



CALICO PHASE 2 ADVANCE WASTEWATER TREATMENT PROJECT

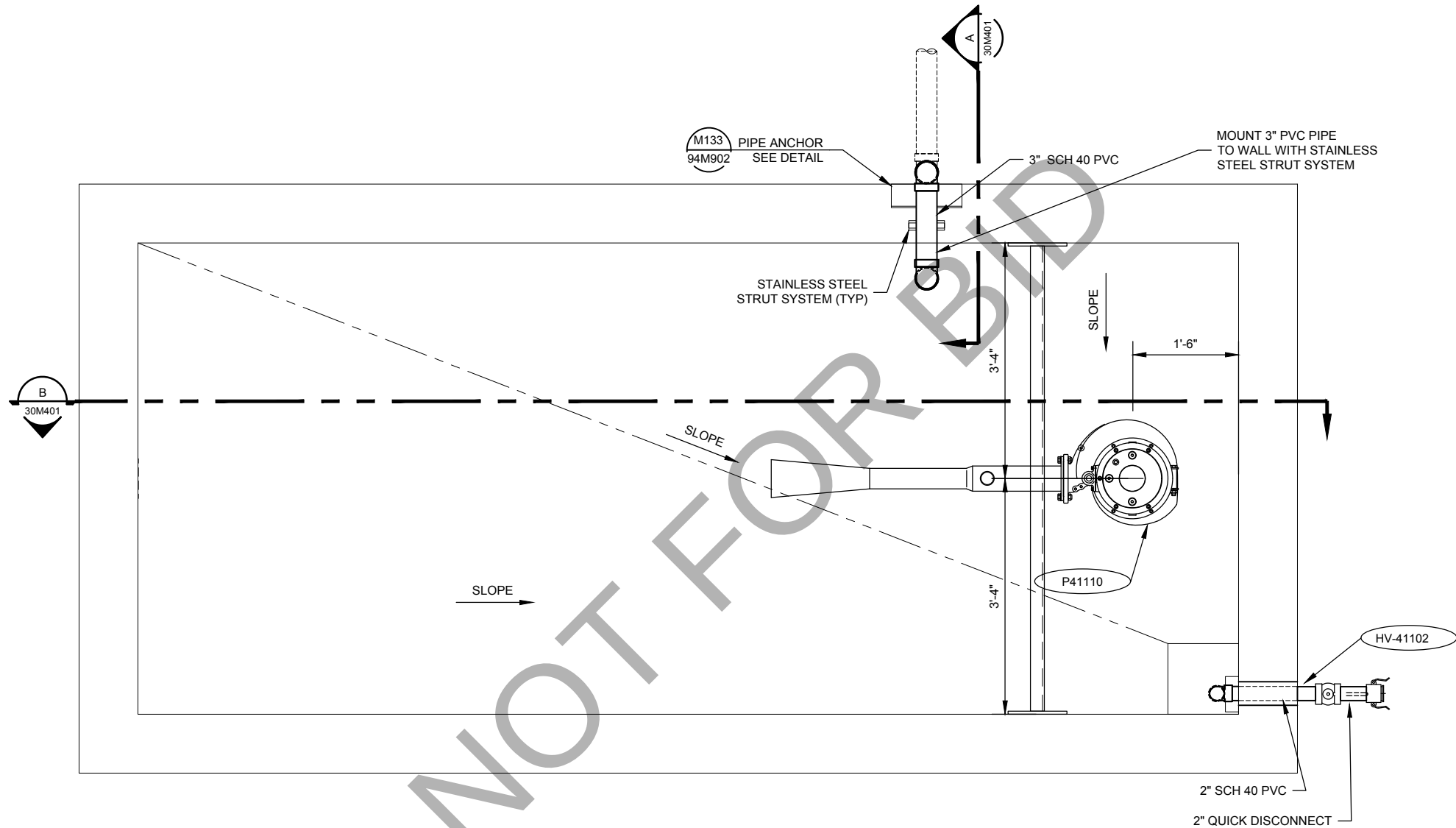
FOR

**CALICO GHOST TOWN REGIONAL PARK
YERMO, CALIFORNIA
PROJECT NO.: 30.30.0074**

WARNING

ALL INDIVIDUALS INTERESTED IN BIDDING ON THIS PROJECT MUST OBTAIN THE FINAL DESIGN PLANS AND SPECIFICATIONS FROM THE DEPARTMENT MANAGING THE PROJECT OR AS OTHERWISE STATED IN THE ADVERTISEMENT FOR BIDS FOR THE PROJECT. DO NOT USE THE PLANS AND SPECIFICATIONS POSTED ON THE CLERK OF THE BOARD'S WEBSITE FOR BIDDING THE PROJECT.

5/24/2021 C:\USERS\BRETT.PRATT\AQUA ENGINEERING\SAN BERNARDINO COUNTY - 001817.C\CALICO WWTP PRELIMINARY DESIGN\050 DRAFTING\002 STRUCTURES\SOLIDS HOLDING\404-30M201 MECHANICAL PLAN.DWG



MECHANICAL PLAN

SCALE: 1"=1'-0"



NOTES:

- 1- ALL PVC PIPING AND VALVES THAT ARE EXPOSED TO UV TO HAVE PROTECTIVE COATING PER SPECIFICATION 99000.
- 2- SEE SCHEDULE SHEET FOR MECHANICAL AND VALVE SCHEDULE.



DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE				ORIGINAL				DESIGN				DRAWN				CHECKED				REVISIONS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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COUNTY OF SAN BERNARDINO
DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS
CALICO GHOST TOWN PH 2 AWWT
SOLIDS HOLDING TANK
MECHANICAL - PLAN

skm 533 W 2600 S, Suite 25
Bountiful, Utah 84010
Phone: (801) 677-0011
www.skmeng.com

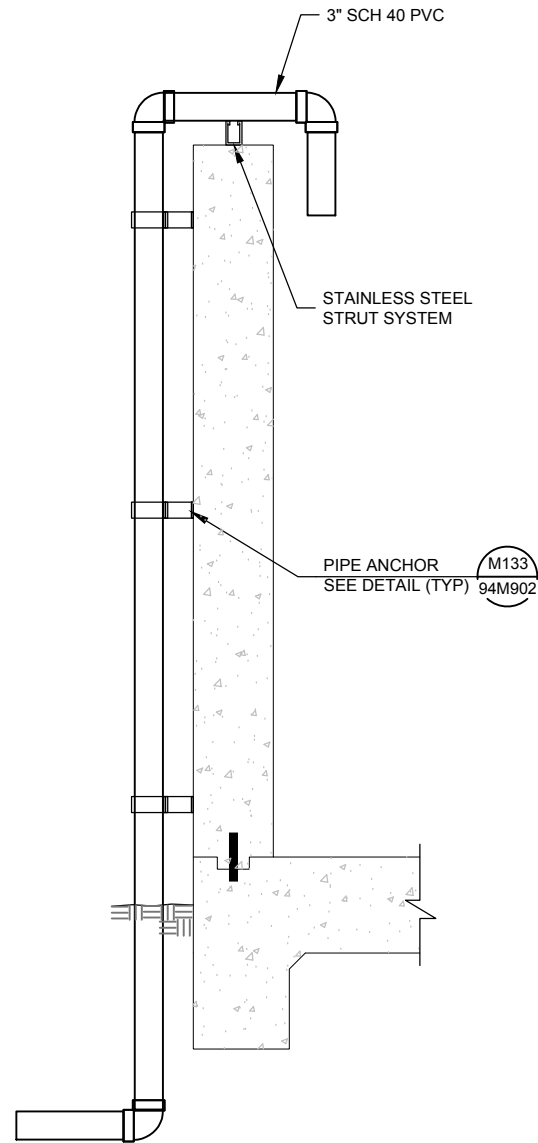
ALBERT A. **WEBB** CIVIL ENGINEERS
3788 McCRAV STREET
RIVERSIDE CA, 92506
PH: (951) 696-1070
FAX: (951) 788-1256
ASSOCIATES
ENGINEERING CONSULTANTS

