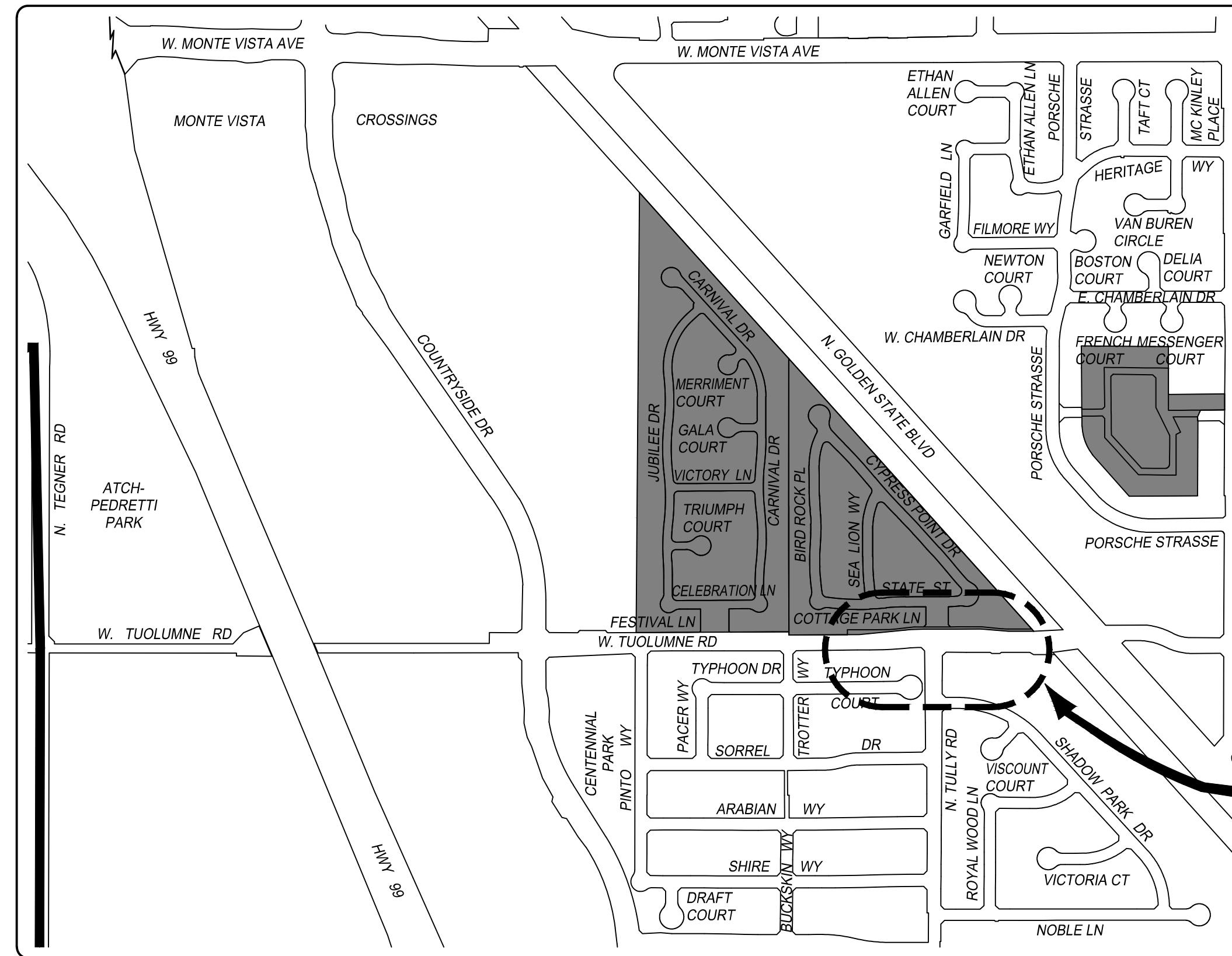


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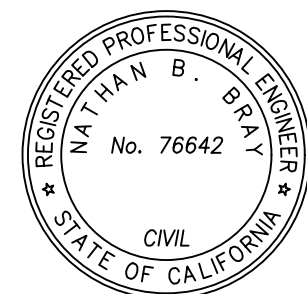
	BENCHMARK
	EX. MONUMENT WELL
	EX. MONUMENTS
	EX. SET MONUMENT
101.97 C	EX. CONCRETE ELEVATION
101.39 FL	EX. FLOWLINE OF CURB ELEVATION
101.39 BSW	EX. BACK OF SIDEWALK ELEVATION
101.14 P	EX. PAVEMENT ELEVATION
101.5	EX. GROUND ELEVATION
	PROPERTY LINE
	CENTERLINE
	EX. FENCE
	EX. 8" SS
	EX. 18" SD
	EX. 12" W
	EX. SANITARY SEWER MANHOLE
	EX. STORM DRAIN MANHOLE
	EX. WATER VALVE
	EX. WATER WELL
	EX. NON-POTABLE WATER VALVE
	EX. MANHOLE
	EX. TELEPHONE MANHOLE
	EX. PRESSURE MANHOLE
	EX. SANITARY SEWER CLEAN OUT
	EX. FIRE HYDRANT
	EX. GAS VALVE
	EX. CATCH BASIN
	EX. DRAIN INLET
	EX. TRAFFIC SIGNAL HAND WELL
	EX. TRAFFIC SIGNAL LOOP DETECTOR
	EX. BOLLARD
	EX. LIGHT
	EX. STREET LIGHT
	EX. SIGN
	EX. POWER POLE
	EX. TELEPHONE POLE
	EX. JOINT UTILITY POLE
	EX. GUY POLE
	EX. UTILITY SERVICE POLE
	EX. TREE
	EX. CABLE CHRISTY BOX
	EX. ELECTRICAL CHRISTY BOX
	EX. FIRE ALARM CHRISTY BOX
	EX. GAS CHRISTY BOX
	EX. IRRIGATION CHRISTY BOX
	EX. STREET LIGHT CHRISTY BOX
	EX. COMMUNICATION CHRISTY BOX
	EX. TRAFFIC CHRISTY BOX
	EX. IRRIGATION CONTROL VALVE BOX
	EX. TELEPHONE CHRISTY BOX
	EX. UTILITY CHRISTY BOX
	EX. WATER CHRISTY BOX
	PROP. 10" SS
	PROP. 18" SD
	PROP. 12" W
	PROP. 12" RW
	PROP. SMH~1
	PROP. SDMH~1
	PROP. CB
	PROP. DI~1
	PROP. SSCO~1
	PROP. SSMH~1
	PROP. PV
	PROP. NPV
	PROP. FH
	PROP. WBOA
	PROP. HMA
	PROP. CONC

ABBREVIATIONS

C	CONCRETE
P	PAVEMENT
R	RADIUS
L	LENGTH
S	SLOPE
W	POTABLE WATER
OC	ON CENTER
BC	BEGINNING OF CURVE
EC	END OF CURVE
AC	ASPHALT CONCRETE
DI	DROP INLET
AV	AIR VENT
IV	IRRIGATION VALVE
AB	AGGREGATE BASE
SF	SQUARE FEET
CY	CUBIC YARD
RW	RIGHT-OF-WAY
PL	PROPERTY LINE
CL	CENTER LINE
FL	FLOWLINE
EP	EDGE OF PAVEMENT
TC	TOP OF CURB
EX	EXISTING
GB	GRADE BREAK
HP	HIGH POINT
LP	LOW POINT
AP	ANGLE POINT
UP	UTILITY POLE
PP	ELECTRICITY POLE
TP	TELEPHONE POLE
JP	JOINT UTILITY POLE
SP	SERVICE POLE
GP	GUY POLE
LF	LINEAR FOOT
CB	CATCH BASIN
SS	SANITARY SEWER
SD	STORM DRAIN
APN	ASSESSORS PARCEL NUMBER
BSW	BACK OF SIDEWALK
INV	INVERT
HMA	HOT MIX ASPHALT
NPW	NON-POTABLE WATER
TYP	TYPICAL
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSE CURVE
IDB	IRRIGATION DISTRIBUTION BOX
ISP	IRRIGATION STAND PIPE
PROP	PROPOSED
RHMA	RUBBERIZED HOT MIX ASPHALT
SSMH	SANITARY SEWER MANHOLE
SSCO	SANITARY SEWER CLEAN OUT
SDMH	STORM DRAIN MANHOLE



VICINITY MAP



NATHAN BRAY, P.E.
INTERIM DEVELOPMENT SERVICES DIRECTOR/
CITY ENGINEER, RCE 76642

11/25/20
PLANS APPROVAL DATE



NOTE:
ALL REFERENCES AND WRITTEN
DIMENSIONS SHALL SUPERCEDE
ALL SCALED DISTANCES AND
SHALL BE VERIFIED IN THE
FIELD. ANY DISCREPANCY SHALL
BE BROUGHT TO THE ATTENTION
OF THE ENGINEER PRIOR TO
THE COMMENCEMENT OF WORK.



STEPHEN FREMMING, P.E.
PRINCIPAL CIVIL ENGINEER

11/25/2020
PLANS APPROVAL DATE



CITY OF TURLOCK
DEVELOPMENT SERVICES
ENGINEERING DIVISION
156 S. BROADWAY, STE 150
(209) 668-5520

SHEET INDEX, LEGEND & VICINITY MAP
CAPITAL PROJECT NO. 18-54
CML-5165 (094)
INTERSECTION IMPROVEMENTS AT
TULLY ROAD AND TUOLUMNE ROAD

VERIFY SCALE
BAR IS 1" ON
ORIGINAL DRAWING
0 1/4" 3/4" 1"
1/2"
IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

DRAWN BY: AZ
REV. BY: --
CH. BY: RJJ
DATE: DECEMBER, 2019
SCALE: NO SCALE
18-54 BASE.dwg

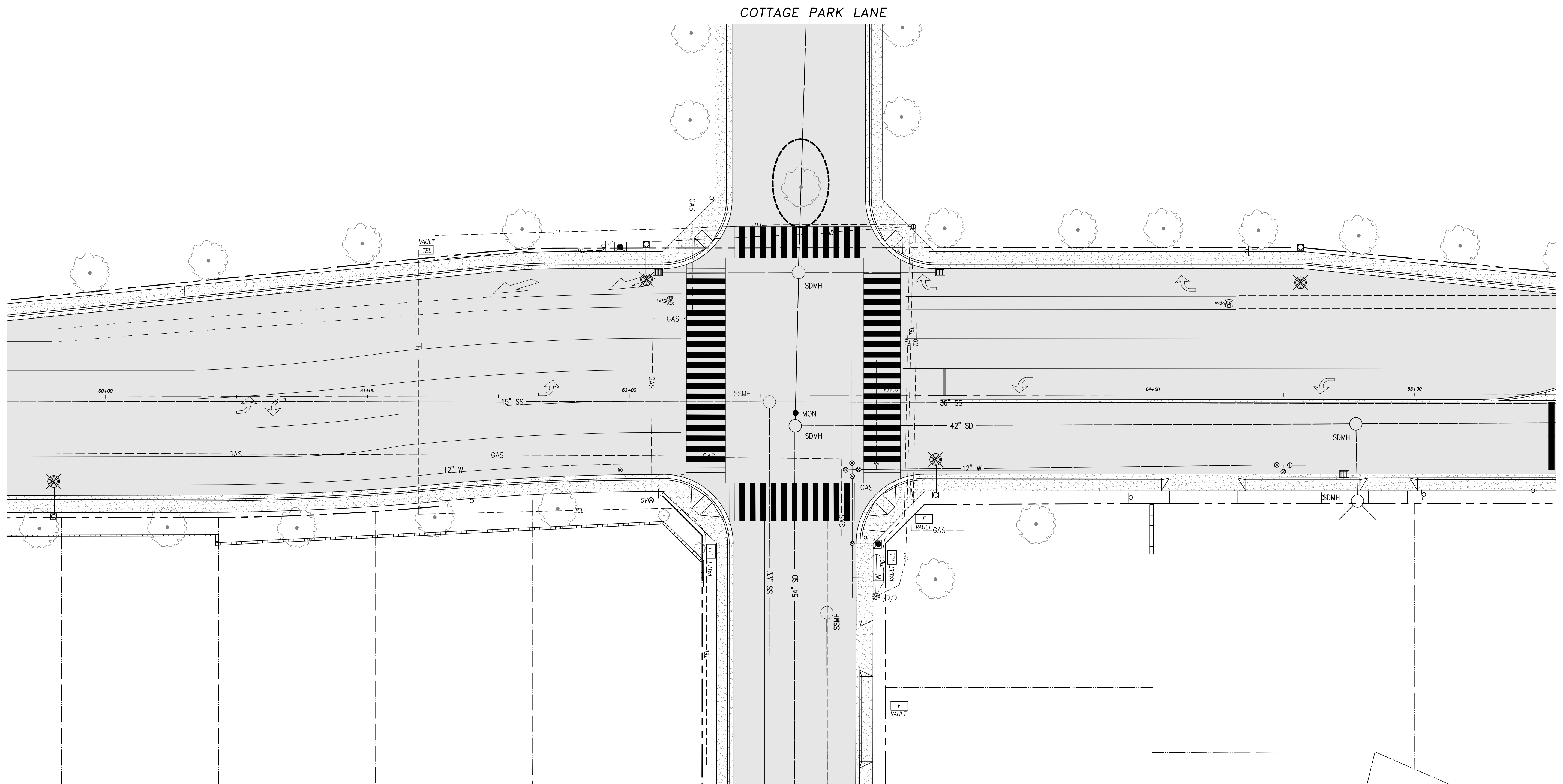
SHEET
1
of 10

SHEET INDEX

SHEET	DESCRIPTION
1	SHEET INDEX, LEGEND & VICINITY MAP
2	TOPOGRAPHY SURVEY PLAN
3	DEMOLITION PLAN
4	GRADING, STRIPING, AND LOOPS PLAN
5	TRAFFIC SIGNAL PLAN
6	TRAFFIC SIGNAL PLAN
7	TRAFFIC SIGNAL DETAILS
8	TRAFFIC SIGNAL SPECIFICATION SHEET
9	TRAFFIC SIGNAL SPECIFICATION SHEET
10	CITY STANDARD DETAILS

CONTACTS

CITY OF TURLOCK, DEVELOPMENT SERVICES DEPARTMENT
(209) 668-5520 ENGINEERING DIVISION
CITY OF TURLOCK, MUNICIPAL SERVICES DEPARTMENT
(209) 668-5590 FOR SEWER, STORM AND WATER LINES
TURLOCK IRRIGATION DISTRICT (ELECTRICAL)
(209) 883-8419 ED JEFFERS
TURLOCK IRRIGATION DISTRICT (IRRIGATION)
(209) 883-8367 TODD TROGLIN
CHARTER COMMUNICATIONS
(209) 633-3311 ABEL DAVILA
PACIFIC GAS & ELECTRIC (GAS)
(209) 576-6662 DAVID LOOMIS
AT&T
(209) 578-7139 SHARON DINNEL
FIRE DEPARTMENT (NON-EMERGENCY)
(209) 668-5580
POLICE DEPARTMENT (NON-EMERGENCY)
(209) 668-1200
AMBULANCE
(209) 632-2271
TURLOCK SCAVENGER
(209) 668-7274



TOPOGRAPHY NOTES:

ALL ELEVATIONS REFER TO NAVD 88 DATUM, BENCHMARKS: AS SHOWN

ALL UTILITY INFORMATION SHOWN ON THIS MAP IS BASED UPON SURFACE EVIDENCE LOCATED IN THE FIELD AND THE RECORDS OF THE VARIOUS UTILITY COMPANIES.

ALL BOUNDARY INFORMATION SHOWN ON THIS MAP IS BASED UPON A FIELD SURVEY AND THE RECORD INFORMATION OF VARIOUS MAPS.

