Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	1	25

INDEX OF PLANS

SHEET No.	DESCRIPTION
1	TITLE AND LOCATION MAP
2 -3	LOCATIONS OF CONSTRUCTION
4-23	ELECTRICAL PLANS
24-25	REVISED STANDARD PLANS

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK.

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

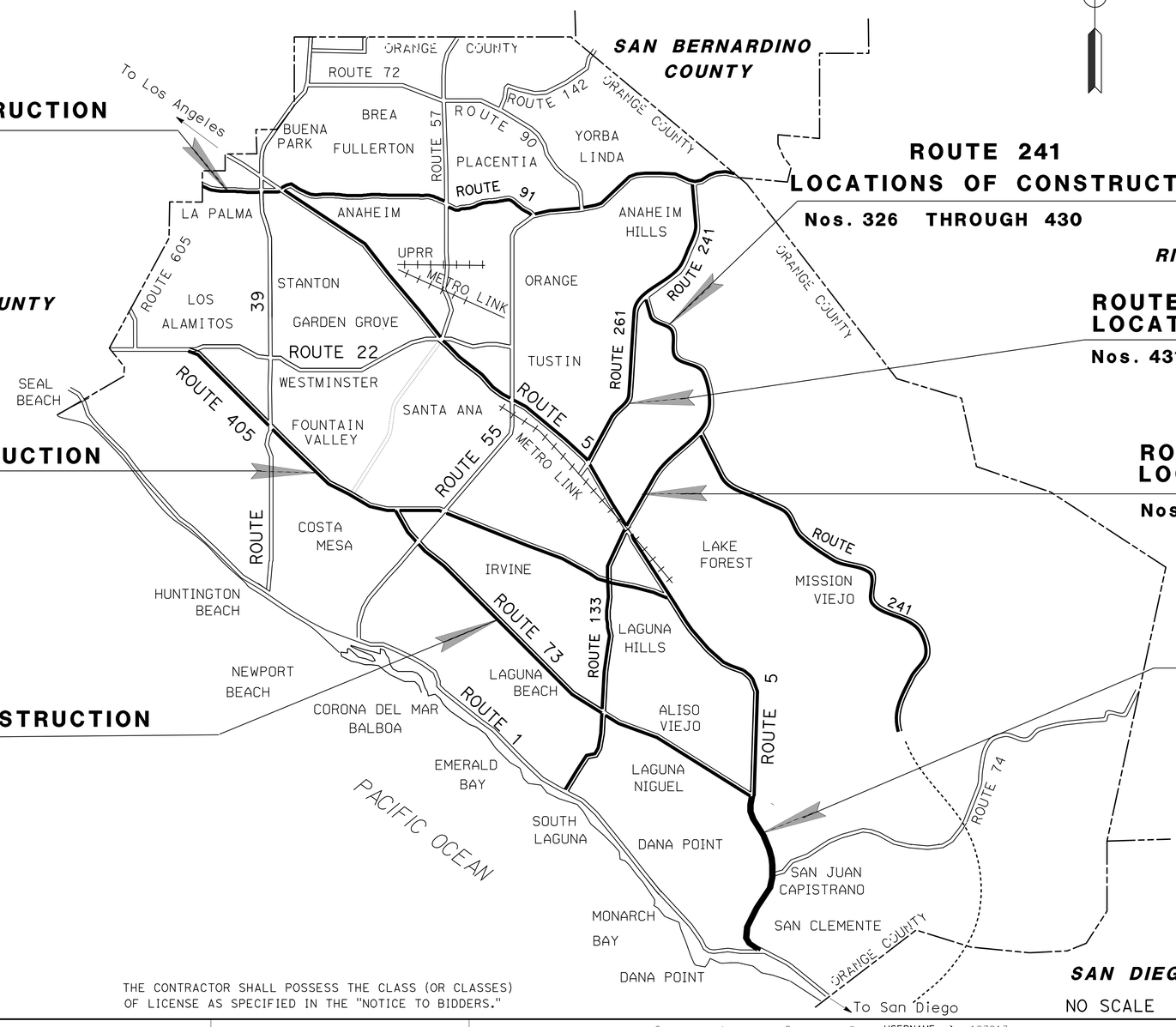
PROJECT PLANS FOR CONSTRUCTION ON

STATE HIGHWAY

IN ORANGE COUNTY AT VARIOUS LOCATIONS

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010

LOCATION MAP



ROUTE 91
LOCATIONS OF CONSTRUCTION
No. 311

ROUTE 241
LOCATIONS OF CONSTRUCTION
Nos. 326 THROUGH 430

ROUTE 261
LOCATIONS OF CONSTRUCTION
Nos. 431 THROUGH 454

ROUTE 405
LOCATIONS OF CONSTRUCTION
No. 455

ROUTE 133
LOCATIONS OF CONSTRUCTION
Nos. 312 THROUGH 325

ROUTE 5
LOCATIONS OF CONSTRUCTION
Nos. 1 THROUGH 238

ROUTE 73
LOCATIONS OF CONSTRUCTION
No. 239 THROUGH 310

LOS ANGELES COUNTY

RIVERSIDE COUNTY

SAN DIEGO COUNTY

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

Mostafa Aliakbarzadeh 06-15-15
PROJECT ENGINEER REGISTERED CIVIL ENGINEER — DATE

June 22, 15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — MOSTAFA ALIAKBARZADEH No. C 53003 Exp. 03-31-17 CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

CONTRACT No.	12-0N7904
PROJECT ID	1214000109

PROJECT MANAGER: TIFINI TRAN
DESIGN MANAGER: FEDRICO HORMOZI

LAST REVISION 02-25-15 — DATE PLOTTED => 25-JUN-2015 — TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	2	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

LOCATIONS OF CONSTRUCTION

Loc No.	COUNTY	Route	PM
1	ORA	5	0.3
2	ORA	5	0.6
3	ORA	5	0.9
4	ORA	5	1.3
5	ORA	5	1.2
6	ORA	5	1.5
7	ORA	5	1.6
8	ORA	5	1.7
9	ORA	5	1.8
10	ORA	5	2.1
11	ORA	5	2.3
12	ORA	5	2.5
13	ORA	5	2.8
14	ORA	5	2.8
15	ORA	5	3.2
16	ORA	5	3.4
17	ORA	5	3.4
18	ORA	5	3.5
19	ORA	5	3.6
20	ORA	5	4.0
21	ORA	5	4.0
22	ORA	5	4.0
23	ORA	5	4.0
24	ORA	5	4.1
25	ORA	5	4.1
26	ORA	5	4.6
27	ORA	5	4.7
28	ORA	5	5.3
29	ORA	5	5.6
30	ORA	5	5.7
31	ORA	5	5.9
32	ORA	5	5.9
33	ORA	5	5.9
34	ORA	5	6.5
35	ORA	5	6.6
36	ORA	5	6.6
37	ORA	5	6.8
38	ORA	5	6.8
39	ORA	5	6.8
40	ORA	5	6.8
41	ORA	5	6.9
42	ORA	5	7.5
43	ORA	5	7.8
44	ORA	5	8.0
45	ORA	5	8.6
46	ORA	5	8.6
47	ORA	5	8.8
48	ORA	5	9.2
49	ORA	5	9.4
50	ORA	5	9.4
51	ORA	5	9.7
52	ORA	5	9.7
53	ORA	5	10.1
54	ORA	5	10.4
55	ORA	5	10.6
56	ORA	5	10.7
57	ORA	5	10.7
58	ORA	5	10.8
59	ORA	5	11.1
60	ORA	5	11.4
61	ORA	5	11.9
62	ORA	5	12.3
63	ORA	5	12.4
64	ORA	5	12.8
65	ORA	5	12.8
66	ORA	5	12.8
67	ORA	5	12.9
68	ORA	5	12.9
69	ORA	5	13.1
70	ORA	5	13.6
71	ORA	5	13.7
72	ORA	5	13.8
73	ORA	5	13.8
74	ORA	5	13.9
75	ORA	5	14.5
76	ORA	5	14.5
77	ORA	5	14.9
78	ORA	5	14.9
79	ORA	5	15.0
80	ORA	5	15.0
81	ORA	5	15.1
82	ORA	5	15.3
83	ORA	5	15.4
84	ORA	5	15.8
85	ORA	5	16.3
86	ORA	5	16.5
87	ORA	5	16.5
88	ORA	5	16.6
89	ORA	5	16.9
90	ORA	5	16.7
91	ORA	5	17.3
92	ORA	5	17.4
93	ORA	5	17.5
94	ORA	5	17.5
95	ORA	5	17.5
96	ORA	5	17.6
97	ORA	5	17.9
98	ORA	5	18.2
99	ORA	5	18.5
100	ORA	5	18.6
101	ORA	5	18.7
102	ORA	5	18.7
103	ORA	5	18.7
104	ORA	5	18.8
105	ORA	5	18.9
106	ORA	5	19.0
107	ORA	5	19.3
108	ORA	5	19.5
109	ORA	5	19.8
110	ORA	5	19.8
111	ORA	5	19.9
112	ORA	5	20.0
113	ORA	5	20.2
114	ORA	5	20.2
115	ORA	5	20.6
116	ORA	5	20.6
117	ORA	5	20.6
118	ORA	5	20.7
119	ORA	5	20.9
120	ORA	5	21.0
121	ORA	5	21.0
122	ORA	5	21.3
123	ORA	5	21.9
124	ORA	5	22.0
125	ORA	5	22.0
126	ORA	5	22.0
127	ORA	5	22.0
128	ORA	5	22.8
129	ORA	5	22.9
130	ORA	5	23.1
131	ORA	5	23.1
132	ORA	5	23.2
133	ORA	5	23.3
134	ORA	5	23.9
135	ORA	5	30.0
136	ORA	5	30.4
137	ORA	5	30.6
138	ORA	5	30.9
139	ORA	5	30.9
140	ORA	5	30.9
141	ORA	5	31.1
142	ORA	5	31.1
143	ORA	5	31.2
144	ORA	5	31.4
145	ORA	5	31.6
146	ORA	5	31.6
147	ORA	5	31.8
148	ORA	5	31.9
149	ORA	5	31.9
150	ORA	5	32.0
151	ORA	5	32.3
152	ORA	5	32.3
153	ORA	5	32.4
154	ORA	5	32.4
155	ORA	5	32.5
156	ORA	5	32.5
157	ORA	5	32.6
158	ORA	5	33.0
159	ORA	5	33.0
160	ORA	5	33.1
161	ORA	5	33.2
162	ORA	5	33.3
163	ORA	5	33.3
164	ORA	5	33.3
165	ORA	5	33.6
166	ORA	5	33.8
167	ORA	5	34.1
168	ORA	5	34.2
169	ORA	5	34.3
170	ORA	5	34.4
171	ORA	5	34.6
172	ORA	5	34.8
173	ORA	5	34.9
174	ORA	5	34.9
175	ORA	5	35.0
176	ORA	5	35.1
177	ORA	5	35.2
178	ORA	5	35.2
179	ORA	5	35.2
180	ORA	5	35.2
181	ORA	5	35.4
182	ORA	5	35.6
183	ORA	5	35.8
184	ORA	5	35.9
185	ORA	5	36.3
186	ORA	5	36.4
187	ORA	5	36.4
189	ORA	5	36.4
188	ORA	5	36.4
190	ORA	5	36.5
191	ORA	5	36.5
192	ORA	5	36.6
193	ORA	5	36.8
194	ORA	5	36.7
195	ORA	5	36.7
196	ORA	5	37.0
197	ORA	5	37.4
198	ORA	5	37.4
199	ORA	5	37.4
200	ORA	5	37.5
201	ORA	5	37.7
202	ORA	5	38.0
203	ORA	5	38.1
204	ORA	5	38.1
205	ORA	5	38.5
206	ORA	5	38.9
207	ORA	5	38.9
208	ORA	5	39.0
209	ORA	5	39.3
210	ORA	5	39.3
211	ORA	5	39.3
212	ORA	5	39.3
213	ORA	5	39.5
214	ORA	5	39.6
215	ORA	5	40.0
216	ORA	5	40.5
218	ORA	5	40.7
217	ORA	5	40.7
219	ORA	5	40.7
220	ORA	5	41.0
221	ORA	5	41.3
222	ORA	5	41.8
223	ORA	5	41.9
224	ORA	5	41.9
225	ORA	5	42.1
226	ORA	5	42.5
227	ORA	5	42.9
228	ORA	5	43.0
229	ORA	5	43.0
230	ORA	5	43.3
231	ORA	5	43.5
232	ORA	5	43.6
233	ORA	5	43.9
234	ORA	5	44.0
235	ORA	5	44.2
236	ORA	5	44.0
237	ORA	5	44.3
238	ORA	5	44.4
239	ORA	73	5.00
240	ORA	73	11.0

LOCATIONS OF CONSTRUCTION

LC-1

REVISED BY | DATE REVISED
HUSSEIN KALAKECH | FEDRICO HORMOZI
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR
FEDRICO HORMOZI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans ELECTRICAL SYSTEMS

LAST REVISION 04-15-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	3	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

LOCATIONS OF CONSTRUCTION

Loc No.	COUNTY	Route	PM
241	ORA	73	11.2
242	ORA	73	11.4
243	ORA	73	11.8
244	ORA	73	11.8
245	ORA	73	11.8
246	ORA	73	12.1
247	ORA	73	12.2
248	ORA	73	12.5
249	ORA	73	12.7
250	ORA	73	12.7
251	ORA	73	12.9
252	ORA	73	13.2
253	ORA	73	13.4
254	ORA	73	13.9
255	ORA	73	13.9
256	ORA	73	13.9
257	ORA	73	14.0
258	ORA	73	14.0
259	ORA	73	14.0
260	ORA	73	14.4
261	ORA	73	14.7
262	ORA	73	14.8
263	ORA	73	15.1
264	ORA	73	15.3
265	ORA	73	15.3
266	ORA	73	15.4
267	ORA	73	15.9
268	ORA	73	16.1
269	ORA	73	16.1
270	ORA	73	16.2
271	ORA	73	16.4
272	ORA	73	16.6
273	ORA	73	17.0
274	ORA	73	17.2
275	ORA	73	17.4
276	ORA	73	17.4
277	ORA	73	17.6
278	ORA	73	17.9
279	ORA	73	18.3
280	ORA	73	18.6
281	ORA	73	19.5
282	ORA	73	19.8
283	ORA	73	20.2
284	ORA	73	20.4
285	ORA	73	20.6
286	ORA	73	20.7
287	ORA	73	20.8
288	ORA	73	21.1
289	ORA	73	21.5
290	ORA	73	21.8
291	ORA	73	22.0
292	ORA	73	22.2
293	ORA	73	22.5
294	ORA	73	22.7
295	ORA	73	22.7
296	ORA	73	22.8
297	ORA	73	23.2
298	ORA	73	23.5
299	ORA	73	23.5
300	ORA	73	23.5