AQUA ENGINEERING
533 W 2600 S, SUITE 275, BOUNTIFUL, UT 84010
PHONE (801) 299-1327 FAX (801) 299-0153

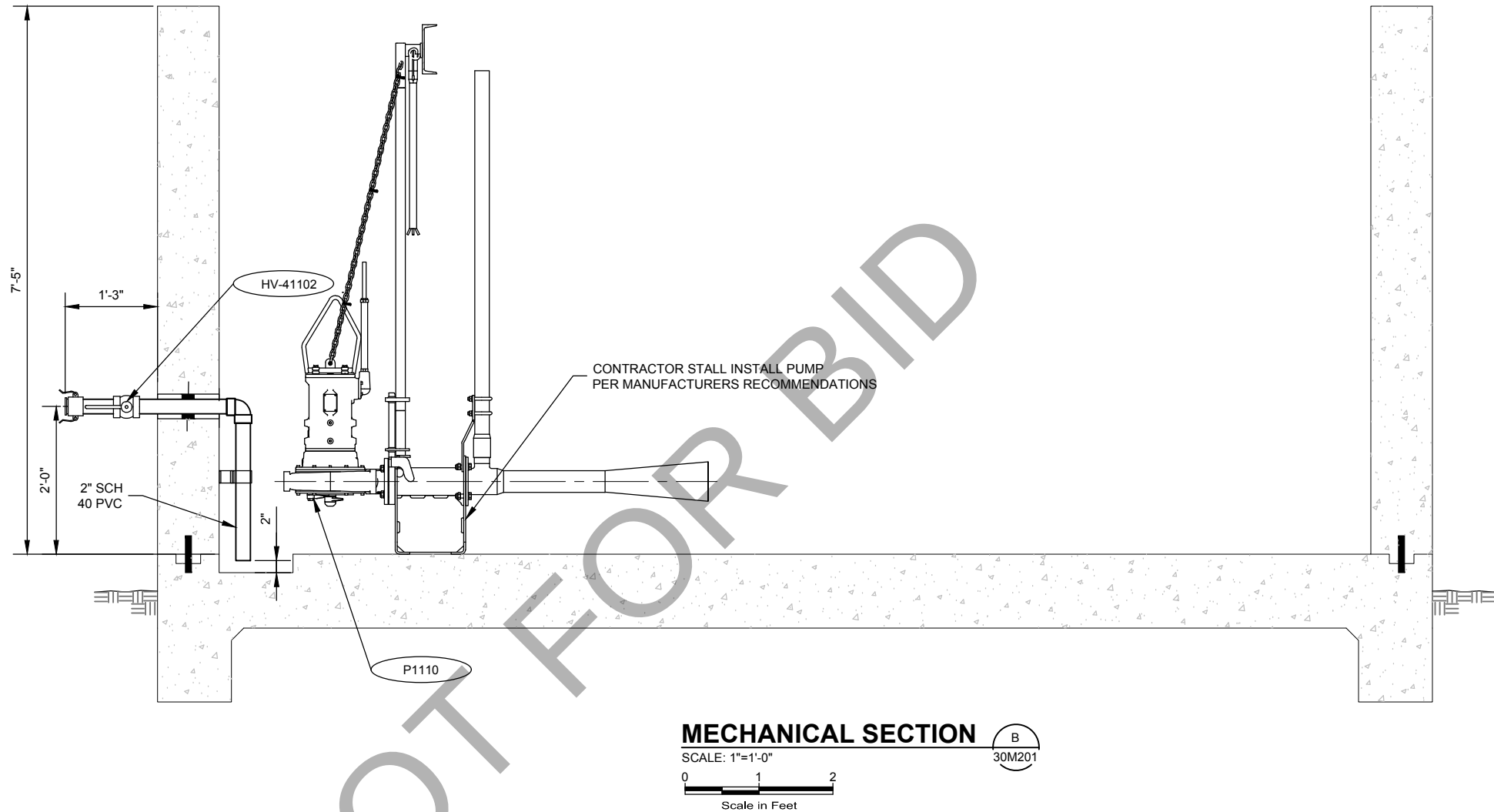
Nelson Smith 6/16/21 DATE
PROJECT ENGINEER DATE
RECOMMENDED DATE

DRAWING NO.
30M201
SHEET 27 of 58

5/24/2021 C:\USERS\BRETT.PRATT\AQUA ENGINEERING\SAN BERNARDINO COUNTY - 001817.C\CALICO WWTP PRELIMINARY DESIGN\050 DRAFTING\002 STRUCTURES\SOLIDS HOLDING\404-30M401 MECHANICAL SECTION.DWG



MECHANICAL SECTION
SCALE: 1"=1'-0"
0 1 2
Scale in Feet
A
30M201



MECHANICAL SECTION
SCALE: 1"=1'-0"
0 1 2
Scale in Feet
B
30M201



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NO.	DATE	DESIGN	DATE	DRAWN	DATE	CHECKED	DATE	NO.	DATE	REVISIONS	DATE
B	06/01/2021	NG	BDP	JRL							

COUNTY OF SAN BERNARDINO
DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS
CALICO GHOST TOWN PH 2 AWWT
SOLIDS HOLDING TANK
MECHANICAL - SECTION

skm
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AQUA
ENGINEERING
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PHONE (801) 299-1327 FAX (801) 299-0153

Nelson Smith
PROJECT ENGINEER
RECOMMENDED
6/16/21
DATE
DATE
DATE

DRAWING NO.
30M401
SHEET 28 of 58

VALVE SCHEDULE								
V#	LOCATION	SERVICE	TYPE	SIZE	MATERIAL	CONNECTION	ACTUATOR	REMARKS
HV-10001	EXISTING SEPTIC TANK	ISOLATION TO ADVANCED TREATMENT	FULL PORT PLUG	6"	CI	MJ	NUT	VALMATIC 5706F/6A02 OR EQUAL
HV-10010	EXISTING SEPTIC TANK	ISOLATION TO SEPTIC TANK 1	FULL PORT PLUG	6"	CI	MJ	NUT	VALMATIC 5706F/6A02 OR EQUAL
HV-10020	EXISTING SEPTIC TANK	ISOLATION TO SEPTIC TANK 2	FULL PORT PLUG	6"	CI	MJ	NUT	VALMATIC 5706F/6A02 OR EQUAL
HV-10030	EXISTING SEPTIC TANK	ISOLATION TO SEPTIC TANK 3 INFLUENT	FULL PORT PLUG	6"	CI	MJ	NUT	VALMATIC 5706F/6A02 OR EQUAL
HV-10040	EXISTING SEPTIC TANK	ISOLATION TO SEPTIC TANK 3 EFFLUENT	FULL PORT PLUG	6"	CI	MJ	NUT	VALMATIC 5706F/6A02 OR EQUAL
HV-10050	EXISTING SEWER LINE	ISOLATION EXISTIGN SEWER LINE	FULL PORT PLUG	6"	CI	MJ	NUT	VALMATIC 5706F/6A02 OR EQUAL
HV-10002	EXISTING SEPTIC TANK	ISOLATION TO ADVANCED TREATMENT TANK 3	FULL PORT PLUG	6"	CI	MJ	NUT	VALMATIC 5706F/6A02 OR EQUAL
HV-10003	PACKAGE PLANT	ISOLATION TO PACKAGE PLANT	FULL PORT PLUG	6"	CI	MJ	NUT	VALMATIC 5706F/6A02 OR EQUAL
HV-10111	EQUALIZATION TANK	INFLUENT PUMP 1 CHECK	CHECK	2"	CL	TRUE UNION	-	SPEARS 4529-020 OR EQUAL
HV-10112	EQUALIZATION TANK	INFFLUENT PUMP 1 DISCHARGE ISOLATION	PLUG	2"	CI	THD	LV	VALMATIC 5802 RTL OR EQUAL
HV-10121	EQUALIZATION TANK	INFLUENT PUMP 2 CHECK	CHECK	2"	CL	TRUE UNION	-	SPEARS 4529-020 OR EQUAL
HV10122	EQUALIZATION TANK	INFFLUENT PUMP 2 DISCHARGE ISOLATION	PLUG	2"	CI	THD	LV	VALMATIC 5802 RTL OR EQUAL
HV-41102	SOLID HOULDING TANK	ISOLATION SOLIDS HOLDING TANK EFFLUENT	PLUG	2"	CI	THD	LV	VALMATIC 5802 RTL OR EQUAL
HV-23223	PACKAGE PLANT	ZONE 2 TANK DRAIN ISOLATION	BALL	2"	PVC	THD	LV	SPEARS 1829-020 OR EQUAL
HV-23213	PACKAGE PLANT	ZONE 1 TANK DRAIN ISOLATION	BALL	2"	PVC	THD	LV	SPEARS 1829-020 OR EQUAL
HV-23342	PACKAGE PLANT	PERMEATE TANK DRAIN ISOLATION	BALL	2"	PVC	THD	LV	SPEARS 1829-020 OR EQUAL

MECHANICAL EQUIPMENT SCHEDULE					
ME #	LOCATION	ITEM	SERVICE	HP (KW)	REMARKS
M-10130	EQUALIZATION TANK	MAG METER	FLOW MEASUREMENT	-	SEE ELECTRICAL SCHEDULE
ME-10200	PACKAGE PLANT	PACKAGE PLANT	MBR PACKAGE WASTEWATER TREATMENT	-	MIN 2,000 TO MAX 30,000 GPD MBR PACKAGE PLANT
ME-10201	PACKAGE PLANT	MEMERGENCY EYE WASH	MEMERGENCY EYE WASH	-	BRADLEY S19214 OR EQUAL

PUMP SCHEDULE							
P #	LOCATION	SERVICE	TYPE	HP (KW)	DESIGN FLOW (GPM)	TDH	REMARKS
P-10110	EQUALIZATION TANK	INFLUENT PUMP	VERTICAL DRY PIT SUBMERSIBLE RECIRCULATION	10	20	21.66/13.66	VAUGHAN VERTICAL RECIRCULATOR CHOPPER PUMP V3LR OR EQUAL
P-10120	EQUALIZATION TANK	INFLUENT PUMP	VERTICAL DRY PIT SUBMERSIBLE RECIRCULATION	10	20	21.66/13.66	VAUGHAN VERTICAL RECIRCULATOR CHOPPER PUMP V3LR OR EQUAL
P-41110	SOLIDS HOLDING TANK	MIXING PUMP	SUBMERSIBLE CHOPPER PUMP	4.9	-	-	LANDIA AIR JET SUBMERSIBLE CHOPPER PUMP DG-I 80 OR EQUAL

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COUNTY OF SAN BERNARDINO
DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS
CALICO GHOST TOWN PH 2 AWWWT
SCHEDULES
MECHANICAL, PUMPAND VALVE

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Phone: (801) 677-0011
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DRAWING NO.