LEGEND

EX. ASPHALT CONCRETE PAVEMENT

EX. CONCRETE

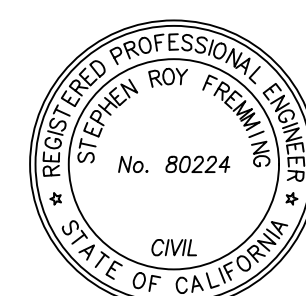
TUOLUMNE ROAD

SCALE: 1" = 20'

TULLY ROAD



NOTE:
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Stephen Fremming
STEPHEN FREMMING, P.E.
PRINCIPAL CIVIL ENGINEER
11/4/2020
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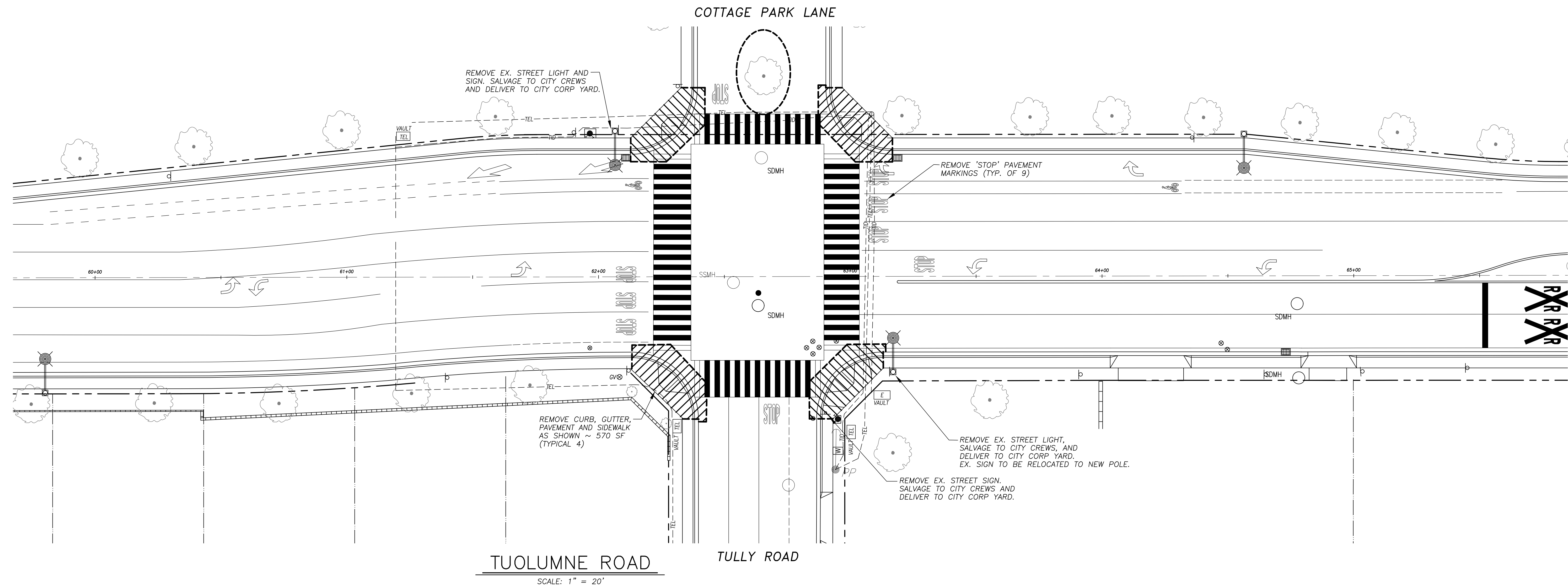
CITY OF TURLOCK
DEVELOPMENT SERVICES
ENGINEERING DIVISION
156 S. BROADWAY, STE 150
(209) 668-5520

TOPOGRAPHY SURVEY PLAN
TUOLUMNE ROAD ~ STA. 59+00 TO END
CAPITAL PROJECT NO. 18-54
CML-5165 (094)
INTERSECTION IMPROVEMENTS AT
TULLY ROAD AND TUOLUMNE ROAD

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CH. BY: RJJ
DATE: DECEMBER, 2019
SCALE: AS NOTED
18-54 BASE.dwg

SHEET
2
OF 10



GENERAL NOTES

1. CONTRACTOR SHALL VERIFY THE LOCATIONS OF THE EXISTING UTILITIES AFFECTED BY CONSTRUCTION, BOTH VERTICALLY AND HORIZONTALLY, PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES TO THE ENGINEER. LOCATIONS OF PIPELINES ARE APPROXIMATE. BEFORE POWER OR HEAVY EQUIPMENT IS USED FOR PURPOSES OF EXCAVATION OR OTHER WORK NEAR THE LINES SHOWN ON THIS SHEET, THE EXACT LOCATION AND DEPTH OF UTILITIES AFFECTED BY CONSTRUCTION SHOULD FIRST BE DETERMINED BY HAND EXCAVATION.
2. THE CONTRACTOR SHALL REMOVE ALL VEGETATION WITHIN THE ROADWAY.
3. THE CONTRACTOR SHALL REMOVE ALL STRIPING AND PAVEMENT MARKERS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL MATERIALS.
5. PROTECT AND PRESERVE ALL MONUMENTS.
6. PROTECT AND PRESERVE ALL EXISTING UTILITIES.

TUOLUMNE ROAD

SCALE: 1" = 20'

TULLY ROAD



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11/4/2020
PLANS APPROVAL DATE



CITY OF TURLOCK
DEVELOPMENT SERVICES
ENGINEERING DIVISION
156 S. BROADWAY, STE 150
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DEMOLITION PLAN
TUOLUMNE ROAD ~ STA. 59+00 TO END
CAPITAL PROJECT NO. 18-54
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INTERSECTION IMPROVEMENTS AT
TULLY ROAD AND TUOLUMNE ROAD

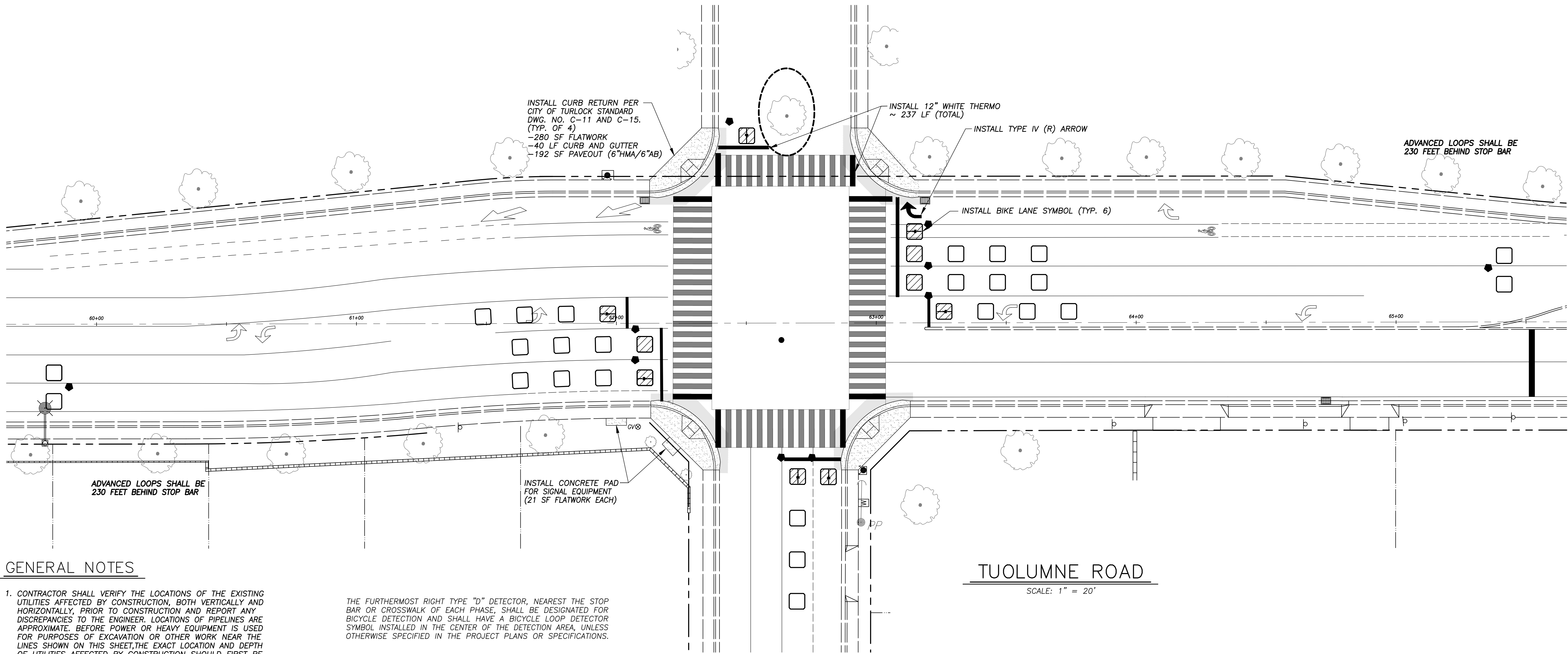
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SHEET

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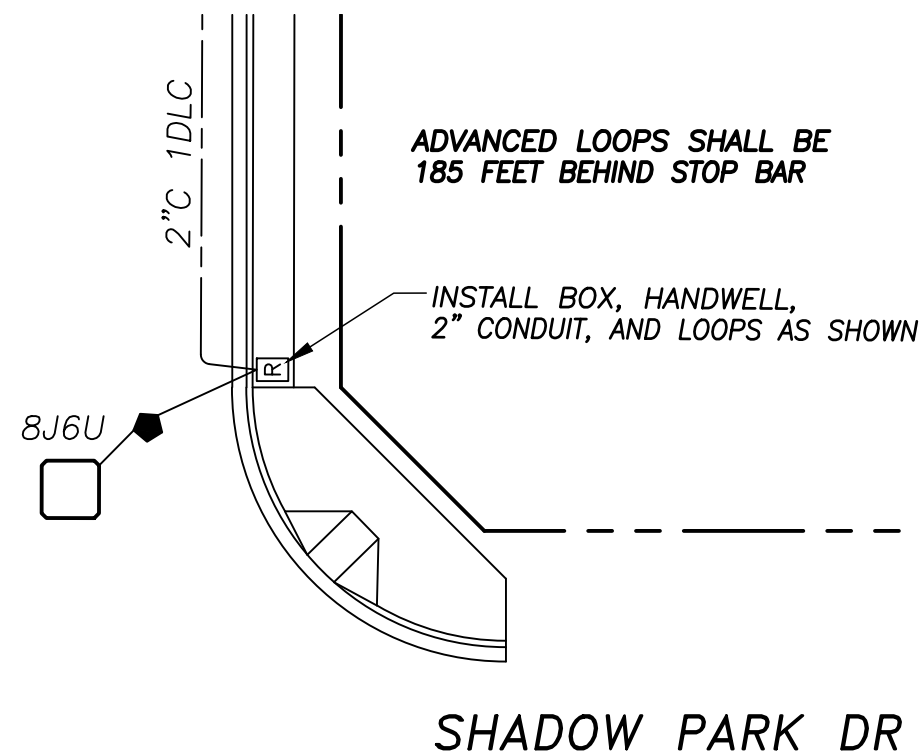
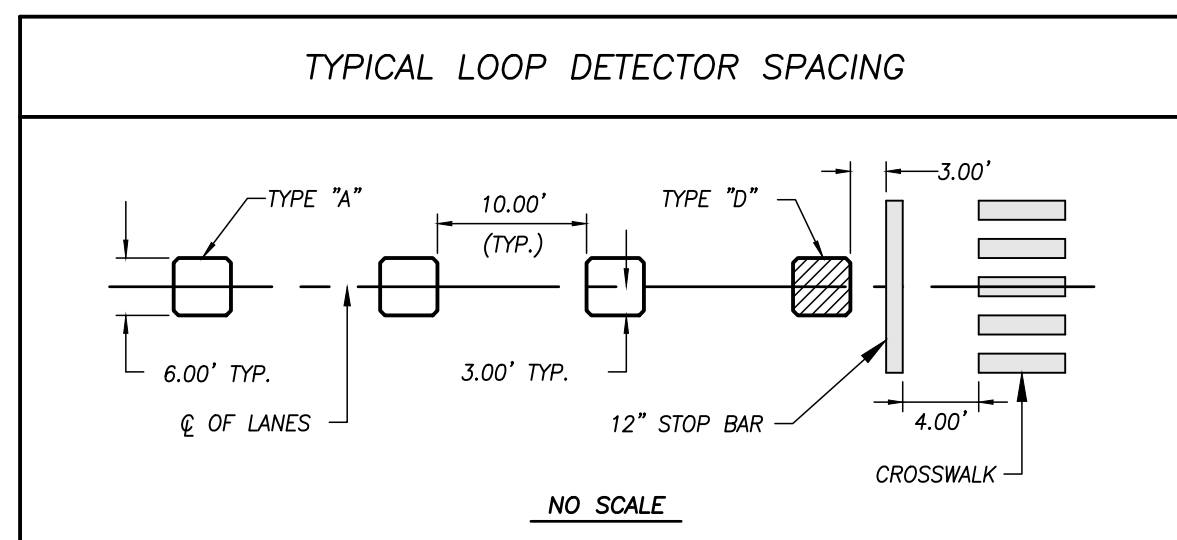
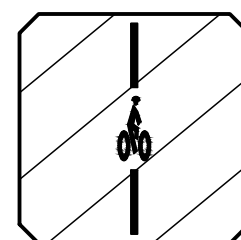
OF 10



GENERAL NOTES

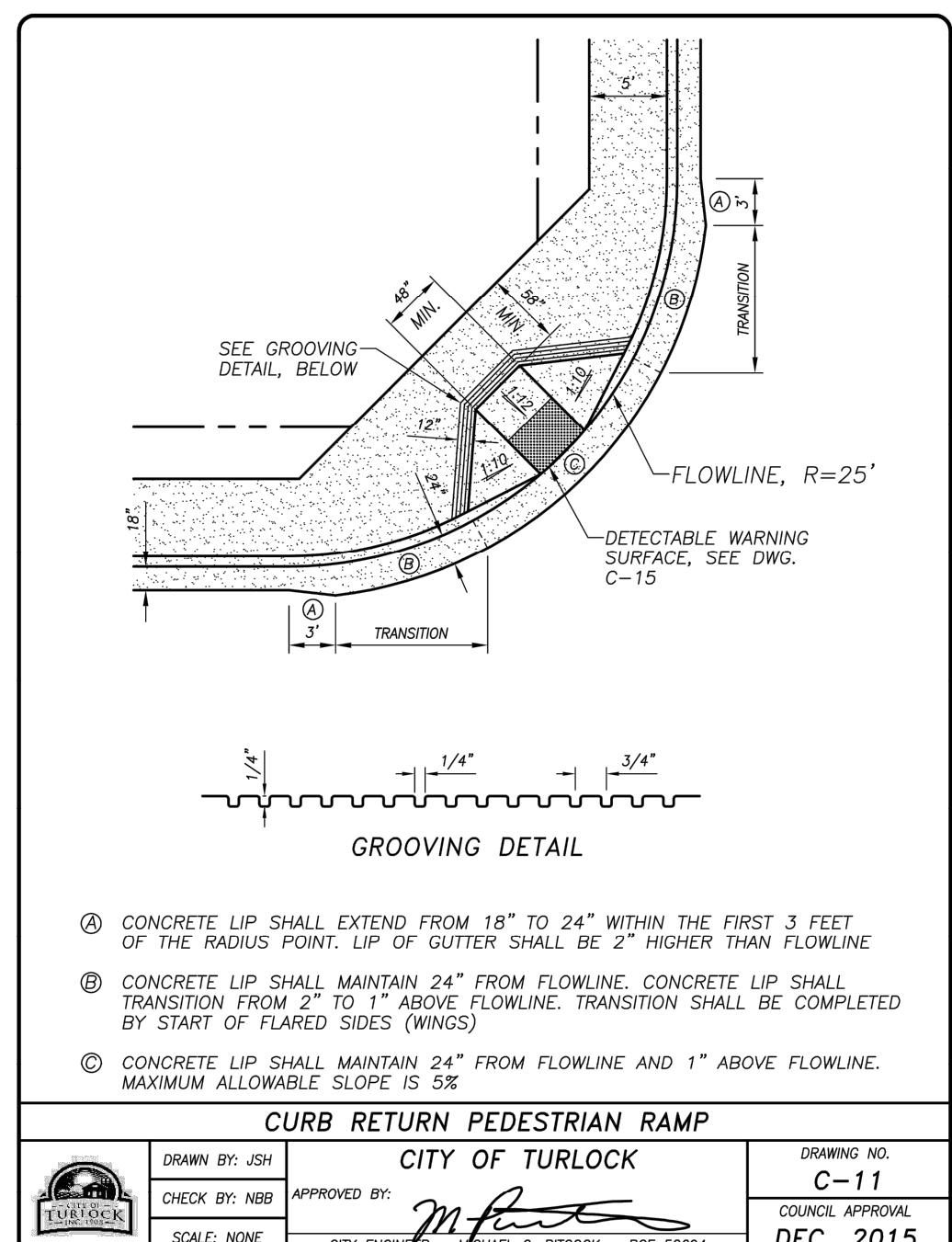
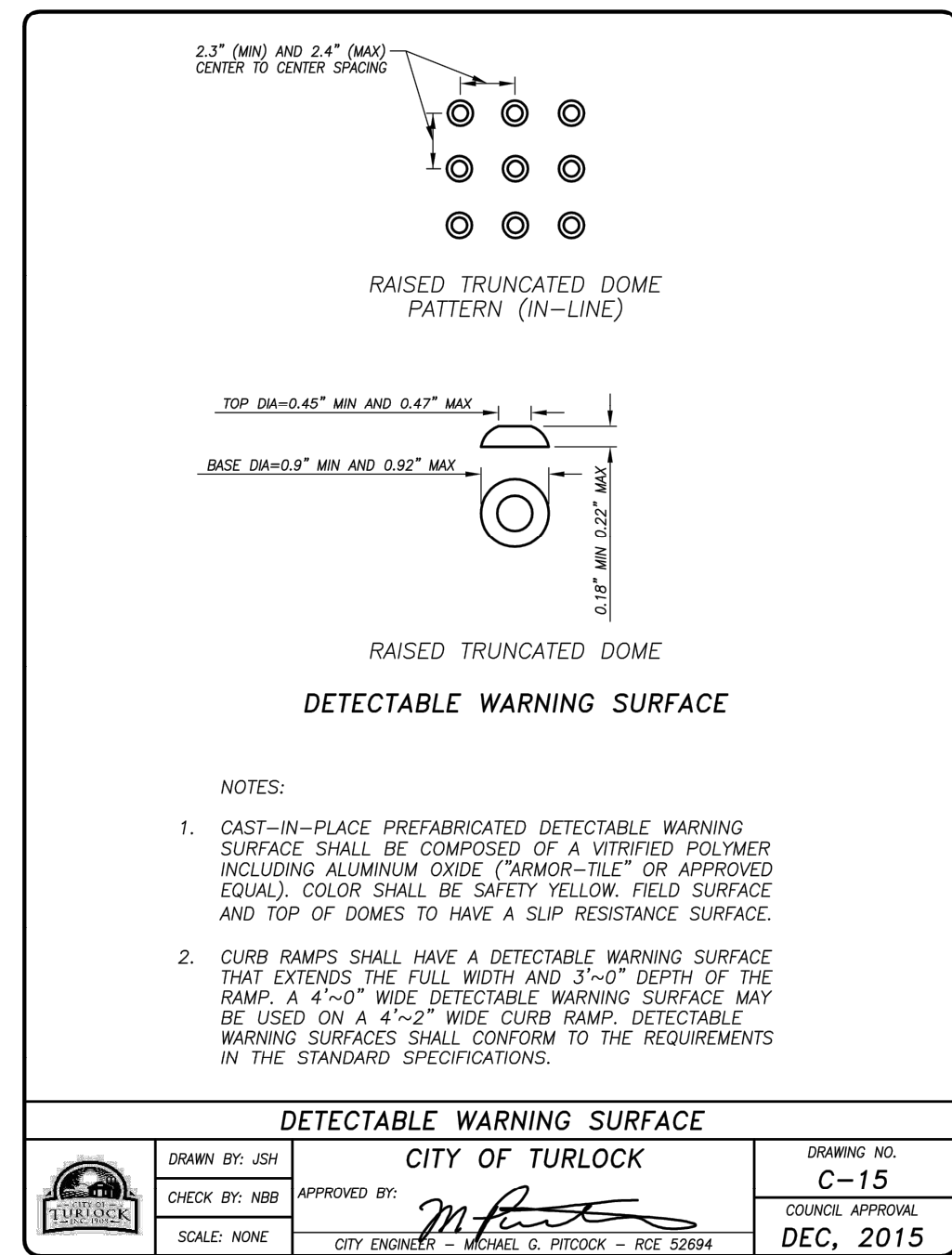
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2. THE CONTRACTOR SHALL REMOVE ALL VEGETATION WITHIN THE ROADWAY.
3. THE CONTRACTOR SHALL REMOVE ALL STRIPING AND PAVEMENT MARKERS THAT CONFLICT WITH PROPOSED STRIPING AND PAVEMENT MARKERS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL MATERIALS.
5. PROTECT AND PRESERVE ALL MONUMENTS.
6. PROTECT AND PRESERVE ALL EXISTING UTILITIES.
7. ALL STRIPING AND SIGNAGE SHALL CONFORM PER THE CA MUTCD & CALTRANS STANDARD PLANS.
8. ALL STRIPING AND PAVEMENT MARKINGS SHALL BE WHITE PAINT.
9. CONTRACTOR SHALL CAT-TRACK STRIPING AND GIVE ENGINEER TWO WORKING DAYS NOTICE TO REVIEW MARKS.
10. STRIPING SHALL OCCUR 7 CALENDAR DAYS AFTER LAST DAY OF PAVING, OR DIRECTLY AFTER RAISING THE FRAMES & COVERS TO GRADE, WHICHEVER IS LONGER.
11. SIGNS SHALL BE HIGH INTENSITY PRISMATIC.
12. THE CONTRACTOR SHALL ADJUST LANDSCAPE IRRIGATION TO PREVENT WATER DAMAGE TO SIGNAL EQUIPMENT.

