

D & D ENGINEERING, INC.

March 4, 2019

Mr. Steve Duethman

AECOM

2380 McGee Street

Kansas City, MO 64108

816-360-4448 direct

913-221-6173 cell

Re: Bridge Sight Distance

Steve,

Per your request we studied sight and stopping distance related to two proposed bridges on Prairie Avenue northbound and Century Boulevard westbound.

Our study shows that in both cases our sight distance is significantly longer than the required stopping distance per the stopping sight distance formula and Table 201.1 of the Caltrans Highway Design Manual for a design speed of 50 miles per hour.

The provided sight distance for the Prairie Avenue bridge is 936', and the required stopping distance for this section of Prairie Avenue is 448', based on an uphill slope of 0.5%, a design speed of 50 miles per hour, a friction factor of 0.31 and a 2.5 second reaction time. The Caltrans Highway Design Manual, Table 201.1 requires a minimum of 430'.

The provided sight distance for the Century Boulevard bridge is 797' and the required stopping distance for this section of Century Boulevard is 457', based on a downhill slope of 0.5%, a design speed of 50 miles per hour, a friction factor of 0.31 and a 2.5 second reaction time. The Caltrans Highway Design Manual, Table 201.1 requires a minimum of 430'.

In both cases stopping distance is significantly less than sight distance and if we increase the bridge clearance for any reason from current 15', we would even have longer sight distance.

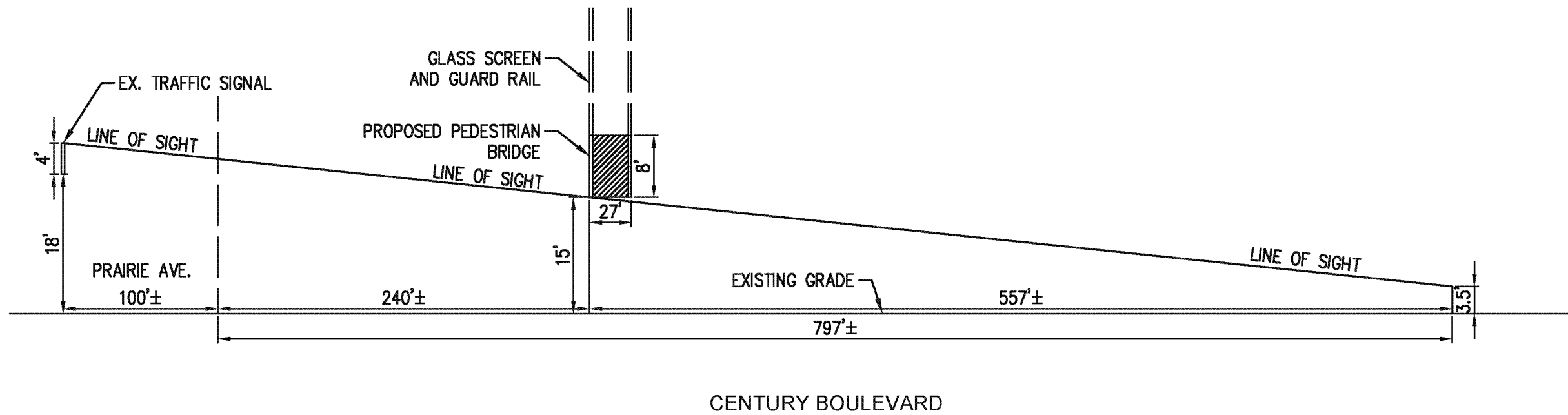
Sincerely,

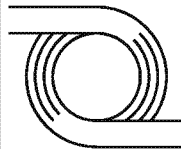
D & D Engineering, Inc.