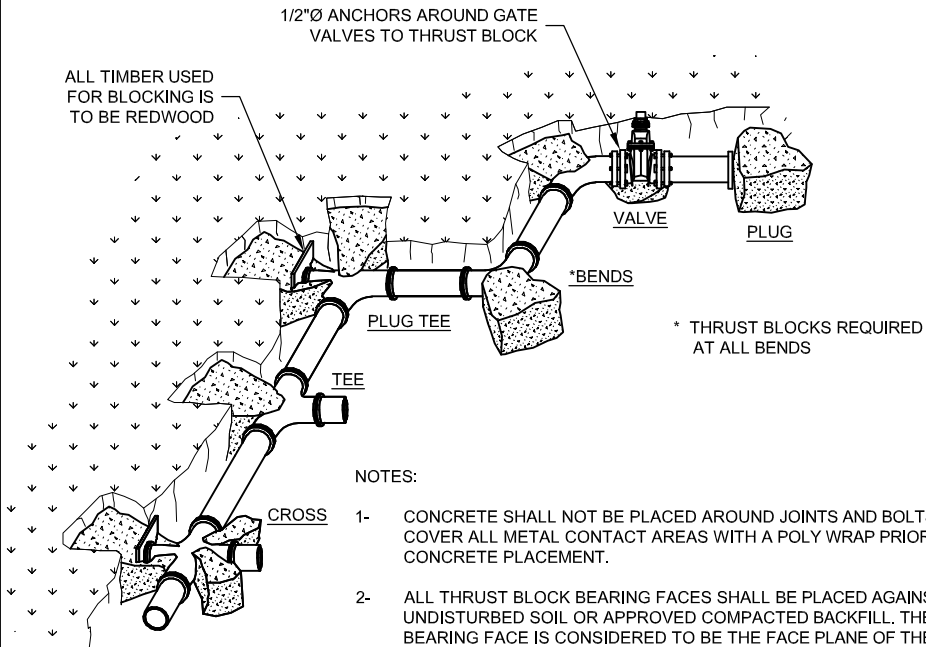
33M801

HEET 29 of 58


 6/16/21
 _____ DATE

PROJECT ENGINEER
 _____ DATE

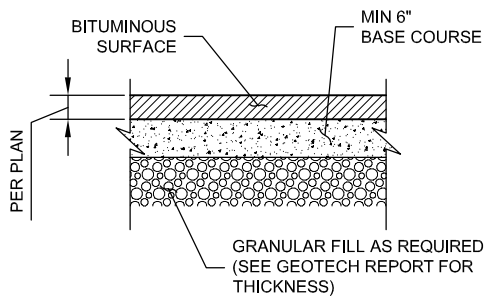
RECOMMENDED
 _____ DATE



NOTES:

- 1- CONCRETE SHALL NOT BE PLACED AROUND JOINTS AND BOLTS. COVER ALL METAL CONTACT AREAS WITH A POLY WRAP PRIOR TO CONCRETE PLACEMENT.
- 2- ALL THRUST BLOCK BEARING FACES SHALL BE PLACED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL. THE BEARING FACE IS CONSIDERED TO BE THE FACE PLANE OF THE BLOCK PERPENDICULAR TO THE AXIS OF FLOW. A FLANGED OR CAPPED PIPE END WILL HAVE ONE BEARING FACE, AND ELBOW THRUST BLOCK WILL HAVE TWO, A TEE WILL HAVE THREE, AND A CROSS WILL HAVE FOUR, EACH OF WHICH MUST MEET THE TABLE REQUIREMENTS. FLOW IS CONSIDERED TO BE IN BOTH DIRECTIONS FOR STRAIGHT THROUGH IN LINE COMPONENTS SUCH AS VALVES, REDUCERS, AND ETC., WHICH THEREFORE HAVE A MINIMUM OF TWO BEARING FACES.
- 3- SQUARE ALL EDGES TO RECEIVE CONCRETE. THRUST BLOCKS SHALL BE GENERALLY CUBIC IN CONFIGURATION.
- 4- CALCULATED WITH AN ALLOWABLE BEARING PRESSURE OF 1500 LBS. PER SQ. FT.
- 5- ALL FITTINGS AND VALVES SHALL BE ANCHORED WITH TWO #5 REBAR.
- 6- CENTER ALL FITTINGS OVER THRUST BLOCKS.
- 7- ALL REBAR SHALL BE FUSION BONDED EPOXY COATED AFTER IT HAS BEEN SHAPED OR BENT TO FIT.
- 8- FACTOR OF SAFETY OF 1.5 WAS USED TO ACCOUNT FOR PRESSURE TESTING.

THRUST BLOCK (C101)
SCALE: NTS



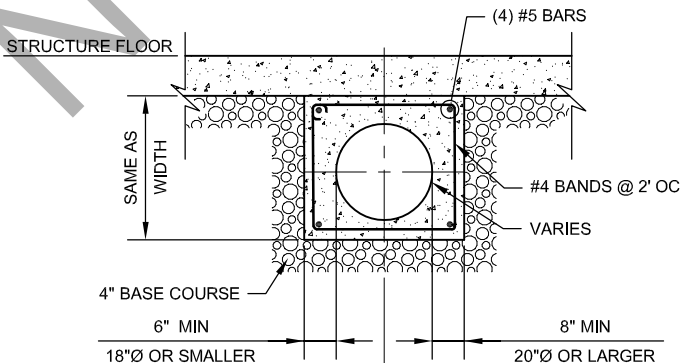
ROADWAY SECTION (C108)
SCALE: NTS

THRUST BLOCK BEARING AREA IN SQ. FT. @150 PSI WORKING PRESSURE									
PIPE SIZE	CROSS	TEE	WYE	DEAD END	VALVE	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4	2.7	1.9	1.9	1.9	1.9	2.7	1.5	1.0	1.0
6	6.0	4.3	4.3	4.3	4.3	6.0	4.3	1.7	1.0
8	10.7	7.6	7.6	7.6	7.6	10.7	5.8	3.0	1.5
10	16.7	11.8	11.8	11.8	11.8	16.7	9.1	4.6	2.4
12	24.0	17.0	17.0	17.0	17.0	24.0	13.0	6.7	3.4
14	32.7	23.1	23.1	23.1	23.1	32.7	17.7	9.1	4.6
16	42.7	30.2	30.2	30.2	30.2	42.7	23.1	11.8	6.0
18	54.0	38.2	38.2	38.2	38.2	54.0	29.3	14.9	7.5
20	66.7	47.2	47.2	47.2	47.2	66.7	36.1	18.4	9.3
24	96.0	67.9	67.9	67.9	67.9	96.0	52.0	26.5	13.4

THRUST BLOCK BEARING AREA IN SQ. FT. @200 PSI WORKING PRESSURE									
PIPE SIZE	CROSS	TEE	WYE	DEAD END	VALVE	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4	3.6	2.6	2.6	2.6	2.6	3.6	2.0	1.0	1.0
6	8.0	5.7	5.7	5.7	5.7	8.0	4.4	2.3	1.2
8	14.3	10.1	10.1	10.1	10.1	14.3	7.7	4.0	2.0
10	22.3	15.8	15.8	15.8	15.8	22.3	12.1	6.2	3.1
12	32.0	22.7	22.7	22.7	22.7	32.0	17.4	8.9	4.5
14	43.6	30.8	30.8	30.8	30.8	43.6	23.6	12.1	6.1
16	56.9	40.3	40.3	40.3	40.3	56.9	30.8	15.7	7.9
18	72.0	50.9	50.9	50.9	50.9	72.0	39.0	19.9	10.0
20	88.9	62.9	62.9	62.9	62.9	88.9	48.1	24.6	12.4
24	128.0	90.5	90.5	90.5	90.5	128.0	69.3	35.4	17.8

THRUST BLOCK BEARING AREA IN SQ. FT. @250 PSI WORKING PRESSURE									
PIPE SIZE	CROSS	TEE	WYE	DEAD END	VALVE	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4	4.5	3.2	3.2	3.2	3.2	4.5	2.5	1.3	1.0
6	10.0	7.1	7.1	7.1	7.1	10.0	5.5	2.8	1.4
8	17.8	12.6	12.6	12.6	12.6	17.8	9.7	5.0	2.5
10	27.8	19.7	19.7	19.7	19.7	27.8	15.1	7.7	3.9
12	40.0	28.3	28.3	28.3	28.3	40.0	21.7	11.1	5.6
14	54.5	38.5	38.5	38.5	38.5	54.5	29.5	15.1	7.6
16	71.1	50.3	50.3	50.3	50.3	71.1	38.5	19.7	9.9
18	90.0	63.7	63.7	63.7	63.7	90.0	48.7	24.9	12.5
20	111.1	78.6	78.6	78.6	78.6	111.1	60.2	30.7	15.4
24	160.0	113.1	113.1	113.1	113.1	160.0	86.6	44.2	22.2

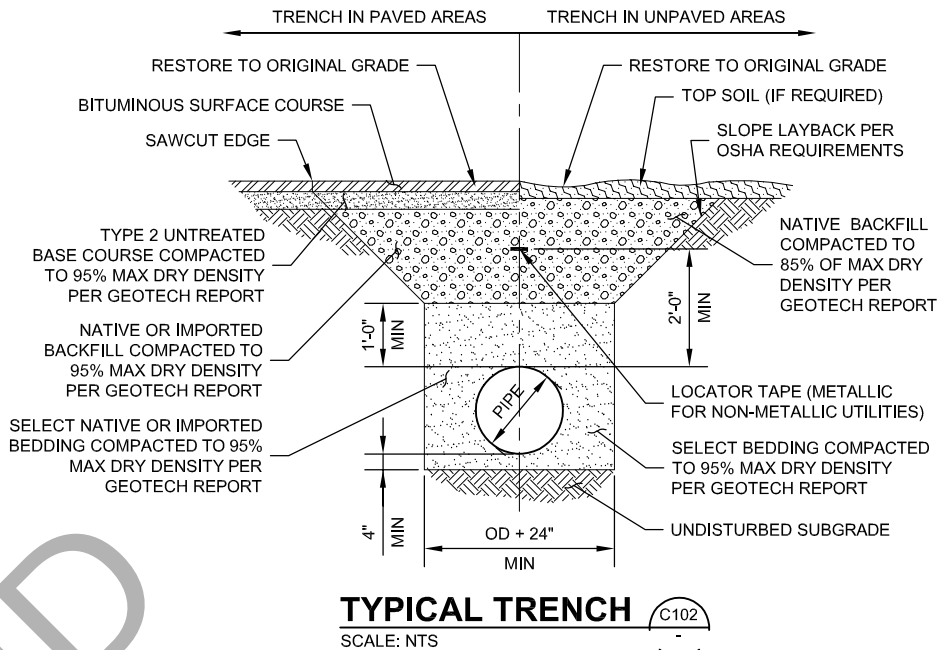
THRUST BLOCK BEARING AREA IN SQ. FT. @500 PSI WORKING PRESSURE									
PIPE SIZE	CROSS	TEE	WYE	DEAD END	VALVE	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4	8.9	6.3	6.3	6.3	6.3	8.9	4.9	2.5	1.3
6	20.0	14.2	14.2	14.2	14.2	20.0	10.9	5.6	2.8
8	35.6	25.2	25.2	25.2	25.2	35.6	19.3	9.9	5.0
10	55.6	39.3	39.3	39.3	39.3	55.6	30.1	15.4	7.7
12	80.0	56.6	56.6	56.6	56.6	80.0	43.3	22.1	11.1
14	108.9	77.0	77.0	77.0	77.0	108.9	59.0	30.1	15.1
16	142.2	100.6	100.6	100.6	100.6	142.2	77.0	39.3	19.8
18	180.0	127.3	127.3	127.3	127.3	180.0	97.4	49.7	25.0
20	222.2	157.1	157.1	157.1	157.1	222.2	120.3	61.3	30.8
24	319.9	226.2	226.2	226.2	226.2	319.9	173.2	88.3	44.4



