working during such time. When it becomes necessary for Railroad to bulletin and assign an employee to a flagging position in compliance with union collective bargaining agreements, Political Body must provide Railroad a minimum of five (5) days notice prior to the cessation of the need for a flagman. If five (5) days notice of cessation is not given, Political Body will still be required to pay flagging charges for the five (5) day notice period required by union agreement to be given to the employee, even though flagging is not required for that period. An additional thirty (30) days notice must then be given to Railroad if flagging services are needed again after such five day cessation notice has been given to Railroad.

D. **Compliance With Laws**. The Political Body shall comply with all applicable federal, state and local laws, regulations and enactments affecting the work. The Political Body shall use only such methods as are consistent with safety, both as concerns the Political Body, the Political Body's agents and employees, the officers, agents, employees and property of the Railroad and the public in general. The Political Body (without limiting the generality of the foregoing) shall comply with all applicable state and federal occupational safety and health acts and regulations. All Federal Railroad Administration regulations shall be followed when work is performed on the Railroad's premises. If any failure by the Political Body to comply with any such laws, regulations, and enactments, shall result in any fine, penalty, cost or charge being assessed, imposed or charged against the Railroad, the Political Body shall reimburse and, to the extent it may lawfully do

so, indemnify the Railroad for any such fine, penalty, cost, or charge, including without limitation attorney's fees, court costs and expenses. The Political Body further agrees in the event of any such action, upon notice thereof being provided by the Railroad, to defend such action free of cost, charge, or expense to the Railroad.

E. **No Interference or Delays**. The Political Body shall not do, suffer or permit anything which will or may obstruct, endanger, interfere with, hinder or delay maintenance or operation of the Railroad's tracks or facilities, or any communication or signal lines, installations or any appurtenances thereof, or the operations of others lawfully occupying or using the Railroad's property or facilities.

F. **Supervision**. The Political Body, at its own expense, shall adequately police and supervise all work to be performed by the Political Body, and shall not inflict injury to persons or damage to property for the safety of whom or of which the Railroad may be responsible, or to property of the Railroad. The responsibility of the Political Body for safe conduct and adequate policing and supervision of the Project shall not be lessened or otherwise affected by the Railroad's approval of plans and specifications, or by the Railroad's collaboration in performance of any work, or by the presence at the work site of the Railroad's representatives, or by compliance by the Political Body with any requests or recommendations made by such representatives. If a representative of the Railroad is assigned to the Project, the Political Body will give due consideration to suggestions and recommendations made by such representative for the safety and protection of the Railroad's property and operations.

G. **Suspension of Work**. If at any time the Political Body's engineers or the Vice President-Engineering Services of the Railroad or their respective representatives shall be of the opinion that any work of the Political Body is being or is about to be done or prosecuted without due regard and precaution for safety and security, the Political Body shall immediately suspend the work until suitable, adequate and proper protective measures are adopted and provided.

H. **Removal of Debris**. The Political Body shall not cause, suffer or permit material or debris to be deposited or cast upon, or to slide or fall upon any property or facilities of the Railroad; and any such material and debris shall be promptly removed from the Railroad's property by the Political Body at the Political Body's own expense or by the Railroad at the expense of the Political Body. The Political Body shall not cause, suffer or permit any snow to be plowed or cast upon the Railroad's property during snow removal from the Crossing Area.

I. **Explosives**. The Political Body shall not discharge any explosives on or in the vicinity of the Railroad's property without the prior consent of the Railroad's Vice

President-Engineering Services, which shall not be given if, in the sole discretion of the Railroad's Vice President-Engineering Services, such discharge would be dangerous or would interfere with the Railroad's property or facilities. For the purposes hereof, the "vicinity of the Railroad's property" shall be deemed to be any place on the Railroad's property or in such close proximity to the Railroad's property that the discharge of explosives could cause injury to the Railroad's employees or other persons, or cause damage to or interference with the facilities or operations on the Railroad's property. The Railroad reserves the right to impose such conditions, restrictions or limitations on the transportation, handling, storage, security and use of explosives as the Railroad, in the Railroad's sole discretion, may deem to be necessary, desirable or appropriate.

J. **Excavation**. The Political Body shall not excavate from existing slopes nor construct new slopes which are excessive and may create hazards of slides or falling rock, or impair or endanger the clearance between existing or new slopes and the tracks of the Railroad. The Political Body shall not do or cause to be done any work which will or may disturb the stability of any area or adversely affect the Railroad's tracks or facilities. The Political Body, at its own expense, shall install and maintain adequate shoring and cribbing for all excavation and/or trenching performed by the Political Body in connection with construction, maintenance or other work. The shoring and cribbing shall be constructed and maintained with materials and in a manner approved by the Railroad's Assistant Vice President Engineering-Design to withstand all stresses likely to be encountered, including any stresses resulting from vibrations caused by the Railroad's operations in the vicinity.

K. **Drainage**. The Political Body, at the Political Body's own expense, shall provide and maintain suitable facilities for draining the Structure and its appurtenances, and shall not suffer or permit drainage water therefrom to flow or collect upon property of the Railroad. The Political Body, at the Political Body's own expense, shall provide adequate passageway for the waters of any streams, bodies of water and drainage facilities (either natural or artificial, and including water from the Railroad's culvert and drainage facilities), so that said waters may not, because of any facilities or work of the Political Body, be impeded, obstructed, diverted or caused to back up, overflow or damage the property of the Railroad or any part thereof, or property of others. The Political Body shall not obstruct or interfere with existing ditches or drainage facilities.

L. **Notice**. Before commencing any work, the Political Body shall provide the advance notice that is required under the Contractor's Right of Entry Agreement.

M. **Fiber Optic Cables**. Fiber optic cable systems may be buried on the Railroad's property. Protection of the fiber optic cable systems is of extreme importance since any break could disrupt service to users resulting in business

interruption and loss of revenue and profits. Political Body shall visit up.com/CBUD to complete and submit the required form to determine if fiber optic cable is buried anywhere on the Railroad's premises to be used by the Political Body. If it is, Political Body will telephone the telecommunications company(ies) involved, arrange for a cable locator, and make arrangements for relocation or other protection of the fiber optic cable prior to beginning any work on the Railroad's premises.

SECTION 7 - **INTERIM WARNING DEVICES**

If at anytime it is determined by a competent authority, by the Political Body, or by agreement between the parties, that new or improved train activated warning devices should be installed at the Crossing Area, the Political Body shall install adequate temporary warning devices or signs and impose appropriate vehicular control measures to protect the motoring public until the construction or reconstruction of the Structure has been completed.

SECTION 8 - **OTHER RAILROADS**

All protective and indemnifying provisions of this Agreement shall inure to the benefit of the Railroad and any other railroad company lawfully using the Railroad's property or facilities.

SECTION 9 - **BOOKS AND RECORDS**

The books, papers, records and accounts of Railroad, so far as they relate to the items of expense for the materials to be provided by Railroad under this Project, or are associated with the work to be performed by Railroad under this Project, shall be open to inspection and audit at Railroad's offices in Omaha, Nebraska, during normal business hours by the agents and authorized representatives of Political Body for a period of three (3) years following the date of Railroad's last billing sent to Political Body.

SECTION 10 -.**REMEDIES FOR BREACH OR NONUSE**

A. If the Political Body shall fail, refuse or neglect to perform and abide by the terms of this Agreement, the Railroad, in addition to any other rights and remedies, may perform any work which in the judgment of the Railroad is necessary to place the Structure and appurtenances in such condition as will not menace, endanger or interfere with the Railroad's facilities or operations or jeopardize the Railroad's employees; and the Political Body will reimburse the Railroad for the expenses thereof.

B. Nonuse by the Political Body of the Crossing Area for public highway purposes continuing at any time for a period of eighteen (18) months shall, at the option of the Railroad, work a termination of this Agreement and of all rights of the Political Body hereunder.

C. The Political Body will surrender peaceable possession of the Crossing Area and Structure upon termination of this Agreement. Termination of this Agreement shall not affect any rights, obligations or liabilities of the parties, accrued or otherwise, which may have arisen prior to termination.

SECTION 11 - MODIFICATION - ENTIRE AGREEMENT

No waiver, modification or amendment of this Agreement shall be of any force or effect unless made in writing, signed by the Political Body and the Railroad and specifying with particularity the nature and extent of such waiver, modification or amendment. Any waiver by the Railroad of any default by the Political Body shall not affect or impair any right arising from any subsequent default. This Agreement and Exhibits attached hereto and made a part hereof constitute the entire understanding between the Political Body and the Railroad and cancel and supersede any prior negotiations, understandings or agreements, whether written or oral, with respect to the work or any part thereof.

EXHIBIT C

RAILROAD COST ESTIMATE

EXHIBIT C

ESTIMATE OF FORCE ACCOUNT WORK
BY THE
UNION PACIFIC RAILROAD COMPANY

DESCRIPTION OF WORK: Engineering and other related services for work to be performed within railroad right of way. This includes project and construction management during construction activities in railroad right of way. All necessary railroad services will be billed at actual cost.

DATE:
8/15/2023

LOCATION:	**SUBDIVISION**	**STATE:**
Mira Loma		
DOT: 906381W	**Los Angeles**	**CA**

DESCRIPTION	**LABOR**	**MATERIAL**	**UP %0**	**Agency % 100**	**TOTAL**
ENGINEERING					
Project Management	$ 20,000	$ -	$ -	$ 20,000.00	**$ 20,000**
Construction Submittals	$ 75,000	$ -	$ -	$ 75,000.00	**$ 75,000**
Construction Management	$ 50,000	$ -	$ -	$ 50,000.00	**$ 50,000**
Final Inspection	$ 5,000	$ -	$ -	$ 5,000.00	**$ 5,000**
TOTAL PROJECT:	**$ 150,000**	**$ -**	**$ -**	**$ 150,000.00**	**$150,000**

TOTAL ESTIMATED COST: **$150,000**

THE ABOVE FIGURES ARE ESTIMATES ONLY AND SUBJECT TO FLUCTUATION. IN THE EVENT OF AN INCREASE OR DECREASE IN THE COST OR QUANTITY OF MATERIAL OR LABOR REQUIRED, THE RAILROAD WILL BILL FOR ACTUAL COSTS AT THE CURRENT RATES EFFECTIVE THEREOF.

Flagging may be performed by a third-party contractor. Any flagging performed by a third-party contractor will be billed at said third-party contractor rate not included in the above estimate. Alternatively, the Agency may enter into a separate agreement with third-party contractor and will be responsible for all actual costs incurred.

EXHIBIT D

RAILROAD COORDINATION REQUIREMENTS

EXHIBIT D
TO
PUBLIC HIGHWAY OVERPASS AGREEMENT

RAILROAD COORDINATION REQUIREMENTS

1.01 DEFINITIONS

Agreement: Agreement that has been signed, or will be signed, between Railroad and Agency covering the construction and maintenance of the Project.
Agency: State of California, acting by and through its Department of Transportation and San Bernardino County Transportation Authority
AREMA: American Railway Engineering and Maintenance-of-way Association
Contractor: The contractor or contractors hired by the Agency to perform any project work on any portion of Railroad's property and shall also include the Contractor's subcontractors and the Contractor's and subcontractor's respective employees, officers and agents, and others acting under its or their authority.
MUTCD: Manual on Uniform Traffic Control Devices
Project: Agency's Project Number _____ covering the widening of the highway overpass
Railroad: Union Pacific Railroad Company
Railroad Project Representative: Railroad's Manager of Industry and Public Projects for this Project (see Section 1.03)
Railroad MTM Representative: Railroad's Manager of Track Maintenance for this Project (see Section 1.03)
Requirements: The Railroad Coordination Requirements set forth in this Exhibit.

1.02 DESCRIPTION

This Project includes construction work within Railroad's right-of-way. These Requirements describe coordination with the Railroad when work by the Contractor will be performed upon, over or under the Railroad right-of-way or may impact current or future Railroad operations. The Contractor will coordinate with the Railroad while performing the work outlined in this Agreement and shall afford the same cooperation with the Railroad as it does with the Agency. All submittals and work shall be completed in compliance with these Requirements, Railroad guidelines and requirements, AREMA recommendations and/or as directed by the Railroad Local Representative and/or the Railroad MTM Representative.

1.03 UPRR CONTACTS

The Railroad Project Representative for this project is:

Nick Vineyard
909-222-5659
nvineyard@benesch.com

For Railroad flagging services and track work, contact the following Railroad MTM Representative:

Eric Perez
909-361-2513
elperez@up.com

1.04 PLANS / SPECIFICATIONS

The plans and specifications for this Project, affecting the Railroad, are subject to the written approval by the Railroad. Changes in the plans made after the execution of the Agreement and/or the awarding of the

Project to the Contractor are subject to the prior review and written approval of the Agency and the Railroad. No construction work shall commence until final stamped plans and/or changes to final stamped plans have been reviewed and approved by the Railroad in writing. The Railroad's review and approval of the Agency's and/or Contractor's plans in no way relieves the Agency and Contractor from their responsibilities, obligations and/or liabilities under this Agreement, Agency's agreement with the Contractor for the Project and/or in the separate Contractor's Right of Entry Agreement referenced in Section 1.08. Railroad's approval will be given with the understanding that the Railroad makes no representations or warranty as to the validity, accuracy, legal compliance or completeness of Agency's and/or Contractor's plans and that any reliance by the Agency or the Contractor with respect to such plans is at the risk of the Agency and the Contractor.

1.05 UTILITIES AND FIBER OPTICS

A. All installations shall be constructed in accordance with current AREMA recommendations and Railroad specifications and requirements. Railroad general guidelines and the required application forms for utility installations can be found on the Railroad website at http://www.uprr.com/reus/pipeline/install.shtml.

B. It shall be the responsibility of the Contractor, at its expense, to make arrangements directly with utility companies involving the protection, encasement, reinforcement, relocation, replacement, removing or abandonment in place of non-railroad facilities affected by the Project. Railroad has no obligation to supply additional Railroad property for non-railroad facilities affected by this Project, nor does the Railroad have any obligation to permit non railroad facilities to be abandoned in place or relocated on Railroad's property. Any facility and/or utility that crosses Railroad right of way must be covered under an agreement with the Railroad including, without limitation, any relocations of an existing facility and/or utility.

C. Any longitudinal fiber optic lines on Railroad right of way shall be treated as Railroad facilities. Project design may need to be altered to accommodate such facilities.

D. Any fiber optic relocations or protections that are required due to this Project will be at the Agency's expense.

1.06 GENERAL

A. It is essential that the proposed construction shall be performed without interference to Railroad operations and in compliance with all applicable Railroad and Federal Railroad Administration rules and regulations. The Railroad shall be reimbursed by the Contractor or Agency for train delay costs and lost revenue claims due to any delays or interruption of train operations resulting from the Contractor's construction or other activities.

B. Track protection is required for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. All work shall be designed and executed outside the temporary construction clearance envelope defined in Section 1.12.

C. The Contractor is also advised that new facilities within the Project may be scheduled to be built by the Railroad and that certain Contractor's activities cannot proceed until that work is complete. The Contractor shall be aware of the limits of responsibilities, allow sufficient time in the schedule for that work to be accomplished and shall coordinate its efforts with the Railroad.

1.07 RAILROAD OPERATIONS

A. The Contractor shall be advised that trains and/or equipment should be expected on any track, at any time, and in either direction. The Contractor shall communicate with the Railroad MTM Representative to improve the Contractor's understanding of Railroad traffic volume and operation at the Project site. The Contractor's bid shall be structured assuming intermittent track windows as defined in Section 1.07 C

B. All Railroad tracks within and adjacent to the Project site are to be assumed as active and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations can occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. The Contractor shall coordinate and schedule the work so that construction activities do not interfere with Railroad's operations.

C. Work windows for this Project shall be coordinated with the Agency or Contractor and the Railroad Project Representative and the Railroad MTM Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A period of time in which Railroad's operations have priority over construction activities. When construction activities may occur on and adjacent to the railroad tracks within 25 feet of the nearest track, a Railroad flag person will be required. At the direction of the flag person, upon approach of a train and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet from the nearest active track or as directed by the Railroad MTM Representative). Conditional Work Windows are available for the project subject to Railroad's local operating unit review and approval.

2. Absolute Work Window: A period of time in which construction activities are given priority over Railroad's operations. During this time the designated Railroad track(s) will be inactive for train movements and may be fouled by the Contractor. Before the end of an Absolute Work Window, all Railroad tracks and signals must be completely operational for normal train operations. Also, all Railroad, Public Utilities Commission and Federal Railroad Administration requirements, codes and regulations for operational tracks must be complied with. Should the operating tracks and/or signals be affected, the Railroad will perform inspections of the work prior to placing the affected track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. **Absolute Work Windows will generally not be granted. Any request will require a detailed written explanation for Railroad review and approval.**

1.08 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Prior to beginning any work within the Railroad right-of-way, the Contractor shall enter into an agreement with the Railroad in the form of the Contractor's Right of Entry Agreement, attached as **Exhibit E**, or latest version thereof provided by the Railroad. There is a fee for processing of the agreement which shall be borne by the Contractor. The right of entry agreement shall specify working time frames, flagging, inspection and insurance requirements and any other items specified by the Railroad.

B. The Contractor shall give advance notice to the Railroad as required in the Contractor's Right of Entry Agreement before commencing work in connection with construction upon or over Railroad's right-of-way and shall observe the Railroad rules and regulations with respect thereto.

C. All work upon the Railroad right-of-way shall be done at such times and in such a manner as not to interfere with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad MTM Representative for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor, which requires flagging service or inspection service, shall be deferred until the flagging protection required by the Railroad is available at the job site. See Section 1.21 for railroad flagging requirements.

D. The Contractor shall make requests in writing to both the Railroad Project Representative and the Railroad MTM Representative for both Absolute and Conditional Work Windows, at least two weeks in advance of any work. The written request must include:

1. Description of work to be done.

2. The days and hours that work will be performed.
3. The exact location of the work and proximity to the tracks.
4. The type of window and amount of time requested.
5. The designated contact person for the Contractor.

The Contractor shall provide a written confirmation notice to the Railroad MTM Representative at least fifteen (15) days prior to commencing work in connection with the approved work windows when work will be performed within **25 feet of any track center line.** All work shall be performed in accordance with previously approved work plans.

E. Should a condition arise from, or in connection with, the work which requires immediate and unusual actions to be made to protect operations and property of the Railroad, the Contractor shall undertake such actions. If, in the judgment of the Railroad MTM Representative, such actions are insufficient, the Railroad MTM Representative may require or provide such actions as deemed necessary. In any event, such actions shall be at the Contractor's expense and without cost to the Railroad. The Railroad or Agency have the right to order the Contractor to temporarily cease operations in the event of an emergency or if, in the opinion of the Railroad MTM Representative, the Contractor's operations may inhibit the Railroads operations. In the event such an order is given, the Contractor shall immediately notify the Agency of the order.

1.09 INSURANCE

The Contractor shall not begin work within the Railroad's right-of-way until the Railroad has been furnished the insurance policies, binders, certificates and endorsements required by the Contractor's Right-of-Entry Agreement, and the Railroad Project Representative has advised the Agency that such insurance is in accordance with such Agreement. The required insurance shall be kept in full force and effect during the performance of work and thereafter until the Contractor removes all tools, equipment, and material from Railroad property and cleans the premises in a manner reasonably satisfactory to the Railroad.

1.10 RAILROAD SAFETY ORIENTATION

All personnel employed by the Agency, Contractor and all subcontractors must complete the Railroad's course "Property Access Training" and be registered prior to working on Railroad property. This training is available at https://www.up.com/aboutup/community/safety/erailsafe/up-pat/index.htm. **This training is required to be completed annually. The preceding training does not apply for longitudinal fiber optic installations.**

1.11 COOPERATION

The Railroad shall cooperate with the Contractor in the scheduling of Project work with the understanding that Railroad's train operations at the job site shall have priority over the Contractor's activities.

1.12 CONSTRUCTION CLEARANCES

The Contractor shall abide by the twenty-one ft six inches (21.5) foot temporary vertical construction clearance defined in section 4.4.1.1 and fifteen (15) foot temporary horizontal construction clearance defined in section 4.4.1.2 of BNSF and UPRR Guidelines for Railroad Grade Separation Projects. It shall be the Contractor's responsibility to obtain such guidelines from the Agency or Railroad.

Reduced temporary construction clearances, which are less than construction clearances defined above, will require special review and approval by the Railroad.

Any proposed variance on the specified minimum clearances due to the Contractor's operations shall be submitted to the Railroad Project Representative through the Agency at least thirty (30) days in advance of the work. No work shall be undertaken until the variance is approved in writing by the Railroad Project Representative.

1.13 SUBMITTALS

A. Construction submittals and Requests for Information (RFI) shall be submitted per Section 3 of BNSF and UPRR Guidelines for Railroad Grade Separation Projects.

B. The minimum review times, as indicated in tables 3-1 and 3-2 of Section 3.10 of the BNSF and UPRR Guidelines for Railroad Grade Separation Projects, should be anticipated for review of all submittals. Guidelines for Railroad Grade Separation Projects, should be anticipated for review of all submittals. The details of the construction affecting the Railroad tracks and property, not already included in the contract plans, shall be submitted by the Agency to the Railroad Project Representative for the Railroad's review and written approval before such construction is undertaken. The Railroad shall not be liable to Agency, Contractor, and or any other person or entity if the Railroad's review exceeds a four-week review time.

C. As Built Submittals shall be submitted per Section 3 of BNSF and UPRR Guidelines for Railroad Grade Separation Projects.

1.14 MAINTENANCE OF PROPER DRAINAGE AND DAMAGE TO RAILROAD FACILITIES

A. The Contractor, at its expense, shall be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from the Contractor's operations and to repair and restore any Railroad property, tracks and facilities of Railroad and/or its tenants.

B. The Contractor must submit a proposed method of erosion control and have the method reviewed and approved by the Railroad prior to beginning any grading on the project site. Erosion control methods must comply with all applicable local, state and federal regulations.

1.15 SITE INSPECTIONS BY RAILROAD PROJECT REPRESENTATIVE, RAILROAD MTM REPRESENTATIVE OR RAILROAD'S CONTRACTOR

A. In addition to the office reviews of construction submittals, site observations will be performed by the Railroad Project Representative, Railroad MTM Representative or Railroad's Contractor at significant points during construction per Section 4.11 of BNSF and UPRR Guidelines for Railroad Grade Separation Projects.

B. Site inspections are not limited to the milestone events listed in the guidelines. Site visits to check the progress of work may be performed at any time throughout the construction process as deemed necessary by the Railroad.

C. A detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to be performed, shall be provided by the Contractor to the Agency for submittal to the Railroad's Project Representative for review and approval prior to commencement of work. This schedule shall also include the anticipated dates on which the above listed events will occur. This schedule shall be updated for all critical listed events as necessary but at least monthly so that site visits may be scheduled.

1.16 RAILROAD REPRESENTATIVES

A. Railroad representatives, conductors, flag persons or watch persons will be provided by the Railroad at the expense of the Agency or Contractor (as stated elsewhere in these bid documents) to protect Railroad facilities, property and movements of its trains and engines. In general, the Railroad will furnish such personnel or other protective services as follows:

1. When any part of any equipment or object, such as erection or construction activities, is standing or being operated within 25 feet, measured horizontally from centerline, of any track on which trains

may operate.

2. For any excavation below the elevation of track subgrade when, in the opinion of the Railroad MTM Representative, the track or other Railroad facilities may be subject to settlement or movement.

3. During any clearing, grubbing, excavation or grading in proximity to Railroad facilities which, in the opinion of the Railroad MTM Representative, may affect Railroad facilities or inhibit operations.

4. During any Contractor's operations when, in the opinion of the Railroad MTM Representative, the Railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines or pipe lines, may be endangered.

B. The Contractor shall arrange with the Railroad Local Representative to provide the adequate number of flag persons to accomplish the work.

1.17 WALKWAYS REQUIRED

Parallel to the outer side of each exterior track of multiple operated track and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending in width not less than fifteen feet (15') perpendicular from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during working hours must be covered, guarded and/or protected as soon as practical. Walkways with railings shall be constructed by the Contractor over open excavation areas when in close proximity of track, and railings shall not be closer than 9' perpendicular from the center line of tangent track or 9' – 6" horizontal from curved track.

1.18 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad, at Agency's expense, will rearrange its communications and signal lines, grade crossing warning devices, train signals, tracks and facilities that are in use and maintained by Railroad forces in connection with its operation. This work by the Railroad will be done by its own forces or by contractors under a continuing contract and may or may not be a part of the work under this contract.

1.19 TRAFFIC CONTROL

The Contractor's operations which control traffic across or around Railroad facilities shall be coordinated with and approved by the Railroad MTM Representative and shall be in compliance with the MUTCD.

1.20 CONSTRUCTION EXCAVATIONS;CALL BEFORE YOU DIG NUMBER

A. The Contractor shall be required to take special precautions and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. In addition to calling the "811" number and/or the local "one call center", the Contractor shall call the Railroad's "Call Before Your Dig" number at least 48 hours prior to commencing work at 1-800-336-9193 during normal business hours (6:30 a.m. to 8:00 p.m. Central Standard Time, Monday through Friday, except holidays - also a 24 hour, 7 day a week number for emergency calls) to determine location of fiber optics. If a telecommunications system is buried anywhere on or near Railroad property, the Contractor will co-ordinate with the Railroad and the Telecommunication Company(ies) to arrange for relocation or other protection of the system prior to beginning any work on or near Railroad property. The determination of whether fiber optics will be affected by the Project shall be made during the initial design phase of the Project.

C. The Railroad does not allow temporary at grade crossings unless absolutely necessary and there is no

alternative route available to contractor to access the project site. Alternative plans should be considered to avoid crossing Railroad tracks at grade.

1.21 RAILROAD FLAGGING

Performance of any work by the Contractor in which person(s) or equipment will be within twenty-five (25) feet of any track, or that any object or equipment extension (such as, but not limited to, a crane boom) will reach within twenty-five (25) feet of any track, require railroad flagging services or other protective measures. The Contractor shall give an advance notice to the Railroad as required in the Contractor's Right of Entry Agreement before commencing any such work, allowing the Railroad to determine the need for flagging or other protective measures which ensure the safety of Railroad's operations, employees and equipment. Contractor shall comply with all other requirements regarding flagging services covered by the Contractor's Right of Entry Agreement. Any costs associated with failure to abide by these requirements will be borne by the Contractor.

The estimated pay rate for each flag person is $1,400 per day for a(n) 8-hour work day with time and one-half for overtime, Saturdays, Sundays; double time and one-half for holidays. Flagging rates are set by the Railroad and are subject to change due to, but not limited to, travel time, setup plus, per diem and rest time (if work is required at night).

1.22 CLEANING OF RIGHT-OF-WAY

The Contractor shall, upon completion of the work to be performed within the right-of-way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities, promptly remove from the Railroad right-of-way all Contractor's tools, implements and other materials whether brought upon the right-of-way by the Contractor or any subcontractors employee or agent of Contractor or of any subcontractor, and leave the right-of-way in a clean and presentable condition to the satisfaction of the Railroad.

1.23 CONTRACTOR'S RESPONSIBILITY OF SUPERVISION

The Contractor, at its expense, shall adequately supervise all work to be performed by the Contractor. Such responsibility shall not be lessened or otherwise affected by Railroad's approval of plans and specifications, or by the presence at the work site of the Railroad Project Representative, Railroad MTM Representative or any other Railroad representative or Railroad contractor providing inspection services, or by the compliance by the Contractor with any requests or recommendations made by such representatives. The Contractor will give due consideration to suggestions and recommendations made by such representatives for the safety and protection of the Railroad's property and operations.

1.24 USE OF EXPLOSIVES AT PROJECT SITE PROHIBITED

The Contractor's use of explosives at the Project site is expressly prohibited unless authorized in advance in writing by the Railroad Project Representative.

EXHIBIT E

CONTRACTORS RIGHT-OF-ENTRY AGREEMENT

Contractor's Right of Entry Public
Projects Form Approved 02/09/2022

EXHIBIT E

TO

PUBLIC HIGHWAY OVERPASS AGREEMENT

CONTRACTOR'S
RIGHT OF ENTRY AGREEMENT

THIS AGREEMENT is made and entered into as of the_____day of_____, 20_____, by and between **UNION PACIFIC RAILROAD COMPANY**, a Delaware corporation ("Railroad"); and _____, a _____ corporation ("Contractor").

