

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY
IN LOS ANGELES COUNTY
IN PARAMOUNT
AT 0.1 MILE WEST OF
FACADE AVENUE OVERCROSSING

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010

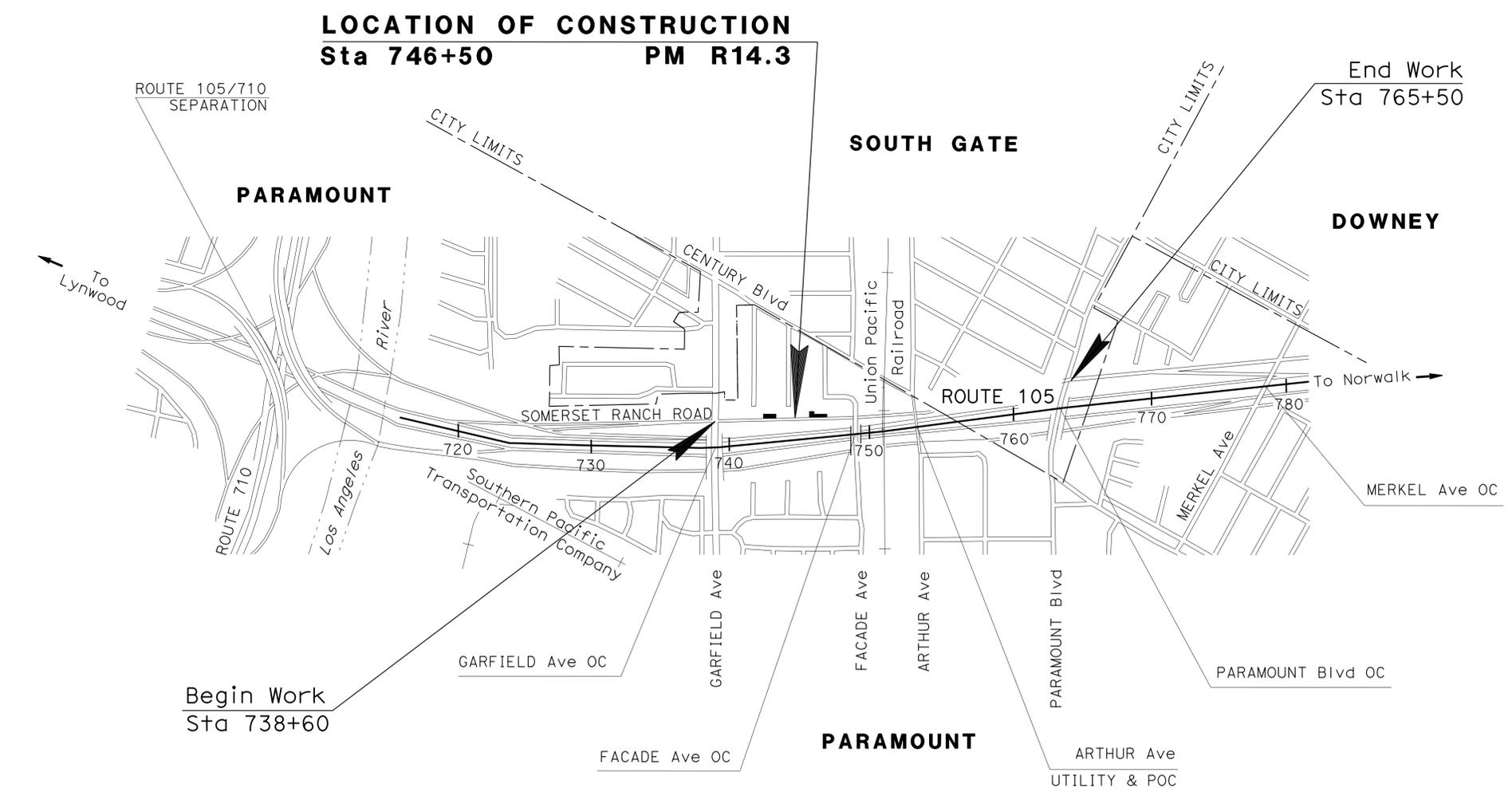
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	LA	105	R14.3	1	22

LOCATION MAP

INDEX OF PLANS

SHEET No.	DESCRIPTION
1	TITLE AND LOCATION MAP
2	CONSTRUCTION AREA SIGNS
3-4	GENERAL PLANS
5-19	ELECTRICAL PLANS
20-22	REVISED STANDARD PLANS

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



APPROVED AS TO IMPACT ON STATE FACILITIES AND CONFORMANCE WITH APPLICABLE STATE STANDARDS AND PRACTICES AND THAT TECHNICAL OVERSIGHT WAS PERFORMED.
 DATE SIGNED 10-03-13
 LICENSE EXP DATE 06-30-14
 REGISTRATION No. C50125
 CALTRANS DESIGN OVERSIGHT APPROVAL [Signature]
 SHAWN ENJILY
 CONSULTANT DESIGN ENGINEER
 MARC DIONNE

Mark Thomas 05-18-12
 PROJECT ENGINEER DATE
 REGISTERED ELECTRICAL ENGINEER
February 3, 2014
 PLANS APPROVAL DATE
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.

REGISTERED PROFESSIONAL ENGINEER
 Mark Thomas
 Tiffany
 No. E13981
 Exp. 6-30-14
 ELECTRICAL
 STATE OF CALIFORNIA

AMEC ENVIRONMENT & INFRASTRUCTURE 2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222 PHONE: 303-935-6505	
CONTRACT No.	07-4T6404
PROJECT ID	0712000422

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

NO SCALE

LAST REVISION: 00-00-00 DATE PLOTTED => 10-FEB-2014 TIME PLOTTED => 05:32

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	2	22

REGISTERED CIVIL ENGINEER *[Signature]* 10-09-13 DATE

PLANS APPROVAL DATE 2-3-14

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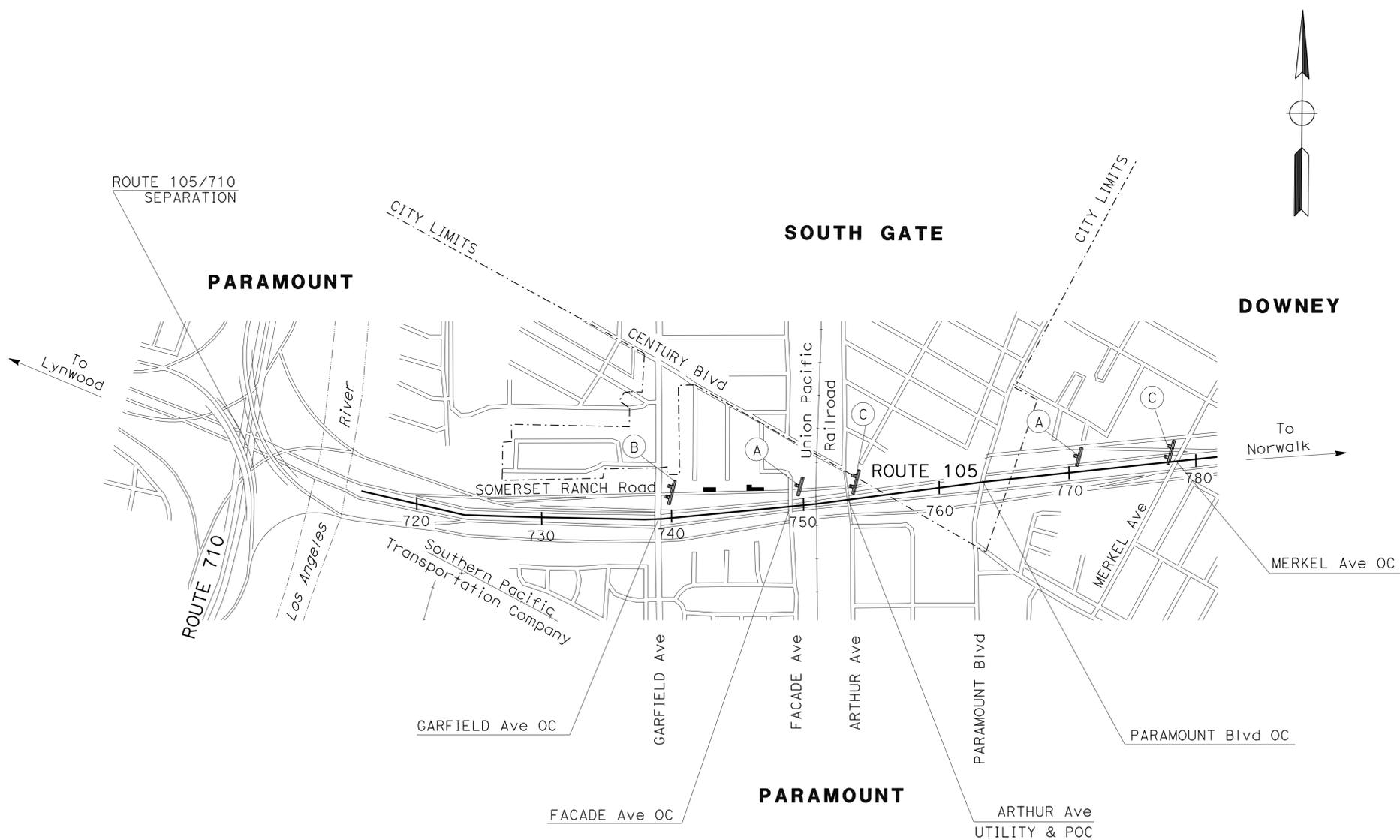
AMEC ENVIRONMENT & INFRASTRUCTURE, PHONE: 303-935-6505
2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222



NOTES:

- "TRAFFIC FINES DOUBLED IN WORK ZONES" SIGNS MUST BE PLACED APPROXIMATELY 500 FEET IN ADVANCE OF "ROAD WORK AHEAD" SIGNS OR AS DETERMINED BY THE ENGINEER.
- LOCATIONS OF CONSTRUCTION AREA SIGNS AS SHOWN ARE APPROXIMATE. EXACT LOCATIONS WILL BE DETERMINED BY THE ENGINEER.

STATIONARY MOUNTED CONSTRUCTION AREA SIGNS					
SIGN NUMBER	SIGN CODE	PANEL SIZE	QUANTITY	NUMBER OF POST AND SIZE	SIGN MESSAGE
(A)	W20-1	48" x 48"	2	1 - 4" x 6"	ROAD WORK AHEAD
(B)	G20-2	60" x 24"	1	2 - 4" x 4"	END ROAD WORK
(C)	C40A(CA)	72" x 36"	2	2 - 4" x 4"	TRAFFIC FINES DOUBLED IN WORK ZONES



NO SCALE

THIS PLAN ACCURATE FOR CONSTRUCTION AREA SIGN WORK ONLY

DESIGN	BY Neil Heckerman	CHECKED Mark Tiffany
DETAILS	BY Kendra Hathaway	CHECKED Mark Tiffany
QUANTITIES	BY Neil Heckerman	CHECKED Mark Tiffany

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN

BRIDGE NO. -
POST MILE R14.3

I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION PLAN

CONSTRUCTION AREA SIGNS

SHEET OF
CS-1

ABBREVIATIONS

A/R	AS REQUIRED	MCC	MOTOR CONTROL CENTER
AWG	AMERICAN WIRE GAUGE	MCP	MAIN CONTROL PANEL
BF	BAG FILTER	MW	MONITORING WELL
CAN	CONTROLLER AREA NETWORK	NEC	NATIONAL ELECTRICAL CODE
CPLG	COUPLING	NIC	NOT IN CONTRACT
DEVICENET	SCADA COMMUNICATIONS NETWORK	NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
DP	DRAIN PIPE		
EA	EACH	PH	PHASE
FF	FINISH FLOOR	PLC	PROGRAMMABLE LOGIC CONTROLLER
FOC	FACE OF CONCRETE	PS	POWER SUPPLY
FS	FLOW SWITCH	REQ	REQUIRED
FT	FEET	RGS	RIGID GALVANIZED STEEL
GAC	GRANULAR ACTIVATED CARBON	rpm	REVOLUTIONS PER MINUTE
GAL	GALLON	SCH	SCHEDULE
GPM	GALLONS PER MINUTE	SDR	STANDARD DIMENSION RATIO
GV	GATE VALVE	ST	STRAIGHT TIP
HMI	HUMAN MACHINE INTERFACE	TBM	TEMPORARY BENCH MARK
IE	INVERT ELEVATION (IN FEET)	TCP	TRANSMISSION CONTROL PROTOCOL
IN	INCH	THWN	THERMOPLASTIC HIGH WATER-RESISTANT NYLON-COATED
I/O	INPUT/OUTPUT		
JB	JUNCTION BOX	TM	RUN TIME METER
KW	KILOWATT	TOC	TOP OF CONCRETE
LB	POUND	USB	UNIVERSAL SERIAL BUS
LF	LINEAR FEET	V(ac)	VOLTS AC
LR	LONG RADIUS	V(dc)	VOLTS DC
LUI	LOCAL USER INTERFACE	VFD	VARIABLE FREQUENCY DRIVE
		VGA	VIDEO GRAPHICS ARRAY
		VPN	VIRTUAL PRIVATE NETWORK
		W/O	WITHOUT

LEGEND

	NEW ABOVEGRADE PIPING
	EXISTING ABOVEGRADE PIPING
	NEW SUBSURFACE PIPING
	EXISTING SUBSURFACE PIPING
	CONCRETE
	DETAIL SHEET NUMBER
99.00	NEW GRADE IN FEET
X (100.00)	EXISTING SPOT GRADE IN FEET
	EXISTING DEWATERING WELL
	EXISTING CONTROL WELL
\emptyset	DIAMETER
	SECTION / ELEVATION LETTER SHEET NUMBER
	TREE/VEGETATION
	DIRECTION OF NORMAL FLOW
	STANDARD PLAN SHEET NO.
	DETAIL NO.
	ELECTRICAL INTERLOCK
	DISCRETE SIGNAL
	COMMUNICATION
	ANALOG SIGNAL
x	03-12 WELLHEAD VFD
	DEVICENET
	TCP/IP
	EQUIPMENT OR MATERIAL TO BE REMOVED AND BECOME THE PROPERTY OF THE CONTRACTOR
	REMOVE AND REUSE EQUIPMENT

PIPING AND INSTRUMENTATION

GENERAL INSTRUMENT OR FUNCTION

DISCRETE INSTRUMENT FIELD MOUNTED	PLC PUMP HOUSE
DISCRETE INSTRUMENT WELL HEAD HIDDEN	PLC WELL HEAD HIDDEN
HMI, SHARED DISPLAY, PUMP HOUSE	LUI, WELL HEAD HIDDEN
	DISCRETE INSTRUMENT W/PILOT LIGHT WELL HEAD

