Vol. II-F: Paleontological Identification Report (PIR)/ Paleontological Evaluation Report (PER)

MOUNT VERNON AVENUE BRIDGE PROJECT
Bridge No. 53C-0066

City of San Bernardino, California

08-SBd-0-SBD

prepared for

City of San Bernardino

California Department of Transportation, District 8

March 2009

PALEONTOLOGICAL IDENTIFICATION REPORT/ PALEONTOLOGICAL EVALUATION REPORT

MOUNT VERNON AVENUE BRIDGE PROJECT
From West 2nd Street to West 5th Street over BNSF railroad facilities

City of San Bernardino, San Bernardino County, California

District 8-SBd-Local Assistance (City of San Bernardino)
Federal Project Number BRLS-0533(042); EA 965120

FOR REVIEW BY:

_____

Gabrielle Duff
Principal Investigator, Prehistoric Archaeology
District 8
464 West Fourth Street, 6th Floor, MS 825
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APPROVED BY:

_____

Christie Hammond, Office Chief
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464 West Fourth Street, 6th Floor, MS 825
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PREPARED BY:

Mark Robinson-Consultant
Jones & Stokes
811 West 7th Street, Suite 800
Los Angeles, California 90017

USGS 7.5' San Bernardino South, CA (1967 edition, photorevised 1980); Township 1 South, Range 4 West, San Bernardino Base and Meridian: Section 8 (projected)

March 2009

For individuals with sensory disabilities, this document is available in alternative formats. Please call or write to California Department of Transportation, Attn: Mr. Russ Williams, 464 West 4th Street, 6th Floor, MS 1163, San Bernardino, CA 92401; (909) 383-1554 Voice, or use the California Relay Service TTY number, 1-800-735-2929.

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SUMMARY OF FINDINGS

This Paleontological Identification Report (PIR)/Paleontological Evaluation Report (PER) was prepared for the California Department of Transportation, District 8. It was prepared in conformance with the format set forth in the Department's *Environmental Handbook, Volume 1*, Chapter 8, Paleontological Resources. The California Department of Transportation (Department), in coordination with the City of San Bernardino, proposes to replace Mount Vernon Bridge (State Bridge No. 54C-0066) over the BNSF railroad facilities between West 2nd Street and West 5th Street in San Bernardino County, California (see Appendix A, Figures 1 and 2). The existing bridge structure would be removed for construction of a new replacement bridge structure and improvements to bridge approaches and roadways in the project vicinity. The new replacement bridge would be 317.1 m (1,040 feet) long and 24.4 m (80 feet) wide with four 3.7-m (12-foot) lanes (two in each direction), a 1.2-m (4-foot)-wide median, and 2.4-m (8-foot)-wide shoulders. The purpose of the proposed project is to provide a bridge that is structurally safe and meets current seismic, design, and roadway standards.

A paleontological literature and records search was conducted by the San Bernardino County Museum (SBCM) Division of Geologic Sciences. The literature and records search indicates that the proposed project is located upon surface exposures of young alluvial valley deposits dating to the Holocene Epoch and has a low potential of adversely impacting important, nonrenewable paleontological resources. Holocene alluvial sediments present at the surface are too young geologically to have potential to contain significant fossil resources. No program to mitigate impacts to resources is therefore recommended for excavation in the Holocene sediments.

Holocene sediments may overlie Pleistocene older alluvium in the subsurface which, *if present*, could have a high potential of adversely impacting significant nonrenewable paleontologic resources. Pleistocene older alluvium may be present at depths in excess of 15 feet below the existing groundsurface; however, actual excavation exceeding 15 feet below the existing ground surface would not occur as part of this project; therefore, a program to mitigate adverse effects on paleontologic resources is not recommended.

INTRODUCTION

A paleontological literature and records review and sensitivity assessment for fossil resources was conducted for the Mount Vernon Avenue Bridge Project between West 2nd Street and West 5th Street. This investigation was performed at the request of the California Department of Transportation in compliance with various Federal regulations. The California Department of Transportation (Department), in coordination with the City of San Bernardino (City), proposes to replace Mount Vernon Avenue Bridge (State Bridge No. 54C-0066) over the BNSF railroad facilities between West 2nd Street and West 5th Street in San Bernardino County, California (see Appendix A, Figures 1 and 2). For the proposed project the existing bridge structure would be removed for construction of a new replacement bridge structure and improvements to bridge approaches and roadways in the project vicinity. The new replacement bridge would be 317.1 m (1,040 feet) long and 24.4 m (80 feet) wide with four 3.7-m (12-foot) lanes (two in each direction), a 1.2-m (4-foot)-wide median, and 2.4-m (8-foot)-wide shoulders. The project is located in Township 1 South; Range 4 West; in the northern portion of Section 8, depicted on the San Bernardino South 7.5 minute topographic map.

The paleontological literature and records review and sensitivity assessment was conducted by the San Bernardino County Museum (SBCM) Division of Geologic Sciences, under the direction of Eric Scott, who meets the Department's qualifications as a Principal paleontologist. This assessment document (see Appendix B) was formatted as a PIR/PER by Jean Lafontaine under Mark C. Robinson who has a B.A. in Geology from the University of Montana (1981) and 14 years experience in southern California archaeology.

PROPOSED PROJECT LOCATION AND DESCRIPTION

The proposed project is located in the City of San Bernardino within San Bernardino County, between West 2nd Street and West 5th Street over the BNSF railroad facilities (see Appendix A, Figures 1 and 2). Mount Vernon Avenue Bridge (State Bridge No. 54C-0066) follows a generally north-south alignment along Mount Vernon Avenue and carries both vehicular and pedestrian traffic. The bridge is approximately 309.7 m (1,016 feet) long and 14.9 m (49 feet) wide with four 3.1 m (10 feet) traffic lanes (two in each direction) and no median or shoulders. The purpose of the proposed project is to provide a bridge that is structurally safe and meets current seismic, design, and roadway standards.

The existing bridge structure would be removed for construction of a new replacement bridge structure and improvements to bridge approaches and roadways in the project vicinity. The new replacement bridge would be 317.1 m (1,040 feet) long and 24.4 m (80 feet) wide with four 3.7-m (12-foot) lanes (two in each direction), a 1.2-m (4-foot)-wide median, and 2.4-m (8-foot)-wide shoulders (see Appendix A, Figure 3). The proposed project includes the following design features and elements.

- Sidewalks on each side of the new bridge would be 1.5 m (5 feet) wide, and would meet Americans ADA requirements for sidewalk width and slopes.
- Concrete barrier railings (1.1 m [3.5 feet) high) topped with fencing (1.9 m [6.1 feet] high) would be provided on each side of the new bridge.
- *Design Speed*. The Build Alternative would be designed for speeds of 56.3 kilometers per hour (35 miles per hour) and up to 64.4 kilometers per hour (40 miles per hour) due to vertical clearance.
- *Vertical Clearance/Horizontal Alignment/Street Geometrics.* The profile of the new replacement bridge would be raised to at least 7.3 m (24 feet) with a maximum clearance of approximately 11.0 m (36 feet), thereby meeting or exceeding the minimum vertical clearances required by CPUC and the BNSF railroad. This alternative would also provide for the minimum 4.6-m (15-foot) clearance over West 3rd Street. Southbound left-turn pockets are proposed at 2nd Street. At the Mount Vernon Avenue/2nd Street intersection, the free right turn from westbound 2nd Street to the northbound Mount Vernon Avenue would be replaced by a right-turn pocket.
- *Horizontal Clearance:* Where required and/or feasible, the bents for the new bridge would include crash walls that would meet or exceed the minimum horizontal clearance requirements. The crash walls would be solid concrete without voids or openings; however, adequate clearances (approximately 0.15 to 0.23 m [0.5 to 0.75 foot]) would be left between the bent columns and the crash walls in order to allow the bridge to move freely under seismic loads without the

columns coming into contact with the crash walls. The crash walls would extend about 0.15 m (0.5 foot) beyond the face of columns.