Henrik Nazarian

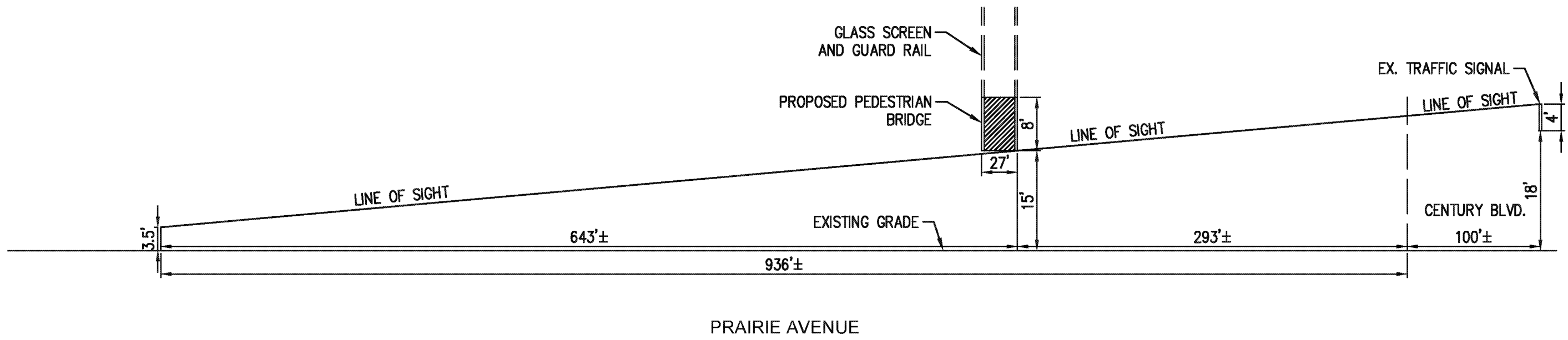
President

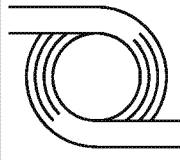
Attachments: Century Westbound Bridge Sight Distance Exhibit, Prairie Northbound Sight Distance Exhibit, Caltrans Highway Design Manual Table 201.1, (2) Street View Images, Traffic Signal Plans



	D & D ENGINEERING, INC. 8901 S. LA CIENEGA BLVD, SUITE 106 INGLEWOOD, CA 90301 Phone: 424-351-6800	SCALE: N.T.S.
	CENTURY WESTBOUND BRIDGE SIGHT DISTANCE EXHIBIT	DATE: 02/27/2019
		SHT NO.: 01 OF 01

Drawing Name: M:\17001\Eng\17001\Exhibits\12_Sight Distance Exhibit (Pedestrian Bridge)_02-27-19\Sight Distance Exhibit - Century.dwg
 Last Opened: Feb 27, 2019 - 5:03pm by: Lester Rodriguez



 D & D ENGINEERING, INC. 8901 S. LA CIENEGA BLVD, SUITE 106 INGLEWOOD, CA 90301 Phone: 424-351-6800	PRAIRIE NORTHBOUND BRIDGE SIGHT DISTANCE EXHIBIT	SCALE: N.T.S.
		DATE: 02/27/2019
		SHT NO.: 01 OF 01

Drawing Name: M:\17001\Eng\17001\Exhibits\12_Sight Distance Exhibit (Pedestrian Bridge)_02-27-19\Sight Distance Exhibit -
 Prairie.dwg
 Last Opened: Feb 27, 2019 - 5:02pm by: Lester Rodriguez

CHAPTER 200 GEOMETRIC DESIGN AND STRUCTURE STANDARDS

Topic 201 - Sight Distance

Index 201.1 - General

Sight distance is the continuous length of highway ahead, visible to the highway user. Four types of sight distance are considered herein: passing, stopping, decision, and corner. Passing sight distance is used where use of an opposing lane can provide passing opportunities (see Index 201.2). Stopping sight distance is the minimum sight distance for a given design speed to be provided on multilane highways and on 2-lane roads when passing sight distance is not economically obtainable. Stopping sight distance also is to be provided for all users, including motorists and bicyclists, at all elements of interchanges and intersections at grade, including private road connections (see Topic 504, Index 405.1, & Figure 405.7). Decision sight distance is used at major decision points (see Indexes 201.7 and 504.2). Corner sight distance is used at intersections (see Index 405.1, Figure 405.7, and Figure 504.3I).

Table 201.1 shows the minimum standards for stopping sight distance related to design speed for motorists. Stopping sight distances given in the table are suitable for Class II and Class III bikeways. The stopping sight distances are also applicable to roundabout design on the approach roadway, within the circulatory roadway, and on the exits prior to the pedestrian crossings. Also shown in Table 201.1 are the values for use in providing passing sight distance.

See Chapter 1000 for Class I bikeway sight distance guidance.

Chapter 3 of "A Policy on Geometric Design of Highways and Streets," AASHTO, contains a thorough discussion of the derivation of stopping sight distance.