DPAH	DIFFERENTIAL PRESSURE ALARM HIGH	BV-X	BALL VALVE
DPI	DIFFERENTIAL PRESSURE INDICATOR	BFV-X	BUTTERFLY VALVE
DPU	DIFFERENTIAL PRESSURE CALCULATION	CV-X	CHECK VALVE
FAL	FLOW ALARM LOW	GLV-1	GLOBE VALVE
FE	FLOW ELEMENT	GV-1	GATE VALVE
FI	FLOW INDICATION		REDUCER
FIQT	FLOW INDICATING TOTALIZER TRANSMITTER	FIQ-X	ELECTROMAGNETIC FLOW METER
FQ	FLOW TOTALIZER		FLANGE
FQR	FLOW TOTALIZER RECORDER	ARV-1	AIR RELIEF VALVE
FQRI	FLOW TOTALIZER RECORDER INDICATION		QUICK DISCONNECT
HI	HAND INDICATION		PLATE STRAINER
HS	HAND SWITCH		
JI	POWER STATUS INDICATOR		
KQ	RUN TIME		
LA	LEVEL ALARM		
LAL	LEVEL ALARM LOW		
LE	LEVEL ELEMENT		
LI	LEVEL INDICATOR		
LIC	LEVEL INDICATING CONTROLLER		
LT	LEVEL TRANSMITTER		
PAL	PRESSURE ALARM LOW		
PI	PRESSURE INDICATOR		
PT	PRESSURE TRANSMITTER		
SC	SPEED CONTROL		
SI	SPEED INDICATION		
ST	SPEED TRANSMITTER		
YA	EVENT ALARM		
YC	EVENT CONTROL (START)		
YI	EVENT INDICATION		
	SAMPLE PORT		
	EXISTING PRESSURE GAUGE		
	EXISTING LEVEL GAUGE		

GENERAL WORK NOTES

1. THE CONTRACTOR MUST VERIFY ALL CONTROLLING FIELD DIMENSIONS AND CONDITIONS BEFORE ORDERING OR FABRICATING ANY MATERIALS.
2. E-01 THROUGH E-06 ARE 20,000 LB GAC VESSELS.
3. W-01 THROUGH W-08 ARE 15,000 LB GAC VESSELS.
4. ALL OBSTRUCTIONS WITHIN THE AREA TO BE IMPROVED MUST BE REMOVED AND/OR RELOCATED AT THE DIRECTION OF THE ENGINEER. UTILITIES ARE TO BE RELOCATED BY THEIR RESPECTIVE OWNERS UNLESS NOTED OTHERWISE.
5. SUBSURFACE PIPING LOCATIONS WERE TAKEN FROM AVAILABLE RECORD DATA AND WERE NOT LOCATED IN THE FIELD, UNLESS OTHERWISE NOTED ON THE PLAN. THE CONTRACTOR MUST FIELD LOCATE ALL BURIED UTILITIES. ALL CONNECTION POINTS MUST BE APPROVED BY THE ENGINEER.
6. ELEVATIONS ARE BASED ON VERTICAL DATUM NAVD 1988.

INDEX OF SHEETS

Sheet No.	Description
GP-1	GENERAL PLAN - INDEX, NOTES, LEGENDS & ABBREVIATIONS
GP-2	GENERAL PLAN - SITE LOCATION PLAN
EE-1	PIPING AND INSTRUMENTATION DIAGRAM -1
EE-2	PIPING AND INSTRUMENTATION DIAGRAM -2
EE-3	COMMUNICATION NETWORK DIAGRAM
EE-4	GENERAL ARRANGEMENT/CONDUIT PLAN
EE-5	CONDUIT & CABLE SCHEDULE
EE-6	MCP BOM & NAMEPLATE SCHEDULE
EE-7	MAIN CONTROL PANEL LAYOUT
EE-8	MCP VAC/VDC SCHEMATIC
EE-9	MCP I/O- ANALOG INPUT (4-WIRE)
EE-10	MCP I/O- ANALOG INPUT (LOOP PWR)
EE-11	MCP I/O- DISCRETE INPUT (1-16)
EE-12	MOTOR CONTROL VFD TYPICAL WIRING DIAGRAM
EE-13	MOTOR CONTROL TYPICAL 120 VAC SCHEMATIC
EE-14	TYPICAL DEMOLITION PLAN
EE-15	MISCELLANEOUS DETAILS

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	3	22
REGISTERED ELECTRICAL ENGINEER DATE 05-18-12					
PLANS APPROVAL DATE 2-3-14					
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AMEC ENVIRONMENT & INFRASTRUCTURE, PHONE: 303-935-6505 2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222					

DESIGN	BY Neil Heckerman	CHECKED Mark Tiffany
DETAILS	BY Kendra Hathaway	CHECKED Mark Tiffany
QUANTITIES	BY Neil Heckerman	CHECKED Mark Tiffany

STATE OF
CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
ELECTRICAL-MECHANICAL-WATER
AND
WASTEWATER DESIGN

BRIDGE NO.	-
POST MILE	R14.3

**I-105 GROUNDWATER TREATMENT
ELECTRICAL MODIFICATION PLAN**
INDEX, NOTES,
LEGENDS & ABBREVIATIONS

SHEET
GP-1

GENERAL NOTES

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	4	22

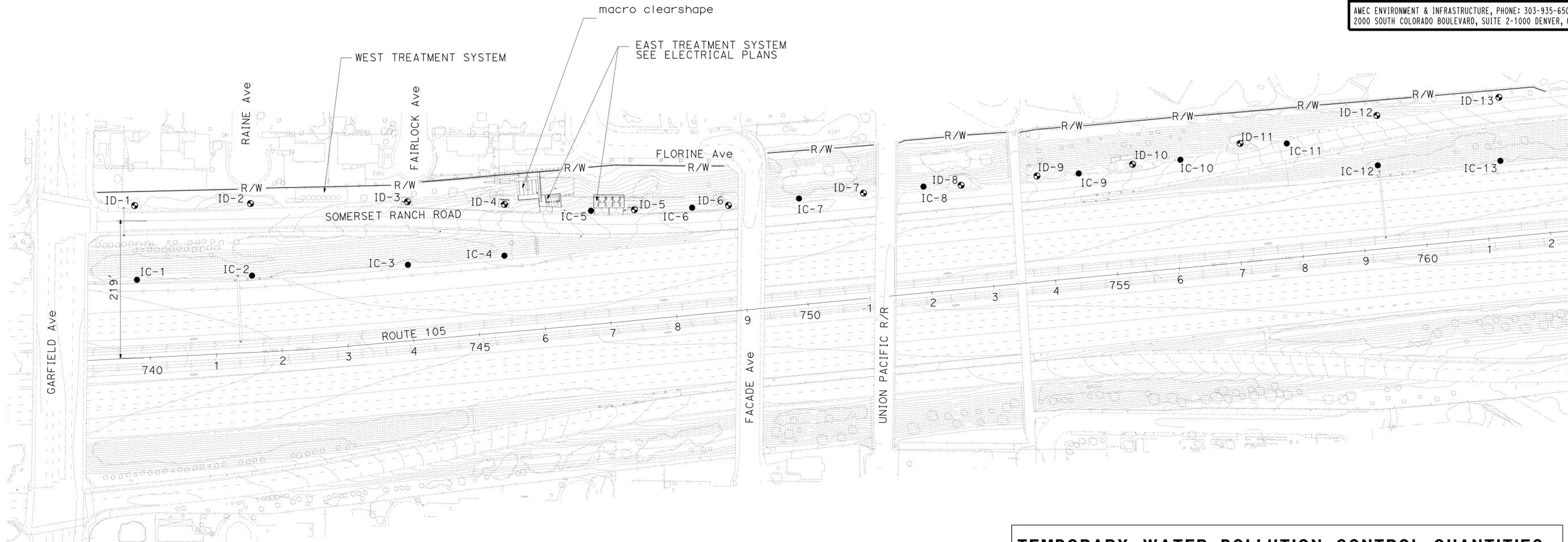
Mark Thomas Tiffany 05-18-12
 REGISTERED ELECTRICAL ENGINEER DATE

2-3-14
 PLANS APPROVAL DATE

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 2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222

REGISTERED PROFESSIONAL ENGINEER
 Mark Thomas Tiffany
 No. E13981
 Exp. 6-30-14
 ELECTRICAL
 STATE OF CALIFORNIA



TEMPORARY WATER POLLUTION CONTROL QUANTITIES		
LOCATION	TEMPORARY GRAVEL BAG BERM	TEMPORARY DRAINAGE INLET PROTECTION
	LF	EA
PM R14.3	600	4

LEGEND

- ⊙ ID-1 THROUGH ID-13 EXISTING GROUNDWATER DEWATERING WELLS
- IC-1 THROUGH IC-13 EXISTING GROUNDWATER CONTROL WELLS

SCALE: 1" = 80'



DESIGN BY Neil Heckerman CHECKED Mark Tiffany DETAILS BY Kendra Hathaway CHECKED Mark Tiffany QUANTITIES BY Neil Heckerman CHECKED Mark Tiffany	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN	BRIDGE NO.	I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION PLAN GENERAL PLAN SITE LOCATION PLAN	SHEET
			POST MILE		R14.3
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3		UNIT PROJECT NUMBER & PHASE 1961 07120004221	DISREGARD PRINTS BEARING EARLIER REVISION DATES → 05-18-12	REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET OF

TAEMWW Imperial Rev. 3/12
 EA 4T6401
 0712000422wa002.dgn

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	5	22

	05-18-12 DATE REGISTERED ELECTRICAL ENGINEER
2-3-14 PLANS APPROVAL DATE	
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AMEC ENVIRONMENT & INFRASTRUCTURE, PHONE: 303-935-6505 2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222	



GENERAL INSTRUMENT OR FUNCTION

DISCRETE INSTRUMENT	PLC
FIELD MOUNTED	PUMP HOUSE
SHARED DISPLAY, PUMP HOUSE	HMI

- LEGEND (THIS SHEET ONLY):**
- (A) PROCESS ALARM SET POINT CAN BE ADJUSTED FROM THE HMI.
 - (B) VERIFY EXISTING FLOW INDICATING TOTALIZING TRANSMITTERS (FIQT) ARE CAPABLE OF FLOW TOTALIZATION.
- NOTE:**
FOR LEGEND AND ABBREVIATIONS, SEE SHEET GP-1

GARFIELD PUMP STATION & FILTRATION
NOT TO SCALE

DESIGN BY Neil Heckerman CHECKED Mark Tiffany DETAILS BY Kendra Hathaway CHECKED Mark Tiffany QUANTITIES BY Neil Heckerman CHECKED Mark Tiffany	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION			BRIDGE NO. - POST MILE R14.3	I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION PIPING AND INSTRUMENTATION DIAGRAM - 1		SHEET EE-1 OF
	ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3	UNIT PROJECT NUMBER & PHASE 1961 07120004221	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY) 05-18-12	SHEET OF		
	TAEMWW Imperial Rev. 3/12	EA 4T6401	0712000422wj001.dgn	07-FEB-2014 15:03			

LEGEND (THIS SHEET ONLY):

- (A) PROCESS ALARM SET POINTS CAN BE ADJUSTED FROM THE HMI.
- (B) PUMP FLOW ALARM LOW FAL-XX01 AND PRESSURE ALARM LOW PAL-XX01 ARE ACTIVE ONLY WHEN PUMP IS OPERATING AND INHIBITED WHEN PUMP IS NOT OPERATING.
- (C) PUMP REMOTE OPERATION IS LIMITED TO A RANGE OF 50% TO 100% OF RATED SPEED.
- (D) VFD FIRMWARE MINIMUM LIMIT IS 50% SPEED.
- (E) DE-WATERING WELL LEVEL ALARM LOW LAL-XX51 IS A PERMISSIVE INTERLOCK TO PUMP OPERATION IN REMOTE MODES OF OPERATION.
- (F) REMOTE AUTOMATIC CONTROL SET POINT CAN BE ADJUSTED FROM LUI. CONTROL LOOP TO ADJUST VFD PUMP SPEED TO MAINTAIN WATER LEVEL BELOW SET POINT.

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	6	22

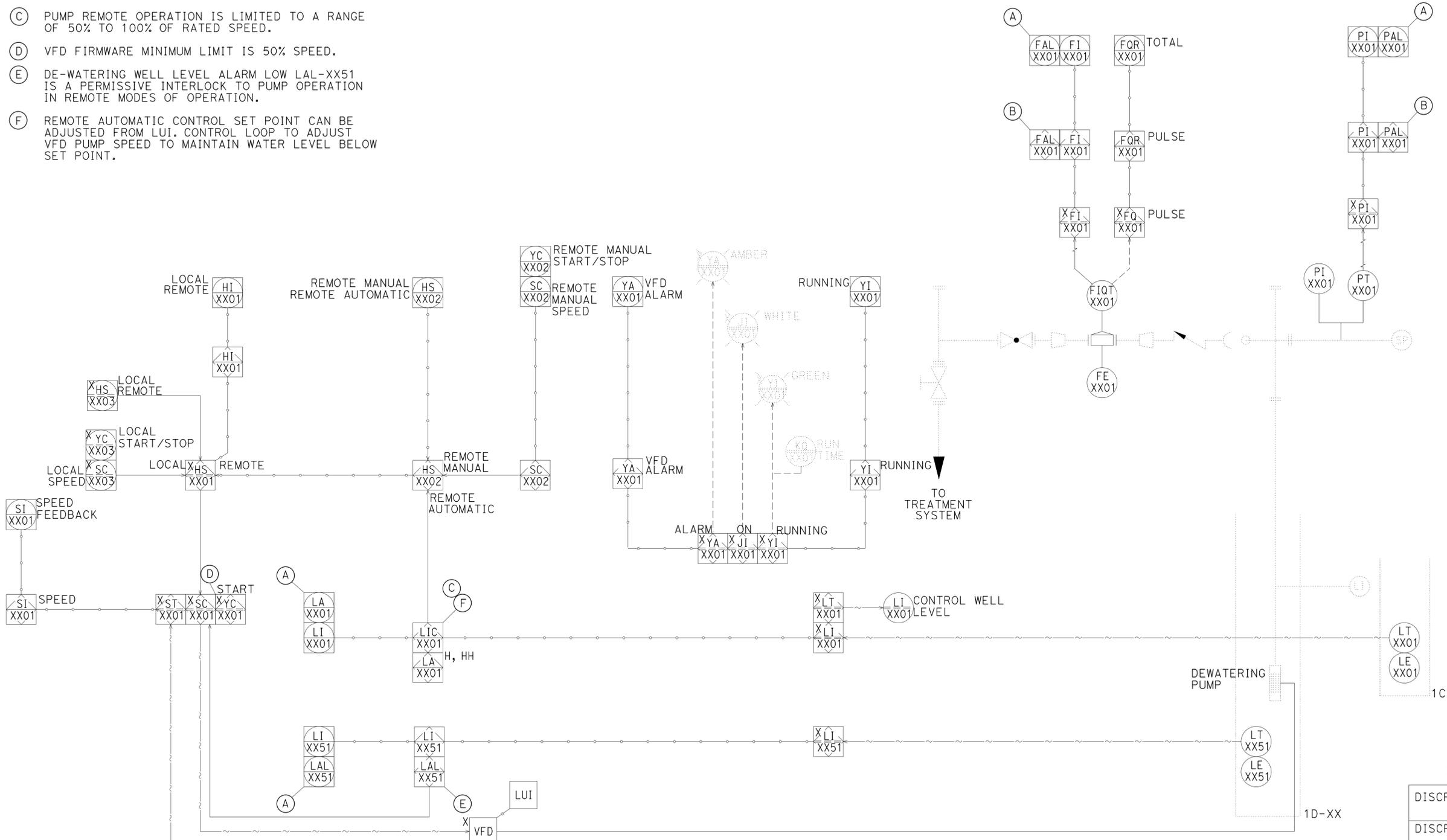
05-18-12
REGISTERED ELECTRICAL ENGINEER DATE