- *Bridge Alignment/Street Geometrics:* The existing alignment of the bridge would be retained. However, to correct the misalignment with the south approach roadway, the bridge would be widened on the west side. This widening would require the Mount Vernon Avenue service road between West 2nd and West 3rd Streets to be closed.

- *Service Roadway:* Because the bridge widening and realignment noted above would require closure of the service road along the southwest end of the Mount Vernon Avenue Bridge, a parallel alleyway behind the residential parcels in this area would be widened to provide a replacement access road for the neighboring residents and railroad facilities. The alleyway would be widened from the existing variable width of 3.7 to 4.3 meters (12 to 14 feet) to a width of 9.1 meters (30 feet). The widening of the alleyway would provide vehicular access to the homes. The widening would occur on the east side of the alley in order to avoid impacts on adjacent homes.

- *Roadway Improvements:* Reconstruct the intersection at the north and south ends of the bridge. Additional roadway improvements at the south end of the bridge would include minor restriping, repaving, and installing of curbs and gutters. At the north end of the new bridge, similar types of roadway improvements would be provided. Additionally, retaining walls would be constructed along both sides of the north approach between about Kingman Avenue and West 4th Street. The intersection of West 4th Street and Mount Vernon Avenue has been reconstructed in a cul-de-sac configuration as part of a separate City public works project.

- *Railroad Operations:* The BNSF rail yard provides service to four different and very active railroad operations—BNSF freight, BNSF storage, Metrolink, and Amtrak. Because of these important railroad services, the primary focus of the structure design would be to maintain railroad operations during the construction of the new bridge. In order to do this, BNSF would require that two temporary railroad tracks (*shoofly* tracks) be installed within the north side of their existing BNSF yard, on both sides of the bridge, parallel to the existing BNSF railroad tracks.

  Construction methods that would minimize impacts on railroad operations would be employed for the new replacement bridge. Removal of the existing bridge would be performed prior to construction using overhead techniques when and where possible. The girders would be precast concrete bulb-tee girders (concrete deck). The bridge foundation would be formed by large diameter drilled shafts (commonly referred to as cast-in-steel-shell piles, or CISS Type Piles) to avoid the substantial footprint area required for pile-group-type foundations. Minimizing the footprint of the substructure would reduce the impact to railroad operations. Columns would be supported on the CISS piles, and where required and/or feasible, crash walls would be implemented (see Appendix A, Figure 4). Construction of the replacement bridge would be carried out using standard

techniques that are typical in California and would be staged in the railroad right-of-way using BNSF and Metrolink authorized work windows.

- *Best Management Practices*: BMPs would be implemented in compliance with the NPDES permit requirements to minimize the potential for project effects on water quality, including the violation of any water quality standards or waste discharge requirements and effects on receiving waters resulting from surface water runoff from the project site, as part of the General Permit from the SWRCB.

- *Utility Relocations:* A 12-inch steel water line along the west side of the bridge, depending on its embedment depth, may need to be relocated onto the bridge if the footing extension could not provide sufficient opening to accommodate the utility. A electric line along the west side of the bridge would need to be relocated further west. 30-inch corrugated metal pipe (CMP) storm drain in the BNSF rail yard 30-inch storm drain may also need to be relocated. This potential conflict would be further clarified in the final design by field utility potholing data. All other minor conflicted utilities would be relocated.

  A study of utility relocations would be conducted during the final design; therefore, specific information on utility relocations is not available at this time. Depending on the level of effects, these facilities would need to be protected, adjusted, modified, or relocated. The affected utilities would be relocated in accordance with state law and regulations, and City policies. There would be ongoing coordination between the Department, City, affected agencies, and utility companies in order to minimize potential disruption of utility service.

- *Pile Driving:* Subsurface disturbance beyond 15 feet is limited to driving CISS type piles approximately 6.5 feet in diameter to an approximate depth of 100 feet, based on the preliminary geotechnical report dated August 31, 2000 (see Appendix A, Figure 4).

  Piles will consist of steel casing only and existing onsite soil/material will fill the piles. The soil inside the piles will be partially compressed by the driving, leaving the soils inside the steel casing below the existing ground surface when the driving is completed.

  Although disturbance in the form of pile driving is expected to exceed 15 feet below the existing ground surface, paleontological monitoring for this construction activity is not feasible. With general pile driving, a heavy weight placed between guides upon the pile. The weight is raised and when the weight reaches its highest point it is then released onto the pile in order to drive it into the ground. Soil will not be exhumed with this process and observation of this construction activity will not yield information regarding potential paleontological resources.

SOURCES CONSULTED

The Division of Geological Sciences at the San Bernardino County Museum conducted a paleontological records search on September 5, 2007. The search included a review of SBCM's Regional Paleontologic Locality Inventory (RPLI) as well as geologic maps stored at SBCM.

Geologic Mapping

The Division of Geological Sciences at the San Bernardino County Museum reviewed geologic maps in order to determine the likelihood of uncovering important paleontologic resources within the project area. Previous geologic mapping of the region including the proposed study area (Bortugno and Spittler,1986; Morton and Miller, 2003) indicates that the proposed project property is located upon surface exposures of young alluvial valley deposits dating to the Holocene Epoch (= units Qya3 and Qya5). Holocene alluvial sediments present at the surface are too young geologically to have potential to contain significant fossil resources. These Holocene sediments have low potential to contain fossil resources.

However, these sediments likely overlie Pleistocene older alluvium in the subsurface; if present, this older alluvium has high potential to contain significant nonrenewable paleontologic resources, depending upon its lithology, and so is assigned high paleontologic sensitivity. Pleistocene alluvium elsewhere throughout inland Riverside and San Bernardino Counties and the Inland Empire has been repeatedly demonstrated to have high paleontologic sensitivity (Jefferson, 1991; Reynolds and Reynolds, 1991; Woodburne, 1991; Springer and Scott,1994; Scott, 1997; Springer and others, 1998, 1999; Anderson and others, 2002). Fossils recovered from these Pleistocene sediments represent extinct taxa including mammoths, mastodons, groundsloths, dire wolves, sabre-toothed cats, large and small horses, large and small camels, and bison(Jefferson, 1991; Reynolds and Reynolds, 1991; Woodburne, 1991; Springer and Scott, 1994; Scott,1997; Springer and others, 1998, 1999).

Regional Paleontologic Locality Inventory

For this review, Eric Scott of the Division of Geological Sciences at the SBCM conducted a review of the Regional Paleontologic Locality Inventory (RPLI). The results of this search indicate that one previously - recorded paleontologic resource locality, SBCM 1.102.2, is located within ½ mile to the south of the proposed development property. This locality yielded fossil wood portions from depths of ~437 feet to ~725 feet below the existing ground surface.

FIELD METHODS

No field survey was undertaken for paleontological resources. The ground surface within the project area is covered with bridge infrastructure, the railroad yard and other development, and no meaningful field observations could be made regarding surface sediments or the relationship of the present ground surface to paleontologically sensitive sediments at depth.

STUDY FINDINGS AND CONCLUSIONS

The literature and records search indicate that the proposed project has a low potential to adversely impact important nonrenewable paleontological resources. Holocene alluvial sediments present at the surface are too young geologically to have potential to contain significant fossil resources. No program to mitigate impacts to resources is therefore recommended for excavation in the Holocene sediments.

However, these sediments likely overlie Pleistocene older alluvium in the subsurface; if present, the proposed project has high potential a high potential to adversely impact significant nonrenewable paleontological resources, depending upon its lithology.