Loc No.	COUNTY	Route	PM
301	ORA	73	23.7
302	ORA	73	23.8
303	ORA	73	23.9
304	ORA	73	24.1
305	ORA	73	24.4
306	ORA	73	24.7
307	ORA	73	24.8
308	ORA	73	25.0
309	ORA	73	25.3
310	ORA	73	25.7
311	ORA	91	17.8
312	ORA	133	9.4
313	ORA	133	10.1
314	ORA	133	10.5
315	ORA	133	10.7
316	ORA	133	11.1
317	ORA	133	11.4
318	ORA	133	11.7
319	ORA	133	12.1
320	ORA	133	12.1
321	ORA	133	12.1
322	ORA	133	12.4
323	ORA	133	12.8
324	ORA	133	13.0
325	ORA	133	13.4
326	ORA	241	14.6
327	ORA	241	14.6
328	ORA	241	14.6
329	ORA	241	17.3
330	ORA	241	17.8
331	ORA	241	17.8
332	ORA	241	17.8
333	ORA	241	17.9
334	ORA	241	18.1
335	ORA	241	18.3
336	ORA	241	18.4
337	ORA	241	18.5
338	ORA	241	18.7
339	ORA	241	18.8
340	ORA	241	19.3
341	ORA	241	19.8
342	ORA	241	19.9
343	ORA	241	20.1
344	ORA	241	20.1
345	ORA	241	20.5
346	ORA	241	20.5
347	ORA	241	21.6
348	ORA	241	21.6
349	ORA	241	21.7
350	ORA	241	21.7
351	ORA	241	21.9
352	ORA	241	22.0
353	ORA	241	22.1
354	ORA	241	22.5
355	ORA	241	22.5
356	ORA	241	22.6
357	ORA	241	22.7
358	ORA	241	22.8
359	ORA	241	22.9
360	ORA	241	23.2

Loc No.	COUNTY	Route	PM
361	ORA	241	23.3
362	ORA	241	23.5
363	ORA	241	23.5
364	ORA	241	23.7
365	ORA	241	24.2
366	ORA	241	24.3
367	ORA	241	24.8
368	ORA	241	25.2
369	ORA	241	25.4
370	ORA	241	25.5
371	ORA	241	25.7
372	ORA	241	25.8
373	ORA	241	25.9
374	ORA	241	26.1
375	ORA	241	26.4
376	ORA	241	26.4
377	ORA	241	26.6
378	ORA	241	26.7
379	ORA	241	26.8
380	ORA	241	27.1
381	ORA	241	27.2
382	ORA	241	27.4
383	ORA	241	27.5
384	ORA	241	27.7
385	ORA	241	27.8
386	ORA	241	28.1
387	ORA	241	28.2
388	ORA	241	28.4
389	ORA	241	28.7
390	ORA	241	29.0
391	ORA	241	29.3
392	ORA	241	29.7
393	ORA	241	29.8
394	ORA	241	30.0
395	ORA	241	30.1
396	ORA	241	30.3
397	ORA	241	30.4
398	ORA	241	30.7
399	ORA	241	30.8
400	ORA	241	31.0
401	ORA	241	31.1
402	ORA	241	31.4
403	ORA	241	31.5
404	ORA	241	31.8
405	ORA	241	31.9
406	ORA	241	32.3
407	ORA	241	32.4
408	ORA	241	32.7
409	ORA	241	32.8
410	ORA	241	33.0
411	ORA	241	33.4
412	ORA	241	33.4
413	ORA	241	33.7
414	ORA	241	33.8
415	ORA	241	34.0
416	ORA	241	34.4
417	ORA	241	34.7
418	ORA	241	34.8
419	ORA	241	35.1
420	ORA	241	35.4

Loc No.	COUNTY	Route	PM
421	ORA	241	35.8
422	ORA	241	36.1
423	ORA	241	36.4
424	ORA	241	36.8
425	ORA	241	37.1
426	ORA	241	37.5
427	ORA	241	37.9
428	ORA	241	38.2
429	ORA	241	38.3
430	ORA	241	38.6
431	ORA	261	0.1
432	ORA	261	0.3
433	ORA	261	0.5
434	ORA	261	0.9
435	ORA	261	1.3
436	ORA	261	1.3
437	ORA	261	1.4
438	ORA	261	1.8
439	ORA	261	2.2
440	ORA	261	2.7
441	ORA	261	2.7
442	ORA	261	2.7
443	ORA	261	3.2
444	ORA	261	3.5
445	ORA	261	3.8
446	ORA	261	4.1
447	ORA	261	4.5
448	ORA	261	4.7
449	ORA	261	4.9
450	ORA	261	5.3
451	ORA	261	5.6
452	ORA	261	5.6
453	ORA	261	5.7
454	ORA	261	5.8
455	ORA	405	12.3

LOCATIONS OF CONSTRUCTION

LC-2

REVISED BY | DATE REVISED
HUSSEIN KALAKECH | FEDRICO HORMOZI
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR | FEDRICO HORMOZI
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

LAST REVISION 04-15-15 | DATE PLOTTED => 25-JUN-2015 | TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	4	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTES:

1. THE LOCATIONS OF EXISTING ELECTRICAL FACILITIES AND ELECTRICAL EQUIPMENT SUCH AS UNDERGROUND CONDUITS, PULL BOXES, SPLICE VAULTS, CONTROLLER CABINETS, SERVICE EQUIPMENT ENCLOSURES, POWER POLES, ARE APPROXIMATE.
2. THE CONTRACTOR MUST PROVIDE 72 HOURS NOTICE (3 WORKING DAYS) ADVANCE WRITTEN NOTICE TO THE ENGINEER AND ALL CONCERNED AGENCIES, PRIOR TO REMOVING OR MODIFYING ANY EXISTING ELECTRICAL FACILITIES.
3. EXISTING FREEWAY COMMUNICATION SYSTEM AND THE ASSOCIATED COMMUNICATION ELEMENT SYSTEMS MUST REMAIN OPERATIONAL UNTIL CUT-OVER TO TEMPORARY COMMUNICATION SYSTEM AND AS PERMITTED BY THE ENGINEER.

LEGEND:

EXISTING NETWORK SWITCH

NEW NETWORK SWITCH

ABBREVIATIONS:

L3AS	LAYER 3 ACCESS SWITCH
HDS	HUB DISTRICBUTION SWITCH
FOC	FIBER OPTIC CABLE
FDU	FIBER DISTRIBUTION UNIT
RMS	RAMP METERING SYSTEM
smfo	EXISTING SINGLE MODE FIBER OPTIC CABLE
SMFO	NEW SINGLE MODE FIBER OPTIC CABLE
TYPE A CABLE	36 SINGLEMODE FIBER OPTIC CABLE
TYPE B CABLE	72 SINGLEMODE FIBER OPTIC CABLE
TYPE C CABLE	72 SINGLEMODE FIBER OPTIC CABLE
TYPE D CABLE	12 SINGLEMODE FIBER OPTIC CABLE
HUB	NETWORK HUB
TS	TRAFFIC SIGNAL
TMS	TRAFFIC MONITORING STATION
TMC	TRANSPORTATION MANAGEMENT CENTER
RMS	RAMP METERING SYSTEM
CMS	CHANGEABLE MESSAGE SIGN
Mbps	MEGABITS PER SECOND
Gig	GIGABITS PER SECOND
VLAN	VIRTUAL LOCAL AREA NETWORK
VSS	VIRTUAL SWITCHING SYSTEM
L2	LAYER 2 OF OPEN SYSTEM INTERCONNECTION MODEL (OSI)
LX	LONG WAVELENGHT OPTICAL TRANSCEIVER
EX	EXTENDED DISTANCE OPTICAL TRANSCEIVER
SFP	SMALL FORM FACTOR PLUGGABLE (OPTICAL TRANSCEIVER MODULE)
VRRP	VIRTUAL ROUTER REDUNDANCE PROTOCOL
N2S	ETHERNET TO SERIAL CARD
CAT5	CATEGORY 5 NETWORKING CABLE
PDA	POWER DISTRIBUTION ASSEMBLY
RJ45	REGISTERED JACK 45 (8 WIRE CONNECTOR)
SC	SQUARE CONNECTOR

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LEGEND, NOTES AND ABBREVIATIONS

E-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: PAULINE NGUYEN
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 06-03-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	5	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

HUBS AND TMC

Location No.	Element	Device ID	Route	PM	Direction	Location	Equipment
18	HUB	HUB 3	5	3.5	NB	I-5 @ Avery Pkwy Off Ramp	Cisco 4500 Switch/Routers/Encoders
133	HUB	HUB 5	5	23.3	NB	SR-241 NB @ Portola	Cisco 4500 Switch
134	HUB	TMC	5	23.9	NB	I-5 @ Sand Canyon	Dual Cisco 6500 Switches/Routers/Decoders
169	HUB	HUB 1	5	34.3	SB	I-5 S To 22 E Exit La Veta 5/22/57	Cisco 4500 Switch/Routers/Encoders
239	HUB	HUB 7	73	5.0	NB	55/73	Cisco 4500 Switch
311	HUB	HUB 2	91	17.8	EB	91 E TO 55 SB O/R	Cisco 4500 Switch/Routers/Encoders
451	HUB	HUB 6	261	5.6	NB	Junction Of 261/241	Cisco 4500 Switch
455	HUB	HUB 4	405	12.3	NB	405 NB Euclid NB O/R	Cisco 4500 Switch/Routers/Encoders

MODIFY COMMUNICATION SYSTEM (HUBS AND TMC)

APPROVED FOR ELECTRICAL WORK ONLY

E-2

REVISED BY | DATE REVISED
HUSSEIN KALAKECH | FEDRICO HORMOZI
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR | FEDRICO HORMOZI
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans ELECTRICAL SYSTEMS

LAST REVISION 05-04-15 | DATE PLOTTED => 25-JUN-2015 | TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133 241,etc.	Var	6	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

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FIELD ELEMENTS

Location No.	Element	Device ID	Route	PM	Direction	Location
1	CMS	24	5	0.3	NB	County Line
20	CMS	74	5	4.0	NB	Vista Hermosa
26	CMS	10	5	4.6	SB	Vista Hermosa
43	CMS	31	5	7.8	NB	Aeropuerto
55	CMS	30	5	10.6	SB	Ortega Hwy
67	CMS	11	5	12.9	NB	Avery Pkwy
76	CMS	12	5	14.5	SB	Crown Valley Pkwy
97	CMS	73	5	17.9	SB	Los Alisos Ave
106	CMS	95	5	19.0	NB	El Toro
113	CMS	13	5	20.2	NB	405 Fwy
153	CMS	92	5	32.4	SB	17TH St
155	CMS	57	5	32.5	NB	17TH St
183	CMS	91	5	35.8	NB	State College
189	CMS	44	5	36.4	SB	South of Katella
206	CMS	90	5	38.7	SB	Broadway Ave
218	CMS	53	5	40.7	NB	Brookhurst St
234	CMS	54	5	44.0	SB	Artesia St
262	CMS	32	73	14.8	NB	S Laguna Hills Dr
286	CMS	34	73	20.7	SB	S Wildlife UC Bridge
308	CMS	33	73	25.0	NB	S. Birch St N/O-Jamboree

MODIFY COMMUNICATION SYSTEM (FIELD ELEMENTS)

APPROVED FOR ELECTRICAL WORK ONLY

E-3

REVISED BY | DATE REVISED
HUSSEIN KALAKECH | FEDRICO HORMOZI
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FUNCTIONAL SUPERVISOR
FEDRICO HORMOZI
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

LAST REVISION 05-04-15 | DATE PLOTTED => 25-JUN-2015 | TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	7	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

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FIELD ELEMENTS

Location No.	Element	Route	PM	Direction	Location
4	TS	5	1.3	NB	5 N/B On & Off Ramp @ El Camino Real
7	TS	5	1.6	NB	5 N/B On & Off Ramp @ El Camino Real / San Juan
8	TS	5	1.7	SB	5 S/B Off Ramp @ El Camino Real - Valencia
11	TS	5	2.3	NB	5 N/B On & Off Ramp @ Presidio
14	TS	5	2.8	SB	5 S/B Off Ramp @ Palizada
16	TS	5	3.4	NB	5 N/B @ Avenida Pico
17	TS	5	3.4	SB	5 S/B @ Avenida Pico
22	TS	5	4.0	SB	5 S/B @ Vista Hermosa Ave
23	TS	5	4.0	NB	5 N/B @ Vista Hermosa Ave
32	TS	5	5.9	SB	5 S/B @ Camino De Estrella
33	TS	5	5.9	NB	5 N/B @ Camino De Estrella
37	TS	5	6.8	NB	5 N/B Off Ramp @ Camino Las Ramblas
38	TS	5	6.8	SB	5 S/B Off Ramp @ Camino Las Ramblas
47	TS	5	8.8	SB	5 S/B Off Ramp @ Camino Capistrano
50	TS	5	9.4	NB	5 N/B @ Ortega HWY (74)
52	TS	5	9.7	SB	5 S/B @ Ortega HWY (74)
57	TS	5	10.7	NB	5 N/B Ramp @ Junipero Serra Rd
58	TS	5	10.8	SB	5 S/B Ramp @ Junipero Serra Rd
65	TS	5	12.8	NB	5 @ N/B Avery Parkway
66	TS	5	12.8	SB	5 S/B Avery Parkway
68	TS	5	12.9	NB	5 Avery Parkway/Camino Capistrano
72	TS	5	13.8	NB	5 N/B Ramp @ Crown Valley Pkwy
73	TS	5	13.8	SB	5 S/B Ramp @ Crown Valley Pkwy
77	TS	5	14.9	NB	5 @ Oso Parkway / Fairfield Inn
78	TS	5	14.9	NB	5 N/B Ramp @ Oso Parkway
79	TS	5	15.0	SB	5 S/B Ramp @ Oso Parkway
88	TS	5	16.6	NB	5 N/B @ La Paz - Muirlands
89	TS	5	16.6	SB	5 S/B @ La Paz - Cabot Rd
93	TS	5	17.5	SB	5 S/B Off Ramp @ Alicia Parkway
94	TS	5	17.5	NB	5 N/B Off Ramp @ Alicia Parkway
102	TS	5	18.7	NB	5 N/B Off Ramp @ El toro Rd / Bridger Rd
103	TS	5	18.7	SB	5 S/B Off Ramp@ Pased De Valencia/Avenida De La Carlota
105	TS	5	18.9	SB	5 S/B @ Avenida De La Carlotta / Pased De Valencia
108	TS	5	19.5	NB	5 N/B @ Lake Forest
109	TS	5	19.8	SB	5 S/B @ Lake Forest
115	TS	5	20.6	NB	5 N/B Off Bake Pkwy
118	TS	5	20.7	SB	5 S/B Off-Ramp @ Bake Pkwy
121	TS	5	21.0	NB	Alton Pkwy @ Enterprise
124	TS	5	22.0	NB	5 N/B Ramp @ Alton Pkwy
127	TS	5	22.2	SB	Alton Pkwy S/B Off Ramp / Enerprise / Fortune
129	TS	5	22.9	NB	5 @ Barranca Pkwy (Car Pool Off Ramp)
139	TS	5	30.9	NB	5 N/B Off Ramp @ First St / Elk
140	TS	5	30.9	SB	5 S/B On Ramp @ First St
141	TS	5	31.1	SB	5 S/B Off Ramp @ Fourth St
142	TS	5	31.1	NB	5 N/B Off Ramp @ Fourth St
146	TS	5	31.6	NB	5 N/B Off Ramp@ Grand Ave
147	TS	5	31.8	SB	5 S/B Off Ramp @ Santa Ana Blvd
148	TS	5	31.9	SB	5 S/B On Ramp @ Grand / Santa Ana Blvd
152	TS	5	32.3	NB	5 N/B Off Ramp @ 17th St / Santiago
154	TS	5	32.4	SB	5 S/B Off Ramp @ Penn Way