RECITALS:

Contractor has been hired by_____to perform work relating to_____(the "Work") with all or a portion of such Work to be performed on property of Railroad in the vicinity of Railroad's Milepost _____on Railroad's_____[Subdivision or Branch] [at or near DOT No. _____located at or near_____, in_____County, State of_____, as such location is in the general location shown on the print marked **Exhibit A**, attached hereto and hereby made a part hereof, which Work is the subject of a contract dated_____between Railroad and_____.

Railroad is willing to permit Contractor to perform the Work described above at the location described above subject to the terms and conditions contained in this agreement

AGREEMENT:

NOW, THEREFORE, it is mutually agreed by and between Railroad and Contractor, as follows:

ARTICLE 1 - DEFINITION OF CONTRACTOR.

For purposes of this agreement, all references in this agreement to Contractor shall include Contractor's contractors, subcontractors, officers, agents and employees, and others acting under its or their authority. For purposes of clarity, Contractor agrees that any CIC (defined below) hired by Contractor is a subcontractor of Contractor and therefore included in the defined term Contractor pursuant to the foregoing sentence.

ARTICLE 2 - RIGHT GRANTED; PURPOSE.

Railroad hereby grants to Contractor the right, during the term hereinafter stated and upon and subject to each and all of the terms, provisions and conditions herein contained, to enter upon and have ingress to and egress from the property described in the Recitals for the purpose of performing the Work described in the Recitals above. The right herein granted to Contractor is limited to those portions of Railroad's property specifically described herein, or as designated by the Railroad Representative named in Article 4.

ARTICLE 3 - TERMS AND CONDITIONS CONTAINED IN EXHIBITS B AND C.

The terms and conditions contained in **Exhibit B** and **Exhibit C**, attached hereto, are hereby made a part of this agreement.

ARTICLE 4 - ALL EXPENSES TO BE BORNE BY CONTRACTOR; RAILROAD REPRESENTATIVE.

A. Contractor shall bear any and all costs and expenses associated with any Work performed by Contractor (including without limitation any CIC), or any costs or expenses incurred by Railroad relating to this agreement.

B. Contractor shall coordinate all of its Work with the following Railroad representative or his or her duly authorized representative (the "Railroad Representative"):

_____
_____
_____
_____

C. Contractor, at its own expense, shall adequately police and supervise all Work to be performed by Contractor and shall ensure that such Work is performed in a safe manner as set forth in Section 7 of **Exhibit B.** The responsibility of Contractor for safe conduct and adequate policing and supervision of Contractor's Work shall not be lessened or otherwise affected by Railroad's approval of plans and specifications involving the Work, or by Railroad's collaboration in performance of any Work, or by the presence at the Work site of a Railroad Representative, or by compliance by Contractor with any requests or recommendations made by Railroad Representative.

ARTICLE 5 - SCHEDULE OF WORK ON A MONTHLY BASIS.

The Contractor, at its expense, shall provide on a monthly basis a detailed schedule of Work to the Railroad Representative named in Article 4B above. The reports shall start at the execution of this agreement and continue until this agreement is terminated as provided in this agreement or until the Contractor has completed all Work on Railroad's property.

ARTICLE 6 - TERM; TERMINATION.

A. The grant of right herein made to Contractor shall commence on the date of this agreement, and continue until_____, unless sooner terminated as herein provided, or at such time as Contractor has completed its Work on Railroad's property, whichever is earlier. Contractor agrees to notify the Railroad Representative in writing when it has completed its Work on Railroad's property.

B. This agreement may be terminated by either party on ten (10) days written notice to the other party.

ARTICLE 7 - CERTIFICATE OF INSURANCE.

A. Before commencing any Work and throughout the entire term of this Agreement, Contractor, at its expense, shall procure and maintain in full force and effect the types and minimum limits of insurance specified in **Exhibit C** of this agreement and require each of its subcontractors to include the insurance endorsements as required under Section 12 of **Exhibit B** of this agreement.

B. Not more frequently than once every two (2) years, Railroad may reasonably modify the required insurance coverage to reflect then-current risk management practices in the railroad industry and underwriting practices in the insurance industry.

C. Upon request of Railroad, Contractor shall provide to Railroad a certificate issued by its insurance

carrier evidencing the insurance coverage required under **Exhibit B**.

D. Contractor understands and accepts that the terms of this Article are wholly separate from and independent of the terms of any indemnity provisions contained in this Agreement.

E. Upon request of Railroad, insurance correspondence, binders, policies, certificates and endorsements shall be sent to:

Union Pacific Railroad Company
_____
[Insert mailing address]
_____
_____
Attn:_____
Project No. 0752724

ARTICLE 8 - PRECONSTRUCTION MEETING.

If the Work to be performed by the Contractor will involve the Railroad providing any flagging protection (or if a CIC is approved to provide flagging protection pursuant to the terms set forth herein) and/or there is separate work to be performed by the Railroad, the Contractor confirms that no work shall commence until the Railroad and Contractor participate in a preconstruction meeting involving flagging procedures and coordination of work activities of the Contractor and the Railroad (and any CIC, as applicable.)

ARTICLE 9. DISMISSAL OF CONTRACTOR'S EMPLOYEE.

At the request of Railroad, Contractor shall remove from Railroad's property any employee of Contractor who fails to conform to the instructions of the Railroad Representative in connection with the Work on Railroad's property, and any right of Contractor shall be suspended until such removal has occurred. Contractor shall indemnify Railroad against any claims arising from the removal of any such employee from Railroad's property.

ARTICLE 10. ADMINISTRATIVE FEE.

Upon the execution and delivery of this agreement, Contractor shall pay to Railroad One Thousand Twenty Five Dollars ($1,025.00) as reimbursement for clerical, administrative and handling expenses in connection with the processing of this agreement.

ARTICLE 11. CROSSINGS; COMPLIANCE WITH MUTCD AND FRA GUIDELINES.

A. No additional vehicular crossings (including temporary haul roads) or pedestrian crossings over Railroad's trackage shall be installed or used by Contractor without the prior written permission of Railroad.

B. Any permanent or temporary changes, including temporary traffic control, to crossings must conform to the Manual of Uniform Traffic Control Devices (MUTCD) and any applicable Federal Railroad Administration rules, regulations and guidelines, and must be reviewed by the Railroad prior to any changes being implemented. In the event the Railroad is found to be out of compliance with federal safety regulations due to the Contractor's modifications, negligence, or any other reason arising from the Contractor's presence on the Railroad's property, the Contractor agrees to assume liability for any civil penalties imposed upon the Railroad for such noncompliance.

ARTICLE 12.- EXPLOSIVES.

Explosives or other highly flammable substances shall not be stored or used on Railroad's property without the prior written approval of Railroad.

IN WITNESS WHEREOF, the parties hereto have duly executed this agreement in duplicate as of the date first herein written.

UNION PACIFIC RAILROAD COMPANY

By: _____

Title: _____

_____
(Name of Contractor)

By: _____

Name: _____

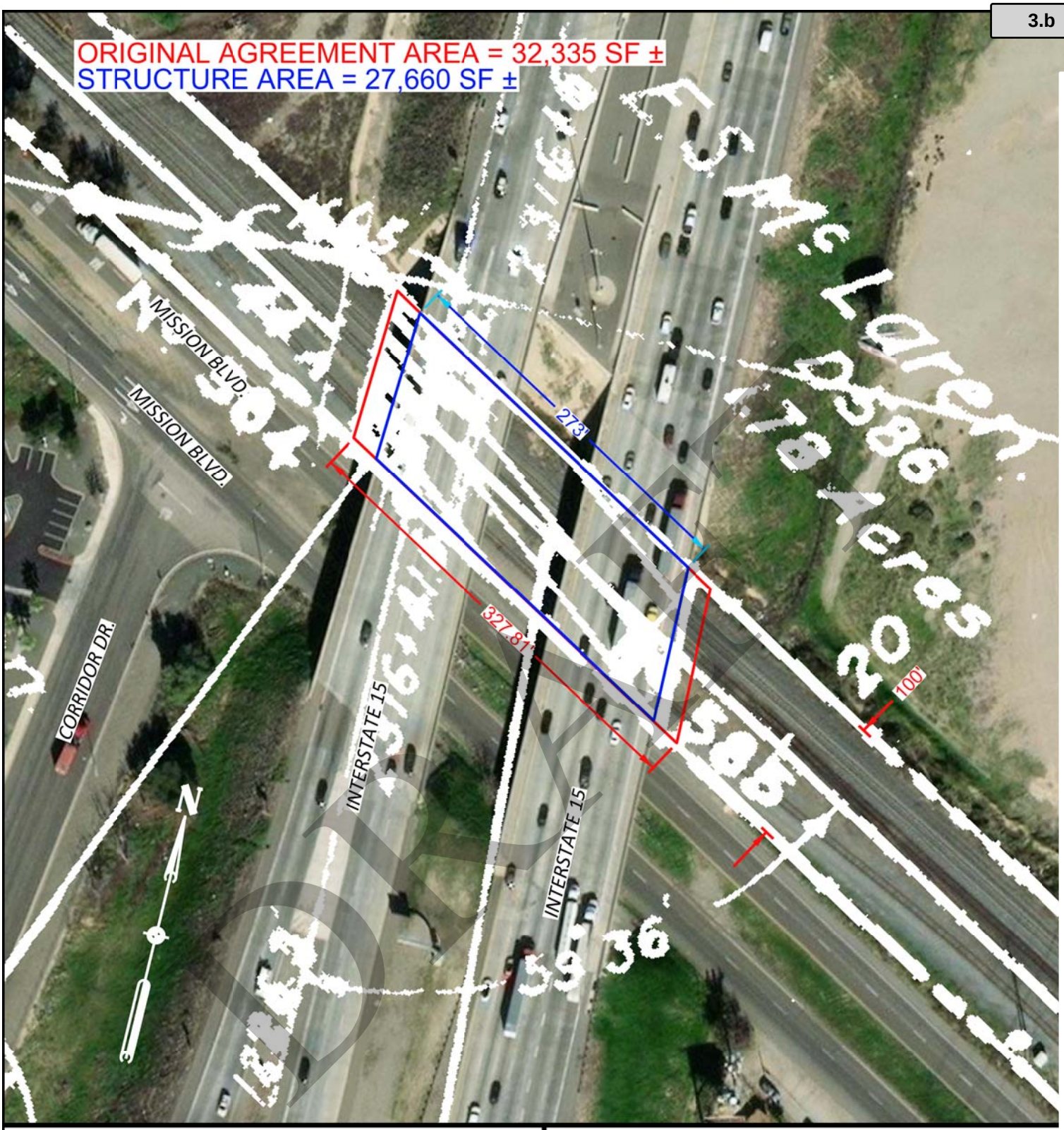
Title: _____

Phone: _____

E-Mail: _____

EXHIBIT A
TO
CONTRACTOR'S RIGHT OF ENTRY AGREEMENT

Exhibit A will be a print showing the general location of the work site.



LEGEND:

ORIGINAL AGREEMENT AREA

STRUCTURE AREA

UPRRCO. R/W OUTLINED

NOTE: BEFORE YOU BEGIN ANY WORK, SEE AGREEMENT FOR FIBER OPTIC PROVISIONS.

EXHIBIT "A"

UNION PACIFIC RAILROAD COMPAN

MIRA LOMA, RIVERSIDE COUNTY, CA

M.P. 43.88 - LOS ANGELES SUB.

MAP LASL CA V-6 / 14

SCALE: 1" = 100'

OFFICE OF REAL ESTATE

OMAHA, NEBRASKA DATE: 8/16/2023

RRM FILE: 07527-24

CADD FILENAME	0752724.DGN
SCAN FILENAME	0752724_CAV06014.TIF

EXHIBIT B
TO
CONTRACTOR'S RIGHT OF ENTRY AGREEMENT

Section 1. NOTICE OF COMMENCEMENT OF WORK - RAILROAD FLAGGING - PRIVATE FLAGGING.

A. Contractor agrees to notify the Railroad Representative at least ten (10) working days in advance of Contractor commencing its Work and at least thirty (30) working days in advance of proposed performance of any Work by Contractor in which any person or equipment will be within twenty-five (25) feet of any track, or will be near enough to any track that any equipment extension (such as, but not limited to, a crane boom) will reach to within twenty-five (25) feet of any track.

B. No work of any kind shall be performed, and no person, equipment, machinery, tool(s), material(s), vehicle(s), or thing(s) shall be located, operated, placed, or stored within twenty-five (25) feet of any of Railroad's track(s) at any time, for any reason, unless and until a Railroad approved flagman is provided to watch for trains. Upon receipt of such thirty (30)-day notice, the Railroad Representative will determine and inform Contractor whether a flagman need be present and whether Contractor needs to implement any special protective or safety measures.

C. Contractor shall be permitted to hire a private contractor to perform flagging or other special protective or safety measures (such private contractor being commonly known in the railroad industry as a contractor-in-charge ("CIC")) in lieu of Railroad providing such services or in concert with Railroad providing such services, subject to prior written approval by Railroad, which approval shall be in Railroad's sole and absolute discretion. If Railroad agrees to permit Contractor to utilize a CIC pursuant to the preceding sentence, Contractor shall obtain Railroad's prior approval in writing for each of the following items, as determined in all respects in Railroad's sole and absolute discretion: (i) the identity of the third-party performing the role of CIC; (ii) the scope of the services to be performed for the project by the approved CIC; and (iii) any other terms and conditions governing such services to be provided by the CIC. If flagging or other special protective or safety measures are performed by an approved CIC, Contractor shall be solely responsible for (and shall timely pay such CIC for) its services. Railroad reserves the right to rescind any approval pursuant to this Section 1, Subsection C., in whole or in part, at any time, as determined in Railroad's sole and absolute discretion.

D. If any flagging or other special protective or safety measures are performed by employees of Railroad and/or any contractor of Railroad, Railroad will bill Contractor for such expenses incurred by Railroad, unless Railroad and a federal, state or local governmental entity have agreed that Railroad is to bill such expenses to the federal, state or local governmental entity. If Railroad will be sending the bills to Contractor, Contractor shall pay such bills within thirty (30) days of Contractor's receipt of billing.

E. If any flagging or other special protective or safety measures are performed by Railroad or a CIC, Contractor agrees that Contractor is not relieved of any of its responsibilities or liabilities set forth in this agreement.

F. The provisions set forth in this subsection are only applicable for Flagging Services performed by employees of Railroad: the rate of pay per hour for each flagman will be the prevailing hourly rate in effect for an eight-hour day for the class of flagmen used during regularly assigned hours and overtime in accordance with labor agreements and schedules in effect at the time the Work is performed. In addition to the cost of such labor, a composite charge for vacation, holiday, health and welfare, supplemental sickness, Railroad Retirement and unemployment compensation, supplemental pension, Employees Liability and Property Damage and Administration will be included, computed on actual payroll. The composite charge will be the prevailing composite charge in effect at the time the Work is performed. One and one-half times the current hourly rate is

paid for overtime, Saturdays and Sundays, and two and one-half times current hourly rate for holidays. Wage rates are subject to change, at any time, by law or by agreement between Railroad and its employees, and may be retroactive as a result of negotiations or a ruling of an authorized governmental agency. Additional charges on labor are also subject to change. If the wage rate or additional charges are changed, Contractor (or the governmental entity, as applicable) shall pay on the basis of the new rates and charges. If flagging is performed by Railroad, reimbursement to Railroad will be required covering the full eight-hour day during which any flagman is furnished, unless the flagman can be assigned to other Railroad work during a portion of such day, in which event reimbursement will not be required for the portion of the day during which the flagman is engaged in other Railroad work. Reimbursement will also be required for any day not actually worked by the flagman following the flagman's assignment to work on the project for which Railroad is required to pay the flagman and which could not reasonably be avoided by Railroad by assignment of such flagman to other work, even though Contractor may not be working during such time. When it becomes necessary for Railroad to bulletin and assign an employee to a flagging position in compliance with union collective bargaining agreements, Contractor must provide Railroad a minimum of five (5) days notice prior to the cessation of the need for a flagman. If five (5) days notice of cessation is not given, Contractor will still be required to pay flagging charges for the five (5) day notice period required by union agreement to be given to the employee, even though flagging is not required for that period. An additional thirty (30) days notice must then be given to Railroad if flagging services are needed again after such five-day cessation notice has been given to Railroad.

Section 2. LIMITATION AND SUBORDINATION OF RIGHTS GRANTED

A. The foregoing grant of right is subject and subordinate to the prior and continuing right and obligation of the Railroad to use and maintain its entire property including the right and power of Railroad to construct, maintain, repair, renew, use, operate, change, modify or relocate railroad tracks, roadways, signal, communication, fiber optics, or other wirelines, pipelines and other facilities upon, along or across any or all parts of its property, all or any of which may be freely done at any time or times by Railroad without liability to Contractor or to any other party for compensation or damages.

B. The foregoing grant is also subject to all outstanding superior rights (whether recorded or unrecorded and including those in favor of licensees and lessees of Railroad's property, and others) and the right of Railroad to renew and extend the same, and is made without covenant of title or for quiet enjoyment.

Section 3. NO INTERFERENCE WITH OPERATIONS OF RAILROAD AND ITS TENANTS.

A. Contractor shall conduct its operations so as not to interfere with the continuous and uninterrupted use and operation of the railroad tracks and property of Railroad, including without limitation, the operations of Railroad's lessees, licensees or others, unless specifically authorized in advance by the Railroad Representative. Nothing shall be done or permitted to be done by Contractor at any time that would in any manner impair the safety of such operations. When not in use, Contractor's machinery and materials shall be kept at least twenty-five (25) feet from the centerline of Railroad's nearest track, and there shall be no vehicular crossings of Railroads tracks except at existing open public crossings.

B. Operations of Railroad and work performed by Railroad personnel and delays in the Work to be performed by Contractor caused by such railroad operations and Work are expected by Contractor, and Contractor agrees that Railroad shall have no liability to Contractor, or any other person or entity for any such delays. The Contractor shall coordinate its activities with those of Railroad and third parties so as to avoid interference with railroad operations. The safe operation of Railroad train movements and other activities by Railroad takes precedence over any Work to be performed by Contractor.

Section 4. LIENS.

Contractor shall pay in full all persons who perform labor or provide materials for the Work to be performed by Contractor. Contractor shall not create, permit or suffer any mechanic's or materialmen's liens of any kind or nature to be created or enforced against any property of Railroad for any such Work performed. Contractor shall indemnify and hold harmless Railroad from and against any and all liens, claims, demands, costs or expenses of whatsoever nature in any way connected with or growing out of such Work done, labor performed, or materials furnished. If Contractor fails to promptly cause any lien to be released of record, Railroad may, at its election, discharge the lien or claim of lien at Contractor's expense.

Section 5. PROTECTION OF FIBER OPTIC CABLE SYSTEMS.

A. Fiber optic cable systems may be buried on Railroad's property. Protection of the fiber optic cable systems is of extreme importance since any break could disrupt service to users resulting in business interruptior and loss of revenue and profits. Contractor shall visit www.up.com/CBUD to complete and submit the required form to determine if fiber optic cable is buried anywhere on Railroad's property to be used by Contractor. If it is, Contractor will telephone the telecommunications company(ies) involved, make arrangements for a cable locator and, if applicable, for relocation or other protection of the fiber optic cable. Contractor shall not commence any Work until all such protection or relocation (if applicable) has been accomplished.

B. IN ADDITION TO OTHER INDEMNITY PROVISIONS IN THIS AGREEMENT, CONTRACTOI SHALL INDEMNIFY, DEFEND AND HOLD RAILROAD HARMLESS FROM AND AGAINST ALL COSTS LIABILITY AND EXPENSE WHATSOEVER (INCLUDING, WITHOUT LIMITATION, ATTORNEYS' FEES COURT COSTS AND EXPENSES) ARISING OUT OF ANY ACT OR OMISSION OF CONTRACTOR, ITS AGENTS AND/OR EMPLOYEES, THAT CAUSES OR CONTRIBUTES TO (1) ANY DAMAGE TO OI DESTRUCTION OF ANY TELECOMMUNICATIONS SYSTEM ON RAILROAD'S PROPERTY, AND/OR (2) ANY INJURY TO OR DEATH OF ANY PERSON EMPLOYED BY OR ON BEHALF OF ANY TELECOMMUNICATIONS COMPANY, AND/OR ITS CONTRACTOR, AGENTS AND/OR EMPLOYEES, OI RAILROAD'S PROPERTY. CONTRACTOR SHALL NOT HAVE OR SEEK RECOURSE AGAINST RAILROAI FOR ANY CLAIM OR CAUSE OF ACTION FOR ALLEGED LOSS OF PROFITS OR REVENUE OR LOSS OI SERVICE OR OTHER CONSEQUENTIAL DAMAGE TO A TELECOMMUNICATION COMPANY USINC RAILROAD'S PROPERTY OR A CUSTOMER OR USER OF SERVICES OF THE FIBER OPTIC CABLE OI RAILROAD'S PROPERTY.

Section 6. PERMITS - COMPLIANCE WITH LAWS.

In the prosecution of the Work covered by this agreement, Contractor shall secure any and all necessar permits and shall comply with all applicable federal, state and local laws, regulations and enactments affecting th Work including, without limitation, all applicable Federal Railroad Administration regulations.

Section 7. SAFETY.

A. Safety of personnel, property, rail operations and the public is of paramount importance in th prosecution of any Work on Railroad property performed by Contractor. Contractor shall be responsible fc initiating, maintaining and supervising all safety, operations and programs in connection with the Work. Contracto shall, at a minimum, comply with Railroad's then current safety standards located at the below web addres ("Railroad's Safety Standards") to ensure uniformity with the safety standards followed by Railroad's own forces As a part of Contractor's safety responsibilities, Contractor shall notify Railroad if Contractor

determines that any of Railroad's Safety Standards are contrary to good safety practices. Contractor shall furnish copies of Railroad's Safety Standards to each of its employees before they enter Railroad property.

http://www.up.com/cs/groups/public/@uprr/@suppliers/documents/up_pdf_nativedocs/pdf_up_supplier_safety_req.pdf

B. Without limitation of the provisions of paragraph A above, Contractor shall keep the job site free from safety and health hazards and ensure that its employees are competent and adequately trained in all safety and health aspects of the job.

C. Contractor shall have proper first aid supplies available on the job site so that prompt first aid services may be provided to any person injured on the job site. Contractor shall promptly notify Railroad of any U.S. Occupational Safety and Health Administration reportable injuries. Contractor shall have a nondelegable duty to control its employees while they are on the job site or any other property of Railroad, and to be certain they do not use, be under the influence of, or have in their possession any alcoholic beverage, drug or other substance that may inhibit the safe performance of any Work.

D. If and when requested by Railroad, Contractor shall deliver to Railroad a copy of Contractor's safety plan for conducting the Work (the "Safety Plan"). Railroad shall have the right, but not the obligation, to require Contractor to correct any deficiencies in the Safety Plan. The terms of this agreement shall control if there are any inconsistencies between this agreement and the Safety Plan.

Section 8. INDEMNITY.

A. TO THE FULLEST EXTENT ALLOWED BY APPLICABLE LAW, CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS RAILROAD, ITS AFFILIATES, AND ITS AND THEIR OFFICERS, AGENTS AND EMPLOYEES (INDIVIDUALLY AN "INDEMNIFIED PARTY" OR COLLECTIVELY "INDEMNIFIED PARTIES") FROM AND AGAINST ANY AND ALL LOSS, DAMAGE, INJURY, LIABILITY, CLAIM, DEMAND, COST OR EXPENSE (INCLUDING, WITHOUT LIMITATION, ATTORNEY'S, CONSULTANT'S AND EXPERT'S FEES, AND COURT COSTS), FINE OR PENALTY (COLLECTIVELY, "LOSS") INCURRED BY ANY PERSON (INCLUDING, WITHOUT LIMITATION, ANY INDEMNIFIED PARTY, CONTRACTOR, OR ANY EMPLOYEE OF CONTRACTOR OR OF ANY INDEMNIFIED PARTY) ARISING OUT OF OR IN ANY MANNER CONNECTED WITH (I) ANY WORK PERFORMED BY CONTRACTOR, OR (II) ANY ACT OR OMISSION OF CONTRACTOR, ITS OFFICERS, AGENTS OR EMPLOYEES, OR (III) ANY BREACH OF THIS AGREEMENT BY CONTRACTOR.

B. THE RIGHT TO INDEMNITY UNDER THIS SECTION 8 SHALL ACCRUE UPON OCCURRENCE OF THE EVENT GIVING RISE TO THE LOSS, AND SHALL APPLY REGARDLESS OF ANY NEGLIGENCE OR STRICT LIABILITY OF ANY INDEMNIFIED PARTY, EXCEPT WHERE THE LOSS IS CAUSED BY THE SOLE ACTIVE NEGLIGENCE OF AN INDEMNIFIED PARTY AS ESTABLISHED BY THE FINAL JUDGMENT OF A COURT OF COMPETENT JURISDICTION. THE SOLE ACTIVE NEGLIGENCE OF ANY INDEMNIFIED PARTY SHALL NOT BAR THE RECOVERY OF ANY OTHER INDEMNIFIED PARTY.

C. CONTRACTOR EXPRESSLY AND SPECIFICALLY ASSUMES POTENTIAL LIABILITY UNDER THIS SECTION 8 FOR CLAIMS OR ACTIONS BROUGHT BY CONTRACTOR'S OWN EMPLOYEES. CONTRACTOR WAIVES ANY IMMUNITY IT MAY HAVE UNDER WORKER'S COMPENSATION OR INDUSTRIAL INSURANCE ACTS TO INDEMNIFY THE INDEMNIFIED PARTIES UNDER THIS SECTION 8. CONTRACTOR ACKNOWLEDGES THAT THIS WAIVER WAS MUTUALLY NEGOTIATED BY THE PARTIES HERETO.

D. NO COURT OR JURY FINDINGS IN ANY EMPLOYEE'S SUIT PURSUANT TO ANY

WORKER'S COMPENSATION ACT OR THE FEDERAL EMPLOYERS' LIABILITY ACT AGAINST A PARTY TO THIS AGREEMENT MAY BE RELIED UPON OR USED BY CONTRACTOR IN ANY ATTEMPT TO ASSERT LIABILITY AGAINST ANY INDEMNIFIED PARTY.

E. THE PROVISIONS OF THIS SECTION 8 SHALL SURVIVE THE COMPLETION OF ANY WORK PERFORMED BY CONTRACTOR OR THE TERMINATION OR EXPIRATION OF THIS AGREEMENT. IN NO EVENT SHALL THIS SECTION 8 OR ANY OTHER PROVISION OF THIS AGREEMENT BE DEEMED TO LIMIT ANY LIABILITY CONTRACTOR MAY HAVE TO ANY INDEMNIFIED PARTY BY STATUTE OR UNDER COMMON LAW.

Section 9. RESTORATION OF PROPERTY.

In the event Railroad authorizes Contractor to take down any fence of Railroad or in any manner move or disturb any of the other property of Railroad in connection with the Work to be performed by Contractor, then in that event Contractor shall, as soon as possible and at Contractor's sole expense, restore such fence and other property to the same condition as the same were in before such fence was taken down or such other property was moved or disturbed. Contractor shall remove all of Contractor's tools, equipment, rubbish and other materials from Railroad's property promptly upon completion of the Work, restoring Railroad's property to the same state and condition as when Contractor entered thereon.

Section 10. WAIVER OF DEFAULT.

Waiver by Railroad of any breach or default of any condition, covenant or agreement herein contained to be kept, observed and performed by Contractor shall in no way impair the right of Railroad to avail itself of any remedy for any subsequent breach or default.

Section 11. MODIFICATION - ENTIRE AGREEMENT.

No modification of this agreement shall be effective unless made in writing and signed by Contractor and Railroad. This agreement and the exhibits attached hereto and made a part hereof constitute the entire understanding between Contractor and Railroad and cancel and supersede any prior negotiations, understandings or agreements, whether written or oral, with respect to the Work to be performed by Contractor.

Section 12. ASSIGNMENT - SUBCONTRACTING.