THE FURTHERMOST RIGHT TYPE "D" DETECTOR, NEAREST THE STOP BAR OR CROSSWALK OF EACH PHASE, SHALL BE DESIGNATED FOR BICYCLE DETECTION AND SHALL HAVE A BICYCLE LOOP DETECTOR SYMBOL INSTALLED IN THE CENTER OF THE DETECTION AREA, UNLESS OTHERWISE SPECIFIED IN THE PROJECT PLANS OR SPECIFICATIONS.

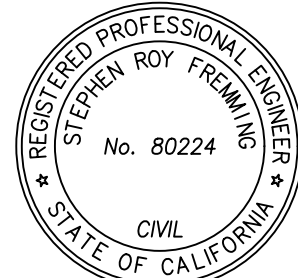


LEGEND

PROPOSED PAVEOUT
PROPOSED CONCRETE



NOTE:
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Stephen Fremming, P.E.
PRINCIPAL CIVIL ENGINEER
11/4/2020
PLANS APPROVAL DATE



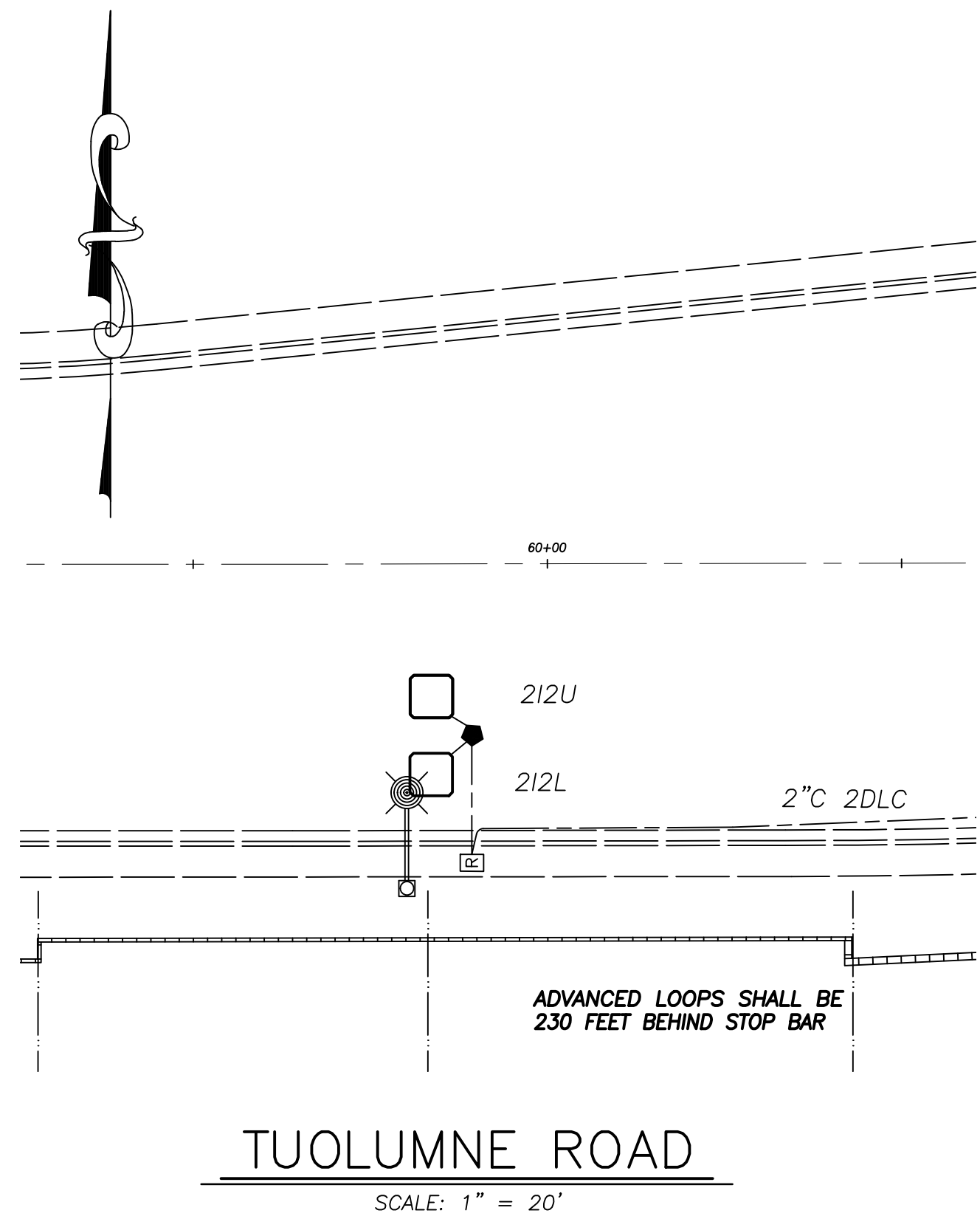
CITY OF TURLOCK
DEVELOPMENT SERVICES
ENGINEERING DIVISION
156 S. BROADWAY, STE 150
(209) 668-5520

GRADING, STRIPING, AND LOOP DETECTORS
CAPITAL PROJECT NO. 18-54
CML-5165 (094)
INTERSECTION IMPROVEMENTS AT
TULLY ROAD AND TUOLUMNE ROAD

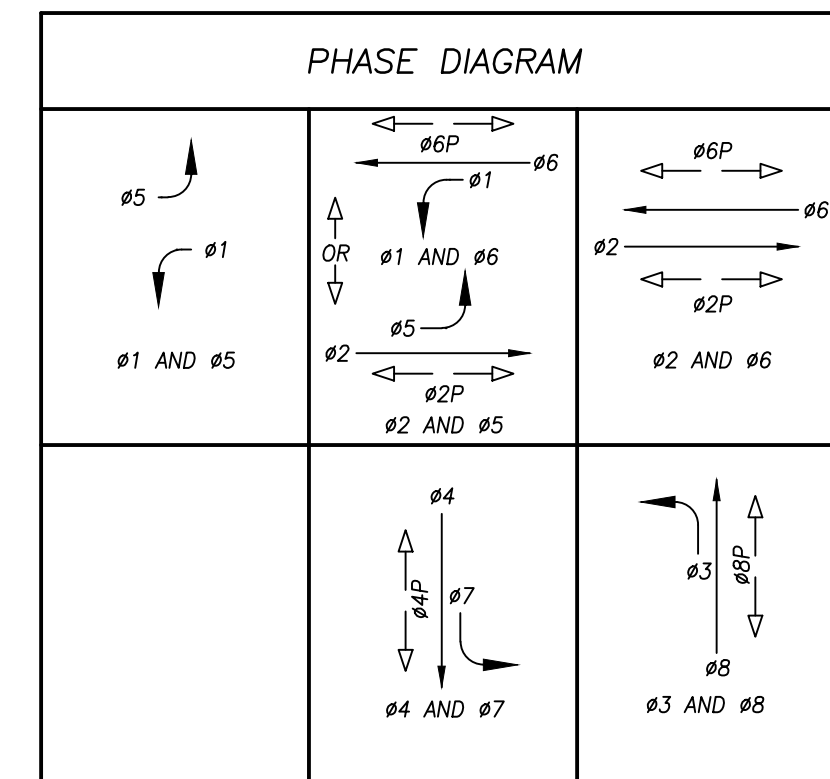
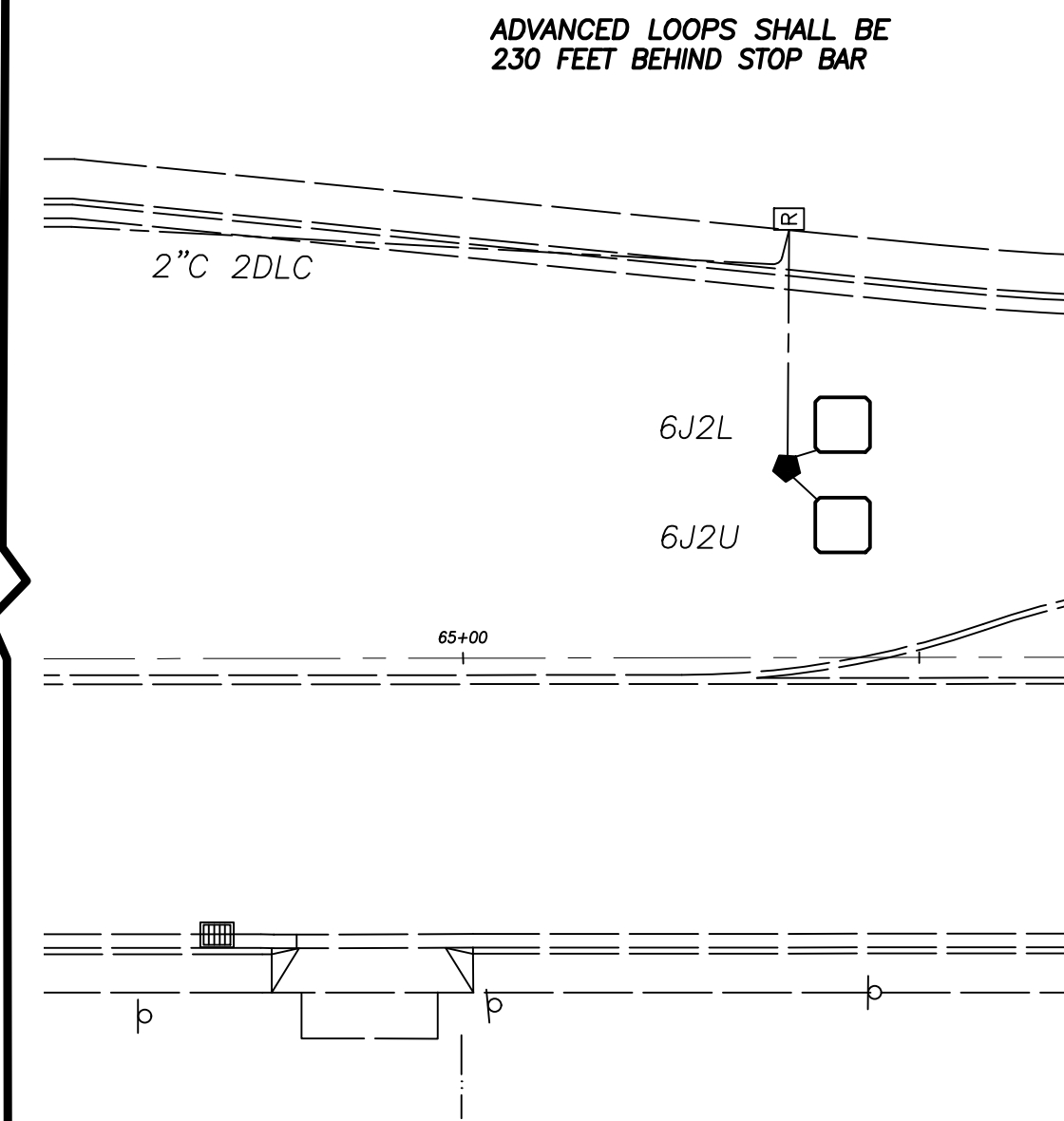
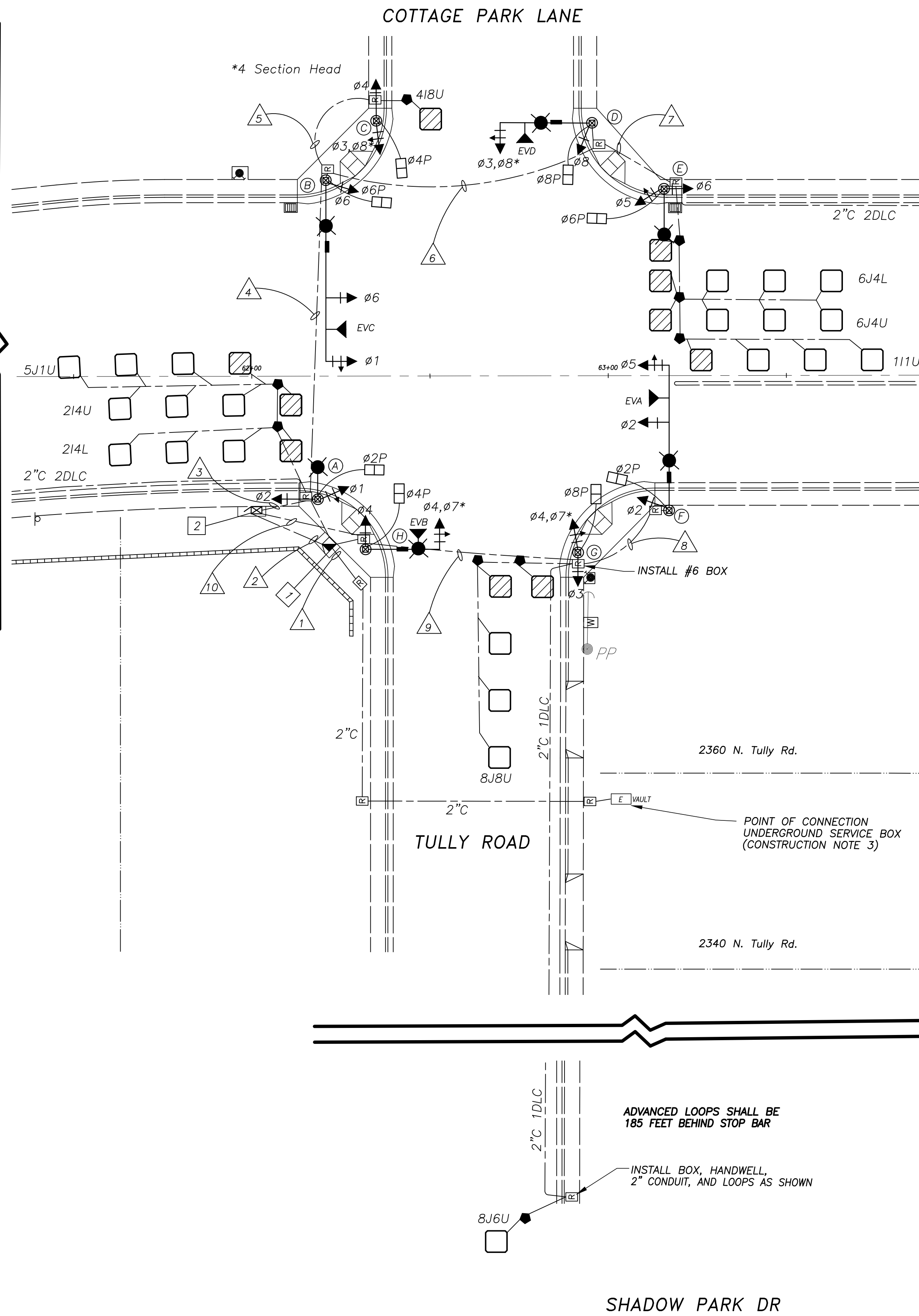
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CH. BY: RJJ
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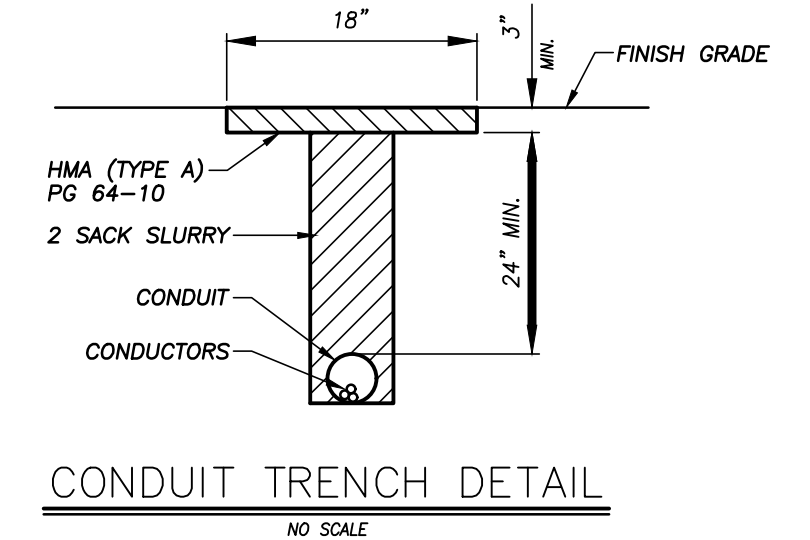
SHEET
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of 10



