CALIFORNIA HIGHWAY PATROL CRASH REPORT

PALM SPRINGS, CA

HWY17MH005

(27 pages)

FACTS – INTRODUCTION

Notification

At 0517 hours on Sunday, October 23, 2016, California Highway Patrol (CHP) Indio Communications Center (ICC) received a 9-1-1 call from Shaun Davalos who reported a collision between a motorcoach and truck-tractor in combination with a semitrailer on Interstate 10 westbound, west of North Indian Canyon Avenue.

At 0518 hours, an ICC communications operator broadcast the collision and assigned CHP Indio Area unit C76-010, Officer M. Johs, ID 21194, to the collision. Officer Johs responded from North Indian Canyon Avenue at Interstate 10 and was the first CHP officer to arrive, arriving at the scene at 0522 hours. At the time Officer Johs arrived on scene, the front of the motorcoach [1996 MCI 102D3] was entangled with the semitrailer [2013 Utility VS2RA] that was in combination with a truck-tractor [2015 International ProStar].[1] All three vehicles had come to rest facing in a westerly direction and were blocking the #2 and #3 traffic lanes. There were three vehicles that had stopped on the right shoulder and dirt area north of the shoulder of Interstate 10 westbound. There were two people standing together on the shoulder adjacent to where the MCI had come to rest. A third person was walking around in the #4 traffic lane adjacent to the MCI.

CHP Indio Area Commander Captain L. Quattlebaum, ID 12917, requested assistance from the Border Division MAIT with the investigation of this collision. At 0702 hours, after the MAIT assistance was approved by CHP Border Division management, Special Services Lieutenant T. Eglin, ID 12999, notified Sergeant Buono of the request. MAIT personnel began responding to the collision scene at 0745 hours and began arriving at 0859 hours. The following MAIT personnel responded to the scene:

Investigator S. Parent arrived at 0859 hours
Investigator J. Snider arrived at 0901 hours
Associate Investigator R. Smith arrived at 0916 hours
Motor Carrier Specialist I T. Carlson arrived at 0930 hours
Sergeant C. Buono, Team Leader, arrived at 0940 hours
Caltrans Engineer D. Tran arrived at 1000 hours

The following MAIT personnel did not respond to the scene, but assisted during the investigation:

Investigator J. Isbister
Investigator K. Chase
Investigator I. Vazquez
Investigator B. Downing
Investigator R. Smith
Investigator H. Castaneda
Investigator I. Sanchez
MCS I S. Turner

[1] Further references to the International may include the combination of the truck tractor and semitrailer [2013 Utility VS2RA].

FACTS – INTRODUCTION

Notification

Personnel from the National Transportation Safety Board (NTSB) responded to conduct a parallel investigation relating to the safety of commercial vehicles. NTSB personnel began arriving at the collision scene at 1530 hours. The NTSB assigned case number HWY17MH005 to its investigation.

CHP Personnel Involved

The following CHP personnel responded to the collision scene and/or assisted with other duties associated with this collision investigation:

California Highway Patrol – Indio Area

Captain L. Quattlebaum, ID 12917
Sergeant S. Ceballos, ID 13415
Officer J. Quintero, ID 13270
Officer E. Pena, ID 15339
Officer H. Gutierrez, ID 16674
Officer K. Kirk, ID 18451
Officer P. Trinidad, ID 18647
Officer S. Rivas, ID 18811
Officer G. Villalobos, ID 19153
Officer F. Maclis, ID 19228
Officer J. Rivera, ID 19267
Officer G. Johnson, ID 19310
Officer S. Hamilton, ID 19409
Officer A. Ponce, ID 19807
Officer S. Armendariz, ID 20996
Officer L. Martinez, ID 21008
Officer M. Johs, ID 21194
Officer I. Mejia, ID 21218
Officer C. Williams, ID 21288

California Highway Patrol – Thermal Air Operations

Pilot Sergeant M. Cannon, ID 11129
Officer J. Earle, ID 17969

California Highway Patrol – Temecula Area

Officer J. Serrano, ID 15757

California Highway Patrol – Border Division Motor Carrier Safety Katella Facility

Motor Carrier Specialist I R. Mack, ID A13749

California Highway Patrol – CPVE Support Unit

Associate ISA D. Tham, ID A16915
Associate ISA J. Culler, ID A17040

FACTS – INTRODUCTION

Materials Reviewed

Throughout this investigation, MAIT received and reviewed numerous items from various entities. Once materials were received and reviewed, the materials were either booked into evidence at the CHP Indio Area (Property Control Number E20160338) or maintained with the electronic and/or paper case file at the CHP Border Division MAIT office. The items reviewed include, but are not limited to the following:

24 7 Drug and Alcohol Testing Center

- 7-page document containing medical examination reports for Bruce Guilford

American Medical Response (AMR)

- 178-page document containing 29 patient care reports for passengers transported from the collision scene

AT&T

- Mobile phone records from target 213-219-8930 obtained by search warrant #SW122320165

California Department of Transportation (Caltrans)

- As-Built plans for Interstate 10 westbound, in the vicinity of this collision
- Traffic Engineering Study "Proposed 70 MPH Highway" and inter-office memo from the Chief of the Office of Traffic Safety to the Chief of Operations Services of Caltrans District 8
- Document declaring a higher maximum speed limit of 70 miles per hour on selected state and interstate highways
- California Department of Transportation Highway Design Manual
- Copies of encroachment permit number 08-16-6-UF-0832 (utility relocation permit for Southern California Edison company) and Encroachment Permit Number 08-07-6-MC-0225 (replacing the street name signs displaying Indian Avenue to North Indian Canyon Drive)
- California Street and Highway Code, Section 674
- Encroachment Permits manual; chapter 600, "Utilities Permits", section 619, "Freeway Aerial, Permit Code UF"
- A list of traffic break related to permits from the year 2014 to the first nine months of 2016
- 2015 Traffic Volumes on California State Highways for the total back annual average daily traffic volume at postmile 33.129
- Hourly traffic counts on each traffic lane of Interstate 10 westbound at Date Palm Drive and Main Street on October 23, 2016
- Copies of traffic collision reports covering a three year period for Interstate 10 westbound from the North Indian Canyon Drive overcrossing bridge to Wall Road (also known as Garnet) overcrossing bridge

FACTS – INTRODUCTION

Materials Reviewed

Cathedral City Fire Department

- 4-page document containing two patient care reports for passengers transported from the collision scene

CHP Indio Area

- Two recordable optical discs containing 187 digital images taken at the scene of the collision
- Five recordable optical discs containing video recorded by MVARS installed in four different CHP patrol vehicles

CHP Thermal Air Operations

- Two optical discs containing 68 digital images (aerial)

Desert Regional Medical Center (DRMC)

- 224-page document containing medical records obtained by search warrant #SW120620161

Eisenhower Medical Center

- 203-page document containing medical records

JFK Hospital

- 35-page document containing medical records obtained by search warrant #SW120620162

Mohica Towing

- USB flash drive containing 28 video files recorded by cameras carried by personnel from Mohica Towing during vehicle recovery efforts

