UPPER GUADALUPE RIVER
FLOOD RISK MANAGEMENT PROJECT
San José, California

Engineering and Design

Geotechnical

Appendix A2
(30% DRAFT)

DRAFT INTEGRATED
GENERAL REEVALUATION REPORT
& SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

November 2022

US Army Corps of Engineers®
San Francisco District

Valley Water

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1 INTRODUCTION

This draft appendix was developed for the Upper Guadalupe River Flood Risk Management project. This appendix summarizes exiting geotechnical conditions at the site and presents the preliminary findings of the engineering analysis conducted to support the development of recommended improvements. This Appendix is based on review of existing subsurface data, design documents from previous projects, consultant and agency geotechnical reports, and published geologic reports.

This appendix is a preliminary draft and is intended to present the site conditions as presently understood. This draft appendix is intended to support feasibility analysis and development of the feasibility cost estimate. Findings and conclusions are preliminary; design will advance as the study progresses.

2 EXISTING SUBSURFACE DATA

For this study, the following reports were reviewed:

- Winzler and Kelly, 1982, Guadalupe River Flood Control Feasibility Study, Geotechnical Investigation.
- USACE, 1983, Guadalupe River Flood Control Feasibility Report for Alternative 2, Supplemental Geotechnical Investigation.
- Dames and Moore, 1992, Subsurface Geotechnical Investigation, Upper Guadalupe River Flood Control Project.
- Geomatrix, 1993, Report of Field Activities, Upper Guadalupe River.
- URS, 2000, Report of Field Activities and Laboratory Test Data, Upper Guadalupe River, Subsurface Geotechnical Investigation.

Table 1 summarizes the available subsurface explorations. Boring and CPT locations are shown on the Geotechnical Site Plans (Sheets 2 to 6).

Table 1. Previous Explorations

Reach	Report	Boring #	Date	Depth	Lat	Long	Type[1]
Reach 7	Dames & Moore (1992)	GCPT-1	2/27/1992	30	37.316148	-121.887995	CPT
	Dames & Moore (1992)	GCPT-2	2/27/1992	30	37.315318	-121.889214	CPT
	Dames & Moore (1992)	GCPT-3	3/12/1992	45	37.314821	-121.889026	CPT
	Dames & Moore (1992)	GCPT-4	3/12/1992	50	37.314638	-121.889443	CPT
	Dames & Moore (1992)	GCPT-5	2/25/1992	30	37.313869	-121.887909	CPT
	Dames & Moore (1992)	GCPT-6	2/25/1992	30	37.312868	-121.887367	CPT
	Dames & Moore (1992)	OP-1	2/25/1992	30	37.312038	-121.887121	CPT
	Dames & Moore (1992)	GCPT-7	2/25/1992	30	37.311332	-121.886578	CPT
	Dames & Moore (1992)	OP-2	2/26/1992	30	37.310349	-121.886075	CPT
	Dames & Moore (1992)	GCPT-8	2/26/1992	30	37.309806	-121.885432	CPT
	Dames & Moore (1992)	OP-3	2/27/1992	30	37.308594	-121.884302	CPT
	Dames & Moore (1992)	GCPT-9	2/27/1992	30	37.307771	-121.884132	CPT
	URS (2000)	GR-99-9	8/7/2000	40	37.314167	-121.887838	RW
	URS (2000)	GR-99-8	8/7/2000	40	37.313000	-121.889106	RW
	URS (2000)	GR-99-11	7/31/2000	40	37.311118	-121.886216	RW
	URS (2000)	GR-99-12	7/31/2000	40	37.310071	-121.885957	RW
	URS (2000)	GR-99-13	8/1/2000	40	37.309132	-121.884610	RW
	URS (2000)	GR-99-14	8/2/2000	40	37.308989	-121.885349	RW
	URS (2000)	GR-99-15	8/1/2000	40	37.307735	-121.883725	RW
Reach 8	Dames & Moore (1992)	GCPT-10	2/28/1992	30	37.305758	-121.882764	CPT
	Dames & Moore (1992)	GCPT-11	2/27/1992	30	37.304640	-121.882094	CPT
	Dames & Moore (1992)	GCPT-12	3/10/1992	84	37.304023	-121.882452	CPT
	Dames & Moore (1992)	GCPT-13	3/10/1992	67	37.303697	-121.881920	CPT
	Dames & Moore (1992)	GCPT-14	2/28/1992	30	37.302887	-121.881703	CPT
	Geomatrix (1993)	GR-93-2	5/28/1993	22.5	37.305854	-121.882560	SSA
	Geomatrix (1993)	GR-93-3	5/27/1993	27.5	37.302549	-121.881619	RW
	URS (2000)	GR-99-18	8/8/2000	40	37.304617	-121.881573	RW
	URS (2000)	GR-99-20	8/10/2000	40	37.303943	-121.881739	RW
	URS (2000)	GR-99-19	8/9/2000	40	37.303925	-121.882501	RW
	URS (2000)	GR-99-17	8/8/2000	40	37.306861	-121.883082	RW
	URS (2000)	GR-99-16	8/3/2000	39.5	37.306499	-121.883919	RW
Canoas	Dames & Moore (1992)	CCPT-5	3/3/1992	30	37.288508	-121.880919	CPT
	Dames & Moore (1992)	OP-8	3/3/1992	30	37.288327	-121.880060	CPT
	Dames & Moore (1992)	CCPT-2	3/3/1992	30	37.288150	-121.879828	CPT
	Dames & Moore (1992)	OP-7	3/3/1992	30	37.287899	-121.878607	CPT
	Dames & Moore (1992)	CCPT-1	3/3/1992	30	37.287736	-121.877790	CPT
	Geomatrix (1993)	CC-93-2	5/27/1993	27.5	37.288081	-121.879829	RW
	Geomatrix (1993)	CC-93-1	5/27/1993	22.0	37.287707	-121.877818	RW
	URS (2000)	GR-99-30	7/27/2000	39.5	37.288649	-121.881474	RW
	URS (2000)	CC-99-6	7/24/2000	36.5	37.288503	-121.881003	RW
	URS (2000)	CC-99-5	7/24/2000	34.5	37.288158	-121.879208	RW