Contractor shall not assign or subcontract this agreement, or any interest therein, without the written consent of the Railroad. Contractor shall be responsible for the acts and omissions of all subcontractors. Before Contractor commences any Work, the Contractor shall, except to the extent prohibited by law; (1) require each of its subcontractors to include the Contractor as "Additional Insured" on the subcontractor's Commercial General Liability policy and Umbrella or Excess policies (if applicable) with respect to all liabilities arising out of the subcontractor's performance of Work on behalf of the Contractor by endorsing these policies with ISO Additional Insured Endorsements CG 20 10, and CG 20 37 (or substitute forms providing equivalent coverage; (2) require each of its subcontractors to endorse their Commercial General Liability Policy with "Contractual Liability Railroads" ISO Form CG 24 17 10 01 (or a substitute form providing equivalent coverage) for the job site; and (3) require each of its subcontractors to endorse their Business Automobile Policy with "Coverage For Certain Operations In Connection With Railroads" ISO Form CA 20 70 10 01 (or a substitute form providing equivalent coverage) for the job site.

EXHIBIT C
TO
CONTRACTOR'S
RIGHT OF ENTRY AGREEMENT

Union Pacific Railroad Company
Insurance Requirements For
Contractor's Right of Entry Agreement

During the entire term of this Agreement and course of the Project, and until all Project Work on Railroad's property has been completed and all equipment and materials have been removed from Railroad's property and Railroad's property has been clean and restored to Railroad's satisfaction, Contractor shall, at its sole cost and expense, procure and maintain the following insurance coverage:

A. **Commercial General Liability** insurance. Commercial general liability (CGL) with a limit of not less than $5,000,000 each occurrence and an aggregate limit of not less than $10,000,000. CGL insurance must be written on ISO occurrence form CG 00 01 12 04 (or a substitute form providing equivalent coverage).

The policy must also contain the following endorsement, which must be stated on the certificate of insurance:

- Contractual Liability Railroads ISO form CG 24 17 10 01 (or a substitute form providing equivalent coverage) showing "Union Pacific Railroad Company Property" as the Designated Job Site.
- Designated Construction Project(s) General Aggregate Limit ISO Form CG 25 03 03 97 (or a substitute form providing equivalent coverage) showing the project on the form schedule.

B. **Business Automobile Coverage** insurance. Business auto coverage written on ISO form CA 00 01 10 01 (or a substitute form providing equivalent liability coverage) with a combined single limit of not less $5,000,000 for each accident and coverage must include liability arising out of any auto (including owned, hired and non-owned autos).

The policy must contain the following endorsements, which must be stated on the certificate of insurance

- Coverage For Certain Operations In Connection With Railroads ISO form CA 20 70 10 01 (or a substitute form providing equivalent coverage) showing "Union Pacific Property" as the Designated Job Site.
- Motor Carrier Act Endorsement - Hazardous materials clean up (MCS-90) if required by law.

C. **Workers' Compensation and Employers' Liability** insurance. Coverage must include but not be limited to:

- Contractor's statutory liability under the workers' compensation laws of the state where the Work is being performed.
- Employers' Liability (Part B) with limits of at least $500,000 each accident, $500,000 disease policy limit $500,000 each employee.

If Contractor is self-insured, evidence of state approval and excess workers compensation coverage must be provided. Coverage must include liability arising out of the U. S. Longshoremen's and Harbor Workers' Act, the Jones Act, and the Outer Continental Shelf Land Act, if applicable.

D. **Railroad Protective Liability** insurance. Contractor must maintain "Railroad Protective Liability" (RPL) insurance written on ISO occurrence form CG 00 35 12 04 (or a substitute form providing equivalent coverage) on behalf of Railroad as named insured, with a limit of not less than $2,000,000 per occurrence

and an aggregate of $6,000,000. The definition of "JOB LOCATION" and "WORK" on the declaration page of the policy shall refer to this agreement and shall describe all WORK or OPERATIONS performed under this agreement. Contractor shall provide this agreement to Contractor's insurance agent(s) and/or broker(s) and Contractor shall instruct such agent(s) and/or broker(s) to procure the insurance coverage required by this agreement. A BINDER STATING THE POLICY IS IN PLACE MUST BE SUBMITTED TO RAILROAD BEFORE THE WORK MAY COMMENCE AND UNTIL THE ORIGINAL POLICY IS FORWARDED TO UNION PACIFIC RAILROAD.

E. **Umbrella or Excess** insurance. If Contractor utilizes umbrella or excess policies, these policies must "follow form" and afford no less coverage than the primary policy.

F. **Pollution Liability** insurance**.** Pollution liability coverage must be included when the scope of the Work as defined in the agreement includes installation, temporary storage, or disposal of any "hazardous" material that is injurious in or upon land, the atmosphere, or any watercourses; or may cause bodily injury at any time.

If required, coverage may be provided in separate policy form or by endorsement to Contractors CGL or RPL. Any form coverage must be equivalent to that provided in ISO form CG 24 15 "Limited Pollution Liability Extension Endorsement" or CG 28 31 "Pollution Exclusion Amendment" with limits of at least $5,000,000 per occurrence and an aggregate limit of $10,000,000.

If the scope of Work as defined in this agreement includes the disposal of any hazardous or non-hazardous materials from the job site, Contractor must furnish to Railroad evidence of pollution legal liability insurance maintained by the disposal site operator for losses arising from the insured facility accepting the materials, with coverage in minimum amounts of $1,000,000 per loss, and an annual aggregate of $2,000,000.

Other Requirements

G. All policy(ies) required above (except business automobile, worker's compensation and employers liability) must include Railroad as "Additional Insured" using ISO Additional Insured Endorsements CG 20 10, and CG 20 37 (or substitute forms providing equivalent coverage). The coverage provided to Railroad as additional insured shall not be limited by Contractor's liability under the indemnity provisions of this agreement. BOTH CONTRACTOR AND RAILROAD EXPECT THAT UNION PACIFIC RAILROAD COMPANY WILL BE PROVIDED WITH THE BROADEST POSSIBLE COVERAGE AVAILABLE BY OPERATION OF LAW UNDER ISO ADDITIONAL INSURED FORMS CG 20 10 AND CG 20 37.

H. Punitive damages exclusion, if any, must be deleted (and the deletion indicated on the certificate of insurance), unless (a) insurance coverage may not lawfully be obtained for any punitive damages that may arise under this agreement, or (b) all punitive damages are prohibited by all states in which this agreement will be performed.

I. Contractor waives all rights of recovery, and its insurers also waive all rights of subrogation of damages against Railroad and its agents, officers, directors and employees for damages covered by the workers compensation and employers liability or commercial umbrella or excess liability obtained by Contractor required in this agreement where prohibited by law. This waiver must be stated on the certificate of insurance.

J. Prior to commencing the Work, Contractor shall furnish Railroad with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements in this agreement.

K. All insurance policies must be written by a reputable insurance company acceptable to Railroad or with a current Best's Insurance Guide Rating of A- and Class VII or better, and authorized to do business in the state where the Work is being performed.

L. The fact that insurance is obtained by Contractor or by Railroad on behalf of Contractor will not be deemed to release or diminish the liability of Contractor, including, without limitation, liability under the indemnity provisions of this agreement. Damages recoverable by Railroad from Contractor or any third party will not be limited by the amount of the required insurance coverage.

EXHIBIT F

RAILROAD GUIDELINES FOR TEMPORARY SHORING

https://www.up.com/cs/groups/public/@uprr/@it/@telecom/documents/up_pdf_nativedocs/commercial_telecom_temp_shorin.pdf

GUIDELINES FOR TEMPORARY SHORING

EMAIL BEFORE YOU DIG
UP.COM/CBUD

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Contents

1. INTRODUCTION

1.1 PURPOSE

a. The purpose of these guidelines is to inform public agencies, design engineers, contractors and inspectors of current Railroad standards and requirements concerning design and construction of temporary shoring.

1.2 SCOPE

a. This guideline governs on the Railroad Right-of-Way. This includes the limits of property owned, controlled and/or operated upon by the Railroad.

b. All requirements addressed within this document shall constitute minimum requirements for all projects or works on the Railroad Right-of-Way. The applicability of each requirement for any given project will be subjected to the Railroad's discretion.

c. Where laws or orders of authority prescribe a higher degree of protection or restriction than specified herein, the higher degree so prescribed shall control.

d. These guidelines supplement the current American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering. For items covered within these guidelines and AREMA, the more restrictive shall control.

   i. **It is the requirement for the Contractor and designer developing Railroad shoring systems to have a copy of the AREMA Manual. Visit www.arema.org to obtain the Manual for Railway Engineering.**

e. These guidelines supersede all previous Railroad guidelines for temporary shoring and are subject to revision without notice.

f. In addition to this guideline, all excavations shall also be governed by each individual Railroad requirements, Federal, State and Local laws, rules and regulations concerning construction safety.

g. These guidelines are provided as a reference and cannot be taken as authority to construct without prior review and written approval of the Railroad. See Section 2.9 for review process.

2. GENERAL CRITERIA

2.1 SAFETY & RAILROAD OPERATIONS

a. Projects shall be designed such that construction activities and phasing will not compromise safety nor impact Railroad operations.

b. Emergency Railroad phone numbers are to be obtained from a Railroad representative prior to the start of any work and shall be posted at the job site.

2.2 SHORING REMOVAL

a. The Contractor is responsible for planning and executing all procedures necessary to construct, maintain and remove the temporary shoring system in a safe and controlled manner.

2.3 RAILROAD FLAGGING

a. A flagman is required when any work is performed within 25 feet of track centerline. If the Railroad provides flagging or other services, the Contractor shall not be relieved of any responsibilities or liabilities as set forth in any document authorizing the work. No work is allowed within 50 feet of track centerline when a train passes the work site, and all personnel must clear the area within 25 feet of track centerline and secure all equipment when trains are present.

2.4 CALL BEFORE YOU DIG & EXISTING UTILITIES

a. Call Before You Dig: Appropriate measures for the installation and protection of fiber optic, or other cables, shall be addressed in the plans and contract documents. For specific Railroad requirements and additional information refer to:

   BNSF: www.bnsf.com or call 1-800-533-2891.

   UPRR: www.up.com/cbud

b. Relocation of utilities or communication lines not owned by the Railroad shall be coordinated with the respective utility owners. Utility relocation plans must then be submitted to the Railroad utility representative(s) for review and prior approval must be secured before work can proceed. The Railroad will not be responsible for costs associated with any utility, signal, or communication line relocation or adjustments.

c. Abandonment of utilities must follow the UPRR Guidelines For Abandonment of Subsurface Utility Structures or the BNSF Utility Accommodation Policy.

2.5 APPLICANT & CONTRACTOR RESPONSIBILITIES

a. The Applicant and Contractor must verify with the Railroad's Local Representative their receipt of the latest version of these guidelines prior to developing Construction Documents.

b. Construction shall NOT impact Railroad operations, functions and facilities:

   i. The Applicant and Contractor shall develop design plans, including, without limitation, all procedures necessary to construct and maintain the proposed shoring project, which cause no interruption to Railroad operations during and after construction.

   ii. Work shall also not impede drainage or other functions of the Railroad.

   iii. Any rail traffic outages or curfews thought to be required for the installation or removal of any portions of a shoring system must be requested by submittal to the Railroad for prior consideration long in advance of mobilization and construction. Such requests may not be granted.

   iv. Unapproved and unscheduled interruptions to Railroad operations may result in your removal from Railroad Right-of-Way, and your authorization to re-enter revoked.

c. Railroad approved design and construction plans:

   i. The Contractor shall install the temporary shoring system per the plans approved by the Railroad.

   ii. Any deviation from the Railroad approved plans requires resubmittal and prior approval by the Railroad prior to proceeding with said deviation. Approval from the Railroad may not be granted.

d. The Contractor must monitor the track, ground and shoring for movement. See Section 2.6 for monitoring.

e. The Applicant and Contractor shall be jointly responsible for the design, construction and performance of the temporary structure.

f. The Contractor must review the temporary shoring plans to ensure that the proposed method of construction is compatible with the existing site and soil conditions. Removal of the shoring system must also be addressed.

g. The Contractor must obtain a valid right of entry permit from the Railroad and comply with all Railroad requirements when working on Railroad property.

h. The Contractor is responsible to protect the Railroad ballast and subballast from contamination.

i. The Contractor shall comply with all State and Federal Laws, county or municipal ordinances and regulations which in any manner affect the work.

j. All removed soils will become the responsibility of the Contractor and shall be disposed of outside the Railroad Right-of-Way according to the applicable Federal, State and Local regulations.

k. The project engineer and the Contractor shall evaluate the quality of materials furnished and work performed.

l. The Applicant, at its expense, shall be solely responsible for all costs, design, construction, future replacement, maintenance, and serviceability of the proposed shoring project, except as noted otherwise in the Construction & Maintenance (C & M) Agreement with the Railroad.

m. The Applicant shall be responsible for obtaining all Federal, State, Local and other permits for construction of the shoring project.

   i. The Engineer-of-Record shall be registered in the state of the project location. The Engineer-of-Record may be Applicant's in-house staff or a consultant retained by the Applicant. The Contractor shall not employ the Engineer-of-Record as the Contractor's Engineer-of-Record or as a specialty engineer, with the exception of design build projects.

n. The Applicant and/or the Engineer-of-Record have the ultimate responsibility and liability for the Construction Documents and liability for damages to Railroad property during and after construction of the shoring.

o. The Contractor is responsible to comply with the construction documents prepared by the Applicant. The Contractor shall comply with Railroad requirements stated in the C & M Agreement prior to the commencement of any construction. The Contractor shall develop work plans that ensure the track(s) remain open to train traffic per Railroad requirements as stated in the C & M Agreement and meet the requirements of the Railroad Right-of-Entry Agreement (if applicable).

p. The Applicant and Contractor is responsible for the security and safety of all people including the general public and trespassers, and the protection of Railroad infrastructure within the limits of the proposed shoring project. Any damage to Railroad property such as track, signal equipment or structure could result in a train derailment. All damages must be reported immediately to the Railroad Local Representative and to the local Railroad Track Maintenance Representative.

q. The Applicant and Contractor are required to meet all safety standards as defined by the Railroad, Federal Railroad Administration (FRA), Division of Occupational Safety and Health Administration (OSHA), Local, State and Federal Governments and the State Railroad Regulatory Body.

2.6 TRACK, GROUND & SHORING MONITORING:

The Contractor must monitor the track, ground and shoring for movement to ensure proper performance of the shoring system and the safe operation of trains. Record top of rail elevations and track alignment for the duration of the project. After the project is complete additional track and ground monitoring may be required as deemed necessary by the Railroad.

a. Track & Ground Monitoring requirements: In addition to Table 2:
   - For UPRR, see the Union Pacific Railroad Guidelines for Track & Ground Monitoring.
   - For BNSF, subject to direction of the BNSF project engineer for the project

   ii. Deflection Limits (Table 2), Section 3.8k, for both track and shoring deflection limits.
   - Displacements exceeding the limits defined in Table 2 must be immediately reported to the Railroad. All work on the project must stop and the Railroad may take any action necessary to ensure safe passage of trains. The Contractor must immediately submit a corrective action plan to the Railroad for review and approval. The Railroad must review and approve the proposed repair procedure. The repair must be inspected by the Railroad before any work on the project can proceed.

b. Any damage to Railroad property such as track, signal equipment or structure could result in a train derailment. All damage must be reported immediately to the Railroad representative in charge of the project and to the Railroad Track Maintenance Representative.

2.7 RAILROAD RIGHT-OF-WAY

a. The Railroad Right-of-Way accommodates existing tracks, drainage systems, multiple utilities, access roads, Railroad support facilities and space for future track(s).

b. The proposed project shall not limit existing or future Railroad operating capacity and utility accommodations within the Railroad Right-of-Way.

c. Limits of Railroad Right-of-Way are to be located by the Applicant and identified on the plans.

2.8 CONSTRUCTION AND MAINTENANCE AGREEMENT

a. Prior to construction on Railroad Right-of-Way, Applicants must have an executed a C & M Agreement with the Railroad.

b. The C & M agreement shall, at a minimum, include a funding source, cost estimate, insurance and indemnification requirements, method of payment, responsibility for design, construction, ownership, maintenance and future replacement.

c. The Applicant shall own, maintain and replace the proposed project at no cost to the Railroad and with no interruption to Railroad operations during construction, maintenance and future replacement of the structure.

d. The Railroad shall, at its own expense, be responsible for ownership and maintenance of ballast and track components only.

e. The Applicant shall provide, at no cost to the Railroad, traffic control and/or detours to allow occupation of the roadway by the Railroad or its contractor(s) to perform periodic inspections as required.

f. The Applicant is responsible for performing the work in accordance with the terms specified in the C & M Agreement.

2.9 RAILROAD REVIEW PROCESS

a. <u>How to Communicate with the Railroad</u>

   i. All design and construction submittals shall be sent to the Railroad Representative who will pass them along for Railroad review.

b. <u>Railroad Compensation Agreement</u>:

   i. Prior to any review, the Railroad Local Representative shall receive written notice from the Applicant agreeing to pay all costs associated with the Railroad's (or its consultant's) review of the design plans, construction documents and construction monitoring phase. This is often referred to as the Preliminary Engineering Agreement (PE Agreement).

   ii. The estimated costs of such PE Agreement shall not be the upper limit of the costs but will provide a guideline for budgeting purposes. Regardless, all actual costs incurred by the Railroad (or its consultants) during the review of design plans, construction documents, and construction monitoring submittals shall be fully recoverable from the Applicant.

c. <u>Railroad Review Duration</u>

   i. Review of design submittals and resubmittals by the Railroad (or its consultants) will require a minimum of 4 weeks each individual submission to the Railroad.

   ii. To expedite the review process of the temporary shoring plans, drawings submitted to the Railroad shall be in accordance with these Guidelines. Otherwise, longer review times shall be expected.

   iii. To avoid impacting the construction schedule, the Contractor should schedule submittals at least 4 to 6 months in advance.

   iv. Partial, incomplete or inadequate designs will be rejected, thus delaying the approval.

   v. Revised submittals will follow the same procedure as the initial submittal until all issues are resolved.

d. Applicant and Engineer of Record Review

i. Before providing submittals for the Railroad to review, the applicant and or Engineer of Record must first review and approve the submittal for compliance with the project specifications, AREMA Manual, these Guidelines and structural capacity. Exceptions or proposed alternatives, if any, must be clearly communicated and identified for all submittals involved.

ii. Drawings and calculations must be signed and stamped by a licensed professional engineer familiar with railway loadings and is licensed in the state where the shoring system is intended for use.

e. Construction May Commence Only When:

i. The Contractor must not begin construction of any component of the shoring system affecting the Railroad Right-of-Way until written Railroad approval has been received.

2.10 APPROVAL EXPIRATION

a. Written approval of Final Plans will be valid for two years from the date of approval by the Railroad unless otherwise provided in the C&M Agreement. If construction of the approved structure has not begun within this period, the Railroad shall have the right to perform a design review, at the cost of the Applicant, to confirm compliance with the Railroad's then-current Guidelines before a Railroad Right-of–Entry Agreement is issued to begin construction.

3. DESIGN

3.1 GENERAL DESIGN REQUIREMENTS

a. Shoring Zones (see Figure 1 below):

i. All dimensions are measured perpendicular to the centerline of track.

ii. For ALL excavations within Zone A, shoring plans shall be accompanied by design calculations.

iii. All shoring within the limits of Zone A must be placed prior to the start of excavation.

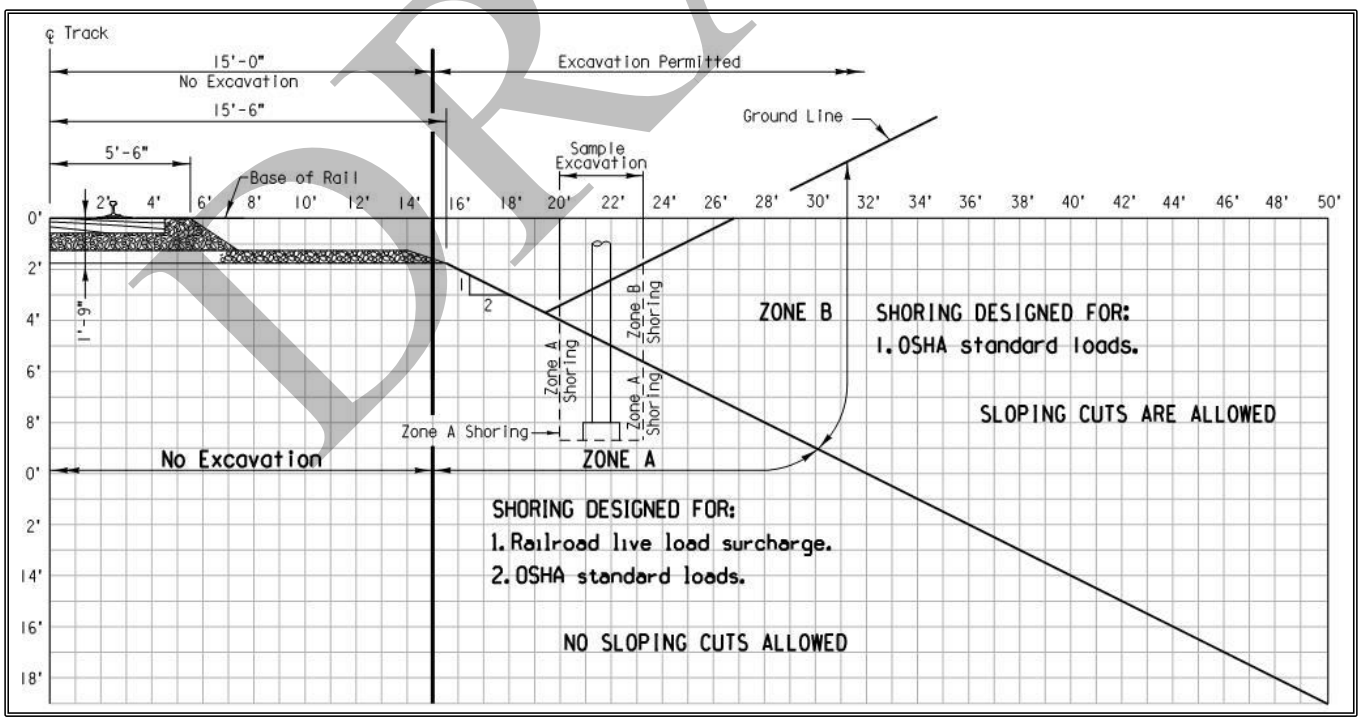


FIGURE 1

b. Excavation Limits: No excavation shall be permitted closer than 15'-0" measured at a right angle from the centerline of track to the trackside of shoring system.

c. Evaluate slope and stability conditions to ensure the Railroad embankment will not be adversely affected. Local and global stability conditions must also be evaluated.

d. Lateral clearances must provide sufficient space for construction of the required Railroad ditches parallel to the standard Railroad roadbed section. The size of ditches will vary depending upon the flow and terrain and should be designed accordingly.

e. Protect Open Excavations:

   i. Any excavation, holes or trenches on the Railroad property shall be covered, guarded and/or protected. Handrails, fence, or other barrier methods must meet OSHA and FRA requirements. Temporary lighting may also be required by the Railroad to identify tripping hazards to train crewmen and other Railroad personnel.

f. The most stringent project specifications shall be used of the Public Utilities Commission Orders, Department of Industrial Safety, OSHA, FRA, AREMA, BNSF, UPRR or other governmental agencies.

g. Secondhand material is not acceptable unless the Engineer of Record submits a full inspection report which verifies the material properties and condition of the secondhand material. The report must be signed and sealed by the Engineer of Record.

h. Shoring Removal:

   i. All components of the shoring system are to be removed when the shoring is no longer needed to the extent that there is no impact to Railroad operations. All voids must be filled and compacted properly, and drainage facilities restored. See compaction requirements in Section 3.5c.

   ii. If the shoring cannot be completely removed, it shall be removed at least 3.0 feet below the final finished grade or at least 3.0 feet below the base of rail, whichever is lower, unless otherwise specified by the Railroad and only if approved by the Railroad.

   iii. No traffic during unsupported excavations resulting from shoring removal.

i. Soldier piles may be installed in predrilled holes if the requirements of AREMA, Vol. 2, Ch. 8, Article 28.5.4.3 and the following are met:

   i. Slurry and drilling fluid type materials are not acceptable as backfill for soldier piles in drilled holes.

   ii. Concrete and flowable backfill may be used but might prevent removal of the embedded piles. If width of the drilled hole will be relied on for passive resistance, the concrete backfill shall have a minimum compressive strength of 3,000 psi, and a minimum coverage of at least 3.0 inches between the edge of the pile and drilled hole.

   iii. Compacted pea gravel material is allowed as backfill if the groundwater level is below the bottom of the drilled hole, the diameter of the hole is at least 12 inches greater than the diagonal width of the pile, and the pea gravel is placed in successive lifts of 8 inches or less in thickness and either consolidated by vibrating the pile or being dry rodded between each lift. The design passive resistance shall be based on the lessor of that derived from either the surrounding subsurface soils or the pea gravel. The pea gravel shall be assumed to have a friction angle no greater than 34 degrees.

   iv. Temporary or permanent casing is used to support the sides of the drilled hole for holes drilled within 25 feet from centerline of track, or 2 times the hole diameter plus 15 feet from centerline of track, whichever is greater. The thickness and strength of the steel casing shall be sufficient to support the loads described in Section 3.7, and shall be specified on the plans.

j. Tieback & Soil Nail Anchor Rods

   i. Soil Nails are defined as drilled-in ground anchors that require ground and wall movement to occur before fully utilized, and Tiebacks are defined as tie rods and drilled-in ground anchors that are prestressed after installation.

ii. Tiebacks & Soil Nails are not approved to permanently retain Railroad embankment supporting tracks.

iii. Tiebacks & Soil Nails installed below active tracks shall be cased during anchor installation.

iv. Tiebacks & Soil Nails shall be installed a minimum of 6 feet below base of rail, unless comprised of fiberglass or fully removed after the shoring is no longer needed. Additionally, the upper surface of the grouted tieback or soil nail shall be no less than 3.5 feet below base of rail.

v. Tiebacks & Soil Nails shall be designed for gravity placement of grout unless pressure grouting can be proven to not cause an unacceptable risk of track heave.

vi. For shoring that will extend above existing grade, which will result in the shoring being backfilled with compacted fill, settlement of the backfill, and associated impacts to shoring and adjacent structures, shall be evaluated. If tieback tie rods will be installed within the compacted backfill, the tie rods shall be placed in the bottom of pipe sleeves that have sufficient diameter to prevent vertical loading on the tie rods from backfill settlement. The pipe sleeves shall also have sufficient strength to support overburden backfill and surcharge loads.

vii. The contractor is responsible for providing an approved test method to verify the capacity of anchored or tieback systems. The manufacturers recommendations for testing must be satisfied. Systems which support the Railroad embankment will be considered high risk in determining the percentage of elements to be proof tested.

viii. Cement-grouted anchors tiebacks shall be installed, tested and stressed in accordance with the project specifications, AREMA requirements, FHWA-IF-99-015, Geotechnical Engineering Circular 4, Ground Anchors and Anchored Systems.

k. The proximity of existing structures shall be evaluated when determining shoring installation methods. Installation of shoring by vibratory or impact hammers has the potential to cause dynamically induced subsidence of existing structures and track. The Railroad may dictate shoring installation methods as required on a case by case basis.

3.2 INFORMATION REQUIRED

a. Plans and calculations shall be submitted, signed and stamped by a Licensed Professional Engineer familiar with Railroad loadings and who is licensed in the state where the shoring system is intended for use. See Section 3.9 for requirements on plan submittals. In addition to plans and calculations, the following information is also required.

b. Field Survey

i. The field survey shall be referenced to the centerline of track(s) and top of rail elevations. Existing grades and alignment of tracks and roads shall be surveyed. The location of existing utilities shall also be determined.

c. Drainage

i. The drainage pattern of the site before and after construction should be analyzed and adequate drainage provisions should be incorporated into the plans and specifications. Consideration should be given to groundwater seepage as well as surface drainage.

ii. Drainage provisions for backfill should be compatible with the assumed water conditions in design.

d. Geotechnical Report – See Section 3.5, Subsurface Characterization.

e. Assumed Loading – See Section 3.7, Applied Loads and Calculations.

f. Structural Design Calculations – See Section 3.8, Structural Design Calculations.

3.3 DESIGN PROCEDURE

a. Shoring design should generally adhere to the following procedure:

Step 1) Determine proposed excavation location and depth.

Step 2) Establish subsurface and surface conditions at proposed shoring location. See Section 3.5 for requirements.