Pleistocene older alluvium may be present at depth and it cannot be determined a priori from the available geologic mapping at what depths such Pleistocene sediments might be encountered. It is inferred that such sediments may be present at depths in excess of 15 feet below the existing groundsurface. If excavation at depths in excess of 15 feet will occur, a Paleontological Mitigation Program (PMP) will be required.

However, excavation at depths in excess of 15 feet will not occur as part of this project. Although disturbance in the form of pile driving is expected to exceed 15 feet below the existing ground surface, paleontological monitoring for this construction activity is not feasible. With general pile driving, a heavy weight placed between guides upon the pile. The weight is raised and when the weight reaches its highest point it is then released onto the pile in order to drive it into the ground. Soil will not be exhumed with this process and observation of this construction activity will not yield information regarding potential paleontological resources.

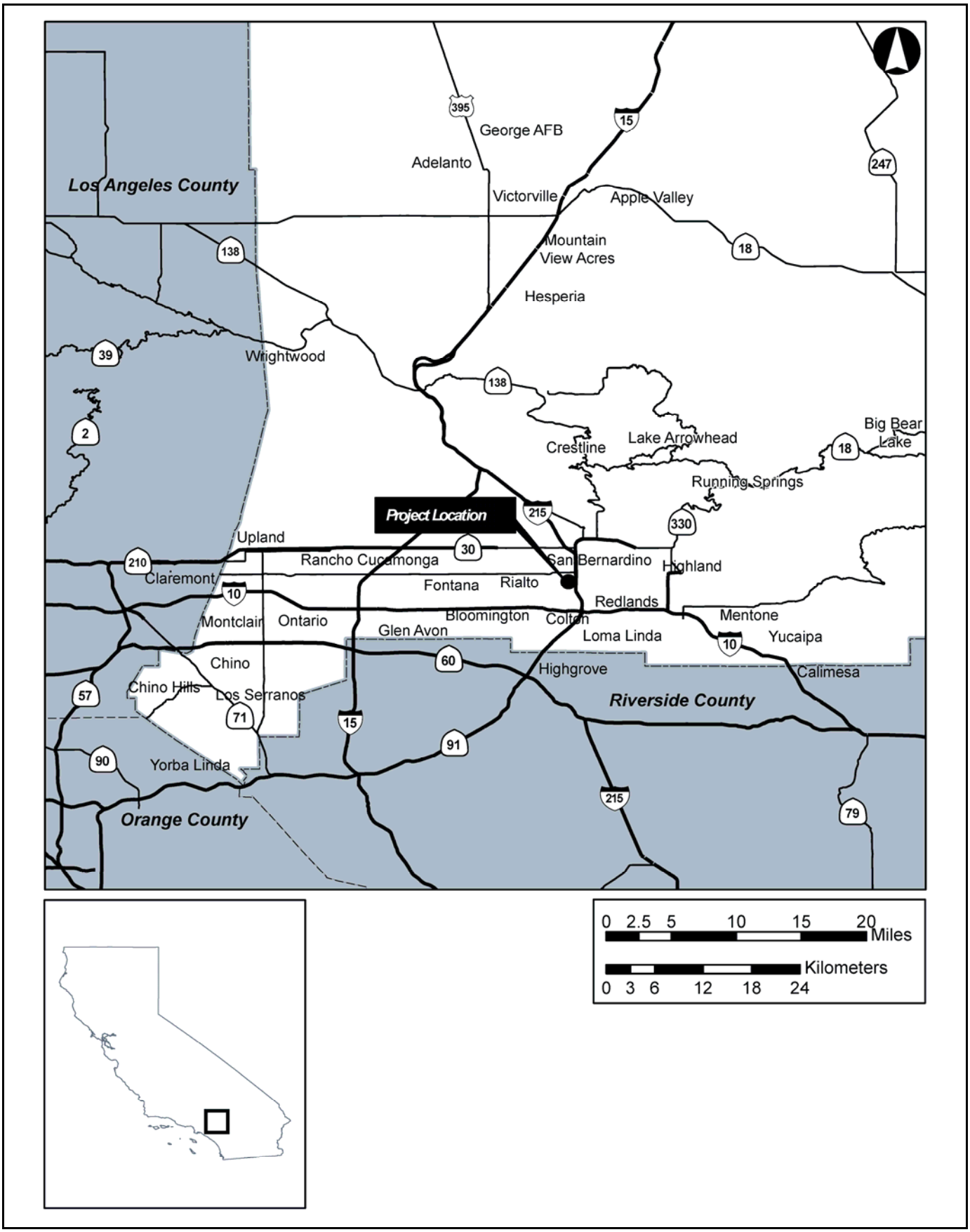
Actual excavation exceeding 15 feet below the existing ground surface would not occur as port of this project therefore a program to mitigate adverse effects on paleontologic resources is not recommended.

REFERENCES CITED

Scott, Eric
2007. *Paleontology Literature and Records Review, Mount Vernon Avenue Bridge Replacement Project, City and County of San Bernardino, California*. Submitted to Jones & Stokes, Los Angeles.

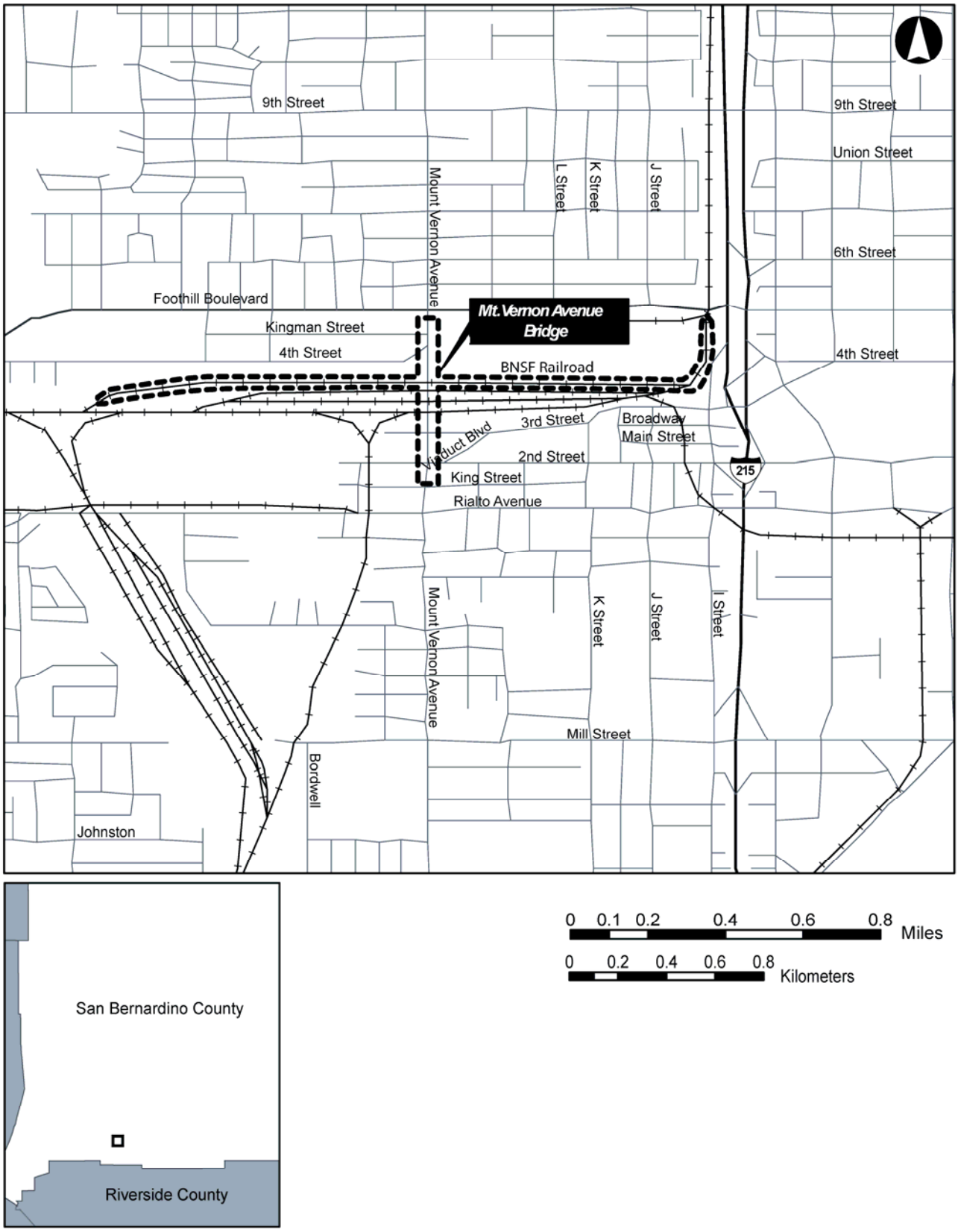
United States Geological Survey (USGS)
1980. *Preliminary Geologic Map of the San Bernardino South 7.5' Quadrangle, San Bernardino County, California*.