- GENERAL NOTES**
- THIS PLAN IS SCHEMATIC FOR ELECTRICAL WORK ONLY.
 - CITY STAFF SHALL COORDINATE WITH THE TURLOCK IRRIGATION DISTRICT FOR REMOVAL OF AERIAL UTILITIES ON UTILITY POLES IN CONFLICT WITH PROPOSED WORK. CONTRACTOR SHALL CONFIRM HEIGHT OF OVERHEAD ELECTRICAL WIRE OF RELOCATED FACILITIES AND ADJUST THE LENGTH OF SIGNAL POLE ALTERNATIVE SECTION TO PROVIDED A MINIMUM 6' CLEARANCE FROM POWER LINES TO LUMINAIRE AND/OR SIGNAL MAST ARM PER CPUC GENERAL ORDER 95.
 - ALL WORK SHALL CONFORM TO THE 2015 EDITION OF THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND PLANS.
 - EXISTING FACILITIES SHOWN ARE FROM EXISTING FACILITIES LOCATED IN THE FIELD OR FROM RECORD DATA. CONTRACTOR SHALL CONTACT U.S.A. TO DETERMINE THE EXACT LOCATION OF ALL UNDERGROUND FACILITIES AND SHALL PROVIDE PROTECTION PRIOR TO AND DURING ALL TRENCHING, JACKING OR BORING OPERATIONS.
 - ALL VEHICLE SIGNAL HEADS SHALL BE 12 INCH INDICATIONS WITH TUNNEL VISORS AND BACK PLATES.
 - ALL TRAFFIC SIGNAL PULL BOXES SIZE SHALL BE NO. 5 UNLESS OTHERWISE NOTED ON THE PLANS.
 - TRAFFIC SIGNAL BOXES ADJACENT TO STANDARDS SHALL BE PLACED WITH A 3 FOOT CLEARANCE FROM SIDE OF FOUNDATION
 - TRAFFIC SIGNAL BOXES INSTALLED IN THE ROADWAY OR SHOULDER SHALL BE INSTALLED AS PER CALTRANS DRAWING ES-8B, "ELECTRICAL SYSTEMS (TRAFFIC PULL BOX)"
 - ALL CONDUIT FOR DETECTOR LEAD IN CABLE SHALL BE 2" IN DIAMETER.
 - ALL CONDUIT SHALL BE A MINIMUM OF 24 INCHES BELOW TOP OF ASPHALT AND CONCRETE SURFACES.
 - ALL SIGNAL FACES AND PEDESTRIAN SIGNAL FACES SHALL BE L.E.D.
 - HIGHWAY SAFETY LIGHTING SHALL HAVE IV PHOTOELECTRIC CONTROL.
 - ISNS SHALL BE TITLE CASE, HIGHWAY GOTHIC D FONT. UPPERCASE LETTER SHALL BE 12" IN HEIGHT. LOWERCASE LETTER SHALL BE 9" IN HEIGHT.
 - MODEL 332 FOUNDATION DETAIL SH ES-3C SHALL BE MODIFIED TO PROVIDE A 24" WIDE RAISED SIDEWALK AREA ON BOTH SIDES OF THE 332 CABINET.



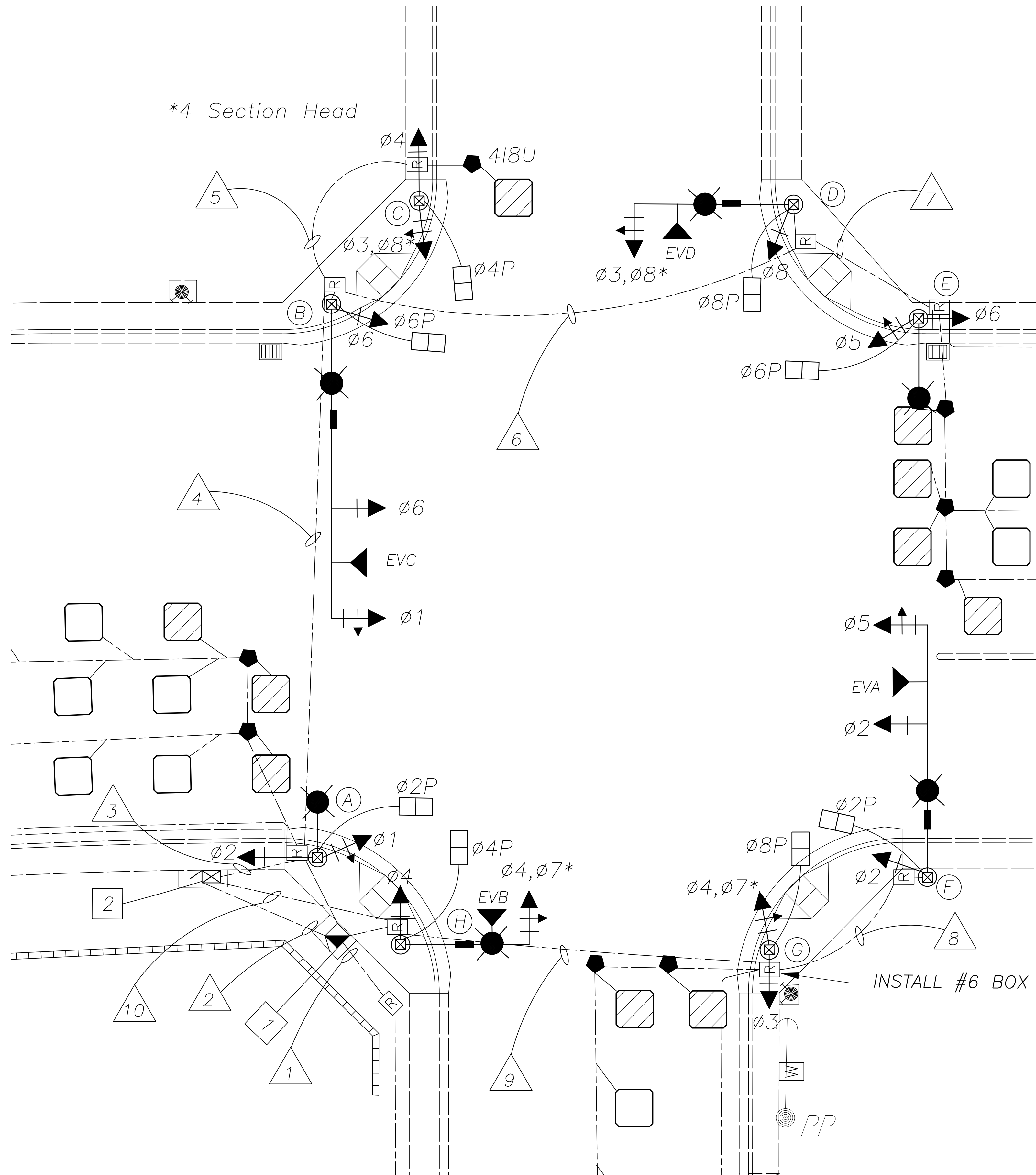
- CONSTRUCTION NOTES**
- CONTRACTOR TO FURNISH AND INSTALL TYPE III-AF SERVICE EQUIPMENT ENCLOSURE FOR 120/240V SERVICE WITH THE FOLLOWING CIRCUIT BREAKERS: 100A, 240V, 3P MAIN; 50A, 120V, 1P SIGNALS; 30A, 120V, 1P LIGHTING; 15A, 120V, 1P ISNS LIGHTING CONTROL; AND 15A, 120V, 1P ISNS INCLUDE ITEMS 1 - 8, 15 - 17 (16 AS MODIFIED) AND 20 - 25 OF THE 120/240V SERVICE WIRING DIAGRAM SHOWN ON THE STATE STANDARD PLAN ES-2D WITH PEU WINDOW.
 - CONTRACTOR TO FURNISH AND INSTALL MODEL 332 CONTROLLER CABINET, MODEL 2070 ATC CONTROLLER, MCCAIN OMNI EX LOCAL INTERSECTION CONTROL SOFTWARE, 20170-1C OF 2070-1E CPU MODULE, 2070-2A OR 2070-2E FIELD I/O MODULE, 2070-3B DISPLAY MODULE, 2070-4A POWER SUPPLY MODULE, 2070-7A ASYNCHRONOUS COMMUNICATION MODULE (DUAL RS-232), 2070-7G GPS TIME BASE MODULE, VEHICLE DETECTION CARDS, SWITCH PACKS AND ALL AUXILIARY EQUIPMENT NECESSARY TO OPERATE THE PHASING SEQUENCE AND EMERGENCY VEHICLE PREEMPTION SHOWN ON THE PLANS.
 - ELECTRICAL POINT OF CONNECTION IS AN UNDERGROUND EXISTING VAULT. CITY TO ARRANGE FOR AND PAY FOR ELECTRICAL SERVICE TURLOCK IRRIGATION DISTRICT. CONTRACTOR SHALL INSTALL CONDUIT FROM POINT OF CONNECTION TO SERVICE PEDESTAL PER T.I.D.'S STANDARDS FOR AN "INDIVIDUAL UNDERGROUND ELECTRICAL FACILITY". REFER TO T.I.D. STANDARDS AVAILABLE ONLINE AT: WWW.TID.ORG/POWER/ENGINEERING-CONSTRUCTION



EMERGENCY VEHICLE PREEMPTION
EV(A) = PHASE 2
EV(B) = PHASE 4
EV(C) = PHASE 6
EV(D) = PHASE 8
FLASHING OPERATION: ALL RED

COTTAGE PARK LANE

*4 Section Head



TUOLUMNE ROAD

TULLY ROAD

SCALE: 1" = 10'

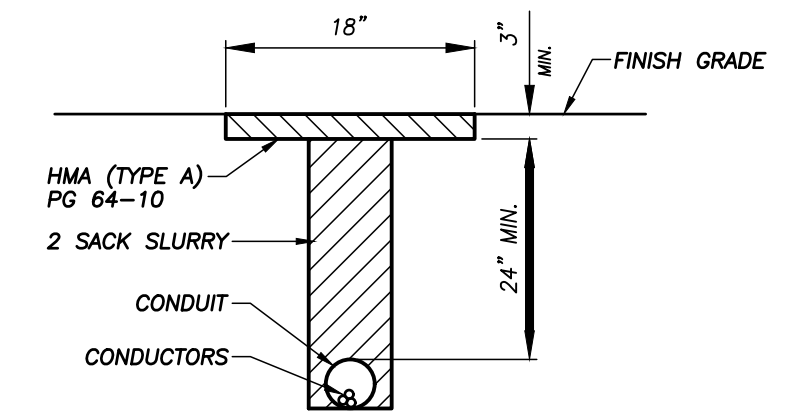
POLE & EQUIPMENT SCHEDULE										
LOCATION	POLE TYPE	MAST ARM		SIGNAL MOUNTING		PPB	6' OR 8' TYPE A 120V ISNS	EV. SYS.	120 VAC LUMINAIRE (INDUCTION)	REMARKS
		SIGNAL	LUMINAIRE	VEHICLE	MAST ARM					
(A)	15-TS	-	12"	SV-2-TA	SV-1-T	4	→	LED, SEE SPECS		
(B)	29-5-100	50"	15"	SV-1-T	50 MAS, 32 MAS	SP-1-T	4	←	Cottage Park Ln	EVC
(C)	1-A	-	-	TV-2-T	-	SP-1-T	6	→		LED, SEE SPECS
(D)	19-3-100	25	12"	SV-1-T	25 MAS	SP-1-T	6	←	Tuolumne Rd	EVD
(E)	15-TS	-	12"	SV-2-TA	-	SP-1-T	3	→	-	LED, SEE SPECS
(F)	26-3-100	40	12"	SV-1-T	40 MAS, 24 MAS	SP-1-T	3	←	Tully Rd	EVA
(G)	1-A	-	-	TV-2-T	-	SP-1-T	2	→	-	LED, SEE SPECS
(H)	17-2-100	20	12"	SV-1-T	20 MAS	SP-1-T	2	←	Tuolumne Rd	EVB