Step 3) Select shoring type (see Section 3.6)

Step 4) Determine Applied Loads

- Lateral Driving Pressures on back side of shoring, which would consist of the following:
  - Earth pressure (Active, At-Rest, Apparent) (see Sections 3.7c.i, 3.7c.ii, and 3.7c.iii)
  - Surcharge pressures (see Section 3.7c.iv)
  - Hydrostatic pressure (see Section 3.7c.v)
- Lateral Resisting Pressures on the front side of shoring, which would consist of the following:
  - Passive earth pressure (see Section 3.7d.i).
  - Passive earth pressure reductions (e.g., seepage uplift) (see Section 3.7d.ii)
  - Resisting loads from braces and tiebacks

Step 5) Perform Structural Design Calculations

- Perform stability analysis to establish the minimum embedment depth of shoring and anchor/brace loads (see Section 3.8j).
  - For complex shoring designs, perform global and basal heave stability analyses (see Section 3.8j).
- Verify deflection is within that allowable (see Section 3.8k).
- Verify strength of structural elements are not exceeded (see Section 3.8i)

3.4 (Step 1) EXCAVATION LOCATION

a. See Figure 1, Section 3.1b for excavation limits.

b. Shoring systems should be located as far from the Railroad track and structures as possible.

3.5 (Step 2) SUBSURFACE CHARACTERIZATION

a. Subsurface exploration.

i. Sufficient borings shall be made along the length of the structure to determine, with a reasonable degree of certainty, the subsurface conditions. Irregularities found during the initial soil boring program may dictate that additional borings be performed.

ii. In general, borings should be performed within 50 feet of the planned location of shoring, or closer as necessary. If the planned shoring is longer than 250 feet in length, additional borings shall be performed along the length of the shoring on an average spacing of 250 feet.

iii. Borings shall be performed to a depth sufficient to fully characterize the soils adjacent to and below the proposed shoring.

iv. Unless otherwise stated in these guidelines, subsurface investigation shall also be made in accordance with the provisions of AREMA, Vol. 2, Ch. 8, Part 22, Geotechnical Subsurface Investigation.

b. Type of backfill and backfill properties.

i. Backfill is defined as material behind the wall, whether undisturbed ground or compacted fill, that contributes to the pressure against the wall.

ii. The compacted fill may be classified with reference to the soil types described in AREMA Vol. 2, Ch. 8, Articles 5.2.5 and 5.3.2. However, the unit weight used in design shall be representative of the actual unit weight of the material as measured by laboratory testing.

c. Backfill placement and compaction.
   i. The compacted fill shall meet the latest version requirements of Section 31 23 26 of the UPRR General Conditions and Specifications (UPRR) or BNSF Standard Construction Specifications (BNSF).
   ii. No dumping of backfill material shall be permitted in such a way that the successive layers slope downward toward the wall. The layers shall be horizontal or shall slope downward away from the wall.
   iii. If the wall is not free to rotate (i.e., is anchored or braced) and achieve an active condition during compaction of the backfill, the induced earth pressure due to compaction shall be evaluated. The assumed earth pressure shall be no less than the at-rest earth pressure (see Section 3.7c.ii).

d. Stress states and corresponding soil strength properties.
   i. Saturated cohesive soils (clays and some silts) can reside in two different stress states while shoring is in service:
      - Undrained / Total Stress: A short-term condition where the undrained shear strength (S_u) of the soil should be used for analysis.
      - Drained / Effective Stress: A long-term condition where drained effective friction angle (ϕ') and effective cohesion (c') of the soil should be used for analysis.
   ii. It is impossible to accurately predict how long saturated cohesive soils will remain in an undrained / total stress state before pore pressures dissipate and the soil achieves a drained / effective stress state. For this reason, the Undrained Cohesive soil state shall only control for design when it results in a higher factor of safety for the shoring design than that estimated for the Drained Cohesive soil state. This will generally only be the case when the cohesive soils are relatively soft.
   iii. It is noted that cohesive soils can also reside in an "unsaturated" state, where the soil can be characterized by an unsaturated shear strength. The unsaturated shear strength of a cohesive soil can vary drastically as it's moisture content increases or decreases. Given the impossibility of predicting moisture content changes for soils exposed to weather and groundwater fluctuations, the unsaturated shear strength of the soil shall not be used for design.
   iv. Saturated and unsaturated cohesionless soils (some silts, sands, and gravels) should be assumed to always reside in a drained / effective stress state.

e. A Geotechnical Report summarizing the existing and proposed subsurface conditions shall be provided by a Licensed Professional Engineer. The Geotechnical Report shall include:
   i. Boring location plan showing the location of each boring in relation to tracks and the proposed shoring.
   ii. Boring logs that indicate the elevation and depth of each layer of soil encountered, USCS classification of each layer of soil, an indication of whether the soil is fill or natural soil, the depth/elevation of groundwater, results of in-situ testing, index properties of the soil layers as determined by laboratory testing (e.g., moisture, density, sand content, plasticity, unconfined strength, etc.)
   iii. Results of all laboratory testing. Laboratory testing shall include at a minimum: moisture content, density, unconfined compression tests on clay/rock, and direct shear or triaxial compression testing on soils to determine the effective cohesion and internal angle of friction.

iv. Recommended soil properties for the design of shoring for each layer of soil as follows:
- Top/bottom elevation of soil layer
- Moist (γ) and effective (γ') unit weight
- Undrained shear strength (S_u) of cohesive soils
- Effective cohesion (c') and friction angle (ϕ')
- Active and passive earth pressure coefficients
- Parameters for p-y curve generation, if necessary.

v. If required, allowable bearing capacity for spread footings.

vi. Compaction recommendations for backfill, optimum moisture content and maximum density of fill material, and design parameters for the compacted fill. See Sections 3.5b and 3.5c.

vii. Water table elevation to be assumed on both sides of the shoring system.

viii. Dewatering recommendations, as needed, and proposed flownets or zones of groundwater influence.

3.6 (Step 3) SHORING TYPES

a. Shoring/Trench Box is a prefabricated shoring system which is installed as the excavation progresses. This system is allowed in special applications only, typically where Railroad live load surcharge is not present unless it can be shown that the over excavation outside the box will be filled and compacted before the presence of Railroad live load.

b. Anchored systems with tiebacks are discouraged, as the tiebacks will be an obstruction to future utility installations and may also damage existing utilities. If used, see Section 3.1.j for design requirements for tiebacks and soil nails.

c. Sheet Pile Wall (Anchored) is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the sheet pile is embedded and the tensile resistance of tiebacks.

d. Sheet Pile Wall (Cantilevered) is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the sheet pile is embedded. Cantilever sheet pile walls shall be used only in granular soils or stiff clays. The maximum height of wall above the excavation line shall be 10 feet in Zone A (see Figure 1) and 12 feet in Zone B.

e. Soldier Pile with Lagging Wall (Anchored) is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil/rock in which the soldier beam is embedded and from the tensile resistance of tiebacks. Soldier beams include steel H-piles, wide flange sections or other fabricated sections that are driven or set in drilled holes. Lagging refers to the members spanning between soldier beams.

f. Soldier Pile with Lagging Wall (Cantilever) is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil/rock in which the soldier beam is embedded. The maximum height of the wall above the excavation line shall be 8 feet for Zone A (see Figure 1) and 12 feet for Zone B.

g. Braced Excavation is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the vertical members are embedded and from the structural capacity of the bracing members. For purposes of these guidelines, the vertical members of the braced excavation system include steel sheet piling or soldier beams comprised of steel H-piles, wide flange sections, or other fabricated sections that are driven or installed in drilled holes. Wales are horizontal structural members designed to transfer lateral loads from the vertical members to struts or rakers. Struts and rakers are structural compression members that support the lateral loads from the wales and transfer the load to either another side of a shored excavation (struts) or to a reaction pile/thrust block (raker).

h. Cofferdam is an enclosed temporary structure used to keep water and soil out of an excavation for a permanent structure such as a bridge pier or abutment or similar structure. Cofferdams may be

constructed of timber, steel, concrete or a combination of these. These guidelines consider cofferdams primarily constructed with steel sheet piles.

3.7 (Step 4) APPLIED LOADS AND CALCULATIONS

a. For shoring design submittal, all design criteria, temporary and permanent loading must be clearly stated in the design calculations and on the contract and record plans.

b. Applied loading will consist of driving pressures/forces on the back of the shoring and resisting pressures/forces on the front of the shoring.

- Driving pressure will generally consist of:
  - Active, At-Rest & Apparent pressures. (Sections 3.7c.i, 3.7c.ii, 3.7c.iii)
  - Surcharge (Section 3.7c.iv)
  - Hydrostatic pressures (Section 3.7c.v).
- Resisting pressure will generally consist of:
  - Passive earth pressure (3.7d.i) and brace/tieback loading.

c. **Driving Pressures/Loads**:

i. **Active Earth Pressure**

- Use for cantilever walls and flexible walls with only one row of tiebacks/braces (i.e., flexible anchored bulkheads), if the minimum deflection criteria per AREMA Vol. 2, Ch. 8, Article 20.1.2.d is met. If the minimum deflection criteria for flexible anchored bulkheads is not met, use Apparent Earth Pressure for top-down shoring construction (Section 3.7c.iii), and At-Rest Earth Pressure for walls that are backfilled (Section 3.7c.ii).
- The active earth pressure may be computed by the Rankine, Coulomb or Log-Spiral theories. The active earth pressure may also be based on general soil type per AREMA Vol. 2, Ch. 8, Part 20, Table 8-20-3 as provided in the Appendix.
- For interface friction angles used for Coulomb and Log-Spiral theories, the interface friction angle shall not be greater than one-half of the effective friction angle of the soil, or that consistent with published values for specific types of soil in contact with either steel or concrete (e.g., **NAVFAC DM7.02, Chapter 3, Table 1**).
- The backslope of the retained soil shall be considered when calculating the active earth pressure.
- See Section 3.5b. Subsurface Characterization, for further requirements for computing earth pressure from compacted backfill.

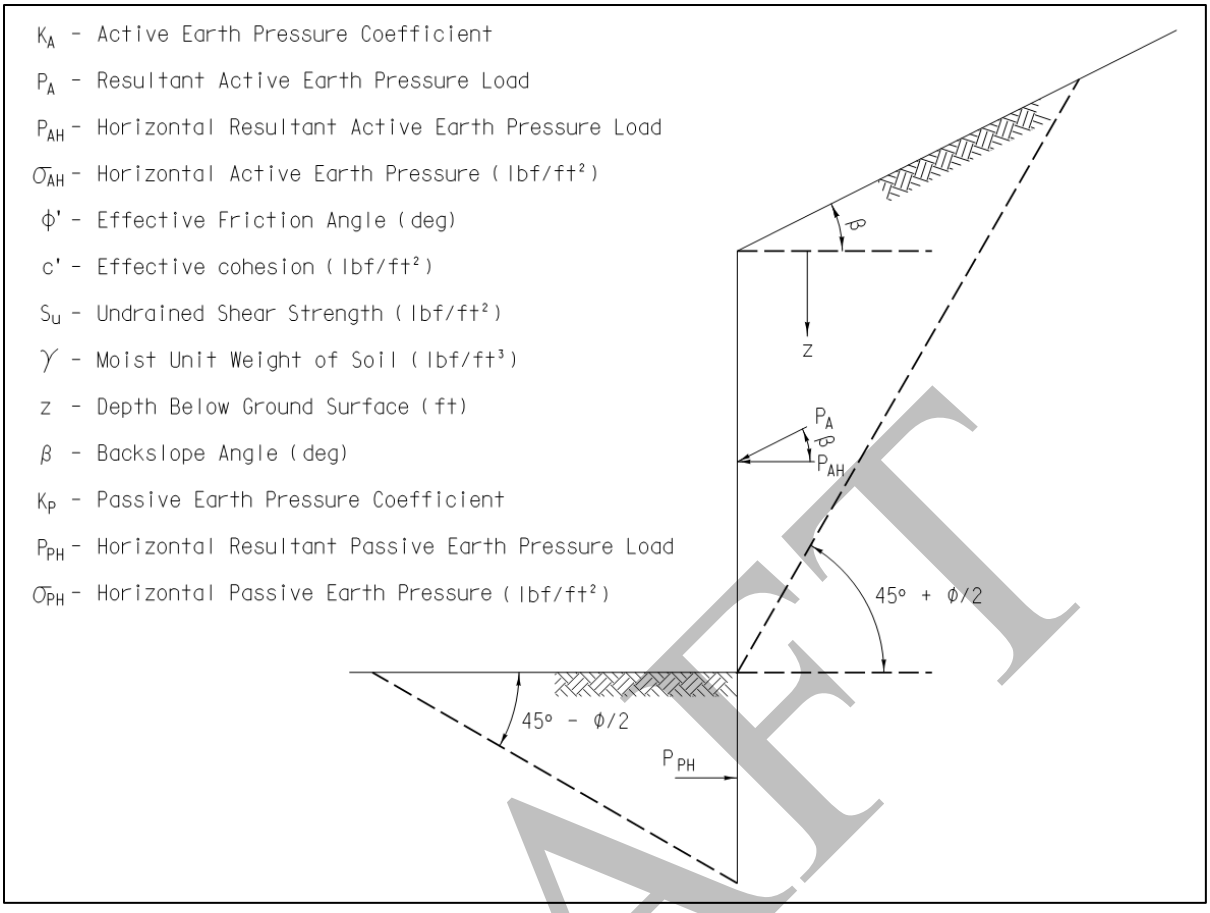


FIGURE 2

❖ NON-COHESIVE SOILS

Level Backslope (Rankine)

$$\sigma_{AH} = K_A \gamma z \quad ,where \quad K_A = tan^2\left(45 - \frac{\phi'}{2}\right)$$

Sloping Backslope (Rankine)

$$\sigma_{AH} = K_A \gamma z \cos\beta \quad ,where \quad K_A = \cos\beta\left(\frac{cos\beta - \sqrt{cos^2\beta - cos^2\phi'}}{cos\beta + \sqrt{cos^2\beta - cos^2\phi'}}\right)$$

❖ COHESIVE SOILS & FRACTURED ROCK

Drained Cohesive & Fractured Rock - Level & Sloping Backslope (Rankine/Bell)

- Use these drained equations unless the undrained equations below result in greater earth pressures in the shoring design.

$$\sigma_{AH} = K_A \gamma z - 2c'\sqrt{K_A}$$

$$K_A = tan^2\left(45 - \frac{\phi'}{2}\right) \, ,For\ Level\ Backslope$$

$$K_A = \cos\beta\left(\frac{cos\beta - \sqrt{cos^2\beta - cos^2\phi'}}{cos\beta + \sqrt{cos^2\beta - cos^2\phi'}}\right) \, ,For\ Sloping\ Backslope$$

- Effective Cohesion Note: Effective cohesion shall be assumed to be zero, unless local experience by a Licensed Geotechnical Engineer indicates the fully softened strength of the clay will have an effective cohesion greater than zero.
- Fractured Rock Note: The active earth pressure for fractured rock and intermediate geomaterials (e.g., weak shales, sandstone, etc.) shall be based on either the rock mass effective cohesion and friction angle, or mass shear strength. The mass strength parameters shall be determine using a methodology that accounts for rock type, intact strength, spacing and conditions of joints, rock quality designation (RQD), geological strength index (GSI), and/or rock mass rating (RMR).

Undrained Cohesive – Level Ground (Rankine/Bell)

- Only use undrained when it results in a higher earth pressure in the shoring design. Otherwise use the Drained equations above.
- Assumes ϕ=0 and c'=S_u

$$\sigma_{AH} = \gamma z - 2S_u$$

or

$$\sigma_{AH} = K_A \gamma z \quad ,where \quad K_A = 1 - \frac{2S_u}{\gamma z}$$

Very Soft to Medium Clays/Silts

- Where the Stability Number $N_s = \gamma * H/S_{ub}$ is greater than 4, active earth pressure shall be estimated as the greater of that determined using the equations above for drained (effective) and undrained (total stress) conditions, or the equations directly below. The factor of safety against basal heave shall also be analyzed per Section 3.8j.ii3.8. For N_s > 6, the global stability of the shoring shall also be evaluated by a limit-equilibrium method of slices per Section 3.8j.ii.

  - For 4 < N_s < 5.14, $K_A = 0.22$
  - For N_s > 5.14 (Henkel, 1971), $K_A = 1 - \frac{4S_u}{\gamma H} + 2\sqrt{2}\frac{d}{H}\left(1 - \frac{5.14S_{ub}}{\gamma H}\right) \geq 0.22$

  Where:

  S_u = Undrained strength of retained soil (lbf/ft^2)
  S_{ub} = Undrained strength of soil below excavation base (lbf/ft^2)
  γ = Total unit weight of retained soil (lbf/ft^3)
  H = Total excavation depth (ft)
  d = Depth of potential base failure surface below base of excavation (ft)
  (The lessor of either the thickness of soft to medium stiff clay below the bottom of excavation, or the width of the excavation divided by the square root of 2. See Figure 3 below.)

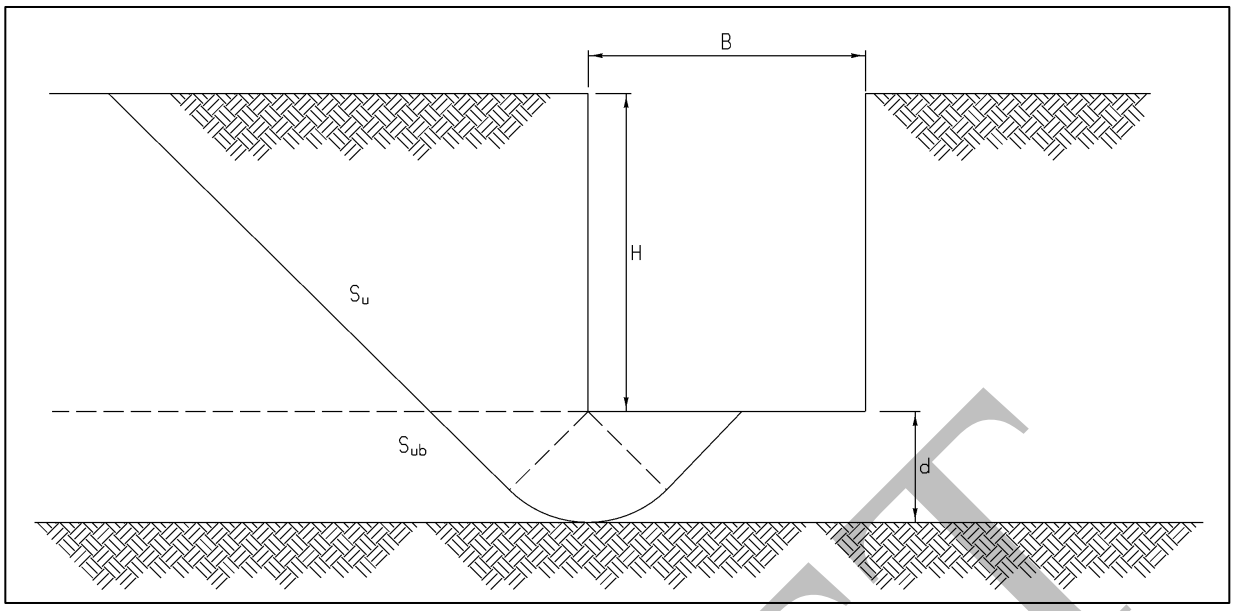


FIGURE 3

ii. **At-Rest Earth Pressure.**

- Used for rigid walls (e.g., reinforced concrete walls) that deflect less than that indicated in Table 1.

Table 1 - When to Use At-Rest Earth Pressure

Type of Backfill	Wall Deflection / Wall Height
Dense sand	0.001
Medium dense sand	0.002
Loose sand	0.004
Compacted Silt	0.002
Compacted lean clay	0.010
Compacted fat clay	0.010

(Clough & Duncan, 1991)

- At-Rest earth pressure shall also be used for walls that are restrained above the dredge line by braces/tiebacks and are backfilled with compacted fill. See also Section 3.8j.ii.
- At-Rest earth pressure shall be calculated as follows:

Level Ground

$$\sigma_{0H} = K_0 \gamma z \ , \ where \ \ K_0 = (1 - sin\phi')OCR^{(sin\phi')}$$

Sloping Backslope

$$\sigma_{0H} = K_0 \gamma z (1 + sin \beta)$$

Where:

σ_{0H} – Horizontal At-Rest Earth Pressure (lbf/ft^2)
K_0 – At-Rest Earth Pressure Coefficient
ϕ' – Effective Friction Angle (deg)
OCR – Over-Consolidation Ratio
β – Backslope Angle (deg)

iii. **Apparent Earth Pressure**

- Use for braced excavations with single or multiple levels of braces/tiebacks.
- Use equations determined per AREMA Vol. 2, Ch. 8, Article 28.5.4.1 or **FHWA-IF-99-015, Sections 5.2.4** (sands), **5.2.5** (stiff to hard clays) and **5.2.6** (soft to medium clays).
- For braced excavations that bottom out in very soft to medium stiff clays/silts, where the Stability Number $N_s = \gamma * H/S_{ub}$ is greater than 4, the requirements of Section 3.7c.i for very soft to medium clays shall also apply if they control for design.

iv. **Surcharge Loads**

- Loads include but are not limited to: Railroad vertical and centrifugal loading, railroad service vehicles (HS-20 truck), roadway loading, fills placed above the top of shoring, construction equipment, crane pads, future grading and paving, structures, material storage piles, and snow.
- Dead load assumptions to be used for design:
  - Spoil pile: must be included assuming a minimum height of two feet of soil adjacent to the excavation.
  - Track: use 200 lbs/linear-ft for rails, inside guardrails and fasteners.
  - Roadbed: ballast, including track ties, use 120 lbs per cubic foot.
- For specific applications of the Cooper E80 live load, refer to in Appendix 5.1, which illustrates Live Load Pressure Due to Cooper E80.
- Additional analysis for centrifugal force calculations as described in AREMA Vol. 2, Ch. 15, Article 1.3.6. Centrifugal Loads are required where shoring is located along the outer side of curved track and track curvature exceeds three degrees.
- Lateral pressure from to infinite and uniform surcharge load.
  - The surcharge can effectively be treated as another soil layer, whereby the vertical surcharge pressure is multiplied by the active or at-rest earth pressure coefficient as shown below:

$$\sigma_{UA} = K_A q \quad or \quad \sigma_{U0} = K_0 q$$

Where:

σ_{UA} – Uniform lateral surcharge pressure for active condition (lbf/ft^2)

σ_{U0} – Uniform lateral surcharge pressure for at-rest condition (lbf/ft^2)

K_A - Active earth pressure coefficient

K_0 – At-rest earth pressure coefficient

q - Uniform surcharge load (lbf/ft^2)

- Lateral pressure from to point, line, uniform strip, and rectangular-area surcharge loads.
  - Equations shall be based on Boussinesq theory (i.e., elastic theory) and a rigid wall condition.
  - For point loads, see **AREMA, Vol. 2 , Ch. 8, Article 20.3.2.4**.
  - For line loads, see **AREMA, Vol. 2 , Ch. 8, Article 20.3.2.3**.
  - For rectangular loads, see **NAVFAC DM7.02, Figure 11**.
  - For uniform strip loads, see Case I (Cooper E80 loading parallel to walls) in Appendix 5.1, or **AREMA, Vol. 2 , Ch. 8, Article 20.3.2.2.**
- Trial Wedge method per AREMA, Vol. 2 , Ch. 8, Article C5.3.2.II may also be used.

v. **Hydrostatic Pressure Due to Unbalanced Groundwater Levels.**

- Hydrostatic pressure shall be assumed on secant/tangent pile and sheet pile shoring if the base of the excavation extends below the water table and no drainage system is installed behind the shoring.
- Weep holes are not considered an effective drainage system, unless the soil behind the shoring above the dredge line is uniformly free-draining granular material.

d. **Resisting Pressures/Loads:**

i. Passive earth pressure

- The passive earth pressure, P_p, below the excavation line may be computed by Rankine or Log-Spiral theories, but not the Coulomb theory.
- For Log-Spiral theory, the interface friction angle shall not be greater than one-half of the effective friction angle of the soil, or that consistent with published values for specific types of soil in contact with either steel or concrete.
- The passive earth pressure for cohesionless soils (sands, gravels and some silts), uncontrolled fill, and mixed layers of cohesive and cohesionless soil shall be calculated based on the effective friction angle of the soil.
- The passive earth pressure for cohesive (clay and some silts) soils and controlled backfill shall be calculated for the effective stress condition (see Section 3.5d.i for definition), unless the resulting earth pressure for the total stress condition (i.e., S_u) is less.
- For conditions where the slope in front of the shoring slopes down and away from the wall, the slope in front of the wall shall be considered when calculating passive pressure. If the ground in front of the shoring slopes upwards away from the wall, the ground level shall be assumed to be level for analysis.
- For reference, Rankine equations are provided below:

K_P – Passive Earth Pressure Coefficient

σ_{PH} – Horizontal Passive Earth Pressure (lbf/ft^2)

ϕ' – Effective Friction Angle (deg)

c' – Effective cohesion (lbf/ft^2)

S_u – Undrained Shear Strength (lbf/ft^2)

γ – Moist Unit Weight of Soil (lbf/ft^3)

z – Depth Below Ground Surface (ft)

β – Front Slope Angle (deg)

NON-COHESIVE SOILS

Level Frontslope (Rankine)

$$\sigma_{PH} = K_P \gamma z \ , where \ \ K_P = tan^2\left(45 + \frac{\phi'}{2}\right)$$

Sloping Frontslope (Rankine)

- Use only if ground is sloping down and away from shoring (i.e., β is negative)

$$\sigma_{PH} = K_P \gamma z \cos\beta \ , where \ \ K_P = \cos\beta\left(\frac{cos\beta + \sqrt{cos^2\beta - cos^2\phi'}}{cos\beta - \sqrt{cos^2\beta - cos^2\phi'}}\right)$$

COHESIVE SOILS & FRACTURED ROCK

Drained Cohesive & Fractured Rock - Level & Sloping Backslope (Bell's)

$$\sigma_{PH} = K_P \gamma z + 2c'\sqrt{K_P}$$

$$K_P = tan^2\left(45 + \frac{\phi'}{2}\right), For\ Level\ Frontslope$$

$$K_P = \cos\beta\left(\frac{cos\beta + \sqrt{cos^2\beta - cos^2\phi'}}{cos\beta - \sqrt{cos^2\beta - cos^2\phi'}}\right), For\ Sloping\ Frontslope$$

- Effective cohesion shall be assumed to be zero unless local experience by a Licensed Geotechnical Engineer indicates the fully softened strength of the clay will have an effective cohesion greater than zero.
- The passive resistance for fractured rock and intermediate geomaterials (e.g., weak shales, sandstone, etc.) shall be based on either the rock mass effective cohesion and friction angle, or mass shear strength. The mass strength parameters shall be determine using a methodology that accounts for rock type, intact strength, spacing and conditions of joints, rock quality designation (RQD), geological strength index (GSI), and/or rock mass rating (RMR).

Undrained Cohesive – Level Ground (Rankine/Bell)

- Only use undrained when it results in a lower earth pressure in the shoring design. Otherwise use Drained equations above.
- Assumes ϕ=0 and c'=S_u

$$\sigma_{PH} = \gamma z + 2S_u$$

or

$$\sigma_{PH} = K_P \gamma z \quad where \quad K_P = 1 + \frac{2S_u}{\gamma z}$$

- For soldier pile walls, the upper 1.5 pile/shaft diameters of passive resistance in soil below the excavation line shall be ignored per AREMA, Vol. 2, Ch. 8, Article 28.5.3.2.a.
- Allowable arching factors for soldier pile walls shall comply with AREMA, Vol. 2, Ch. 8, Article 28.5.3.2.a.
- As noted in Section 3.1i.ii above, the width of the drilled hole for a soldier pile shall not be assumed to provide passive resistance unless the concrete backfill has a minimum compressive strength of 3,000 psi, and a minimum coverage of at least 3.0 inches between the edge of the pile and drilled hole.
- P-y curve methods shall use a P-multiplier less than 1 to account for group effects on sheet and soldier pile walls when piles are spaced less than 3.5D apart on center, and for slopes in front of the wall.

ii. Seepage pressures on bulkheads and cofferdams.

- Where the imbalance of water levels results in water seeping under the bottom of shoring and upward into the excavation, the seepage pressures on the wall and base of excavation shall be based on flownet or equivalent analyses, and the passive resistance reduced accordingly. See AREMA, Vol. 2, Ch. 8, Article 20.3.5 or FHWA-IF-99-015 Section 5.2.9 for further detail.