APPENDIX A: Figures



Source: ICF Jones & Stokes 2009

Figure1
Regional Location Map
Mount Vernon Avenue Bridge Project



Source: ICF Jones & Stokes 2009

Figure 2
Project Location Map
Mount Vernon Avenue Bridge Project

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
8	SBd				

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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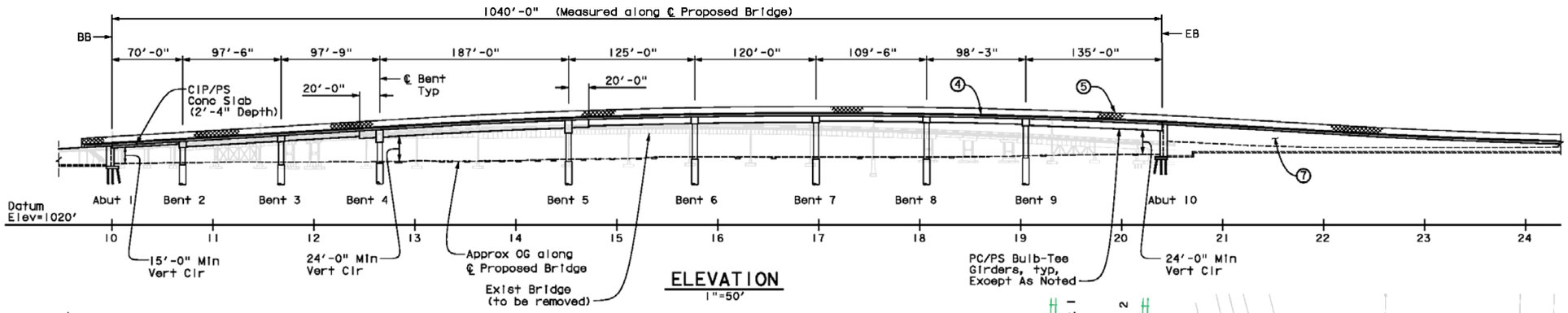
LIM & NASCIMENTO ENGINEERING
1887 BUSINESS CENTER DRIVE, SUITE 6
SAN BERNARDINO, CA 92408

PROFILE GRADE
No Scale



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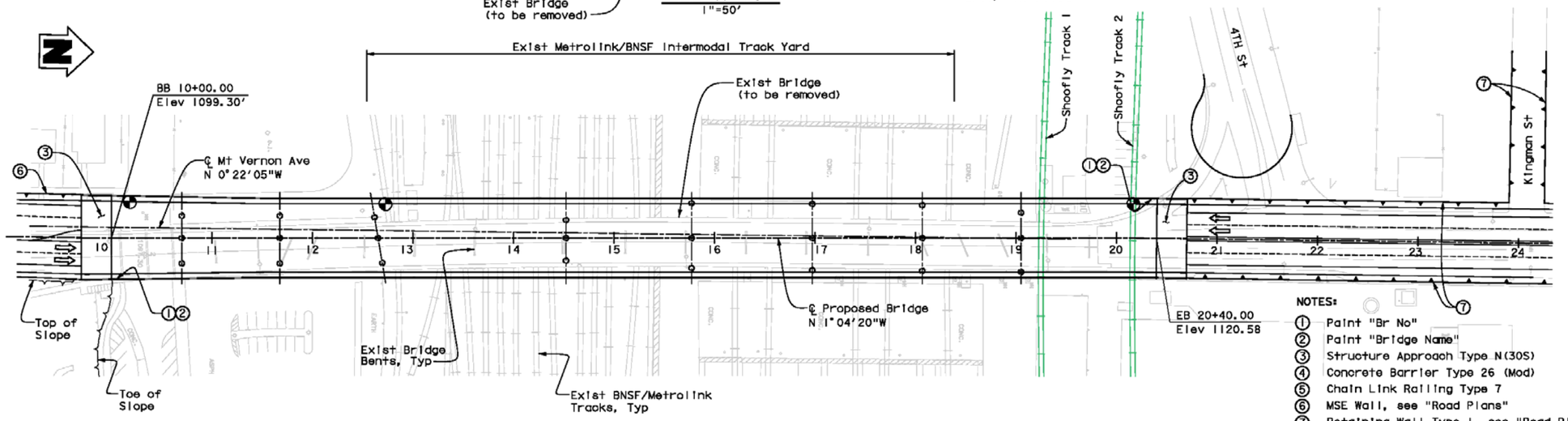

PLAN
1"=50'

NOTES:
1. Paint "Br No"
2. Paint "Bridge Name"
3. Structure Approach Type N(30S)
4. Concrete Barrier Type 26 (Mod)
5. Chain Link Railing Type 7
6. MSE Wall, see "Road Plans"
7. Retaining Wall Type 1, see "Road Plans"

Point of minimum vertical clearance
Indicates existing

Note:
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.

DESIGN OVERSIGHT	DESIGN	BY	CHECKED	PREPARED FOR THE CITY OF SAN BERNARDINO	PROJECT ENGINEER
	DETAILS	BY R. ANDRASEK	CHECKED		
SIGN OFF DATE	QUANTITIES	BY	CHECKED		

DESIGN GENERAL PLAN SHEET (METRIC) (REV.3/1/98)

CU
EA

FILE => #REQUEST

BRIDGE NO.	MT VERNON AVE VIADUCT
54C-0066	GENERAL PLAN
KILOMETER POST	

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY) — - — SHEET 1 OF 2

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd				

REGISTERED CIVIL ENGINEER

DATE APPROVED

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

LIM & NASCIMENTO ENGINEERING CORPORATION
1887 BUSINESS CENTER DR, STE 6
SAN BERNARDINO, CA 92408

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DATE	REVISED BY	DATE REVISED