[1]CPT = Cone Penetration Test, SSA = Solid Stem Auger Boring, RW = Rotary Wash Boring

Table 1. Previous Explorations (cont.)

Reach	Report	Boring #	Date	Depth	Lat	Long	Type[1]
Ross Creek	Dames & Moore (1992)	OP-9	3/5/1992	30	37.265464	-121.878613	CPT
	Dames & Moore (1992)	GCPT-40	3/6/1992	30	37.265437	-121.877350	CPT
	Dames & Moore (1992)	RCPT-1	3/5/1992	30	37.265248	-121.878583	CPT
	Dames & Moore (1992)	OP-10	3/4/1992	30	37.264951	-121.879976	CPT
	Dames & Moore (1992)	RCPT-3A	3/4/1992	30	37.264392	-121.882245	CPT
	Dames & Moore (1992)	RCPT-4	3/18/1992	30	37.264012	-121.884308	CPT
	Dames & Moore (1992)	RCPT-3	3/4/1992	30	37.263771	-121.884522	CPT
	Dames & Moore (1992)	OP-12	3/17/1992	30	37.263686	-121.885573	CPT
	Dames & Moore (1992)	OP-11	3/4/1992	30	37.263496	-121.885535	CPT
	Dames & Moore (1992)	RCPT-5	3/4/1992	30	37.263346	-121.886145	CPT
	Geomatrix (1993)	RC-93-1	5/25/1993	40.0	37.264936	-121.879879	HSA
	Geomatrix (1993)	RC-93-2	5/26/1993	30.0	37.264064	-121.883403	RW
	Geomatrix (1993)	RC-93-3	5/26/1993	18.0	37.263600	-121.885647	SSA
	URS (2000)	GR-99-44	8/14/2000	40	37.266426	-121.877099	RW
	URS (2000)	GR-99-43	7/19/2000	40	37.266132	-121.878719	RW
	URS (2000)	GR-99-46	7/20/2000	40	37.265635	-121.876656	RW
	URS (2000)	RC-99-4	7/7/2000	35	37.265323	-121.878912	RW
	URS (2000)	RC-99-5	7/6/2000	35	37.264679	-121.881492	RW
	URS (2000)	RC-99-6	7/7/2000	35	37.263754	-121.885045	RW
	URS (2000)	RC-99-7	7/6/2000	35.5	37.262967	-121.887917	RW
	URS (2000)	RC-99-8	7/10/2000	34.5	37.262366	-121.889693	RW
	URS (2000)	RC-99-9	7/5/2000	35.5	37.262056	-121.891596	RW
	URS (2000)	RC-99-11	7/5/2000	36.5	37.261929	-121.893032	RW
	URS (2000)	RC-99-10	7/10/2000	35	37.261795	-121.892341	RW