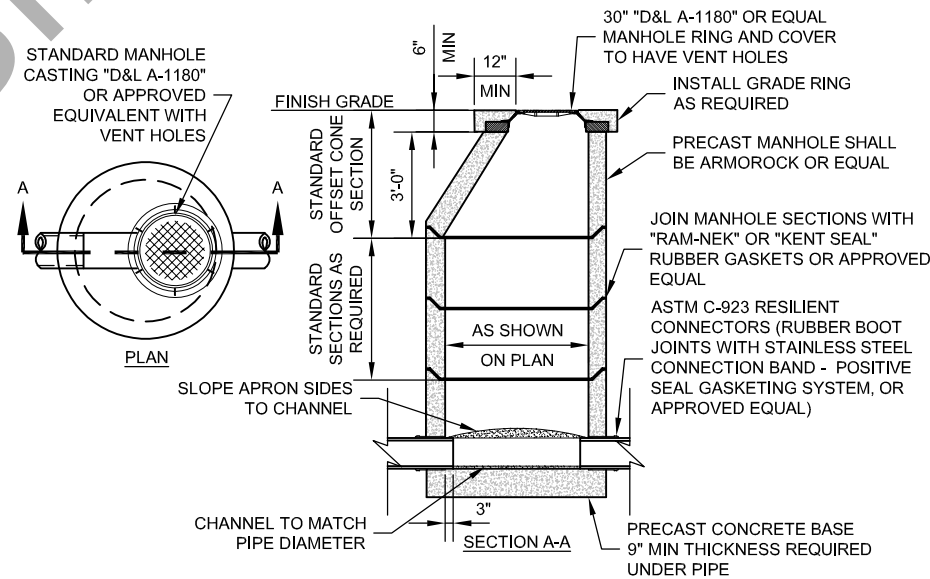
NOTE:

TOP OF ENCASEMENT IS NOT REQUIRED TO EXTEND TO STRUCTURE UNLESS IT IS WITHIN 6" OF BOTTOM OF STRUCTURE CONCRETE.

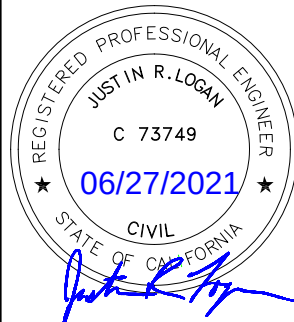
CONCRETE ENCASEMENT (C111)
SCALE: NTS



TYPICAL TRENCH (C102)
SCALE: NTS



PRECAST MANHOLE (C103)
SCALE: NTS



0		1/2		1		DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE													
																			
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REVISIONS																			

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CALICO GHOST TOWN PH 2 AWWT
DETAILS
CIVIL

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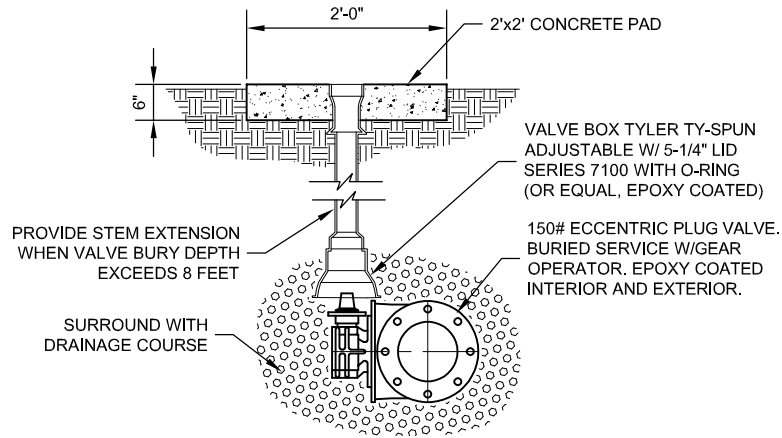
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533 W 2600 S, SUITE 275, BOUNTIFUL, UT 84010
PHONE (801) 299-1327 FAX (801) 299-0153

6/16/21 DATE
PROJECT ENGINEER
RECOMMENDED
DATE

DRAWING NO.
91C901
SHEET 30 of 58

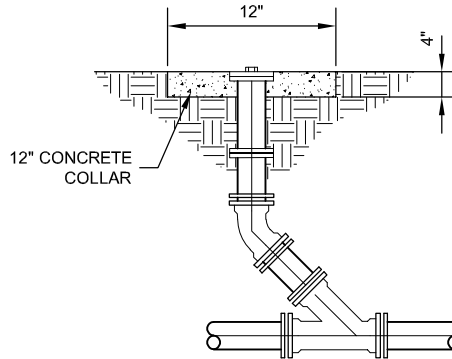
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**BURIED PLUG VALVE
FLANGED OR MJ**

SCALE: NTS

C126



GRAVITY CLEANOUT

SCALE: NTS

C138



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0	1/2	1		DESIGN	NG	DRAWN	BDP	CHECKED	JRL	B	06/01/2021				

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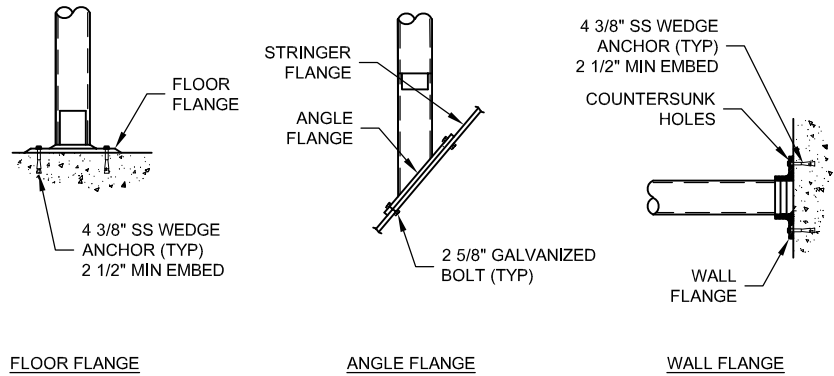
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Nelson Smith 6/16/21 DATE
PROJECT ENGINEER DATE
RECOMMENDED DATE

DRAWING NO.
91C902
SHEET 31 of 58

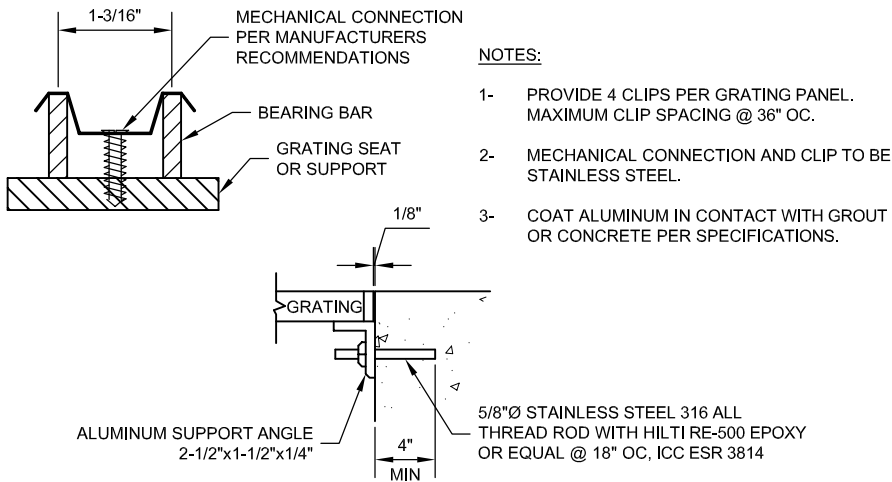
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RAILING GUARDRAIL & HANDRAIL SUPPORT

SCALE: NTS

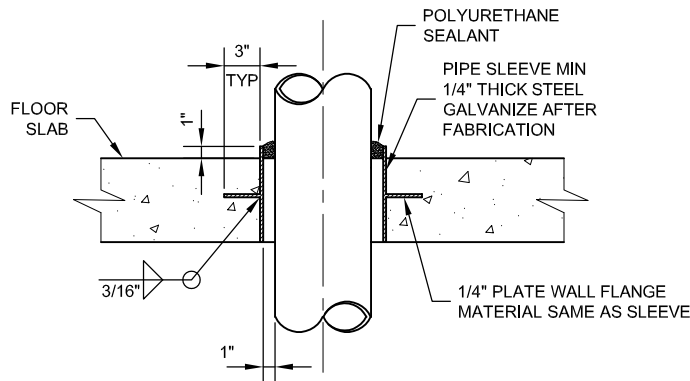
S101



SURFACE MOUNT ALUMINUM GRATING

SCALE: NTS

S114



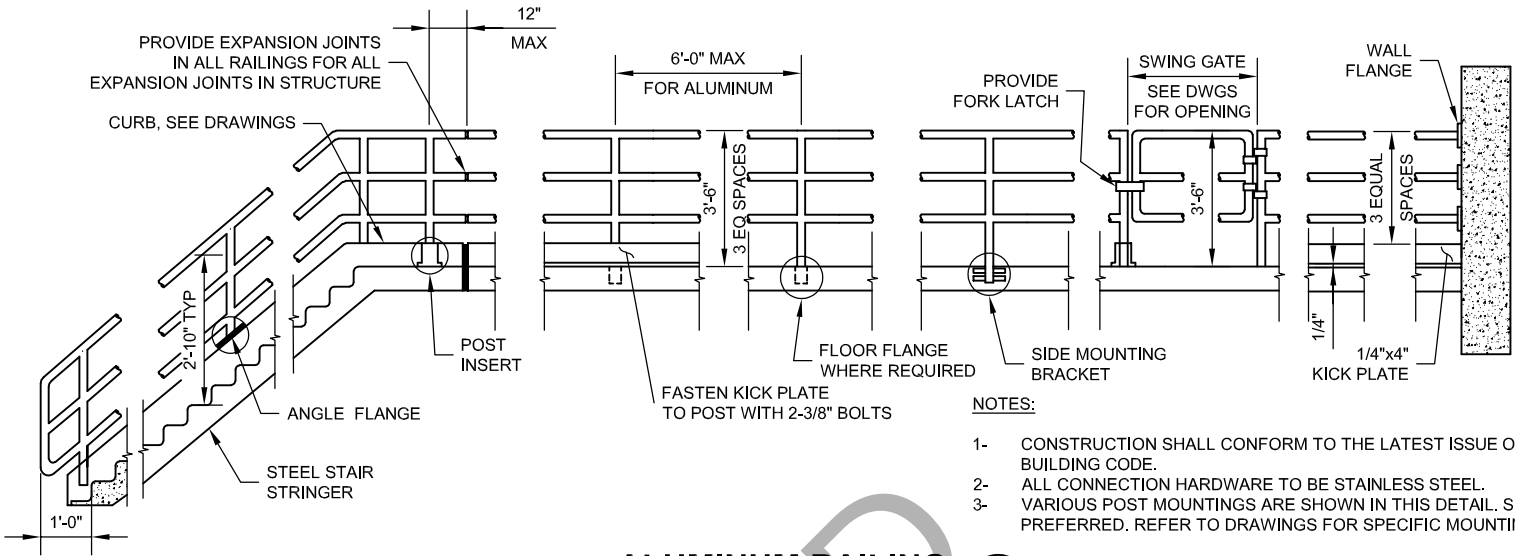
NOTE:

- 1- ALL FLOOR PENETRATIONS FOR HARD PIPING OF EQUIPMENT SHALL HAVE A FLOOR SLEEVE.

FLOOR PIPE SLEEVE

SCALE: NTS

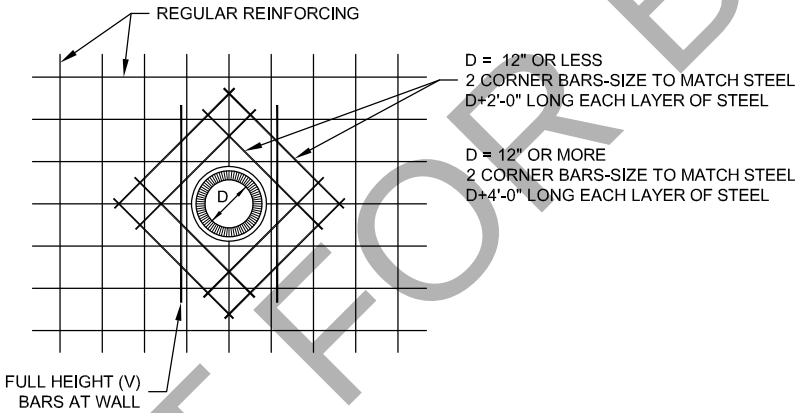
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ALUMINUM RAILING

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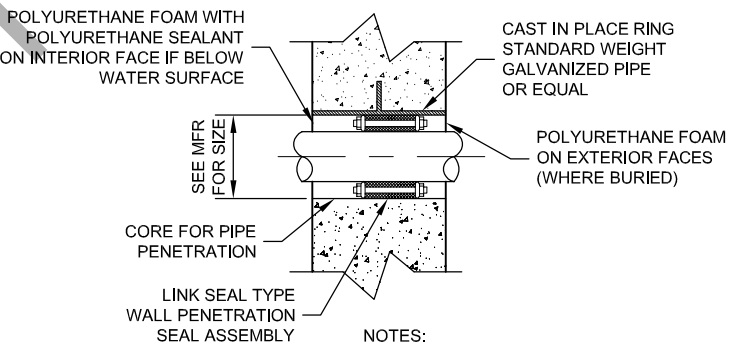
S108



PIPE PENETRATION EXTRA REINFORCING

SCALE: NTS

S121



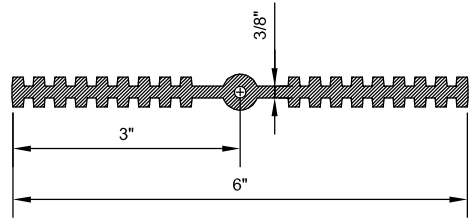
LINK SEAL

SCALE: NTS

S131

NOTE:

ALL CONSTRUCTION JOINTS BELOW GRADE MUST HAVE WATERSTOP. THE WATERSTOP MUST BE PVC SERRATED TYPE WITH CENTER BULB, NOT LESS THAN 3/8" THICK AND 6" WIDE.

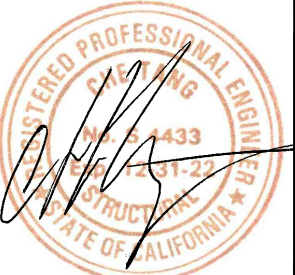


WATERSTOP

SCALE: NTS

S122

Nelson Smith
6/16/21
PROJECT ENGINEER
RECOMMENDED
DATE
DATE
DATE



DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE		ORIGINAL		DESIGN		DRAWN		CHECKED		REVISIONS	
NO.	DATE	DESIGN	DRAWN	CHECKED	NO.	DATE	DESIGN	DRAWN	CHECKED	NO.	DATE
B	06/01/2021	NG	BDP	JRL							

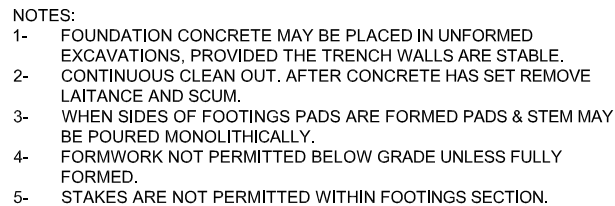
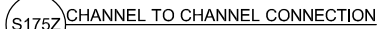
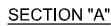
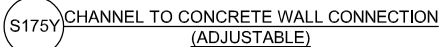
COUNTY OF SAN BERNARDINO
DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS
CALICO GHOST TOWN PH 2 AWWT
DETAILS
STRUCTURAL

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3788 McCRAV STREET
RIVERSIDE, CA 92506
PH: (951) 686-1070
FAX: (951) 788-1256
ENGINEERING CONSULTANTS

AQUA ENGINEERING
533 W 2600 S, SUITE 275, BOUNTIFUL, UT 84010
PHONE (801) 299-1327 FAX (801) 299-0153

DRAWING NO.
93S901
SHEET 33 of 58



SCALE: NTS

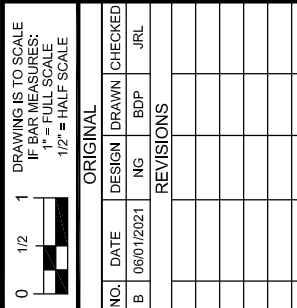


SCALE: NTS



NOTE:
ALL REINFORCING TO BE WELDABLE GRADE ASTM A706

SCALE: NTS



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ASSOCIATES
ENGINEERING CONSULTANTS

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RIVERSIDE CA. 92506
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FAX (951) 788-1256



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PHONE (801) 299-1327 FAX (801) 299-0153

DRAWING NO.

93S902

SHEET 34 of 58

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NOTES:

- 1- UNITS SHALL BE FABRICATED FROM 3/16" 6061-T6 ALUMINUM ALLOY PLATE.
- 2- ATTACH TO VERTICAL HANDRAIL OR INDIVIDUAL POST WITH PLATES AND (4)-1/4" STAINLESS STEEL BOLTS.

HANDRAIL MOUNTED HOSE RACK

 6/16/21 _____ DATE

PROJECT ENGINEER _____ DATE

RECOMMENDED _____ DATE

REGISTERED PROFESSIONAL ENGINEER
JUSTIN R. LOGAN
C 73749
06/27/2021
CIVIL
STATE OF CALIFORNIA

[illegible]

COUNTY OF SAN BERNARDINO
DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS
CALICO GHOST TOWN PH 2 AWWT
DETAILS
MECHANICAL

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Bountiful, Utah 84010
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ENGINEERING

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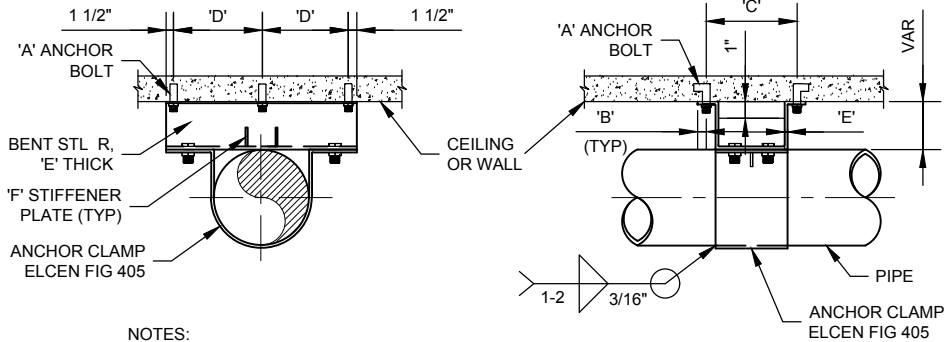
DRAWING NO.