NTSB

- Records obtained by NTSB containing data transmitted by the International ProStar to Fleetmatics, obtained by search warrant #SW120920165
- Data retrieved by NTSB from the ECM installed in the International ProStar, obtained by search warrant #SW120920166
- Data retrieved by NTSB from the ECM installed in the MCI, obtained by search warrant #SW120720162
- Recordable optical disc containing video recorded by two surveillance cameras at the FedEx ground facility in Palm Springs
- 2-page document containing a materials laboratory factual report related to an examination of the brake pedal, brake pedal mount, and brake linkage from the MCI

FACTS – INTRODUCTION

Materials Reviewed – NTSB

- 15-page document containing a report related to the analysis conducted by ZF of the steering gear from the MCI
- 4-page Federal Motor Carrier Safety Administration (FMCSA) Safety Measurement System (SMS) report related to the carrier, Teodulo E. Vides
- 10-page FMCSA SMS report related to the carrier, Tri-State Collision LLC

Red Earth Casino

- 1-page document containing player history from October 13 to October 23 for Elias Vides
- 5-page document containing player history from October 2 to October 23 for Elias Vides
- 2-page document containing the Red Earth Casino USA Holiday Bus[2] Program Agreement #10
- 3-page document containing Red Earth Casino Player Trac for all passengers on the USA Holiday Bus between October 22 and 23
- 29-page document containing group manifests for USA Holiday Bus Tour passengers for October 13, 15, 16, 18, 20, and 22
- USB flash drive containing 6 video files recorded by surveillance cameras at the Red Earth Casino between 2322 and 0423 hours on October 22 and 23

Riverside County Sheriff's Department – Coroner's Office

- 13 autopsy and coroner investigation reports for the 13 deceased parties in the collision

Rockdale Family Practice

- 34-page document containing medical records for Bruce Guilford

Ross Health Care Clinic

- 21-page document containing medical examination reports for Teodulo Vides

Southern California Edison Company (SCE)

- A response letter from SCE to follow-up questions from the field meeting on October 28, 2016

Statewide Integrated Traffic Records System (SWITRS)

- A collision records, party records, and victim records report for the CHP Indio Area from October 23, 2012, to October 23, 2016

Verizon Wireless

- Mobile phone records from target 770-841-5480 obtained by search warrant #SW122320165

[2] The terms "bus" and "motorcoach," as it relates to vehicles, are interchangeable throughout this report.

FACTS – ROADWAY DESCRIPTION

General Description

The location of the collision is depicted in Figure 1. This collision occurred on Interstate 10 westbound, west of the North Indian Canyon Drive overcrossing bridge (56-0843, postmile 33.129), in the city of Palm Springs and county of Riverside, California, at the approximate coordinates: latitude 33°54'18.46" N (33.905128°) and longitude 116°33'26.37" W (-116.557326°). This roadway is operated and maintained by the California Department of Transportation (Caltrans). The location of the utility permit work was approximately 1.4 miles west of the collision location and 2.0 miles west of the North Indian Canyon Drive overcrossing bridge.

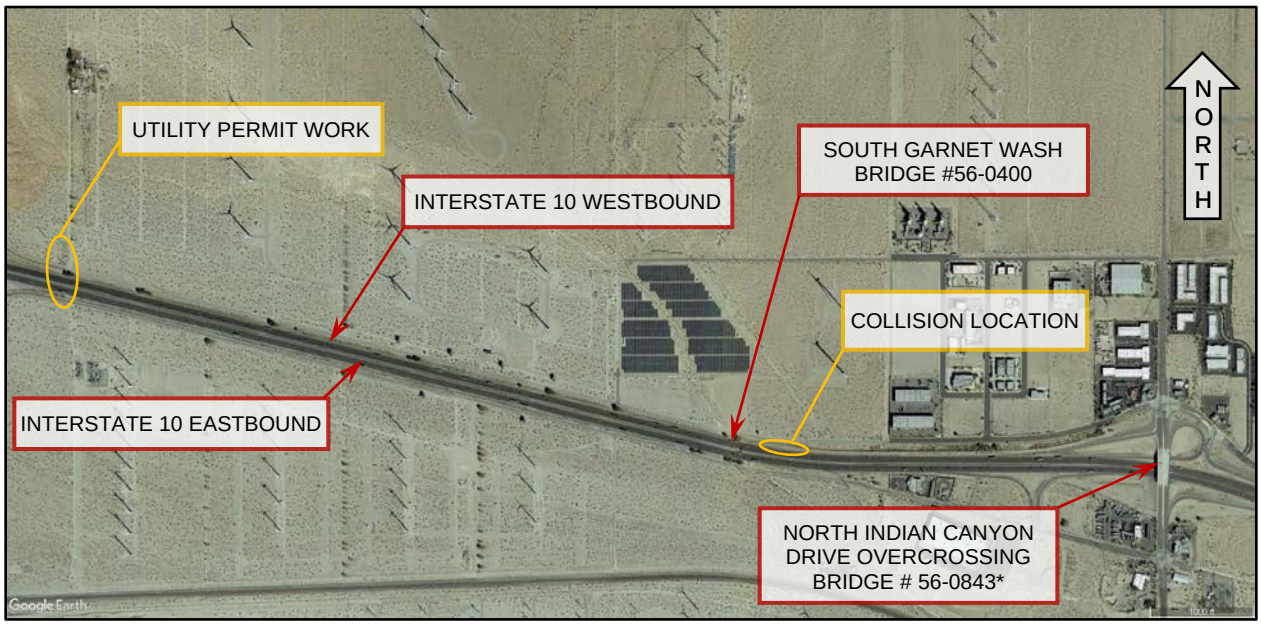


Figure 1. Aerial view of the collision location. Source: Google Earth. 33.905128° and -116.557326°. October 22, 2016 [Cited: May 18, 2017].

Note: * Per "California Log of Bridges on State Highways," dated April 2017, and Caltrans District 8 Postmile Log Notes (Revised December 23, 2015)

In this Roadway Description section, "left shoulder" is defined as the section of the asphalt concrete pavement located between the edge of traveled way of the #1 traffic lane and the dirt area, the vertical face of the single or double thrie beam barriers, or concrete bridge rail with tubular railing. The "right shoulder" is defined as the section of the asphalt concrete pavement located between the edge of traveled way of the #4 traffic lane and the dirt area, the vertical face of the metal beam guard railing, concrete bridge rail with tubular railing, or the asphalt concrete dike.

In order to document the roadway environment and physical evidence, MAIT investigators utilized a 3D laser scanner. The point cloud from the 3D scan was processed and imported to AutoCAD Civil 3D software to generate a surface, horizontal alignment, profile, cross sections, offsets, and dimensions of the roadway.

FACTS – ROADWAY DESCRIPTION

General Description

Approaching the collision location on Interstate 10 westbound from the North Indian Canyon Drive overcrossing bridge, in general, the roadway was oriented from southeast to northwest with four traffic lanes and shoulders. All traffic lanes and shoulders were paved with asphalt concrete. A lane line pattern consisting of a four-inch-wide painted broken white line (supplemented with four non-reflective white pavement markers) and one-way clear retroreflective pavement markers delineated traffic lanes. A four-inch-wide painted solid yellow edgeline with one-way yellow retroreflective pavement markers separated the left shoulder and the #1 traffic lane. The #4 traffic lane was separated from the right shoulder by a four-inch-wide painted solid white edgeline. Rumble strips were installed on the left and right paved shoulder areas to alert inattentive drivers of the potential danger of running off the road.