CONSTRUCTION NOTES

- CONTRACTOR TO FURNISH AND INSTALL TYPE III-AF SERVICE EQUIPMENT ENCLOSURE FOR 120/240V SERVICE WITH THE FOLLOWING CIRCUIT BREAKERS: 100A, 240V, 3P MAIN; 50A, 120V, 1P SIGNALS; 30A, 120V, 1P ISNS LIGHTING CONTROL; AND 15A, 120V, 1P ISNS INCLUDE ITEMS 1 - 8, 15 - 17 (16 AS MODIFIED) AND 20 - 25 OF THE 120/240V SERVICE WIRING DIAGRAM SHOWN ON THE STATE STANDARD PLAN ES-2D WITH PEU WINDOW.
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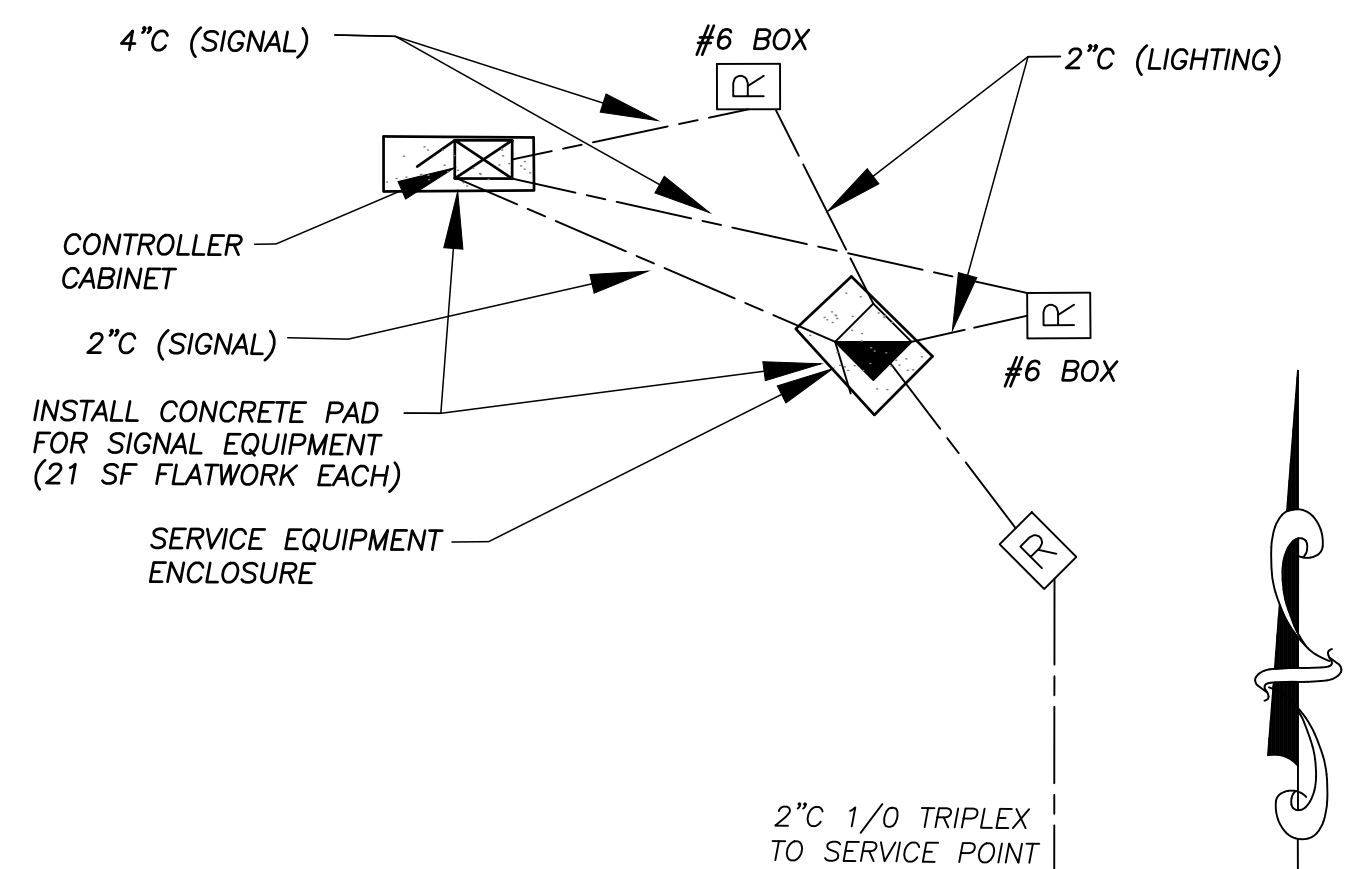
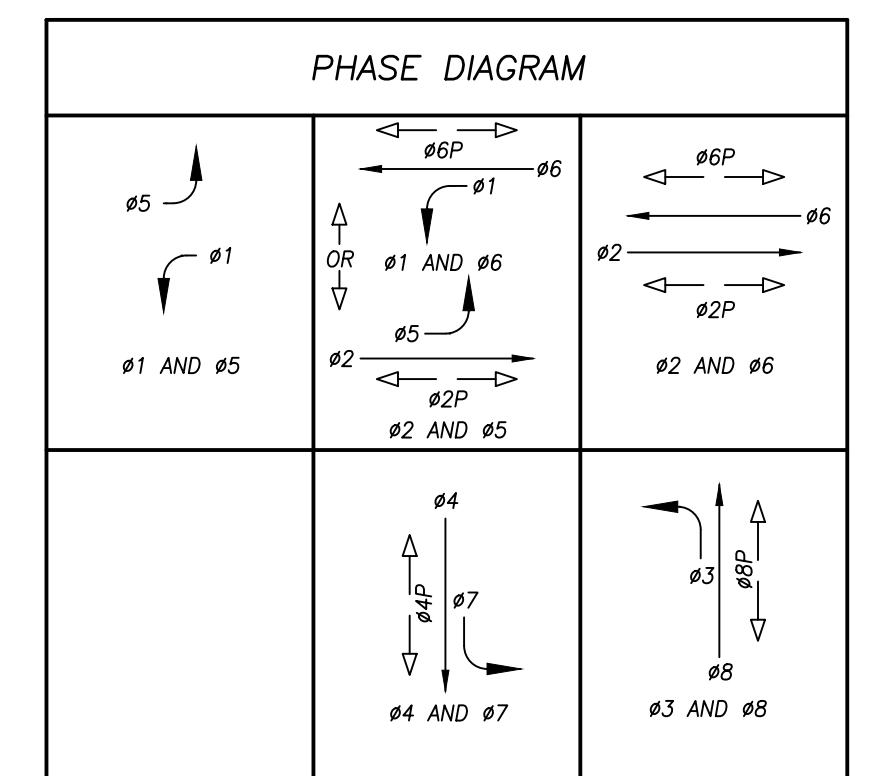
CONDUIT AND CONDUCTOR SCHEDULE													
S T D	PHASES AND CABLE TYPES			CONDUIT RUN									
	12 COND. 11-#14 1-#12	9 COND. 8-#14 1-#12	3 COND. 3-#14 (PPB)	QTY 1 2 IN.	QTY 1 2 IN.	QTY 1 4 IN.	QTY 1 4 IN.	QTY 1 2 IN.	QTY 1 3 IN.	QTY 1 3 IN.	QTY 1 2 IN.	QTY 1 3 IN.	QTY 1 4 IN.
(A)	φ1, φ2, φ2P		φ4 PPB			1/0/1							
(B)	φ1, φ6, φ6, φ6P		φ4 PPB			1/0/1	1/0/1						
(C)	φ3 & φ6, φ4, φ6P		φ6 PPB			1/0/1	1/0/1	1/0/1					
(D)	φ3 & φ6, φ6, φ6P		φ6 PPB			1/0/1	1/0/1		1/0/1				
(E)	φ5, φ6, φ6P		φ3 PPB			1/0/1	1/0/1		1/0/1	1/0/1			
(F)	φ2, φ2, φ5, φ2P		φ3 PPB							1/0/1	1/0/1	1/0/1	
(G)	φ3, φ4 & φ6, φ6P		φ2 PPB								1/0/1	1/0/1	
(H)	φ4, φ4 & φ7, φ4P		φ2 PPB										1/0/1
TOTAL				0/0/0	0/0/0	5/0/5	4/0/4	1/0/1	2/0/2	1/0/1	1/0/1	2/0/2	3/0/3
SERVICE				1/0 TRIPLEX									
SIGNALS				#4 AWG									
LIGHTING				#8 AWG									
ISNS				#10 AWG									
EMERGENCY VEHICLE PREEMPTIVE CABLE													
				EVA									
				EVB									
				EVC									
				EVD									
				TOTAL EV CABLE									
				0	0	2	2	0	1	0	1	1	2
DETECTOR LEAD IN CABLE (DLC)													
				φ2 DETECTORS									
				φ6 DETECTORS									
				φ4 DETECTORS									
				φ8 DETECTORS								2	2
				φ1 DETECTORS									
				φ5 DETECTORS									
				φ3 DETECTORS									
				φ7 DETECTORS									
				TOTAL DLCs								0	2

NOTES:
-CONDUIT RUN NO. 1 AND CONDUCTOR TO BE INSTALLED AS AN INDIVIDUAL UNDERGROUND ELECTRIC FACILITY.
CONTRACTOR TO FURNISH ALL MATERIAL AND INSTALL PER TURLOCK IRRIGATION DISTRICT (T.I.D.) STANDARDS. THE DEVELOPER INFORMATION BOOK CONTAINING THE STANDARDS CAN BE FOUND ONLINE AT [HTTP://WWW.TID.ORG/POWER/ENGINEERING-CONSTRUCTION](http://WWW.TID.ORG/POWER/ENGINEERING-CONSTRUCTION)



CONDUIT TRENCH DETAIL

EMERGENCY VEHICLE PREEMPTION
EV(A) = PHASE 2
EV(B) = PHASE 4
EV(C) = PHASE 6
EV(D) = PHASE 8
FLASHING OPERATION: ALL RED



TRAFFIC SIGNAL SERVICE DIAGRAM (10 SCALE)

SECTION 11 SIGNALS, LIGHTING & ELECTRICAL SYSTEMS

TRAFFIC SIGNAL, LIGHTING, AND SIGN ILLUMINATION SHALL CONFORM TO THE PROVISIONS IN SECTION 86, "SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS", OF THE CALTRANS PLANS AND SPECIFICATIONS, EXCEPT AS AMENDED BY THIS PROJECT'S SPECIFICATIONS.

TRAFFIC SIGNAL INSTALLATION AND REMOVAL OF EXISTING ELECTRICAL EQUIPMENT, STREET LIGHT POLES AND STANDARDS WORK SHALL BE PERFORMED AT THE FOLLOWING LOCATIONS: INTERSECTION OF TULLY ROAD AND TUOLUMNE ROAD.

11.01 COST BREAK-DOWN

SUBMIT A COST BREAK-DOWN FOR THE SIGNALS, LIGHTING, AND ELECTRICAL SYSTEMS BID ITEMS. THE BREAK-DOWN SHALL INCLUDE THE FOLLOWING BID ITEM SUB-PARTS: FOUNDATIONS, STANDARDS AND POLES, CONDUIT, PULL BOXES, CONDUCTORS AND CABLES, SERVICE EQUIPMENT, SIGNAL HEADS, PEDESTRIAN HEADS, PEDESTRIAN PUSH BUTTONS, LOOP DETECTORS, LUMINAIRES.

THE COST BREAKDOWN SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL WITHIN 15 DAYS AFTER THE CONTRACT HAS BEEN APPROVED. BEFORE ANY PARTIAL PAYMENT FOR THE ITEMS OF ELECTRICAL WORK WILL BE MADE, THE ENGINEER SHALL APPROVE THE COST BREAKDOWN, IN WRITING.

11.02 STANDARDS, STEEL PEDESTALS AND POSTS

WHERE THE PLANS REFER TO THE SIDE TENON DETAIL AT THE END OF THE SIGNAL MAST ARM, THE APPLICABLE TYP TENON DETAIL MAY BE SUBSTITUTED.

THE SIGN MOUNTING HARDWARE SHALL BE INSTALLED AT THE LOCATIONS SHOWN ON THE PLANS. HANDHOLES FOR SIGNAL STANDARDS SHALL BE LOCATED 90 DEGREES CLOCKWISE FROM THE TRAFFIC SIGNAL MAST ARM.

TYPE 1 STANDARDS SHALL BE ASSEMBLED AND SET WITH THE HANDHOLE ON THE DOWNSTREAM SIDE OF THE POLE IN RELATION TO TRAFFIC, OR AS SHOWN ON THE PLANS.

11.03 CONDUIT

CONDUIT TO BE INSTALLED UNDERGROUND SHALL BE TYPE 3 UNLESS OTHERWISE SPECIFIED. DETECTOR TERMINATION CONDUITS SHALL BE TYPE 3.

THE CONDUIT IN A FOUNDATION AND BETWEEN A FOUNDATION AND THE NEAREST PULL BOX SHALL BE TYPE 1.

WHEN TYPE 3 CONDUIT IS PLACED IN A TRENCH (NOT IN PAVEMENT OR UNDER PORTLAND CEMENT CONCRETE SIDEWALK), AFTER THE BEDDING MATERIAL IS PLACED AND THE CONDUIT IS INSTALLED, THE TRENCH SHALL BE BACKFILLED WITH COMMERCIAL QUALITY CONCRETE, CONTAINING NOT LESS THAN 420 LB OF PORTLAND CEMENT PER CUBIC YARD, TO NOT LESS THAN 4 INCHES ABOVE THE CONDUIT BEFORE ADDITIONAL BACKFILL MATERIAL IS PLACED.

CONDUIT RUNS SHOWN ON THE PLANS TO BE LOCATED BEHIND CURBS, MAY BE INSTALLED IN THE STREET, WITHIN 3 FEET OF AND PARALLEL WITH THE FACE OF THE CURB, BY THE "TRENCHING IN PAVEMENT METHOD" IN CONFORMANCE WITH THE CALTRANS STANDARD SPECIFICATIONS. PULL BOXES SHALL BE LOCATED BEHIND THE CURB OR AT THE LOCATIONS SHOWN ON THE PLANS.

AFTER CONDUCTORS HAVE BEEN INSTALLED, THE ENDS OF CONDUITS TERMINATING IN PULL BOXES, SERVICE EQUIPMENT ENCLOSURES, AND CONTROLLER CABINETS SHALL BE SEALED WITH AN APPROVED TYPE OF SEALING COMPOUND.

AT OTHER LOCATIONS WHERE CONDUIT IS REQUIRED TO BE INSTALLED UNDER PAVEMENT AND IF A DELAY TO VEHICLES WILL NOT EXCEED 5 MINUTES, CONDUIT MAY BE INSTALLED BY THE "TRENCHING IN PAVEMENT METHOD." ALL CONDUITS INSTALLED IN THE STREET AREAS SHALL BE INSTALLED AT A MINIMUM 24 INCH DEPTH FROM THE SURFACE OF THE FINISHED STREET TO THE TOP OF THE CONDUIT.

11.04 PULL BOXES

GROUT SHALL BE PLACED IN THE BOTTOM OF PULL BOXES.

11.05 CONDUCTORS AND WIRING

SPICES SHALL BE INSULATED BY METHOD "B" OR, AT THE CONTRACTOR'S OPTION, SPLICES OF CONDUCTORS SHALL BE INSULATED WITH HEAT-SHRINK TUBING OF THE APPROPRIATE SIZE AFTER THOROUGHLY PAINTING THE SPLICED CONDUCTORS WITH ELECTRICAL INSULATING COATING.

TESTING

THE CONTRACTOR SHALL PERFORM A HIGH-VOLTAGE SERIES LIGHTING TEST CONSISTING OF THE OPEN CIRCUIT VOLTAGE OF THE CONNECTED CONSTANT CURRENT TRANSFORMER BETWEEN CONDUCTORS AND GROUND.

THE HIGH-VOLTAGE TEST SHALL NOT BE PERFORMED ON EXISTING CIRCUITS OR EQUIPMENT. NON-TESTING OF EXISTING CIRCUITS AND EQUIPMENT SHALL NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY FOR MALFUNCTIONING OF EXISTING LIGHTING CIRCUITS DUE TO THE CONTRACTOR MAKING SPLICES IN OR CONNECTING TO THE CIRCUITS AND SUCH MALFUNCTIONS SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.

11.06 ELECTRICAL SERVICE

CONTINUOUS WELDING OF EXTERIOR SEAMS IN SERVICE EQUIPMENT ENCLOSURES IS NOT REQUIRED.

TYPE III SERVICE EQUIPMENT ENCLOSURES SHALL BE THE ALUMINUM TYPE.

CIRCUIT BREAKERS SHALL BE THE CABLE-IN/CABLE-OUT TYPE, MOUNTED ON NON-ENERGIZED CLIPS. ALL CIRCUIT BREAKERS SHALL BE MOUNTED VERTICALLY WITH THE UP POSITION OF THE HANDLE BEING THE "ON" POSITION.

SERVICE SHALL BE PROVIDED WITH UP TO 2 MAIN CIRCUIT BREAKERS, WHICH SHALL DISCONNECT UNGROUNDED SERVICE ENTRANCE CONDUCTORS. WHERE THE "MAIN" CIRCUIT BREAKER CONSISTS OF 2 CIRCUIT BREAKERS AS SHOWN ON THE PLANS OR REQUIRED IN THE SPECIAL PROVISIONS, EACH OF THE CIRCUIT BREAKERS SHALL HAVE A MINIMUM INTERRUPTING CAPACITY OF 10,000 AMPS, RMS.

CIRCUIT BREAKERS USED AS SERVICE DISCONNECT EQUIPMENT SHALL HAVE A MINIMUM INTERRUPTING CAPACITY OF 42,000 AMPS, RMS, FOR 120/240 V(AC) SERVICES AND 30,000 AMPS, RMS, FOR 480 V(AC) SERVICES.

CITY SHALL ARRANGE FOR SINGLE PHASE ELCTRICAL SERVICE THROUGH THE TURLOCK IRRIGATION DISTRICT AS SHOWN ON THE PLANS. CITY SHALL PAY ALL T.I.D. FEES DIRECTLY. CONTRACTOR SHALL BE RESPONSIBLE TO INSTALL ALL CONDUIT AND CONDUCTOR FROM THE TRANSFORMER TO THE SERVICE PANEL PER T.I.D. STANDARDS.

11.07 MODEL 2070 CONTROLLER ASSEMBLY

THE MODEL 2070 CONTROLLER ASSEMBLIES SHALL INCLUDE MODEL 2070 ATC CONTROLLER, MCCAIN OMNI EX LOCAL INTERSECTION CONTROL SOFTWARE, 2070-1C OR 2070-1E CPU MODULE, 2070-2A OR 2070-2E FIELD I/O MODULE, 2070-3B DISPLAY MODULE, 2070-4A POWER SUPPLY MODULE, 2070-7A ASYNCHRONOUS COMMUNICATION MODULE (DUAL RS-232), 2070-7G GPS TIME BASE MODULE, VEHICLE DETECTION CARDS, SWITCH PACKS AND ALL AUXILIARY EQUIPMENT NECESSARY TO OPERATE THE PHASING SEQUENCE AND EMERGENCY VEHICLE PREEMPTION SHOWN ON THE PLANS.

THE TYPE 332 CABINET SHALL HAVE A CONTROLLER CABINET DRAWER INCLUDED TO HOLD PLANS, MAINTENANCE LOGS AND TIMING SHEETS. THE CONTROLLER SHALL ALSO INCLUDE A CABINET LIGHT AS REQUIRED WITHIN THE CALTRANS STANDARD SPECIFICATIONS. THE LIGHT SHALL AUTOMATICALLY TURN ON AND REMAIN ON ANYTIME ONE OF THE CABINET DOORS IS OPENED.

THE TESTING OF THE CONTROLLER AND CABINET SHALL BE PERFORMED BY A TESTING LABORATORY AND CERTIFIED TO MEET THE SPECIFICATIONS AND REQUIREMENTS OF THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION. THE TESTING COSTS AND TRANSPORTATION OF THE CONTROLLER AND CABINET TO THE TESTING LABORATORY SHALL BE AT THE CONTRACTOR'S EXPENSE AND SHALL BE INCLUDED IN THE LUMP SUM PRICE PAID FOR THE TRAFFIC SIGNAL AS SET FORTH IN THE PROPOSAL.

THE CONTRACTOR SHALL MAKE ARRANGEMENTS TO HAVE A SIGNAL TECHNICIAN, QUALIFIED TO WORK ON THE CONTROLLER UNIT AND EMPLOYED BY THE CONTROLLER UNIT MANUFACTURER OR HIS REPRESENTATIVE, PRESENT AT THE TIME THE EQUIPMENT IS TURNED ON.

THE TYPE 332 TRAFFIC SIGNAL CABINETS SHALL BE PRE-WIRED WITH "GREEN SENSOR" HARNESS FOR "OPTICOM" PREEMPTION.