[1]CPT = Cone Penetration Test, SSA = Solid Stem Auger Boring, RW = Rotary Wash Boring

3 GEOLOGY AND SEISMICITY

The San Francisco Bay and Santa Clara Valley are parts of a long, northwest-trending structural depression within the central California Coast Range, located between the San Andreas fault in the Santa Cruz Mountains to the west, and the Hayward and Calaveras faults in the Diablo Range to the east. The basement consists of accreted Franciscan Complex structurally overlain by Coast Range ophiolite and marine clastics of the Mesozoic Great Valley sequence (Wentworth et al, 1999). Tertiary sediments, lithified into sandstone, shale, conglomerate, and chert, unconformably overlies and is in fault contact with the basement rock (Helley and Lajoie, 1979; Wagner et al, 1991).

The Upper Guadalupe River project is located on the upper portion of the alluvial plain formed by coalescing alluvial fans at the southern end of the Santa Clara Valley. The Santa Clara basin began collecting alluvial sediments of sand, gravel, silts and clays from the eroding uplifted and folded areas. Those sediments comprise the Santa Clara Formation. The thickness of the Santa Clara formation overlying bedrock is quite variable, having been dissected by erosion prior to being covered by younger Pleistocene and Holocene alluvium.

The project is located along the Guadalupe River between the Caltrain/Union Pacific Railroad bridge near Highway 87 to Willow Glen Way. The proposed project also includes reaches along tributaries Canoas Creek and Ross Creek.

The Guadalupe River has a gentle, slightly sinuous path flowing in a northerly direction with a relatively gentle gradient. Surficial deposits in the area are mapped primarily as Holocene alluvial fan deposits (Qhf), with Holocene alluvial levee deposits (Qhl) and stream channel deposits (Qhc) along the river and tributaries (CGS, 2002). Portions of Guadalupe River, as well as, Canoas Creek and Ross Creek have been channelized.

Subsurface investigation along the Guadalupe River shows that the upper 30 feet of the natural levee deposits consists of interbedded silty clays, sandy clays, silts, clayey sand and silty sand layers of variable thickness. Generally, from Willow Street upstream to Willow Glen Way the upper 30 feet of soil consists predominantly of silty to sandy clays and clayey silts including fat clays and elastic silt with some clayey and silty sand interbeds, and fill soils were encountered at the surface in the majority of the borings. Upstream of Willow Glen Way, the soil becomes increasingly sandier with interbeds of silty to sandy clays and silts. The clays are generally stiff to very stiff, partially drained. Upstream of Bryan Avenue on the west side of the river, the sand content of the soil increased, probably reflecting a gradual change to coarser, natural levee materials and finally to the Holocene, alluvial fan deposit of Wesling and Helley (1989).

Canoas Creek has, for the most part, been channelized downstream of Blossom Hill Road by man. There is very little of the natural stream channel left except perhaps as it skirts the southwestern edge of Oak Hill. Leaving Oak Hill the creek has been channeled across the natural levee deposit of the Guadalupe River. The creek bottom is approximately 11 feet below the ground surface and approximately 15 feet below the man-made levee crest. Subsurface exploration indicates that below the 4-foot ± high levees the soil is generally clayey with a variable sand content. The borings also showed the presence of fill at the surface, clay, silt, fat clay, and elastic silt. The soil on the south bank appears to have a higher sand content than the north bank. Further upstream along Canoas Creek, but downstream of Blossom Hill Road, the creek channel is in Holocene flood basin deposits (Helley and Wesling, 1990). Helley and Wesling described the Holocene flood basin deposits as "Organic-rich dark clay to very fine silty clay deposits occupying the lowest topographic position either between Holocene levee deposits or Holocene floodplain deposits."