MODIFY COMMUNICATION SYSTEM (FIELD ELEMENTS)

APPROVED FOR ELECTRICAL WORK ONLY

E-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: HUSSEIN KALAKECH
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 05-04-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	8	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

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FIELD ELEMENTS

Location No.	Element	Route	PM	Direction	Location
159	TS	5	33.0	SB	5 S/B On Ramp @ Main / Buffalo
160	TS	5	33.1	SB	5 S/B Off Ramp @ Main / Santa Clara
162	TS	5	33.3	NB	5 N/B Off Ramp @ Broadway
164	TS	5	33.3	NB	5 N/B Off Ramp @ Main / Edge wood
172	TS	5	34.8	NB	Chapman Ave @ Renaissance (Pinnacle)
173	TS	5	34.9	NB	5 @ Chapman Ave / Rampart
174	TS	5	34.9	NB	5 N/B Off Ramp @ Chapman Ave
178	TS	5	35.2	NB	5 N/B Off Ramp @ State College Blvd / Anaheim Way
179	TS	5	35.2	SB	5 S/B Off Ramp @ State College Blvd / The City Drive
180	TS	5	35.2	NB	5 @ State College Blvd / Orange Center Dr
184	TS	5	35.9	NB	5 Hov Off Ramp @ Gene Autry Way
186	TS	5	36.4	NB	5 N/B Off Ramp @ Katella Ave / Anaheim Way
187	TS	5	36.4	SB	5 S/B Off Ramp @ Katella Ave / Manchester
193	TS	5	36.7	SB	5 S/B On Ramp @ Anaheim Blvd / Disney way- Manchester
194	TS	5	36.7	NB	5 N/B On Ramp @ Anaheim Blvd / Anaheim Way
195	TS	5	36.7	SB	5 S/B Off Ramp @ Disney Way
198	TS	5	37.4	NB	5 N/B Off Ramp @ Harbor Blvd
199	TS	5	37.4	SB	5 S/B Off Ramp @ Harbor Blvd
204	TS	5	38.1	SB	5 S/B Off Ramp @ Disneyland Dr
210	TS	5	39.3	NB	5 N/B Off Ramp @ Lincoln / Wilshire Blvd
211	TS	5	39.3	NB	5 @ Lincoln Ave / Manchester Ave
212	TS	5	39.3	SB	5 S/B Off Ramp @ Lincoln Ave
213	TS	5	39.5	NB	5 NB / SB Off Ramps @ Euclid St
219	TS	5	40.7	NB	5 NB / SB @ Brookhurst St
224	TS	5	41.9	NB	5 N/B Off Ramp @ Buckingham / Magnolia Ave
225	TS	5	42.1	SB	5 S/B On / Off Ramps @ Magnolia Ave
227	TS	5	42.9	NB	5 N/B Off Ramp @ Beach Blvd /1/64 Auto Center Dr
231	TS	5	43.5	NB	5 N/B Off Ramp @ Auto Center Dr
236	TS	5	44.3	NB	5 N/B Off Ramp @ Artesia Blvd / Firestone Blvd
237	TS	5	44.3	SB	5 S/B Off Ramp @ Artesia / Knott
243	TS	73	11.8	NB	73 N/B Off Ramp @ Green Field Dr
245	TS	73	11.8	SB	73 S/B Off Ramp @ Green Field Dr
249	TS	73	12.7	NB	Moulton Pkwy N/B Ramps
250	TS	73	12.7	SB	Moulton Pkwy S/B Ramps
255	TS	73	13.9	NB	La Paz N/B Ramps
256	TS	73	13.9	SB	La Paz S/B Off Ramp
258	TS	73	14.0	NB	Aliso Creek N/B Off Ramp
259	TS	73	14.0	SB	Aliso Creek S/B Off Ramp
264	TS	73	15.3	SB	73 S/B @ Gelen Wood Dr / Enterprise / Pacific park
265	TS	73	15.3	NB	73 N/B @ Glen Wood Dr
268	TS	73	16.1	SB	El Toro Rd S/B Off Ramp
269	TS	73	16.1	NB	El Toro Rd N/B Off Ramp
275	TS	73	17.4	SB	Laguna Canyon Rd S/B Off Ramp
276	TS	73	17.4	NB	Laguna Canyon Rd N/B Off Ramp
291	TS	73	22.0	NB	New Port Coast Dr N/B Off Ramp
294	TS	73	22.7	NB	Bonita Canyon Dr @ 73 N/B Ramps
295	TS	73	22.7	SB	Bonita Canyon Rd S/B Off Ramp
299	TS	73	23.5	NB	Bison Ave / NB -Off Ramp
300	TS	73	23.5	SB	Bison Ave / SB -Off Ramp
302	TS	73	23.8	NB	Macarthur Blvd / NB- Off Ramp

MODIFY COMMUNICATION SYSTEM (FIELD ELEMENTS)

APPROVED FOR ELECTRICAL WORK ONLY

E-5

REVISED BY | DATE REVISED
HUSSEIN KALAKECH | FEDRICO HORMOZI
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

LAST REVISION 05-04-15 | DATE PLOTTED => 25-JUN-2015 | TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	9	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

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FIELD ELEMENTS

Location No.	Element	Route	PM	Direction	Location
320	TS	133	12.1	NB	N/B Off Ramp & Irvine Blvd
321	TS	133	12.1	SB	S/B Off Ramp & Irvine Blvd
326	TS	241	14.6	NB	N/B On Ramp @ Oso Pkwy
327	TS	241	14.6	SB	S/B Off Ramp @ Oso Pkwy
328	TS	241	14.6	SB	S/B @ Oso Parkway / Tesoro Creek Rd
330	TS	241	17.8	NB	N/B Off Ramp @ Antonio Pkwy
332	TS	241	17.8	SB	S/B Off Ramp @ Antonio Pkwy
336	TS	241	18.5	SB	S/B Off Ramp @ Santa Marguerita
337	TS	241	18.5	NB	N/B Off Ramp @ Santa Marguerita
343	TS	241	20.1	NB	N/B Off Ramp @ Los Alisos
345	TS	241	20.5	SB	S/B Off Ramp @ Los Alisos
349	TS	241	21.7	NB	Off Ramps @ Portola
354	TS	241	22.5	NB	N/B On Ramp @ Lake Forest
355	TS	241	22.6	SB	S/B Off Ramp @ Lake Forest
362	TS	241	23.5	NB	Alton Pkwy
404	TS	241	31.8	NB	N/B Off Ramp @ Santiago Canyon 1/64 Rd
435	TS	261	1.3	SB	S/B On-Off Ramps & Irvine Blvd
436	TS	261	1.3	NB	N/B On-Off Ramps & Irvine Blvd
440	TS	261	2.7	NB	N/B On-Off Ramps & Portola Pkwy
441	TS	261	2.7	SB	S/B On-Off Ramps & Portola Pkwy
453	TS	261	5.7	NB	N/B On-Off Ramps & Santiago Canyon Rd
454	TS	261	5.8	SB	S/B On-Off Ramps & Santiago Canyon Rd

MODIFY COMMUNICATION SYSTEM (FIELD ELEMENTS)

APPROVED FOR ELECTRICAL WORK ONLY

E-6

REVISED BY | DATE REVISED
HUSSEIN KALAKECH | FEDRICO HORMOZI
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans ELECTRICAL SYSTEMS

LAST REVISION 05-04-15 | DATE PLOTTED => 25-JUN-2015 | TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	10	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER FEDRICO HORMOZI No. E14460 Exp. 6/30/16 ELECTRICAL STATE OF CALIFORNIA

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FIELD ELEMENTS

Location No.	Element	Device ID	Route	PM	Direction	Location
2	TMS	2611	5	0.6	SB	S LUIS REY
3	TMS	689	5	0.9	SB	CALAFIA
5	TMS	530	5	1.3	NB	MAGDALENA
6	TMS	688	5	1.5	SB	EL CAMINO REAL
9	TMS	531	5	1.8	NB	EL CAMINO REAL
10	TMS	687	5	2.1	SB	PRESIDIO
12	TMS	1514	5	2.5	NB	PRESIDIO
13	TMS	532	5	2.8	NB	PALIZADA
15	TMS	686	5	3.2	SB	PICO 1
19	TMS	533	5	3.6	NB	PICO 2
21	TMS	2036	5	4.0	NB	HERMOSA 1
24	TMS	5588	5	4.1	NB	HERMOSA 2
25	TMS	5509	5	4.1	SB	HERMOSA 2
27	TMS	2035	5	4.7	SB	S OF VAQUERO
28	TMS	2034	5	5.3	SB	N OF VAQUERO
29	TMS	685	5	5.6	SB	ESTRELLA
30	TMS	534	5	5.7	NB	ESTRELLA1
31	TMS	535	5	5.9	NB	ESTRELLA2
34	TMS	2543	5	6.5	NB	SACRAMENTO
35	TMS		5	6.6	SB	RTE 1 SB 3
36	TMS	684	5	6.6	SB	RTE 1 SB
39	TMS		5	6.8	NB	LAS RAMBLAS 3
40	TMS	549	5	6.8	SB	LAS RAMBLAS
41	TMS	536	5	6.9	NB	LAS RAMBLAS
42	TMS	539	5	7.5	NB	CAPISTRANO
44	TMS	2033	5	8.0	SB	AEROPUERTO
45	TMS	682	5	8.6	SB	S JUAN CREEK
46	TMS	540	5	8.6	NB	S JUAN CREEK
48	TMS	2032	5	9.2	SB	PLAZA
49	TMS	681	5	9.4	SB	ORTEGA 1
51	TMS	541	5	9.7	NB	ORTEGA 2
53	TMS	2031	5	10.1	SB	EL HORNO
54	TMS	5008	5	10.4	NB	SERRA PARK
56	TMS	680	5	10.7	SB	JUNIPERO SERRA
59	TMS	542	5	11.1	NB	JUNIPERO SERRA
60	TMS	2030	5	11.4	SB	TRABUCO
61	TMS	2544	5	11.9	NB	WILDWOOD
62	TMS	2009	5	12.3	NB	S OF 73
63	TMS	5011	5	12.4	SB	S OF 73
64	TMS	679	5	12.8	SB	AVERY 1
69	TMS	543	5	13.1	NB	AVERY 2
70	TMS	678	5	13.6	SB	CROWN VA1
71	TMS	544	5	13.7	NB	CROWN VA1
74	TMS	545	5	13.9	NB	CROWN VA2
75	TMS	2015	5	14.5	NB	FAIRCOURT
80	TMS	677	5	15.0	SB	OSO PARK1
81	TMS		5	15.1	NB	OSO PARK1
82	TMS	676	5	15.3	SB	OSO PARK2
83	TMS		5	15.4	NB	OSO PARK2
84	TMS	2014	5	15.8	SB	CERVANTES
85	TMS	674	5	16.3	SB	LA PAZ 1
86	TMS	673	5	16.5	SB	LA PAZ 2
87	TMS	550	5	16.5	NB	LA PAZ 1
90	TMS	552	5	16.7	NB	LA PAZ 2

APPROVED FOR ELECTRICAL WORK ONLY

MODIFY COMMUNICATION SYSTEM (FIELD ELEMENTS)

E-7

REVISED BY | DATE REVISED
HUSSEIN KALAKECH | FEDRICO HORMOZI
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR
FEDRICO HORMOZI
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

LAST REVISION 05-04-15 | DATE PLOTTED => 25-JUN-2015 | TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	11	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

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FIELD ELEMENTS

Location No.	Element	Device ID	Route	PM	Direction	Location
91	TMS	1447	5	17.3	SB	ALICIA 1
92	TMS	1445	5	17.4	NB	ALICIA 1
95	TMS	1446	5	17.5	SB	ALICIA 2
96	TMS	546	5	17.6	NB	ALICIA 2
98	TMS	2013	5	18.2	NB	ANKERTON
99	TMS	671	5	18.5	SB	EL TORO 1
100	TMS	554	5	18.6	NB	EL TORO 1
101	TMS	670	5	18.7	SB	EL TORO 2
104	TMS	555	5	18.8	NB	EL TORO 2
107	TMS	2012	5	19.3	NB	RED ROBIN
110	TMS	668	5	19.8	SB	LAKE FOREST 1
111	TMS	669	5	19.9	SB	LAKE FOREST 2
112	TMS	557	5	20.0	NB	LAKE FOR2
114	TMS	2011	5	20.2	NB	OLDFIELD
116	TMS	558	5	20.6	NB	BAKE 1
117	TMS	558	5	20.6	SB	BAKE 1
119	TMS	566	5	20.9	NB	BAKE 2
120	TMS	566	5	21.0	SB	BAKE 2
122	TMS	2303	5	21.3	SB	At 405
123	TMS	1518	5	21.9	SB	ALTON 1
125	TMS	1518	5	22.1	NB	ALTON 2
126	TMS	1520	5	22.2	NB	ALTON 3
128	TMS	2615	5	22.8	SB	BARRANCA
130	TMS	2616	5	23.1	SB	S OF 133
131	TMS	2617	5	23.1	SB	N OF 133
132	TMS	2619	5	23.2	NB	N OF 133
135	TMS	2267	5	30.2	NB	S OF 55
136	TMS	2268	5	30.4	NB	N OF 55
137	TMS	2288	5	30.6	SB	WILLIAMS
138	TMS	213	5	30.9	SB	1ST
143	TMS	568	5	31.2	NB	4TH
144	TMS	2300	5	31.4	NB	CONCORD
145	TMS	2320	5	31.6	SB	GRAND 1
149	TMS	569	5	31.9	NB	GRAND 2
150	TMS	212	5	32.0	SB	GRAND 2
151	TMS	211	5	32.3	SB	17TH 1
156	TMS	572	5	32.5	NB	17TH 2
157	TMS	570	5	32.6	NB	17TH 3
158	TMS	210	5	33.0	SB	MAIN 1
161	TMS	571	5	33.2	NB	MAIN 2
163	TMS	2302	5	33.3	SB	BROADWAY
165	TMS	5010	5	33.6	NB	SANTIAGO
166	TMS	2299	5	33.8	NB	S OF 22
167	TMS	2284	5	34.1	SB	LA VETA
168	TMS	2298	5	34.2	NB	LA VETA
170	TMS	2269	5	34.4	NB	N OF 57
171	TMS	265	5	34.6	SB	CHAPMAN 1
175	TMS	573	5	35.0	NB	CHAPMAN 2
176	TMS	5500	5	35.1	NB	STATE COLLEGE
177	TMS	264	5	35.2	SB	STATE COLLEGE
181	TMS	5502	5	35.4	SB	ORANGEWOOD 1
182	TMS	2018	5	35.6	NB	GENE AUTRY
185	TMS	263	5	36.3	SB	KATELLA
188	TMS	5503	5	36.4	NB	ORANGEWOOD 2