2-3-14
PLANS APPROVAL DATE

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AMEC ENVIRONMENT & INFRASTRUCTURE, PHONE: 303-935-6505
2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222

PROFESSIONAL ENGINEER
Mark Thomas Tiffany
No. E13981
Exp. 6-30-14
ELECTRICAL
STATE OF CALIFORNIA



**ID-03 THROUGH ID-12 WELL HEADS
(TYPICAL)**
XX REPRESENTS WELL HEAD LOCATION 03 THROUGH 12

GENERAL INSTRUMENT OR FUNCTION	
DISCRETE INSTRUMENT FIELD MOUNTED	PLC PUMP HOUSE
DISCRETE INSTRUMENT WELL HEAD HIDDEN	PLC WELL HEAD HIDDEN
SHARED DISPLAY, HMI, PUMP HOUSE	LUI, WELL HEAD HIDDEN
	DISCRETE INSTRUMENT W/PILOT LIGHT WELL HEAD

DESIGN BY Neil Heckerman DETAILS BY Kendra Hathaway QUANTITIES BY Neil Heckerman	CHECKED Mark Tiffany CHECKED Mark Tiffany CHECKED Mark Tiffany	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN	BRIDGE NO. -	I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION PIPING AND INSTRUMENTATION DIAGRAM - 2	SHEET EE-2
				POST MILE R14.3		
				UNIT PROJECT NUMBER & PHASE 1961 07120004221		DISREGARD PRINTS BEARING EARLIER REVISION DATES

TAEMWW Imperial Rev. 3/12 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3 UNIT PROJECT NUMBER & PHASE 1961 07120004221 DISREGARD PRINTS BEARING EARLIER REVISION DATES 05-18-12

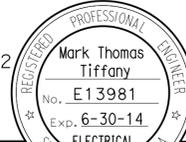
NOTES:

1. WELL PUMP CONTROL CABINET 1,2 AND 13 ARE NOT INCLUDED IN THE SCOPE OF THIS PROJECT AND NOT SHOWN ON THIS DRAWING.
2. FOR WELL LOCATIONS SEE GP-2.

LEGEND (THIS SHEET ONLY):

- (A) DEVICENET OPTION MODULE.
- (B) DEVICENET PLC I/O CARD.
- (C) INTELLIGENT VARIABLE FREQUENCY DRIVE, HMI IS MOUNTED ON THE DOOR. [RC] EXISTING DRIVE AND HMI.
- (D) CAN/DEVICENET BUS EXPANDER TO BE INSTALLED IN WELL PUMP CONTROL CABINETS 7 AND 8.
- (E) DEVICENET TERMINATING RESISTOR.
- (F) EXISTING COMMUNICATIONS TERMINAL BLOCKS TO BE [RR] AS AN OPEN STYLE DEVICENET TAP.
- (G) COORDINATE BROADBAND INTERNET SERVICE TO GARFIELD PUMPHOUSE AND EXTEND BROADBAND INTERNET SERVICE TO VPN FIREWALL IN MCP.

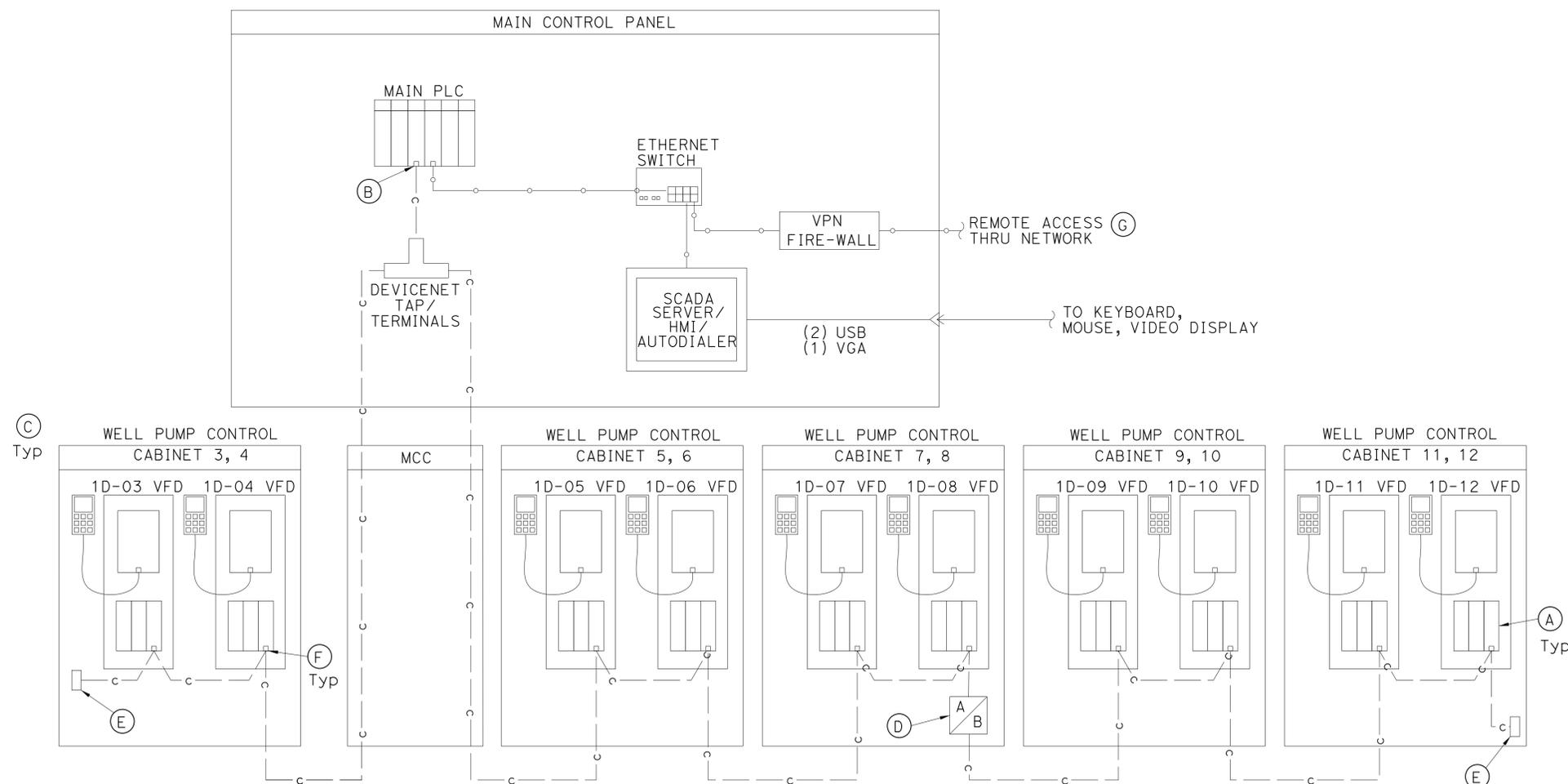
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	7	22


 REGISTERED ELECTRICAL ENGINEER DATE 05-18-12

2-3-14
 PLANS APPROVAL DATE

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AMEC ENVIRONMENT & INFRASTRUCTURE, PHONE: 303-935-6505
2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222



WELL HEAD/MCC/MCP NETWORK DIAGRAM

DESIGN	BY Neil Heckerman	CHECKED Mark Tiffany
DETAILS	BY Kendra Hathaway	CHECKED Mark Tiffany
QUANTITIES	BY Neil Heckerman	CHECKED Mark Tiffany

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN

BRIDGE NO.	-
POST MILE	R14.3

I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION
COMMUNICATION NETWORK DIAGRAM

SHEET EE-3

NOTES (THIS SHEET ONLY):

1. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY.
2. ALL CONDUITS MUST BE TYPE 1.
3. CONDUITS TO INDIVIDUAL INSTRUMENTS FROM CONDUIT TEES NOT SHOWN FOR CLARITY. SUPPLY AND INSTALL THEM PER NEC.

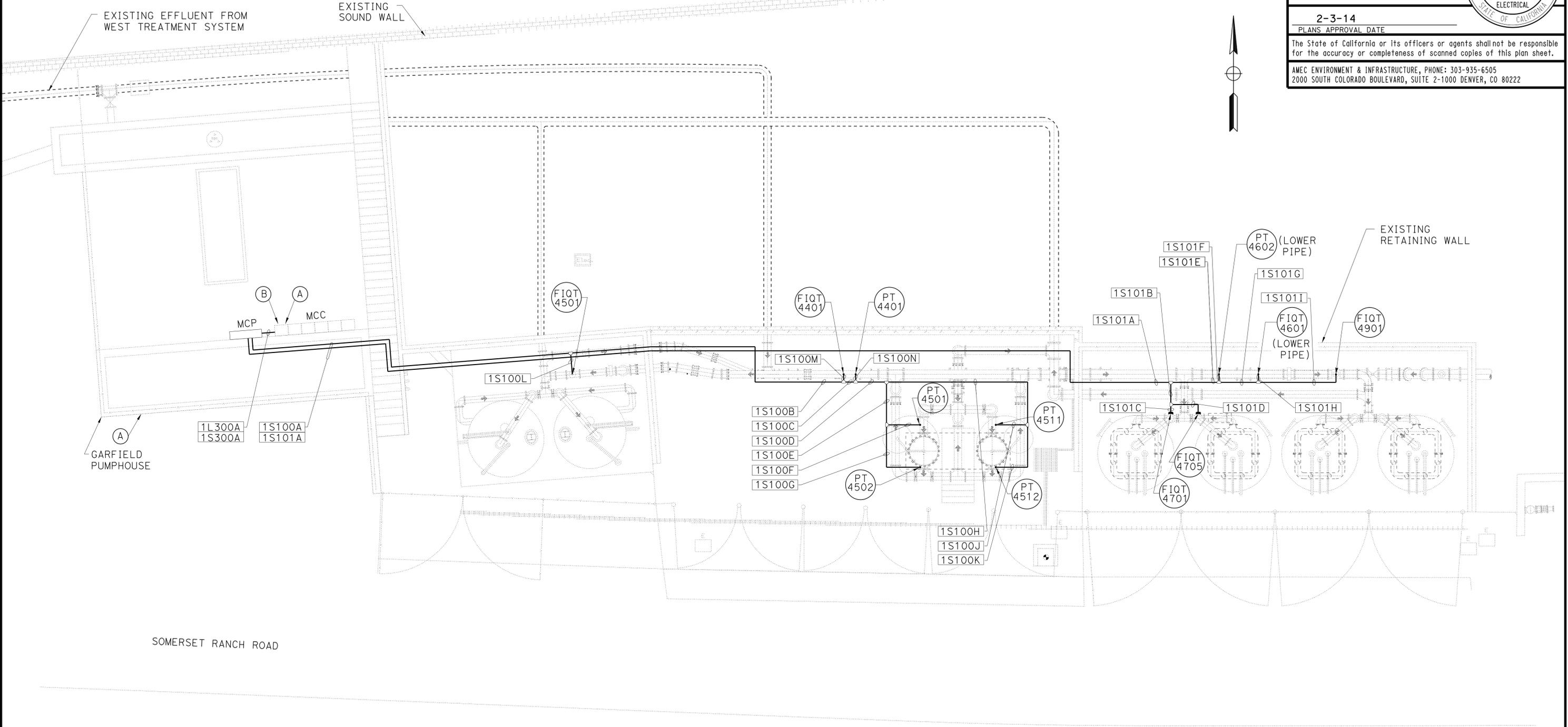
LEGEND (THIS SHEET ONLY):

- (A) EXISTING EQUIPMENT.
- (B) VERIFY EXISTING CONDUIT FROM EXISTING MCC TO CABINETS 3-4 AND FROM MMC TO CABINETS 5-6 AND EXTENDS TO CABINETS 11-12 VIA CABINETS 5-6, CABINETS 7-8, AND CABINETS 9-10. REPAIR AND REPLACE AS NECESSARY.

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	8	22


 Mark Thomas Tiffany
 REGISTERED ELECTRICAL ENGINEER
 DATE 05-18-12
 EXP. 6-30-14

2-3-14
 PLANS APPROVAL DATE
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 AMEC ENVIRONMENT & INFRASTRUCTURE, PHONE: 303-935-6505
 2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222



GARFIELD PUMP STATION & FILTRATION

SCALE: 1" = 6'

DESIGN BY Neil Heckerman CHECKED Mark Tiffany DETAILS BY Kendra Hathaway CHECKED Mark Tiffany QUANTITIES BY Neil Heckerman CHECKED Mark Tiffany	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN	BRIDGE NO. - POST MILE R14.3	I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION GENERAL ARRANGEMENT/CONDUIT PLAN	SHEET EE-4 OF
	ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3	UNIT PROJECT NUMBER & PHASE 1961 07120004221 EA 4T6401	DISREGARD PRINTS BEARING EARLIER REVISION DATES 05-18-12	REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET OF
	TAEMWW Imperial Rev. 3/12	0712000422w\004.dgn	12-FEB-2014 11:13	12-FEB-2014 11:13	12-FEB-2014 11:13

LEGEND (THIS SHEET ONLY):

- (A) RECOMMENDED CONDUIT SIZE. SIZE CONDUIT APPROPRIATELY PER NEC AND CONNECT TO DEVICES PER MANUFACTURER DIRECTIONS.
- (B) FIELD VERIFY LOCATIONS AND REUSE EXISTING CONDUIT WHERE POSSIBLE.