94M901

SHEET 35 of 58

5/5/2021 C:\USERS\BRETT.PRATT\AQUA ENGINEERING\SAN BERNARDINO COUNTY - 001817.C\CALICO WWTP PRELIMINARY DESIGN\050 DRAFTING\990 DETAILS\MECHANICAL DETAILS.DWG

DIMENSIONS IN INCHES						
PIPE DIA	'A'	'B'	'C'	'D' (APPROX)	'E'	'F'
2 TO 4	(4) 5/8x6	1 1/4	5 3/4	8 1/2 (OMIT ONE)	3/8	1/4
6 TO 10	(4) 3/4x7	1 1/2	11	7 5/8 (OMIT ONE)	1/2	3/8
12 TO 16	(6) 7/8x8 1/2	1 1/2	13	10 1/4	1/2	3/8
18 TO 30	(6) 1x9	1 1/2	15	17 1/4	5/8	1/2

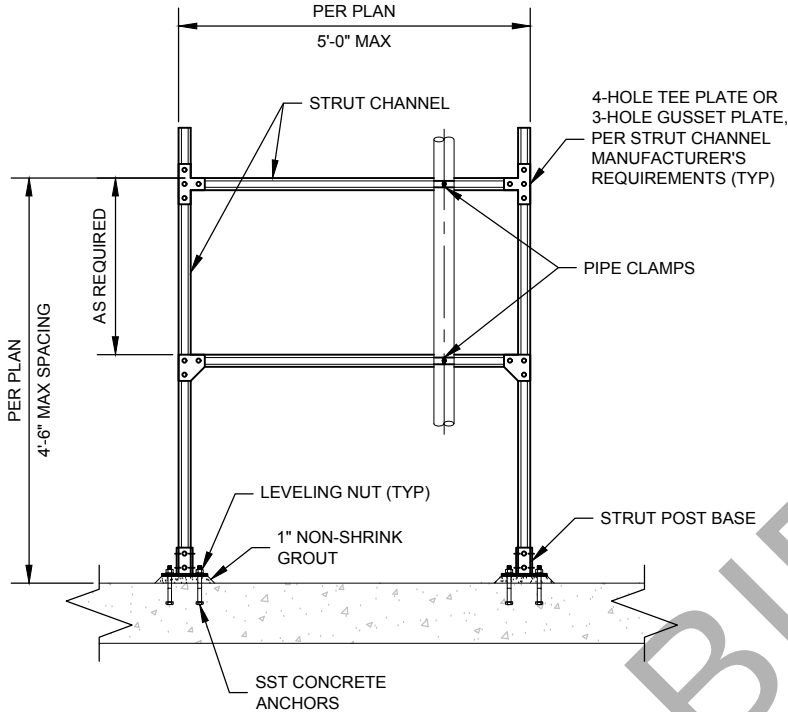


NOTES:

- 1- WHEN THICKNESS OF CONCRETE LIMITS THE USE OF ANCHOR BOLT LENGTHS AS TABULATED, SHORTER BOLTS WELDED TO REINFORCING BARS MAYBE USED.
- 2- GALVANIZE AFTER FABRICATION.

PIPE ANCHOR

SCALE: NTS



NOTES:

- 1- FOR PIPING INSTALLED HORIZONTALLY, ADD ADDITIONAL VERTICAL PREFORMED CHANNEL SUPPORT CENTERED BETWEEN HORIZONTAL SUPPORTS.
- 2- FOR UTILITY WATER, FOUL AIR, AND OTHER PIPING LESS THAN 4" DIAMETER (4" MAX) IS REQUIRED.
- 3- MATERIAL SHALL BE AS NOTED ON DRAWINGS.
- 4- CONTRACTOR SHALL DESIGN, AND FURNISH.
- 5- CONTRACTOR SHALL PROVIDE DESIGN AND LAYOUT SUBMITTALS FOR ENGINEERS REVIEW AND APPROVAL PER SECTION 013300.

FREE STANDING PIPING/
CONDUIT STRUT SUPPORT

SCALE: NTS



DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE				ORIGINAL				REVISIONS			
NO.	DATE	DESIGN	DRAWN	CHECKED	NG	BDP	JRL				
B	06/01/2021										

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AQUA
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PHONE (801) 299-1327 FAX (801) 299-0153

Nelson Smith
PROJECT ENGINEER
RECOMMENDED
6/16/21
DATE
DATE
DATE

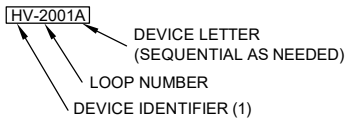
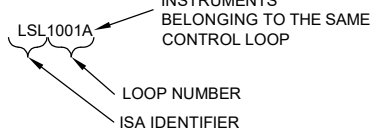
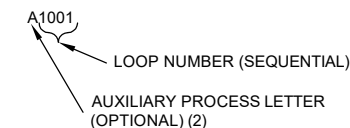
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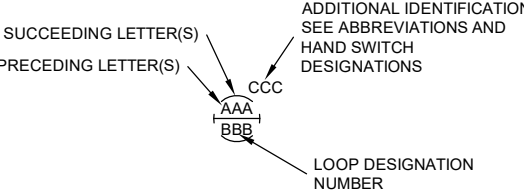
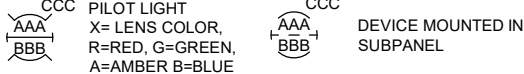
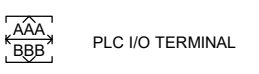
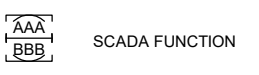
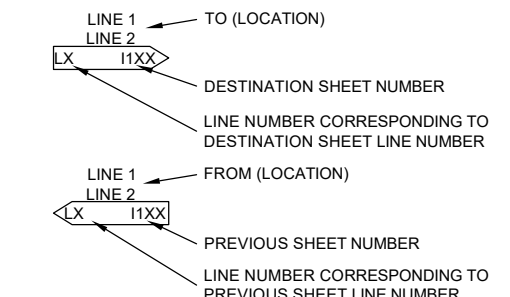
94M902

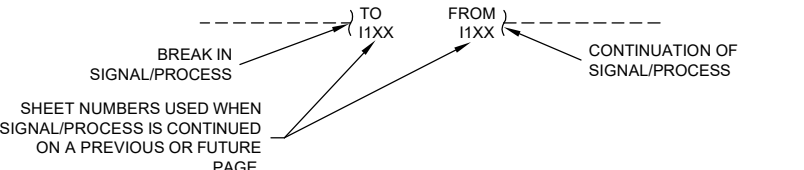
SHEET 36 of 58

4/30/2021 C:\USERS\MICHAEL JOHNSON\AQUA ENGINEERING\SAN BERNARDINO COUNTY - 001817.C CALICO WWTP PRELIMINARY DESIGN\050 DRAFTING\988 INSTRUMENTATION\988-1001.DWG

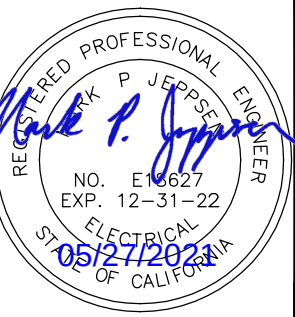
ISA INSTRUMENT IDENTIFICATION TABLE					
PRECEDING LETTERS			SUCCEEDING LETTERS		
MEASURED OR INITIATING VARIABLE		MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		EMERGENCY	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY			CONTROL	
D	DENSITY OR SPECIFIC GRAVITY	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW RATE	RATIO			
G	GAUGE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOTOR	MOMENTARY	MOISTURE		MIDDLE
N	VIDEO		USER'S CHOICE	USER'S CHOICE	NORMAL
O	USER'S CHOICE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE, VACUUM		POINT CONNECTION		STOP
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD, OR PRINT		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X-AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, OR PRESENCE	Y-AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z-AXIS		DRIVER, ACTUATOR, FINAL CONTROL ELEMENT	

EQUIPMENT TAG	(1) DEVICE IDENTIFIERS
	CNV CONVEYANCE EQUIPMENT CV CHECK VALVE FV AUTOMATIC VALVE (ACTUATED VALVE) G GATE H HVAC/ODOR HV HAND VALVE M METERING ME CHEMICAL/MECHANICAL EQUIPMENT MFV MULTIFUNCTION VALVE P PUMP SPV SAMPLE VALVE SV SOLENOID VALVE
INSTRUMENT/SCADA TAG	(2) AUXILIARY PROCESS LETTERS
	A ACCESS CONTROL SYSTEMS C COLLECTIONS SYSTEM F FIRE SYSTEMS H HVAC SYSTEMS P POWER SYSTEMS
LOOP NUMBER CRITERIA	
	

TAG NUMBERS AND ADDITIONAL DESIGNATIONS	
	
P&ID INTERFACE SYMBOLS	
NOTE: REFER TO ISA INSTRUMENT IDENTIFICATION TABLE FOR DEFINITION OF LETTERS AAA INSIDE THE BUBBLES. BBB REPRESENTS LOOP ID (IF USED). SEE ABBREVIATIONS LIST FOR SUPERSCRIPT CCC.	
	
	
	
INPUT/OUTPUT SYMBOLS	
 ANALOG INPUT	 ANALOG OUTPUT
 DISCRETE INPUT	 DISCRETE OUTPUT
 PULSE INPUT	 PULSE OUTPUT
P&ID LINETYPES	
 CHANNEL	
 ELECTRICAL SIGNAL	
 EQUIPMENT	
 EXISTING/FUTURE PIPING AND EQUIPMENT	
 HYDRAULIC SIGNAL	
 INTERNAL SYSTEM SIGNAL LINK (SOFTWARE OR DATA LINK)	
 LOOP DIVIDER	
 PNEUMATIC SIGNAL	
 PROCESS PIPING	
 SUBPROCESS PIPING	
 VENDOR SUPPLIED	
PROCESS/SIGNAL LINE TO/FROM A PRECEDING SHEET	
	