APPROVED FOR ELECTRICAL WORK ONLY

MODIFY COMMUNICATION SYSTEM (FIELD ELEMENTS)

E-8

REVISED BY | DATE REVISED
HUSSEIN KALAKECH | FEDRICO HORMOZI
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR
FEDRICO HORMOZI
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

LAST REVISION 05-04-15 | DATE PLOTTED => 25-JUN-2015 | TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	12	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

FIELD ELEMENTS

Location No.	Element	Device ID	Route	PM	Direction	Location
190	TMS	5504	5	36.5	SB	ANAHEIM 1
191	TMS	574	5	36.5	NB	KATELLA
192	TMS	5504	5	36.6	NB	ANAHEIM 2
196	TMS	2491	5	37.0	NB	S OF HARBOR
197	TMS	575	5	37.4	NB	HARBOR
200	TMS	261	5	37.5	SB	HARBOR
201	TMS	576	5	37.7	NB	BALL
202	TMS	260	5	38.0	SB	SOUTH 1
203	TMS	577	5	38.1	NB	SOUTH 2
205	TMS	2017	5	38.5	SB	PEPPER
207	TMS	578	5	38.9	NB	LINCOLN
208	TMS	595	5	39.0	SB	LINCOLN
209	TMS	5505	5	39.3	SB	EUCLID 1
214	TMS	580	5	39.6	NB	EUCLID 2
215	TMS	581	5	40.0	NB	CRESCENT
216	TMS	259	5	40.5	SB	BROOKHURST 1
217	TMS	1512	5	40.7	NB	BROOKHURST 2
220	TMS	582	5	41.0	NB	LA PALMA
221	TMS	2016	5	41.3	NB	GILBERT
222	TMS	258	5	41.8	SB	MAGNOLIA
223	TMS	2270	5	41.9	NB	MAGNOLIA 2
226	TMS	266	5	42.5	NB	ORANGETHORPE 2
228	TMS		5	43.0	NB	N OF ORANGETHORPE
229	TMS	257	5	43.0	NB	STANTON
230	TMS	2559	5	43.3	SB	BEACH 1
232	TMS		5	43.6	NB	BEACH 2
233	TMS		5	43.9	SB	WESTERN
235	TMS		5	44.2	SB	ARTESIA 1
238	TMS		5	44.4	NB	ARTESIA 2
240	TMS	7310	73	11.0	NB	CAPISTRANO
241	TMS	7311	73	11.2	NB	SORRENTO
242	TMS	7312	73	11.4	SB	CABOT
244	TMS	7313	73	11.8	SB	GREENFIELD 1
246	TMS	7314	73	12.1	NB	GREENFIELD 2
247	TMS	7315	73	12.2	NB	ROCKRIDGE
248	TMS	7316	73	12.5	NB	WESTRIDGE
251	TMS	7317	73	12.9	SB	MOULTON
252	TMS	7318	73	13.2	NB	PACIFIC PARK
253	TMS	7319	73	13.4	NB	LA PAZ 1
254	TMS	7321	73	13.9	NB	ALICIA
257	TMS	7322	73	14.0	NB	ALISO 1
260	TMS	7323	73	14.4	NB	ALISO 3
261	TMS	7325	73	14.7	NB	ALISO 4
263	TMS	7326	73	15.1	NB	LAGUNA HILLS
266	TMS	7327	73	15.4	NB	GLENWOOD 1
267	TMS	7328	73	15.9	SB	EL TORO 1
270	TMS	7329	73	16.2	SB	EL TORO 2
271	TMS	7330	73	16.4	SB	EL TORO 3
272	TMS	7331	73	16.6	NB	EL TORO 4
273	TMS	7334	73	17.0	NB	RTE 133 - 3
274	TMS	7335	73	17.2	NB	RTE 133 4
277	TMS	7336	73	17.6	NB	S OF PM 18
278	TMS	7337	73	18.0	NB	AT PM 18
279	TMS	7338	73	18.3	NB	WILDLIFE

APPROVED FOR ELECTRICAL WORK ONLY

MODIFY COMMUNICATION SYSTEM (FIELD ELEMENTS)

E-9

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: HUSSEIN KALAKECH
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 05-04-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	13	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

FIELD ELEMENTS

Location No.	Element	Device ID	Route	PM	Direction	Location
280	TMS	7339	73	18.6	NB	CATALINA 1
281	TMS	7340	73	19.5	NB	CATALINA 2
282	TMS	7341	73	19.8	NB	CATALINA 3
283	TMS	7342	73	20.2	NB	SAND CANYON 1
284	TMS	7343	73	20.4	NB	SAND CANYON 2
285	TMS	7344	73	20.6	NB	SAND CANYON 3
287	TMS	7345	73	20.8	NB	SAND CANYON 4
288	TMS	7346	73	21.1	NB	SAND CANYON 5
289	TMS	7347	73	21.5	SB	NEWPORT COAST 1
290	TMS	7348	73	21.8	NB	NEWPORT COAST 2
292	TMS	7349	73	22.2	NB	S OF BONITA
293	TMS	7350	73	22.5	SB	BONITA 1
296	TMS	7351	73	22.8	NB	BONITA 2
297	TMS	7352	73	23.2	NB	N OF BONITA
298	TMS	7353	73	23.5	SB	BISON 1
301	TMS	7354	73	23.7	SB	MACARTHUR 1
303	TMS	7372	73	23.9	NB	BISON 2
304	TMS	7355	73	24.1	NB	MACARTHUR 2
305	TMS	7356	73	24.4	NB	UNIVERSITY SOUTH
306	TMS	7357	73	24.7	SB	JAMBOREE 1
307	TMS	7358	73	24.8	NB	JAMBOREE 2
309	TMS	7360	73	25.3	SB	ORCHID
310	TMS	7361	73	25.7	NB	CAMPUS
312	TMS	6100	133	9.4	NB	S OF 5
313	TMS	6103	133	10.1	NB	MARINE WAY
314	TMS	6104	133	10.5	NB	N OF MARINE
315	TMS	6105	133	10.7	NB	S OF PM 11
316	TMS	6106	133	11.1	NB	AT PM 11
317	TMS	6107	133	11.4	NB	N OF PM 11
318	TMS	6580	133	11.7	SB	IRVINE BLVD 1
319	TMS	6582	133	12.1	NB	IRVINE BLVD 3
322	TMS	6108	133	12.4	NB	S OF PORTOLA
323	TMS	6109	133	12.8	NB	N OF PORTOLA
324	TMS	6110	133	13.0	NB	ORANGE 1
325	TMS	6111	133	13.4	NB	ORANGE 2
329	TMS		241	17.3	NB	SOLAR S OF ANTONIO
331	TMS	6550	241	17.8	NB	ANTONIO 2
333	TMS		241	17.9	NB	SOLAR ANTONIO 2
334	TMS	6050	241	18.1	NB	BANDERAS
335	TMS	6551	241	18.3	SB	SANTA MARGUERITA
338	TMS	6552	241	18.7	NB	SANTA MARGARITA
339	TMS	6051	241	18.8	NB	TRABUCO CREEK
340	TMS	6052	241	19.3	NB	MELINDA
341	TMS	6553	241	19.8	SB	LOS ALISOS 1
342	TMS		241	19.9	SB	SOLAR LOS ALISOS 1
344	TMS	6554	241	20.1	NB	LOS ALISOS 2
346	TMS	6053	241	20.5	NB	UPPER OSO
347	TMS	6054	241	21.6	NB	PORTOLA S 1
348	TMS	6555	241	21.6	SB	PORTOLA S 1
350	TMS		241	21.7	SB	SOLAR PORTOLA S1
351	TMS	6556	241	21.9	NB	PORTOLA S 2
352	TMS		241	22.0	SB	PORTOLA S 2
353	TMS		241	22.1	SB	SOLAR PORTOLA S2
356	TMS	6557	241	22.6	NB	LAKE FOREST

APPROVED FOR ELECTRICAL WORK ONLY

MODIFY COMMUNICATION SYSTEM (FIELD ELEMENTS)

E-10

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: HUSSEIN KALAKECH
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 05-04-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	14	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

FIELD ELEMENTS

Location No.	Element	Device ID	Route	PM	Direction	Location
357	TMS		241	22.7	NB	SOLAR LAKE FOREST
358	TMS		241	22.8	NB	BAKE
359	TMS		241	22.9	NB	SOLAR BAKE
360	TMS	6558	241	23.2	SB	ALTON 1
361	TMS		241	23.3	SB	SOLAR ALTON 1
363	TMS		241	23.5	NB	ALTON 2
364	TMS		241	23.7	NB	SOLAR ALTON 2
365	TMS	6057	241	24.2	NB	N OF ALTON
366	TMS		241	24.3	NB	SOLAR N OF ALTON
367	TMS	6561	241	24.8	SB	SOUTH OF PORTOLA
368	TMS		241	25.2	NB	PORTOLA N2
369	TMS	6058	241	25.4	NB	TOMATO 1
370	TMS		241	25.5	NB	SOLAR TOMATO 1
371	TMS	6059	241	25.7	SB	TOMATO 2
372	TMS		241	25.8	SB	SOLAR TOMATO 2
373	TMS	6060	241	26.0	NB	TOMATO 3
374	TMS		241	26.1	NB	SOLAR TOMATO 3
375	TMS	6061	241	26.4	SB	TOMATO 4
376	TMS		241	26.4	SB	SOLAR TOMATO 4
377	TMS	6062	241	26.6	NB	133-1
378	TMS		241	26.7	NB	SOLAR 133-1
379	TMS	6063	241	26.8	NB	133-2
380	TMS	6064	241	27.1	NB	133-3
381	TMS		241	27.2	NB	SOLAR 133-3
382	TMS	6065	241	27.4	NB	BEE CANYON
383	TMS		241	27.5	NB	SOLAR BEE CANYON
384	TMS	6066	241	27.7	NB	N OF 133
385	TMS		241	27.8	NB	SOLAR N OF 133
386	TMS	6067	241	28.1	NB	S OF JEFFREY
387	TMS		241	28.2	NB	SOLAR S OF JEFFREY
388	TMS	6068	241	28.4	NB	N OF JEFFREY
389	TMS		241	28.7	NB	N OF HAUL ROAD
390	TMS	6070	241	29.0	NB	HAUL-CULVER
391	TMS	6071	241	29.3	NB	S OF CULVER S
392	TMS	6072	241	29.7	NB	N OF CULVER S
393	TMS		241	29.8	NB	SOLAR N OF CULVER
394	TMS	6073	241	30.0	NB	CULVER-CULVER 1
395	TMS		241	30.1	NB	SOLAR CUL-CULVER 1
396	TMS	6074	241	30.3	NB	CULVER-CULVER 2
397	TMS		241	30.4	NB	SOLAR CUL-CULVER 2
398	TMS	6075	241	30.7	NB	S OF CULVER N
399	TMS		241	30.8	NB	SOLAR S OF CULVER N
400	TMS	6076	241	31.0	NB	N OF CULVER N
401	TMS		241	31.1	NB	SOLAR N OF CULVER N
402	TMS	6077	241	31.4	NB	S OF EOC OC
403	TMS		241	31.5	NB	SOLAR S OF EOC OC
405	TMS		241	31.9	NB	CHAPMAN 1
406	TMS	6562	241	32.3	NB	CHAPMAN 2
407	TMS		241	32.4	NB	SOLAR CHAPMAN 2
408	TMS	6079	241	32.7	NB	CHAPMAN 3
409	TMS		241	32.8	NB	SOLAR CHAPMAN 3
410	TMS	6563	241	33.0	NB	CHAPMAN 4
411	TMS	6080	241	33.4	NB	N OF CHAPMAN
412	TMS		241	33.5	NB	SOLAR N OF CHAPMAN

APPROVED FOR ELECTRICAL WORK ONLY

MODIFY COMMUNICATION SYSTEM (FIELD ELEMENTS)

E-11

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: HUSSEIN KALAKECH
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 05-04-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	15	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

FIELD ELEMENTS

Location No.	Element	Device ID	Route	PM	Direction	Location
413	TMS	6081	241	33.7	NB	S OF SANT CREEK
414	TMS		241	33.8	NB	SOLAR S OF SANT CK
415	TMS	6082	241	34.0	NB	N OF SANT CR1
416	TMS	6083	241	34.4	NB	N OF SANT CR2
417	TMS	6084	241	34.7	NB	S OF OAK
418	TMS		241	34.8	NB	SOLAR S OF OAK
419	TMS	6085	241	35.1	NB	N OF OAK
420	TMS	6086	241	35.4	NB	S OF SCE OC
421	TMS	6087	241	35.8	NB	WINDY RIDGE 1
422	TMS		241	36.1	NB	WINDY RIDGE 2
423	TMS		241	36.4	NB	WINDY RIDGE 3
424	TMS	6090	241	36.8	NB	W R WILDLIFE
425	TMS		241	37.1	NB	N OF W R WILDLIFE 1
426	TMS	6092	241	37.5	NB	N OF W R WILDLIFE 2
427	TMS	6093	241	37.9	NB	N OF W R WILDLIFE 3
428	TMS	6094	241	38.2	NB	S OF 91
429	TMS	6096	241	38.3	NB	RT 91 OFF
430	TMS		241	38.6	SB	RT 91 ON
431	TMS	6115	261	0.0	NB	JAMBOREE
432	TMS	6585	261	0.3	NB	WALNUT 2
433	TMS	6116	261	0.5	SB	S OF 5
434	TMS	6117	261	0.9	NB	EL CAMINO REAL
437	TMS	6586	261	1.4	SB	IRVINE BLVD 1
438	TMS	6587	261	1.8	NB	IRVINE BLVD 2
439	TMS	6118	261	2.2	NB	IRVINE RANCH
442	TMS	6588	261	2.7	SB	PORTOLA 1
443	TMS	6589	261	3.2	NB	PORTOLA 2
444	TMS	6119	261	3.5	NB	PORTOLA 3
445	TMS	6120	261	3.8	NB	PORTOLA 4
446	TMS	6121	261	4.1	NB	S OF UTILITY
447	TMS	6122	261	4.5	NB	N OF UTILITY
448	TMS	6123	261	4.7	NB	HANDY 1
449	TMS	6124	261	4.9	NB	HANDY 2
450	TMS	6125	261	5.3	NB	HANDY 3
452	TMS	6590	261	5.6	NB	CHAPMAN