3.8 (Step 5) STRUCTURAL DESIGN CALCULATIONS

a. Temporary shoring is defined by AREMA, Vol. 2, Ch. 8, Article 28.1.1, and is anticipated to be in service for not more than an 18-month period. Earth retention structures that are anticipated to be in service for more than 18 months shall be designed per AREMA as permanent structures.

b. Calculations shall be performed for each stage of construction, when one or more rows of braces/tiebacks are being implemented. The calculations shall be performed for each stage of excavation before the braces/tiebacks are installed for that stage.

c. Calculations shall be performed by one of two methods:

   1. Classical Method: A sum of forces and moments analysis whereby driving and resisting pressures are balanced. Driving pressures are applied from the top to the bottom of the back side of the shoring. For braced excavations, Apparent earth pressure will be applied from the top down to the excavation line, and below the excavation line, Active earth pressure will be applied down to the bottom of the shoring on the back side of the shoring. Resisting pressures/forces are applied from the excavation line to the bottom of the front side of the shoring. To achieve an acceptable factor of safety for embedment, the passive resistance will be reduced as required in Section 3.8j.i. It is noted that all AREMA requirements are based on an assumption that the Classical Method will be used for design.
   2. P-y Method: A force-deflection analysis (i.e., Winkler beam analysis) whereby the soil below the excavation line on both sides of the shoring is characterized as springs. Driving earth pressures are generally only applied above the excavation line. However, surcharge loads are generally applied to the bottom of the shoring elements. Minimum embedment is based on the base of the shoring reaching fixity as required in Section 3.8j.i.

d. Calculations shall be in English units. If Metric units are used, all controlling dimensions, elevations, design criteria assumptions, and material stresses shall be expressed in dual units, with English units to be in parentheses.

e. List all assumptions used to design the temporary shoring system, and provide references for equations, tables, figures, and design criteria obtained from design manuals and guidelines.

f. Computerized calculations and programs must clearly indicate the input and output data. List all equations used in determining the output.

g. Example calculations with values must be provided to support computerized output and match the calculated computer result.

h. Provide a simple free body diagram showing all controlling dimensions and applied loads on the temporary shoring system.

i. Documents and manufacturer's recommendations which support the design assumptions must be included with the calculations.

j. **Embedment depth and stability.**

   i. The minimum depth of embedment is that required to balance driving and resisting pressures/loads.

      - The minimum factor of safety for balancing active and passive pressures shall be 1.5 (See AREMA, Vol. 2, Ch. 8, Article 20.5.1.a). The factor of safety is achieved by reducing the passive earth pressure resistance by a factor of 0.67. A calculated factor of safety based on shallow penetration into strong soil layer is not acceptable.
      - Note, some commercially available software packages add ~ 30% length to the embedment computed for moment equilibrium in order to achieve force equilibrium. This additional length added by the software is not the required factor of safety noted above. Additional embedment, beyond the 30% added by the software package, is required to achieve the specified factor of safety.

- The minimum embedment for p-y methods shall be based on both the shoring meeting the deflection limit criteria in Table 2 over the full height of the shoring, and a moment reversal (i.e., moment diagram passes through zero twice) being achieve below the excavation line.

ii. In special circumstances, as indicated in these guidelines, minimum embedment might also be controlled by basal heave or global stability.

- The minimum factor of safety against basal heave shall be 1.5 for temporary structures. See FHWA-IF-99-015, Section 5.8.2 for further details on methodology.
- The minimum factor of safety for global stability shall be 1.3 when using a limit-equilibrium method of slices. (See AREMA, Vol. 2, Ch. 8, Article 20.4.1.c). The global stability analyses shall consider failure surfaces that pass both below and through non-continuous shoring (e.g., soldier piles) located below the dredge line, as well as both through and behind wall anchors. See FHWA IF-99-015, Section 5.7.3 for further details on methodology.
- Global stability shall also be analyzed for slopes steeper than 2(H):1(V) that are above, adjacent or below shoring.

iii. Multiple tiers of shoring should not be used if the active wedge of the lower wall overlies the passive wedge of the upper wall.

- If there is active/passive overlap between tiers of shoring, or the shoring will be supporting an existing retaining wall, the effect of loading of the upper wall/shoring on the lower wall shall be evaluated. This will require estimating the bearing, sliding and/or passive resistance demand of the upper wall, and applying those demands in part or fully to the lower wall. In addition, any loading in front of or behind the upper wall that is not fully supported by the wall, would also need to be applied to the shoring. Lastly, a global stability analysis per Section 3.8j.ii shall be performed to determine the external stability of the multi-tiered wall/shoring system.

k. **Deflection limits**.

i. Calculated total deflections of any part of the temporary shoring system and top of rail elevation shall not exceed the criteria outlined in Table 2 Deflection Criteria. Include the accumulated elastic deflection of all of the wall elements (piles, anchors, lagging, walers, strut/raker restraints, etc.), as well as the deflection due to the passive deflection of the resisting soil mass.

Table 2 - Deflection Criteria

Horizontal distance from shoring to track C/L measured at a right angle from track	Maximum horizontal movement of shoring system	Maximum acceptable horizontal or vertical movement of rail
15’ < S < 18’	3/8”	1/4”
18’ < S < 25’	1/2”	1/4”
S > 25’	1% of shoring height above excavation line	-

ii. Braced excavations should be designed for conditions in which the ground surface on all sides is relatively uniform in elevation. If the ground surface elevation varies significantly from one side of the excavation to the other, the deflection of the higher braced shoring towards the side with lower braced shoring shall be evaluated. This analysis would approximate that required for shoring supported by rakers, where the lower shoring acts as the raker thrust block, such that the passive deflection of the lower shoring is added to the higher shoring deflection and the resulting sum is verified to not exceed the deflection criteria in Table 2.

l. **Strength design.**

i. Shall be performed using the Service Load Design method. Allowable Stresses based on AREMA requirements are as follows:

- Structural Steel Allowable Stress: See AREMA, Vol. 2, Ch. 15, Section 1.4, Table 15-1-11 For common shoring components, generally 0.55 of the yield strength of the steel.
- Sheet Pile Sections: 2/3 of yield strength for steel. (AREMA, Vol. 2, Ch. 8, Article 20.5.7)
- Concrete: 1/3 of Compressive strength. (AREMA, Vol. 2, Ch. 8, Article 20.5.7)
- Anchor Rods: 1/2 of yield strength for steel. (AREMA, Vol. 2, Ch. 8, Article 20.5.7)

ii. AISC allowances for increasing allowable stress due to temporary loading conditions are not acceptable.

iii. Structures and structural members shall be designed to have design strengths at all sections at least equal to the required strengths calculated for the loads and forces in such combinations as stipulated in AREMA, Vol. 2, Ch. 8, Article 2.2.4b, which represents various combinations of loads and forces to which a structure may be subjected. Each part of the structure shall be proportioned for the group loads that are applicable, and the maximum design required shall be used.

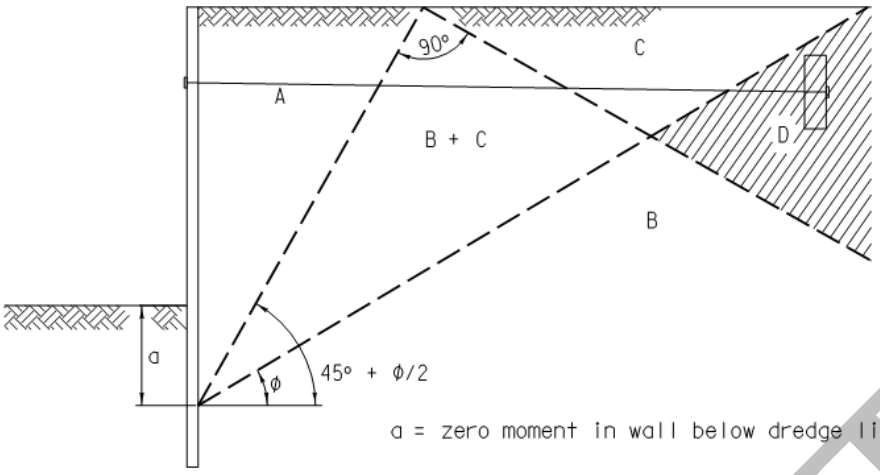
iv. In braced excavations, the connections between struts and wales shall be designed to resist both axial demands as well as the vertical demands from the self-weight of the members and any incidental vertical loads applied during construction.

v. Stiffeners shall be provided at points of bearing concentrated load. (See AREMA Vol. 2, Ch.15, Article 1.7.7).

m. Gravity type temporary shoring systems must also be analyzed for settlement, overturning, sliding, bearing capacity per AREMA, Vol. 2, Ch. 8, Part 5, and global stability per the requirements in Section 3.8j.ii.

n. Anchor blocks and deadman for tiebacks shall be designed for a safety factor of 2.0, where safety factor is derived as the ratio of the net passive resistance (passive earth pressure minus active earth pressure) on the anchor block to the load on tie rod. To utilize the full allowable anchor capacity, the minimum length of the tie rod shall be as shown in Figure 4. If site constraints prevent the minimum length of tie rods from being implemented, the anchor capacity shall be reduced as Indicated in Figure 4. For deriving anchor block capacity where minimum tie rod length is achieved, NAVFAC DM7.02 or CalTrans 2011 may be referenced.

i. For sheet and soldier pile deadman, p-y methods may be used. The sum of the estimated deflection of the deadman pile and shoring shall be less than that indicated in Section 3.8k.



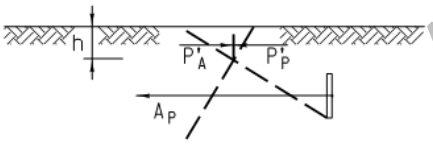
a = zero moment in wall below dredge line

Cohesionless Soil

For Cohesionless soils, anchor resistance in each zone is as follows:

A - No Anchor resistance available

B - Anchor block resistance is reduced by $P'_P - P'_A$



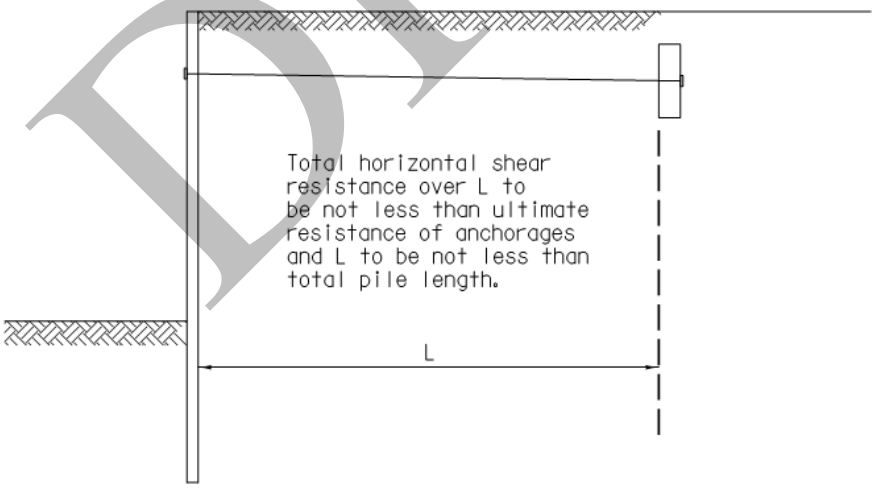
$$P'_P = \frac{1}{2} h^2 \gamma \tan^2\left(45° + \frac{\Phi}{2}\right)$$

$$P'_A = \frac{1}{2} h^2 \gamma \tan^2\left(45° - \frac{\Phi}{2}\right)$$

C - Anchor block achieves full resistance but pressure is increased on the wall by ΔP_P.
(See ΔP_P force diagram in Theoretical Soil Mechanics, pgs. 232-233 or NAVFAC DM7.02, Figure 20)

B + C - Anchor block resistance is reduced by $P'_P - P'_A$ and pressure is increased on the wall by ΔP_P.

D - Anchor block achieves full resistance without adding additional load to the wall



Cohesive Soil or Stratum of Cohesive Extending Below Anchor to Wall (Dismuke, 1991)

FIGURE 4

3.9 DESIGN PLAN REQUIREMENTS

a. Shoring design plans shall be in English units. If Metric units are used, all controlling dimensions, elevations, design criteria assumptions, and material stresses shall be expressed in dual units, with English units to be in parentheses. The shoring plans must completely identify the site constraints and the shoring system, and must be signed and stamped by a Licensed Professional Engineer, registered in the state where the work will be performed. Use the design templates provided in the appendix as an example to show the required information, specifications and drawings. The specific requirements of the plan submittals are as follows:

i. **General plan view should show:**

- Railroad Right-of-Way and North arrow.
- Position of all railroad tracks and identify each track as mainline, siding, spur, etc.
- Spacing between all existing tracks.
- Location of all access roadways, drainage ditches and direction of flow.
- Contours of existing grade elevations.
- Footprint of proposed structure, proposed shoring system and any existing structures if applicable.
- Proposed horizontal construction clearances. The minimum allowable is 15 feet measured at a right angle from centerline of track. In curved track the temporary horizontal construction clearances shall increase either 6 inches total or 1.5 inches for every degree of curve, whichever is greater, per Section 4.4.1.2 of the BNSF-UPRR Guidelines for Railroad Grade Separation Projects.
- Location of existing and proposed utilities.
- Location of soil borings used for design.
- Specifications for all elements of the proposed shoring.
- Detailed view of shoring along with controlling elevations and dimensions.

ii. **Typical sections and elevations perpendicular to adjacent track alignment should show:**

- Top of rail and/or top of tie elevations for all tracks.
- Offset from the outside face of shoring system to the centerline of all tracks at all changes in horizontal alignment.
- All structural components, controlling elevations and dimensions of shoring system.
- All drainage ditches and controlling dimensions.
- All slopes, existing structures and other facilities which may surcharge the shoring system.
- Location of all existing and proposed utilities.
- Total depth of shoring system.
- For shoring with tiebacks/bracing, elevations for each temporary stage of shoring construction.
- The assumed groundwater elevation.
- The extent of the Zone A envelope as it overlies the proposed shoring.

iii. **General notes**

- Design loads to be based on the AREMA manual and Cooper E80 loading.
- Pressure due to embankment surcharges.
- ASTM designation and yield strength for each material.
- Maximum allowable bending stress for structural steel is 0.55Fy.
- Temporary overstress allowances are not acceptable.
- All timber members shall be Douglas Fir grade 2 or better.
- In-situ soil classification.
- Backfill soil classification.
- Soil properties used for design.
- Active and passive soil coefficients.
- Fill and backfill compaction criteria.
- Slopes without shoring shall not be steeper than 2 horizontal to 1 vertical.
- Dredge line elevation.
- Shoring deflection to be calculated and meet Railroad requirements.
- Rail, ground and shoring movement monitoring requirements.

iv. **Miscellaneous:**

- Project name, location, GPS coordinates, track owner, railroad line segment, milepost and subdivision in the title block.
- A detailed construction sequence outlining the installation and removal of the temporary shoring system.
- A description of the tieback installation including

drilling, casing, grouting, stressing information and testing procedures, anchor capacity, type of tendon, anchorage hardware, minimum unbonded lengths, minimum anchor lengths, angle of installation, tieback locations, spacing, and distance below bottom of tie.

- All details for construction of drainage facilities associated with the shoring system shall be clearly indicated.
- Details and descriptions of all shoring system members and connection details.
- Handrail and protective fence details along the excavation.
- Railroad and other “CALL BEFORE YOU DIG” numbers and web sites
- Construction clearance diagram.

4. DEFINITIONS

Access Road:

A road used and controlled by the Railroad for maintenance, inspection and repair.

Applicant:

Any party proposing a temporary retaining structure project on Railroad Right-of-Way or other Railroad operating location, regardless of track being active or out of service. Includes all agents working on behalf of the Applicant.

AREMA:

The current edition of the American Railway Engineering and Maintenance-of-Way Association Manual for Railway Engineering.

AASHTO:

The current edition of the American Association of State Highway and Transportation Officials Standard Specifications for Highway Bridges.

BNSF:

Burlington Northern Sante Fe Railway

C & M Agreement:

A Construction and Maintenance Agreement that has been negotiated between the Railroad and the Applicant that addresses all the duties and responsibilities of each party regarding the construction of the proposed grade separation and the maintenance requirements after construction of the said structure.

Construction Documents:

Design plans and calculations, project and/or standard specifications, geotechnical report and drainage report.

Construction Window:

A timeframe in which construction or maintenance can be performed by the Contractor with the required presence of a Flagman.

Contractor:

The individual, partnership, corporation or joint venture and all principals and representatives (including Applicant’s subcontractors) with whom the contract is made by the Applicant for the construction of the Grade Separation Project.

Crossover:

A track connection which allows trains and on-track equipment to cross from one track to another.

Engineer-of-Record:

The licensed Professional Engineer that develops the criteria and concept for the project and is responsible for the preparation of the Plans and Specifications.

Final Plans:

100% plans signed & stamped by the Engineer-of-Record.

Flagman:

A qualified employee of the Railroad providing protection to and from Railroad operations per Railroad requirements.

Guidelines:

Information contained in this document or referenced in AREMA or AASHTO.

Grade Separation Project:

A project that includes an Overhead or Underpass Structure that crosses the Railroad Right-of-Way or other Railroad operating location regardless of track status being active or out of service.

Main Track:

A principle track, designated by Timetable or special instructions, upon which train movements are generally authorized and controlled by the train dispatcher. Main Track must not be occupied without proper authority.

Multiple Main Tracks:

Two or more parallel or adjacent Main Tracks.

Overhead Structure:

A Roadway and/or Trail Structure over the Railroad Right-of-Way.

Railroad Local Representative / Railroad Representative:

The individual designated by the Railroad as the primary point of contact for the project.

Railroad:

Refers to BNSF Railway and/or Union Pacific Railroad.

Railroad Track Maintenance Representative (UPRR=MTM, BNSF=RDM):

Railroad representative responsible for maintenance of the track and supporting subgrade.

Railroad Right-of-Entry Agreement:

An agreement between the Railroad and an Applicant or a Contractor allowing access to Railroad property.

Railroad Right-of-Way:

The limits of property owned, controlled and/or operated upon by the Railroad.

Shoofly:

A temporary track built to bypass an obstruction or construction site.

Siding:

A track connected to the Main Track used for storing or passing trains.

Timetable:

A Railroad publication with instructions on train, engine or equipment movement. It also contains other essential Railroad information.

Trail:

A pathway impacting Railroad Right-of-Way or other Railroad operating locations regardless of track status being active or out of service. This includes pedestrian, bicycle, approved motorized recreational equipment and equestrian uses.

Underpass Structure:

Railroad Structure over a Roadway and/or Trail.

UPRR:

Union Pacific Railroad

Yard:

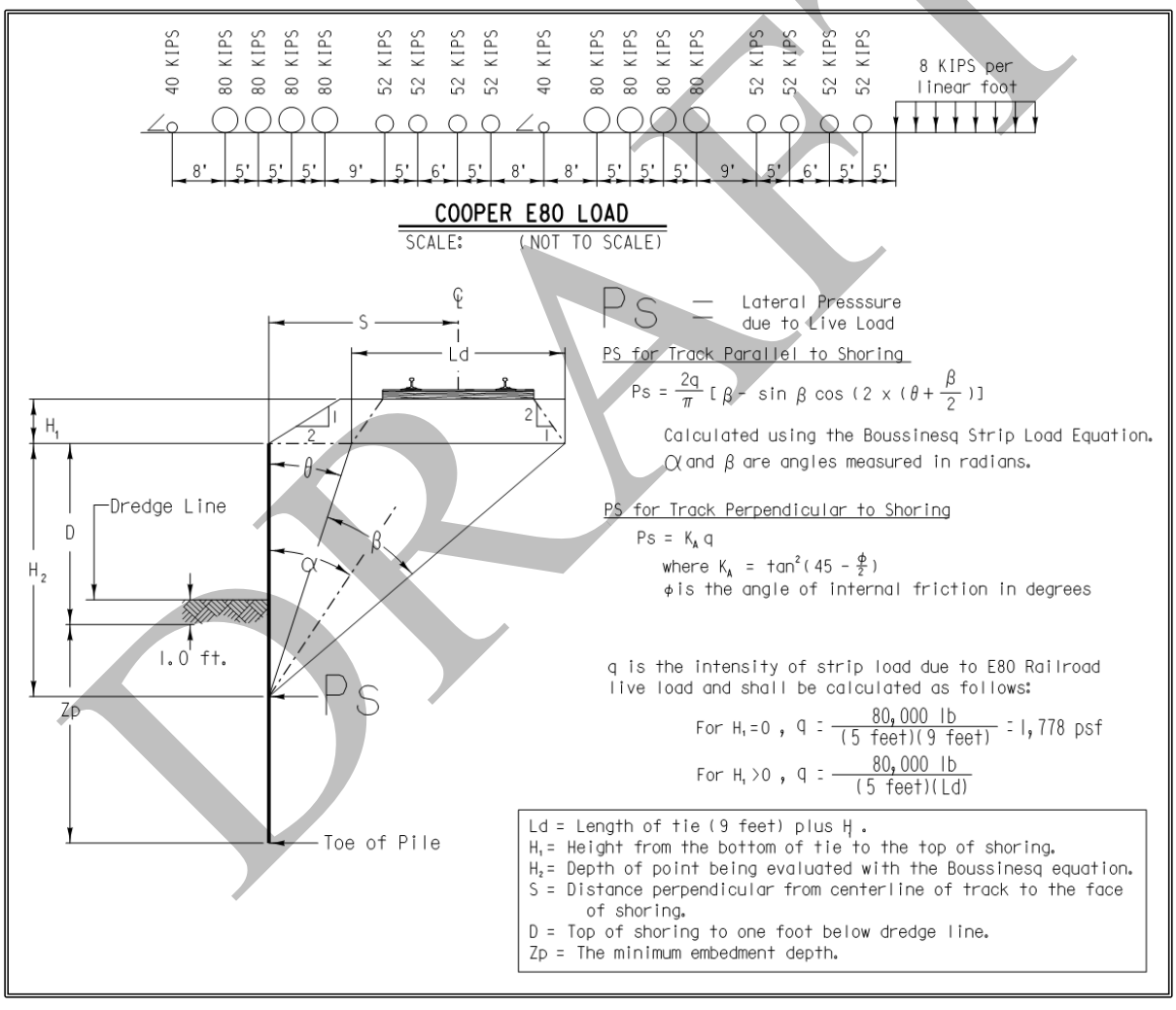
A system of tracks of defined limits, other than main tracks and sidings, for storing and sorting cars and other purposes.

Yard Limits:

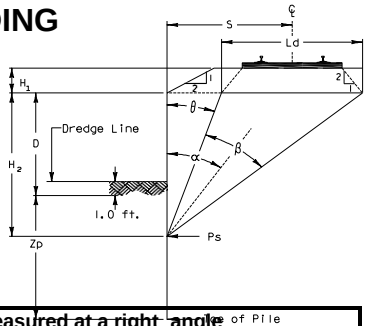
A portion of main track designated by “yard limit” signs and included in the timetable special instructions or a track bulletin.

5. APPENDIX

5.1 LIVE LOAD PRESSURE DUE TO COOPER E80 LOADING



5.2 CHART – LIVE LOAD PRESSURE DUE TO E80 LOADING



This chart identifies the active pressure and resulting forces due to E80 liveload.

1. Select distance S from track centerline to face of shoring.
2. Select depth H_2 below base of tie.
3. Read Ps, M, R and $\bar{Z}$ from the table.
4. Use the procedure outlined in the sample problem to determine values at non-tabulated points.

$$Ps = \frac{2q}{\pi}[\beta - \sin\beta\cos(2\alpha)] \quad \textbf{where q = 1778 psf}$$

Boussinesq surcharge pressure E80 live load for H_1=0

Depth below top of shoring H_2 (ft)	Variables		Horizontal distance (S) from shoring to track CL measured at a right angle									
			12	14	16	18	20	22	24	26	28	30
2	**Ps**	(psf)	**305**	**220**	**166**	**130**	**105**	**86**	**72**	**61**	**53**	**46**
	α	(radians)	1.38	1.41	1.44	1.45	1.47	1.48	1.48	1.49	1.50	1.50
	β	(radians)	0.14	0.10	0.07	0.06	0.05	0.04	0.03	0.03	0.02	0.02
	z	(ft)	1.32	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
	M	(ft-lbs/ft)	215	152	114	89	71	58	49	41	36	31
	R	(lbs/ft)	317	226	170	132	106	87	73	62	53	46
4	**Ps**	(psf)	**496**	**381**	**299**	**240**	**197**	**164**	**138**	**118**	**102**	**89**
	α	(radians)	1.21	1.27	1.31	1.34	1.36	1.38	1.40	1.41	1.43	1.44
	β	(radians)	0.25	0.19	0.14	0.11	0.09	0.07	0.06	0.05	0.05	0.04
	z	(ft)	2.59	2.61	2.63	2.64	2.64	2.65	2.65	2.65	2.65	2.66
	M	(ft-lbs/ft)	1,609	1,165	882	692	557	459	384	327	281	244
	R	(lbs/ft)	1,141	840	643	508	411	339	285	242	209	182
6	**Ps**	(psf)	**558**	**461**	**381**	**317**	**266**	**225**	**193**	**167**	**146**	**128**
	α	(radians)	1.06	1.13	1.19	1.23	1.27	1.29	1.32	1.34	1.35	1.37
	β	(radians)	0.33	0.25	0.20	0.16	0.13	0.11	0.09	0.08	0.07	0.06
	z	(ft)	3.77	3.83	3.88	3.90	3.92	3.94	3.95	3.96	3.96	3.97
	M	(ft-lbs/ft)	4,944	3,674	2,830	2,244	1,822	1,508	1,269	1,082	933	813
	R	(lbs/ft)	2,214	1,696	1,332	1,070	877	731	618	529	458	400
8	**Ps**	(psf)	**535**	**476**	**414**	**358**	**309**	**268**	**234**	**205**	**181**	**160**
	α	(radians)	0.94	1.02	1.08	1.13	1.17	1.21	1.24	1.26	1.29	1.30
	β	(radians)	0.37	0.29	0.24	0.19	0.16	0.14	0.12	0.10	0.09	0.08
	z	(ft)	4.84	4.97	5.06	5.11	5.16	5.19	5.21	5.23	5.24	5.26
	M	(ft-lbs/ft)	10,481	8,006	6,286	5,051	4,141	3,452	2,920	2,501	2,165	1,892
	R	(lbs/ft)	3,316	2,641	2,134	1,751	1,456	1,228	1,047	903	786	689
10	**Ps**	(psf)	**474**	**449**	**411**	**370**	**329**	**293**	**260**	**232**	**207**	**186**
	α	(radians)	0.83	0.92	0.99	1.04	1.09	1.13	1.17	1.19	1.22	1.24
	β	(radians)	0.38	0.32	0.26	0.22	0.19	0.16	0.14	0.12	0.10	0.09
	z	(ft)	5.81	6.02	6.16	6.26	6.34	6.39	6.44	6.47	6.50	6.52
	M	(ft-lbs/ft)	18,145	14,227	11,385	9,280	7,689	6,463	5,502	4,736	4,117	3,610
	R	(lbs/ft)	4,328	3,571	2,964	2,482	2,099	1,792	1,544	1,341	1,175	1,037
12	**Ps**	(psf)	**404**	**403**	**386**	**360**	**331**	**302**	**274**	**248**	**225**	**204**
	α	(radians)	0.75	0.83	0.90	0.96	1.01	1.06	1.10	1.13	1.16	1.18
	β	(radians)	0.38	0.33	0.28	0.24	0.20	0.18	0.15	0.13	0.12	0.11
	z	(ft)	6.68	6.97	7.18	7.34	7.46	7.55	7.61	7.67	7.71	7.75
	M	(ft-lbs/ft)	27,703	22,237	18,121	14,980	12,550	10,641	9,121	7,895	6,894	6,068
	R	(lbs/ft)	5,207	4,424	3,763	3,214	2,762	2,389	2,080	1,823	1,608	1,427
14	**Ps**	(psf)	**338**	**351**	**349**	**337**	**319**	**298**	**276**	**255**	**234**	**215**
	α	(radians)	0.68	0.76	0.83	0.89	0.94	0.99	1.03	1.07	1.10	1.13
	β	(radians)	0.38	0.33	0.28	0.25	0.22	0.19	0.17	0.15	0.13	0.12
	z	(ft)	7.46	7.85	8.13	8.35	8.51	8.64	8.74	8.82	8.89	8.94
	M	(ft-lbs/ft)	38,880	31,856	26,395	22,116	18,729	16,021	13,831	12,043	10,568	9,339
	R	(lbs/ft)	5,948	5,178	4,499	3,913	3,414	2,990	2,631	2,327	2,068	1,847
16	**Ps**	(psf)	**280**	**301**	**310**	**308**	**300**	**286**	**271**	**254**	**237**	**220**
	α	(radians)	0.62	0.70	0.77	0.83	0.88	0.93	0.97	1.01	1.04	1.07
	β	(radians)	0.36	0.32	0.28	0.25	0.22	0.20	0.18	0.16	0.14	0.13
	z	(ft)	8.17	8.64	9.01	9.29	9.51	9.68	9.82	9.93	10.03	10.10
	M	(ft-lbs/ft)	51,411	42,880	36,066	30,598	26,183	22,590	19,644	17,207	15,175	13,468
	R	(lbs/ft)	6,563	5,829	5,158	4,560	4,034	3,576	3,179	2,837	2,540	2,284