201.2 Passing Sight Distance

Passing sight distance is the minimum sight distance required for the driver of one vehicle to pass another vehicle safely and comfortably. Passing must be

accomplished assuming an oncoming vehicle comes into view and maintains the design speed, without reduction, after the overtaking maneuver is started.

**Table 201.1
Sight Distance Standards**

Design Speed ⁽¹⁾ (mph)	Stopping ⁽²⁾ (ft)	Passing (ft)
10	50	---
15	100	---
20	125	800
25	150	950
30	200	1,100
35	250	1,300
40	300	1,500
45	360	1,650
50	430	1,800
55	500	1,950
60	580	2,100
65	660	2,300
70	750	2,500
75	840	2,600
80	930	2,700

(1) See Topic 101 for selection of design speed.

(2) For sustained downgrades, refer to underlined standard in Index 201.3

The sight distance available for passing at any place is the longest distance at which a driver whose eyes are 3 ½ feet above the pavement surface can see the top of an object 4 ¼ feet high on the road. See Table 201.1 for the calculated values that are associated with various design speeds.

In general, 2-lane highways should be designed to provide for passing where possible, especially those routes with high volumes of trucks or recreational vehicles. Passing should be done on tangent horizontal alignments with constant grades or a slight sag vertical curve. Not only are drivers reluctant to pass on a long crest vertical curve, but it is impracticable to design crest vertical curves to provide for passing sight distance because of high cost where crest cuts are involved. Passing sight



18'

RIGHT LANE
MUST
TURN RIGHT

NO
STOPPING
ANY TIME

Google

Embury Blvd



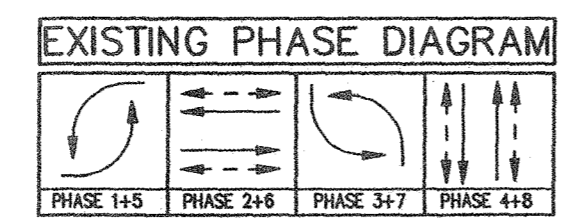
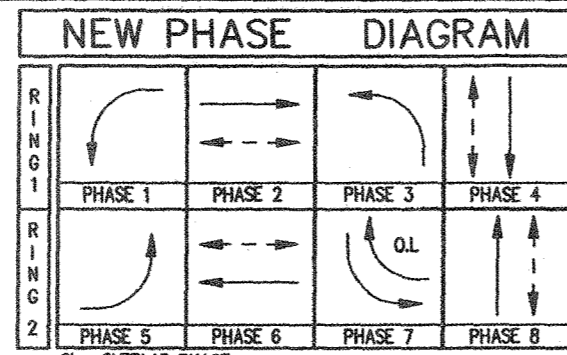
18'

Prairie Ave

Chevron

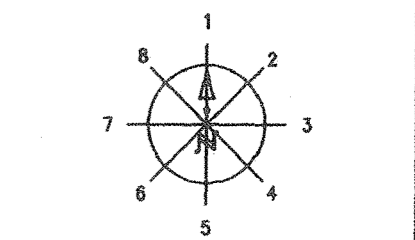
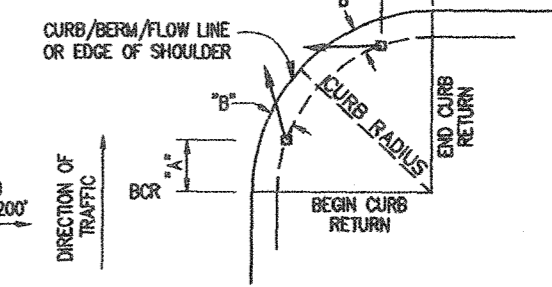
CONDUCTOR SCHEDULE												
AWG SIZE OR CABLE TYPE	POLE & PHASES	CONDUIT LOCATION										
		1	2	3	4	5	6	7	8	9	10	11
12 CABLE	① #1, #6, #6P / #4PPB							1/1			1/1	1/1
	② #3, #4P / #6PPB										1/1	1/1
	③ #3, #6, #6P / #6PPB										1/1	1/1
	④ #5, #6, #7, #6P / #6PPB								1/1 (N)		1/1	1/1
11-#14 1-#12	⑤ #5, #2, #2XP / #8PPB	1/1	1/1	1/1	1/1	1/1	1/1				1/1	1/1
	⑥ #7, #8P / #2PPB	1/1	1/1	1/1	1/1	1/1	1/1				1/1	1/1
	⑦ #7, #4, #4P		1/-	1/-	1/-	1/-	1/-				1/-	1/-
	⑧ #2PPB			-/1	-/1	-/1	-/1				-/1	-/1
(3-#14, PPB)	⑨ #4PPB							-/1	-/1		-/1	-/1
	⑩ #1, #2P					1/-	1/-	1/-			1/-	1/-
3 CABLE	TOTALS 12 CONDUCTOR / 3 CONDUCTOR	1/1	2/2	3/2	3/3	1/-	4/4	5/5	1/1 (N)	2/2	8/8	8/8
	#10 LUMINAIRES	2	2	2	2	2	2	2	2 (N)	2	2	2
#6 SIGNAL SERVICE												
VIDEO DETECTION CABLE		1	1	2	2		2	3			1	4
6 PR #19 INTERCONNECT									1	1	1	
CONDUIT SIZE		2"	2"	2"	2"	2"	2"	2"	3"	2"	2-3"	2-3"