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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05-18-12
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2-3-14
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2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222

CONDUIT & CABLE SCHEDULE

CONDUIT NAME	CONDUIT SIZE (A)	CONDUIT TYPE	SIZE OF WIRE/CABLE	# OF WIRES/CABLE	WIRE TYPE	CONDUIT FROM	CONDUIT TO	NOTES	3' Max LIQUIDTIGHT FLEXIBLE MC REQ'D
1L300A	3/4"	RGS	12 AWG	3	THWN	PUMPHOUSE MCC PANELBOARD	PUMPHOUSE MCP	120 V(ac)	NO
1S100A	1.5"	RGS	16 AWG	2/7	SHIELDED TWISTED PAIR	PUMPHOUSE MCP	TEE 100A	SIGNAL	YES
			14 AWG	8	THWN			24 V(dc)	
1S100B	1.5"	RGS	16 AWG	2/6	SHIELDED TWISTED PAIR	TEE 100A	TEE 100B	SIGNAL	YES
			14 AWG	4	THWN			24 V(dc)	
1S100C	1.5"	RGS	16 AWG	2/5	SHIELDED TWISTED PAIR	TEE 100B	TEE 100C	SIGNAL	YES
1S100D	1"	RGS	16 AWG	2/4	SHIELDED TWISTED PAIR	TEE 100C	TEE 100D	SIGNAL	YES
1S100E	1"	RGS	16 AWG	2/2	SHIELDED TWISTED PAIR	TEE 100D	TEE 100E	SIGNAL	YES
1S100F	1"	RGS	16 AWG	2/1	SHIELDED TWISTED PAIR	TEE 100E	PT-4501	SIGNAL	YES
1S100G	1"	RGS	16 AWG	2/1	SHIELDED TWISTED PAIR	TEE 100E	PT-4502	SIGNAL	YES
1S100H	1"	RGS	16 AWG	2/2	SHIELDED TWISTED PAIR	TEE 100D	TEE 100H	SIGNAL	YES
1S100J	1"	RGS	16 AWG	2/1	SHIELDED TWISTED PAIR	TEE 100H	PT-4511	SIGNAL	YES
1S100K	1"	RGS	16 AWG	2/1	SHIELDED TWISTED PAIR	TEE 100H	PT-4512	SIGNAL	YES
1S100L	1.5"	RGS	16 AWG	2/1	SHIELDED TWISTED PAIR	TEE 100A	FIQT-4501	SIGNAL	YES
			14 AWG	4	THWN			24 V(dc)	
1S100M	1.5"	RGS	16 AWG	2/2	SHIELDED TWISTED PAIR	TEE 100B	FIQT-4401	SIGNAL	YES
			14 AWG	4	THWN			24 V(dc)	
1S100N	1.5"	RGS	16 AWG	2/1	SHIELDED TWISTED PAIR	TEE 100C	PT-4401	SIGNAL	YES
1S101A	1.5"	RGS	16 AWG	2/5	SHIELDED TWISTED PAIR	PUMPHOUSE MCP	TEE 101A	SIGNAL	YES
			14 AWG	16	THWN			24 V(dc)	
1S101B	1"	RGS	16 AWG	2/2	SHIELDED TWISTED PAIR	TEE 101A	TEE 101B	SIGNAL	YES
			14 AWG	8	THWN			24 V(dc)	
1S101C	1"	RGS	16 AWG	2/1	SHIELDED TWISTED PAIR	TEE 101B	FIQT-4701	SIGNAL	YES
			14 AWG	4	THWN			24 V(dc)	
1S101D	1"	RGS	16 AWG	2/1	SHIELDED TWISTED PAIR	TEE 101B	FIQT-4705	SIGNAL	YES
			14 AWG	4	THWN			24 V(dc)	
1S101E	1"	RGS	16 AWG	2/3	SHIELDED TWISTED PAIR	TEE 101A	TEE 101E	SIGNAL	YES
			14 AWG	8	THWN			24 V(dc)	
1S101F	1"	RGS	16 AWG	2/1	SHIELDED TWISTED PAIR	TEE 101E	PT-4602	SIGNAL	YES
1S101G	1"	RGS	16 AWG	2/2	SHIELDED TWISTED PAIR	TEE 101E	TEE 101G	SIGNAL	YES
			14 AWG	8	THWN			24 V(dc)	
1S101H	1"	RGS	16 AWG	2/1	SHIELDED TWISTED PAIR	TEE 101G	FIQT-4601	SIGNAL	YES
			14 AWG	4	THWN			24 V(dc)	
1S101I	1"	RGS	16 AWG	2/1	SHIELDED TWISTED PAIR	TEE 101G	FIQT-4901	SIGNAL	YES
			14 AWG	2	THWN			24 V(dc)	
1S103A	1.5"	RGS	~ 0.48" OD	5 / 1	THICK DEVICENET	WELL PUMP CONTROL CABINET 1D03 & 1D04	PUMPHOUSE MCC	EXISTING	NO
1S104A	1.5"	RGS	~ 0.48" OD	5 / 1	THICK DEVICENET	WELL PUMP CONTROL CABINET 1D05 & 1D06	PUMPHOUSE MCC	EXISTING	NO
1S105A	1.5"	RGS	~ 0.48" OD	5 / 1	THICK DEVICENET	WELL PUMP CONTROL CABINET 1D05 & 1D06	WELL PUMP CONTROL CABINET 1D07 & 1D08	EXISTING	NO
1S106A	1.5"	RGS	~ 0.48" OD	5 / 1	THICK DEVICENET	WELL PUMP CONTROL CABINET 1D07 & 1D08	WELL PUMP CONTROL CABINET 1D09 & 1D10	EXISTING	NO
1S107A	1.5"	RGS	~ 0.48" OD	5 / 1	THICK DEVICENET	WELL PUMP CONTROL CABINET 1D09 & 1D10	WELL PUMP CONTROL CABINET 1D11 & 1D12 & 1D13	EXISTING	NO
1S300A	1.5"	RGS	~ 0.48" OD	5 / 2	THICK DEVICENET	PUMPHOUSE MCC	PUMPHOUSE MCP	SIGNAL	NO

(B)

DESIGN BY Neil Heckerman DETAILS BY Kendra Hathaway QUANTITIES BY Neil Heckerman	CHECKED Mark Tiffany CHECKED Mark Tiffany CHECKED Mark Tiffany	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN	BRIDGE NO. - POST MILE R14.3	I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION CONDUIT & CABLE SCHEDULE	SHEET EE-5 OF
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3		UNIT PROJECT NUMBER & PHASE 1961 07120004221		DISREGARD PRINTS BEARING EARLIER REVISION DATES → 05-18-12		REVISION DATES (PRELIMINARY STAGE ONLY)

TAEWW Imperial Rev. 3/12 EA 4T6401 0712000422wJ005.dgn 12-FEB-2014 11:13

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	10	22

05-18-12
 REGISTERED ELECTRICAL ENGINEER DATE
 Mark Thomas Tiffany
 No. E13981
 Exp. 6-30-14
 ELECTRICAL
 STATE OF CALIFORNIA

2-3-14
 PLANS APPROVAL DATE

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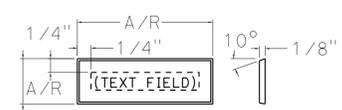
AMEC ENVIRONMENT & INFRASTRUCTURE, PHONE: 303-935-6505
 2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222

PARTS LIST/MATERIALS LIST					
ITEM	QTY	UNIT	VENDOR/MFG	PARTS/DASH NUMBER	NOMENCLATURE/DESCRIPTION
1	1	EA			NEMA 12, TWO DOOR FLOOR MOUNT ENCLOSURE
2	1	EA			BACK PANEL
3	1	EA			ENCLOSURE LIGHT W/LAMP & MOUNTING KIT, 120 V(ac)
4	2	EA			GROUND BAR, TIN PLATED CU, UL
5	A/R	EA			ZINC PLATED, CHROMATED STEEL, 35 mm X 7.5 mm DIN RAIL
6	A/R	EA			1" DIN RAIL STANDOFF
7	1	EA			CIRCUIT BREAKER TERMINAL LUG, 1 POLE
8	1	EA			CIRCUIT BREAKER BUS BAR, 1 POLE, 6 CIRCUITS
9	6	EA			CIRCUIT BREAKER UL489/CSA 22.2 No. 5.1, 1 POLE, TRIP CURVE C, 15 AMP, 277 V(ac)
10	A/R	EA			END ANCHOR, USED W/ STANDARD 35 mm DIN RAIL, GRAY
11	A/R	EA			END BARRIER FOR SINGLE CIRCUIT TERMINAL BLOCK, GRAY
12	A/R	EA			END BARRIER FOR TWO CIRCUIT TERMINAL BLOCK, GRAY
13	20	EA			1-CIRCUIT FEED-THROUGH BLOCK, GRAY
14	22	EA			1-CIRCUIT FEED-THROUGH BLOCK, WHITE
15	21	EA			1-CIRCUIT FEED-THROUGH BLOCK, GREEN
16	8	EA			TWO CIRCUIT FEED-THROUGH BLOCK, GRAY
17	10	EA			SINGLE CIRCUIT FUSIBLE BLOCK, LED 10-57 VOLTS, 4 mm Max WIRE, BLACK
18	15	EA			SINGLE CIRCUIT FUSIBLE BLOCK, NEON 85-264 VOLTS, 4 mm Max WIRE, BLACK
19	40	EA			FUSE HOLDER, TWO-CIRCUIT, TOP 5 X 20 mm FUSE, INDICATION, 24 V(dc)
20	A/R	EA			END BARRIER FOR TWO-CIRCUIT FUSE HOLDER
21	A/R	EA			SNAP IN MARKER CARDS FOR FEED-THROUGH TERMINAL BLOCKS
22	A/R	EA			SNAP IN MARKER CARDS FOR FUSE TERMINAL BLOCKS
23	A/R	EA			MARKER CARDS FOR END ANCHOR
24	A/R	EA			SCREW TYPE CENTER JUMPER (10 POLE)
25	A/R	EA			SIDE JUMPER
26	1	EA			COMPACT POWER SUPPLY, 24-28 V, 240 W, 120/240 V(ac) INPUT
27	1	EA			500 VA UPS, 115 V(ac) INPUT, 40 DEG C BATTERY
28	1	EA			DIN RAIL RECEPTACLE, 15 A, 125 V, UL498
29	1	EA			INDUSTRIAL SCADA SERVER
30	A/R	EA			1/2 A, 5 X 20 mm FAST ACTING FUSE
31	A/R	EA			2 A, 5 X 20 mm FAST ACTING FUSE
32	A/R	EA			5 A, 5 X 20 mm FAST ACTING FUSE
33	1	EA			2 A, SLO-BLO FUSE FOR PLC POWER SUPPLY
34	1	EA			ETHERNET SWITCH (100/100 TX, RJ-45), W/FIBER PORTS(100 FX MULTIMODE, ST Conn), DIN MOUNT
35	A/R	EA			ETHERNET CABLE
36	1	EA			SILICON SURGE SUPPRESSOR, DIN MOUNT, 120 V(ac)
37	1	EA			PLC BACKPLANE, 10 SLOT
38	1	EA			PLC POWER SUPPLY, AC POWER
39	1	EA			PLC DEVICENET COMMUNICATION CARD
40	1	EA			PLC CONTROLLER
41	2	EA			PLC ANALOG INPUT MODULE
42	1	EA			PLC DISCRETE INPUT MODULE
43	3	EA			PLC TERMINAL BLOCK
44	1	EA			ENCLOSURE VENT
45	1	EA			ENCLOSURE FAN
46	1	EA			PC CABLING BULKHEAD (2-USB, 1-VGA PORT, 1-RECEPT)
47	1	EA			DEVICE NET TAP (TERMINAL ASSEMBLY)
48	A/R	FT			1" X 4" WIREWAY, LIGHT GRAY
49	A/R	FT			1" WIREWAY COVER, LIGHT GRAY
50	A/R	FT			1" X 4" WIREWAY, WHITE
51	A/R	FT			1" WIREWAY COVER, WHITE
52	A/R	FT			2" X 4" WIREWAY, WHITE
53	A/R	FT			2" WIREWAY COVER, WHITE
54	A/R	FT			3" X 4" WIREWAY, WHITE
55	A/R	FT			3" WIREWAY COVER, WHITE
56	1	EA			INDUSTRIAL ETHERNET VPN FIREWALL, DIN RAIL MOUNT
57	1	EA			DEVICENET POWER SUPPLY, 24 V-28 V, 120/240 V(ac) INPUT

NAMEPLATE SCHEDULE							
#	QTY	TYPE	MATERIAL CODE	COLOR CODE	LINE 1 DESCRIPTION	LINE 2 DESCRIPTION	LINE 3 DESCRIPTION
1	1	A	M1	1	GARFIELD PUMP HOUSE	MAIN CONTROL PANEL	
2	1	B	M1	3	WARNING:	CONTAINS POTENTIAL ENERGY FROM UPS	WHEN POWERED DOWN
3	1	C	M2	1	RACK 1	MAIN	
4	1	C	M2	1	INDUSTRIAL	SCADA	SERVER
5	1	C	M3	1	DEVICENET	TAP	
6	1	C	M3	1	CB01-06	120 V(ac)	
7	1	C	M3	1	TB1	120 V(ac)	
8	1	C	M3	1	TB1N		
9	1	C	M3	1	TB2	120 V(ac)	
10	1	C	M3	1	TB2N		
11	1	C	M3	1	TB3	24 V(dc)	
12	1	C	M3	1	TB3C		
13	1	C	M3	1	TB3G		
14	1	C	M3	1	COMPUTER	USE ONLY	
15	1	C	M3	1	PS1-24	120 V(ac)/24 V(dc)	
16	1	C	M3	1	SW1-24	24V(dc)/ENET/FO	
17	1	C	M3	1	TS2	24 V(dc)	
18	1	C	M3	1	TS3	24 V(dc)	
19	1	C	M3	1	TS4	24 V(dc)	
20	1	C	M3	1	PS2-24	120 V(ac)/24 V(dc)	DEVICENET BUS PS
21	1	C	M3	1	VPN	FIREWALL	
22	1	C	M3	1	TB4	24 V(dc)	
23	1	C	M3	1	TB4C		

NAMEPLATE COLOR CODE		
CODE #	BACKGROUND COLOR	LETTERING COLOR
1	WHITE	BLACK
2	RED	WHITE
3	YELLOW	BLACK

NAMEPLATE MATERIAL CODE		
CODE#	MATERIAL TYPE	ATTACHMENT METHOD
M1	1/8" LAMINATED PLASTIC	EPOXY
M2	STICKER	N/A
M3	END ANCHOR LABEL	END ANCHOR



NAMEPLATE TYPE		
TYPE	USE	LETTERING HEIGHT
A	EXTERNAL TITLE	1/2"
B	EXTERNAL GENERAL	1/4"
C	INTERNAL	1/8"

M1 MATERIAL

NOTES (THIS SHEET ONLY):

- UL-508A PANEL FABRICATOR TO LABEL WIREWAYS AS SHOWN AND NUMBER TERMINAL BLOCKS. ROUTE CONDUCTORS IN APPROPRIATE WIREWAYS. UTILIZE GRAY FOR 120 V(ac) AND WHITE FOR 24 V(dc).
- INSTALL TERMINAL BLOCK TERMINAL NUMBERS AS REQUIRED. IF TERMINAL BLOCK DETAIL PROVIDED, LABELS MUST MATCH TERMINAL BLOCK DETAIL NUMBER SCHEMES.
- PANEL FABRICATOR TO PROVIDE FIVE (5) SPARE FUSES OF EACH TYPE OF FUSE USED AS SPARES INSIDE OF PANEL.
- GROUND PANEL DOORS AND BLOCK PANEL TO GROUND BAR.
- USE ISOLATING MOUNTING BRACKETS TO MOUNT COPPER ISOLATED INSTRUMENTATION GROUND BAR.