Continued

Depth below top of shoring H_2 (ft)	Variables		Horizontal distance (S) from shoring to track CL measured at a right angle									
			12	14	16	18	20	22	24	26	28	30
18	**Ps**	(psf)	**231**	**256**	**271**	**277**	**276**	**269**	**259**	**247**	**234**	**220**
	α	(radians)	0.57	0.64	0.71	0.77	0.82	0.87	0.92	0.96	0.99	1.02
	β	(radians)	0.35	0.31	0.28	0.25	0.23	0.20	0.18	0.16	0.15	0.13
	z	(ft)	8.80	9.37	9.81	10.16	10.44	10.67	10.85	11.00	11.12	11.22
	M	(ft-lbs/ft)	65,062	55,110	46,976	40,313	34,834	30,304	26,536	23,384	20,728	18,477
	R	(lbs/ft)	7,072	6,386	5,739	5,145	4,609	4,132	3,710	3,338	3,012	2,725
20	**Ps**	(psf)	**191**	**217**	**236**	**246**	**250**	**249**	**244**	**237**	**227**	**217**
	α	(radians)	0.52	0.59	0.66	0.72	0.77	0.82	0.87	0.91	0.94	0.98
	β	(radians)	0.33	0.30	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14
	z	(ft)	9.37	10.03	10.56	10.98	11.32	11.59	11.82	12.01	12.16	12.30
	M	(ft-lbs/ft)	79,641	68,368	58,973	51,137	44,586	39,093	34,465	30,548	27,216	24,367
	R	(lbs/ft)	7,493	6,859	6,245	5,668	5,135	4,651	4,214	3,822	3,474	3,163
22	**Ps**	(psf)	**159**	**184**	**204**	**217**	**225**	**228**	**227**	**223**	**217**	**210**
	α	(radians)	0.49	0.55	0.62	0.67	0.73	0.77	0.82	0.86	0.90	0.93
	β	(radians)	0.31	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.14
	z	(ft)	9.89	10.64	11.24	11.73	12.14	12.47	12.74	12.97	13.17	13.33
	M	(ft-lbs/ft)	94,986	82,497	71,913	62,945	55,341	48,878	43,370	38,658	34,611	31,122
	R	(lbs/ft)	7,842	7,260	6,684	6,131	5,611	5,128	4,685	4,283	3,918	3,590
24	**Ps**	(psf)	**133**	**157**	**176**	**191**	**202**	**207**	**210**	**209**	**206**	**201**
	α	(radians)	0.45	0.52	0.58	0.63	0.68	0.73	0.78	0.82	0.85	0.89
	β	(radians)	0.30	0.28	0.26	0.24	0.22	0.20	0.19	0.17	0.16	0.15
	z	(ft)	10.35	11.19	11.87	12.44	12.90	13.29	13.62	13.89	14.13	14.32
	M	(ft-lbs/ft)	110,969	97,366	85,670	75,625	66,997	59,577	53,183	47,661	42,875	38,716
	R	(lbs/ft)	8,132	7,600	7,064	6,540	6,037	5,564	5,122	4,715	4,342	4,001
26	**Ps**	(psf)	**112**	**134**	**153**	**168**	**180**	**188**	**192**	**194**	**193**	**191**
	α	(radians)	0.42	0.48	0.54	0.60	0.65	0.69	0.74	0.78	0.82	0.85
	β	(radians)	0.28	0.27	0.25	0.23	0.22	0.20	0.19	0.17	0.16	0.15
	z	(ft)	10.78	11.69	12.45	13.09	13.62	14.07	14.44	14.77	15.04	15.28
	M	(ft-lbs/ft)	127,485	112,863	100,135	89,071	79,460	71,105	63,836	57,499	51,963	47,113
	R	(lbs/ft)	8,376	7,890	7,393	6,899	6,418	5,959	5,524	5,118	4,741	4,393
28	**Ps**	(psf)	**94**	**114**	**132**	**148**	**160**	**169**	**175**	**179**	**180**	**180**
	α	(radians)	0.40	0.46	0.51	0.56	0.61	0.66	0.70	0.74	0.78	0.81
	β	(radians)	0.27	0.26	0.24	0.23	0.21	0.20	0.19	0.17	0.16	0.15
	z	(ft)	11.17	12.16	12.99	13.70	14.29	14.80	15.23	15.60	15.91	16.19
	M	(ft-lbs/ft)	144,448	128,896	115,211	103,191	92,642	83,385	75,258	68,113	61,823	56,274
	R	(lbs/ft)	8,581	8,137	7,677	7,214	6,758	6,315	5,892	5,491	5,115	4,764
30	**Ps**	(psf)	**80**	**98**	**115**	**130**	**142**	**152**	**160**	**165**	**167**	**168**
	α	(radians)	0.37	0.43	0.48	0.53	0.58	0.63	0.67	0.71	0.74	0.78
	β	(radians)	0.26	0.25	0.23	0.22	0.21	0.20	0.18	0.17	0.16	0.15
	z	(ft)	11.52	12.59	13.49	14.26	14.92	15.48	15.97	16.38	16.75	17.06
	M	(ft-lbs/ft)	161,789	145,388	130,819	117,903	106,466	96,343	87,381	79,443	72,404	66,153
	R	(lbs/ft)	8,755	8,349	7,925	7,492	7,060	6,636	6,227	5,834	5,462	5,112
32	**Ps**	(psf)	**69**	**85**	**101**	**115**	**127**	**137**	**145**	**151**	**155**	**157**
	α	(radians)	0.35	0.41	0.46	0.51	0.55	0.60	0.64	0.68	0.71	0.75
	β	(radians)	0.25	0.24	0.22	0.21	0.20	0.19	0.18	0.17	0.16	0.15
	z	(ft)	11.85	12.98	13.95	14.79	15.51	16.13	16.67	17.13	17.54	17.89
	M	(ft-lbs/ft)	179,452	162,274	146,888	133,136	120,859	109,909	100,144	91,432	83,655	76,706
	R	(lbs/ft)	8,904	8,532	8,140	7,736	7,329	6,925	6,531	6,150	5,785	5,438

5.3 TABLES FOR SOIL SPECIFICATIONS

Table 8-20-1. Granular Soils

Descriptive Term for Relative Density	Standard Penetration Test Blows per Foot "N"
Very Loose	0 – 4
Loose	4 – 10
Medium	10 – 30
Dense	30 – 50
Very Dense	Over 50

Table 8-20-2. Silt and Clay Soils

Descriptive Term for Consistency	Unconfined Compressive Strength Tons per Square Foot
Very Soft	Less than 0.25
Soft	0.25 – 0.50
Medium	0.50 – 1.00
Stiff	1.00 – 2.00
Very Stiff	2.00 – 4.00
Hard	Over 4.00

Table 8-20-3. Unit Weights of Soils, and Coefficients of Earth Pressure

Type of Soil	Unit Weight of Moist Soil, γ (Note 1)		Unit Weight of Submerged Soil, γ' (Note 1)		Coefficient of Active Earth Pressure, K_a				Coefficient of Passive Earth Pressure, K_p		
					For Backfill	For Soils in Place	Friction Angles (Note 2)		For Soils in Place	Friction Angles (Note 2)	
	Minimum	Maximum	Minimum	Maximum			ϕ	δ		ϕ	δ
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Clean Sand:											
Dense	110	140	65	78		0.20	38	20	9.0	38	25
Medium	110	130	60	68		0.25	34	17	7.0	34	23
Loose	90	125	56	63	0.35	0.30	30	15	5.0	30	20
Silty Sand:											
Dense	110	150	70	88		0.25			7.0		
Medium	95	130	60	68		0.30			5.0		
Loose	80	125	50	63	0.50	0.35			3.0		
Silt and Clay (Note 3)	$\frac{165(1+w)}{1+2.65w}$		$\frac{103}{1+2.65w}$		1.00	$1-\frac{q_u}{\bar{p}+\gamma z}$			$1+\frac{q_u}{\bar{p}+\gamma z}$		

Note 1: In pounds per cubic foot.
Note 2: These angles, expressed in degrees, are ϕ, the angle of internal friction, and δ, the angle of wall friction, and are used in estimating the coefficients under which they are listed.
Note 3: The symbol γ represents γ or γ', whichever is applicable; $\bar{p}$ is the effective unit pressure on the top surface of the stratum; q_u is the unconfined compressive strength; w is the natural water content, in percentage of dry weight; and z is the depth below the top surface of the stratum.

6. REFERENCES

a. The following list of references used in these guidelines are placed here in alphabetical order for your convenience.

i. AREMA Manual for Railway Engineering, 2019, American Railway Engineering and Maintenance-of-Way Association.

ii. Clough and Duncan, 1991, “Earth Pressures,” Foundation Engineering Handbook, 2nd Edition, Fang, Chapter 6.

iii. CalTrans Trenching and Shoring Manual, 2011, Revision 1, State of California Department of Transportation, Office of Structures Construction.

iv. Dismuke, T.D., 1991, “Retaining Structures and Excavations,” Foundation Engineering Handbook, 2nd Edition, Fang, Chapter 12.

v. FHWA-IF-99-015, Geotechnical Engineering Circular 4, Ground Anchors and Anchored Systems, June 1999, Federal Highway Administration, Office of Bridge Technology.

vi. Henkel, D. J., 1971, "The Calculation of Earth Pressures in Open Cuts in Soft Clays.” The Arup Journal, Vol. 6, No. 4, pp. 14-15.

vii. NAVFAC DM7.02, Foundations and Earth Structures, September 1986, Department of the Navy, Naval Facilities Engineering Command.

viii. Terzaghi, K., 1943, Theoretical Soil Mechanics, John Wiley & Sons, Inc., New York, NY.

Minute Action

AGENDA ITEM: 4

Date: September 14, 2023

Subject:
Interstate 10 Corridor Freight and Express Lanes - Contract 2 Release Request for Proposals for Construction Management Services

Recommendation:
That the following be reviewed and recommended for final approval by the Board of Directors, acting as the San Bernardino County Transportation Authority, at a regularly scheduled Board meeting:

Authorize the release of Request for Proposals No. 23-1002960 for Construction Management Services for the Interstate 10 Corridor Freight and Express Lanes Project – Contract 2.

Background:
On July 6, 2022, the San Bernardino County Transportation Authority (SBCTA) awarded the design services contract to initiate the Plans, Specifications and Estimates (PS&E) phase of the Interstate 10 (I-10) Corridor Freight and Express Lanes Project – Contract 2 (Project). The Project will include a single express lane in the median in each direction from Interstate 15, in the City of Ontario, to Pepper Avenue, in the City of Colton.

The Project is currently in the final design phase with a target for design approval in spring 2024. In anticipation of the completion of the 95% plans in fall 2023, staff is recommending that the Construction Management (CM) firm be brought on board to perform constructability reviews and provide construction feedback prior to completion of the PS&E package and subsequent advertisement for construction.

Staff is requesting authorization from the SBCTA Board of Directors (Board) to release Request for Proposals (RFP) No. 23-1002960 to procure CM Services for the Project. A future recommendation is anticipated to be presented to the Board in fall 2023 for the award of the contract. This contract will be funded with Measure I Freeway Program funds.

Financial Impact:
This item is consistent with the Fiscal Year 2023/2024 Budget under Task No. 0820 (Freeway Projects), Sub-Task No. 0821 (I-10 Corridor Project - Contract 2).

Reviewed By:
This item is not scheduled for review by any other policy committee or technical advisory committee. SBCTA General Counsel, Procurement Manager and Risk Manager have reviewed this item and the draft RFP.

Responsible Staff:
Khalid Bazmi, Construction Manager

Approved
Board of Directors Metro Valley Study Session
Date: September 14, 2023

Witnessed By:

Entity: San Bernardino County Transportation Authority

ATTACHMENT A - SCOPE OF WORK

INDEX

A. DESCRIPTION OF SERVICES

The San Bernardino County Transportation Authority (SBCTA) will utilize the services of CONSULTANT to support the construction activities for the Project. The CONSULTANT will provide construction management, materials testing, construction surveying and source inspection, landscape inspection and assist in public outreach for the Project. A description of the Project is given below. Reference Project Environmental Reports on the SBCTA website for more detail information:

https://www.gosbcta.com/wp-content/uploads/2019/09/I-10-CP-FinalEIR-EIS.pdf

Project General Description:

The San Bernardino County Transportation Authority ("SBCTA") is seeking professional services for the construction management for the Interstate 10 (I-10) Corridor Freight and Express Lanes Project – Contract 2 ("Project") which would extend from Interstate 15, in the City of Ontario to Pepper Avenue, in the City of Colton, a length of 11 miles connecting to the I-10 Corridor Contract 1 express lanes currently under construction. SBCTA Sales Tax Measure I funds, State Transportation Improvement Program (STIP) will be used to cover the cost of this work. It is anticipated that the construction phase will be split in two contract phases 2A and 2B as follows:

2A I-15 to Sierra Avenue ; 2B from Sierra Avenue to Pepper Avenue

The Project will provide one express lane in each direction in the median from Interstate 15 (I-15), in the City of Ontario to Pepper Avenue, in the City of Colton.

The project will improve eastbound acceleration lanes between Cherry Avenue and Citrus Avenue; and Sierra Avenue to Cedar Avenue and add auxiliary lanes in both directions from Riverside Avenue to Pepper Avenue.

The Project includes interchange ramp modifications at Etiwanda Avenue, Cherry Avenue, Citrus Avenue, Sierra Avenue, Cedar Avenue, Riverside and Pepper Avenue.

The Project will include structure widening, replacement, or abandonment at Day Creek Channel (widen); Etiwanda Wash (widen); Valley Blvd exit ramp undercrossing(widen); Etiwanda-San Sevaine Channel (widen); Etiwanda-San Sevaine Channel Ramp (replacement); Kaiser Spur Overhead(widen); San Sevaine Creek(abandonment);and Mulberry Creek(abandonment)

This Project will include both the roadway work as well as toll collection system layout and infrastructure. The toll collection system design requirements will be prepared by the SBCTA toll system provider (TSP); however, extensive coordination will be required with the TSP, and the toll collection system design will be incorporated into the final design plans developed under the design contract.

Services

Services are anticipated to generally include, but are not limited to the following:

participation in the evaluation of scheduling of the proposed Project; constructability review; construction Project advertising, bid analysis, and award; construction inspection; construction surveying, materials testing, landscape inspection, contractor interface and contract administration; office engineering; and other assorted duties as appropriate in managing construction of a Caltrans and city roadway improvement project.

It is expected that the Consultant will assign a full-time Resident Engineer to coordinate all contract and personnel activities for all phases of construction. Other Assistant Resident Engineer(s) and inspection personnel may be assigned to direct and coordinate all Project specific field activities and responsibilities as needed for satisfactory performance on the Project.

The Resident Engineer assigned for this Project shall be licensed as a Professional Civil Engineer in the State of California at the time of proposal submittal through the duration of the contract. The Consultant is expected to provide a Structures Representative, Assistant Structures Representative, Structures Inspectors, Survey Project Manager, Materials Testing/Source Inspection Project Manager, and Landscape Architect to administer the construction support services requested herein and to assign qualified field personnel to perform the requested services. Furthermore, the Resident Engineer shall act as the public outreach liaison to assist the Authority's Public Information Office in implementing the Public Outreach Program established for this project.

Insofar as the Consultant's approach described in the Proposal, the scope of responsibility and the total number of personnel assigned to each phase is left to the discretion of the Consultant. The Proposal shall include a staffing plan, an organization chart and a resource loaded schedule that establish the firm's ability to adequately and appropriately staff and manage the Project.

CONSULTANT shall provide qualified construction management and inspection, materials testing, construction surveying and public relations personnel to perform a wide variety of construction management, support and contract administration duties as outlined in this Scope of Services for the Project.

The SBCTA Director of Project Delivery has designated a Construction Manager to coordinate all construction activities.

SBCTA anticipates that the contract duration will be approximately 30 months plus six months for close out for each of the phases. Preconstruction services for contract 2A and 2B anticipated to start in June 2024 and December 2024 respectively. Contruction for phases 2A and 2B is anticipated to start in June 2025 and December 2025 respectively.. The estimated construction capital cost of the project for both phases is approximately $637 million.

Mr. Khalid Bazmi, Construction Manager

The CONSULTANT shall report to and receive direction from SBCTA through the Construction Manager, or his designees. The SBCTA Construction Manager is responsible for coordination of all SBCTA construction activities and for coordinating the efforts of the total construction team. The SBCTA Construction Manager will be the main contact

and primary source of information between SBCTA, cities, outside agencies, supporting consultants and the public for the construction Projects.

B. PERFORMANCE REQUIREMENTS

Construction Management: CONSULTANT shall furnish a Project Manager to coordinate CONSULTANT operations with SBCTA. The Project Manager shall be responsible for all matters related to CONSULTANT personnel and operations. The Project Manager may also serve as the Resident Engineer.

CONSULTANT shall also furnish Resident Engineer(s) and Structures Representative(s) and supporting teams for both phases of the Project.. The Resident Engineer shall be assigned to direct and coordinate construction activities under this contract. Other Assistant Resident Engineers may be assigned to each specific Project responsibilities as needed. The Resident Engineer shall be a Civil Engineer registered in the State of California and shall be in responsible charge of construction management and construction activity within the Project.

The number of CONSULTANT personnel assigned to the Project will vary throughout the duration of the contract. CONSULTANT personnel will be assigned, in varying levels of responsibility, as needed by the CONSULTANT to meet the Project schedule, Project requirements, and construction activities.

Resumes of personnel must be submitted to SBCTA for review and approval prior to assignment to the Project. SBCTA and CONSULTANT will jointly determine the level of and quantity of services that are required by CONSULTANT personnel. Personnel selected for assignment by CONSULTANT shall be made available for personal interviews prior to acceptance by SBCTA. If, in the opinion of SBCTA, an individual lacks adequate experience, the individual may be rejected or may be accepted on a trial basis until such time the individual's ability to perform the required services has been demonstrated. If, at any time, the performance of CONSULTANT personnel is unsatisfactory to SBCTA, SBCTA may release him/her by written notice and may request another qualified person be assigned.

If CONSULTANT personnel are on leave of absence, the Project Manager shall provide equally qualified replacement personnel until the assigned personnel returns to the Project approved by SBCTA.

The typical workday includes all hours worked by the construction Contractor. Overtime for CONSULTANT personnel may be required. The construction Contractor's operations may be restricted to specific hours during the week, which shall become the normal workday for CONSULTANT personnel. The Project Manager, with prior concurrence from SBCTA, shall have the authority to increase, decrease, or eliminate CONSULTANT personnel work hours dependent on the schedule and requirements of the construction Contractor. All overtime worked by CONSULTANT personnel shall be approved and authorized, in writing, by SBCTA prior to each occurrence. Overtime authorization shall be attached to the invoice in which the overtime is billed.

CONSULTANT personnel shall be knowledgeable of and comply with all applicable local, state, and federal regulations. CONSULTANT personnel shall cooperate and consult with SBCTA, State, and City officials during the course of the Project. CONSULTANT personnel shall perform duties as may be required to assure that construction is being performed in accordance with the Project plans and specifications. CONSULTANT personnel shall keep accurate and timely records and document all work performed by the Contractor and CONSULTANT.

CONSULTANT shall monitor for Contractor's compliance with the labor standards provisions of the Projects and the related wage determination decisions of the Secretary of Labor.

Consultant shall follow State Highway Procedures DBE Commercially Useful Function (CUF) Compliance and monitoring guide requirements per link below:

https://dot.ca.gov/-/media/dot-media/programs/construction/documents/labor-compliance/dbe-cuf-compliance-and-monitoring-guide-a11y.pdf

CONSULTANT personnel shall assist SBCTA and local agencies in obtaining compliance with the safety and accident prevention provisions of the Project. Local agencies will retain jurisdictional control for traffic control.

All services required herein shall be performed in accordance with California Department of Transportation guidelines, regulations, policies, procedures, manuals, and standards, except as noted in the special provisions.

Materials Testing & Source Inspection: The number of field testing and source inspection personnel assigned to the Project will vary throughout the duration of the construction contract. CONSULTANT certified materials testing and source inspection personnel will be assigned as needed by the Resident Engineer to meet the required numbers and frequencies of testing based on schedule of the construction contractor.

Materials Testing /Source Inspection Services will be provided on an on-call basis. The duration of assignments could vary from a minimum of a few hours to the full term of the Project. CONSULTANT personnel will be available within one (1) day of written notification by SBCTA.

It is the intent of SBCTA to maintain a consistency of material testing/source inspection quality throughout each phase of each project. CONSULTANT is therefore encouraged to provide, where ever and whenever possible, the same personnel for the duration of construction of each project.

On days when work is not performed by the construction contractor, such as rainy or unsuitable weather days, CONSULTANT will not provide services unless authorized by the SBCTA Construction Manager.

Consultant shall be responsible for finalizing a Source Inspection Quality Management Plan (SIQMP) to match the Project requirements, assist SBCTA in gaining Caltrans

approval, and manage the SIQMP. The SIQMP shall meet SBCTA and Caltrans requirements. Consultant shall provide Structural Materials Representative (SMR), Steel inspectors, Non-destructive Steel Inspectors, Coating Inspectors, Precast Concrete Inspectors and other source inspectors as needed.

All CONSULTANT personnel will be knowledgeable of, and comply with, all applicable local, state, and federal regulations. All personnel shall cooperate and consult with SBCTA during the course of the contract; and perform other duties as may be required to assure that the construction is being performed in accordance with the Project plans and specifications. CONSULTANT's personnel will keep records and document the work as directed by the Resident Engineer.

All services required herein will be performed in accordance with Caltrans regulations, policies, procedures, manuals, and standards.

Construction Surveying: CONSULTANT will furnish surveying crew(s) to perform construction surveys for the Project. The number of survey crew(s) assigned to the Project may vary throughout the duration of the construction contract to meet the Project needs. CONSULTANT personnel will be assigned as needed by the Resident Engineer to meet the schedule of the construction contractor.

Construction surveying services will be provided on an on-call basis. It is the intent of SBCTA to maintain a consistency of construction survey quality throughout each phase of each project. Therefore, CONSULTANT is encouraged to provide the same field personnel for the duration of construction. It is important that the Field Party Chief(s) assigned to a project be completely familiar with the survey requirements and the assignments for the Project.

Construction surveying will not be performed when conditions such as weather, traffic, and other factors prevent safe and efficient operation.

CONSULTANT personnel will:

- Be knowledgeable of, and comply with all, applicable local, Caltrans, state, and federal regulations.
- Cooperate and consult with SBCTA officials during the course of the contract.
- Perform duties as may be required to assure construction is performed in accordance with the Project plans and specifications.
- Keep records and document work as directed by SBCTA Construction Manager.

All services required herein will be performed in accordance with Caltrans regulations, policies, procedures, manuals, and standards.

C. DUTIES AND RESPONSIBILITIES

1. Pre-construction Services

a. Schedule

CONSULTANT shall review the proposed Project schedule, compare it to the Project plans and specifications, and provide recommendations to SBCTA, as appropriate, to ensure efficiency of Contractor and CONSULTANT operations and safe and expeditious completion of the Project.

b. Budget

CONSULTANT shall review the Project estimate, quantities and provide recommendations to SBCTA, as appropriate, to ensure efficient utilization of funds and control of Project costs.

c. Constructability Review

CONSULTANT shall review Project plans and special provisions for possible errors and deficiencies and report such findings to SBCTA in a format provide by SBCTA.

2. Bid Process

a. Bid Documents
CONSULTANT shall assist SBCTA, as requested, with the following tasks:

1) Review of bid documents
2) Preparation of bid tabulations and recommendation(s)

b. Pre-construction Meetings

CONSULTANT shall assist SBCTA in conducting one, or more, pre-construction meetings with all involved parties on the Project. Parties may include, but are not limited to, the Contractor, design engineer, Caltrans, County and City staff, utility companies, and developers.

c. Contract Award

CONSULTANT shall assist SBCTA, as requested, with the following tasks:

1) Review of bid for completeness and responsiveness

2) Perform bid analysis

3) Development of contractor payment schedules, and other procedural items.

4) Checking Contractor references, licenses, insurance, and sureties.

5) Coordination with prospective Contractor for award of construction contract(s).

All processes will be consistent with procedures outlined by the California Department of Transportation for Special Funded Programs and Local Assistance Procedure Manuals.

3. Project Administration

a. CONSULTANT shall administer Project construction contracts using Caltrans Construction Manual as a guideline.

b. CONSULTANT shall conduct regular Project coordination meetings with Contractor, SBCTA, local agencies, and design engineer, as appropriate.

c. CONSULTANT shall prepare Contractor progress payments and maintain payment records and supporting documentation. All progress payments shall be reviewed by SBCTA for approval.

d. CONSULTANT shall provide reports as needed to comply with specific funding requirements.

e. CONSULTANT shall establish and maintain Project records in accordance with the Caltrans Construction Manual. Project record keeping shall include, but are not limited to, correspondence, memoranda, contract documents, change orders, claims, SBCTA and engineer directives, meeting minutes, shop drawings, supplementary drawings, and requests for payment. CONSULTANT shall maintain a record of the names, addresses, and telephone and fax numbers of the Contractors, subcontractors, and principal material suppliers.

f. CONSULTANT shall establish and maintain a filing system in hard copies files and in electronic forms for each Project using the Caltrans Construction Manual as a guideline. Electronic data documentation will be required to be uploaded weekly to SBCTA. Laserfiche Repository per SBCTA IS Instruction 1004. Instructions, account and training will be provided by SBCTA.

g. CONSULTANT shall provide a technical review of the Contractors' CPM construction schedules, within 5 days of Contractor's submittal, on an ongoing basis, alert SBCTA to conditions that may lead to delays in completion of the Project, and advise SBCTA of the necessary corrections or revisions for contract compliance.

h. CONSULTANT shall prepare and submit a monthly Activity Summary Report for the Project in a format approved by SBCTA. The activity report shall include among other items status of SWPPP issues, RFIs, contract change orders, and notice of potential claims; construction activities completed, ongoing, and upcoming; status of Project budget and schedule,

and other highlights and critical issues.

i. CONSULTANT shall review and ensure compliance with environmental requirements.

j. CONSULTANT shall participate in partnering sessions with the Contractor, SBCTA, and Local Agencies, as required.

k. CONSULTANT shall ensure that the Project meets all provisions of the SBCTA Construction Materials Quality Assurance Program and Caltrans Quality Assurance Program Manual.

l. CONSULTANT shall review Contractors' certified payroll records and ensure compliance with the requirements of the construction contract.

m. CONSULTANT shall monitor and track DBE Commercially Useful Function requirements per Caltrans requirements stated under "Performance Requirements" of this RFP

n. CONSULTANT shall ensure that the Project meets all provisions of the Storm Water Pollution Prevention Plan (SWPPP).

o. CONSULTANT shall assure that the Project meets all applicable regulations of the Air Quality Management District (AQMD) and State Water Resource Control Board (SWRCB).

p. CONSULTANT shall maintain redlined as-built plans on an ongoing basis throughout the duration of the Project. Redlined plans shall show all changes made to the original contract plans, each change identified with the name of the approver, date of change approval , and CCO number, if applicable

4. Construction Coordination

a. CONSULTANT shall provide a minimum of one qualified Resident Engineer to effectively manage the Project.

b. CONSULTANT Resident Engineer shall act as a prime point of contact between Contractor, SBCTA, CONSULTANT's construction surveyor, CONSULTANT's materials inspector, and utility companies. CONSULTANT may, when requested by SBCTA, act as point of contact between design engineers, cities, and the public. CONSULTANT shall ensure coordination with property owners adjacent to Project right-of-way to ensure timely communication regarding property-condition survey and construction activities and scheduling.

c. CONSULTANT shall maintain regular contact with SBCTA's Construction Manager.

d. CONSULTANT shall coordinate utility relocations with utility companies and their designees, as well as the utility inspector.

e. CONSULTANT shall proactively review Project plans and special provisions for possible errors and deficiencies prior to construction of any specific element and report such findings to SBCTA. Should SBCTA determine that changes are necessary, CONSULTANT shall assist in implementation and processing of change orders in accordance with contract documents.

f. CONSULTANT shall proactively review Project plans and special provisions; monitor, coordinate, and track construction progress schedule and RFIs; and communicate with various agencies prior to construction of any specific elements to ensure the Project proceeds on schedule and according to the order of work in the plans and special provisions. CONSULTANT shall expedite work, as required, to maintain schedule in conjunction with the overall construction staging program.

g. CONSULTANT shall coordinate review of shop drawings and Requests for Information (RFI) with the SBCTA Construction Manager. CONSULTANT shall log and track all submittals and requests.

h. CONSULTANT shall provide a qualified SWPPP Coordinator who along with the Resident Engineer shall review and certify contractor prepared Storm Water Pollution Prevention Plans (SWPPP) and coordinate approval with SBCTA and the State Water Resource Control Board. The SWPPP Coordinator shall be at a minimum a Qualified Storm Water Pollution Prevention Plan (SWPPP) Developer (QSD) and a Qualified SWPPP Practitioner (QSP). CONSULTANT shall provide at a minimum weekly SWPPP monitoring and shall cooperate with all monitoring agency inspections and field reviews.

i. CONSULTANT shall coordinate the implementation of any changes with the SBCTA Construction Manager and the design engineer.

j. CONSULTANT shall review and approve falsework and shoring plans.

k. CONSULTANT shall review and approve Traffic Control Plans and forward to SBCTA for Caltrans/City/County approvals, as necessary.

l. CONSULTANT shall coordinate all Project construction activities with other on-going projects within and adjacent to the Project limits.