Ross Creek, downstream of Branham Avenue, has been channelized. Ross Creek flows northeast from Branham Avenue for approximately 0.7 mile to near Hallbrook Drive before turning east-northeast into a relatively straight channel that carries the creek for approximately 1.5 miles to the Guadalupe River. Between Branham Ave. and Hallbrook Drive, Ross Creek flows in a narrow finger of Holocene, alluvial fan deposits that have been laid down on older, alluvial fan deposits of Pleistocene age (Wesling and Helley, 1989). This finger of Holocene, alluvial fan deposits may be partly natural levee deposits of coarse material. The channelized section running east-northeast has been excavated in Pleistocene, alluvial fan deposit and in the Holocene, natural levee deposits of the Guadalupe River. Within the project limits, Ross Creek has been channelized in Holocene, natural levee deposits. The creek bottom lies approximately 8 to 13 feet below its banks and 8 to 15 feet below the surrounding ground surface. There are essentially no existing levees along Ross Creek within the project area. Subsurface investigation along Ross Creek indicates that the soil is essentially clayey with variable sand content ranging from little sand to clayey sand; locally some sandy, clayey gravels were also found at or below creek bottom elevation. The south bank appears to have a higher sand content than the north bank; however, the south bank was more extensively investigated due to greater accessibility.

3.1 Seismicity

The San Francisco Bay area is recognized by geologists and seismologists as one of the most seismically active regions in the United States. Significant earthquakes occurring in the Bay area are generally associated with crustal movement along well-defined, active fault zones of the San Andreas Fault system. A regional fault map is presented as Figure 1, illustrating the relative distances of the site to significant fault zones. The faults considered capable of generating significant earthquakes are generally associated with the well-defined areas of crustal movement, which trend northwesterly. The San Andreas Fault generated the great San Francisco earthquake of 1906 and the Loma Prieta earthquake of 1989 and passes 10 miles southwest of the proposed school site. The Hayward Fault and the Calaveras Fault are located approximately 8½ and 9½ miles to the east, respectively. The Monte Vista-Shannon fault is located approximately 5 miles southwest.

The Working Group on California Earthquake Probabilities developed estimates of future earthquakes in California. Their most recent report, the Uniform California Earthquake Rupture Forecast (2014), estimates that there is a 72% chance of a magnitude 6.7 or greater earthquake on one of the Bay Area faults between 2014 to 2044, and a 90% chance of a magnitude 6 or greater during the same time period (Field and WGCEP, 2015).

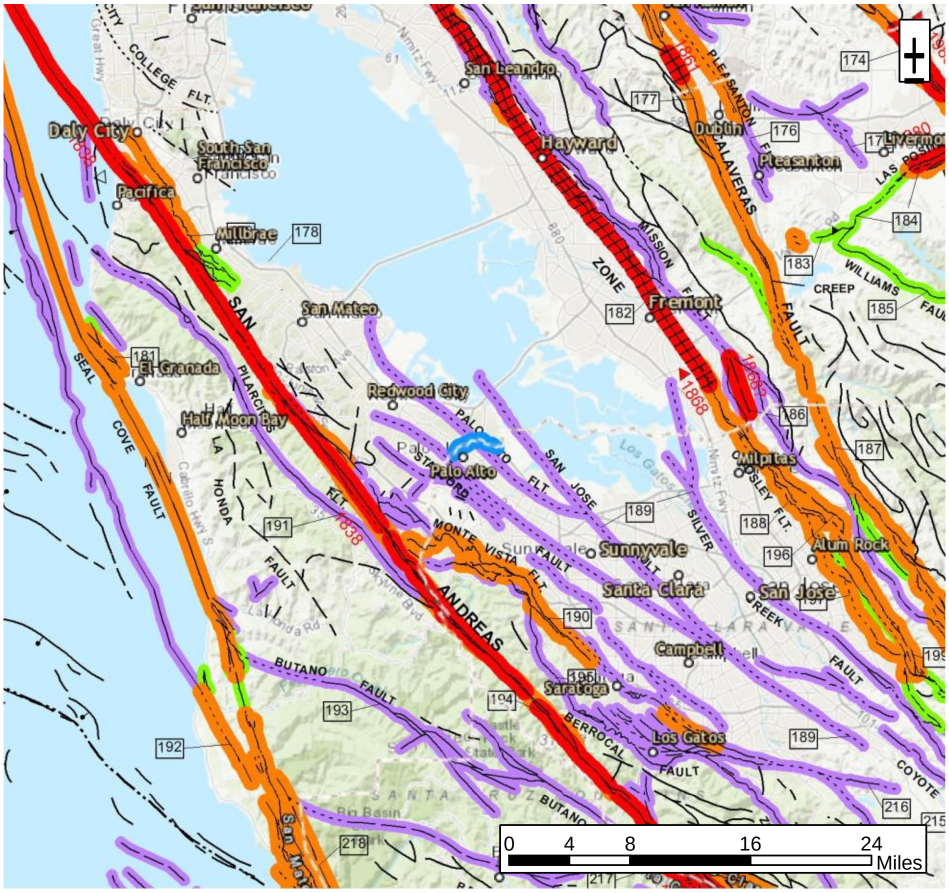

Figure 1: Regional Active Faults

The Peak Ground Acceleration (PGA) was calculated for return periods of 475 to 2,475 years using the on-line United States Geological Survey (USGS) Unified Hazard. Based on review of available borings, local geology, and nearby shear wave velocity measurements, the site can be classified as Site Class D for seismic design.