DESIGN BY Neil Heckerman CHECKED Mark Tiffany	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN	BRIDGE NO.	I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION	SHEET EE-6
			POST MILE R14.3		
DETAILS BY Kendra Hathaway CHECKED Mark Tiffany	ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3	UNIT PROJECT NUMBER & PHASE 1961 07120004221	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY) 05-18-12	SHEET OF
QUANTITIES BY Neil Heckerman CHECKED Mark Tiffany	EA 4T6401	0712000422w\006.dgn			

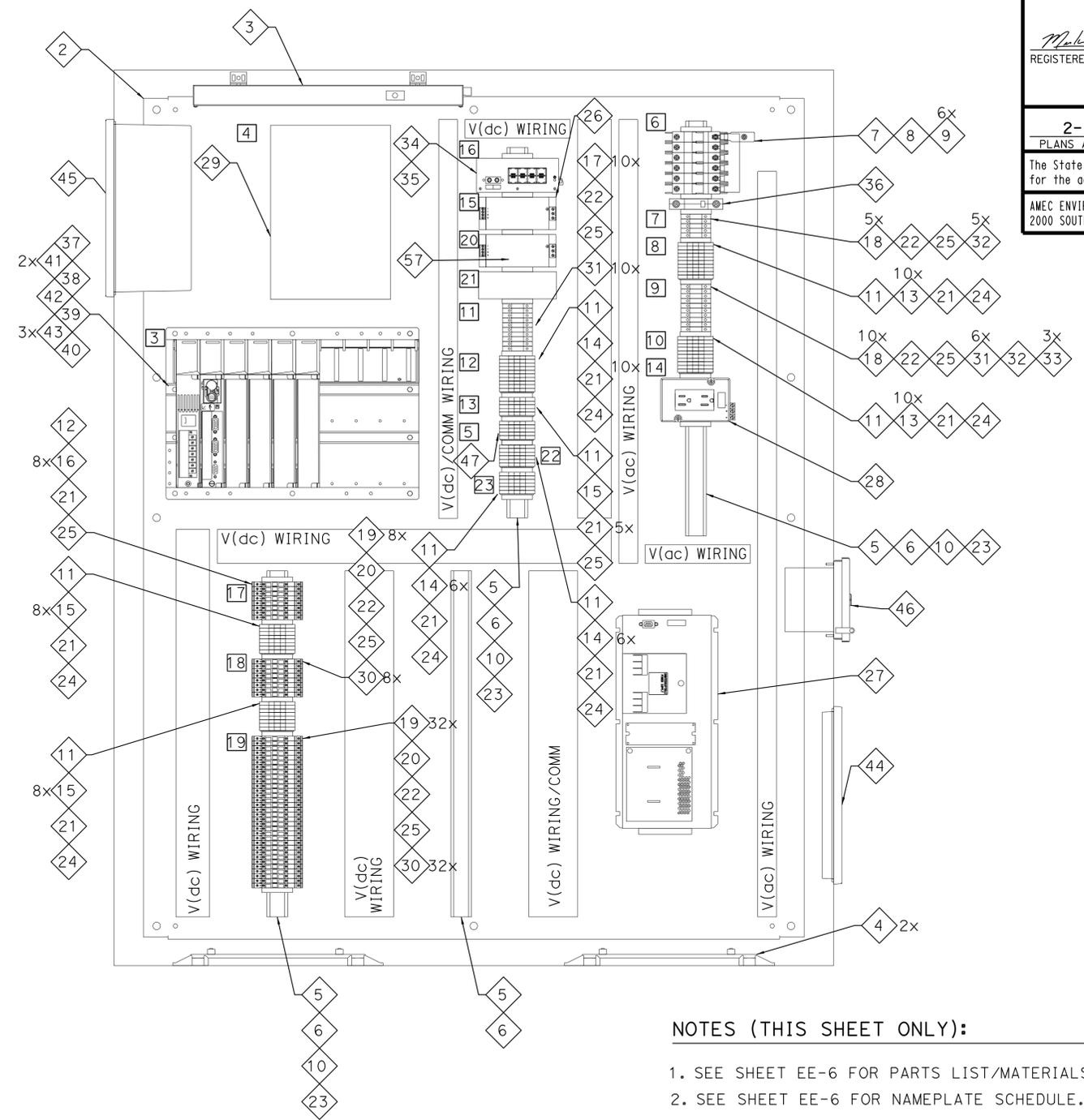
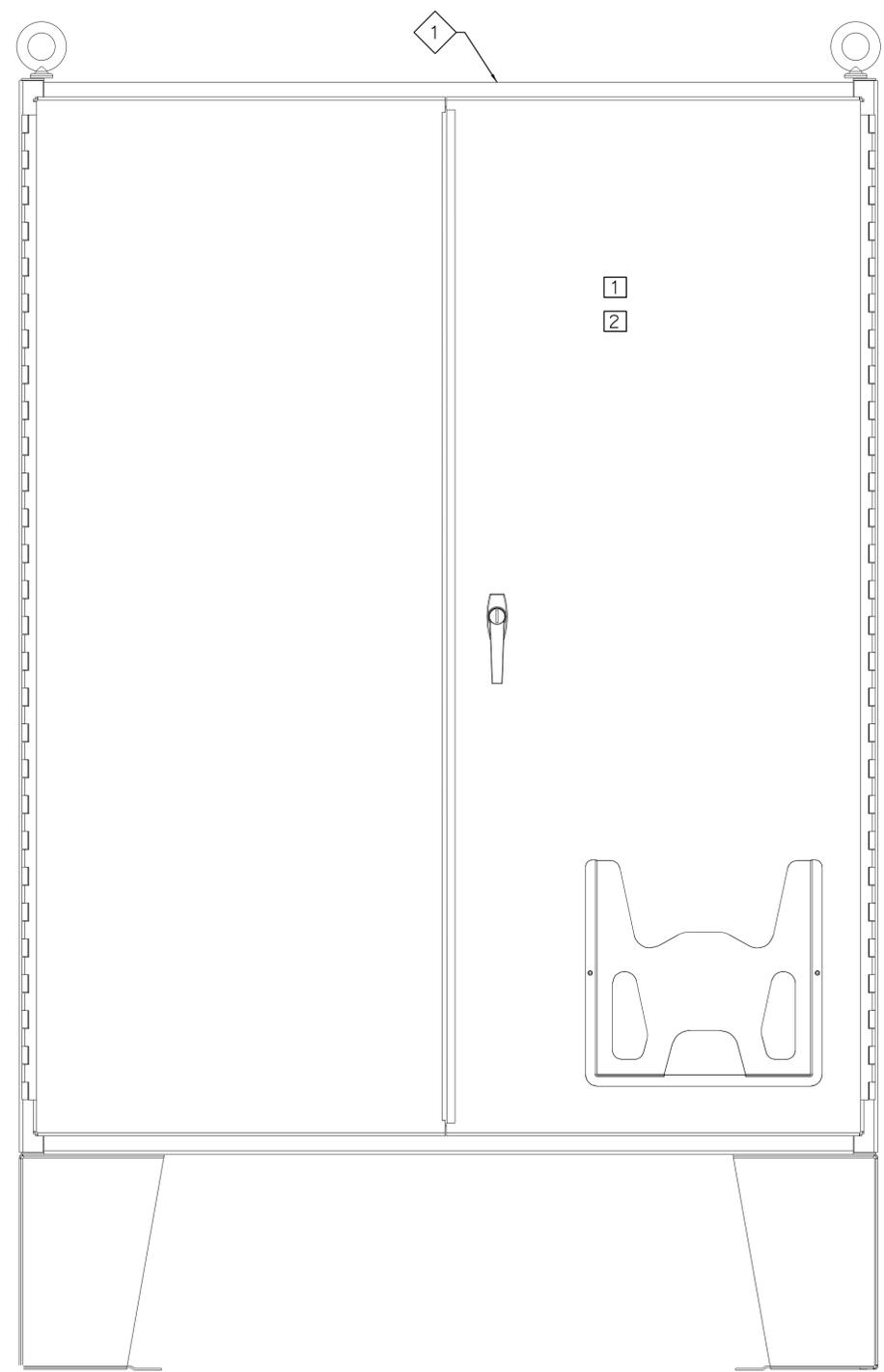
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	11	22

Mark Thomas Tiffany 05-18-12
 REGISTERED ELECTRICAL ENGINEER DATE
 No. E13981
 Exp. 6-30-14
 ELECTRICAL
 STATE OF CALIFORNIA

2-3-14
 PLANS APPROVAL DATE

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- NOTES (THIS SHEET ONLY):**
- SEE SHEET EE-6 FOR PARTS LIST/MATERIALS LIST. #
 - SEE SHEET EE-6 FOR NAMEPLATE SCHEDULE. #

MAIN CONTROL PANEL

TAEMWW Imperial Rev. 3/12 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3	DESIGN BY Neil Heckerman CHECKED Mark Tiffany	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN	BRIDGE NO. - POST MILE R14.3	I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION MAIN CONTROL PANEL (MCP) LAYOUT	SHEET EE-7 OF
	DETAILS BY Kendra Hathaway CHECKED Mark Tiffany		UNIT PROJECT NUMBER & PHASE 1961 07120004221 EA 4T6401	DISREGARD PRINTS BEARING EARLIER REVISION DATES 05-18-12		
QUANTITIES BY Neil Heckerman CHECKED Mark Tiffany	ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN	BRIDGE NO. - POST MILE R14.3	I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION MAIN CONTROL PANEL (MCP) LAYOUT	SHEET EE-7 OF

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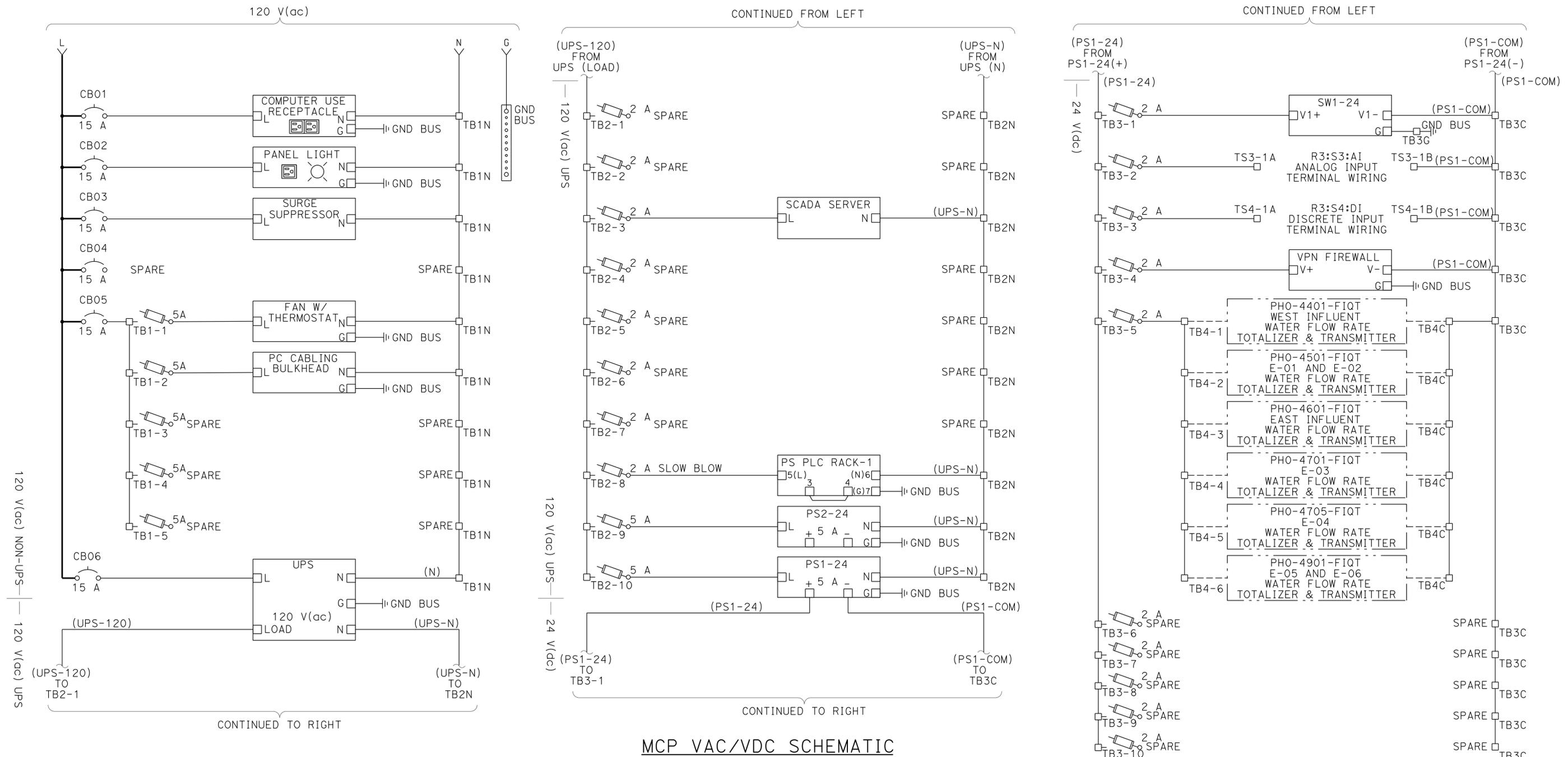
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	12	22

Mark Thomas Tiffany
 REGISTERED ELECTRICAL ENGINEER
 No. E13981
 Exp. 6-30-14
 STATE OF CALIFORNIA

05-18-12 DATE
 2-3-14 PLANS APPROVAL DATE

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MCP VAC/VDC SCHEMATIC

DESIGN	BY Neil Heckerman	CHECKED Mark Tiffany
DETAILS	BY Kendra Hathaway	CHECKED Mark Tiffany
QUANTITIES	BY Neil Heckerman	CHECKED Mark Tiffany

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
 ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN

BRIDGE NO.	-
POST MILE	R14.3

I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION
 MCP VAC/VDC SCHEMATIC

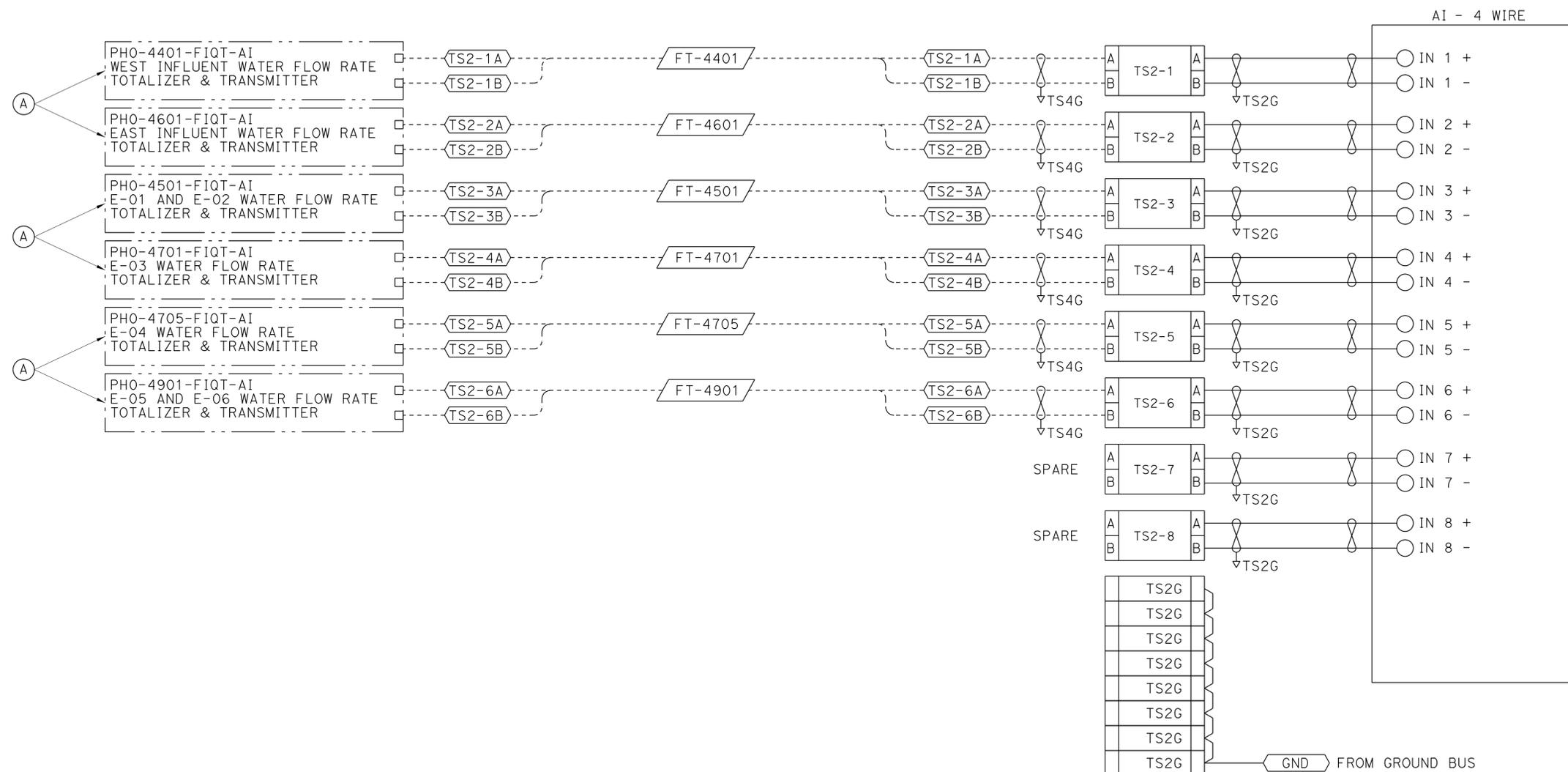
SHEET EE-8

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	13	22

	05-18-12 REGISTERED ELECTRICAL ENGINEER DATE
2-3-14 PLANS APPROVAL DATE	
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LEGEND (THIS SHEET ONLY):