5. Construction Inspection

a. CONSULTANT shall coordinate all required inspections necessary for the Project. CONSULTANT shall ensure that appropriate City and local agencies are notified and present as required throughout the Project.

CONSULTANT shall notify SBCTA immediately regarding any directives, recommendations, notices, etc. received from agencies other than SBCTA.

b. CONSULTANT shall perform daily on-site observations, and shall provide daily reports, with photos, of the progress and quality of construction to determine if the work being performed is in general conformance with the contract documents, all applicable laws, codes, and ordinances.

c. CONSULTANT shall exercise reasonable care and diligence to discover and promptly report to SBCTA any and all defects or deficiencies in the materials or workmanship used in the Project.

d. CONSULTANT personnel assigned to the Project shall be thoroughly familiar with Caltrans Standard Specifications, Caltrans Standard Plans, Caltrans Erosion Control and Highway Planting requirements, safety standards and State Water Resources Control Board requirements. CONSULTANT personnel shall have the ability to read and interpret construction plans and specifications. CONSULTANT personnel shall also have knowledge of State of California Construction Safety Orders (CalOSHA) and traffic control practices as specified in the Work Area Traffic Control Handbook (WATCH). In addition, CONSULTANT personnel shall be thoroughly familiar with the construction requirements of Caltrans' Storm Water Pollution Prevention Program.

e. Assignments to be performed by CONSULTANT personnel shall include, but are not limited to, the following:

i. Paving and subgrade inspection, sub-surface & finish surface drainage inspection, structures and foundation inspection, electrical inspection for traffic, ramp meter and irrigation control equipment, signing and striping inspection, quantity calculations, checking grade and alignment, construction traffic control inspection, soil amendments and plant material identification & quality control, hardscape inspection, trenching & irrigation inspection and duties that may be required to determine that construction of the Project is being performed in accordance with the contract documents.

ii. Identifying actual and potential problems associated with the Project and recommending sound engineering solutions.

iii. Identifying common plant diseases and/or pests together with their respective eradication techniques, directing of plant adaptability requirements along with proper planting & pruning techniques, and avoiding potential problems associated with the Project by recommending sound engineering solutions.

iv. Perform basic sampling of construction materials in the field per California Test Method 105 and 125 by both the prime and subconsultant personnel.

v. Maintaining awareness of safety and health requirements. Monitoring Contractors' compliance with applicable regulations and construction contract provisions for the protection of the public

and Project personnel.

vi. Preparing complete and accurate daily reports, calculations, Project records, payment quantity documents, reports, and correspondence related to Project activities.

vii. Preparing construction sketches, drawings, and cross-sections, as necessary.

viii. Assisting in the preparation of as-built plans.

ix. Providing inspections for environmental compliance as well as ECR tracking.

x. Maintaining awareness of water discharge requirements. Monitoring Contractors' compliance with applicable regulations and construction contract provisions.

xi. Monitoring Contractors' compliance with applicable regulations required by AQMD.

xii. Other duties as may be required or reasonably requested.

6. Project Support

a. Construction Surveys

CONSULTANT shall perform construction surveying services, field calculations, and home office calculations to support construction of the Project. CONSULTANT may be requested to review available survey data, construction plans, and right-of-way plans to confirm compatibility and to identify discrepancies prior to and during construction of proposed projects. The Resident Engineer will assign survey work to the CONSULTANT as needed by issuing a "Request for Survey Services". Requests may include, but not be limited to, the following types of surveys and related services:

1) Construction Surveys

CONSULTANT shall perform construction staking and calculations as needed.

a) Survey calculations and adjustments shall be performed with established and computed coordinates based on the California Coordinate System.

b) Cross-section data collection shall be performed by conventional and terrain line interpolation survey methods.

c) Survey data will include topography, cross-section, and other survey data in computer formats compatible with the Caltrans computer survey and design systems.

d) Prepare and maintain survey documents. Survey documents include survey field notes, maps, drawings, and other survey documents.

e) Perform construction staking as directed by Resident Engineer, including but not limited to:

i. Utility relocations
ii. Clearing limits
iii. Slope staking
iv. Storm drain, sanitary sewer, and irrigation systems
v. Drainage structures
vi. Curbs, gutters, and sidewalk
vii. Horizontal and vertical control for structures and portions of structures (bents, abutments, wingwalls, etc.)
viii. Rough grade
ix. Finish grade

f) Monitor for settlement, if required.

g) Global Positioning Satellite (GPS) equipment shall be made available if required by SBCTA

2) Grid Grades

Grid grade data shall provide pavement elevations at the station line, the left edge of pavement, the right edge of pavement, and the right edge of travel way at 25 foot intervals for travel lanes.

3) Open Ended Traverses and Profile Data Sheets

Separate open-ended traverse calculations and point maps shall depict plan data for station lines, utility lines, wall layout lines, and abutment/bent alignment. Specific information to be shown will be part numbers, coordinates, bearings, and curve data.

Profile data sheets are required for all profiles shown on the plans identifying vertical design elements such as grade, point of intersection (PI) location, beginning of vertical curve (BVC) location, end of vertical curve (EVC) location, and curve length.

4) Three Line Profiles

Separate profile plots are required for the left edge of pavement, the right edge of pavement, and the edge of shoulder for all travel lanes.

5) Right of Way Lines

Existing right of way and easements will be established from Local Agency's record information and existing monumentation.

a) Right of way monumentation shall be renewed and restored in accordance with Section 10.4 of the Caltrans "Survey Manual" and the State of California Land Surveyor's Act.

b) Corner records and records of surveys shall be prepared and filed in accordance with the applicable standards and the State of California Land Surveyor's Act and the California Subdivision Map Act.

c) Perpetuate existing monumentation, which includes restoring, renewing, referencing, and resetting existing boundary related monumentation. In addition, stake areas where construction disturbs the existing right of way, preparing and filing required maps and records.

d) New right of way and easements will be established from plans, right of way maps, utility drawings, and Local Agency record information, and existing monumentation.

e) Right of Way Surveys, which includes research and preparation filing of required maps and records. In addition, locate and set monuments for right or way and easement lines, staking for right of way and easement fences.

f) Final monumentation, which includes setting of centerline points of control upon completion of construction.

6) Special Design – Data Surveys

Includes drainage, utility, and surveys required for special field studies.

7) Control Survey

Includes Project control surveys, aerial mapping control surveys, horizontal and vertical control surveys. In addition control surveys will include restoration, renewal, reference, relocation, and resetting of existing control monumentation. The CONSULTANT will be required to provide horizontal and vertical control at the end of each bridge.

8) Topographic Surveys

Topographic surveys will normally be compiled by ground survey methods only.

CONSULTANT will provide all necessary Project related surveys and construction staking, including horizontal and vertical control, right of way, and easements. CONSULTANT shall coordinate all staking and verify accuracy. CONSULTANT shall ensure timely coordination of all staking requests from the Contractor.

b. Materials Testing, Source Inspection and Geotechnical Services

1) CONSULTANT will provide experienced personnel, equipment, and facilities to perform various construction materials sampling and testing. Laboratory and field materials testing will be used to ensure that structure and roadway construction work conforms to California State Department of Transportation (Caltrans) standards, specifications, and special provisions for material quality and workmanship.

2) All field and laboratory testing is to be performed in accordance with California Test Methods.

3) CONSULTANT will be responsible for the accuracy and completeness of all test data compilation and results.

c. Public Outreach

General Public Outreach Plan will be provided and administered by SBCTA. Project Specific Outreach Plan will be provided and administered by the CONSULTANT.

1) SBCTA's primary goal is to assure the public that SBCTA is a public agency that delivers quality transportation projects and trustworthy, accurate and timely public information.

2) SBCTA will provide the primary outreach effort with supplemental support as requested from CONSULTANT. This will be a targeted approach with incremental outreach based on construction schedule and staging. The primary target audiences identified for this Project include, but are not limited to:

i. LOCAL AGENCY
ii. SBCTA Board
iii. LOCAL AGENCY and area Emergency Service Providers
iv. School Transportation Coordinator(s)
v. Local Business Community

vi) Specific businesses with expanding priority based on proximity to work zone and detours
vii) Chamber of Commerce
viii) Commuters
ix). Recreational Travelers
x).Trucking Industry
xi). Local media
xii)) Print
xiii) Radio
iv)) Television

c) In the weeks prior to the selection of a construction contractor, SBCTA may coordinate an Emergency Responders Project Briefing to highlight the Project details and possible access challenges for consideration by the Project team.

d) Following the emergency responders briefing, SBCTA may coordinate a Chamber of Commerce Project Briefing to highlight the Project benefits, possible construction schedule and traffic management plan.

e) Just prior to the start of field construction activities, SBCTA and CONSULTANT (includes all PR subs) may coordinate a groundbreaking media event with the LOCAL AGENCY to ceremoniously open the Project. CONSULTANT will be called up on to develop (with input from SBCTA) and maintain a task list of deliverables for this event. CONSULTANT will acquire the necessary items authorized for the event. CONSULTANT will be responsible for set up and breakdown of the event site.

f) Prior to construction beginning, SBCTA and CONSULTANT may coordinate a community meeting to share Project information, construction scheduling, detour information and expected challenges with the general public. CONSULTANT will be called up on to develop (with input from SBCTA) and maintain a task list of deliverables for this event. CONSULTANT will acquire the necessary items authorized for the event. CONSULTANT will be responsible for set up and breakdown of the event site. Staffing this event will be determined based on availability.

g) Near the completion of the construction Project, SBCTA and CONSULTANT will coordinate a ribbon-cutting media event. CONSULTANT will be called upon in a similar fashion to the groundbreaking event.

h) At various stages throughout the Project, SBCTA will request support from CONSULTANT for the following items:

i. Establish and maintain stakeholder and/or 'interested parties' list(s) – used for sharing Project updates during Project construction. May need to be filtered to specific audiences (i.e. emergency responders, city government, etc.)
ii. Development of a Project fact sheet (include Project description, Project budget, Project schedule, SBCTA contact information, LOCAL AGENCY contact information, photos, logos, etc.)
iii. Weekly media advisories (use SBCTA template). CONSULTANT (or sub) will make weekly contact with Project team to establish what road or lane closures (and associated detours if applicable) will be taking place, develop the advisory, send to SBCTA Public Information Office for approval, submit to webmaster for posting, distribute to appropriate media and stakeholder list.
iv. Emergency notices – when needed.
v. Develop web content for Project tab on SBCTA website. This page should include same elements of fact sheet with expanded detail when possible. If the information is dynamic, please provide updates to SBCTA Public Information Office for approval prior to submitting to webmaster.

3) All requests for speaking to government councils, boards, chambers of commerce or similar business or social groups shall be directed to the SBCTA Public Information Office before agreeing to appear.

4) All media inquiries shall be directed to the SBCTA Public Information Office.

d. Permits

CONSULTANT shall review the Project for permit compliance and coordinate with SBCTA and the design engineer to ensure that necessary permits are obtained. CONSULTANT shall assist SBCTA in the coordination, timely processing and verification of approval for all permits. CONSULTANT shall maintain permits and permit documentation on site.

7. Cost and Schedule

a. CONSULTANT shall monitor and track the following:

1) Contract pay item quantities and payments
2) Contract change orders
3) Supplemental work items
4) Agency furnished materials
5) Contingency balance
6) Project budget

b. CONSULTANT shall review and monitor Contractor's schedule by keeping its own updated schedule to "shadow" that of the contractor and inform SBCTA of any significant changes or deviations in the schedule; CONSULTANT shall submit shadow schedule monthly with the Monthly Activity Summary Report.

c. CONSULTANT shall provide and maintain a Project staffing plan of field office personnel based on the Contractor submitted baseline schedule update. In cooperation with SBCTA, the staffing plan shall be periodically updated to reflect Project progress and needs.

8. Change Orders and Claims

a. CONSULTANT shall receive and evaluate requests for changes and/or substitutions by the Contractor. Contract Change Orders submitted to SBCTA shall be accompanied by CONSULTANT recommendations. Where applicable, CONSULTANT shall convey proposed changes to design engineer, or other Project consultants. If the requested changes are accepted, CONSULTANT shall negotiate and prepare appropriate Contract Change Orders.

b. CONSULTANT shall attempt to avoid unnecessary Contract Change Orders. When a Contract Change Order is necessary, CONSULTANT shall consult with SBCTA prior to its preparation. Unless directed otherwise by SBCTA, the preferred method of payment for Contract Change Orders should be as follows

1) Agreed Price
2) Adjustment in compensation to a bid item
3) Time and materials or Force Account

CONSULTANT shall perform force account analysis to validate cost submitted by the Contractor for contract change orders with agreed unit price, lump sum price, and adjustment in components. Analysis shall be based on realistic production and resource needs to complete the work.

c. CONSULTANT shall attempt to identify all potential claims, track and monitor unresolved claims. The CONSULTANT shall implement appropriate claims avoidance processes where in the best interests of SBCTA as determined by SBCTA's Construction Manager.

d. CONSULTANT shall assist SBCTA, as requested, in the identification, resolution, and final disposition of claims filed by the Contractor or third parties against SBCTA or the Project.

9. Safety

In addition to the requirements specified elsewhere in this contract, the following shall also apply:

a. CONSULTANT shall implement and conduct a comprehensive safety program including regular tail-gate safety meetings for CONSULTANT personnel. CONSULTANT shall provide SBCTA with monthly status of safety reports.

b. CONSULTANT shall comply with State of California Construction Safety Orders and provisions of the Caltrans Construction Manual.

c. CONSULTANT shall provide appropriate safety training for all CONSULTANT field personnel.

d. CONSULTANT shall provide all necessary safety equipment as required for CONSULTANT personnel.

10. Toll System Construction Oversight

The CONSULTANT shall:

- Monitor the overall construction of tolling systems civil construction activities to identify critical milestones and priorities;
- Coordinate and conduct pre-construction and pre-activity meetings with the CONTRACTOR and Toll System Provider (TSP);
- Provide engineering assessment of plans for adequacy of design, particularly with respect to suitability to actual field conditions;
- Ensure compliance with the plans, specifications shop drawings, and material data submittals by the CONTRACTOR for the Toll Collection System (TCS) civil infrastructure; recommend, modify, interpret, and edit special provisions and prepare modification estimates; and keep necessary records pertaining to construction progress, and budget performance;
- Monitor compliance of CONTRACTOR and TSP safety plans and note concerns or deficiencies immediately to CONTRACTOR or TSP for their implementation of corrective measures;
- Provide construction oversight of the delivery of the TCS civil infrastructure by the CONTRACTOR. Validate/confirm the CONTRACTOR work, in coordination with the TSP, is correct per the design and technical requirements. This includes validating and testing power and communications conduit duct banks, gantries, CMS and camera pole installation;
- Perform oversight and review of laboratory, shop, and mill test reports of materials and equipment, as needed; and
- Monitor test and inspection records and noncompliance reports for satisfactory resolution of noncompliant work.

It should be noted that CM service excludes oversight of the installation of TSP work.

11. Project Close Out

a. When the Contractor approaches substantial completion milestone or at the direction of SBCTA Construction Manager , CONSULTANT shall prepare a list of items to be completed and/or corrected by the Contractor for final completion of the Project.

b. CONSULTANT shall collect and furnish as-built information to the design engineer for preparation of as-built drawings including pre-stress drawings and pile logs, as applicable.

c. CONSULTANT shall review and verify completeness of as-built drawings.

d. CONSULTANT shall conduct a final walk-through with SBCTA, Local Agencies, Contractors, and design engineers.

e. CONSULTANT shall prepare final construction reports including the Project Completion Report within 45 days of achieving the full Relief From Maintenance.

f. CONSULTANT shall prepare and deliver to SBCTA all Project files.

g. CONSULTANT shall assist SBCTA and Contractor in obtaining final release of all Project permits.

h. Project closeout services will be completed within two months of Project acceptance.

D. DELIVERABLES

1. Inspector daily reports, extra work diaries and Resident Engineers' daily diaries.

2. Monthly Project Summary Reports and SIQMP Monthly Reports.

3. Weekly update of all files to SBCTA Portal.

4. Monthly Contractor progress payments, back-up documentation, and Contractor payment records.

5. Contractor final payment documents, delivered to SBCTA no later than ten (10) working days after Acceptance by SBCTA of the completed construction Project.

6. Project Completion Report documents per Local Assistance Procedure Manual and Caltrans Construction Manual.

7. All Project files, Project reports, Record As-builts, correspondence, memoranda, shop drawings, Project logs, schedule updates, change order data, claims and claim reports, and Contractor payment records per Caltrans Construction Manual.

8. Certified payrolls and fringe benefit statements for all employees, CONSULTANT and Contractor, who are subject to the State and/or Federal prevailing wage rates.

9. American For Disabilities Act certification of Project per Caltrans Standards.

10. All material test results will be provided in accordance with the applicable Standard Specifications and Special Provisions, and test methods. Failing tests will be immediately reported to the Resident Engineer or Structures Representative. All test results will be recorded on the appropriate forms. The test documents will be legible and show the identity of the tester where appropriate. A notebook containing all test results and reports will be maintained by CONSULTANT throughout the duration of the Project and delivered to SBCTA with the Project files. CONSULTANT shall provide the material certification at the end of the project.

11. Record of Survey and Right of Way Monumentations and recording with County.

12. Unless otherwise specified in the survey request, the deliverables shall conform to the following:

    a. Survey points, lines, and monuments shall be established, marked, identified, and referenced as required by survey request and requirements herein.

    b. Survey notes, drawings, calculations, and other survey documents and information shall be completed as required by the survey request and the requirements herein.

    c. All original survey documents resulting from this contract, including original field notes, adjustment calculations, final results, and appropriate intermediate documents, shall be delivered to the Resident Engineer and shall become the property of SBCTA. A copy of all survey documents furnished by SBCTA shall be retained by CONSULTANT for future reference.

       When the survey is performed with a total station survey system, the original field notes shall be a hard copy in a readable format of the data (observations) as originally collected and submitted by the survey party. The hard copy shall be signed by the Party Chief. If the Party Chief is not licensed, the person in "responsible charge" will be required to sign.

    d. Deliverables to the Resident Engineer shall follow the format specified below:

1) Horizontal Control
2) Alpha numeric hard copy point listing with adjusted California Coordinate System northing and easting and the appropriate descriptions.
3) Vertical Control
4) Alpha numeric hard copy benchmark listing with adjusted elevations compatible with the design datum.
5) Topography
6) Alpha numeric hard copy listing, hard copy drawing, and computer aided drawing and design (CADD) digital drawing. The CADD drawing shall be compatible with the systems utilized by Caltrans.

e. Data collection method used to collect cross-section data and the coding (feature description) of terrain data for cross-sections shall conform to the survey request requirements. Deliverables shall depend on the data collection method as follows:

1) Conventional Cross – Sections (each cross – section):
For each cross - section and alpha numeric listing, a hard copy drawing, and a computer formatted file compatible with the systems utilized by Caltrans.
2) Terrain Line Interpolation Cross – Section Data (each terrain line interpolation survey):
Terrain line interpolation cross – sections shall include an alpha numeric listing, a hard copy plan view drawing of the terrain lines, and a computer input file. The computer input file shall be provided in a format compatible with the systems utilized by Caltrans.
3) Data Collector Data
If specified in the survey request, the raw data from the data collector shall be provided in a format conforming to the survey request requirements.
4) Other—As specified in the survey request.

13. Risk Register

a. obtain and review all available risk assessment information, including the risk register already developed by SBCTA and Caltrans that identifies risks, probability and severity of risk occurrence, proposed mitigation strategies, responsible parties, and mitigation timing.

b. Perform ongoing Project risk identification and management activities by working with the various Project work groups.

c. Provide quarterly updates of the risk register showing resolution and mitigation of defined Project risks, identification of new risks, and required mitigation measures; and

d. Provide all necessary reports and actions requested by SBCTA to support requests of Caltrans, or others in documenting adherence to all risk management requirements and practices.

e. Provide a Sequential list of activities during Preconstruction, Construction, Post Construction and Close out showing person responsible for each activity.

f. Provide a "monthly staffing plan showing proposed expenditures plan through completion" (cost to complete the project) showing all CM personnel and subconsultants estimated billable hours and ODC's. This document should also show planned vs actual charges from contract start date to current month expenditures.

E. EQUIPMENT AND MATERIALS TO BE PROVIDED BY CONSULTANT

1. CONSULTANT shall provide all necessary equipment including software, materials, supplies, miscellaneous tools, phones, vehicles, and safety equipment required for its personnel to perform the services accurately, efficiently, and safely. The above noted items are not to be included in Attachment B of Consultants Cost Proposal and are part of the consultants overhead. Only those items authorized by SBCTA in Attachment B, CONSULTANT Cost Proposal, shall be reimbursed by SBCTA.

2. CONSULTANT personnel shall be provided with vehicles suitable for the location and nature of the work involved. Vehicles shall be equipped with flashing yellow lights, either permanently or temporarily affixed.

3. CONSULTANT personnel shall be provided with a mobile radio, cellular phone, or other means to assure full-time communication. If a radio system is to be used, CONSULTANT shall provide a base station at the field office.

4. CONSULTANT personnel shall be provided with all applicable standard plans, specifications, and other standards as appropriate (see item G below).

5. For Materials Testing, CONSULTANT and its staff will be fully equipped at all times to perform the services required, including but not limited to the following:

   a. An on-site mobile laboratory or laboratory in close proximity to the Project will be required. The type and location of the lab should be such that it can meet the needs of the Project in an efficient, time effective manner. The laboratory is to be fully staffed, equipped, and supplied to conduct all required soils, materials, and concrete breaking tests in a timely manner.

   b. Field personnel will be provided with all necessary safety equipment to permit work to be performed safely and efficiently within operating highway and construction zone environments.

c. All equipment to be calibrated as per Section 3-10 and 3-11 of Caltrans' Quality Assurance Program Manual.

6. For construction surveying, CONSULTANT and staff shall have adequate equipment and supplies to complete the required survey work. Equipment and supplies shall, include, but not be limited to:

a. Survey vehicles:

Survey vehicles will be suitable to perform the required work in varying terrain and conditions encountered on the Project. Vehicles shall be fully equipped with all necessary tools, instruments, supplies, and safety equipment required to perform the work accurately, efficiently, and safely. Vehicles shall be equipped with a flashing yellow beacon light.

b. Data Processing Systems:

Data processing systems shall include hardware and software to:

1) Performing survey and staking calculations from the design plans and specifications;
2) Reduce survey data collected with conventional and total station survey systems;
3) Perform network adjustments for horizontal and vertical control surveys;
4) Format survey data to be compatible with the Caltrans computer survey and data system.

c. Drafting equipment and supplies.

d. Digital calculators.

e. Hand tools as appropriate for the requested survey work.

f. Traffic cones (minimum 25). Traffic cones shall be 28 inches in height (minimum).

g. Traffic control devices as required to perform the requested survey work. Traffic control devices include signs, sign bases, flags, and hand held signs.

h. Leveling instruments and equipment:
1) Self-leveling level. Precision: Standard deviations in one mile of double run leveling 0.005 feet or less.
2) Suitable level rods for the work to be performed.

i. Distance measuring instruments and equipment:

1) Electronic distance measurer (EDM). Precision: standard deviation 3 mm plus 3 PPM, or less; Range: Minimum one mile under average atmospheric conditions.
2) Prisms, sufficient to perform the required work.
3) Tapes; steel, cloth.

j. Angle measuring instruments and equipment:
1) Theodolite for non-control surveys; Precision: direct circle reading to three seconds, or equivalent, horizontal and vertical.
2) Targets as required to perform the work.

k. When required for efficient survey operations, total station survey systems consisting of an electronic angle measuring instrument, EDM, and electronic data collector shall be provided. The angle measuring instruments and EDM shall conform to the requirements for the equipment previously listed.

l. Radio or cellular communications equipment for communication between field office and field crews.

m. Caltrans manuals, standards, forms, and other policies and procedures to be followed to perform the required work.

F. MATERIALS TO BE FURNISHED BY CONSULTANT

1. Consultant will provide three (3) copies of all Project construction documents including plans, and special provisions, and one (1) copy of all other reports, designer prepared resident engineer files, and contracts. In addition, Consultant will provide one (1) full size (24" x 36") sets of plans for use in the construction field office as record documents.

G. MATERIALS TO BE PROVIDED BY SBCTA

1. SBCTA will provide copies of all previously secured permits and Project authorizations.

2. SBCTA Construction Management Forms including SBCTA Construction Materials Quality Assurance Program, sample SIQMP and appropriate forms for recording test data in accordance with Caltrans practices and procedures outlined in the "Manual of Test".

H. AVAILABILITY AND WORK HOURS

The typical workday includes all hours worked by SBCTA's construction Contractor including nights and weekends. The construction Contractor's operations may be restricted to specific hours during the week, which will become the normal workday for CONSULTANT's personnel. On days when work is not performed by the construction contractor, such as rainy or unsuitable weather days, CONSULTANT services will not be provided unless authorized by the SBCTA Construction Manager.

Unless otherwise directed by SBCTA, the normal work week will consist of 40 hours. From time to time, overtime may be required. However, overtime will be worked only when approved in writing by SBCTA. This written authorization must be attached to the invoice where the overtime is billed.

I. STANDARDS

All construction inspection, surveys, materials sampling and testing, and contract administration shall be in accordance with the Project bid documents, special provisions, plans, and current Caltrans Manuals including:

1. Construction Manual and its revisions
2. Bridge Construction Records and Procedures Manual
3. Quality Assurance Program Manual
4. Manual of Traffic Controls for Construction and Maintenance Work Zones
5. Caltrans Standard Specifications and Standard Plans
6. Caltrans Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual
7. Manual of Test (3 volumes)
8. Survey Manual
9. District 8 Standard Staking Procedures Manual

Work not covered by the manuals shall be performed in accordance with accepted professional standards.

Surveys performed by CONSULTANT shall conform to the requirements of the Land Surveyor's Act. In accordance with the Land Surveyor's Act, "responsible charge" for the work shall reside with the Licensed Land Surveyor or a pre-January 1, 1982, Registered Professional Civil Engineer in the State of California.

Unless otherwise specified in the survey request, control surveys shall conform to second order (modified) accuracy standards as specified in the Caltrans "Survey Manual".

Additional standards for specific survey work may be included in the applicable request for survey. Such standards supplement the standards specified herein. If additional standards conflict with the standards specified herein, the "Survey Request's" standard shall govern.