Table 2. Peak Ground Acceleration

Annual Probability of Exceedance	Return Period (years)	PGA (g's)
2% in 50 years	2,475	0.89 to 0.90g
5% in 50 years	975	0.70 to 0.72g
10% in 50 years	475	0.57 to 0.59g

4 GEOLOGIC HAZARDS

4.1 Fault Rupture

As discussed above, several significant faults are located within 15 miles of the site. No known faults cross the site. The site is not located within an Alquist-Priolo Earthquake Fault Zone, known formerly as a Special Studies Zone (CDMG, 1982), nor is it within a City of San Jose Potential Hazard Zone (City of San Jose, 1983) or a County Fault Rupture Hazard Zone (Santa Clara County, 2002). Therefore, fault rupture hazard is not a significant geologic hazard at the site.

4.2 Liquefaction

Liquefaction refers to the tendency for loose, saturated, coarse-grained (sandy) soils to lose strength during earthquakes. The site is located within a State-designated Liquefaction Hazard Zone (CGS, 2002) and a Santa Clara County Liquefaction Hazard Zone (Santa Clara County, 2002). CGS (2002) characterizes the liquefaction susceptibility of the alluvial fan and levee deposits (Qhf and Qhl) as "moderate" and recent stream channel deposits as "high." The majority of the soils encountered in the borings within the project area were predominantly fine-grained. Interbedded loose to medium dense sand layers were encountered throughout the project area. These soils may be susceptible to liquefaction and will be evaluated further.

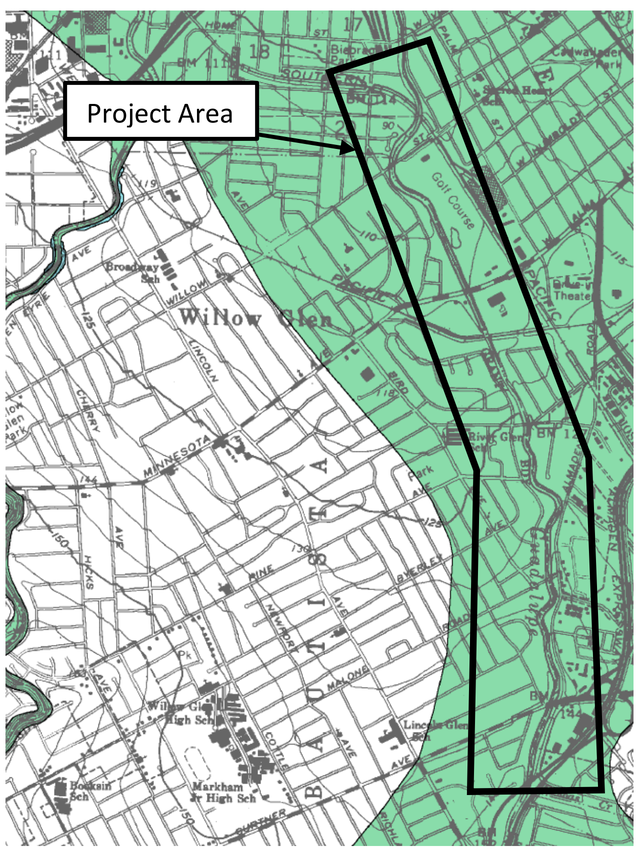

Figure 2 – California Seismic Hazard Zone for Liquefaction

5 TENTATIVELY SELECTED PLAN

The Tentatively Selected Plan (TSP) is Alternative 8b: Combination Plan.