Based on the field scan data, the total roadway width of Interstate 10 westbound varied between 65.1 feet and 72.2 feet (from edge of pavement to edge of pavement). The left shoulder varied in width from 7.3[3] to 9.7 feet with its cross slopes changing from 4.9 percent downward and toward the dirt median to 2.2 percent downward and toward the #1 traffic lane. The traffic lanes varied in width from 11.7 to 17.8[4] feet with cross slopes varying from 0.0 to 3.5 percent downward and toward the right shoulder. The right shoulder varied in width from 9.1 to 10.7 feet with its cross slopes varying from 0.4 to 7.0 percent downward and toward the dirt area (see "Typical Cross Sections" in Environment Diagram #1). Sections of single and double thrie beam barriers separated the median area of Interstate 10 westbound and eastbound.

Horizontal and Vertical Alignment

To establish the horizontal alignment ("WB" line) for Interstate 10 westbound, a best-fit method was applied to selected points on the four-inch-wide yellow edgeline that separated the #1 traffic lane and the left shoulder. An arbitrary starting station of 100+00 was designated as the beginning station. This location was 9.7 feet north and perpendicular to the four-inch-wide yellow edgeline from the postmile marker 32.5 and 1,200 feet east of the same four-inch-wide yellow edgeline. The station numbers increased along the "WB" line from east to west (same as the direction of travel) and ended 1,136 feet west of the same postmile marker (measured along the same four-inch-wide yellow edgeline), at station 123+36.7 (see the horizontal alignment in the Layouts of the Environment Diagrams).

Within the limits of the 3D scan, "WB" line consisted of a mix of two tangents and a horizontal curve. "WB" line began with an assigned arbitrary station of 100+00 and a tangent of 719.53 feet at a bearing N 89° 45' 24.65" W. The alignment continued with a 1,397.73-foot-long horizontal curve, which had a radius of 6,000 feet, to the right. The alignment continued to the west end of field scan with a tangent of 219.4 feet at a bearing N 76° 24' 34.33" W and ended at station 123+36.7. Unless indicated otherwise, all of the roadway measurements and callouts on the diagram were referenced to this line.

[3] Three cross sections of the left shoulder were noted having widths less than 8 feet because offsets being measured from the best-fit horizontal alignment.
[4] The lane width included the merging area locating at the end of the merged traffic lane from the North Indian Canyon Drive entrance ramp.

FACTS – ROADWAY DESCRIPTION

Horizontal and Vertical Alignment

Cross sections were generated perpendicular to the "WB" line to create points on the profile at 100-foot-long intervals. Profile grades were calculated between these points. Based upon the generated roadway surface, the profile of the "WB" line was relatively flat with varying grades from 0.0 to 0.7 percent (see the Profiles in the Environment Diagrams).

INTERSTATE 10 (WESTBOUND)
WEST OF
INDIAN CANYON DRIVE OVERCROSSING

STATE OF CALIFORNIA
DEPARTMENT OF CALIFORNIA HIGHWAY PATROL
MULTIDISCIPLINARY ACCIDENT INVESTIGATION TEAM NARRATIVE/DIAGRAM
CHP 558D (Rev. 9-08) OPI 065 ***(MAIT use only)***

DATE OF COLLISION (MONTH-DAY-YEAR)	TIME (2400)	NCID	OFFICER I.D.	NUMBER	MAIT CASE NUMBER	PAGE
10/23/2016	0516	9630	16159	9630-2016-6823	BF-033-16	21

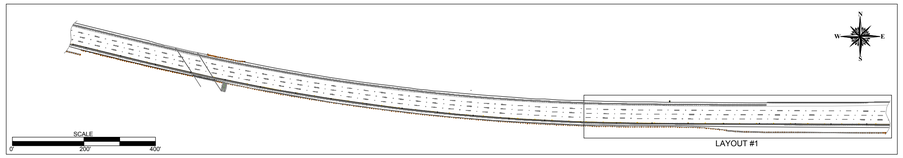
ENVIRONMENT DIAGRAM #1
PREPARED BY: S. PARENT, ID 16159 AND D. TRAN, RCE C62652

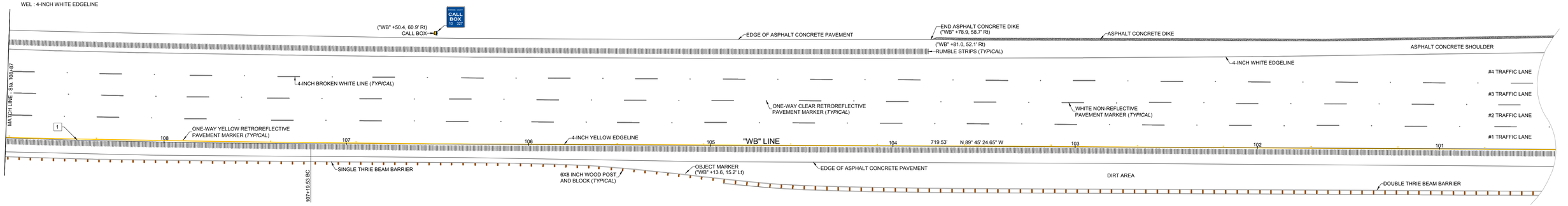
SCALE 0 25 50

GENERAL NOTES:
1. UNLESS OTHERWISE NOTED, ALL TRAFFIC LANES AND SHOULDERS WERE CONSTRUCTED OF ASPHALT CONCRETE.
2. "WB" LINE WAS THE BEST-FITTED HORIZONTAL ALIGNMENT AND WAS OBTAINED FROM POINTS ON THE 4-INCH YELLOW EDGELINE THAT SEPARATED THE #1 TRAFFIC LANE AND THE LEFT SHOULDER.
3. ALIGNMENT, PROFILE, CROSS SECTIONS, STATIONS, AND OFFSETS DATA WERE BASED ON THE POINT CLOUD OBTAINED FROM THE FIELD SCAN.
4. THE SEGMENT OF THE HORIZONTAL ALIGNMENT "WB" AND ITS PROFILE FROM Sta 100+00 TO Sta 134+88.0 "WB" LINE WERE NOT SHOWN IN THIS DIAGRAM.

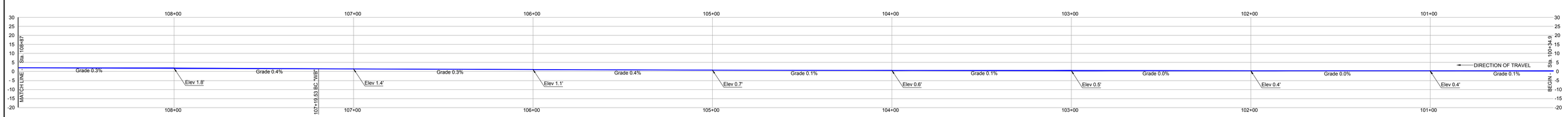
ABBREVIATIONS:
BC : BEGIN OF CURVE
EC : END OF CURVE
EP : EDGE OF PAVEMENT
ETW : EDGE OF TRAVELED WAY
Elev : ELEVATION
Lt : LEFT
PE : PHYSICAL EVIDENCE
Rt : RIGHT
Sta : STATION
YEL : 4-INCH YELLOW EDGELINE
WEL : 4-INCH WHITE EDGELINE

CURVE DATA				
No.	R	△	T	L
1	6,000.0'	13° 20' 50"	702.041'	1,397.727'