* ALL CONDUCTORS AND CABLES ARE EXISTING UNLESS NOTED OTHERWISE (N) = NEW

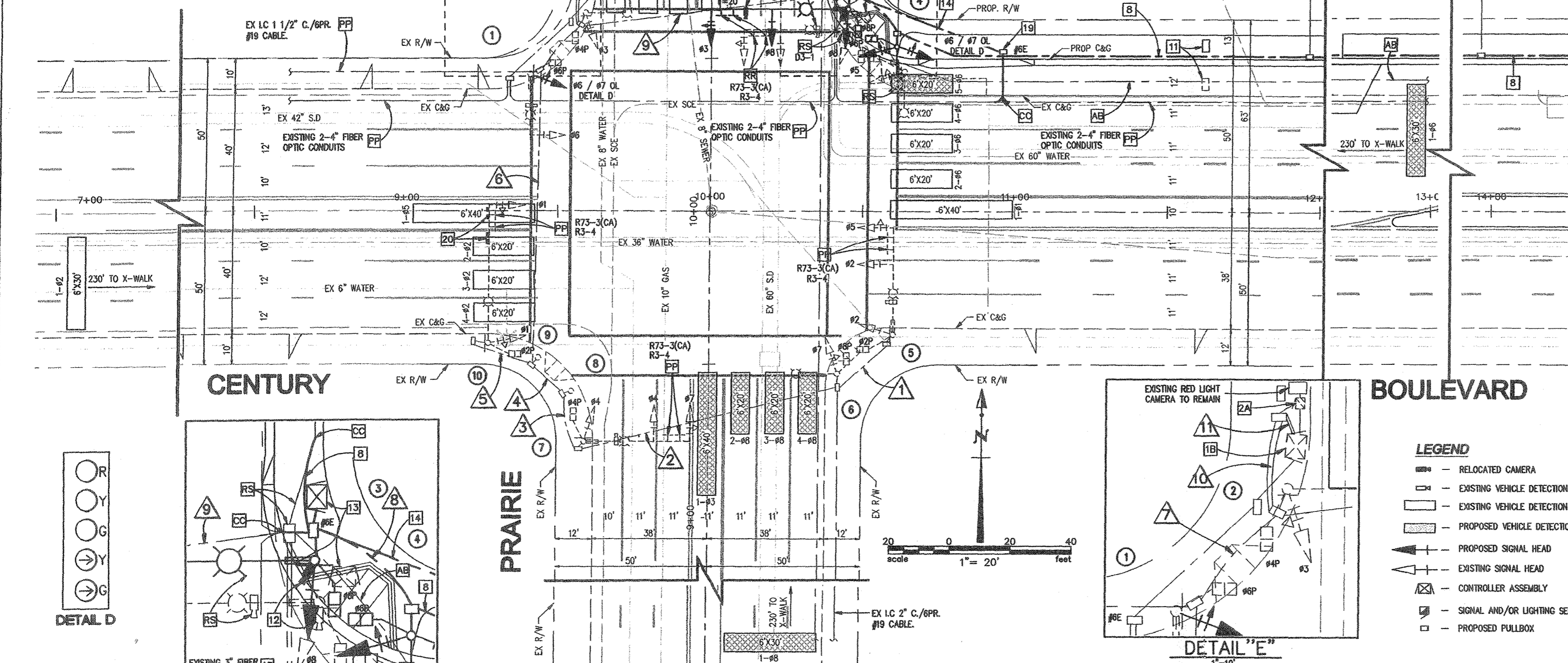


No.	STANDARD				LUMINAIRE	S.N.S. LEGEND I.S.N.S.	SIGNAL MOUNTING			PED PUSH BTN			POLE LOCATION		REMARKS
	Type	Height	Sig. M.g.	Lum. M.g.			M.A.	POLE	PED	QUAD.	PHASE	ARROW	A	B	
①	TYPE III	30'	20'	12'	400W HPSV	Prairie	MAS	SV-1-T(N)	SP-1-T	3	#4	←	EXISTING	RS SV-1-T INSTALL DETAIL "D" SV-1-T	
②	TYPE X	30'		12'	400W HPSV	-	-	SV-1-T	SP-1-T	5	#6	→	EXISTING	-	
③	TYPE X	30'	45'	15'(N)	400W HPSV	Century(R)	2 MAS	SV-1-T(R)	SP-1-T(R)	5	#6	←	14'	3'	RS EXISTING POLE, REMOVE FOUNDATION COMPLETE PPB, SP-1-T, SV-1-T AND 2 MAS
④	TYPE X(N)	30'		15'(N)	400W HPSV	-	-	SV-2-T(R)	SP-1-T(R)	7	#8	→	7'	3'	RS EXISTING POLE, REMOVE FOUNDATION COMPLETE PPB, SP-1-T AND SV-1-T
⑤	19-3-70	30'	35'	12'	400W HPSV	Prairie	2 MAS	SV-1-T	SP-1-T	7	#8	←	EXISTING	-	