5.1 Reach 7

Reach 7 is approximately 4,000 feet long and extends from the Caltrain/Union Pacific Railroad Bridge (UPRR) bridge at Station 741+00 to the abandoned UPRR bridge at Station 781+00. The TSP includes widening the eastern bank and implementing new bypass channels at crossings which comprise an expanded floodplain, maintenance road with access ramps, gravel augmentation, and a pilot channel for low flow activities. The proposed extended floodplain will have a 2% slope towards the existing channel. A 50 to 100-ft wide floodplain with consist of riparian vegetation along the low-flow channel and natural mitigation islands throughout the channel to help reduce high velocity flow. Biotechnical bank stabilization and rip rap will also be included along the existing channel side to help reduce erosion and scours where necessary. UPRR/Caltrain Bridge will be extended to span the proposed widened channel. The new 18-foot-wide maintenance road will be located at the toe of the new eastern channel which can be accessed from the new access ramp. The 2:1 (H:V) slopes will be stabilized by natural plantings. At the Willow Street Crossing and Alma Avenue Crossing, a new bridge and bypass have been proposed at both locations.

There are two permanent placement sites within Reach 7: Willow Street & Lelong Street and W Alma Avenue (Elks Lodge). These sites will also act as construction staging areas which will help reduce the truck trips during construction reducing the environmental impact of transporting all the earthwork.

The subsurface soils encountered at these locations consist predominantly of lean clays and clayey silts in the upper 30 feet. The consistency of this material is generally soft in the upper 8 feet and medium stiff from 8 to 30 feet. Underlying this material are interbedded layers of sand with gravel, silty clays, and sandy silts to the maximum depth explored (51 feet in GCPT-4).

5.2 Reach 8

Reach 8 extends from the abandoned UPRR Bridge at Station 781+00 to Willow Glen Way at Station 795+00. Continuation of the Reach 7 channel widening will be constructed within Reach 8. The TSP includes a combination of widening the eastern bank and creating a bypass channel utilizing natural mitigation islands. The existing UPRR Bridge will be rehabilitated to provide recreation access and connectivity across the Guadalupe River. A new 3-cell box culvert is proposed to be installed below the existing UPRR tracks. The widened portion of the channel will consist of an expanded floodplain, maintenance road with access ramp, rip rap and a pilot channel for low flow activities. The bypass portion of the design will consist of an adjacent channel, separated by a mitigation island, with a maintenance road, access ramp, and a pilot channel to allow for low flow activities.

The river channel will be widened on the east side similar to Reach 7 with side slopes 1:1 and undetermined excavation depth of the new channel. There will be 3-cells box culvert that pass the widened channel flow underneath the UPRR at about Station 781+50. Each culvert cell is estimated to be 20 feet wide and 17 feet tall.

5.3 Canoas Creek (Almaden Expressway to Nightingale Drive)

The proposed design for Canoas Creek, consist of widening the channel on the eastern bank. An additional box culverts are proposed at both Almaden Expressway and Nightingale Drive Crossing. At Almaden Expressway Culvert Crossing, a new box culvert will be constructed on the eastern side adjacent to the existing double culverts. While the new box culvert at Nightingale Drive Crossing will be built on the western side adjacent to the existing double culverts. New eastern wingwall at Almaden Expressway and new western wingwall at Nightingale Drive will be built to incorporate the additional culverts. Utilities will be protected and adjusted in coordination with implementing these new culverts at both locations. Floodwalls are proposed along both creek banks (each floodwall approximately 2800-ft in length) to increase the channel height. The floodwalls heights will vary between 4-ft to 6-ft from existing grade.

5.4 Ross Creek (Almaden Expressway to Kirk Road)

The TSP includes 20-foot wide box culvert underneath Almaden Expressway to be placed adjacent to an existing 12-foot wide, three-cell box culvert. Flood walls will be built along the northern and southern banks, respectively just west of Almaden Expressway. West of Cherry Avenue, flood walls will be built along the northern and southern creek banks, respectively. A12-foot wide box culvert will be added adjacent to the 12-foot wide two-cell box culvert across Cherry Avenue. Also, east of Jarvis avenue, a flood wall will be built along the northern bank, and west of Cherry Avenue, flood walls will be built along the northern and southern Ross Creek northern and southern banks, respectively. A 12-foot wide box culvert will be built adjacent to the existing 12-foot wide culvert across Jarvis Avenue. The height of the culvert wingwall is estimated to be 13 feet tall. Two 12-foot wide cells will be added on the sides of an existing one underneath Meridian Avenue, and one 10-foot wide cell will be added to the existing double cells box culvert across Kirk Road.

6 CONCLUSIONS

The preliminary findings presented in this appendix is based on review of existing data. Design will be further developed during the prior to the Agency Decision Milestone.

The current plans were developed at a preliminary level based on the currently available topographic data. Additional topographic surveys will be performed. Specific analyses, such as slope stability, culvert design, and foundation design, should be performed once the design has progressed.