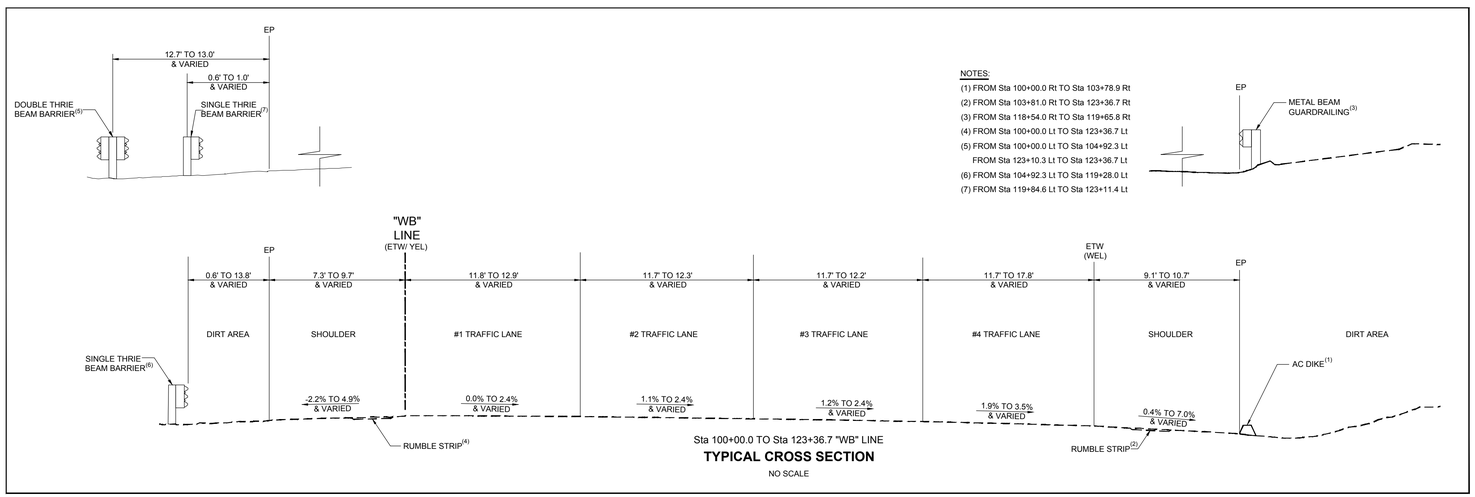




FROM Sta 100+34.9 TO Sta 108+87.0 "WB" LINE
LAYOUT #1



FROM Sta 100+34.9 TO Sta 108+87.0 "WB" LINE
PROFILE



Sta 100+00.0 TO Sta 123+36.7 "WB" LINE
TYPICAL CROSS SECTION
NO SCALE

INTERSTATE 10 (WESTBOUND)
WEST OF
INDIAN CANYON DRIVE OVERCROSSING

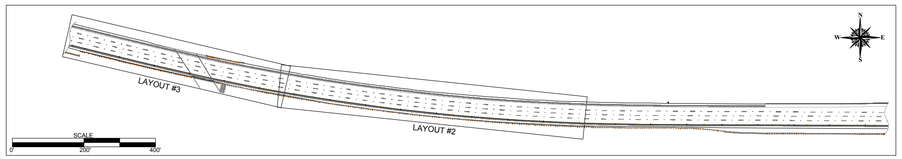
STATE OF CALIFORNIA
DEPARTMENT OF CALIFORNIA HIGHWAY PATROL
MULTIDISCIPLINARY ACCIDENT INVESTIGATION TEAM NARRATIVE/DIAGRAM
CHP 558D (Rev. 9-08) OPI 065 ***(MAIT use only)***

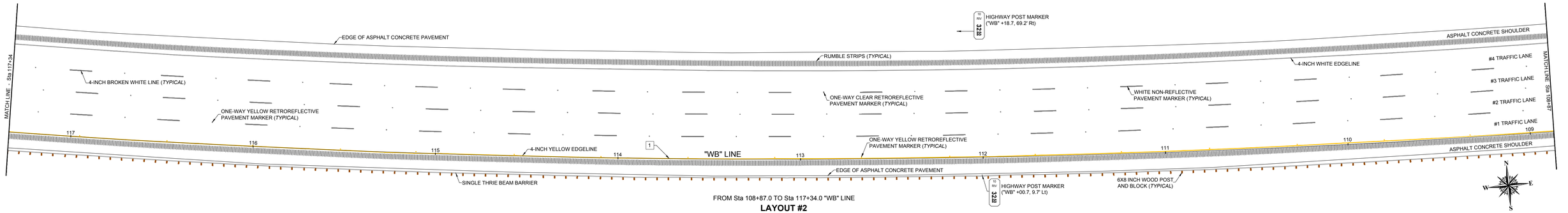
DATE OF COLLISION (MONTH-DAY-YEAR)	TIME (2400)	NCID	OFFICER I.D.	NUMBER	MAIT CASE NUMBER	PAGE
10/23/2016	0516	9630	16159	9630-2016-6823	BF-033-16	22

ENVIRONMENT DIAGRAM #2
PREPARED BY: S. PARENT, ID 16159 AND D. TRAN, RCE C62652

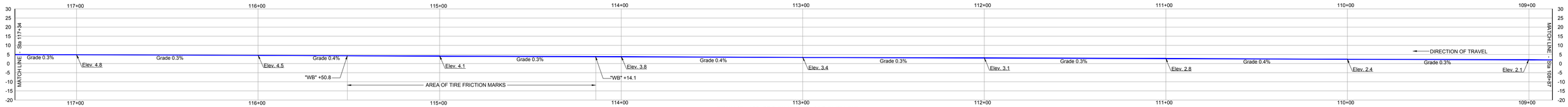
SCALE 0 25 50

CURVE DATA				
No.	R	Δ	T	L
1	6,000.0'	13° 20' 50"	702.041'	1,397.727'