CALCULATED/ DESIGNED BY

CHECKED BY

DESIGN OVERSITE

CITY OF SAN BERNARDINO

400.00' VC
Grade In = 0.47%
Grade Out =6.00%

814.00' VC
Grade In = 6.00%
Grade Out =-6.00%

440.00' VC
Grade In = -6.00%
Grade Out =0.92%

4+58.12 BVC
1077.85 FS

8+58.12 EVC
1090.79 FS

12+93.09 BVC
1116.88 FS

21+07.09 EVC
1116.88 FS

22+10.00 BVC
1110.71 FS

25+91.43 LO
1099.27 FS

26+50.00 EVC
1099.54 FS

20'Wx24'H CLEARANCE

EXISTING BRIDGE SURFACE

PROFILE

20'Wx24'H CLEARANCE

6.00%

0.27%

-6.00%

0.92%

3RD ST
16.02'
CLR

BOTTOM OF SOFFIT, TYP

RAIL 24.18'
CLR

OG

17+00.09 HI
1129.09 FS

PROJECTED RAILYARD FG

24.21'
CLR

END OF CONSTRUCTION
STA 26+50.00

1150
1100
1050

DATUM
ELEV = 1000

4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00

ELEVATION

EXISTING RR YARD

EXIST R/W TYP

NEW BRIDGE

3RD STREET

WIDENED ACCESS

R/W TAKE (FEE)

SHOOFLY TRACKS

SHOOFLY TRACK 1

SHOOFLY TRACK 2

CUL-DE-SAC

4TH STREET

KINGMAN

5TH STREET

MT VERNON AVE

ALLEY

2ND STREET

LIMITS OF ROADWAY IMPROVEMENTS TYP

EXIST R/W TYP

R/W TEMPORARY CONSTRUCTION EASEMENT

LIMITS OF ROADWAY IMPROVEMENTS TYP

MT VERNON AVE.

PLAN

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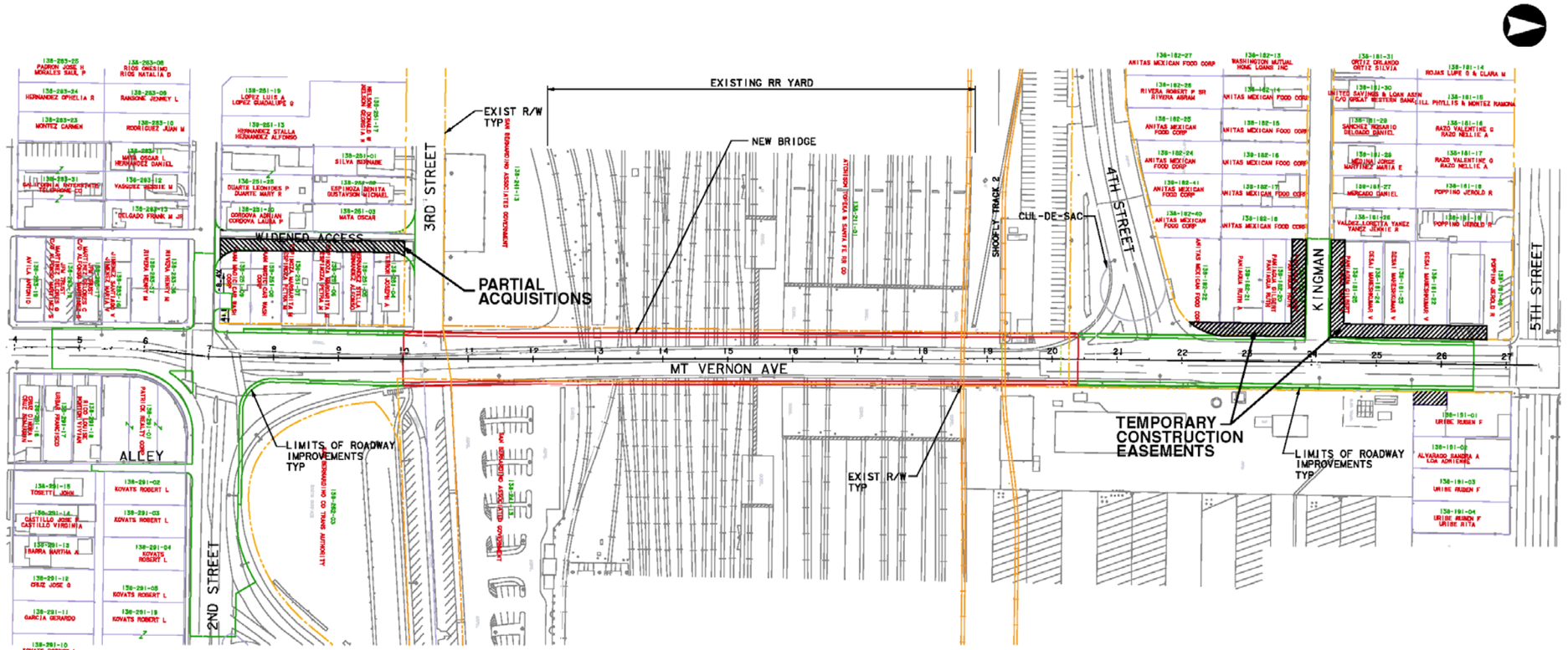
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EXIST R/W TYP
NEW BRIDGE
3RD STREET
WIDENED ACCESS
PARTIAL ACQUISITIONS
SHOOFLY TRACK 2
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4TH STREET
KINGMAN
5TH STREET
MT VERNON AVE
ALLEY
2ND STREET
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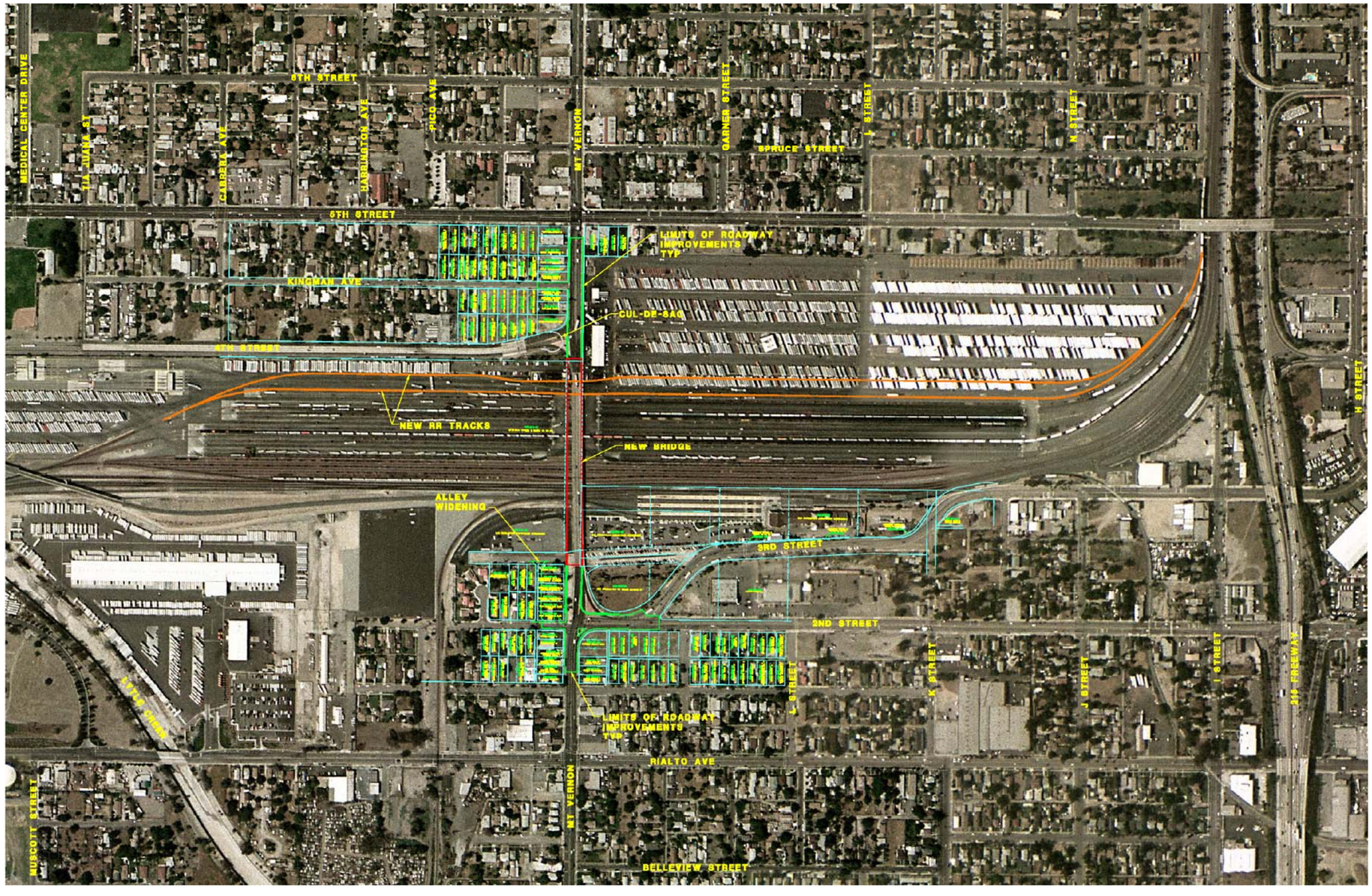
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PICO AVE
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GARNER STREET
L STREET
SPRUCE STREET
N STREET
6TH STREET
6TH STREET
KINGMAN AVE
LIMITS OF ROADWAY IMPROVEMENTS TYP
CUL-DE-SAC
8TH STREET
NEW RR TRACKS
NEW BRIDGE
ALLEY WIDENING
3RD STREET
2ND STREET
L STREET
K STREET
J STREET
I STREET
210- FREEWAY
H STREET
LITTLE CREEK
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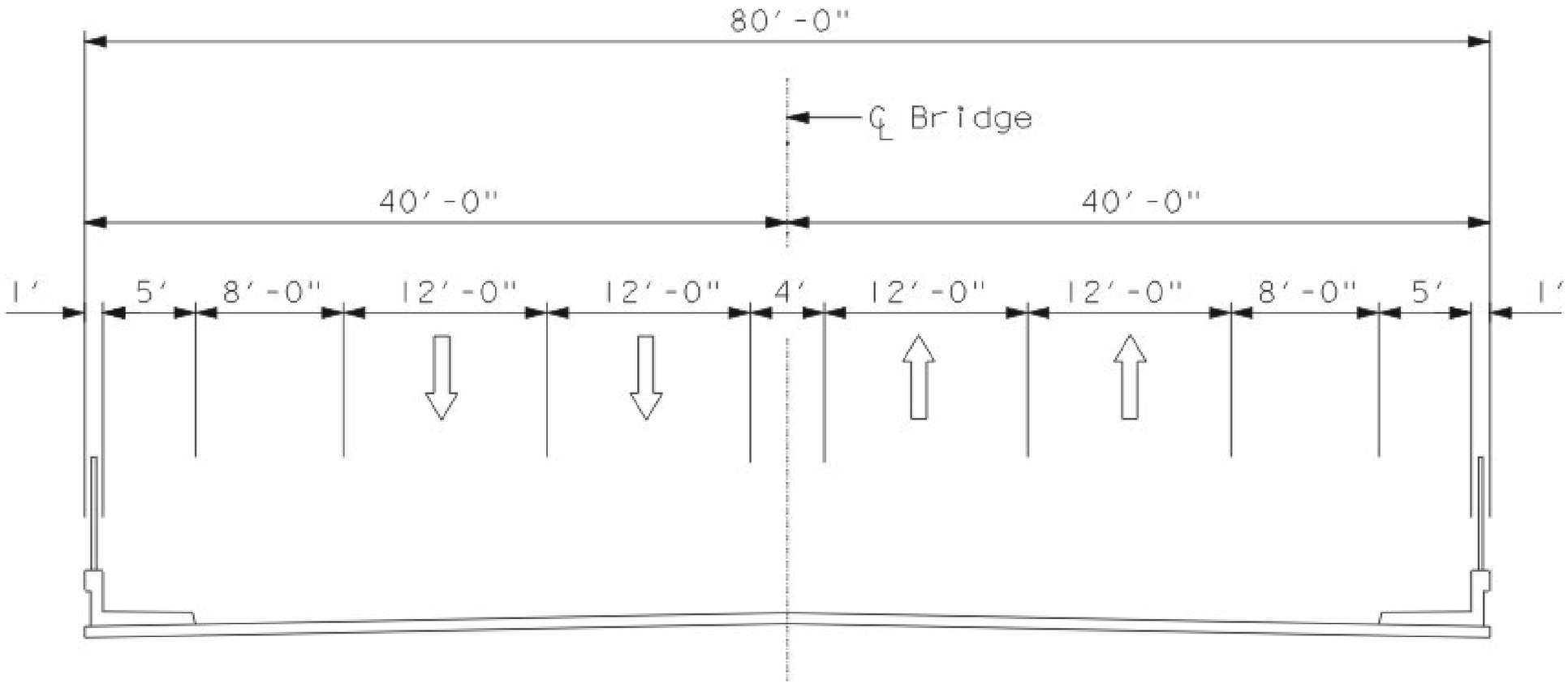
MT VERNON
BELLEVIEW STREET