- (A) FLOW TRANSMITTERS TO BE LINE POWERED, NOT LOOP POWERED DEVICES AND INCLUDE A PULSE TOTALIZER OUTPUT. VERIFY FLOW TRANSMITTER FUNCTIONALITY.



MCP VAC/VDC SCHEMATIC

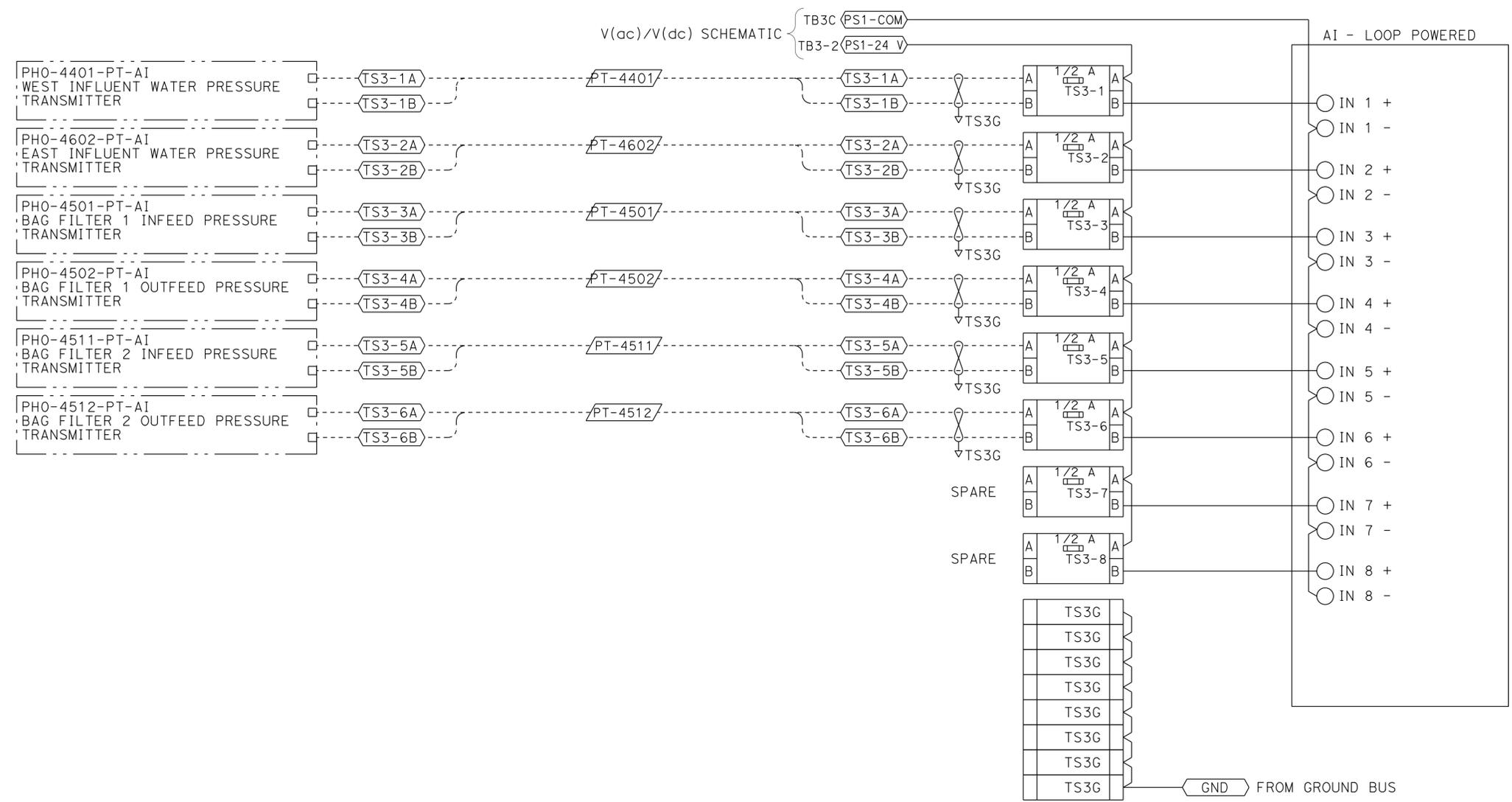
TAEMWW Imperial Rev. 3/12	DESIGN	BY Neil Heckerman	CHECKED Mark Tiffany	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN	BRIDGE NO.	-	I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION MCP VAC/VDC SCHEMATIC	SHEET	OF								
	DETAILS	BY Kendra Hathaway	CHECKED Mark Tiffany			POST MILE	R14.3		EE-9									
	QUANTITIES	BY Neil Heckerman	CHECKED Mark Tiffany															
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS				0 1 2 3	UNIT PROJECT NUMBER & PHASE	1961 07120004221	DISREGARD PRINTS BEARING EARLIER REVISION DATES			REVISION DATES (PRELIMINARY STAGE ONLY)	05-18-12							

07-FEB-2014 13:43

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	14	22

Mark Thomas Tiffany
 REGISTERED ELECTRICAL ENGINEER DATE 05-18-12
 No. E13981
 EXP. 6-30-14
 STATE OF CALIFORNIA
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2-3-14
 PLANS APPROVAL DATE
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MCP I/O - ANALOG INPUT (LOOP PWR)

DESIGN	BY Neil Heckerman	CHECKED Mark Tiffany
DETAILS	BY Kendra Hathaway	CHECKED Mark Tiffany
QUANTITIES	BY Neil Heckerman	CHECKED Mark Tiffany

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN

BRIDGE NO.	-
POST MILE	R14.3

I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION
MCP I/O - ANALOG INPUT (LOOP PWR)

SHEET **EE-10**

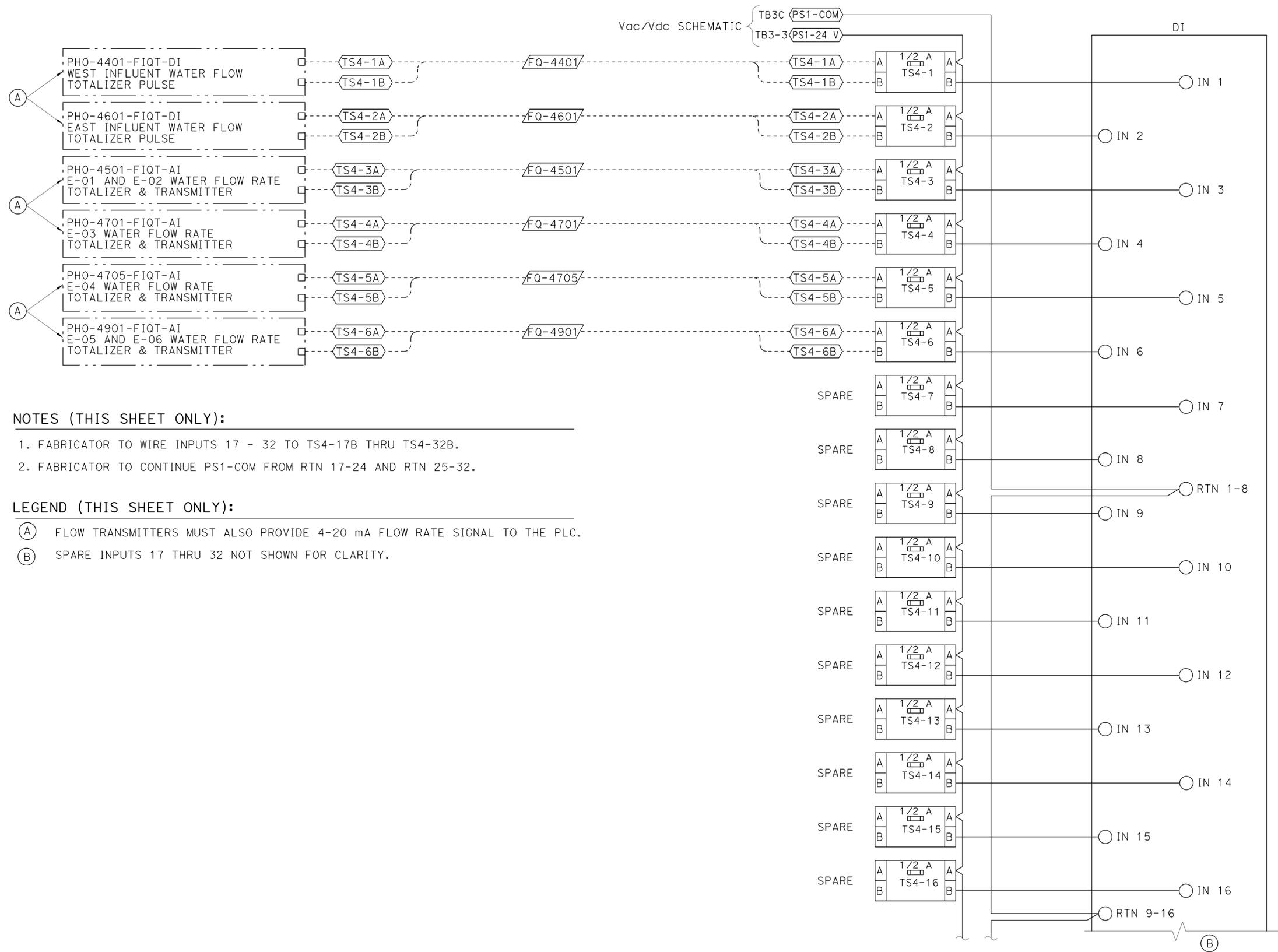
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	15	22

Mark Thomas Tiffany
 REGISTERED ELECTRICAL ENGINEER
 DATE 05-18-12
 No. E13981
 EXP. 6-30-14
 ELECTRICAL
 STATE OF CALIFORNIA

2-3-14
 PLANS APPROVAL DATE

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NOTES (THIS SHEET ONLY):

- FABRICATOR TO WIRE INPUTS 17 - 32 TO TS4-17B THRU TS4-32B.
- FABRICATOR TO CONTINUE PS1-COM FROM RTN 17-24 AND RTN 25-32.

LEGEND (THIS SHEET ONLY):

- (A) FLOW TRANSMITTERS MUST ALSO PROVIDE 4-20 mA FLOW RATE SIGNAL TO THE PLC.
- (B) SPARE INPUTS 17 THRU 32 NOT SHOWN FOR CLARITY.

MCP I/O - DISCRETE INPUT (1-16)

DESIGN BY Neil Heckerman CHECKED Mark Tiffany DETAILS BY Kendra Hathaway CHECKED Mark Tiffany QUANTITIES BY Neil Heckerman CHECKED Mark Tiffany	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN	BRIDGE NO. - POST MILE R14.3	I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION MCP I/O - DISCRETE INPUT (1-16)	SHEET EE-11 OF
	ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3	UNIT PROJECT NUMBER & PHASE 1961 07120004221 EA 4T6401	DISREGARD PRINTS BEARING EARLIER REVISION DATES → 05-18-12	REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET OF
	TAEMWW Imperial Rev. 3/12	0712000422wJ011.dgn	10-FEB-2014 05:59		

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	16	22

<i>Mark Thomas Tiffany</i> 05-18-12 REGISTERED ELECTRICAL ENGINEER DATE		
2-3-14 PLANS APPROVAL DATE		

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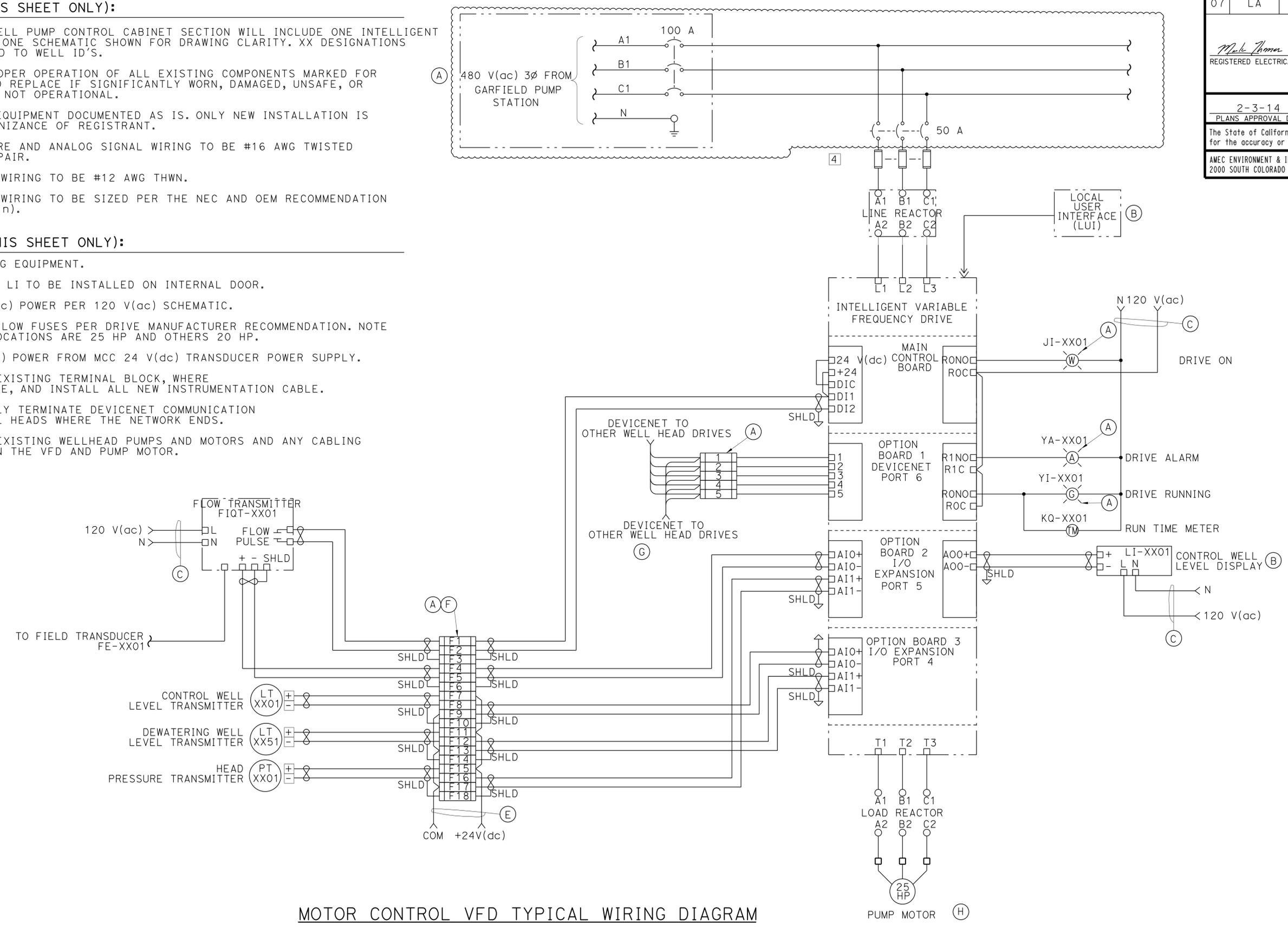
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NOTES (THIS SHEET ONLY):