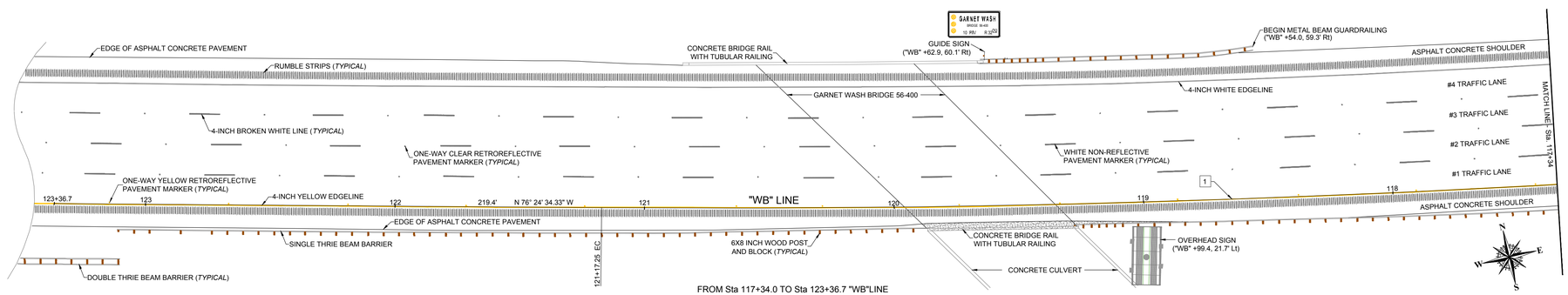




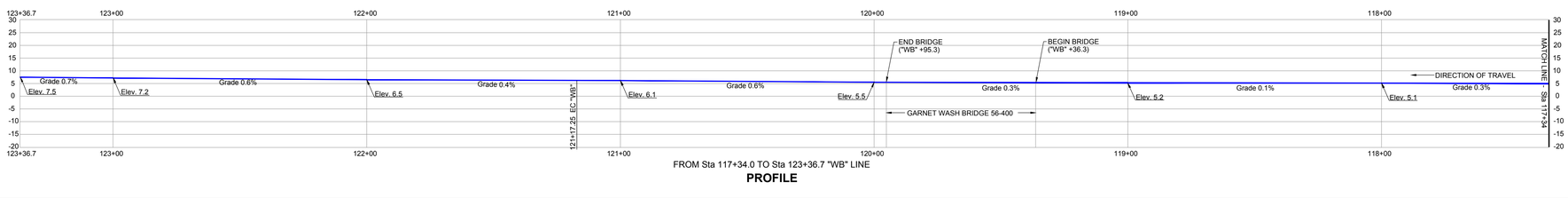
FROM Sta 108+87.0 TO Sta 117+34.0 "WB" LINE
LAYOUT #2



FROM Sta 108+87.0 TO Sta 117+34.0 "WB" LINE
PROFILE



FROM Sta 117+34.0 TO Sta 123+36.7 "WB"LINE
LAYOUT #3



FROM Sta 117+34.0 TO Sta 123+36.7 "WB" LINE
PROFILE

FACTS – ROADWAY DESCRIPTION

Sight Distance

According to the Caltrans Highway Design Manual, sight distance is defined as the continuous length of highway ahead visible to the driver. Since this collision occurred during the hours of darkness, sight distance was dependent upon the ability of approaching drivers to see an object, in this case, the rear of the Utility. The sight distance was evaluated during daylight hours by taking a series of images at the collision scene on October 23, 2016. The images were taken by Engineer Tran while facing in a westerly direction and sitting in a stopped vehicle (within the #2 traffic lane) or standing in the #2 traffic at heights of 5.2 or 5.0 feet above the pavement respectively. It should be noted that because the collision occurred during the hours of darkness, the sight distance depicted in the images may not be the sight distance afforded to drivers during the hours of darkness. The distances listed in the following figures represent the estimated distance between the camera and the position of rest of the MCI[5] and were determined based upon roadway features and striping delineation.

Figure 2. View of Interstate 10 westbound (looking west), approximately 2,505 feet east of the MCI.

Figure 3. View of Interstate 10 westbound (looking west), approximately 1,658 feet east of the MCI.

Figure 4. View of Interstate 10 westbound (looking west), approximately 1,009 feet east of the MCI.

Figure 5. View of Interstate 10 westbound (looking west), approximately 449 feet east of the MCI.

[5] Although referred to as "position of rest," the MCI was moved prior to the taking of these images in order to extricate passengers.

FACTS – ROADWAY DESCRIPTION

Sight Distance

Figure 6. View of Interstate 10 westbound (looking west), approximately 220 feet east of the MCI.

Figure 7. View of Interstate 10 westbound (looking west), approximately 115 feet east of the MCI.

FACTS – ROADWAY DESCRIPTION

Traffic Controls

Signage

From the beginning limit of the field scan to the collision location, there was an object marker with a message "Closure Point" (Figure 8), a general service sign for a call box (Figure 9), and two highway post markers at postmile 32.5 (Figure 10 and Figure 11).

The object marker was located between the left shoulder and the single thrie beam barrier and was 900.5 feet east of the first tire friction mark. The general service sign was used to designate call boxes on the county Service Authority for Freeway Emergencies (SAFE) call box system and was located approximately 764 feet east of the first tire friction mark. The highway post markers were installed on the left and right side of the highway in the dirt area and located approximately 195 and 213 feet east of the first tire friction mark.

Figure 8. Object marker "Closure Point."

Figure 9. General service sign for the call box.

FACTS – ROADWAY DESCRIPTION

Traffic Controls – Signage

Figure 10. Location of the highway post marker at postmile 32.5 on the left side of the highway.

Figure 11. Locations of the highway post markers (circled) at postmile 32.5 on the both sides of the highway.

West of the collision location, there was an overhead guide sign (Figure 12 and Figure 13) and an inventory marker to identify the Garnet Wash bridge (picture was not taken). The inventory marker was located at the beginning of the bridge and on the right side of the highway.

Figure 12. Overhead guide sign (circled)

Figure 13. Message on the overhead guide sign (close-up image)

FACTS – ROADWAY DESCRIPTION

Weather Conditions

On June 14, 2017, Investigator Parent accessed weather information for the Palm Springs International Airport [1] (Figure 14). The weather station (KPSP) was located approximately 6.3 miles southeast of the collision location.

Time (PDT)	Temp.	Heat Index	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:53 AM	70.0 °F	-	35.1 °F	28%	29.89 in	10.0 mi	West	4.6 mph	-	N/A		Clear
1:53 AM	72.0 °F	-	28.0 °F	20%	29.89 in	10.0 mi	NW	5.8 mph	-	N/A		Clear
2:53 AM	70.0 °F	-	26.1 °F	19%	29.89 in	10.0 mi	NNW	5.8 mph	-	N/A		Clear
3:53 AM	69.1 °F	-	21.0 °F	16%	29.90 in	10.0 mi	NNW	5.8 mph	-	N/A		Clear
4:53 AM	69.1 °F	-	28.0 °F	22%	29.91 in	10.0 mi	Calm	Calm	-	N/A		Clear
5:53 AM	66.9 °F	-	36.0 °F	32%	29.92 in	10.0 mi	Calm	Calm	-	N/A		Clear

Figure 14. Hourly weather history and observations for October 23, 2016.

Lighting Conditions

There were no potential sources of artificial illumination in the area of this collision except light provided by vehicle headlights.

Astronomy data was obtained from the U.S. Naval Observatory [2] by Investigator Parent (Figure 15 and Figure 16). The Moon may have had a marginal effect on providing illumination to the collision scene.

Palm Springs, Riverside County, CA (Longitude W116° 32', Latitude N33° 49')	
Sunday, October 23, 2016	Pacific Daylight Time
Sun	
Begin civil twilight	6:33 a.m.
Sunrise	6:58 a.m.
Sun transit	12:30 p.m.
Sunset	6:02 p.m.
End civil twilight	6:28 p.m.
Moon	
Moonrise	12:27 a.m.
Moon transit	7:25 a.m.
Moonset	2:17 p.m.

Figure 15. Astronomical data for October 23, 2016.

Figure 16. Phase of the Moon: Waning Crescent with 40% of the Moon's visible disk illuminated.

FACTS – ROADWAY DESCRIPTION

Traffic Engineer's Report

Speed Limit

Pursuant to the provisions of Section 22356 (a) of the California Vehicle Code (CVC), after consultation with the Department of California Highway Patrol, and completion of a traffic engineering study, Caltrans increased the speed limit to 70 miles per hour on Interstate 10, from County Line Road in the city of Beaumont (Riverside County) to the Arizona state line on January 1, 1996. The closest sign (Figure 17) was located east of Bob Hope Drive overcrossing (PM 43.148). This speed limit sign was located approximately 10.5 miles east of the collision location. Autos with trailers and trucks were limited to 55 miles per hour as specified in CVC 22406. The closest sign was located west of Bob Hope Drive overcrossing (Figure 17, circled). The maximum speed limits would not preclude enforcing violations of CVC 22350, if a motorist was driving at a speed greater than was reasonable or prudent having due regard for weather, visibility, the traffic on, and the surface width of the highway.