MODIFY COMMUNICATION SYSTEM (FIELD ELEMENTS)

APPROVED FOR ELECTRICAL WORK ONLY

E-12

REVISED BY | DATE REVISED
HUSSEIN KALAKECH | FEDRICO HORMOZI
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR
FEDRICO HORMOZI
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

LAST REVISION 05-04-15 | DATE PLOTTED => 25-JUN-2015 TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	16	25

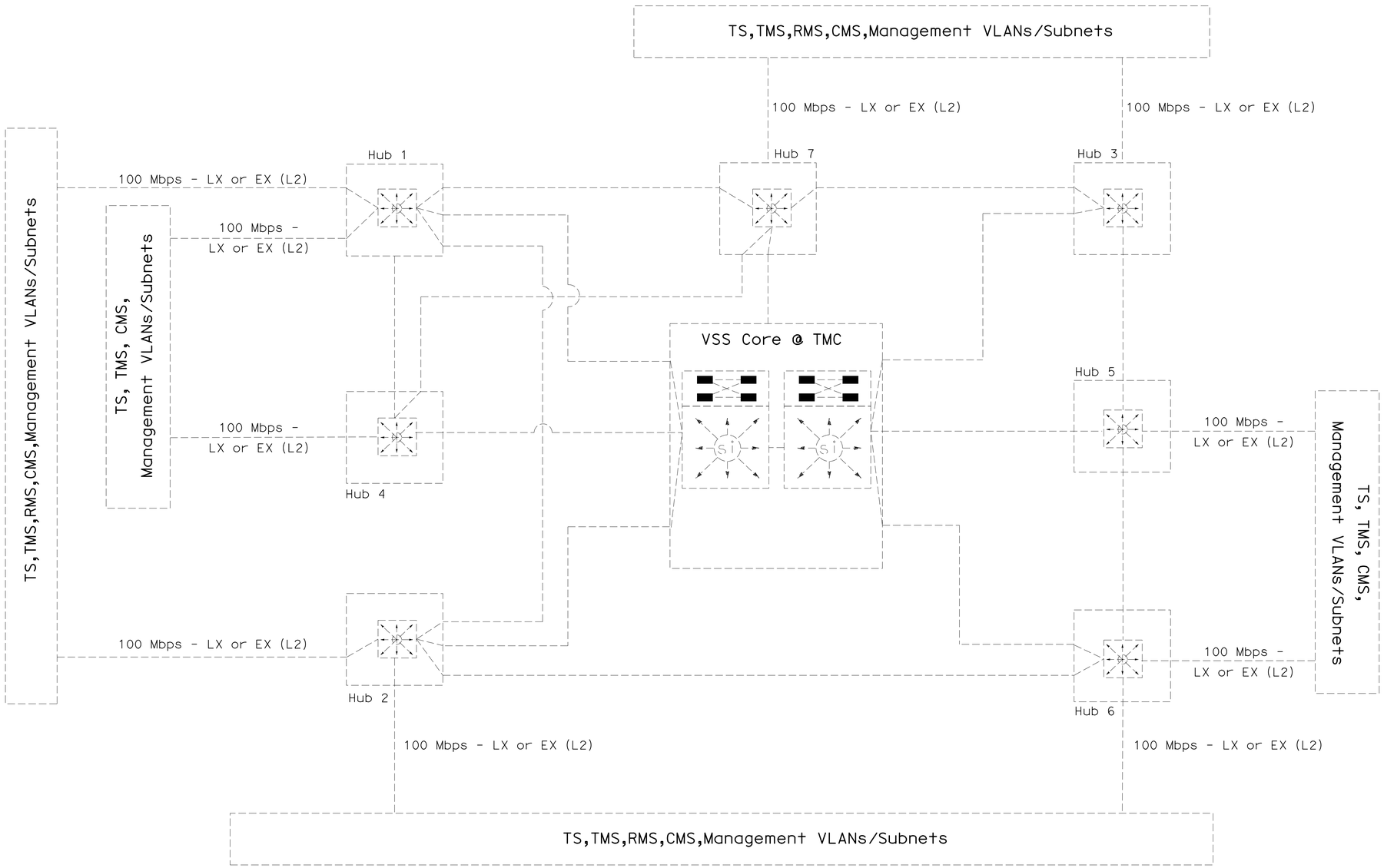
REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER FEDRICO HORMOZI No. E14460 Exp. 6/30/16 ELECTRICAL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

EXISTING TOSNET DIGITAL NETWORK INFRASTRUCTURE



NO WORK THIS SHEET. FOR INFORMATION ONLY

ELECTRICAL DETAILS TOSNET DIGITAL NETWORK INFRASTRUCTURE (EXISTING)

E-13

APPROVED FOR ELECTRICAL WORK ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: HUSSEIN KALAKECH
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 05-04-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	17	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER FEDRICO HORMOZI No. E14460 Exp. 6/30/16 ELECTRICAL STATE OF CALIFORNIA

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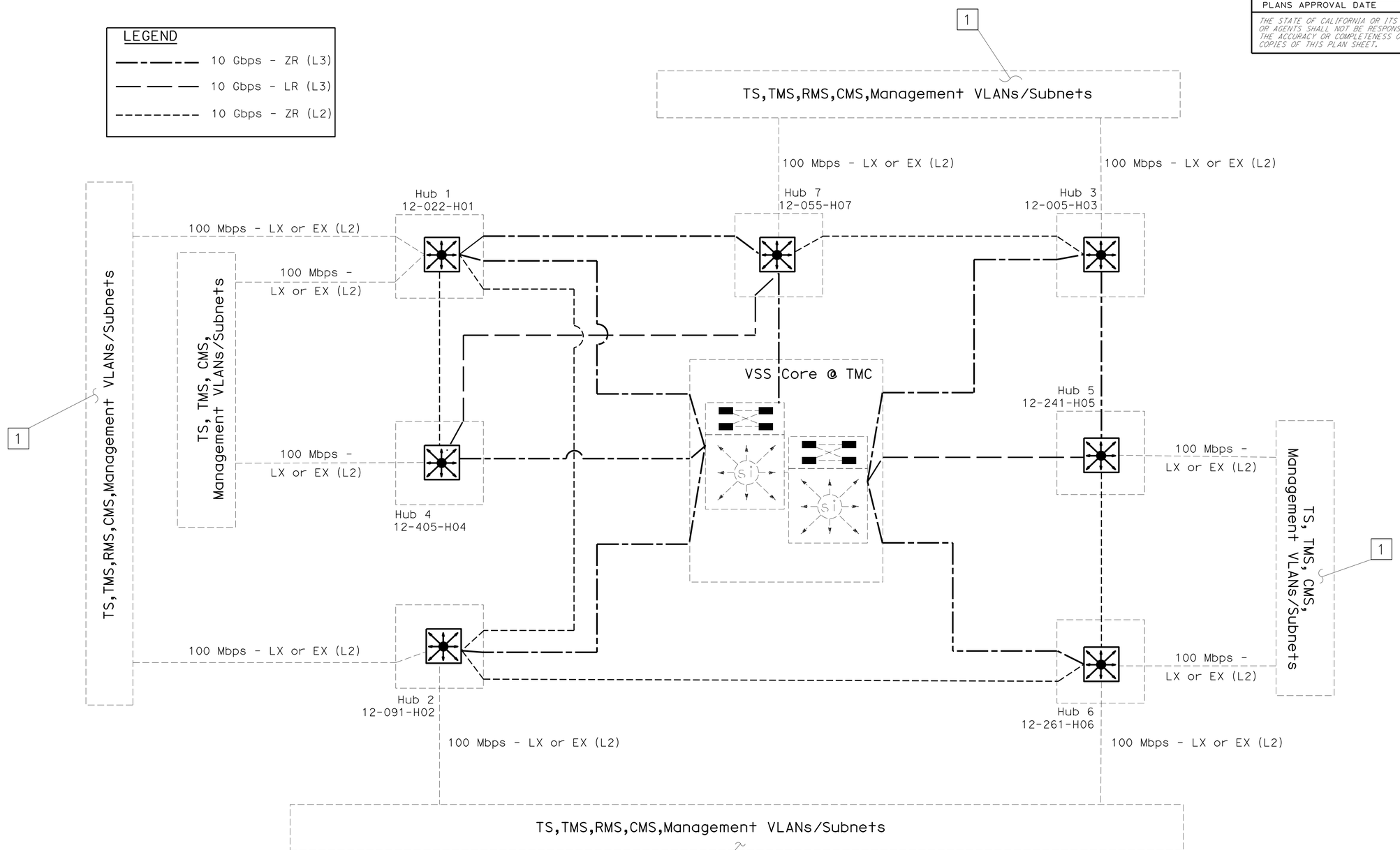
PROPOSED TOSNET DIGITAL NETWORK INFRASTRUCTURE

NOTE (THIS SHEET):

1 SEE TYPICAL DETAIL FOR SWITCH CIRCUIT DETAILS ON SHEET E-20



ELECTRICAL DETAILS TOSNET DIGITAL NETWORK INFRASTRUCTURE (NEW)

APPROVED FOR ELECTRICAL WORK ONLY

E-14

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: HUSSEIN KALAKECH
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 05-03-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	18	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

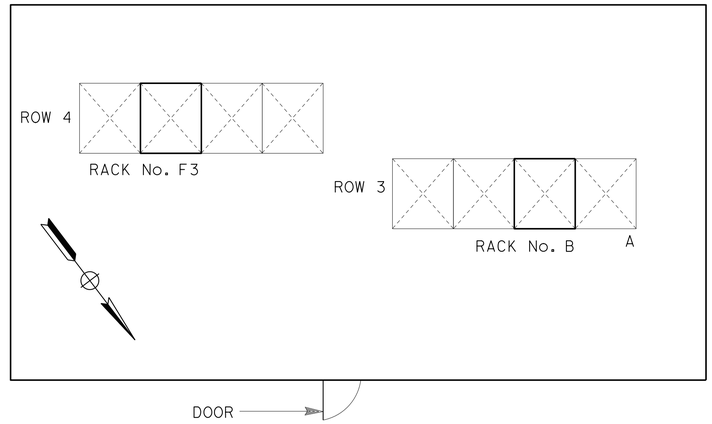
EXISTING TMC COMMUNICATION ROOM

NOTE (THIS SHEET):

1. MODIFY EXISTING CISCO CATALYST C6506-E VIRTUAL SWITCHING SYSTEM TO PROVIDE THE PROPER COMMUNICATIONS TO THE PROPOSED FIELD ELEMENTS, AS DIRECTED BY THE ENGINEER.

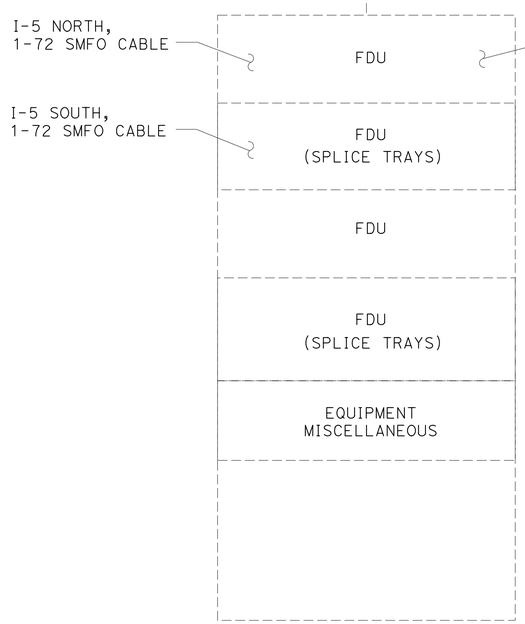
LEGEND

1 RS EXISTING SUPERVISORY CARD AND DELIVER TO ELECTRICAL SYSTEMS BRANCH.

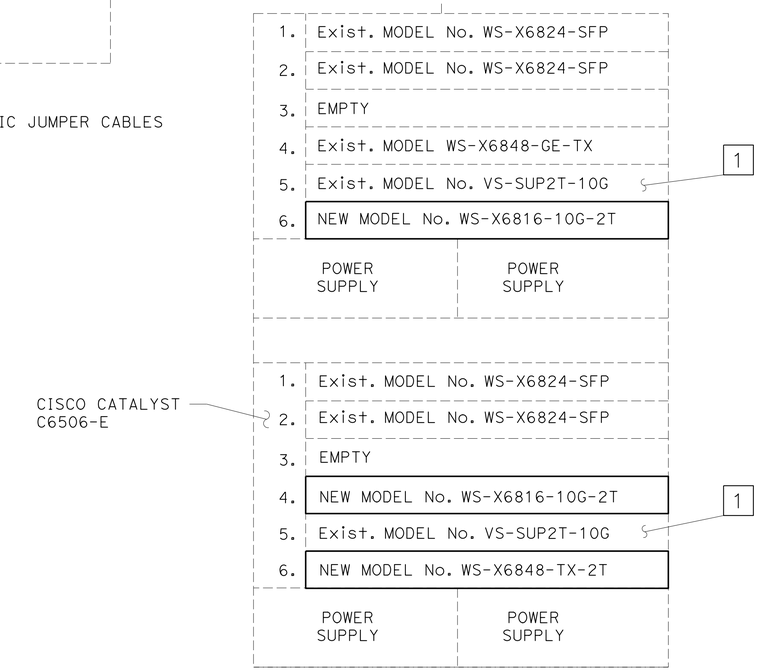


EXISTING TMC COMMUNICATION ROOM

EXISTING FIBER OPTIC JUMPER CABLES



EXISTING EQUIPMENT
RACK No. F3



EXISTING EQUIPMENT
RACK No. B

ELECTRICAL DETAILS (TMC COMMUNICATION ROOM)

APPROVED FOR ELECTRICAL WORK ONLY

E-15

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: HUSSEIN KALAKECH
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 05-04-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	19	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