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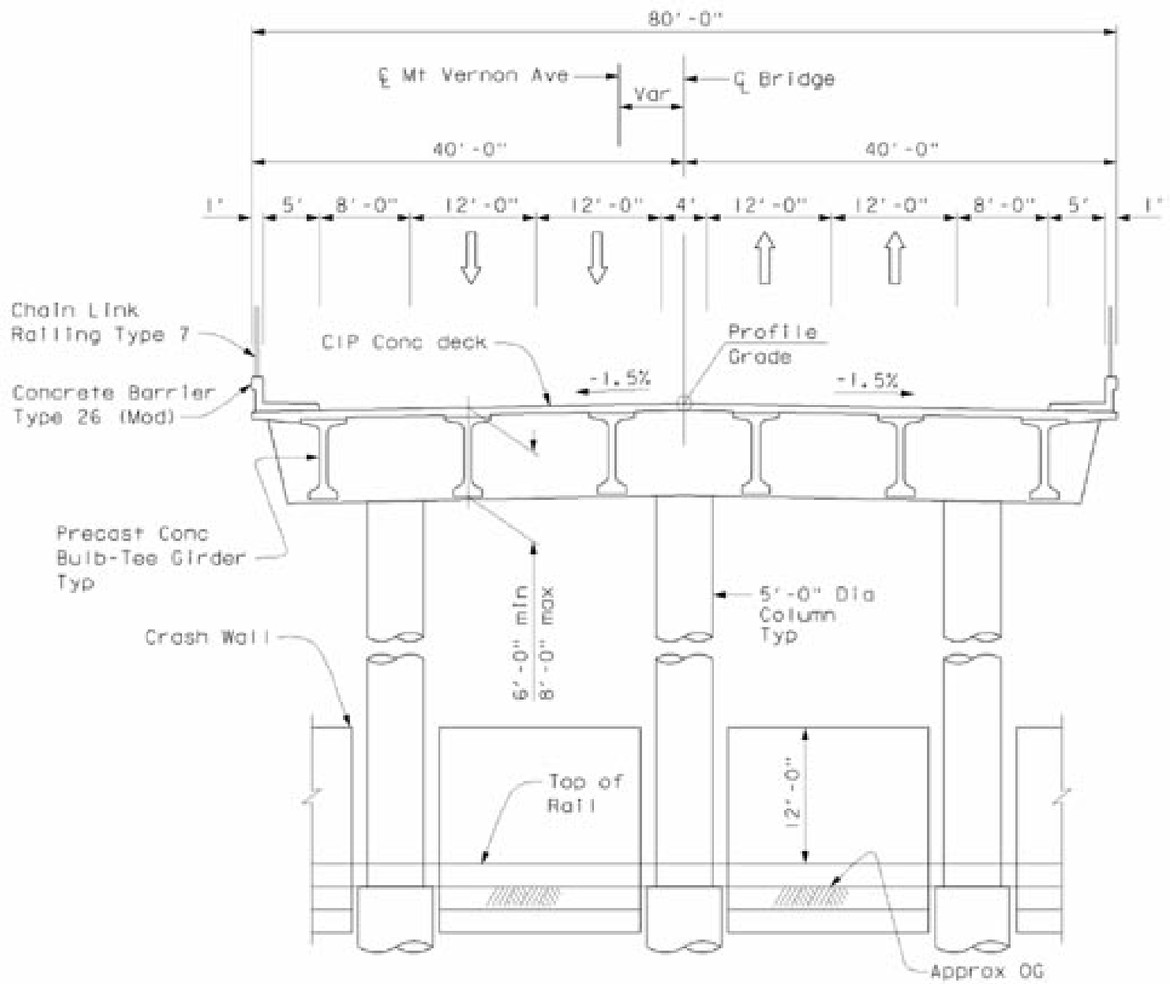