Figure 17. Posted speed limit signs

Stopping Sight Distance

The California Department of Transportation Highway Design Manual was used as a reference to determine the design stopping sight distance for Interstate 10 westbound in the vicinity of the collision scene. According to the California Department of Transportation Highway Design Manual, Table 201.1, "Sight Distance Standards," the minimum stopping sight distance for the design speed of 70 miles per hour is 750 feet. Stopping sight distance is measured from the driver's eye, which is assumed to be 3.5 feet above the roadway surface to an object 0.5-foot above the roadway.

FACTS – ROADWAY DESCRIPTION

Traffic Engineer's Report

Permit Work

At the time of this collision, there was an encroachment work permit, Permit Number 08-16-6-UF-0832[6], performed by Southern California Edison (SCE) utility company to transfer six existing overhead transmission conductors[7] from the existing two-pole wood structure (also called "H" frame wood structure) to a new tubular steel pole structure (Figure 18: A). Both pole structures were located outside of the Caltrans right-of-way, north of Interstate 10 and 20th Avenue/ Diablo Road. The existing transmission conductor was suspended across the state right-of-way and Interstate 10 between the existing tubular steel pole structure, which was located on the south side of Interstate 10 (Figure 18: B), and the existing two-pole wood structure on the north side of Interstate 10. There was no conductor relocation work on the south side of Interstate 10 referenced in the encroachment permit. The location of utility work was approximately 1.4 miles west of the collision location (Figure 1).

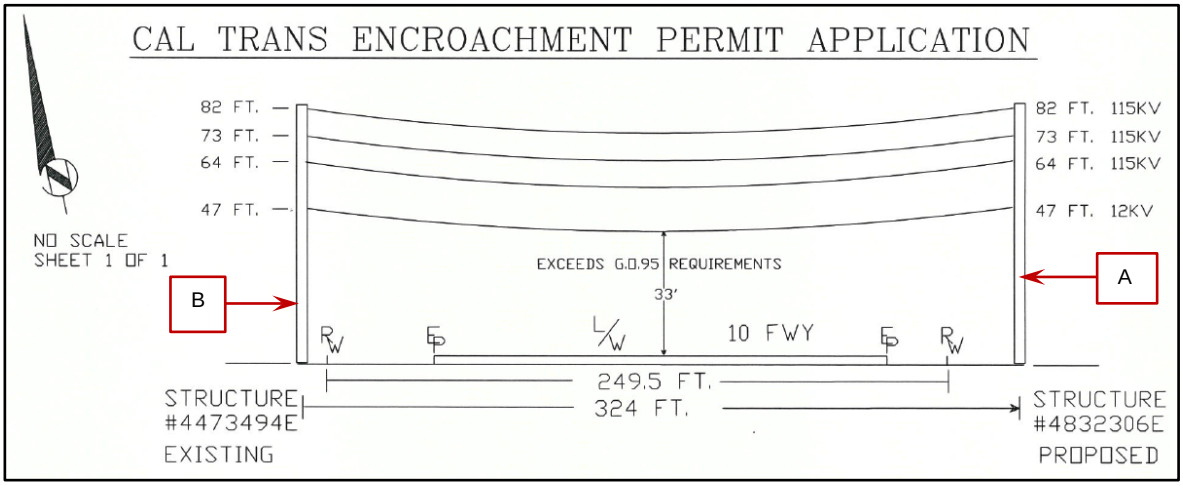


Figure 18. A portion of SCE Encroachment Permit drawing detail

[6] Dated October 07, 2016

[7] The bottom line shown in Figure 18 contained three separate transmission conductors.

FACTS – ROADWAY DESCRIPTION

Traffic Engineer's Report – Permit Work

The following requirements were referenced on the issued permit:

- Traffic breaks were required while transferring overhead cables to the new pole.
- Traffic breaks shall be provided by the California Highway Patrol during the non-peak hours.
- Each traffic break shall not exceed 5 minutes and there could be no more than 5 breaks in the same day.
- A pre-job meeting with a CT representative was required at least 7 days prior to start of the permit work.
- Work needed to be completed before January 7, 2017.

The definition of a "traffic break" and the time the traffic break began was not defined in the permit document.

According to CT District 8 Permit Engineer Richard Goh, California Street and Highways Code, Section 674, stated:

> The department[8] may, but is not required to, supervise any work done under any permit, issued under the provisions of this chapter in which event the permittee shall, in addition, to any fees charged pursuant to Section 671.1, pay the reasonable cost of such supervision to the department, but no cost of supervision shall be charged by the department to any public corporation.

Therefore, Caltrans was not required to have an inspector or a representative supervising the work being done under permit. In addition, Permit Engineer Goh also stated the aerial crossing work and traffic breaks respectively were SCE and CHP area of expertise. A "Reimbursable Letter of Agreement" (Form CHP 465) signed by CHP Indio Area Commander[9], Captain Quattlebaum, was sent to CT representative Ebraham by email on October 17, 2016. SCE Transmission Foreman James Lopez also provided the CHP agreement to CT representative Ebraham at the pre-construction meeting on October 20, 2016.

From reviewing the permit document, Engineer Tran noted that the duration of time between the pre-job meeting and permit start date was varied on different pages of the permit package.[10] A pre-job (or pre-construction) meeting was held on October 20, 2016, three days before the start of the work. The signed pre-construction meeting records indicated the presence of Caltrans representative Ebraham and SCE Transmission Foreman James Lopez at the meeting on October 20, 2016.

[8] Per General Provision 20 of California Streets and Highways Code, it is the California Department of Transportation.

[9] On the copy version ('pdf' format) of the agreement provided to MAIT Engineer Tran, the signature of SCE General Superintendent Marc Ferguson was not shown on the agreement; however, a copy of a check with an amount of a $3,446.64 payment to the CHP Indio Area from SCE and the Counter Receipt from CHP Area office were included in the permit document.

[10] At least 7 days was shown on page 1 of the permit; at least 2 weeks was shown on page 3 of the Special Provisions section; 2 days or more was shown on the "Preconstruction Meeting Agreement".

FACTS – ROADWAY DESCRIPTION

Traffic Engineer's Report – Permit Work

Engineer Tran also noted that SCE General Superintendent Marc Ferguson signed and dated the "Preconstruction Meeting Agreement" on a different date, October 17, 2016. However, based on the Encroachment Permit Report (Diary), Form TR-0130, CT representative Ebraham indicated that he spoke to SCE General Superintendent Ferguson (with the listed superintendent's phone number) on October 17, 2016, and agreed on the preconstruction meeting on October 20, 2016. The superintendent sent the CHP agreement to CT representative Ebraham by email on the same date. Although it was an option (wording "and/ or") listed on the permit, there was no record in the provided permit documents of the invitation or attendance of a CHP representative to a meeting at least two weeks prior to start of the work as specified on page 3 of the Special Provisions of the permit document. However, on page 3 of Special Provisions, the permittee was required to notify the CHP area commander at least 72 hours prior to implementing traffic control.