Once the design has developed further, additional geotechnical explorations may be advisable to fill data gaps. The applicable codes and specifications for the proposed road crossings and bridges should be identified with applicable type of loading and loading conditions to assess the need for the additional explorations. Deeper explorations will be required for bridges and deep underground crossings.

Fill was encountered along Guadalupe River, Canoas Creek, and Ross Creek. Also, within these soils fat clays and elastic silts were present. The presence and continuity of fill soils should be identified and check for records of these fills, otherwise any foundation soils identified as fill without documentation should be either evaluated and accepted or removed and replaced with suitable compacted soils.

Flow velocities in the Guadalupe River near Willow Glen Way are very high and could cause soil erosion. The project should include streambank protection and erosion measures in areas with high velocities.

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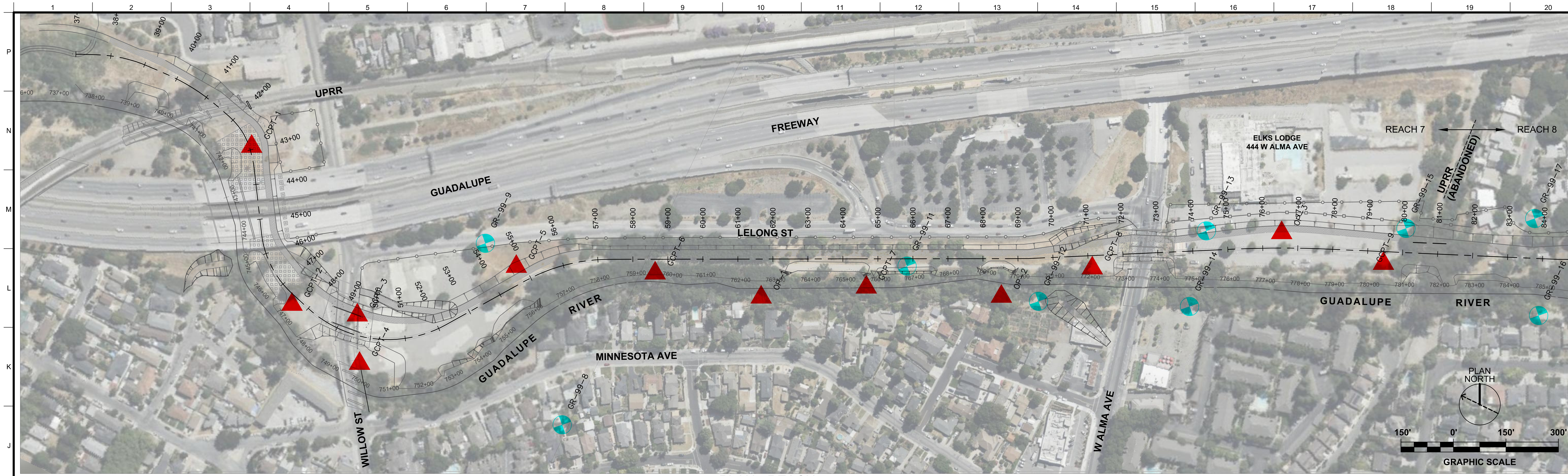


PLAN - REACH 7

SCALE: 1"-150'

PLAN - REACH 8

SCALE: 1"-150'

LEGEND

- CONE PENETRATION TEST BY DAMES AND MOORE (1992)
- EXPLORATORY BORINGS BY GEOMATRIX (1993)
- EXPLORATORY BORINGS BY URS (2000)

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. WAIR
DRAWN BY: F. CHAN
CHECKED BY: B. WAIR
SUBMITTED BY: S. HA
SIZE: ANSI D

ISSUE DATE: XXX 2022
SOLICITATION NO.: W912P722B00XX
CONTRACT NO.: W912P722C00XX

U.S. ARMY CORPS OF ENGINEERS
SAN FRANCISCO DISTRICT
450 GOLDEN GATE AVE, 4TH FLOOR
SAN FRANCISCO, CA 94102-3404

SANTA CLARA COUNTY, CALIFORNIA
UPPER GUADALUPE PROJECT
FLOOD RISK MANAGEMENT PROJECT
GEOTECHNICAL SITE PLAN

REACH 7 & 8

SHEET ID

2 OF 7

PLAN - CANOAS CREEK

SCALE: 1"= 75'