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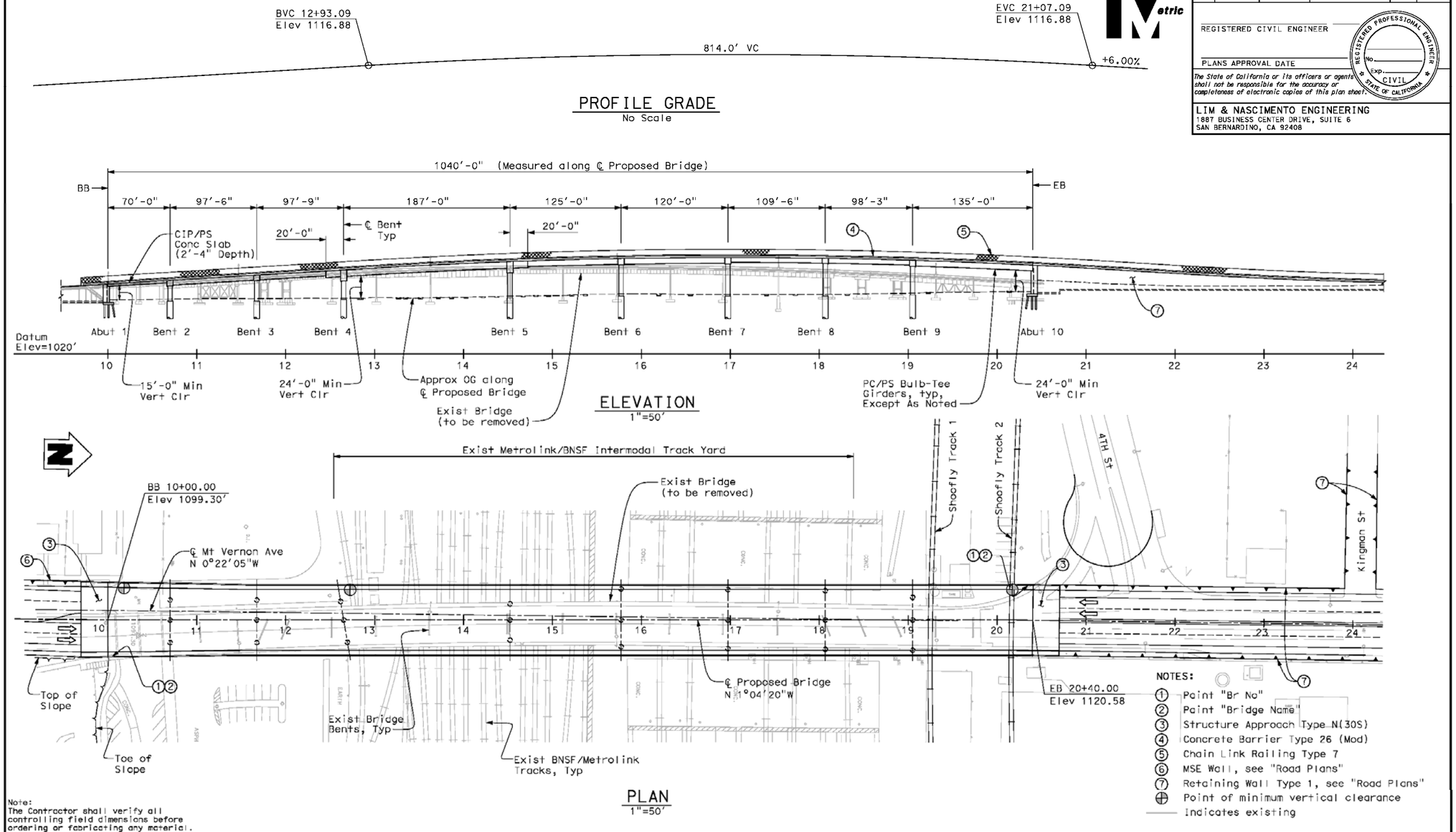
BENT 2 THRU BENT 9
1/8" = 1'-0"



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
8	SBd				

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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SAN BERNARDINO, CA 92408

Note:
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.

DESIGN OVERSIGHT	DESIGN	BY	CHECKED	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD		CHECKED
SIGN OFF DATE	DETAILS	BY R. ANDRASEK	CHECKED	LAYOUT	BY		PLANS AND SPECS COMPARED
	QUANTITIES	BY	CHECKED	SPECIFICATIONS	BY		

PREPARED FOR THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT ENGINEER

CU
EA

BRIDGE NO. 54C-0066
KILOMETER POST

MT VERNON AVE VIADUCT
GENERAL PLAN OPTION 2

DESIGN GENERAL PLAN SHEET (METRIC) (REV.3/1/99)

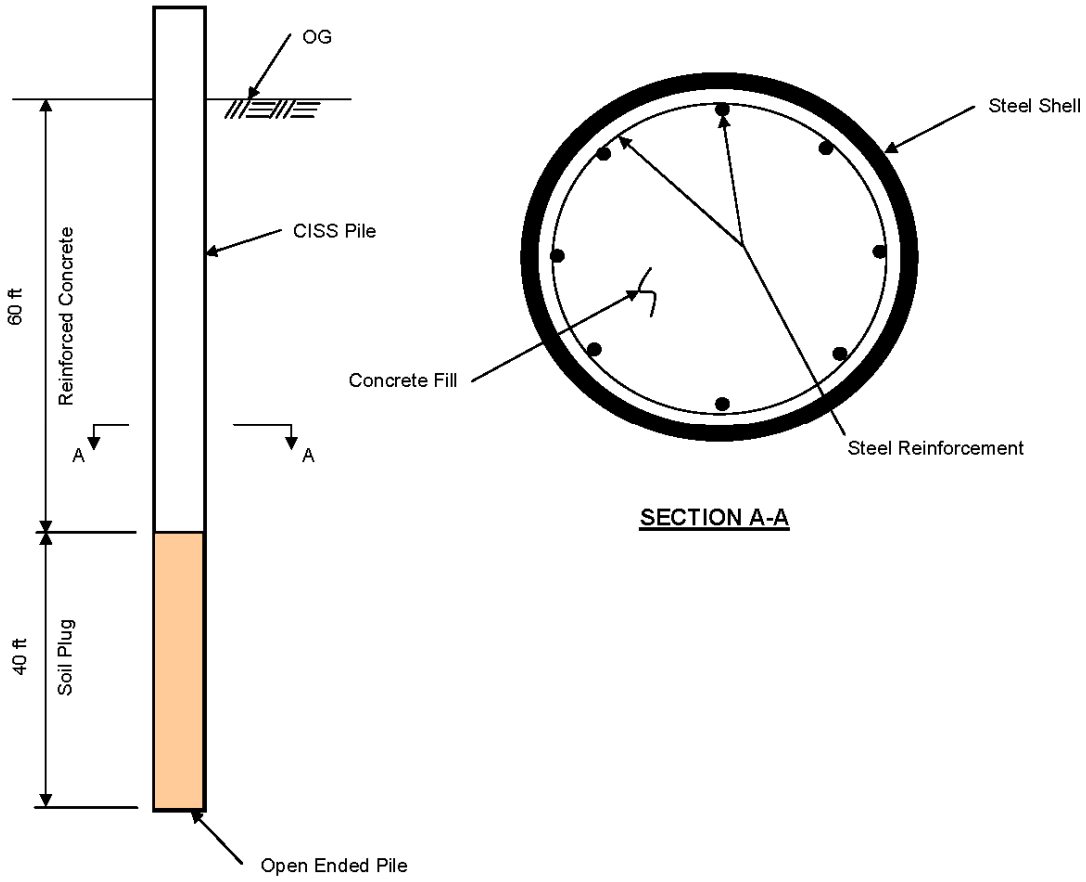
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) -