On May 25, 2017, Engineer Tran made an inquiry to CT representative Ebraham about the variation in the advanced time frame for the pre-job meeting as required in the permit. CT representative Ebraham provided the following clarification:

- When there was a requirement for closure of traffic lanes, Caltrans required a pre-construction meeting at least 7 days prior to start of the work.
- When there was a requirement for CHP involvement with the permit work, Caltrans recommended the permittee to contact CHP at least two weeks prior to the start of any work.
- When there was no requirement for a traffic lane closure, Caltrans required a pre-construction meeting two days or more prior to the planned start of the work.

According to an email dated October 17, 2016, from SCE General Superintendent Marc Ferguson to SCE personnel and CT representative Ebraham, Superintendent Ferguson confirmed the utility relocation work on Sunday morning at 0200 hours and there would be "no more than 5, 5 minute breaks." However, there was no permit record mentioning the end of work hour at 0500. On May 25, 2017, and May 31, 2017, Engineer Tran contacted CT representative Ebraham to inquire about the work hours between 0200 and 0500 hours and the source of the five-minute traffic break requirement indicated on the permit document. CT representative Ebraham stated the following:

- The work hours were verbally mentioned at the pre-job meeting.
- The requirements for the utility relocation work to be done on the weekend morning and the traffic break duration were based on five-minute clearing times per Caltrans Encroachment Permit manual; chapter 600, "Utilities Permits"; Section 619, [11] "Freeway Aerial, Permit Code UF", which stated:

[11] The last update of this section was "current as of 07/2013", page 6-33 and 6-34.

FACTS – ROADWAY DESCRIPTION

Traffic Engineer's Report – Permit Work

> Installation or removal of overhead conductors crossing a freeway require traffic control by the California Highway Patrol (CHP) and usually occur on weekend mornings. The CHP can perform a rolling break in traffic on most highways to allow up to five-minute clearing. These breaks are adequate for simple cable installation. Utility personnel carry the conductors across the freeway lanes and hoist them into place on the opposite side of the freeway.

On October 28, 2016, NTSB and CHP MAIT investigators met with SCE and CT representative Ebraham at the location of the utility work. The objective of the meeting was to inquire about the timeline, scope, and detail information of the utility relocation work. The following items were mentioned at the meeting and were from SCE responses[12] to the follow-up inquiries, dated February 15, 2017, from NTSB and MAIT investigators:

- Traffic breaks shall be provided by CHP during the non-peak hour. Each traffic break shall not exceed 5 minutes and there can be no more than 5 breaks in the same day.
- Utility work was to be performed between 0200 and 0500 hours on Sunday, October 23, 2016.
- SCE crew began to mobilize equipment at 2100 hours on October 22, 2016.
- SCE notified Caltrans dispatch before the utility work was performed.
- SCE contacted CHP dispatch to request CHP patrol units.
- SCE would communicate with a CHP unit about the traffic break by cell phones.
- There was a delay of service from CHP Indio Area units for the traffic breaks at the time SCE foreman called and requested the service.
- SCE foreman provided responses to inquiries such as: the information about the existing and new structures, vertical clearance of the transmission conductors, numbers of involved SCE personnel, safety devices, lighting at the job site, location of SCE foreman and his vehicle, method of communication between the crew members, how SCE crews transferred the transmission conductors during the traffic break, and the removal of the existing H-frame wood structure from the job site.

[12] Dated March 17, 2017 by SCE investigator Julie Olin.

FACTS – ROADWAY DESCRIPTION

Traffic Engineer's Report – Permit Work

- The top three transmission conductors were transferred by two-man crews working from elevated buckets during the one traffic break completed before the collision, which lasted approximately 8 minutes. The relocation of remaining lower three transmission conductors was completed without additional traffic breaks due to the temporary traffic hold up at the traffic collision location.
- SCE would email a 100 percent completion notice to CT representative to close out the permit. CT representative Ebraham provided the "100% Completion Notice" to MAIT Engineer Tran on May 31, 2017.

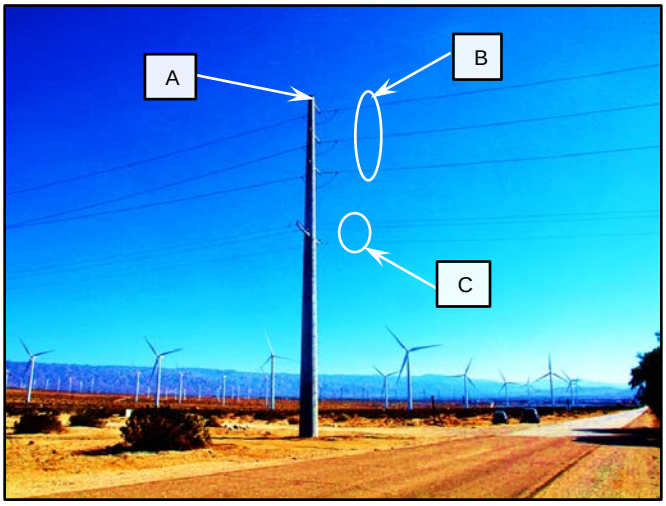


Figure 19. New tubular steel pole structure [A] with the relocated top three [B] and lower three [C] overhead transmission conductors

FACTS – ROADWAY DESCRIPTION

Traffic Engineer's Report – Permit Work

The following is the summary of the total number of issued traffic break permits[13], provided by Caltrans District 8 Permit Office, for the overhead utility crossing works on freeways and conventional highways, dated from the year 2014 to the date of this traffic collision:

Table 1
Summary of the Permits with Traffic Breaks for the Overhead Utility Crossing Work issued by Caltrans District 8 Permit Office

Year	Total of Issued Permits to Utility Companies	Total of Issued Permits to SCE
2016[a]	49	40
2015	87	64
2014	51	28
Total	187	132

Note. [a]First nine months

As indicated in the table above, over 70 percent of the permits for utility crossing work were issued to SCE and there were no traffic issues reported to, or documented by, CT District 8 Permit personnel.

Traffic Volume

The 2015 total back annual average daily traffic (AADT) volume for both directions of travel on Interstate 10 was 81,900 vehicles at postmile 33.129 - Indian Avenue (which was later renamed North Indian Canyon Drive Overcrossing[14]). Since Interstate 10 is an east-west roadway, the back AADT represented traffic west of the count station location and was the quotient of the total volume for the 2015 year and 365 days. This total traffic volume was for both directions of travel. Assuming half of the traffic volume was in one direction, the estimated annual average daily traffic for westbound traffic near the collision location was 40,950 vehicles per day.

During the early stage of the investigation, at the request of NTSB Investigator Daniel Walsh, CT District 8 personnel provided 24-hour traffic volume for October 23, 2016, for Interstate 10 westbound at two locations:

- Date Palm Drive (at or near Date Palm Drive overcrossing bridge #56-560, post mile 39.493)
- Main Street (at or near Main Street overcrossing, also known as East Cabazon Ramp overcrossing, post mile R19.398)

[13] Not including traffic breaks for filming permits or other type of work, such as ten for oversized truck detours, two for installing banners over conventional highways, and one placing prefabricated metal bridge over highway. The numbers of issued filming permits were broken down as followed: 14 permits for year 2014, 9 permits for year 2015, and 17 permits for the first 9 months of year 2016.
[14] Name changed in the year 2007 under Permit Number: 08-07-6-MC-0225. Only a portion of the first page of the Encroachment Permit was provided to Engineer Tran for reference.