⑥	TYPE X	30'		12'	400W HPSV	-	-	SV-1-T	SP-1-T	1	#2	→	EXISTING	-	
⑦	19-3-70	30'	35'	12'	400W HPSV	Century	2 MAS	SV-1-T	SP-1-T	-	-	-	EXISTING	-	
⑧	PPB POLE	3'								1	#2	←	EXISTING	-	
⑨	PPB POLE	3'								3	#4	→	EXISTING	-	
⑩	26-3-70	30'	45'	12'	400W HPSV	-	MAS	SV-1-T	SP-1-T	-	-	-	EXISTING	-	

ALL EQUIPMENT IS EXISTING UNLESS OTHERWISE INDICATED.
 (N) = NEW EQUIPMENT
 (R) = RELOCATE
 ** MANUFACTURE SHORTER MAST-ARM PER POLE SCHEDULE
 ** LUMINAIRE SHALL BE 213-W LED AMERICAN ELECTRIC LIGHTING LED ASSEMBLY # ATB2 GOBLEPEIO MOLT R2 N.P. OR OTHERWISE APPROVED BY CITY TRAFFIC ENGINEER



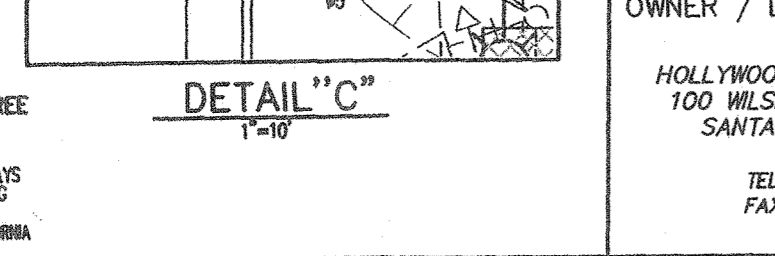
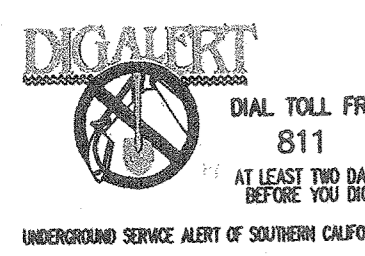
DETAIL "A" TYPICAL SIGNAL STANDARD PLACEMENT UNLESS DIMENSIONED ON PLANS.
 FOR "A" AND "B" DIMENSIONS, SEE POLE SCHEDULE OR AS DIRECTED BY THE ENGINEER.