11.08 NUMBERING ELECTRICAL EQUIPMENT

THE CONTRACTOR SHALL PLACE TURLOCK IRRIGATION DISTRICT NUMBER LABELS ON ELECTRICAL EQUIPMENT. THE TURLOCK IRRIGATION DISTRICT WILL SUPPLY THE NUMBERS FOR THE CONTRACTOR'S INSTALLATION.

11.09 VEHICLE SIGNAL FACES AND SIGNAL HEADS

ALL RED, AMBER AND GREEN LIGHTS (BALL OR ARROW) SHALL BE 12 INCH IN SIZE AND SHALL UTILIZE LIGHT EMITTING DIODE SIGNAL MODULES. EACH LIGHT EMITTING DIODE SIGNAL MODULE SHALL CONSIST OF AN ASSEMBLY THAT UTILIZES LIGHT EMITTING DIODES AS THE LIGHT SOURCE. EACH LIGHT EMITTING DIODE SIGNAL MODULE SHALL BE DESIGNED TO BE INSTALLED IN THE DOOR FRAME OF A STANDARD TRAFFIC SIGNAL HOUSING. THE CONTRACTOR SHALL FURNISH ALL LED LAMPS.

11.10 PEDESTRIAN SIGNALS

PEDESTRIAN SIGNALS SHALL BE TYPE A BLACK IN COLOR. INTERNATIONAL SYMBOL INDICATIONS SHALL BE PROVIDED. THE PEDESTRIAN SIGNAL INDICATIONS SHALL HAVE LED'S SIGNAL MODULES THAT MEET CALTRANS SPECIFICATIONS "COUNTDOWN TYPE" WITH "FULL FIGURE DISPLAY".

THE FOLLOWING TYPE OF SCREEN SHALL BE PROVIDED: A 1 1/2-INCH DEEP EGGRATE-TYPE SCREEN EITHER OF 0.020-INCH MAXIMUM THICKNESS 3003 H14 ALUMINUM ALLOY OR OF 0.030-INCH NOMINAL THICKNESS POLYCARBONATE. THE ASSEMBLY SHALL BE MOUNTED IN A FRAME CONSTRUCTED OF 0.040-INCH MINIMUM THICKNESS ALUMINUM ALLOY OR POLYCARBONATE BLACK IN COLOR.

THE EGGRATE-TYPE SCREEN SHALL BE INSTALLED PARALLEL TO THE FACE OF THE MESSAGE PLATE AND SHALL BE HELD IN PLACE BY THE USE OF STAINLESS STEEL SCREWS.

THE HOOD DESCRIBED IN SECTION 86-4.05C, "VISORS", OF THE STATE STANDARD SPECIFICATIONS IS NOT REQUIRED.

THE SCREEN AND FRAME SHALL BE ANODIZED FLAT BLACK OR MAY BE FINISHED WITH FLAT BLACK ENAMEL AS SPECIFIED IN SECTION 91-4.01, "ENAMEL: TRAFFIC SIGNAL LUSTERLESS BLACK", CONTRACTOR'S EXPENSE.

ALTERNATE METHODS MAY BE SUBSTITUTED FOR THE ABOVE SCREENING PROVIDING THE RESULTS ARE EQUAL TO OR SUPERIOR TO THOSE OBTAINED WITH THE ABOVE-SPECIFIED SCREEN AS DETERMINED BY THE CITY ENGINEER.

11.11 PEDESTRIAN PUSHBUTTONS

PEDESTRIAN PUSHBUTTONS SHALL MEET MUTCD REQUIREMENTS FOR ACCESSIBLE PEDESTRIAN SIGNALS (APS). CONTRACTOR SHALL PROVIDE THE APS WHERE THE MUTCD LANGUAGE IS SUCH THAT A FEATURE "SHALL" BE REQUIRED. THE PUSH BUTTON SIGN SHALL BE PORCELAIN ENAMELED METAL. THE PUSH BUTTON SHALL INCLUDE A R10-36 SIGN IMMEDIATELY ABOVE THE BUTTON.

POLE-SUPPORTED PEDESTRIAN TRAFFIC CONTROL BUTTONS SHALL BE IDENTIFIED WITH COLOR CODING CONSISTING OF A TEXTURED HORIZONTAL YELLOW BAND 2" IN WIDTH ENCIRCLING THE POLE, AND A 1" WIDE DARK BORDER BAND ABOVE AND BELOW THE YELLOW BAND. COLOR CODING SHOULD BE PLACED IMMEDIATELY ABOVE THE CONTROL BUTTON. CONTROL BUTTONS SHALL BE LOCATED NO HIGHER THAN 48" ABOVE THE SURFACE ADJACENT TO THE POLE.

11.12 EMERGENCY VEHICLE DETECTOR SYSTEM

TRAFFIC SIGNAL SHALL HAVE AN EMERGENCY VEHICLE DETECTOR SYSTEM THAT SHALL CONFORM TO THE DETAILS SHOWN ON THE PLANS AND THESE SPECIAL PROVISIONS.

GENERAL

EACH EMERGENCY VEHICLE DETECTOR SYSTEM SHALL CONSIST OF AN OPTICAL EMITTER ASSEMBLY OR ASSEMBLIES LOCATED ON THE APPROPRIATE VEHICLE AND AN OPTICAL DETECTOR/DISCRIMINATOR ASSEMBLY OR ASSEMBLIES LOCATED AT THE TRAFFIC SIGNAL.

EMITTER ASSEMBLIES ARE NOT REQUIRED FOR THIS PROJECT EXCEPT UNITS FOR TESTING PURPOSES TO DEMONSTRATE THAT THE SYSTEMS PERFORM AS SPECIFIED. TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE ENGINEER AS DESCRIBED BELOW UNDER "SYSTEM OPERATION" DURING THE SIGNAL TEST PERIOD. THE ENGINEER SHALL BE GIVEN A MINIMUM OF 2 WORKING DAYS NOTICE PRIOR TO PERFORMING THE TESTS.

EACH SYSTEM SHALL PERMIT DETECTION OF 2 CLASSES OF AUTHORIZED VEHICLES. CLASS I (MASS TRANSIT) VEHICLES SHALL BE DETECTED AT RANGES OF UP TO 900 FEET FROM THE OPTICAL DETECTOR. CLASS II (EMERGENCY) VEHICLES SHALL BE DETECTED AT RANGES UP TO 1800 FEET FROM THE OPTICAL DETECTOR.

CLASS I SIGNALS (THOSE EMITTED BY CLASS I VEHICLES) SHALL BE DISTINGUISHED FROM CLASS II SIGNALS (THOSE EMITTED BY CLASS II VEHICLES) ON THE BASIS OF THE MODULATION FREQUENCY OF THE LIGHT FROM THE RESPECTIVE EMITTER. THE MODULATION FREQUENCY FOR CLASS I SIGNAL EMITTERS SHALL BE 9.639 HZ \pm 0.110 HZ. THE MODULATION FREQUENCY FOR CLASS II SIGNAL EMITTERS SHALL BE 14.035 HZ \pm 0.250 HZ.

A SYSTEM SHALL ESTABLISH A PRIORITY OF CLASS II VEHICLE SIGNALS OVER CLASS I VEHICLE SIGNALS AND SHALL CONFORM TO THE REQUIREMENTS IN SECTION 26352 OF THE CALIFORNIA VEHICLE CODE.

OPTICAL DETECTION/DISCRIMINATOR ASSEMBLY

GENERAL

EACH OPTICAL DETECTION/DISCRIMINATOR ASSEMBLY SHALL CONSIST OF ONE OR MORE OPTICAL DETECTORS, CONNECTING CABLE AND A DISCRIMINATOR MODULE.

EACH ASSEMBLY, WHEN USED WITH STANDARD EMITTERS, SHALL HAVE A RANGE OF AT LEAST 990 FEET FOR CLASS I SIGNALS AND 1800 FEET FOR CLASS II SIGNALS. STANDARD EMITTERS FOR BOTH CLASSES OF SIGNALS SHALL BE AVAILABLE FROM THE MANUFACTURER OF THE SYSTEM. RANGE MEASUREMENTS SHALL BE TAKEN WITH ALL RANGE ADJUSTMENTS ON THE DISCRIMINATOR MODULE SET TO "MAXIMUM".

OPTICAL DETECTOR

EACH OPTICAL DETECTOR SHALL BE A WATERPROOF UNIT CAPABLE OF RECEIVING OPTICAL ENERGY FROM TWO SEPARATELY AMIABLE DIRECTIONS. THE HORIZONTAL ANGLE BETWEEN THE 2 DIRECTIONS SHALL BE VARIABLE FROM 180 DEGREES TO 5 DEGREES.

THE RECEPTION ANGLE FOR EACH PHOTOCCELL ASSEMBLY SHALL BE A MAXIMUM OF 8 DEGREES IN ALL DIRECTIONS ABOUT THE AIMING AXIS OF THE ASSEMBLY. MEASUREMENTS OF RECEPTION ANGLE WILL BE TAKEN AT A RANGE OF 990 FEET FOR A TYPE I EMITTER AND AT A RANGE OF 1800 FEET FOR A TYPE II EMITTER.

INTERNAL CIRCUITRY SHALL BE SOLID STATE AND THE ASSOCIATED DISCRIMINATOR MODULE SHALL PROVIDE ELECTRICAL POWER.

EACH OPTICAL DETECTOR SHALL BE CONTAINED IN A HOUSING, WHICH SHALL INCLUDE 2 ROTATABLE PHOTOCCELL ASSEMBLIES, AN ELECTRONIC ASSEMBLY AND A BASE. THE BASE SHALL HAVE AN OPENING TO PERMIT MOUNTING ON A MAST ARM OR A VERTICAL PIPE NIPPLE, OR SUSPENSION FROM A SPAN WIRE. THE MOUNTING OPENING SHALL HAVE FEMALE THREADS FOR ONE INCH CONDUIT. A CABLE ENTRANCE SHALL BE PROVIDED WHICH SHALL HAVE MALE THREADS AND GASKETING TO PERMIT A WATERPROOF CABLE CONNECTION. EACH DETECTOR SHALL HAVE MASS OF LESS THAN 2.4 LBS AND SHALL PRESENT A MAXIMUM WIND LOAD AREA OF 36 INCHES SQUARED. THE HOUSING SHALL BE PROVIDED WITH WEEP HOLES TO PERMIT DRAINAGE OF CONDENSED MOISTURE.

EACH OPTICAL DETECTOR SHALL BE INSTALLED, WIRED AND AIMED AS SPECIFIED BY THE MANUFACTURER.

CABLE

OPTICAL DETECTOR CABLE (EV-C) SHALL MEET THE REQUIREMENTS OF IPCEA-S-61-402/NEMA WC 5, SECTION 7.4, 600V (AC) CONTROL CABLE, 75 C, TYPE B, AND THE FOLLOWING:

- A. THE CABLE SHALL CONTAIN 3 CONDUCTORS, EACH OF WHICH SHALL BE NO. 20 (7 X 28) STRANDED, TINNED COPPER WITH LOW-DENSITY POLYETHYLENE INSULATION. MINIMUM AVERAGE INSULATION THICKNESS SHALL BE 0.63 MM. INSULATION OF INDIVIDUAL CONDUCTORS SHALL BE COLOR-CODED: 1-YELLOW, 1-BLUE, AND 1-ORANGE.
- B. THE SHIELD SHALL BE EITHER TINNED COPPER BRAID OR ALUMINIZED POLYESTER FILM WITH A NOMINAL 20 PERCENT OVERLAP. WHERE FILM IS USED, A NO. 20 (7 X 28) STRANDED, TINNED, BARE DRAIN WIRE SHALL BE PLACED BETWEEN THE INSULATED CONDUCTORS AND THE SHIELD AND IN CONTACT WITH THE CONDUCTIVE SURFACE OF THE SHIELD.
- C. THE JACKET SHALL BE BLACK POLYVINYL CHLORIDE WITH MINIMUM RATINGS OF 600 V (AC) AND 80 C AND A MINIMUM AVERAGE THICKNESS OF 1.1 MM. THE JACKET SHALL BE MARKED AS REQUIRED BY IPCEA/NEMA.
- D. THE FINISHED OUTSIDE DIAMETER OF THE CABLE SHALL NOT EXCEED 8.9 MM.
- E. THE CAPACITANCE, AS MEASURED BETWEEN ANY CONDUCTOR AND THE OTHER CONDUCTORS AND THE SHIELD, SHALL NOT EXCEED 157 PF PER METER AT 1000 HZ.
- F. THE CABLE RUN BETWEEN EACH DETECTOR AND THE CONTROLLER CABINET SHALL BE CONTINUOUS WITHOUT SPLICES OR SHALL BE SPLICED ONLY AS DIRECTED BY THE DETECTOR MANUFACTURER.

DISCRIMINATOR MODULE

EACH DISCRIMINATOR MODULE SHALL BE DESIGNED TO BE COMPATIBLE AND USABLE WITH A MODEL 170 CONTROLLER UNIT AND TO BE MOUNTED IN THE INPUT FILE OF A MODEL 332 OR MODEL 336 CONTROLLER CABINET, AND SHALL CONFORM TO THE REQUIREMENTS OF CHAPTER I OF THE STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, "TRAFFIC SIGNAL CONTROL EQUIPMENT SPECIFICATIONS".

EACH DISCRIMINATOR MODULE SHALL BE CAPABLE OF OPERATING TWO CHANNELS, EACH OF WHICH SHALL PROVIDE AN INDEPENDENT OUTPUT FOR EACH SEPARATE INPUT.

EACH DISCRIMINATOR MODULE, WHEN USED WITH ITS ASSOCIATED DETECTORS, SHALL PERFORM THE FOLLOWING:

- A. RECEIVE CLASS I SIGNALS AT A RANGE OF UP TO 900 FEET AND CLASS II SIGNALS AT A RANGE OF UP TO 1800 FEET.
- B. DECODE THE SIGNALS, ON THE BASIS OF FREQUENCY, AT 9.639 HZ \pm 0.119 HZ FOR CLASS I SIGNALS AND 14.035 HZ \pm 0.255 HZ FOR CLASS II SIGNALS.
- C. ESTABLISH THE VALIDITY OF RECEIVED SIGNALS ON THE BASIS OF FREQUENCY AND LENGTH OF TIME RECEIVED. A SIGNAL SHALL BE CONSIDERED VALID ONLY WHEN RECEIVED FOR MORE THAN 0.50-SECOND. NO COMBINATION OF CLASS I SIGNALS SHALL BE RECOGNIZED AS A CLASS II SIGNAL REGARDLESS OF THE NUMBER OF SIGNALS BEING RECEIVED, UP TO A MAXIMUM OF 10 SIGNALS. ONCE A VALID SIGNAL HAS BEEN RECOGNIZED, THE EFFECT SHALL BE HELD BY THE MODULE IN THE EVENT OF TEMPORARY LOSS OF THE SIGNAL FOR A PERIOD ADJUSTABLE FROM 4.5 SECONDS TO 11 SECONDS IN AT LEAST 2 STEPS AT 5 SECONDS \pm 0.5 SECOND AND 10 SECONDS \pm 0.5 SECOND.
- D. PROVIDE AN OUTPUT FOR EACH CHANNEL THAT WILL RESULT IN A "LOW" OR GROUNDED CONDITION OF THE APPROPRIATE INPUT OF A MODEL 170 CONTROLLER UNIT. FOR CLASS I SIGNAL THE OUTPUT SHALL BE A 6.25 HZ \pm 0.1 PERCENT, RECTANGULAR WAVEFORM WITH A 50 PERCENT DUTY CYCLE. FOR CLASS II SIGNALS THE OUTPUT SHALL BE STEADY.

EACH DISCRIMINATOR MODULE SHALL RECEIVE ELECTRIC POWER FROM THE CONTROLLER CABINET AT EITHER 24 V (DC) OR 120 V (AC).

EACH CHANNEL TOGETHER WITH THE CHANNEL'S ASSOCIATED DETECTORS SHALL DRAW NOT MORE THAN 100 MA AT 24 V (DC) OR MORE THAN 100 MA AT 120 V (AC). ELECTRIC POWER, ONE DETECTOR INPUT FOR EACH CHANNEL AND ONE OUTPUT FOR EACH CHANNEL SHALL TERMINATE AT THE PRINTED CIRCUIT BOARD EDGE CONNECTOR PINS LISTED BELOW:

BOARD EDGE CONNECTOR PIN ASSIGNMENT

A	DC GROUND		
B	+24V (DC)	P	(NC)
C	(NC)		
D	DETECTOR INPUT, CHANNEL A	R	(NC)
E	+24V (DC) TO DETECTORS	S	(NC)
F	CHANNEL A OUTPUT (C)	T	(NC)
		U	(NC)
H	CHANNEL A OUTPUT (E)	V	(NC)
J	DETECTOR INPUT, CHANNEL B	W	CHANNEL B OUTPUT (C)
K	DC GROUND TO DETECTORS	X	CHANNEL B OUTPUT (E)
L	CHASSIS GROUND	Y	(NC)
M	AC-	Z	(NC)
N	AC+		

- (C) COLLECTOR, SLOTTED FOR KEYING
- (E) EMITTER, SLOTTED FOR KEYING
- (NC) NOT CONNECTED, CANNOT BE USED BY MANUFACTURER FOR ANY PURPOSE.