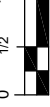
P&ID ABBREVIATIONS	PROCESS IDENTIFIERS
AI ANALOG INPUT AO ANALOG OUTPUT ARV AIR RELIEF VALVE AS AIR SUPPLY BWL BOTTOM WATER LEVEL CLZ CHLORINE CV CONTROL VALVE/CONTROL VARIABLE DCS DISTRIBUTED CONTROL SYSTEM DI DISCRETE INPUT DO DISSOLVED OXYGEN DP DIFFERENTIAL PRESSURE DWG DRAWING ETM ELAPSED TIME METER ETMf ELAPSED TIME METER (FAST SPEED) ETMs ELAPSED TIME METER (SLOW SPEED) ES EMERGENCY STOP FA FOUL AIR FC FAIL CLOSED FE FLOW ELEMENT FVNR FULL VOLTAGE NON-REVERSING FVR FULL VOLTAGE REVERSING GA GALLONS GCP GENERATOR CONTROL PANEL GND GROUND GPD GALLONS PER DAY GPH GALLONS PER HOUR GPM GALLONS PER MINUTE H2S HYDROGEN SULFIDE HMI HUMAN MACHINE INTERFACE IO INPUT/OUTPUT ISB INTRINSICALLY SAFE BARRIER LAN LOCAL AREA NETWORK LCP LOCAL CONTROL PANEL M MOTOR MA MILLIAMP MCC MOTOR CONTROL CENTER MFR(S) MANUFACTURER(S) MGD MILLION GALLONS PER DAY MGL MILLIGRAMS PER LITER MLR MIXED LIQUOR RETURN MO MOISTURE MOD MODULATING MTU MASTER TELEMETRY UNIT NTU TURBIDITY OIT OPERATOR INTERFACE TERMINAL OL OVERLOAD PER PERMISSIVE PLC PROGRAMMABLE LOGIC CONTROLLER PNL PANEL POS POSITION POT POTENTIOMETER PPM PARTS PER MILLION PR PAIR PSI POUNDS PER SQUARE INCH PV PROCESS VARIABLE RF RADIO FREQUENCY RIO REMOTE INPUT OUTPUT RST RESET RTU REMOTE TELEMETRY UNIT RVSS REVERSE VOLTAGE SOFT START SB SLUDGE BLANKET SD SMOKE DETECTOR SLC SINGLE LOOP CONTROLLER SO2 SULFUR DIOXIDE SP SET POINT/SPARE SPD SPEED SV SOLENOID OPERATED VALVE T/M TEMPERATURE AND/OR MOISTURE TSS TOTAL SUSPENDED SOLIDS TWL TOP WATER LEVEL UG UNDERGROUND VFD VARIABLE FREQUENCY DRIVE VTP VERTICAL TURBINE PUMP	A AERATION AIR COMPRESSED AIR AS AIR SUPPLY BD BOTTOM DRAIN BS BENDED SLUDGE C CONDENSATE CD CHEMICAL DRAIN AND VENT CL CHLORINE (GAS OR LIQUID STATE) CLS CHLORINE SOLUTION CLV CHLORINE GAS UNDER VACUUM CSL CIRCULATED SLUDGE CV CHLORINATOR VENT AND DETECTION LINE DN DECANT DSL DIGESTED SLUDGE DW DEMINERALIZED WATER EE ENGINE EXHAUST EV EVAPORATIVE COOLING EWR ENGINE COOLING WATER RETURN EWS ENGINE COOLING WATER SUPPLY EX AIR EXHAUST FA FOUL AIR FE FINAL EFFLUENT FM FORCE MAIN FOR FUEL RETURN FOS FUEL SUPPLY FS FROTH SPRAY FSP FIRE PROTECTION SPRINKLER SYSTEM FW FINISHED WATER G GRIT H HYPOCHLORITE HR HEATING WATER RETURN HS HEATING WATER SUPPLY HW HOT WATER HWR HOT WATER RETURN HWS HOT WATER SUPPLY HY HYDRAULIC IA INSTRUMENT AIR IO LUBE OIL LSP LANDSCAPING SPRINKLER SYSTEM ML MIXED LIQUOR NG NOT USED NATURAL GAS NPW NON-POTABLE WATER OF OVERFLOW PA PLANT AIR PD PLANT DRAIN PEA POLYMER-ANIONIC PEC POLYMER-CATIONIC PEF PRIMARY EFFLUENT PEN POLYMER-NONIONIC PI PLANT INFLUENT PW POTABLE WATER RAS RETURN ACTIVATED SLUDGE RSL RAW SLUDGE RW RAW WATER RWL RAINWATER LEADER S SCUM SA SAMPLE LINE (SEE LIST AT RIGHT) SB SODIUM BISULFITE SD SANITARY DRAIN AND VENT SDR STORM DRAIN SE SECONDARY EFFLUENT SF SLUDGE FILTRATE SG SLUDGE GAS SN SUBNATANT SPD SUMP PUMP DISCHARGE SS SANITARY SEWER ST STEAM SU STRUCTURE UNDERDRAIN SUC STRUCTURE UNDERDRAIN COLLECTOR TSL THICKENED SLUDGE UW UTILITY WATER WAS WASTE ACTIVATED SLUDGE WLO WASTE LUBE OIL WW WASTEWATER
CONTINUATION	
	
SHEET NUMBERS USED WHEN SIGNAL/PROCESS IS CONTINUED ON A PREVIOUS OR FUTURE PAGE.	

GENERAL NOTES	
1. ADDITIONAL INSTRUMENTATION AND CONTROL SYMBOLS MAY BE USED AS REQUIRED. SYMBOLS AND NOMENCLATURE ARE BASED ON ISA STANDARD S-5.1.	
2. SEE ASSOCIATED ELECTRICAL SYMBOL SHEETS FOR ELECTRICAL SYMBOLS AND ABBREVIATIONS.	
P&ID CONTINUATION ARROW LINE NUMBER SEQUENCE	
LINE#	PROCESS
1-10	INFLUENT TO EFFLUENT LINE
11-20	PRIMARY TREATMENT (SLUDGE, SCUM, SCREENINGS)
21-30	SECONDARY TREATMENT (RAS/WAS)
31-40	SOLIDS HANDLING (DIGESTERS, DEWATERING, THICKENING, CONVEYORS/TRUCKS)
41-50	TERTIARY/MISC. PROCESS (DRAINS, CLOTH FILTERS, REUSE PUMP STATIONS)
	SUBPROCESS
51-60	POTABLE/NON-POTABLE
61-80	AIR/PNEUMATIC/HYDRAULIC
81-90	CHEMICAL
91-100	MISC. SUBPROCESS
HAND SWITCH DESIGNATIONS	
ES	EMERGENCY STOP
FOR	FORWARD-OFF-REVERSE
FR	FORWARD-REVERSE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORA	HAND-OFF-REMOTE-AUTO
IOE	INTERNAL-OFF-EXTERNAL
JOA	JOG-OFF-AUTO
LOAR	LOWER-OFF-AUTO-RAISE
LOR	LOCAL-OFF-REMOTE
LR	LOCAL-REMOTE
MA	MANUAL-AUTO
MOA	MANUAL-OFF-AUTO
MOR	MOMENTARY-OFF-RUN
OC	OPEN-CLOSE
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OO	ON-OFF
OOA	ON-OFF-AUTO
OOC	ON-OFF-CLOSE
OOR	ON-OFF-REMOTE
OSC	OPEN-STOP-CLOSE
POT	POTENTIOMETER
ROO	RESET-OFF-ON
RST	RESET PUSHBUTTON
SS	START-STOP
 6/16/21 _____ DATE	
PROJECT ENGINEER _____ DATE	
RECOMMENDED _____ DATE	



05/27/2021

DRAWING IS TO SCALE
IF BAR MEASURES:
1" = FULL SCALE
1/2" = HALF SCALE



0 1/2 1

ORIGINAL	DESIGN	DRAWN	CHECKED	MPJ	DCL	MPJ
NO.	DATE	B	06/01/2021			

REVISIONS	
NO.	DESCRIPTION

COUNTY OF SAN BERNARDINO
DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS
CALICO GHOST TOWN PH 2 AWWT
INSTRUMENTATION - GENERAL
LEGEND

533 W 2600 S, Suite 25
Bountiful, Utah 84010
Phone: (801) 677-0011
www.skmeng.com



ALBERT A. WEBB
ASSOCIATES
ENGINEERING CONSULTANTS

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RIVERSIDE CA 92506
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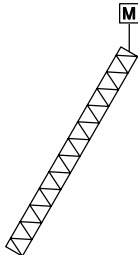
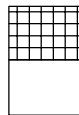
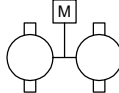
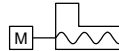
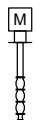
533 W 2600 S, SUITE 275, BOUNTIFUL, UT 84010
PHONE (801) 299-1327 FAX (801) 299-0153

DRAWING NO.

1001

SHEET 37 of 58

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VALVES		ACTUATORS		FLOW ELEMENTS		MISCELLANEOUS		PRIMARY ELEMENT SYMBOLS		<div><div>REGISTERED PROFESSIONAL ENGINEER</div><div>MARK P. JEPPESEN</div><div>NO. E16627</div><div>EXP. 12-31-22</div><div>05/27/2024</div><div>ELECTRICAL</div><div>STATE OF CALIFORNIA</div></div> <div><div>DRAWING IS TO SCALE</div><div>IF BAR MEASURES:</div><div>1" = FULL SCALE</div><div>1/2" = HALF SCALE</div><div>0 1/2 1</div><div><div>ORIGINAL</div><div>DESIGN</div><div>DRAWN</div><div>CHECKED</div><div>NO.</div><div>DATE</div><div>B</div><div>06/01/2021</div><div>MPJ</div><div>DCL</div><div>MPJ</div><div colspan="4">REVISIONS</div></div></div>		
	3 WAY VALVE		ACTUATOR: H=HYDRAULIC, M=MOTOR, P=PNEUMATIC, S=SOLENOID		MAGNETIC FLOW ELEMENT		FINE SCREEN		ANALYZER ELEMENT			
	4 WAY VALVE		MANUAL		MASS FLOW ELEMENT ANNUBAR (INSERTION)		MEMBRANE		DO ANALYZER			
	ANGLE VALVE		PNEUMATIC DIAPHRAGM		MASS FLOW ELEMENT ANNUBAR (SPOOL)		EDUCTOR		DO SENSOR			
	BACK PRESSURE RELIEF VALVE		PNEUMATIC DIAPHRAGM WITH POSITIONER		PITOT TUBE	NOT FOR BID			FLOAT SWITCH			
	BALANCING VALVE	PIPING			PROPELLER FLOW ELEMENT (INSERTION)				ORP ANALYZER			
	BALL VALVE		BLIND FLANGE		PROPELLER FLOW ELEMENT (SPOOL)				ORP SENSOR			
	BUTTERFLY VALVE		CAPPED OR PLUGGED END		ROTAMETER				pH ANALYZER			
	CHECK VALVE		DRAIN		THERMAL MASS FLOW ELEMENT (INSERTION)				pH SENSOR			
	DIAPHRAGM VALVE		QUICK CONNECT/DISCONNECT		THERMAL MASS FLOW ELEMENT (SPOOL)				ULTRASONIC LEVEL TRANSDUCER			
	ECCENTRIC PLUG VALVE		REDUCER		ULTRASONIC FLOW ELEMENT (INSERTION)				RADAR LEVEL TRANSDUCER			
	GATE VALVE		Y-STRAINER		ULTRASONIC FLOW ELEMENT (SPOOL)							
	GLOBE VALVE		FLEXIBLE CONNECTOR									
	KNIFE VALVE	PUMPS										
	LUBRICATED PLUG VALVE		CENTRIFUGAL PUMP									
	MIX VALVE		MECHANICAL DIAPHRAGM PUMP									
	MUD VALVE		METERING PUMP									
	NEEDLE VALVE		MIXED FLOW PUMP									
	PINCH VALVE		PERISTALTIC PUMP									
	PRESSURE REDUCING VALVE		PROGRESSIVE CAVITY PUMP									
	PRESSURE RELIEF VALVE		ROTARY LOBE PUMP									
	SLEEVE VALVE		SUBMERSIBLE PUMP									
	TELESCOPING VALVE		VERTICAL TURBINE PUMP									
	VACUUM VALVE											
HVAC												
	AIR COMPRESSOR											
	AIR FILTER											
	DAMPER											
	FILTER											
	GUIDE VANES											
	HEAT EXCHANGER											
	LOUVER WITH HOOD											
	SILENCER											
	UNIT HEATER											
GATES												
	FLAPPER GATE											
	SLIDE GATE											
	SLUICE GATE											
	STOP GATE											
										PROJECT ENGINEER RECOMMENDED 6/16/21 DATE DATE DATE		