LEGEND

- CONE PENETRATION TEST BY DAMES AND MOORE (1992)
- EXPLORATORY BORINGS BY GEOMATRIX (1993)
- EXPLORATORY BORINGS BY URS (2000)

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. WAIR	ISSUE DATE: XXX 2022
DRAWN BY: F. CHAN	SOLICITATION NO.: W912P722B00XX
CHECKED BY: B. WAIR	CONTRACT NO.: W912P722C00XX
SUBMITTED BY: S. HA	
SIZE: ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAN FRANCISCO DISTRICT
450 GOLDEN GATE AVE, 4TH FLOOR
SAN FRANCISCO, CA 94102-3404

SANTA CLARA COUNTY, CALIFORNIA
UPPER GUADALUPE PROJECT
FLOOD RISK MANAGEMENT PROJECT
GEOTECHNICAL SITE PLAN

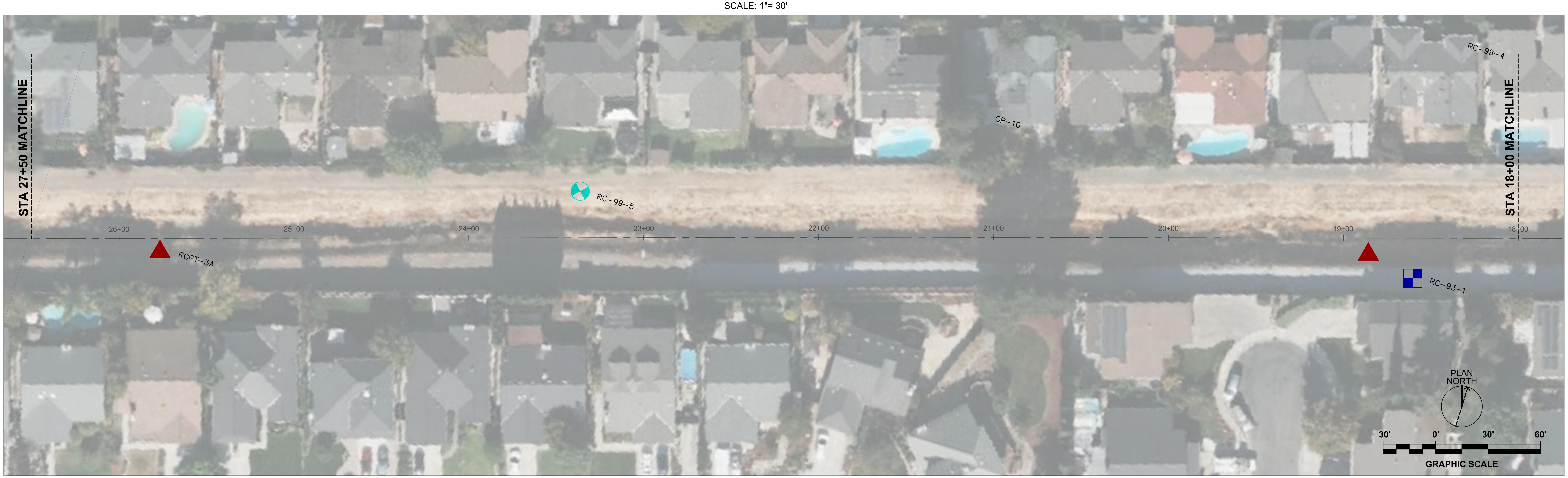
CANOAS CREEK

SHEET ID

3 OF 7

PLAN - ROSS CREEK

SCALE: 1"= 30'



PLAN - ROSS CREEK

SCALE: 1"= 30'

LEGEND

- CONE PENETRATION TEST BY DAMES AND MOORE (1992)
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GEOTECHNICAL SITE PLAN

ROSS CREEK

SHEET ID

4 OF 7

PLAN - ROSS CREEK
SCALE: 1"= 30'

PLAN - ROSS CREEK
SCALE: 1"= 30'

LEGEND

- ▲ CONE PENETRATION TEST BY DAMES AND MOORE (1992)
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GEOTECHNICAL SITE PLAN

ROSS CREEK

SHEET ID
5 OF 7

PLAN - ROSS CREEK

SCALE: 1"= 30'

PLAN - ROSS CREEK

SCALE: 1"= 30'

LEGEND

- CONE PENETRATION TEST BY DAMES AND MOORE (1992)
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GEOTECHNICAL SITE PLAN

ROSS CREEK

SHEET ID

6 OF 7