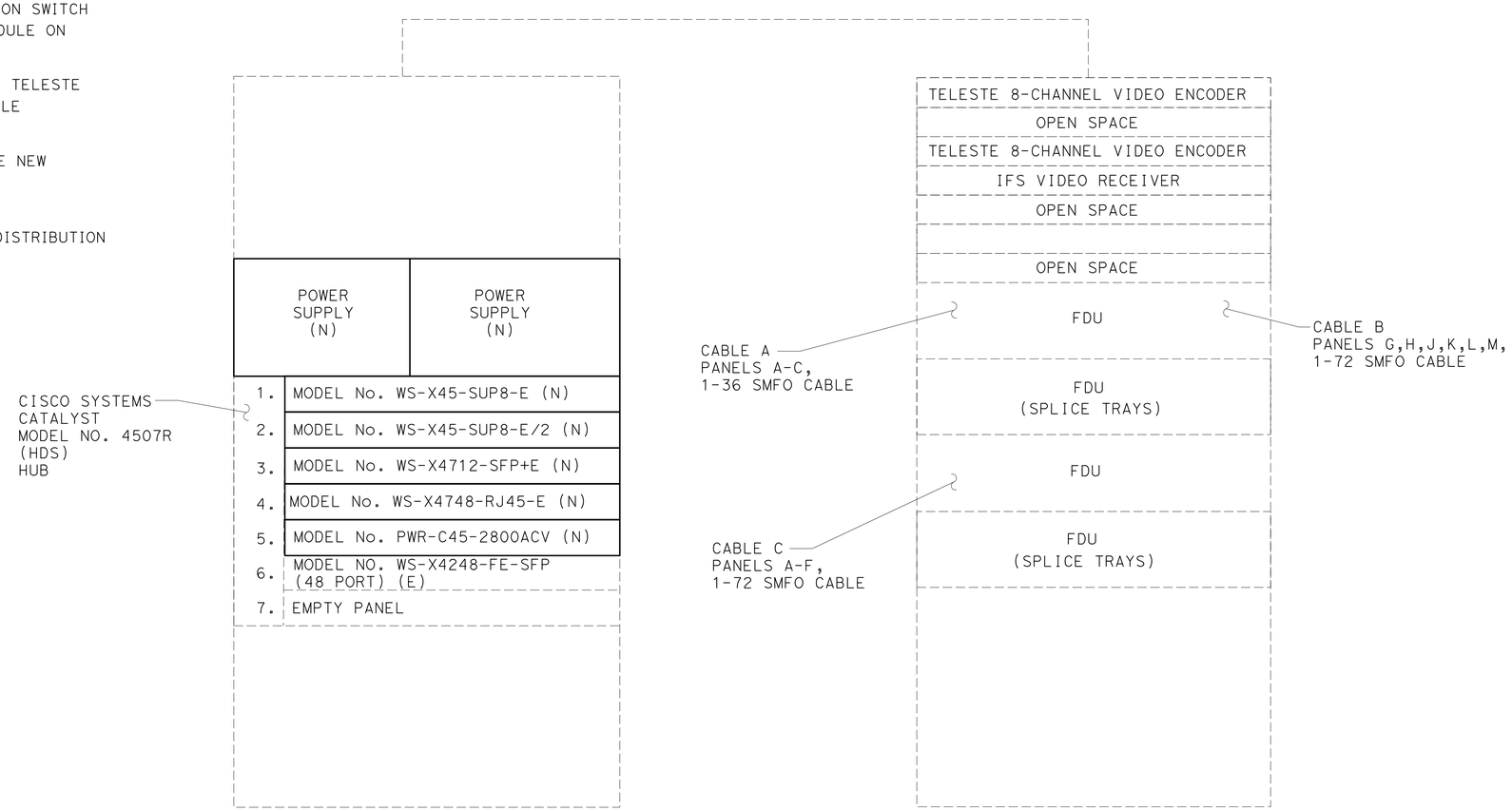
REGISTERED PROFESSIONAL ENGINEER FEDRICO HORMOZI No. E14460 Exp. 6/30/16 ELECTRICAL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

EXISTING HUB DETAILS (HUBS 1-4)

NOTES (SHEETS E-16 AND E-17)

1. RS EXISTING CISCO CATALYST 4507R DISTRIBUTION SWITCH WITH DUAL SUPERVISORS FOR REDUNDANCY.
2. RS THE 1 GIG LAYER 3 SFP'S OF THE LINKS TO THE TMC AND L2 VRRP LINKS TO ADJACENT HUBS OVER FIBER OPTIC PLANT.
3. RR THE 100 LX OR EX SFP'S THAT CONNECT THE FIELD ELEMENT CHAINS TO THE DISTRIBUTION SWITCH AND REUSE THE EXISTING COPPER LINE MODULE ON THE NEW DISTRIBUTION SWITCH.
4. RECONNECT MULTI-CHANNEL ENCODERS FROM TELESTE ARE CONNECTED TO THE COPPER LINE MODULE ON THE NEW SWITCH.
5. RR THE SAME FIBER JUMPER CABLE ON THE NEW SWITCH FOR THE LINKS GOING TO TMC AND ADJACENT HUBS.
6. INSTALL, SETUP AND CONFIGURE THE NEW DISTRIBUTION SWITCH.



FOR NOTES AND LEGEND SEE SHEET E-1

ELECTRICAL DETAILS (HUBS 1-4)

NO SCALE

APPROVED FOR ELECTRICAL WORK ONLY

E-16

REVISED BY | DATE REVISED
HUSSEIN KALAKECH | FEDRICO HORMOZI
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans ELECTRICAL SYSTEMS

LAST REVISION 06-02-15 | DATE PLOTTED => 25-JUN-2015 | TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	20	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

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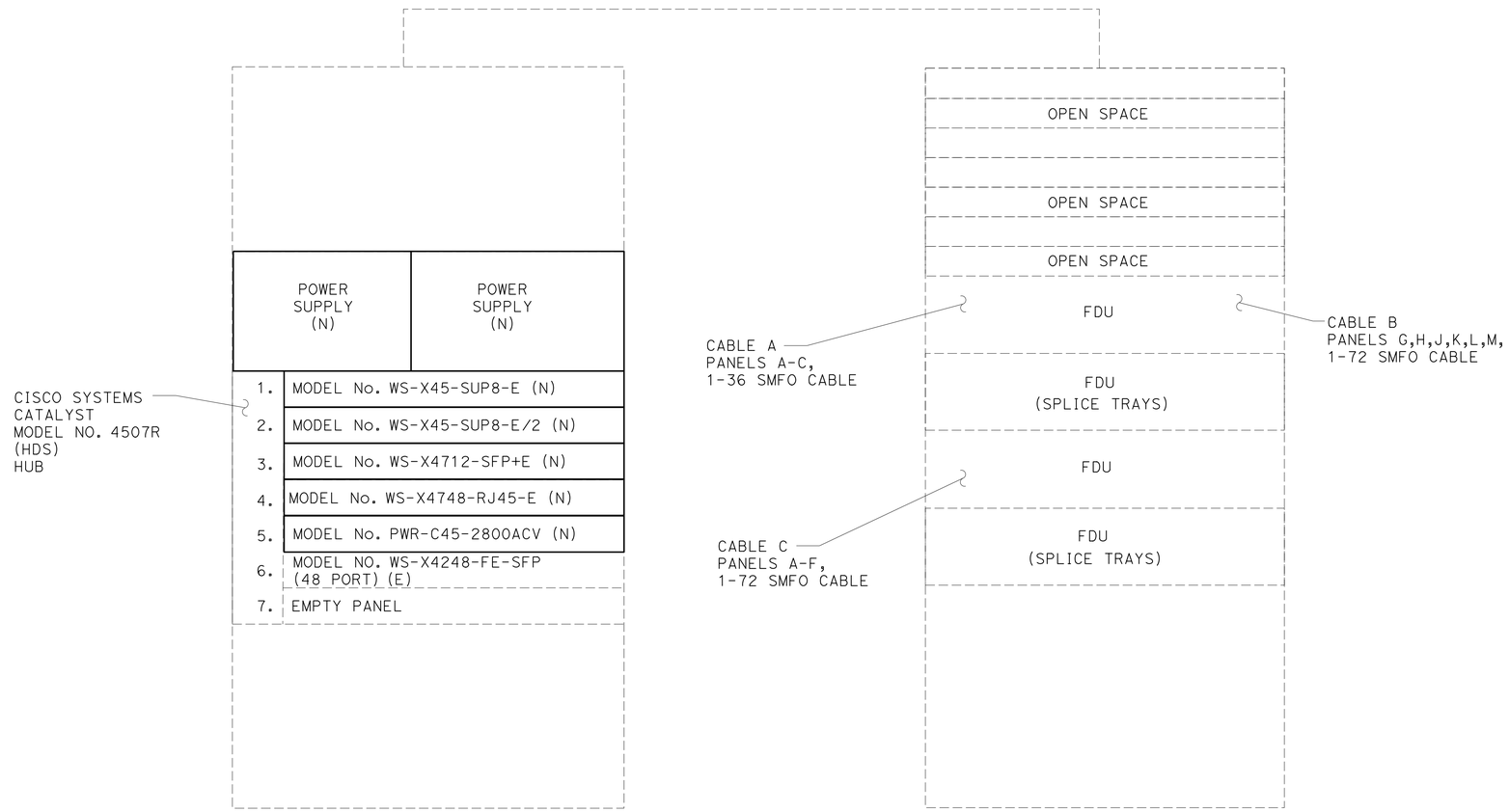
NOTE (THIS SHEET):

1. REFER TO NOTES ON SHEET E-16

EXISTING HUB DETAILS (HUBS 5-7)



EXISTING EQUIPMENT RACK
(N) - NEW
(E) - EXISTING

EXISTING EQUIPMENT RACK

FOR NOTES AND LEGEND SEE SHEET E-1

ELECTRICAL DETAILS (HUBS 5-7)

NO SCALE

APPROVED FOR ELECTRICAL WORK ONLY

E-17

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: HUSSEIN KALAKECH
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 06-02-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	21	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER FEDRICO HORMOZI No. E14460 Exp. 6/30/16 ELECTRICAL STATE OF CALIFORNIA

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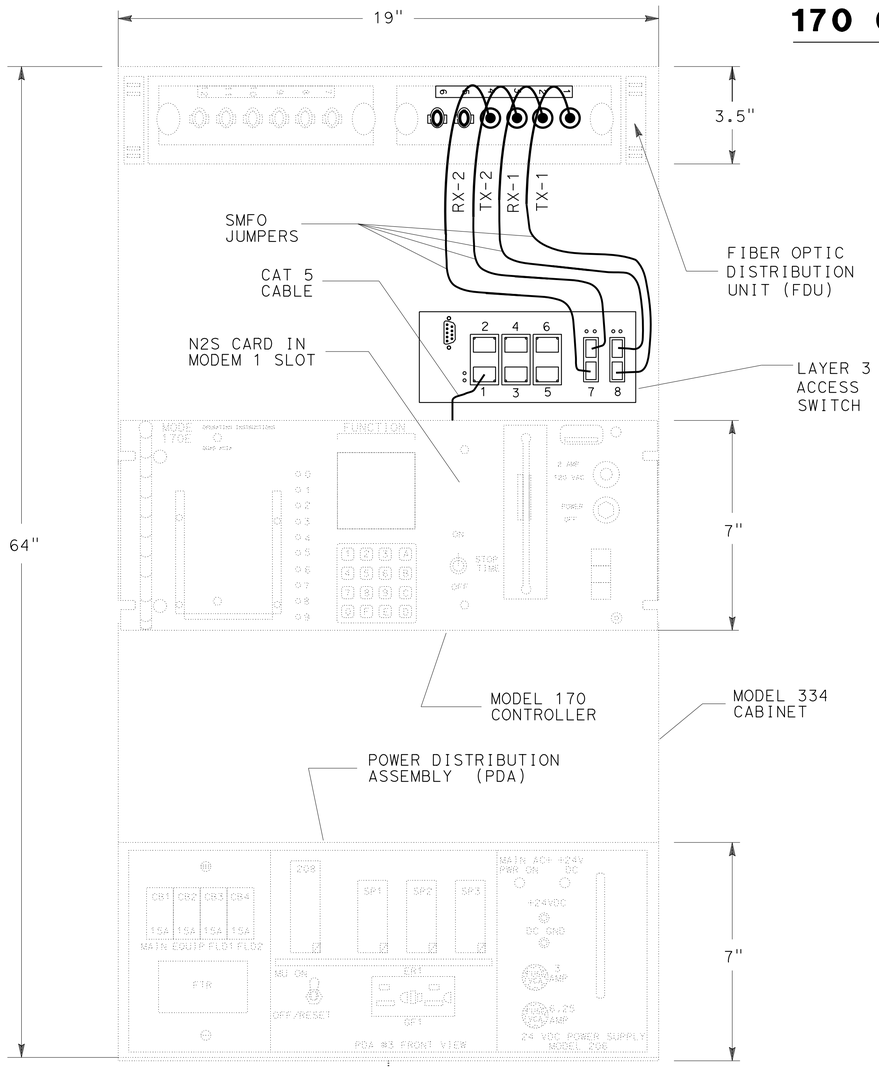
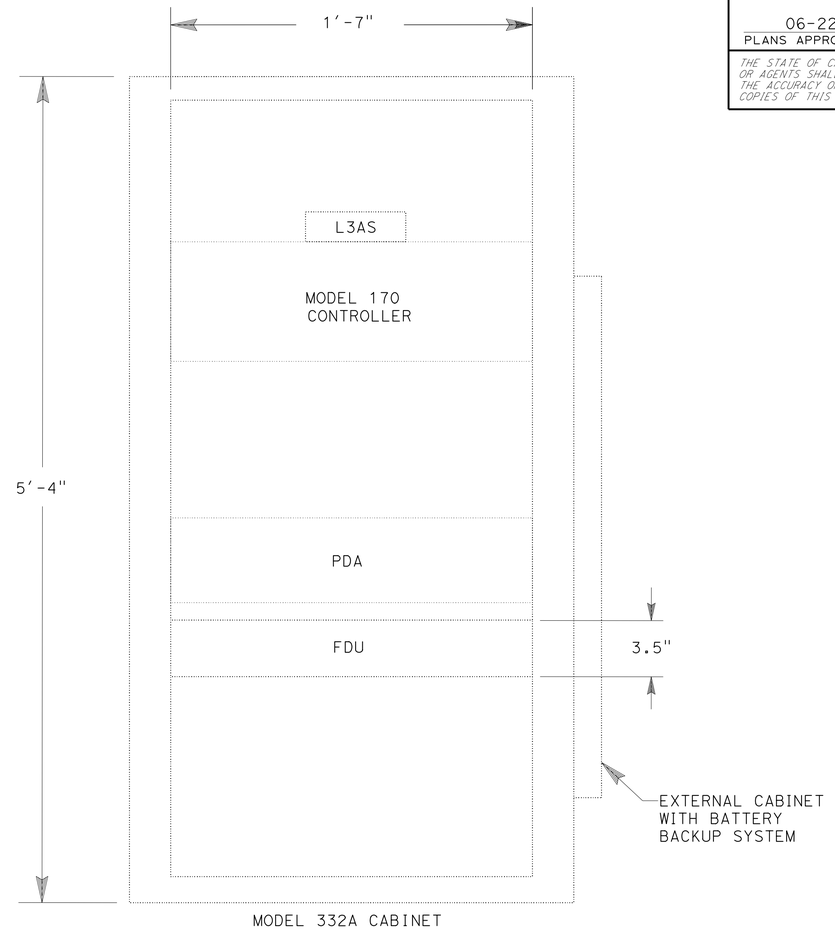
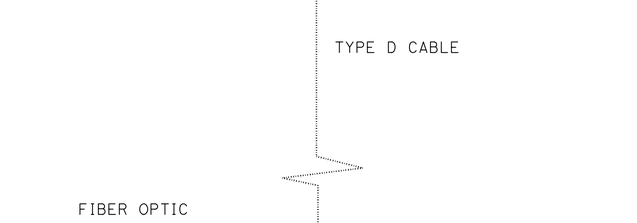
170 CONTROLLER INTERFACE