FACTS – ROADWAY DESCRIPTION

Traffic Engineer's Report – Traffic Volume

The hourly vehicle counts (vehicles per hour) on each lane of Interstate 10 westbound on the date of the traffic collision between 0000 hours to 2300 hours at the referenced post miles are presented in Table 2 and Table 3.

Table 2
Hourly Traffic Volumes Between 0000 and 1100 hours

Hour	Traffic Volume Post Mile 39.493	Traffic Volume Post Mile 19.398
00:00	799	718
01:00	519	475
02:00	353	418
03:00	343	392
04:00	304	388
05:00	417	507
06:00	698	908
07:00	1042	1125
08:00	1457	1440
09:00	1837	1884
10:00	2071	2494
11:00	2012	2889

Table 3
Hourly Traffic Volumes Between 1200 and 2300 hours

Hour	Traffic Volume Post Mile 39.493	Traffic Volume Post Mile 19.398
12:00	1921	2960
13:00	2032	2986
14:00	1789	3496
15:00	1845	3194
16:00	2545	3016
17:00	2677	2839
18:00	2450	2767
19:00	2529	2501
20:00	2210	2072
21:00	1668	1663
22:00	1165	1143
23:00	935	780

Based upon the traffic volumes presented in Table 2 and Table 3, this collision occurred during a time (between 0500 and 0600 hours) that Interstate 10 westbound had a low hourly traffic volume.

FACTS – ROADWAY DESCRIPTION

Traffic Engineer's Report

Collision History

On November 10, 2016, Engineer Tran conducted a search for Traffic Collision Reports (CHP 555) on the Statewide Integrated Traffic Records System (SWITRS) for traffic collisions, which had occurred on Interstate 10 westbound, between the North Indian Canyon Drive overcrossing bridge (PM 33.129) and the Wall Road overcrossing bridge[15] (also known as the Garnet overcrossing bridge, PM 30.798[16]). The time frame for these reports was a four-year period[17]; October 23, 2012 to October 23, 2016. A total of 38 traffic collisions[18] were reported within this location range and time period from this database.

On May 23, 2017, Engineer Tran also conducted a search on the Caltrans Document Retrieval System (DRS) and Caltrans Transportation System Network (TSN) reports database for reported traffic collisions that had occurred on Interstate 10 westbound, from PM 30.798 to PM 33.129. The time frame for these reports was a four-year period[17], from October 23, 2012 to October 23, 2016. A total of 24[19] traffic collisions were reported within this location range and time period from this database.

The following criteria (similar conditions to this collision) were utilized to analyze the collision data on Interstate 10 westbound:

- Type of collision: "Rear End"
- Lighting: dark – with or without street lights
- Weather: clear, cloudy, windy
- Roadway condition: dry road surface and no unusual conditions

A total of three traffic collisions were reported that met the above criteria. One previous traffic collision occurred west of, the other two previous traffic collisions occurred east of this traffic collision scene. California Vehicle Code (CVC) section 22350, unsafe speed, was listed as the primary collision factor (PCF) for all three traffic collisions. One of the traffic collisions resulted in one "complaint of pain" injury.

[15] California Log of Bridges on State Highways, April 2017

[16] Caltrans District 8 Postmile Log, revised 12/23/2015

[17] A three-year period of collision history is typically mentioned in Caltrans Project Reports or Project Study Reports; however, due to the delay in database update, a search for a four-year period of collision history (from the date of this collision) was conducted for this report.

[18] During analysis of the traffic collision data, 28 out of 48 Traffic Collision Reports had the postmiles at the collision locations being calculated from the provided distances and secondary roads.

[19] 2016 traffic collision data was not available on this database at the completion of the traffic collision history analysis.

FACTS – ROADWAY DESCRIPTION

Findings

Roadway

- Varied widths of traffic lanes and shoulders (as shown in the Typical Cross Section) may have been the result of construction tolerances and the offset measurements from the best-fit horizontal alignment "WB" to the selected points on the striping delineation and the edges of pavement in the point cloud during the roadway analysis. The width of traffic lane #4 was measured up to 17.8 feet wide due to the merging area at the end of the merged traffic lane from the North Indian Canyon Avenue entrance ramp to Interstate 10 westbound. With the exception of the construction tolerances, the shoulders and traffic lanes were determined to be constructed per as-built project plans.
- Based on the generated cross sections at 100-foot interval, the rotation of the cross slopes on the left shoulder from 4.9 percent downward and toward the dirt median to 2.2 percent downward and toward the #1 traffic lane was in response to the superelevation of a horizontal curve on the alignment "WB". The cross slopes of the left shoulder met the standard set by the current Caltrans Highway Design Manual.
- The first physical evidence item (tire friction mark) was identified near the middle section of the horizontal curve, which had a radius of 6,000 feet. With a relatively flat profile and a large curve radius, there was no environmental visual obstruction to the line of sight that was available to motorists traveling on Interstate 10 westbound.
- The posted maximum speed limit for this section of Interstate 10 westbound was 70 miles per hour. For autos with trailers and trucks, the maximum speed was limited to 55 miles per hour.
- Based on the evaluation of the sight distance from the images taken during the daylight hours, it was determined that this section of Interstate 10 westbound had sufficient stopping sight distance for a driver traveling at or near the posted speed limit to stop his/her vehicle before reaching an unexpected hazard in the path of the vehicle.

Permit Work

- Per California Streets and Highways Code, Section 674, Caltrans was not required to have an inspector or a representative supervising the permit work.
- Although there was no signature of SCE General Superintendent Marc Ferguson on the "Reimbursable Letter of Agreement" (Form CHP 465), a copy of a check with an amount of $3,446.64 was paid to California Highway Patrol Indio Area and a Counter Receipt (CHP 251) was included in the permit document.
- Utility work hours were from 0200 to 0500 hours and were verbally mentioned at the pre-construction meeting. However, there was a delay in service from CHP Indio area units.

FACTS – ROADWAY DESCRIPTION

Findings – Permit Work

- One of the requirements in the issued permit was that each traffic break not to exceed 5 minutes and there could be no more than 5 breaks in the same day. Although the time the traffic break began was not defined in the permit document, it would not have been safe for SCE personnel to conduct work in or near traffic lanes until all vehicles were prevented from continuing on Interstate 10 by CHP personnel, including vehicles entering the freeway from entrance ramps.
- From 2014 through the first 9 months of 2016, out of total 187 permits issued to utility companies for overhead utility crossing works by Caltrans District 8, SCE had applied for and completed 132 permits (over 70% of the total approved permits). During this time period, there were no reported incidents or traffic collisions related to the overhead utility crossing work.

Traffic Volume

From comparing the hourly traffic volumes within 24-hour period at two locations (postmile 39.493 and R 19.398), the collision occurred at the time the hourly traffic volume was low (between 400 and 500 vehicles) on Interstate 10 westbound.

Collision History

In the four years prior to this collision, from postmile 30.798 to 33.129, with similar environment conditions to this traffic collision, there were three “rear end” type collisions, none of which occurred in a construction zone. The primary collision factor for these traffic collisions was listed as California Vehicle Code section 22350; unsafe speed.