1. TYPICAL WELL PUMP CONTROL CABINET SECTION WILL INCLUDE ONE INTELLIGENT VFD. ONLY ONE SCHEMATIC SHOWN FOR DRAWING CLARITY. XX DESIGNATIONS CORRESPOND TO WELL ID'S.
2. VERIFY PROPER OPERATION OF ALL EXISTING COMPONENTS MARKED FOR REUSE, AND REPLACE IF SIGNIFICANTLY WORN, DAMAGED, UNSAFE, OR OTHERWISE NOT OPERATIONAL.
3. EXISTING EQUIPMENT DOCUMENTED AS IS. ONLY NEW INSTALLATION IS UNDER COGNIZANCE OF REGISTRANT.
4. ALL DISCRETE AND ANALOG SIGNAL WIRING TO BE #16 AWG TWISTED SHIELDED PAIR.
5. 120 V(ac) WIRING TO BE #12 AWG THWN.
6. 480 V(ac) WIRING TO BE SIZED PER THE NEC AND OEM RECOMMENDATION (#6 AWG Min).

LEGEND (THIS SHEET ONLY):

- (A) EXISTING EQUIPMENT.
- (B) LUI AND LI TO BE INSTALLED ON INTERNAL DOOR.
- (C) 120 V(ac) POWER PER 120 V(ac) SCHEMATIC.
- (D) QUICK BLOW FUSES PER DRIVE MANUFACTURER RECOMMENDATION. NOTE SOME LOCATIONS ARE 25 HP AND OTHERS 20 HP.
- (E) 24 V(dc) POWER FROM MCC 24 V(dc) TRANSDUCER POWER SUPPLY.
- (F) REUSE EXISTING TERMINAL BLOCK, WHERE POSSIBLE, AND INSTALL ALL NEW INSTRUMENTATION CABLE.
- (G) PROPERLY TERMINATE DEVICENET COMMUNICATION AT WELL HEADS WHERE THE NETWORK ENDS.
- (H) REUSE EXISTING WELLHEAD PUMPS AND MOTORS AND ANY CABLING BETWEEN THE VFD AND PUMP MOTOR.



MOTOR CONTROL VFD TYPICAL WIRING DIAGRAM

DESIGN	BY Neil Heckerman	CHECKED Mark Tiffany
DETAILS	BY Kendra Hathaway	CHECKED Mark Tiffany
QUANTITIES	BY Neil Heckerman	CHECKED Mark Tiffany

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF ENGINEERING SERVICES
 ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN

BRIDGE NO.	-	I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION
POST MILE	R14.3	
MOTOR CONTROL VFD TYPICAL WIRING DIAGRAM		SHEET EE-12

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	17	22

Mark Thomas Tiffany
 REGISTERED ELECTRICAL ENGINEER DATE 05-18-12
 No. E13981
 Exp. 6-30-14
 STATE OF CALIFORNIA

2-3-14
 PLANS APPROVAL DATE

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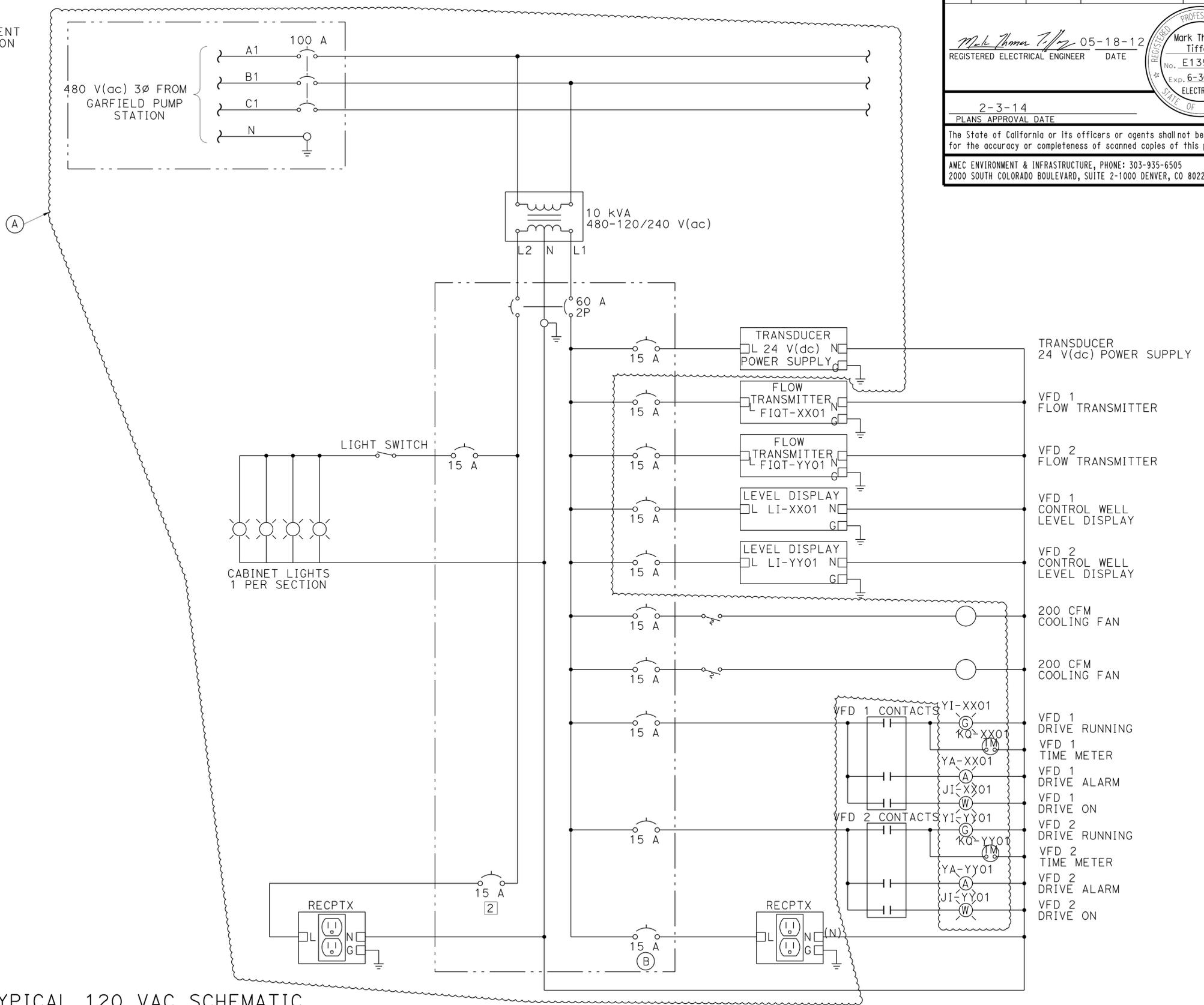
AMEC ENVIRONMENT & INFRASTRUCTURE, PHONE: 303-935-6505
 2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222

NOTES (THIS SHEET ONLY):

1. TYPICAL WELL PUMP CONTROL CABINET WILL INCLUDE TWO INTELLIGENT VFD'S, EACH IN ITS OWN SECTION. THIS IS A TYPICAL CONFIGURATION WITH XX AND YY DESIGNATIONS CORRESPONDING TO WELL ID'S.
2. VERIFY PROPER OPERATION OF ALL EXISTING COMPONENTS MARKED FOR REUSE, AND REPLACE IF SIGNIFICANTLY WORN, DAMAGED, UNSAFE, OR OTHERWISE NOT OPERATIONAL.
3. EXISTING EQUIPMENT DOCUMENTED AS IS. ONLY NEW INSTALLATION IS UNDER COGNIZANCE OF REGISTRANT.

LEGEND (THIS SHEET ONLY):

- (A) EXISTING EQUIPMENT.
- (B) GFCI STYLE CIRCUIT BREAKERS.



MOTOR CONTROL TYPICAL 120 VAC SCHEMATIC

DESIGN	BY Neil Heckerman	CHECKED Mark Tiffany
DETAILS	BY Kendra Hathaway	CHECKED Mark Tiffany
QUANTITIES	BY Neil Heckerman	CHECKED Mark Tiffany

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF ENGINEERING SERVICES
 ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN

BRIDGE NO. -
 POST MILE R14.3
I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION
 MOTOR CONTROL TYPICAL 120 VAC SCHEMATIC

SHEET EE-13 OF

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	18	22

LEGEND (THIS SHEET ONLY):

- (A) **RC** VFD, LINE REACTOR, FUSES/HOLDERS, AND TERMINAL BLOCKS. INSTALL NEW VFD, LOAD AND LINE REACTORS, FUSE HOLDERS, AND T-LEAD TERMINALS PER THE UPDATED DRIVE SCHEMATIC. EXISTING CIRCUIT BREAKER TO BE TESTED AND VERIFIED TO OEM STANDARDS.
- (B) **RC** PLC, FLOW TRANSMITTER, AND ASSOCIATED CABLING.
- RC** WIREWAY.
- (C) **RC** COMMUNICATION CABLE. USE EXISTING TERMINAL BLOCKS AS AN OPEN AIR DEVICENET TAP FOR NEW VFD.
- (D) **RC** CABLING FROM REMOTE INSTRUMENTATION. REUSE TERMINAL BLOCKS FOR USE AS MARSHALLING TERMINAL BLOCK FOR NEW ANALOG I/O TO NEW VFD.
- (E) EXISTING VFD HUMAN INTERFACE MODULE TO BE REPLACED WITH THE NEW VFD LUI. EXISTING TERMINAL BLOCKS AS AN AIR DEVICENET TAP FOR NEW VFD.
- (F) **RC** OFF/HAND SWITCH AND INSTALL HOLE COVER.
- (G) **RC** DISPLAY AND REPLACE WITH 4-20 mA DISPLAY UNIT (LI-XX01), SHOWING CONTROL WELL LEVEL, WIRED TO ANALOG OUTPUT FROM NEW VFD. FABRICATE PATCH PLATE, AS REQUIRED, AND PAINT TO MATCH EXISTING DOOR.
- (H) EXISTING RUN TIME METER TO BE REUSED AND LABELED.