170 EQUIPMENT RACK LAYOUT



TYPICAL FIELD ELEMENT CONNECTION (EXISTING)

NOTES:(THIS SHEET ONLY)

1. REMOVE MODEL 400 MODEM CARD FROM 170 CONTROLLER & EXISTING LAYER 2 SWITCH.
2. INSTALL DIGI N2S CARD WITH 5-FOOT RJ-45 CABLE (CAT 5) TO MODEM SLOT OF 170 CONTROLLER.
3. CONNECT OTHER END PLUG OF CAT 5 CABLE TO 1X RJ-45 SOCKET OF SWITCH
4. INSTALL 4 SMFO SC JUMPERS BETWEEN SWITCH AND FDU.
5. INSTALL NEW L3AS AND RE-INSTALL SMFO JUMPERS.

LEGEND:

TX-1: TRANSMIT UPSTREAM TO SWITCH
RX-1: RECEIVE DOWNSTREAM FROM SWITCH
TX-2: TRANSMIT DOWNSTREAM FROM SWITCH
RX-2: RECEIVE UPSTREAM FROM SWITCH

ELECTRICAL DETAILS (170 CONTROLLER INTERFACE)

NO SCALE

APPROVED FOR ELECTRICAL WORK ONLY

E-18

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: HUSSEIN KALAKECH
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 06-02-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	22	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

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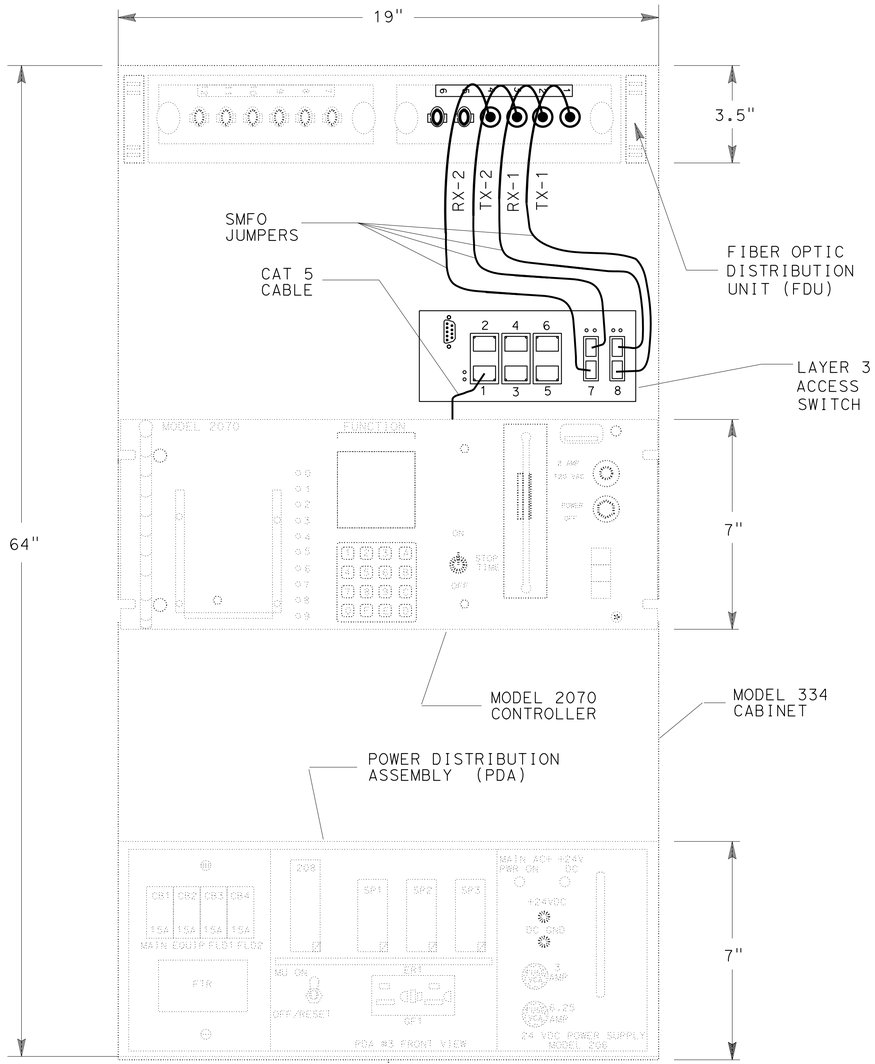
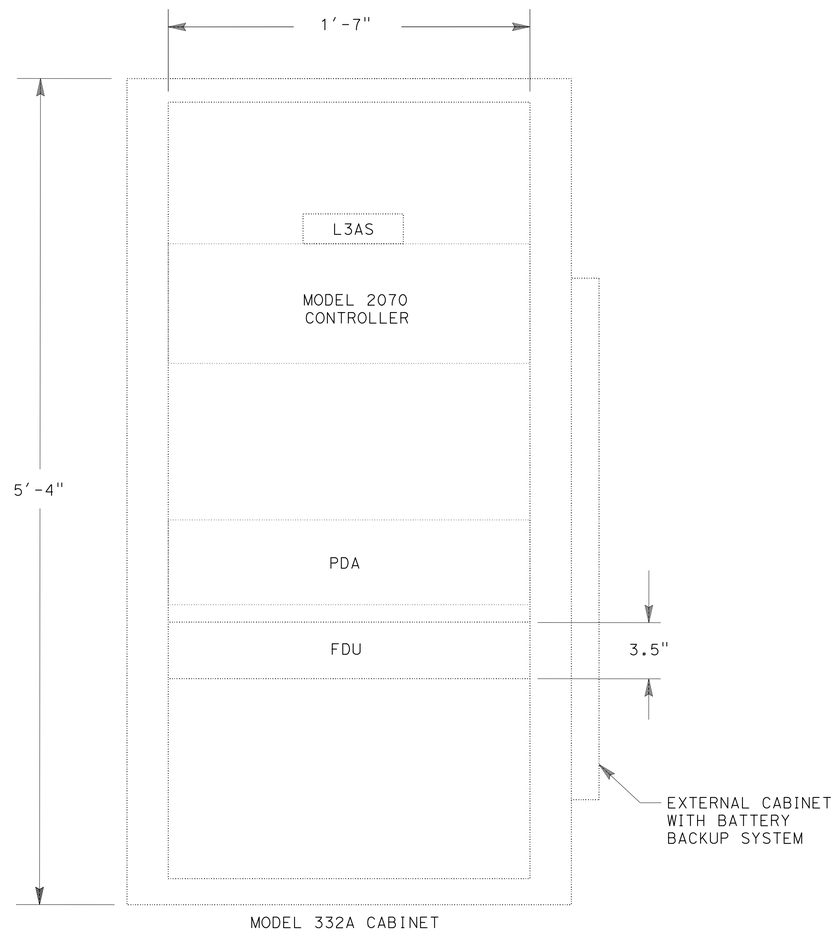
2070 CONTROLLER INTERFACE



TYPICAL FIELD ELEMENT CONNECTION (EXISTING)

NOTE: (THIS SHEET)

1. INSTALL L3AS, CAT5E CABLE, AND SMFO JUMPERS



2070 EQUIPMENT RACK LAYOUT

APPROVED FOR ELECTRICAL WORK ONLY

ELECTRICAL DETAILS (2070 CONTROLLER INTERFACE)

NO SCALE

E-19

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: HUSSEIN KALAKECH
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 06-02-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241,etc.	Var	23	25

REGISTERED ELECTRICAL ENGINEER 06-15-15 DATE

06-22-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FEDRICO HORMOZI
No. E14460
Exp. 6/30/16
ELECTRICAL
STATE OF CALIFORNIA

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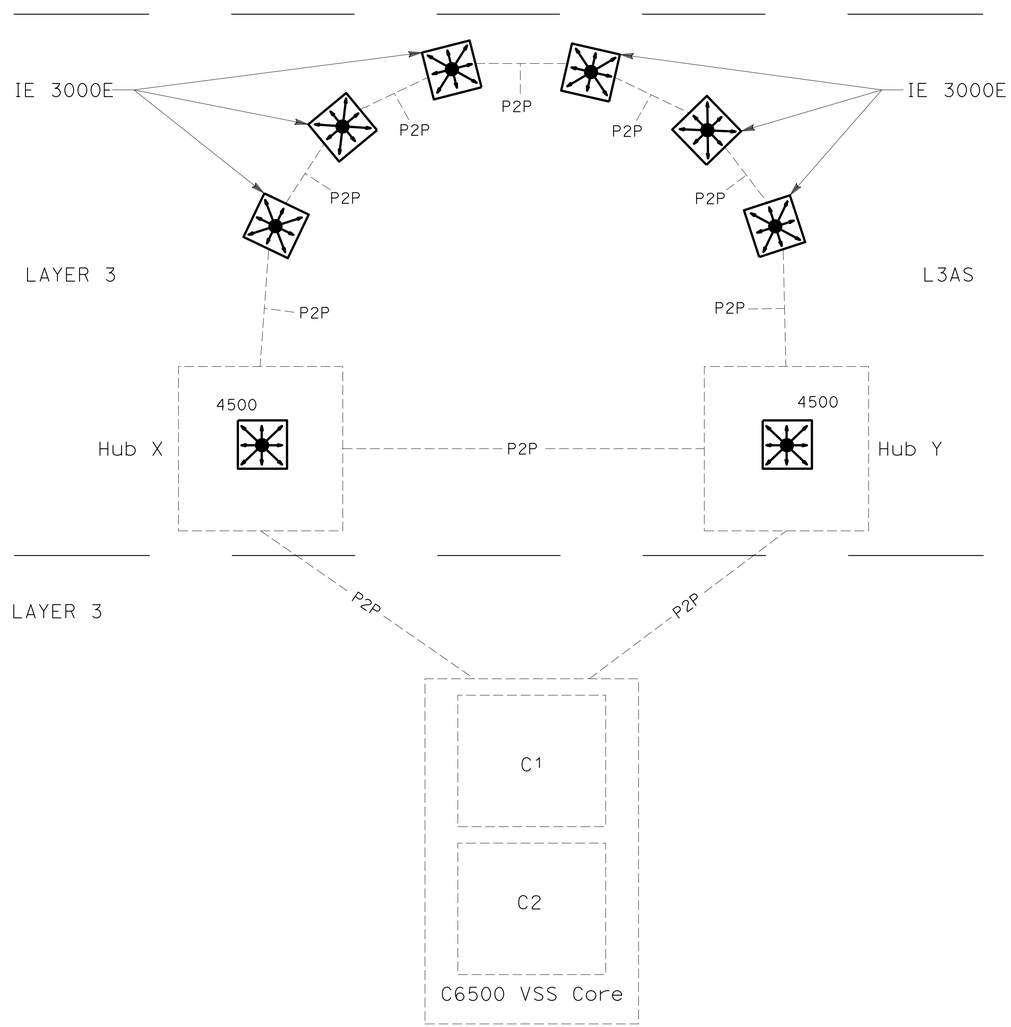
TYPICAL LAYER 3 FIELD ACCESS SWITCH CIRCUIT DETAILS

PROPOSED D12 TOSNET NETWORKS
Complete Layer 3



NOTE: (THIS SHEET)

1. A MAXIMUM OF 7 SWITCHES PER CIRCUIT ARE ALLOWED

ELECTRICAL DETAILS
(TYPICAL LAYER 3 FIELD ACCESS SWITCH CIRCUIT)

E-20

APPROVED FOR ELECTRICAL WORK ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ELECTRICAL SYSTEMS

FUNCTIONAL SUPERVISOR: FEDRICO HORMOZI
CALCULATED-DESIGNED BY: HUSSEIN KALAKECH
CHECKED BY: FEDRICO HORMOZI
REVISED BY
DATE REVISED

LAST REVISION 06-02-15
DATE PLOTTED => 25-JUN-2015
TIME PLOTTED => 14:02

M

Maint	MAINTENANCE
Max	MAXIMUM
MB	METAL BEAM
MBB	METAL BEAM BARRIER
MBGR	METAL BEAM GUARD RAILING
Med	MEDIAN
MGS	MIDWEST GUARDRAIL SYSTEM
MH	MANHOLE
Min	MINIMUM
Misc	MISCELLANEOUS
Misc I & S	MISCELLANEOUS IRON AND STEEL
Mkr	MARKER
Mod	MODIFIED,
	MODIFY
Mon	MONUMENT
MP	METAL PLATE
MPGR	METAL PLATE GUARD RAILING
MR	MOVEMENT RATING
MSE	MECHANICALLY STABILIZED EMBANKMENT
Mt	MOUNTAIN, MOUNT
Mtl	MATERIAL
MVP	MAINTENANCE VEHICLE PULLOUT

N

N	NORTH
NB	NORTHBOUND
No.	NUMBER (MUST HAVE PERIOD)
Nos.	NUMBERS (MUST HAVE PERIOD)
NPS	NOMINAL PIPE SIZE
NS	NEAR SIDE
NSP	NEW STANDARD PLAN
NTS	NOT TO SCALE

O

Oblr	OBLITERATE
OC	OVERCROSSING
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OG	ORIGINAL GROUND
OGAC	OPEN GRADED ASPHALT CONCRETE
OGFC	OPEN GRADED FRICTION COURSE
OH	OVERHEAD
OHWM	ORDINARY HIGH WATER MARK
O-O	OUT TO OUT
Opp	OPPOSITE
OSD	OVERSIDE DRAIN