The Resident Engineer and SBCTA will decide all questions, which may arise as to the quality or acceptability of deliverables furnished and work performed for this contract. Any CONSULTANT employee who does not perform adequately will be replaced if directed by the SBCTA Construction Manager.

J. LIMITATIONS TO AUTHORITY

CONSULTANT does not have the authority to:

1. Authorize deviations from the contract documents.

2. Approve substitute materials or equipment; except as authorized in writing by SBCTA.
3. Conduct or participate in tests or third party inspections; except as authorized in writing by SBCTA.
4. Assume any of the responsibilities of the Contractors, Contractors' Superintendent, or subcontractors.
5. Exercise control over or be responsible for construction means, methods, techniques, sequences, procedures, or safety precautions.
6. Communicate directly with subcontractors or material suppliers without the prior consent of the Contractor.
7. Verbally authorize or approve change orders or extra work for the Project.
8. Offer or receive incentives, inducements, or other forms of enumeration to or from the Contractor to perform services or work outside the terms of any executed contracts for this Project.

K. THIRD PARTY RELATIONSHIPS

This Contract is intended to provide unique services for a specific project. In the development of the Project, SBCTA has worked closely with various professional consultants, agencies, and others in the preparation of the construction documents and other Project related materials. SBCTA, however, is solely responsible for and will be the sole point of contact for all contractual matters related to the Project. CONSULTANT shall take direction **only** from SBCTA and shall regularly inform **only** SBCTA of Project progress, outstanding issues, and all Project related matters.

During the course of the Project, CONSULTANT may find occasion to meet with Caltrans, City or County representatives, the design engineer, Project consultants, or other third parties who have assisted with the Project. These entities may, from time to time, offer suggestions and/or recommendations regarding the Project or elements of the Project. While SBCTA enjoys a close relationship with and has considerable confidence in the capabilities of these other parties, CONSULTANT shall not act on any suggestions, solicited or unsolicited, without obtaining specific direction from SBCTA. All oral and written communication with outside agencies or consultants related to the Project shall be directed only to SBCTA. Distribution of Project related communication and information shall be at the sole discretion of SBCTA representatives.

L. CONSTRUCTION SITE SAFETY

In addition to the requirements specified elsewhere in this contract, the following also will apply.

1. CONSULTANT will conform to the safety provisions of the Caltrans Construction Manual.

2. CONSULTANT's field personnel will wear white hard hats with proper suspension, safety vests per current OSHA standards, sleeved shirt, long pants, and leather boots with ankle support and rubber soled shoes at all times while working in the field.

3. CONSULTANT will provide appropriate safety training for all CONSULTANT's personnel, including work on and near highways.

4. All safety equipment will be provided by CONSULTANT.

M. BASIS FOR SURVEY AND MONUMENT MARKING

SBCTA will designate the existing horizontal and vertical control monuments that are the basis of CONSULTANT performed surveys. SBCTA will provide the California Coordinate System values and/or elevation values for these monuments. CONSULTANT shall adjust CONSULTANT performed surveys to be the designated control monuments and the values.

Monuments established by CONSULTANT shall be marked by CONSULTANT with furnished disks, plugs, tags. In addition, CONSULTANT shall identify CONSULTANT established monuments by tagging or stamping the monuments with the license or registration number of CONSULTANT'S surveyor who is in "responsible charge" of the work.

N. PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The quantity and qualifications of field personnel to be assigned will be determined by the scope of the Project and the degree of difficulty of required tasks to be performed. Again, all personnel and personnel assignments are subject to approval by SBCTA. While some areas of responsibility may overlap, as a guideline, CONSULTANT personnel assigned to the Project should have the following qualifications:

1. Project Manager

   a. A minimum of six (6) years' project management experience on similar construction projects is desired.

   b. Accessible to SBCTA at all times during normal working hours.

   c. A thorough understanding of Caltrans construction practices and procedures.

   d. A thorough understanding of Cal-OSHA practices and procedures.

   e. The Project Manager will assume the following functional responsibilities:

      1) Review, monitor, train, and provide general direction for CONSULTANT personnel.
      2) Assign personnel to projects on an as-needed basis.
      3) Administer personal leave.
      4) Prepare monthly reports for delivery to SBCTA.

2. Resident Engineer

a. A minimum of eight (8) years' resident engineer experience on similar construction projects is desired.

b. Licensed Professional Civil Engineer in the State of California.

c. Ability to work independently, make effective decisions concerning construction work in progress, and solve field problems.

d. Accessible to SBCTA at all times including weekends and holidays.

e. Certified as a Qualified SWPPP Developer or Practitioner is desired.

f. A thorough understanding of Cal-OSHA practices and procedures.

g. A thorough understanding of American with Disability Act (ADA) and Caltrans ADA requirements. Completion of Caltrans Temporary Pedestrian Facilities training within last 6 months.

h. A thorough understanding of Caltrans field methods, practices, and construction office procedures. The Resident Engineer will assume the following functional responsibilities:

1) Monitor and provide daily direction to CONSULTANT Resident Engineers and inspection personnel.
2) Assign field personnel to specific project tasks.
3) Monitor and track Contractor progress.
4) Prepare daily, weekly and monthly reports as required.
5) Coordinate utility relocations with appropriate agencies and the utility inspector.
6) Act as prime field contact between various project Contractors and SBCTA's Construction Manager.

3. Assistant Resident Engineer

a. A minimum of four (4) years' experience on similar construction projects is desired.

b. Licensed Professional Civil Engineer in the State of California.

c. Ability to work independently, make effective decisions concerning construction work in progress, and solve field problems.

d. Accessible to SBCTA at all times including weekends and holidays.

e. Certified as a Qualified SWPPP Developer or Practitioner is desired.

f. A thorough understanding of Cal-OSHA practices and procedures.

g. A thorough understanding of American with Disability Act (ADA) and Caltrans ADA requirements. Completion of Caltrans Temporary Pedestrian Facilities training within last 6 months.

h. Thorough understanding of Caltrans field methods, practices, and construction office procedures. The Assistant Resident Engineer shall act under the direction of the Resident Engineer and will assume the following functional responsibilities:

1) Monitor and provide daily direction to CONSULTANT inspection personnel.
2) Assign field personnel to specific project tasks.
3) Monitor and track Contractor progress.
4) Prepare daily, weekly and monthly reports as required.
5) Coordinate utility relocations with appropriate agencies.

4. Lead Field Inspector

a. A minimum of six (6) years' construction inspection experience in public works or similar projects ***or*** a four-year degree in the field of civil engineering, transportation and four years of similar construction experience is desired.

b. A thorough understanding of Cal-OSHA practices and procedures.

c. Knowledge of Caltrans construction practices, physical characteristics and properties of highway construction materials, and approved methods and equipment used in making physical tests of construction materials.

d. Ability to work independently, make effective decisions concerning construction work in progress, and solve field problems.

e. Ability to direct the efforts of subordinate inspectors.

f. Ability to use an automatic level and transit for the purpose of verifying line and grade.

g. Certified as a Qualified SWPPP Developer or Practitioner is desired.

h. A thorough understanding of American with Disability Act (ADA) and Caltrans ADA requirements. Completion of Caltrans Temporary Pedestrian Facilities training within last 6 months.

i. Understanding of Caltrans field and construction office procedures. The Lead Field Inspector will assume the following functional responsibilities:

1) Assist in inspections to assure compliance with contract plans, specifications, and special provisions on all phases of construction.

2) Assist in the preparation of contract change orders, contract estimates, progress pay estimates, and other documents or reports required for the Project.
3) Coordinate field testing of materials to monitor compliance with Project specifications and Caltrans Quality Assurance Program.
4) Maintain accurate and timely Project records. Perform quantity calculations for progress pay estimates.
5) Perform analytical calculations such as basic earthwork, grading, profiles, and special staking procedures.
6) Provide input for the redesign of facilities to fit existing field conditions.
7) Monitor and track Contractor progress. Prepare daily, weekly, and monthly reports as required.

5. Field Inspector

a. Two (2) years' construction inspection experience in public works or similar projects ***or*** a four-year degree in the field of civil transportation engineering is desired.

b. A thorough understanding of Cal-OSHA practices and procedures.

c. Knowledge of construction practices, physical characteristics and properties of construction materials, and approved methods and equipment used in making physical tests of construction materials.

d. Ability to work independently. Ability to make minor decisions concerning construction work in progress and to solve field and office problems.

e. Ability to use an automatic level and transit for the purpose of verifying line and grade.

f. Certified as a Qualified SWPPP Developer or Practitioner is desired.

g. A thorough understanding of Americans with Disability Act (ADA) and Caltrans ADA requirements. Completion of Caltrans Temporary Pedestrian Facilities training within last 6 months.

h. Understanding of Caltrans construction methods and practices. The Field Inspector will assume the following functional responsibilities:

1) Assist in inspections to assure compliance with contract plans, specifications, and special provisions on all phases of project construction.
2) Assist in preparation of contract change orders, contract estimates, progress pay estimates, and other documents or reports required for the Project.
3) Coordinate field testing of materials to monitor compliance with

Project specifications and Caltrans Quality Assurance Program.

4) Perform quantity calculations for progress pay estimates and maintain Project records.
5) Perform analytical calculations such as basic earthwork, grading, profiles, and special staking procedures.
6) Provide input for the redesign of facilities to fit existing field conditions.
7) Perform construction materials sampling.
8) Perform labor compliance interviews of the Contractors' personnel.

6. Structural Representative

a. A minimum of six (6) years' of bridge or structural construction inspection as related to major public works projects and a four-year degree in civil engineering is desired.

b. A minimum or four (4) years as a Structural Representative on major public works projects.

c. Licensed Professional Civil Engineer in the State of California.

d. Knowledge of stress analysis, structural mechanics, and strength of materials.

e. A thorough understanding of Cal-OSHA practices and procedures.

f. Knowledge of Caltrans and Greenbook construction practices and the physical characteristics and properties of various bridge construction materials including concrete.

g. Experience in the following areas: foundations, pile driving, concrete prestressing, bridge deck construction, cast-in-place wall construction, falsework, and shoring.

h. Ability to work independently. Ability to perform duties in the construction field office and effectively make decisions concerning construction work in progress and solving field problems.

i. Ability to direct the efforts of subordinate inspectors.

j. Ability to use an automatic level and transit for the purpose of verifying line and grade.

k. Thorough understanding of Caltrans field methods, practices, and construction office procedures. The Structural Representative shall assume the following functional responsibilities:

1) Assist in inspections to assure compliance with contract plans, specifications, and special provisions on all phases of structural

construction such as bridges, foundations, walls, falsework, shoring, and drainage structures.

2) Make grade, alignment, quantity, falsework, and shoring calculations.

3) Assist in the preparation of contract change orders, contract estimates, progress pay estimates, and other documents or reports required for the Project. Coordinate the sampling and testing of construction materials to monitor compliance with contract specifications.

4) Monitor and track Contractor progress. Prepare daily, weekly, and monthly reports as required.

5) Coordinate with Resident Engineer, as well as the Construction Staking and Material Testing consultants.

6) Direct the daily activities of subordinate inspectors.

7. Structural Inspector

a. A minimum of four (4) years' of bridge design or structural construction inspection as related to Caltrans or major public works projects ***and*** a four-year degree in civil or structural engineering is desired.

b. Knowledge of stress analysis, structural mechanics, and strength of materials.

c. A thorough understanding of Cal-OSHA practices and procedures.

d. Knowledge of construction practices and the physical characteristics and properties of various highway bridge construction materials including concrete.

e. Experience in one or more of the following areas: pile driving, concrete prestressing, bridge deck construction, retaining wall construction, falsework, and shoring.

f. Ability to work independently and make minor decisions concerning construction work in progress and to solve field and office problems.

g. Ability to use an automatic level and transit for the purpose of verifying line and grade.

h. Understanding of Caltrans construction methods and practices. The Structural Inspector will assume the following functional responsibilities:

1) Assist in inspections to assure compliance with contract plans, specifications, and special provisions on all phases of structural construction such as bridges, foundation, walls, falsework, shoring, and drainage structures.

2) Make grade, alignment, quantity, falsework, and shoring calculations.

3) Assist in the preparation of contract change orders, contract estimates, progress pay estimates, and other documents or reports required for the Project.

4) Sampling and testing of construction materials to monitor compliance with contract specifications and Caltrans Quality Assurance Program.

8. Office Engineer

a. A minimum of two (2) years' experience as an office engineer on similar construction projects is desired.

b. Knowledge of Caltrans Office of Highway Construction forms used to administer construction projects.

c. Knowledge of Caltrans system of document organization.

d. Knowledge of construction records and accounting procedures.

e. Knowledge of documentation, procedures, and reporting for federally funded projects.

f. Knowledge of laws and regulations governing the payment of prevailing wages.

g. The Office Engineer will assume the following functional responsibilities:

1) Process monthly progress pay estimates, monthly status reports, extra work reports, and weekly statements of working days.
2) Prepare and process contract change orders.
3) Monitor construction budget and schedule.
4) Prepare, maintain, and/or file project documents including labor and equipment records, correspondence, memoranda, meeting minutes, claims, personnel records, labor compliance reports, and daily, weekly, and monthly reports.
5) Perform routine calculations and checking of quantities.
6) Coordinate all office activities and functions with SBCTA representatives.

9. Materials Testing/Source Inspection Project Manager

a. A minimum four (4) years' project management experience on a similar highway/bridge construction project is desired.

b. Licensed Civil Engineer in the State of California.

c. Ability to use typical computer programs including word processing and spreadsheets.

d. The Materials Testing/Source Inspection Project Manager will assume the following functional responsibilities:

1) Review, monitor, train, and provide general direction for CONSULTANT's laboratory, field and source inspection personnel.
2) Assign personnel to projects on an as-needed basis in coordination with the Resident Engineer.
3) Administer personal leave, subject to approval of the Resident Engineer.
4) Prepare monthly reports for delivery to the Resident Engineer.
5) Provide direction, administration, and responsibility for Materials Certification per Caltrans Construction Manual, Section 8-01.
6) Assist SBCTA and Resident Engineer in preparing the project specific Source Inspection Quality Management Plan (SIQMP) for Caltrans review and approval. (Reference Caltrans "Source Inspection Quality Management Plan (SIQMP Outline dated 04/17/12).
7) Provide direction, administration, and responsibility for implementation of the approved SIQMP per Caltrans Construction Procedures Directive (CPD) 08-5 and FHWA Title 23 requirements.

Material testing/source inspection personnel will be certified by a California Registered Civil Engineer as being experienced and competent in the test procedures required for the work involved (and possess a current certificate of proficiency (Form MR-0111) in accordance with Quality Assurance Program Manual (Section 3-5). Independent certification of Caltrans test procedures may be performed at the discretion of the SBCTA Construction Manager.

10. Materials Technicians

CONSULTANT personnel provided under this contract will have a variety of skills and experience appropriate for the level of tasks to be assigned. Field personnel shall be certified by Caltrans and should have a minimum of two (2) years' experience in conducting material sampling and testing of the type required for the projects involved and possess the following additional capabilities:

a. Have the ability to establish specific locations for appropriate tests when construction contract administration personnel are not available.

b. Be familiar with construction practices and be fully aware of construction activities at the Project site.

c. Have knowledge of and comply with safety and health regulations and requirements applicable to the Project.

d. Specific qualifications for technicians are as follows:

1) CONSTRUCTION TECHNICIAN I

a) Performs a variety of semi-skilled activities. Examples of duties assigned to this classification are:

i. Conducting quality control tests such as soil densities, sieve analysis tests, operation scales and inspecting spread operations.

ii. Sampling and transporting produced construction materials from point of application or production to testing laboratory.

b) Knowledge and Skills Required

i. Knowledge of tools, equipment and vehicles utilized in construction.
ii. Knowledge of standard equipment and materials used for the sampling and testing of construction material.
iii. Knowledge of basic mathematics used in the computation of a variety of construction items.
iv. Knowledge of record keeping, preparing of documents and reports.

2) CONSTRUCTION TECHNICIAN II

a) Performs a variety of skilled activities. Examples of duties assigned to this classification are:

i. Inspecting minor construction items, sampling and inspection of steel reinforcement, sampling and inspection of concrete placing operation.
ii. Collect and analyze soil samples of construction materials to determine compaction and moisture content.
iii. Inspection and sampling of all phases of asphalt concrete and PCC paving operation, including plant inspection.
iv. Confers with construction engineers and contractors regarding construction in progress and is conformance to specifications and construction plans.

v. Answers questions and resolves problems.
vi. Inspects construction in progress to ensure conformance with specification, agreements, and established requirements.
vii. Keeps daily diary of work progress.
viii. Prepares reports on all field inspections and submits project quantities on a daily basis.
ix. Keeps accurate documentation for force accounts and possible claims.

b) Knowledge and Skills Required

i. All knowledge and skills required of lower classification.
ii. Knowledge of currently accepted methods, procedures and techniques used in highway construction inspection, survey, materials testing, and quality control equipment.
iii. Skill in interpersonal relations as applied to contact with contractors, representatives of other governmental jurisdictions, and other SBCTA/Caltrans staff.

3) CONSTRUCTION TECHNICIAN III

a) Exercises considerable independent judgment within general Caltrans standards and guidelines. Examples of duties assigned to this classification are:

i. Inspect Project construction on an ongoing basis to assure compliance with contract and in accordance with State and local standards.
ii. Perform a variety of structural material tests and inspections.
iii. Reviews construction plans and verified that these are in accordance with designated specifications and other requirements.
iv. Participates in the preparation of completed work estimates, to calculate compensation due contractor.
v. Examines and verifies numeric data and material specifications on project cost source documents, utilizing geometry and trigonometry calculations.
vi. Supervises all work activities involved in construction projects, laboratory, and quality control work.
vii. Recommends approval of proposed Project changes.

b) Knowledge and Skills Required

i. All knowledge and skills required of lower classifications.
ii. Knowledge of the principles and practices of Civil Engineering as applied to the construction of state highways.
iii. Skill in analyzing and evaluating a wide variety of highly technical engineering data, including construction plans, field survey and quality control documents.
iv. Skill in interpreting and implementing Caltrans standards, policies, procedures and regulations.
v. Skill in interpersonal relations, as applied to contacts with contractors, representatives of other governmental jurisdictions, and other SBCTA/Caltrans staff.

11. Construction Surveying Project Manager

a. A minimum four (4) years' project management experience on similar construction projects is desired.

b. Licensed Surveyor or pre-January 1, 1982 Registered Professional Engineer in the State of California.

c. Accessible to the Resident Engineer and SBCTA at all times during normal working hours as specified in this Scope of Services.

d. Under the direction of the Resident Engineer, the Survey Project Manager will be responsible for:

1) Review, monitor, train, and provide general direction for CONSULTANT survey personnel.
2) Assign personnel to projects on an as-needed basis.
3) Administer personal leave, subject to approval of the Resident Engineer.
4) Prepare monthly reports for delivery to the Resident Engineer.

12. Field Party Chief(s)

a. The person(s) holding the position of Party Chief shall meet at least one of the following licensing requirements:

1) A licensed Land Surveyor in the State of California.
2) A pre-January 1, 1982, Registered Professional Civil Engineer in the State of California.
3) An experienced surveyor who serves as chief under the direction or supervision of a person who is a licensed Land Surveyor or pre-January 1, 1982 Registered Professional Civil Engineer in the State

of California. The direction or supervision shall place the supervisor in "responsible charge" of the work. "Responsible Charge" is defined in Chapter 15 of the Business and Professions Code (the Land Surveyor's Act) and Title 16, Chapter 5, of the California Administrative Code (regulations adopted by the Board of Registration for Professional Engineers and Land Surveyors).

b. The Party Chief(s) should have a minimum two (2) years' survey experience on similar construction projects and possess the following additional capabilities:

1) Thorough knowledge of construction survey practices and the ability to read and interpret plans and specifications.
2) Ability to make effective decisions concerning field problems and work in progress.
3) Familiarity with typical coordinate geometry computer programs.
4) Familiarity with safety requirements for surveying near traffic.

c. The Party Chief(s) will assume the following responsibilities:

1) Perform construction staking services for Project construction.
2) Administer day to day activities for the survey party.
3) Perform analytical survey calculations for items such as grading, horizontal and vertical control, right of way, and minor in-field design.
4) Maintain continuous communication with the Resident Engineer, field personnel, and construction administration staff.

13. Survey Crews

a. Qualifications for survey crew members should include the following:

1) A minimum of one (1) year of survey experience on similar construction projects is desired.
2) Fundamental knowledge of construction survey practices and the ability to read and interpret plans and specifications.
3) Ability to assist Party Chiefs and office personnel in all required surveying work.
4) One survey crew member must have the ability to assume temporary leadership of the survey party in the absence of the Party Chief.

b. Under the direction of the Resident Engineer and the Party Chief, the survey crew members will assume the following responsibilities:

1) Perform basic calculations to support construction staking.
2) Maintain continuous communication with Party Chiefs and office personnel.

END OF SCOPE OF WORK

Additional Information

BOARD OF DIRECTORS METRO VALLEY STUDY SESSION ATTENDANCE - 2023
VALLEY BOARD MEMBER ATTENDANCE

Name	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Eunice Ulloa City of Chino	X	X	X	X	X	X						
Ray Marquez City of Chino Hills	X	X	X		X	X		X				
Frank Navarro City of Colton	X			X	X			X				
Aquanetta Warren City of Fontana		X	X	X	X			X				
Sylvia Robles City of Grand Terrace	X	X	X	X		X						
Larry McCallon City of Highland	X	X	X	X				X				
Rhodes 'Dusty' Rigsby City of Loma Linda	X		X	X	*							
John Dutrey City of Montclair	X	X	X	X	X			X				
Alan Wapner City of Ontario		X	X	X		X		X				
L. Dennis Michael City of Rancho Cucamonga		X		X	X	X						
Paul Barich City of Redlands		X	X		X			X				
Deborah Robertson City of Rialto				X		X						
Helen Tran City of San Bernardino		X	X		X	X		X				
Rudy Zuniga City of Upland	X	X	X	X	X	X		*				
Bobby Duncan City of Yucaipa	X			X	X	X						
Curt Hagman Board of Supervisors	X	X	X	X	X	X		X				

X = member attended meeting. * = alternate member attended meeting. Empty box = Did not attend meeting Crossed out box = not a Board Member at the time.
Shaded box = No meeting

Communication: Attendance (Additional Information)

BOARD OF DIRECTORS METRO VALLEY STUDY SESSION ATTENDANCE – 2023

VALLEY BOARD MEMBER ATTENDANCE (Cont.)

Name	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Dawn Rowe Board of Supervisors	X			X		X		X				
Jesse Armendarez Board of Supervisors	X				X			X				
Joe Baca, Jr. Board of Supervisors	X	X	X	X	X	X		X				

MOUNTAIN/DESERT BOARD MEMBER ATTENDANCE

Daniel Ramos City of Adelanto												
Art Bishop Town of Apple Valley	X	X	X	X	X	X						
Paul Courtney City of Barstow												
Rick Herrick City of Big Bear Lake												
Rebekah Swanson City of Hesperia	X	X	*	X	X			X				
Janet Jernigan City of Needles					X							
Joel Klink City of Twentynine Palms												
Debra Jones City of Victorville												
Rick Denison Town of Yucca Valley	X	X	X	X	X	X		X				
Paul Cook Board of Supervisors	X	X	X	X	X	X		X				

X = member attended meeting. * = alternate member attended meeting. Empty box = Did not attend meeting Crossed out box = not a Board Member at the time.

MVSSatt23 Shaded box = No meeting

Communication: Attendance (Additional Information)

Acronym List

This list provides information on acronyms commonly used by transportation planning professionals. This information is provided in an effort to assist Board Members and partners as they participate in deliberations at Board meetings. While a complete list of all acronyms which may arise at any given time is not possible, this list attempts to provide the most commonly-used terms. Staff makes every effort to minimize use of acronyms to ensure good communication and understanding of complex transportation processes.

AB	Assembly Bill
ACE	Alameda Corridor East
ACT	Association for Commuter Transportation
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
APTA	American Public Transportation Association
AQMP	Air Quality Management Plan
ARRA	American Recovery and Reinvestment Act
ATMIS	Advanced Transportation Management Information Systems
BAT	Barstow Area Transit
CALACT	California Association for Coordination Transportation
CALCOG	California Association of Councils of Governments
CALSAFE	California Committee for Service Authorities for Freeway Emergencies
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CMAQ	Congestion Mitigation and Air Quality
CMIA	Corridor Mobility Improvement Account
CMP	Congestion Management Program
CNG	Compressed Natural Gas
COG	Council of Governments
CPUC	California Public Utilities Commission
CSAC	California State Association of Counties
CTA	California Transit Association
CTC	California Transportation Commission
CTC	County Transportation Commission
CTP	Comprehensive Transportation Plan
DBE	Disadvantaged Business Enterprise
DEMO	Federal Demonstration Funds
DOT	Department of Transportation
EA	Environmental Assessment
E&D	Elderly and Disabled
E&H	Elderly and Handicapped
EIR	Environmental Impact Report (California)
EIS	Environmental Impact Statement (Federal)
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FSP	Freeway Service Patrol
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
GFOA	Government Finance Officers Association
GIS	Geographic Information Systems
HOV	High-Occupancy Vehicle
ICTC	Interstate Clean Transportation Corridor
IEEP	Inland Empire Economic Partnership
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
IIP/ITIP	Interregional Transportation Improvement Program
ITS	Intelligent Transportation Systems
IVDA	Inland Valley Development Agency
JARC	Job Access Reverse Commute
LACMTA	Los Angeles County Metropolitan Transportation Authority
LNG	Liquefied Natural Gas
LTF	Local Transportation Funds

MAGLEV	Magnetic Levitation
MARTA	Mountain Area Regional Transportation Authority
MBTA	Morongo Basin Transit Authority
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MSRC	Mobile Source Air Pollution Reduction Review Committee
NAT	Needles Area Transit
NEPA	National Environmental Policy Act
OA	Obligation Authority
OCTA	Orange County Transportation Authority
PA&ED	Project Approval and Environmental Document
PASTACC	Public and Specialized Transportation Advisory and Coordinating Council
PDT	Project Development Team
PNRS	Projects of National and Regional Significance
PPM	Planning, Programming and Monitoring Funds
PSE	Plans, Specifications and Estimates
PSR	Project Study Report
PTA	Public Transportation Account
PTC	Positive Train Control
PTMISEA	Public Transportation Modernization, Improvement and Service Enhancement Account
RCTC	Riverside County Transportation Commission
RDA	Redevelopment Agency
RFP	Request for Proposal
RIP	Regional Improvement Program
RSTIS	Regionally Significant Transportation Investment Study
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agencies
SB	Senate Bill
SAFE	Service Authority for Freeway Emergencies
SAFETEA-LU	Safe Accountable Flexible Efficient Transportation Equity Act – A Legacy for Users
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCRRA	Southern California Regional Rail Authority
SHA	State Highway Account
SHOPP	State Highway Operations and Protection Program
SOV	Single-Occupant Vehicle
SRTP	Short Range Transit Plan
STAF	State Transit Assistance Funds
STIP	State Transportation Improvement Program
STP	Surface Transportation Program
TAC	Technical Advisory Committee
TCIF	Trade Corridor Improvement Fund
TCM	Transportation Control Measure
TCRP	Traffic Congestion Relief Program
TDA	Transportation Development Act
TEA	Transportation Enhancement Activities
TEA-21	Transportation Equity Act for the 21st Century
TMC	Transportation Management Center
TMEE	Traffic Management and Environmental Enhancement
TSM	Transportation Systems Management
TSSDRA	Transit System Safety, Security and Disaster Response Account
USFWS	United States Fish and Wildlife Service
VCTC	Ventura County Transportation Commission
VVTA	Victor Valley Transit Authority
WRCOG	Western Riverside Council of Governments

cta sb cog

San Bernardino County Transportation Authority

San Bernardino Council of Governments

MISSION STATEMENT

Our mission is to improve the quality of life and mobility in San Bernardino County. Safety is the cornerstone of all we do.

We achieve this by:

- Making all transportation modes as efficient, economical, and environmentally responsible as possible.
- Envisioning the future, embracing emerging technology, and innovating to ensure our transportation options are successful and sustainable.
- Promoting collaboration among all levels of government.
- Optimizing our impact in regional, state, and federal policy and funding decisions.
- Using all revenue sources in the most responsible and transparent way.

Approved December 4, 2019