CONSTRUCTION NOTES

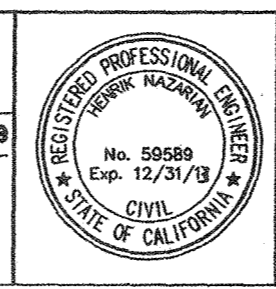
- 1B EXISTING TYPE 170E CONTROLLER ASSEMBLY AND 332 CABINET, TO REMAIN. FURNISH AND INSTALL ADDITIONAL DETECTOR SENSOR UNITS AND ALL NECESSARY APPURTENANCES TO PROVIDE THE INTENDED OPERATION. UPGRADE DETECTION CARDS TO ITERS VANTAGE EDGE 2.
- 2A EXISTING SERVICE ENCLOSURE TO REMAIN.
- 8 INSTALL I.C. 2" CONDUIT 6 P.R. #19 INTERCONNECT.
- 11 RELOCATE EXISTING LIGHTED MONUMENT SIGN, CONDUITS SIZE AND LOCATION, PULLBOXES LOCATION, SERIES CIRCUITS, WIRING DIAGRAMS AND SERVICE LOCATION PER SEPARATE PLAN BY OTHERS.
- 12 RELOCATE EXISTING CCTV CAMERA.
- 13 RELOCATE EXISTING 334 ITS CCTV CONTROLLER CABINET.
- 14 FURNISH AND INSTALL 3" PVC CONDUIT, 48-STRANDED SINGLE MODE FIBER OPTIC CABLE, AND ONE (1) #10 GREEN STRANDED.
- 19 INSTALL 6E F.O. PULLBOX. INSTALL 2-4" CONDUITS BY CONNECTING IN TO EXISTING 2-4" F.O. CONDUITS. PULL NEW 2-48 SMOF CABLE TO THE NEXT INTERSECTION. PER DETAILS ON SHEET 10.
- 20 REMOVE EXISTING ILLUMINATION DIRECTIONAL SIGNS AND FOUNDATION COMPLETE.
- 22 RELOCATE VIDEO DETECTION UNIT TO MAST ARM WITH EXTENSION BAR 'UGLY STICK', PER SPECIFICATIONS.

- AB ABANDON CONDUIT, REMOVE CONDUCTORS.
- CB INSTALL CONDUIT IN EX PULL BOX
- CC CONNECT NEW AND EXISTING CONDUIT
- RR REMOVE AND REUSE
- RS REMOVE AND SALVAGE EQUIPMENT
- PP PROTECT IN PLACE
- SC INSTALL PULL BOX IN EXISTING CONDUIT RUN.
- SC SPLICE NEW TO EXISTING CONDUIT.



OWNER / DEVELOPER:
 HOLLYWOOD PARK LAND CO., LLC
 100 WILSHIRE BLVD, SUITE 940
 SANTA MONICA, CA 90401
 TEL: (310) 382-9000
 FAX: (310) 382-9097

Hall & Foreman, Inc.
 Engineering • Surveying • Planning • Landscape Architecture
 25152 SPRINGFIELD COURT, SUITE 350 • SANTA CLARITA, CA 91355 • 661-284-7400
 PREPARED UNDER THE SUPERVISION OF:
 HENRIK NAZARIAN, P.E. R.C.E. 59589 DATE 1/31/12



NO.	DATE	REVISION DESCRIPTION
1	2/18/12	REVISED LUMINAIRE TYPE HN
2	1/11/12	UPDATED SIGNAL POLE X MOUNTING TYPES AS SHOWN

APPROVED BY: [Signature]
 PUBLIC WORKS
 SUBMITTED BY: [Signature]
 CHECKED BY: [Signature]
 CHAD SHEET, SENIOR TRANSPORTATION ENG. DATE 1/31/12



CITY OF INGLEWOOD, CALIFORNIA
 PUBLIC WORKS DEPARTMENT
 PLANS FOR THE MODIFICATION OF
 TRAFFIC SIGNALS W/ SAFETY LIGHTING
 AT THE INTERSECTION OF
 CENTURY BLVD. and PRAIRIE AVE.
 PERMIT NUMBER: TS-0000 PLAN SCALE: 1" = 20' SHEET NO. 5 OF 10 PLAN NUMBER: TR-3903

Drawing Name: L:\07119\Eng\07119-2000 Final Plans\OFF-SITE\Traffic Signal\05_070119-2000.dwg
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