P

P	PAGE
PAP	PERFORATED ALUMINUM PIPE
PB	PULL BOX
PC	POINT OF CURVATURE,
	PRECAST
PCC	POINT OF COMPOUND CURVE,
	PORTLAND CEMENT CONCRETE
PCMS	PORTABLE CHANGEABLE MESSAGE SIGN
PCP	PERFORATED CONCRETE PIPE,
	PRESTRESSED CONCRETE PIPE
PCVC	POINT OF COMPOUND VERTICAL CURVE
PEC	PERMIT TO ENTER AND CONSTRUCT
Ped	PEDESTRIAN
Ped OC	PEDESTRIAN OVERCROSSING
Ped UC	PEDESTRIAN UNDERCROSSING
Perm Mtl	PERMEABLE MATERIAL

P continued

PG	PROFILE GRADE
PI	POINT OF INTERSECTION
PJP	PARTIAL JOINT PENETRATION
Pkwy	PARKWAY
ℙ,PL	PLATE
P/L	PROPERTY LINE
PM	POST MILE,
	TIME FROM NOON TO MIDNIGHT
PN	PAVING NOTCH
POC	POINT OF HORIZONTAL CURVE
POT	POINT OF TANGENT
POVC	POINT OF VERTICAL CURVE
PP	PIPE PILE,
	PLASTIC PIPE,
	POWER POLE
PPL	PREFORMED PERMEABLE LINER
PPP	PERFORATED PLASTIC PIPE
PRC	POINT OF REVERSE CURVE
PRF	PAVEMENT REINFORCING FABRIC
PRVC	POINT OF REVERSE VERTICAL CURVE
PS&E	PLANS, SPECIFICATIONS AND ESTIMATES
PS, P/S	PRESTRESSED
PSP	PERFORATED STEEL PIPE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
Pvmt	PAVEMENT

Q

Qty	QUANTITY

R

R	RADIUS
R & D	REMOVE AND DISPOSE
R & S	REMOVE AND SALVAGE
R/C	RATE OF CHANGE
RCA	REINFORCED CONCRETE ARCH
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
RCPA	REINFORCED CONCRETE PIPE ARCH
Rd	ROAD
Reinf	REINFORCED,
	REINFORCEMENT,
	REINFORCING
Rel	RELOCATE
Repl	REPLACEMENT
Ret	RETAINING
Rev	REVISED, REVISION
Rdwy	ROADWAY
RHMA	RUBBERIZED HOT MIX ASPHALT
Riv	RIVER
RM	ROAD-MIXED
RP	RADIUS POINT,
	REFERENCE POINT
RR	RAILROAD
RSP	ROCK SLOPE PROTECTION,
	REVISED STANDARD PLAN
Rt	RIGHT
Rte	ROUTE
RW	REDWOOD,
	RETAINING WALL
R/W	RIGHT OF WAY
Rwy	RAILWAY

S

S	SOUTH,
	SUPPLEMENT
SAE	STRUCTURE APPROACH EMBANKMENT
Salv	SALVAGE
SAPP	STRUCTURAL ALUMINUM PLATE PIPE
SB	SOUTHBOUND
SC	SAND CUSHION
SCSP	SLOTTED CORRUGATED STEEL PIPE
SD	STORM DRAIN
Sec	SECOND,
	SECTION
Sep	SEPARATION
SG	SUBGRADE
Shld	SHOULDER
Sht	SHEET
Sim	SIMILAR
℄	STATION LINE
SM	SELECTED MATERIAL
Spec	SPECIAL,
	SPECIFICATIONS
SPP	SLOTTED PLASTIC PIPE
SS	SLOPE STAKE
SSBM	STRAP AND SADDLE BRACKET METHOD
SSD	STRUCTURAL SECTION DRAIN
SSPA	STRUCTURAL STEEL PLATE ARCH
SSPP	STRUCTURAL STEEL PLATE PIPE
SSPPA	STRUCTURAL STEEL PLATE PIPE ARCH
SSRP	STEEL SPIRAL RIB PIPE
St	STREET
Sta	STATION
STBB	SINGLE THRIE BEAM BARRIER
Std	STANDARD
Str	STRUCTURE
Surf	SURFACING
SW	SIDEWALK,
	SOUND WALL
Swr	SEWER
Sym	SYMMETRICAL
S4S	SURFACE 4 SIDES

T

T	SEMI-TANGENT
Tan	TANGENT
TBB	THRIE BEAM BARRIER
Tbr	TIMBER
TC	TOP OF CURB
TCB	TRAFFIC CONTROL BOX
TCE	TEMPORARY CONSTRUCTION EASEMENT
Tel	TELEPHONE
Temp	TEMPORARY
TG	TOP OF GRADE
Tot	TOTAL
TP	TELEPHONE POLE
TPB	TREATED PERMEABLE BASE
TPM	TREATED PERMEABLE MATERIAL
Trans	TRANSITION

T continued

TS	TRANSVERSE,
	TRAFFIC SIGNAL,
	TUBULAR STEEL
Typ	TYPICAL

U

UC	UNDERCROSSING
UD	UNDERDRAIN
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
UP	UNDERPASS

V

V	VALVE,
	DESIGN SPEED
Var	VARIABLE,
	VARIES
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
Vert	VERTICAL
Via	VIADUCT
Vol	VOLUME

W

W	WEST,
	WIDTH
WB	WESTBOUND
WH	WEEP HOLE
WM	WIRE MESH
WS	WATER SURFACE
WSP	WELDED STEEL PIPE
Wt	WEIGHT
WV	WATER VALVE
WW	WINGWALL
WWLOL	WINGWALL LAYOUT LINE

X

X Sec	CROSS SECTION
Xing	CROSSING

Y

Yr	YEAR
Yrs	YEARS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241, etc.	Var	24	25

Grace M. Tsushima
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Grace M. Tsushima
No. C49814
Exp. 9-30-14
CIVIL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED 06-22-15

UNIT OF MEASUREMENT SYMBOLS:

Some of the symbols used in the project plan quantity tables and in the Bid Item List are:

TABLE A

SYMBOL USED	DEFINITIONS
ACRE	ACRE
CF	CUBIC FOOT
CY	CUBIC YARD
EA	EACH
GAL	GALLON
LB	POUND
LF	LINEAR FOOT
SQFT	SQUARE FOOT
SQYD	SQUARE YARD
STA	100 FEET
TAB	TABLET
TON	2,000 POUNDS

Some of the symbols used in the plans other than in the project plan quantity tables are:

TABLE B

SYMBOL USED	DEFINITIONS
ksi	KIPS PER SQUARE INCH
ksf	KIPS PER SQUARE FOOT
psi	POUNDS PER SQUARE INCH
psf	POUNDS PER SQUARE FOOT
lb/ft^3, pcf	POUNDS PER CUBIC FOOT
tsf	TONS PER SQUARE FOOT
mph, MPH *	MILES PER HOUR
ø	NOMINAL DIAMETER
oz	OUNCE
lb	POUND
kip	1,000 POUNDS
cal	CALORIE
ft	FOOT OR FEET
gal	GALLON

* For use on a sign panel only

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ABBREVIATIONS (SHEET 2 OF 2)

NO SCALE

RSP A10B DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN A10B DATED MAY 20, 2011 - PAGE 2 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A10B

2010 REVISED STANDARD PLAN RSP A10B

6-7-13

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5,73,91,133, 241, etc.	Var	25	25

Theresa Gabriel
REGISTERED ELECTRICAL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Theresa Aziz Gabriel
No. E15129
Exp. 6-30-14
ELECTRICAL
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED 06-22-15

LEGEND:

AB	ABANDON. IF APPLIED TO CONDUIT, REMOVE CONDUCTORS
BC	INSTALL PULL BOX IN EXISTING CONDUIT RUN
BP	PEDESTRIAN BARRICADE, TYPE AS INDICATED ON PLAN
CB	INSTALL CONDUIT INTO EXISTING PULL BOX
CC	CONNECT NEW AND EXISTING CONDUIT. REMOVE EXISTING CONDUCTORS AND INSTALL CONDUCTORS AS INDICATED
CF	CONDUIT TO REMAIN FOR FUTURE USE. REMOVE CONDUCTORS. INSTALL PULL TAPE
DH	DETECTOR HANDHOLE
FA	FOUNDATION TO BE ABANDONED
IS	INSTALL SIGN ON SIGNAL MAST ARM
NS	NO SLIP BASE ON STANDARD
PEC	PHOTOELECTRIC CONTROL
PEU	PHOTOELECTRIC UNIT
RC	EQUIPMENT OR MATERIAL TO BE REMOVED AND BECOME THE PROPERTY OF THE CONTRACTOR
RE	REMOVE ELECTROLIER, FUSES AND BALLAST. TAPE ENDS OF CONDUCTORS
RL	RELOCATE EQUIPMENT
RR	REMOVE AND REUSE EQUIPMENT
RS	REMOVE AND SALVAGE EQUIPMENT
SC	SPLICE NEW TO EXISTING CONDUCTORS
SD	SERVICE DISCONNECT
TSP	TELEPHONE SERVICE POINT

ABBREVIATIONS

APS	ACCESSIBLE PEDESTRIAN SIGNAL
BBS	BATTERY BACKUP SYSTEM
BC	BOLT CIRCLE
BPB	BICYCLE PUSH BUTTON
C	CONDUIT
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
Ckt	CIRCUIT
CMS	CHANGEABLE MESSAGE SIGN
Ctid	CALTRANS IDENTIFICATION
Comm	COMMUNICATION
DLC	LOOP DETECTOR LEAD-IN CABLE
EMS	EXTINGUISHABLE MESSAGE SIGN
EVUC	EMERGENCY VEHICLE UNIT CABLE
EVUD	EMERGENCY VEHICLE UNIT DETECTOR
FB	FLASHING BEACON
FBCA	FLASHING BEACON CONTROL ASSEMBLY
FBS	FLASHING BEACON WITH SLIP BASE
FO	FIBER OPTIC
G	EQUIPMENT GROUNDING CONDUCTOR
GB	GROUND BUS
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
HAR	HIGHWAY ADVISORY RADIO
Hex	HEXAGONAL
HPS	HIGH PRESSURE SODIUM
IISNS	INTERNALLY ILLUMINATED STREET NAME SIGN
ISL	INDUCTION SIGN LIGHTING
LED	LIGHT EMITTING DIODE
LMA	LUMINAIRE MAST ARM
LPS	LOW PRESSURE SODIUM
Ltg	LIGHTING
Lum	LUMINAIRE
M	METERED
MAT	MAST ARM MOUNTING TOP ATTACHMENT
MAS	MAST ARM MOUNTING SIDE ATTACHMENT
M/M	MULTIPLE TO MULTIPLE TRANSFORMER
Mtg	MOUNTING
MV	MERCURY VAPOR LIGHTING FIXTURE
MVDS	MICROWAVE VEHICLE DETECTION SYSTEM
N	NEUTRAL (GROUNDED CONDUCTOR)
NB	NEUTRAL BUS
NC	NORMALLY CLOSE
NO	NORMALLY OPEN
P	CIRCUIT BREAKER'S POLE
PB	PULL BOX
PBA	PUSH BUTTON ASSEMBLY
PEC	PHOTOELECTRIC CONTROL
Ped	PEDESTRIAN
PEU	PHOTOELECTRIC UNIT
PT	CONDUIT WITH PULL TAPE
RE	RELOCATED EQUIPMENT
RM	RAMP METERING
RWIS	ROADSIDE WEATHER INFORMATION SYSTEM
SB	SLIP BASE
SIC	SIGNAL INTERCONNECT CABLE
Sig	SIGNAL
SMA	SIGNAL MAST ARM
SNS	STREET NAME SIGN
SP	SERVICE POINT
TDC	TELEPHONE DEMARCATION CABINET
TMS	TRAFFIC MONITORING STATION
TOS	TRAFFIC OPERATIONS SYSTEM
Veh	VEHICLE
VIVDS	VIDEO IMAGE VEHICLE DETECTION SYSTEM
WIM	WEIGH-IN-MOTION
Xfmr	TRANSFORMER

SOFFIT AND WALL MOUNTED LUMINAIRES

PENDANT, 70 W HPS UNLESS OTHERWISE SPECIFIED

FLUSH, 70 W HPS UNLESS OTHERWISE SPECIFIED

WALL SURFACE, 70 W HPS UNLESS OTHERWISE SPECIFIED

EXISTING SOFFIT OR WALL LUMINAIRE TO REMAIN UNMODIFIED

EXISTING SOFFIT OR WALL LUMINAIRE TO BE MODIFIED AS SPECIFIED

NOTE:

Arrow indicates "street side" of luminaire.

MISCELLANEOUS ELECTROLIERS

NEW	EXISTING	
		LUMINAIRE ON WOOD POLE
		NON-STANDARD ELECTROLIER (SEE PROJECT NOTES OR PROJECT PLANS)
		CITY ELECTROLIER
		ELECTROLIER FOUNDATION (FUTURE INSTALLATION)

NOTES:

1. HPS luminaires shall be 310 W HPS when installed on Type 21, 21D, 30, 31 and 32 Standards, unless otherwise specified. HPS luminaires shall be 200 W when installed on other type standards or poles, unless otherwise specified.
2. LED luminaires shall be 235 W when installed on Type 21, 21D, 30, 31 and 32 Standards, unless otherwise specified. LED luminaires shall be 165 W when installed on other type standards or poles, unless otherwise specified.
3. Luminaires shall be the cutoff type, ANSI Type III medium cutoff lighting distribution, unless otherwise specified.

STANDARD ELECTROLIER

NEW	EXISTING	STANDARD TYPE
		15
		15D
		15 STRUCTURE
		15D STRUCTURE
		21
		21D
		21 STRUCTURE
		21D STRUCTURE
		30
		31
		32

COMMONLY USED SYMBOLS FOR UNITED STATES CUSTOMARY UNITS OF MEASUREMENT:

SYMBOL USED	DEFINITIONS
Ω	OHMS
min	MINUTE
s	SECOND
bps	BITS PER SECOND
Bps	BYTES PER SECOND
A	AMPERE
V	VOLT
V(dc)	VOLT (DIRECT CURRENT)
V(ac)	VOLT (ALTERNATING CURRENT)
FC	FOOT - CANDLE
W	WATTS
VA	VOLT-AMPERE
M	MEGA
k	KILO
m	MILLI
μ	MICRO
P	PICO
Hz	HERTZ

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (LEGEND AND ABBREVIATIONS)

NO SCALE

RSP ES-1A DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-1A DATED MAY 20, 2011 - PAGE 425 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP ES-1A

2010 REVISED STANDARD PLAN RSP ES-1A