TWO AUXILIARY INPUTS FOR EACH CHANNEL SHALL ENTER EACH MODULE THROUGH THE FRONT PANEL CONNECTOR. PIN ASSIGNMENT FOR THE CONNECTOR SHALL BE AS FOLLOWS:

- A. AUXILIARY DETECTOR 1 INPUT, CHANNEL A
- B. AUXILIARY DETECTOR 2 INPUT, CHANNEL A
- C. AUXILIARY DETECTOR 1 INPUT, CHANNEL B
- D. AUXILIARY DETECTOR 2 INPUT, CHANNEL B

EACH CHANNEL OUTPUT SHALL BE AN OPTICALLY ISOLATED NPN OPEN COLLECTOR TRANSISTOR CAPABLE OF SINKING 50 MA AT 30 V (AC) AND SHALL BE COMPATIBLE WITH THE MODEL 170 CONTROLLER UNIT INPUTS.

EACH DISCRIMINATOR MODULE SHALL BE PROVIDED WITH MEANS OF PREVENTING TRANSIENTS RECEIVED BY THE DETECTOR FROM AFFECTING THE MODEL 170 CONTROLLER ASSEMBLY.

EACH DISCRIMINATOR MODULE SHALL HAVE A SINGLE CONNECTOR BOARD AND SHALL OCCUPY ONE SLOT WIDTH OF THE INPUT FILE. THE FRONT PANEL OF EACH MODULE SHALL HAVE A HANDLE TO FACILITATE WITHDRAWAL AND THE FOLLOWING CONTROLS AND INDICATORS FOR EACH CHANNEL:

- A. THREE SEPARATE RANGE ADJUSTMENTS EACH FOR BOTH CLASS I AND CLASS II SIGNALS.
- B. A 3-POSITION, CENTER-OFF, MOMENTARY CONTACT SWITCH, ONE POSITION (DOWN) LABELED FOR TEST OPERATION OF CLASS I SIGNALS, AND ONE POSITION (UP) LABELED FOR TEST OPERATION OF CLASS II SIGNALS.
- C. A "SIGNAL" INDICATION AND A "CALL" INDICATION EACH FOR CLASS I AND FOR CLASS II SIGNALS. THE "SIGNAL" INDICATION DENOTES THAT A SIGNAL ABOVE THE THRESHOLD LEVEL HAS BEEN RECEIVED. A "CALL" INDICATION DENOTES THAT A STEADY, VALIDLY CODED SIGNAL HAS BEEN RECEIVED. THESE 2 INDICATIONS MAY BE ACCOMPLISHED WITH A SINGLE INDICATION LAMP; "SIGNAL" BEING DENOTED BY A FLASHING INDICATION AND "CALL" WITH A STEADY INDICATION.

IN ADDITION, THE FRONT PANEL SHALL BE PROVIDED WITH A SINGLE CIRCULAR, BAYONET-CAPTURED, MULTI-PIN CONNECTOR FOR 2 AUXILIARY DETECTOR INPUTS FOR EACH CHANNEL. CONNECTOR SHALL BE A MECHANICAL CONFIGURATION CONFORMING TO THE REQUIREMENTS IN MILITARY SPECIFICATION MIL-C-26482 WITH 10-4 INSERT ARRANGEMENT, SUCH AS BURNDY TRIM TRIO BANTAMATE SERIES.

- A. WALL MOUNTING RECEPTACLE, G0B10-4PNE WITH SM20M-156 GOLD PLATED PINS.
- B. PLUG, G6L10-4SNE WITH SC20M-156 GOLD PLATED SOCKETS, CABLE CLAMP AND STRAIN RELIEF THAT SHALL PROVIDE FOR A RIGHT ANGLE TURN WITHIN 65 MM MAXIMUM FROM THE FRONT PANEL SURFACE OF THE DISCRIMINATOR MODULE.

CABINET WIRING

THE MODEL 332 CABINET HAS PROVISIONS FOR CONNECTIONS BETWEEN THE OPTICAL DETECTORS, THE DISCRIMINATOR MODULE AND THE MODEL 170 CONTROLLER UNIT.

WIRING FOR A MODEL 332 CABINET SHALL CONFORM TO THE FOLLOWING:

- A. SLOTS 12 AND 13 OF INPUT FILE "J" HAVE EACH BEEN WIRED TO ACCEPT A 2-CHANNEL MODULE.
- B. FIELD WIRING FOR THE PRIMARY DETECTORS, EXCEPT 24-V (DC) POWER, SHALL TERMINATE ON EITHER TERMINAL BOARD TB-9 IN THE CONTROLLER CABINET OR ON THE REAR OF INPUT FILE "J". DEPENDING ON CABINET CONFIGURATION. WHERE TB-9 IS USED, POSITION ASSIGNMENTS SHALL BE AS FOLLOWS:

POSITION	ASSIGNMENT
4	CHANNEL A DETECTOR INPUT, 1ST MODULE (SLOT J-12)
5	CHANNEL B DETECTOR INPUT, 1ST MODULE (SLOT J-12)
7	CHANNEL A DETECTOR INPUT, 2ND MODULE (SLOT J-13)
8	CHANNEL B DETECTOR INPUT, 2ND MODULE (SLOT J-13)

THE 24V (DC) CABINET POWER WILL BE AVAILABLE AT POSITION 1 OF TERMINAL BOARD TB-1 IN THE CONTROLLER CABINET.

FIELD WIRING FOR THE AUXILIARY DETECTORS SHALL TERMINATE ON TERMINAL BOARD TB-0 IN THE CONTROLLER CABINET. POSITION ASSIGNMENTS ARE AS FOLLOWS:

FOR MODULE 1 (J-12)

POSITION	ASSIGNMENT
1	+24V (DC) FROM (J-12E)
2	DETECTOR GROUND FROM (J-12K)
3	CHANNEL A AUXILIARY DETECTOR INPUT 1
4	CHANNEL A AUXILIARY DETECTOR INPUT 2
5	CHANNEL B AUXILIARY DETECTOR INPUT 1
6	CHANNEL B AUXILIARY DETECTOR INPUT 2

FOR MODULE 2 (J-13)

POSITION	ASSIGNMENT
7	+24V (DC) FROM (J-13E)
8	DETECTOR GROUND FROM (J-13K)
9	CHANNEL A AUXILIARY DETECTOR INPUT 1
10	CHANNEL A AUXILIARY DETECTOR INPUT 2
11	CHANNEL B AUXILIARY DETECTOR INPUT 1
12	CHANNEL B AUXILIARY DETECTOR INPUT 2

SYSTEM OPERATION

THE CONTRACTOR SHALL DEMONSTRATE THAT THE COMPONENTS OF EACH SYSTEM ARE COMPATIBLE AND WILL PERFORM SATISFACTORILY AS A SYSTEM. SATISFACTORY PERFORMANCE SHALL BE DETERMINED USING THE FOLLOWING TEST PROCEDURE DURING THE FUNCTIONAL TEST PERIOD:

- A. EACH SYSTEM TO BE USED FOR TESTING SHALL CONSIST OF AN OPTICAL EMITTER ASSEMBLY, AN OPTICAL DETECTOR, AN OPTICAL DETECTOR CABLE AND A DISCRIMINATOR MODULE.
- B. THE DISCRIMINATOR MODULES SHALL BE INSTALLED IN THE PROPER INPUT FILE SLOT OF THE MODEL 170 CONTROLLER ASSEMBLY.
- C. TWO TESTS SHALL BE CONDUCTED; ONE USING A CLASS I SIGNAL EMITTER AND A DISTANCE OF 900 FEET BETWEEN THE EMITTER AND THE DETECTOR, THE OTHER USING A CLASS II SIGNAL EMITTER AND A DISTANCE OF 1800 FEET BETWEEN THE EMITTER AND THE DETECTOR. RANGE ADJUSTMENTS ON THE MODULE SHALL BE SET TO "MAXIMUM" FOR EACH TEST.
- D. EACH TEST SHALL BE CONDUCTED FOR A PERIOD OF ONE HOUR, DURING WHICH, THE EMITTER SHALL BE OPERATED FOR 30 CYCLES, EACH CONSISTING OF A ONE-MINUTE "ON" INTERVAL AND A ONE-MINUTE "OFF" INTERVAL. DURING THE TOTAL TEST PERIOD THE EMITTER SIGNAL SHALL CAUSE THE PROPER RESPONSE FROM THE MODEL 170 CONTROLLER UNIT DURING EACH "ON" INTERVAL AND THERE SHALL BE NO IMPROPER OPERATION OF EITHER THE MODEL 170 CONTROLLER UNIT OR THE MONITOR DURING EACH "OFF" INTERVAL.

11.13 UNINTERRUPTED POWER SUPPLY:

THE CONTRACTOR SHALL INSTALL AN UNINTERRUPTED POWER SUPPLY UNIT CAPABLE OF SUPPLYING ELECTRICAL POWER FOR A FULLY EQUIPPED EIGHT PHASE TYPE 332 CABINET CONTROLLED WITH A TYPE 2070 TRAFFIC SIGNAL CONTROLLER. STANDARD RUN TIME SHALL BE 3 HOURS WITH ALL LED SIGNAL INDICATIONS. THE COMPONENTS SHALL BE WIRED AND CONFORM TO NEMA, NEC AND UL STANDARDS. THE UNIT SHALL BE EQUAL TO A TESCO 22 BBS 1400XL-6 OR AN APPROVED EQUAL. THE UNIT SHALL BE ELECTRICAL SERVICE MOUNTED ENCLOSURE. THE CONTRACTOR SHALL ENSURE THAT THE MOUNTING OF THIS UNIT TO THE ELECTRICAL SERVICE CABINET WILL NOT LIMIT THE WARRANTY OF ANY EQUIPMENT SUPPLIED WITH THIS PROJECT.



NOTE:
ALL REFERENCES AND WRITTEN DIMENSIONS SHALL SUPERSEDE ALL SCALED DISTANCES AND SHALL BE VERIFIED IN THE FIELD. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.



STEPHEN FREMMING, P.E.
PRINCIPAL CIVIL ENGINEER

11/4/2020

PLANS APPROVAL DATE



CITY OF TURLOCK
DEVELOPMENT SERVICES
ENGINEERING DIVISION
156 S. BROADWAY, STE 150
(209) 668-5520

TRAFFIC SIGNAL SPECIFICATIONS
CAPITAL PROJECT NO. 18-54
CML-5165 (094)
INTERSECTION IMPROVEMENTS AT
TULLY ROAD AND TUOLUMNE ROAD

VERIFY SCALE
BAR IS 1" ON
ORIGINAL DRAWING
1/4" 3/4" 1"
0 1/2"
IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

DRAWN BY: AZ
REV. BY: --
CH. BY: RJJ
DATE: DECEMBER, 2019
SCALE: NO SCALE
18-54 BASE.dwg

SHEET
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OF 10

11.14 LUMINAIRES

LUMINAIRES SHALL EACH HAVE THE FOLLOWING FEATURES:

- INTERSECTION SAFETY LIGHTING MOUNTED TO TRAFFIC SIGNAL POLES (QTY=4):
 - HIGH-FLUX WHITE LED PRODUCING A MINIMUM OF 90% OF INITIAL INTENSITY OVER 75,000 HOURS OF LIFE PER IES TM-21. LEDS TESTING PER IES LM-80.
 - 120V - 277V.
 - UTILITY WATTAGE LABEL AND RUBBER WILDLIFE GUARD OPTIONS INCLUDED.
 - 4000K COLOR TEMPERATURE
 - TYPE 2 MEDIUM DISTRIBUTION, FULLY SEALED WITH IP66 RATING
 - 2-HOUR BURN IN FACTORY TEST
 - FACTORY SET "1A" DRIVE CURRENT CODE
 - ONE PIECE DIE CAST ALUMINUM HOUSING WITH UNIVERSAL TWO-BOLT SLIP FITTER TO MOUNT TO 1-1/4" TO 2" DIAMETER MAST ARM
 - LEVELING ADJUSTMENT FROM +/- 5 DEGREES
 - RATED LIFE OF ELECTRICAL COMPONENTS IS 100,000 HOURS.
 - FADE RESISTANT POLYESTER POWDER COAT FINISH WITH 3 MIL THICKNESS. FINISH TESTED TO WITHSTAND 5,000 HOURS SALT SPRAY PER ASTM B117.
 - UL LISTED FOR USE IN WET LOCATIONS IN THE USA.
 - 10 YEAR WARRANTY
 - VANDAL RESISTANCE OF HOUSING AND OPTICS RATED TO IK10
 - MINIMUM DELIVERED LUMENS = 11,720 Lm, WITH EFFICACY (Lm/W) MINIMUM = 116
 - GREENCOBRA MIDSIZE LED STREET LIGHT BY LEOTEK (GCM2-30H-MV-NW-2-GY-1A-WL-RWG), OR APPROVED EQUAL
 - PHOTO CELL SHALL BE INT-MATELC4536 305V PHOTO CONTROL

- THE SIGN SHALL COME FROM THE MANUFACTURER WITH ONE EYE BOLT MOUNTED SECURELY IN THE TOP RIGHT END AND ONE EYE BOLT MOUNTED SECURELY IN THE TOP LEFT END OF THE SIGN, NO MORE THAN 3.25" FROM THE SIGN'S END, FOR THE ATTACHMENT OF SAFETY CABLES UPON INSTALLATION.
- THE SIGN AND POWER SUPPLY SHOULD BE ABLE TO WITHSTAND AND OPERATE AT TEMPERATURE EXTREMES OF -22 DEG F TO +140 DEG F.

2.0 LED LIGHT SOURCE & LUMINANCE

- THE INTERNALLY-ILLUMINATED SIGN'S LEDS SHALL HAVE A LIFE SPAN OF 60,000 HOURS BEFORE LIGHT OUTPUT DEGRADES TO JUST 70% OF ITS INITIAL BRIGHTNESS.
- THE SIGN SHALL BE LISTED AND APPROVED TO UL 48 STANDARDS BY A NATIONALLY RECOGNIZED TESTING LABORATORY. THE OUTSIDE OF THE SIGN SHALL BE MARKED WITH A CERTIFICATION MARK FOR ELECTRIC SIGNS UL 48.
- THE SIGN SHALL HAVE LIGHT OUTPUT RATING OF 750-780 LUX ACROSS THE ENTIRE SIGN FACE, AS MEASURED BY A LIGHT METER AT 50 DIFFERENT POINTS ACROSS THE ENTIRE SIGN FACE.
- SIGN PANEL LEDS SHALL BE WIRED TO ENSURE THAT A FAILURE OF ONE LED DOES NOT AFFECT THE SIGN'S LUX OUTPUT BY MORE THAN 10% LUX OVER THE AFFECTED AREA.
- SIGN'S LED PANELS WILL HAVE ONE (1) PRESS CONNECTION TERMINAL ON EACH END OF THE REPLACEABLE LED PANEL SO THAT ONLY COMMON HAND TOOLS ARE REQUIRED FOR THE WIRING REPLACEMENT OF SAID LED PANEL
- THE SIGN ENCLOSURE SHALL BE DESIGNED AS TO ALLOW COMPLETE REPLACEMENT OF THE HEAT SYNC LED PANELS WITH COMMON TOOLS (PHILLIPS HEAD SCREWDRIVER) IF NECESSARY.
- THREADED STANDOFFS, MOUNTED TO THE INTERIOR OF THE SIGN, SHALL BE MOUNTED 1/4" AWAY FROM ANY EXTERIOR SURFACE TO ALLOW FOR MINIMAL HEAT TRANSFER AND DAMAGE TO THE LED PANEL FROM SUNLIGHT HEATING THE OUTSIDE OF THE ENCLOSURE, MAXIMIZING THE LIFE OF THE LEDS.

3.0 LED SINGLE OUTPUT SWITCHING POWER SUPPLY

- LED SINGLE OUTPUT SWITCHING POWER SUPPLY SHALL BE A FULLY-ENCAPSULATED, CONSTANT CURRENT DESIGN BUILT TO WITHSTAND 300VAC SURGE INPUT FOR 5 SECONDS, WITH INHERENT SHORT CIRCUIT/OVER CURRENT/OVER VOLTAGE PROTECTION. THE POWER SUPPLY SHALL BE A UL 1310 CLASS 2 POWER UNIT, AND WILL BE HOUSED IN A FULLY SOLATED PLASTIC CASE TO PREVENT WATER INTRUSION.
- THE SIGN'S LED SINGLE OUTPUT SWITCHING POWER SUPPLY SHALL BE RATED FOR A 1750 MA (MILLIAMPS) RATED CURRENT, A DC VOLTAGE RANGE OF 9-34V, A POWER RATING OF 59.5W, A VOLTAGE TOLERANCE 0+/- 5.0%, AN AC CURRENT OF 0.7A/230VAC, AND VOLTAGE RANGE OF 127-370VDC WITH 87% OPERATING EFFICIENCY RATING, PLUS A WORKING TEMPERATURE OF -30 TO +70 DEGREES CELSIUS
- SAFETY STANDARDS SHALL MEET THE FOLLOWING CRITERIA: UL1310 CLASS 2, CAN/CSA C22.2 NO. 223-M91 (FOR LPC-60-1750 ONLY), IP67 APPROVED; DESIGN REFER TO TUV EN60950-1, EN61347-2-13.