SHEET 1 OF 2

Figure 4. Cast in Steel Shell (CISS) Type Piles



APPENDIX B: San Bernardino County Museum Letter Report

5 September 2007

Jones & Stokes
attn: Mark Robinson, Archaeologist
811 West 7th Street, Suite #800
Los Angeles, CA 90017

re: **PALEONTOLOGY LITERATURE AND RECORDS REVIEW, MOUNT VERNON AVENUE BRIDGE REPLACEMENT PROJECT, CITY AND COUNTY OF SAN BERNARDINO, CALIFORNIA**

Dear Mark,

The Division of Geological Sciences of the San Bernardino County Museum (SBCM) has completed a records search for the above-referenced property in the City of San Bernardino, San Bernardino County. The proposed study area is located in the northern portion of section 8 (projected), Township 1 South, Range 4 West, San Bernardino Base and Meridian, as seen on the San Bernardino South, California 7.5' United States Geological Survey topographic quadrangle map (1967 edition, photorevised 1980).

Previous geologic mapping of the region including the proposed study area (Bortugno and Spittler, 1986; Morton and Miller, 2003) indicates that the proposed project property is located upon surface exposures of young alluvial valley deposits dating to the Holocene Epoch (= units **Qya$_3$** and **Qya$_5$**). These Holocene sediments have low potential to contain fossil resources, and so are assigned low paleontologic sensitivity. These sediments likely overlie Pleistocene older alluvium in the subsurface; if present, this older alluvium has high potential to contain significant nonrenewable paleontologic resources, depending upon its lithology, and so is assigned high paleontologic sensitivity. Pleistocene alluvium elsewhere throughout inland Riverside and San Bernardino Counties and the Inland Empire has been repeatedly demonstrated to have high paleontologic sensitivity (Jefferson, 1991; Reynolds and Reynolds, 1991; Woodburne, 1991; Springer and Scott, 1994; Scott, 1997; Springer and others, 1998, 1999; Anderson and others, 2002). Fossils recovered from these Pleistocene sediments represent extinct taxa including mammoths, mastodons, ground sloths, dire wolves, sabre-toothed cats, large and small horses, large and small camels, and bison (Jefferson, 1991; Reynolds and Reynolds, 1991; Woodburne, 1991; Springer and Scott, 1994; Scott, 1997; Springer and others, 1998, 1999).

For this review, I conducted a search of the Regional Paleontologic Locality Inventory (RPLI) at the SBCM. The results of this search indicate that one previously - recorded paleontologic resource

locality, SBCM 1.102.2, is located within ½ mile to the south of the proposed development property. This locality yielded fossil wood portions from depths of ~437 feet to ~725 feet below the existing ground surface.

Recommendations

The results of the literature review and the check of the RPLI at the SBCM demonstrate that excavation in conjunction with development has low potential to cause significant adverse impacts to nonrenewable paleontologic resources. Holocene alluvial sediments present at the surface are too young geologically to have potential to contain significant fossil resources. No program to mitigate impacts to resources is therefore recommended for excavation in the Holocene sediments.

However, Pleistocene older alluvium may be present at depth. If present, this alluvium would have high paleontologic sensitivity. It cannot be determined *a priori* from the available geologic mapping at what depths such Pleistocene sediments might be encountered; for the purposes of this report, it is inferred that such sediments may be present at depths in excess of 15' below the existing ground surface. If excavation is restricted to depths of approximately 15' below the existing ground surface, or less, then older Pleistocene sediments are not expected to be encountered. At these depths, no program to mitigate adverse impacts to paleontologic resources is recommended at this time.

In the event that excavation is expected to exceed 15' below the existing ground surface in depth, a qualified vertebrate paleontologist must be retained to develop a program to mitigate impacts to such resources, including full curation of recovered significant resources (see Scott and others, 2004). This mitigation program should be consistent with the provisions of the California Environmental Quality Act (Scott and Springer, 2003), as well as with regulations currently implemented by the County of San Bernardino and the proposed guidelines of the Society of Vertebrate Paleontology.

The County of San Bernardino (Development Code §82.20.040) defines a qualified vertebrate paleontologist as meeting the following criteria:

Education: An advanced degree (Masters or higher) in geology, paleontology, biology or related disciplines (exclusive of archaeology).

Professional experience: At least five years professional experience with paleontologic (not including cultural) resources, including the collection, identification and curation of the resources.

The County of San Bernardino (Development Code §82.20.030) requires that paleontologic mitigation programs include, but not be limited to:

(a) Field survey before grading. In areas of potential but unknown sensitivity, field surveys before grading shall be required to establish the need for paleontologic monitoring.

(b) Monitoring during grading. A project that requires grading plans and is located in an area of known fossil occurrence, or that has been demonstrated to have fossils present in a field survey, shall have all grading monitored by trained paleontologic crews working under the direction of a qualified professional, so that fossils exposed during grading can be recovered and preserved. Paleontologic monitors shall be equipped to salvage fossils as they are unearthed, to avoid construction delays, and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. Monitors shall be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Monitoring is not necessary if the potentially-fossiliferous units described for the property in question are not present, or if present are determined upon exposure and examination by qualified paleontologic personnel to have low potential to contain fossil resources.

(c) Recovered specimens. Qualified paleontologic personnel shall prepare recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. Preparation and stabilization of all recovered fossils is essential in order to fully mitigate adverse impacts to the resources.

(d) Identification and curation of specimens. Qualified paleontologic personnel shall identify and curate specimens into the collections of the Division of Geological Sciences, San Bernardino County Museum, an established, accredited museum repository with permanent retrievable paleontologic storage. These procedures are also essential steps in effective paleontologic mitigation and CEQA compliance. The paleontologist must have a written repository agreement in hand prior to the initiation of mitigation activities. Mitigation of adverse impacts to significant paleontologic resources is not considered complete until curation into an established museum repository has been fully completed and documented.

(e) Report of findings. Qualified paleontologic personnel shall prepare a report of findings with an appended itemized of specimens. A preliminary report shall be submitted and approved before granting of building permits, and a final report shall be submitted and approved before granting of occupancy permits. The report and inventory, when submitted to the appropriate Lead Agency along with confirmation of the curation of recovered specimens into the collections of the San Bernardino County Museum, will signify completion of the program to mitigate impacts to paleontologic resources.

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Please do not hesitate to contact us with any further questions you may have.

Sincerely,

Eric Scott, Curator of Paleontology
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