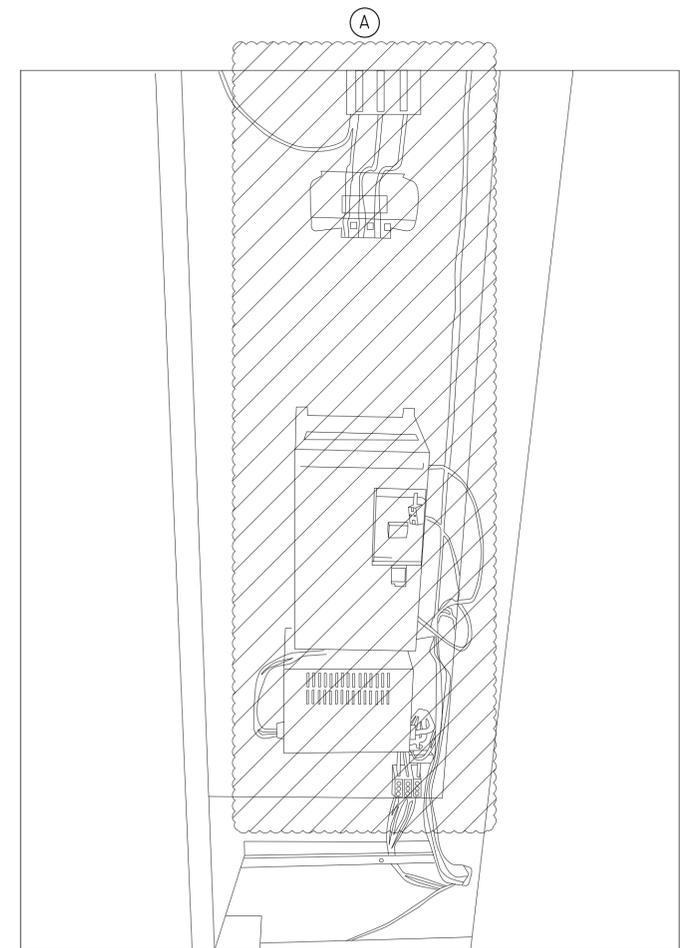
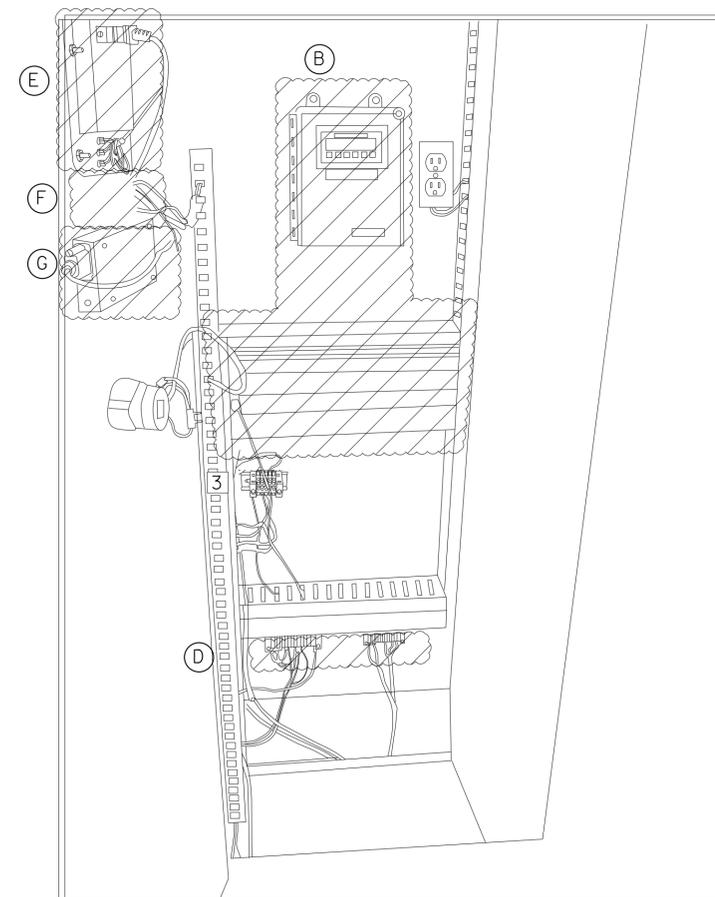
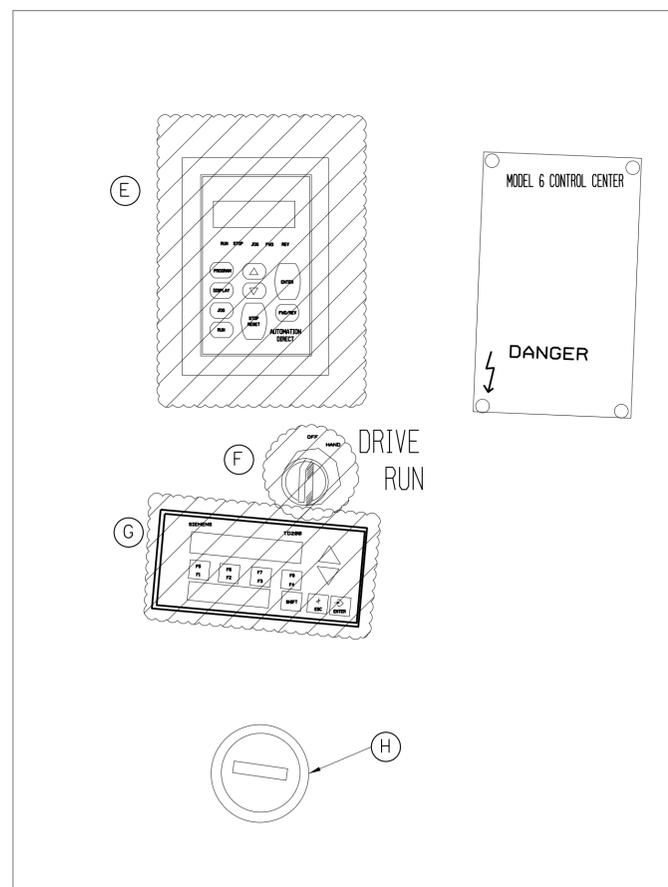
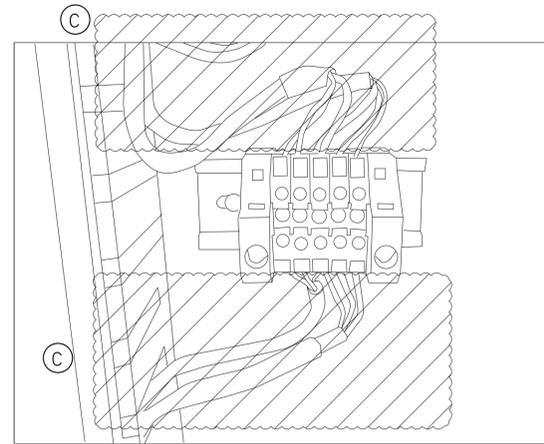
Mark Thomas Tiffany 05-18-12
 REGISTERED ELECTRICAL ENGINEER DATE

PROFESSIONAL ENGINEER
 Mark Thomas Tiffany
 No. E13981
 Exp. 6-30-14
 ELECTRICAL
 STATE OF CALIFORNIA

2-3-14
 PLANS APPROVAL DATE

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AMEC ENVIRONMENT & INFRASTRUCTURE, PHONE: 303-935-6505
 2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222



TYPICAL DEMOLITION PLAN

DESIGN	BY Neil Heckerman	CHECKED Mark Tiffany
DETAILS	BY Kendra Hathaway	CHECKED Mark Tiffany
QUANTITIES	BY Neil Heckerman	CHECKED Mark Tiffany

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
 ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN

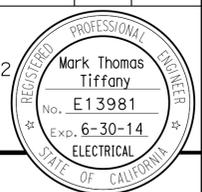
BRIDGE NO.	-
POST MILE	R14.3

I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION
 TYPICAL DEMOLITION PLAN

SHEET **EE-14** OF

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	105	R14.3	19	22

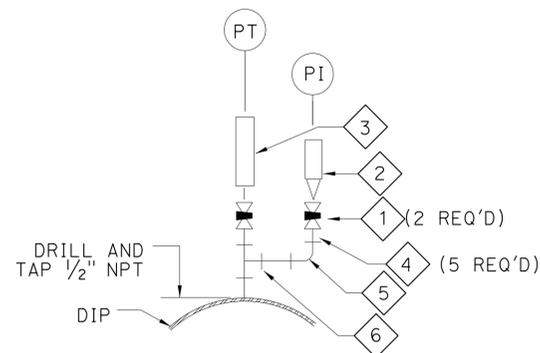
Mark Thomas Tiffany 05-18-12
 REGISTERED ELECTRICAL ENGINEER DATE



2-3-14
PLANS APPROVAL DATE

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AMEC ENVIRONMENT & INFRASTRUCTURE, PHONE: 303-935-6505
2000 SOUTH COLORADO BOULEVARD, SUITE 2-1000 DENVER, CO 80222



1 PRESSURE TRANSMITTER/INDICATOR
 NOT TO SCALE

ITEM No.	DESCRIPTION	SIZE	Qty
1	GAUGE COCK, FNPT	1/2"	2
2	PRESSURE GAUGE, MNPT	1/2"	1
3	PRESSURE TRANSMITTER, FNPT	1/2"	1
4	PIPE NIPPLE, SCH. 80, ASTM A-276, 316SS, MNPT, 2" LONG	1/2"	5
5	PIPE ELBOW, 3000#, ASTM A-182, 316SS, FNPT	1/2"	1
6	PIPE TEE, 3000#, ASTM A-182, 316SS, FNPT	1/2"	1

DESIGN	BY Neil Heckerman	CHECKED Mark Tiffany
DETAILS	BY Kendra Hathaway	CHECKED Mark Tiffany
QUANTITIES	BY Neil Heckerman	CHECKED Mark Tiffany

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
 ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN

BRIDGE NO.	-
POST MILE	R14.3

I-105 GROUNDWATER TREATMENT ELECTRICAL MODIFICATION
 MISCELLANEOUS DETAILS

SHEET **EE-15** OF

	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	
MtI	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	
Obir	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 MtI	PERMEABLE MATERIAL	

	P continued	
PG	PROFILE GRADE	
PI	POINT OF INTERSECTION	
PJP	PARTIAL JOINT PENETRATION	
Pkwy	PARKWAY	
PL, 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	
SL	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	
TeI	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	
WWL	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
07	LA	105	R14.3	20	22

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

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TO ACCOMPANY PLANS DATED 2-3-14

UNIT OF MEASUREMENT SYMBOLS:

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

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:

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

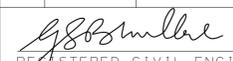
**ABBREVIATIONS
(SHEET 2 OF 2)**

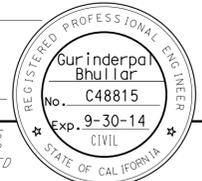
NO SCALE

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

2010 REVISED STANDARD PLAN RSP A10B

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	LA	105	R14.3	21	22


 REGISTERED CIVIL ENGINEER
 July 19, 2013
 PLANS APPROVAL DATE



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TO ACCOMPANY PLANS DATED 2-3-14

TABLE 1

TAPER LENGTH CRITERIA AND CHANNELIZING DEVICE SPACING							
SPEED (S)	MINIMUM TAPER LENGTH * FOR WIDTH OF OFFSET 12 FEET (W)				MAXIMUM CHANNELIZING DEVICE SPACING		
					X	Y	Z **
	TANGENT 2L	MERGING L	SHIFTING L/2	SHOULDER L/3	TAPER	TANGENT	CONFLICT
mph	ft	ft	ft	ft	ft	ft	ft
20	160	80	40	27	20	40	10
25	250	125	63	42	25	50	12
30	360	180	90	60	30	60	15
35	490	245	123	82	35	70	17
40	640	320	160	107	40	80	20
45	1080	540	270	180	45	90	22
50	1200	600	300	200	50	100	25
55	1320	660	330	220	55	110	27
60	1440	720	360	240	60	120	30
65	1560	780	390	260	65	130	32
70	1680	840	420	280	70	140	35

* - For other offsets, use the following merging taper length formula for L:
 For speed of 40 mph or less, $L = WS^2/60$
 For speed of 45 mph or more, $L = WS$

Where: L = Taper length in feet
 W = Width of offset in feet
 S = Posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

** - Use for taper and tangent sections where there are no pavement markings or where there is a conflict between existing pavement markings and channelizers (CA).

TABLE 2

LONGITUDINAL BUFFER SPACE AND FLAGGER STATION SPACING				
SPEED *	Min D **	DOWNGRADE Min D ***		
		-3%	-6%	-9%
		ft	ft	ft
mph	ft	ft	ft	ft
20	115	116	120	126
25	155	158	165	173
30	200	205	215	227
35	250	257	271	287
40	305	315	333	354
45	360	378	400	427
50	425	446	474	507
55	495	520	553	593
60	570	598	638	686
65	645	682	728	785
70	730	771	825	891

* - Speed is posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

** - Longitudinal buffer space or flagger station spacing

*** - Use on sustained downgrade steeper than -3 percent and longer than 1 mile.

TABLE 3

ADVANCE WARNING SIGN SPACING			
ROAD TYPE	DISTANCE BETWEEN SIGNS *		
	A	B	C
	ft	ft	ft
URBAN - 25 mph OR LESS	100	100	100
URBAN - MORE THAN 25 mph TO 40 mph	250	250	250
URBAN - MORE THAN 40 mph	350	350	350
RURAL	500	500	500
EXPRESSWAY / FREEWAY	1000	1500	2640

* - The distances are approximate, are intended for guidance purposes only, and should be applied with engineering judgment. These distances should be adjusted by the Engineer for field conditions, if necessary, by increasing or decreasing the recommended distances.

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION

**TRAFFIC CONTROL SYSTEM TABLES
 FOR LANE AND RAMP CLOSURES**

NO SCALE

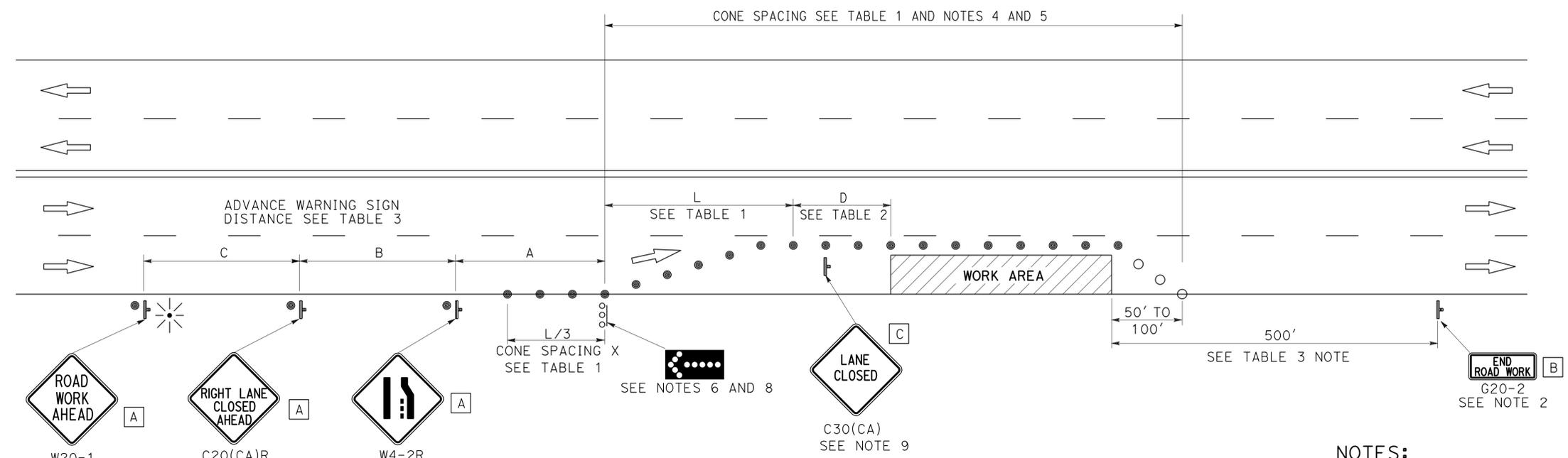
RSP T9 DATED JULY 19, 2013 SUPERSEDES RSP T9 DATED APRIL 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP T9

2010 REVISED STANDARD PLAN RSP T9



TO ACCOMPANY PLANS DATED 2-3-14



TYPICAL LANE CLOSURE

NOTES:

See Revised Standard Plan RSP T9 for tables.
 Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.
 Unless otherwise specified in the special provisions, all temporary warning signs shall have black legend on fluorescent orange background.
 California codes are designated by (CA). Otherwise, Federal (MUTCD) codes are shown.

NOTES:

- Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
- A G20-2 "END ROAD WORK" sign, as appropriate, shall be placed at the end of the lane closure unless the end of work area is obvious, or ends within a larger project's limits.
- If the W20-1 sign would follow within 2000' of a stationary W20-1 or G20-1 "ROAD WORK NEXT _____ MILES", use a C20(CA) sign for the first advance warning sign.
- All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
- Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.
- Flashing arrow sign shall be either Type I or Type II.
- For approach speeds over 50 mph, use the "Traffic Control System for Lane Closure On Freeways And Expressways" plan for lane closure details and requirements.
- A minimum 1500' of sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at the top of crest vertical curve or on a horizontal curve.
- Place a C30(CA) sign every 2000' throughout length of lane closure.
- Median lane closures shall conform to the details as shown except that C20(CA)L and W4-2L signs shall be used.
- At least one person shall be assigned to provide full time maintenance of traffic control devices for lane closure unless, otherwise directed by the Engineer.

LEGEND

- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- ⌋ TEMPORARY TRAFFIC CONTROL SIGN
- FLASHING ARROW SIGN (FAS)
- FAS SUPPORT OR TRAILER
- ☼ PORTABLE FLASHING BEACON

SIGN PANEL SIZE (Min)

- A 48" x 48"
- B 36" x 18"
- C 30" x 30"

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
**TRAFFIC CONTROL SYSTEM
 FOR LANE CLOSURE ON
 MULTILANE CONVENTIONAL
 HIGHWAYS**

NO SCALE

RSP T11 DATED APRIL 19, 2013 SUPERSEDES STANDARD PLAN T11 DATED MAY 20, 2011 - PAGE 239 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP T11

2010 REVISED STANDARD PLAN RSP T11