4.0 ENERGY REQUIREMENTS

THE AVERAGE POWER CONSUMPTION OF THE SIGN SHALL NOT EXCEED:

6FT = 32 WATTS
8FT = 48 WATTS
10FT = 55 WATTS

5.0 SIGN FACE AND MATERIAL

- SIGN FACES SHALL BE DESIGNED USING ONLY CURRENT MUTCD APPROVED FONTS AND FONT SIZES, IN ADDITION TO THE REQUESTING AGENCY'S OWN PREFERENCES AND SPECIFICATIONS.
- THE SIGN SHALL HAVE A 3MM OR 4MM ACRYLIC FRONT PANEL THAT IS UV, WEATHER, ABRASION AND IMPACT RESISTANT. THE FRONT PANEL SHALL BE REPLACEABLE SO THAT MAINTAINING AGENCIES HAVE THE OPTION TO SUPPLY THEIR OWN SHEETING AND 3M 1170 SERIES ELECTROCRUT™ FILM FOR THE SIGN FACES.
- THE SIGN SHALL UTILIZE 3M'S 1170 SERIES ELECTROCRUT™ FILM FOR THE SIGN LEGEND AND SIGN BACKGROUND.
- 3M 4090 SERIES ASTM TYPE IX DIAMOND GRADE™ SHEETING SHALL BE UTILIZED, WHEN SPECIFIED, TO MEET MINIMUM LEVELS OF THE RETRO-REFLECTIVITY OF THE SIGN FACE, AS RECOMMENDED BY THE MUTCD, IF THE SIGN'S LED'S SHOULD FAIL.
- THE LIGHT TRANSMISSION FACTOR OF THE SIGN PANEL MUST PROVIDE A LETTER TO BACKGROUND RATIO OF A MINIMUM OF 4:1.
- THE SIGN SHALL UTILIZE IMPACT RESISTANT, MATCH-GRADE COMPONENT ACRYLICS (IN BOTH 3MM AND 4MM VARIANTS) WITH THE ABOVE-SPECIFIED 3M ELECTROCRUT™ TO PREVENT OUT-GASSING, BUBBLING, PEELING, AND CRACKING OF THE SIGN FACE FILM, ENSURING SIGN FACE DURABILITY OVER THE LIFE OF THE SIGN.

6.0 MANUFACTURER'S WARRANTY

THE SIGN WILL CARRY A 5-YEAR MANUFACTURER'S WARRANTY ON THE SIGN ENCLOSURE AND ALL OF ITS INTERNAL COMPONENTS.

11.16 PHOTOELECTRIC CONTROLS

CONTACTORS SHALL BE THE MECHANICAL ARMATURE MERCURY TYPE, MODEL NO. ELC4536 BY INTERMATIC, OR APPROVED EQUAL.

11.17 REMOVING, REINSTALLING OR SALVAGING EQUIPMENT

SALVAGED ELECTRICAL MATERIALS SHALL BE HAULED TO THE CITY OF TURLOCK AT 901 S. WALNUT ROAD.

THE CONTRACTOR SHALL PROVIDE THE EQUIPMENT, AS NECESSARY, TO SAFELY REMOVE ALL DESIGNATED FLASHING BEACONS, STREET LIGHT POLES, ARMS, STANDARDS AND UNLOAD AND STOCKPILE THE MATERIAL. A MINIMUM OF 2 WORKING DAYS' NOTICE SHALL BE GIVEN PRIOR TO DELIVERY.

11.18 INDUCTIVE LOOP DETECTORS

THE CONTRACTOR SHALL FURNISH LOOP DETECTOR SENSOR UNITS.

LOOP WIRE SHALL BE TYPE 2.

LOOP DETECTOR LEAD-IN CABLE SHALL BE TYPE B.

SLOTS SHALL BE FILLED WITH HOT-MELT RUBBERIZED ASPHALT SEALANT.

TRAFFIC SIGNAL LOOPS SHALL BE TYPE "A" AND TYPE "D" AS DESIGNATED ON THE PLANS.

THE DEPTH OF LOOP SEALANT ABOVE THE TOP OF THE UPPERMOST LOOP WIRE IN THE SAWED SLOTS SHALL BE 2 INCH, MINIMUM.

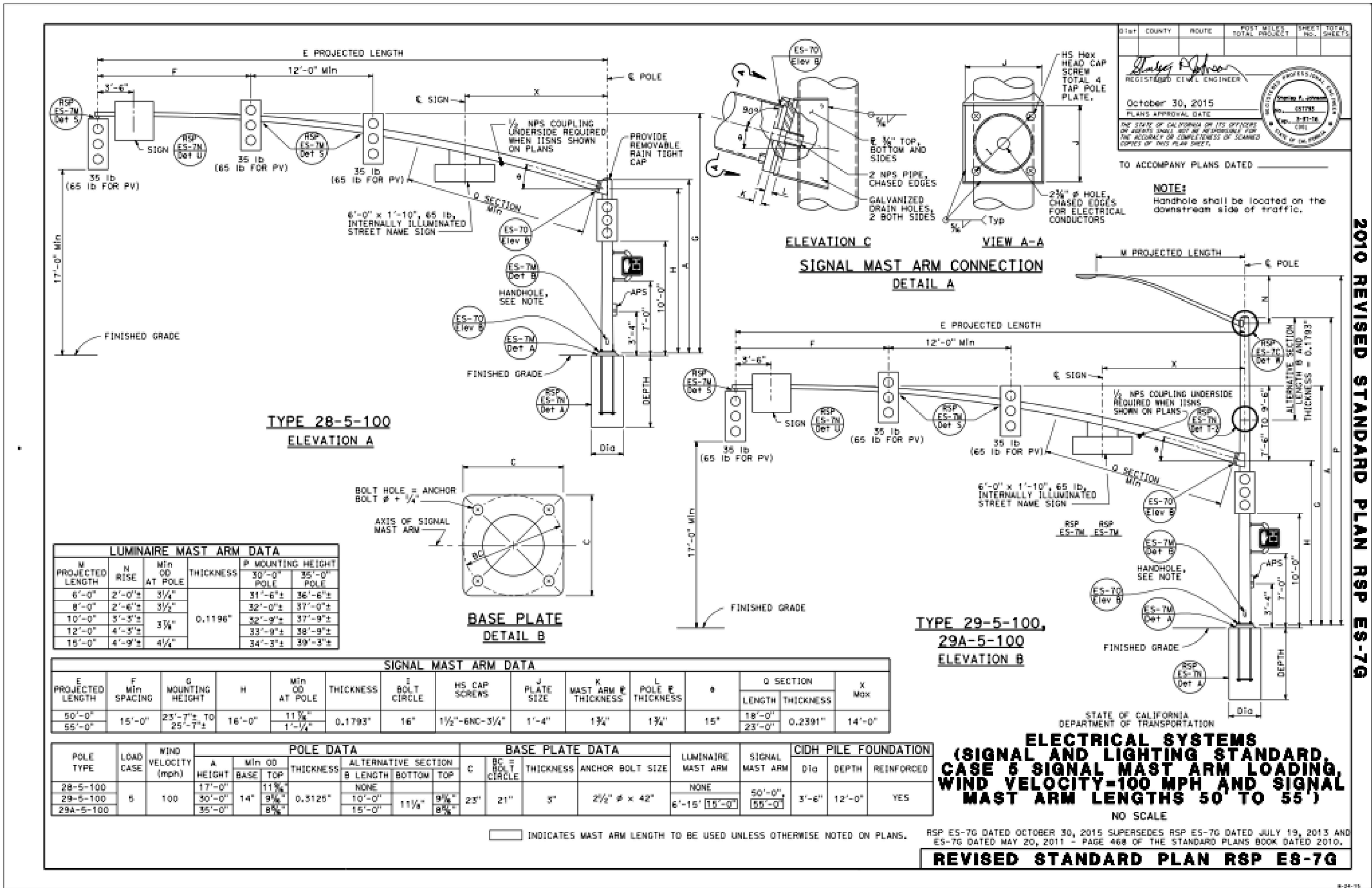
THE FURTHERMOST RIGHT TYPE "D" DETECTOR, NEAREST THE STOP BAR OR CROSSWALK OF EACH PHASE, SHALL BE DESIGNATED FOR BICYCLE DETECTION AND SHALL HAVE A BICYCLE LOOP DETECTOR SYMBOL INSTALLED IN THE CENTER OF THE DETECTION AREA, UNLESS OTHERWISE SPECIFIED IN THE PROJECT PLANS OR SPECIFICATIONS.

THE BICYCLE LOOP DETECTOR SYMBOL SHALL BE PER THE CURRENT EDITION OF THE STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, STANDARD PLANS.

11.15 INTERNALLY ILLUMINATED STREET NAME SIGNS

1.0 ENCLOSURE

- THE SIGN SHALL BE CONSTRUCTED OF 0.125" THICK TYPE 5052-832 GRADE ALUMINUM, WITH A TIG-WELDED FRAME FOR MAXIMUM DURABILITY OF THE SIGN ENCLOSURE.
- THE SIGN'S VIEWABLE OPENING SHALL BE AVAILABLE IN 15", 18", AND 24" INCH SPANS (HEIGHTS).
- THE SIGN'S VIEWABLE OPENING SHALL BE AVAILABLE IN 48", 72", 96", AND 120" INCH LENGTHS, AS MEASURED BY THE VIEWABLE OPENING OF THE SIGN.
- THE SIGN ENCLOSURE SHALL BE NO MORE THAN 3.50" INCHES THICK, REGARDLESS OF WHETHER IT IS A SINGLE-FACED SIGN OR A DOUBLE-FACED SIGN.
- THE SIGN SHALL BE DESIGNED IN SUCH A WAY AS TO MAKE IT POSSIBLE TO CONVERT THE SIGN FROM A SINGLE-SIDED SIGN TO A DOUBLE-SIDED SIGN (OR THE REVERSE), WITH ONLY A CHANGE IN THE FACE PLATES/BACK PLATES OF THE SIGN. THE ENCLOSURE MUST NOT CHANGE DIMENSIONS WITH THIS CONVERSION FROM A SINGLE-SIDED SIGN TO A DOUBLE-SIDED SIGN (OR THE REVERSE).
- THE SIGN SHALL WEIGH NO MORE THAN 5 LBS. PER SQUARE FOOT.
- THE SIGN SHALL UTILIZE A CONTINUOUS STAINLESS STEEL HINGE ON THE BOTTOM OF THE ENCLOSURE FOR A 180 - DEGREE SWING-DOWN DOOR OPERATION. THE SIGN SHALL ALSO BE FABRICATED IN A WAY TO ENSURE THAT NO COMPONENTS FALL OUT WHILE A TECHNICIAN IS OPENING OR WORKING INSIDE THE SIGN ENCLOSURE, BECAUSE ADHESIVE TAPE AND SILICONE ARE NOT ACCEPTABLE ALTERNATIVES FOR FASTENING THE SIGN FACE TO THE DOOR OF THE ENCLOSURE WHEN OPENED, RIGID ALUMINUM BRACKET HARDWARE WILL BE UTILIZED TO KEEP THE SIGN FACE IN THE DOOR.
- THE SIGN MUST BE DESIGNED FOR DEPENDABLE WEATHER - RESISTANT OPERATION WITHOUT THE USE OF SILICONE TO SEAL THE ENCLOSURE.
- THE SIGN SHALL UTILIZE A UL-LISTED NEOPRENE GASKET BETWEEN THE DOOR FRAME AND THE SIGN FACE ACRYLIC ON THE DOOR OF THE ENCLOSURE. POLYVINYL CHLORIDE / ACRYLONITRILE BUTADIENE RUBBER / CHLOROPRENE (NEOPRENE ®) GASKET SHALL BE UL 94 LISTED, OUTDOOR OZONE POLYMER NEPORENE GASKET THAT CONFORMS TO ASTM 1056 FOR COMPRESSION RESISTANCE OF 4-6 PSI AT 25% COMPRESSION, ASTM 1667 FOR WATER ABSORPTION THAT DOES NOT EXCEED 0.1 LBS/FT2, CONFORMITY WITH ASTM-412 FOR A TENSILE STRENGTH MINIMUM OF 50 PSI. THE NEOPRENE GASKET SHALL BE APPLIED TO THE DOOR FRAME, AND WILL NOT BE APPLIED TO THE SIGN FACE ACRYLIC.
- THE SIGN SHALL ALLOW FOR POWER CONNECTION TO EITHER END OF THE SIGN VIA PRE-FABRICATED "KNOCKOUT".
- THE SIGN FACE ENCLOSURE SHALL BE DESIGNED AS TO ALLOW COMPLETE REPLACEMENT OF THE SIGN FACE WITH COMMON TOOLS (8/32" NUT DRIVER).
- THE COMPLETED SIGN ASSEMBLY, INCLUDING THE SIGN PANELS AND SIGN MOUNTING HARDWARE, SHALL BE DESIGNED AND CONSTRUCTED TO WITHSTAND SUSTAINED WINDS OF 110 MPH, AND GUSTS OF 150 MPH, WITHOUT DAMAGE TO THE SIGN'S EXTERIOR OR ANY OF ITS INTERNAL COMPONENTS AS DETERMINED BY AN INDEPENDENT TESTING LABORATORY.
- MOUNTING HARDWARE WILL BE SECURELY AFFIXED TO THE TOP AND BOTTOM OF THE ENCLOSURE FOR A SECURE FIT ON THE ENCLOSURE, AND THE MOUNTING BRACKET HARDWARE SHALL EXTEND NO MORE THAN 3/16" ABOVE THE TOP PLANE OF THE SIGN AND SHALL NOT EXTEND MORE THAN 3/16" BELOW THE BOTTOM PLANE OF THE SIGN, RESPECTIVELY. THE SIGN HARDWARE SHALL NOT BE CONSPICUOUS AS VIEWED FROM THE FRONT OF THE SIGN ENCLOSURE. THE SIGN MUST BE SUPPLIED WITH RIGID BACK BRACE MOUNTING BRACKETS ON TWO POSITIONS ON THE BACK OF THE SIGN, THE RIGID BACK BRACE MOUNTING BRACKETS WILL BE POWDER-COAT PAINTED TO AN EXACT MATCH OF THE SIGN EXTRUSIONS, AND SHALL BE IN ACCORDANCE WITH MILITARY STANDARD MIL-C-24712.
- THE SIGN WILL HAVE NO HOLES DRILLED THOUGH THE ENCLOSURE'S BACK PLATE FOR USE IN A RIGID MOUNT MAST ARM CONFIGURATION.
- ALL OF THE SIGN'S WEIGHT WILL BE SUPPORTED BY A BRACKET WHICH SECURELY GRASPS BOTH THE TOP AND BOTTOM RIGID ALUMINUM EXTRUSIONS. SIGN BRACKETS, AS PROVIDED BY THE MANUFACTURER, WILL BE DESIGNED AS TO ALLOW ADEQUATE VERTICAL TRAVEL FOR ADJUSTABLE INSTALLATION ON BOTH STRAIGHT AND CURVILINEAR MAST ARMS.
- THE SIGN'S EXTERIOR SURFACES SHALL BE POWDER - COAT PAINTED IN ACCORDANCE WITH MILITARY STANDARD MIL-C-24712. FINISH WILL MEET THE REQUIREMENTS OF ASTM 03359, ASTM 03363, AND ASTM 0552 FOR MAXIMUM DURABILITY AND COLOR RETENTION OVER THE LIFE OF THE SIGN. THE SIGN SHALL NOT BE WET-PAINTED ON ANY PORTION OF THE SIGN. ALL EXTERNAL OPTIONS THAT ACCOMPANY THE SIGN, TO INCLUDE THE EXTERNAL JUNCTION BOX, SHALL ALSO BE POWDER-COATED TO THE SAME STANDARDS.
- THE SIGN SHALL UTILIZE A UL-LISTED NEOPRENE GASKET BETWEEN THE DOOR FRAME AND THE SIGN FACE ACRYLIC ON THE DOOR OF THE ENCLOSURE. POLYVINYL CHLORIDE / ACRYLONITRILE BUTADIENE RUBBER / CHLOROPRENE (NEOPRENE ®) GASKET SHALL BE UL 94 LISTED, OUTDOOR OZONE POLYMER NEPORENE GASKET THAT CONFORMS TO ASTM 1056 FOR COMPRESSION RESISTANCE OF 4-6 PSI AT 25% COMPRESSION, ASTM 1667 FOR WATER ABSORPTION THAT DOES NOT EXCEED 0.1 LBS/FT2, CONFORMITY WITH ASTM-412 FOR A TENSILE STRENGTH MINIMUM OF 50 PSI, AND SHALL BE A MINIMUM THICKNESS OF ONE - HALF INCH BEFORE INSTALLATION AND COMPRESSION ON A CLEAN, DE-GREASED SURFACE.



NOTE:
ALL REFERENCES AND WRITTEN DIMENSIONS SHALL SUPERSEDE ALL SCALED DISTANCES AND SHALL BE VERIFIED IN THE FIELD. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.



Stephen R. Fremming, P.E.
PRINCIPAL CIVIL ENGINEER

11/4/2020
PLANS APPROVAL DATE



CITY OF TURLOCK
DEVELOPMENT SERVICES
ENGINEERING DIVISION
156 S. BROADWAY, STE 150
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TRAFFIC SIGNAL SPECIFICATIONS,
GENERAL AND CONSTRUCTION NOTES
CAPITAL PROJECT NO. 18-54
CML-5165 (094)
INTERSECTION IMPROVEMENTS AT
TULLY ROAD AND TUOLUMNE ROAD

VERIFY SCALE
BAR IS 1" ON ORIGINAL DRAWING
1/4" 3/4" 1"
1/2"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DRAWN BY: AZ
REV. BY: --
CH. BY: RJJ
DATE: DECEMBER, 2019
SCALE: NO SCALE
18-54 BASE.dwg

SHEET
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OF 10