COUNTY OF SAN BERNARDINO

DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS

CALICO GHOST TOWN PH 2 AWWT

INSTRUMENTATION - GENERAL SYMBOLS

skm

533 W 2600 S, Suite 25
Bountiful, Utah 84010
Phone: (801) 677-0011
www.skmeng.com

ALBERT A. WEBB ASSOCIATES

CIVIL ENGINEERS

3788 MCCRAY STREET
RIVERIDGE CA 92506
PH: (951) 886-1070
FAX (951) 788-1268

AQUA ENGINEERING

533 W 2600 S, SUITE 275, BOUNTIFUL, UT 84010
PHONE (801) 299-1327 FAX (801) 299-0153

6/16/21

DATE

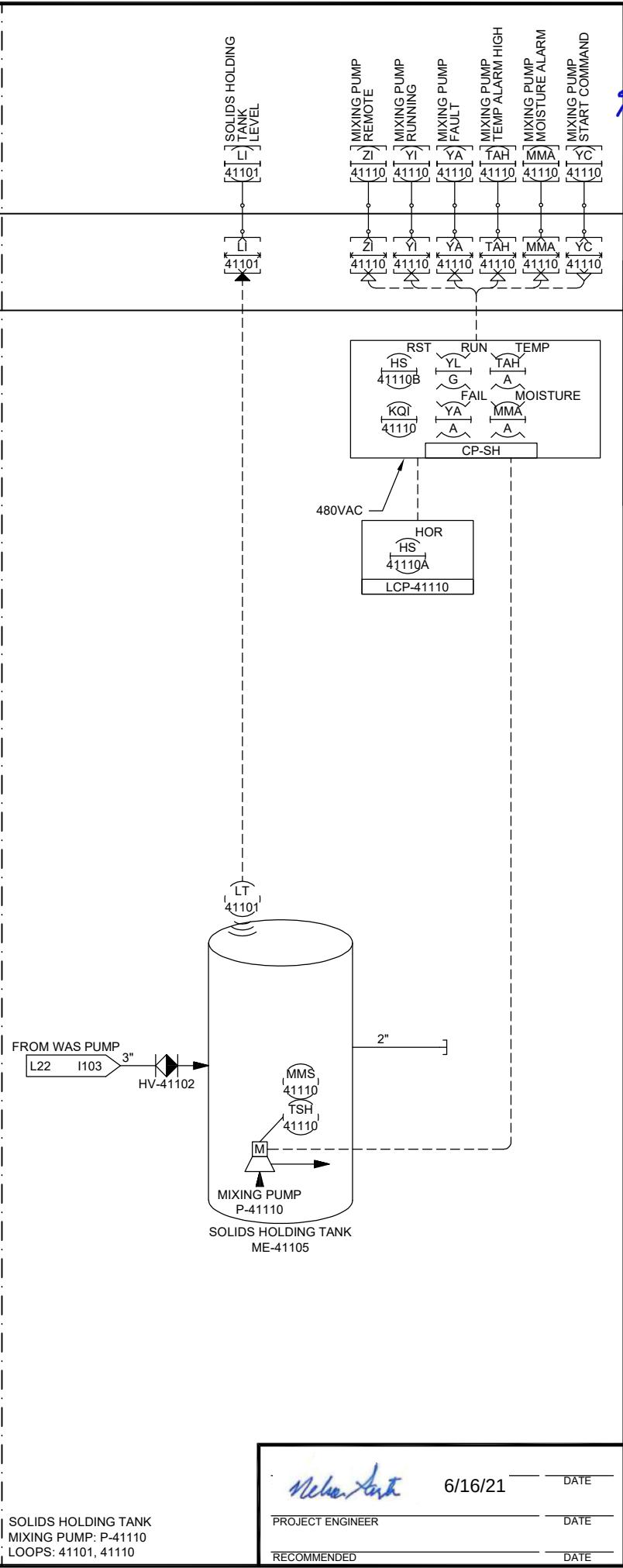
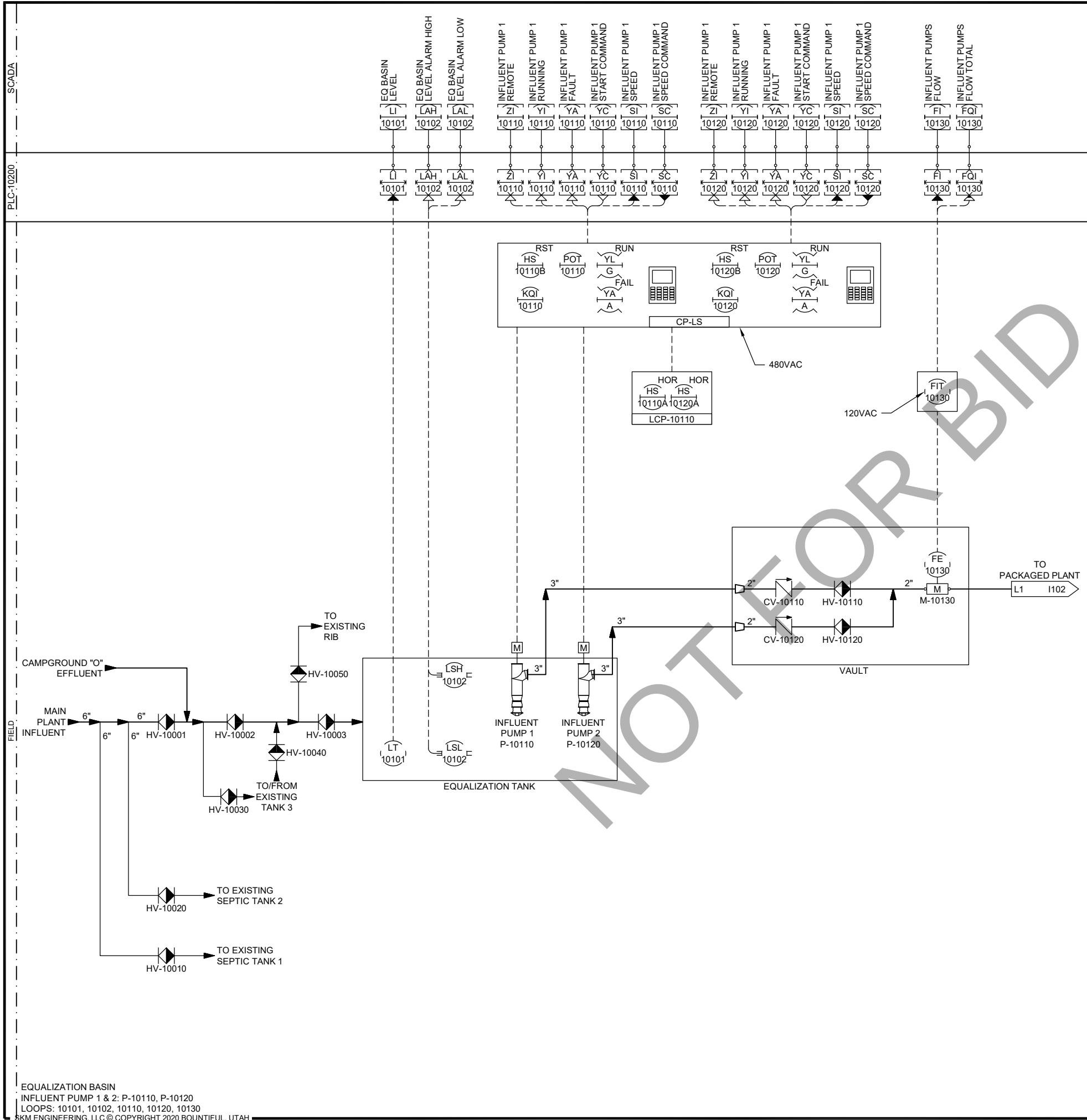
DATE

DATE

DRAWING NO.

1002

SHEET 38 of 58



REGISTERED PROFESSIONAL ENGINEER
MARK P. JEPPESE
NO. E16627
EXP. 12-31-22
ELECTRICAL
STATE OF CALIFORNIA
05/27/2021

DRAWING IS TO SCALE
IF BAR MEASURES:
1" = FULL SCALE
1/2" = HALF SCALE

NO.	DATE	DESIGN	DRAWN	CHECKED	MPJ	DCI	MPJ
B	06/01/2021						

REVISIONS

COUNTY OF SAN BERNARDINO
DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS
CALICO GHOST TOWN PH 2 AWWT
INSTRUMENTATION - P&ID
EQUALIZATION BASIN & SOLIDS HOLDING TANK

skm 533 W 2600 S, Suite 25
Bountiful, Utah 84010
Phone: (801) 677-0011
www.skmeng.com

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAV STREET
RIVERSIDE CA 92506
PH. (951) 686-1070
FAX (951) 788-1256

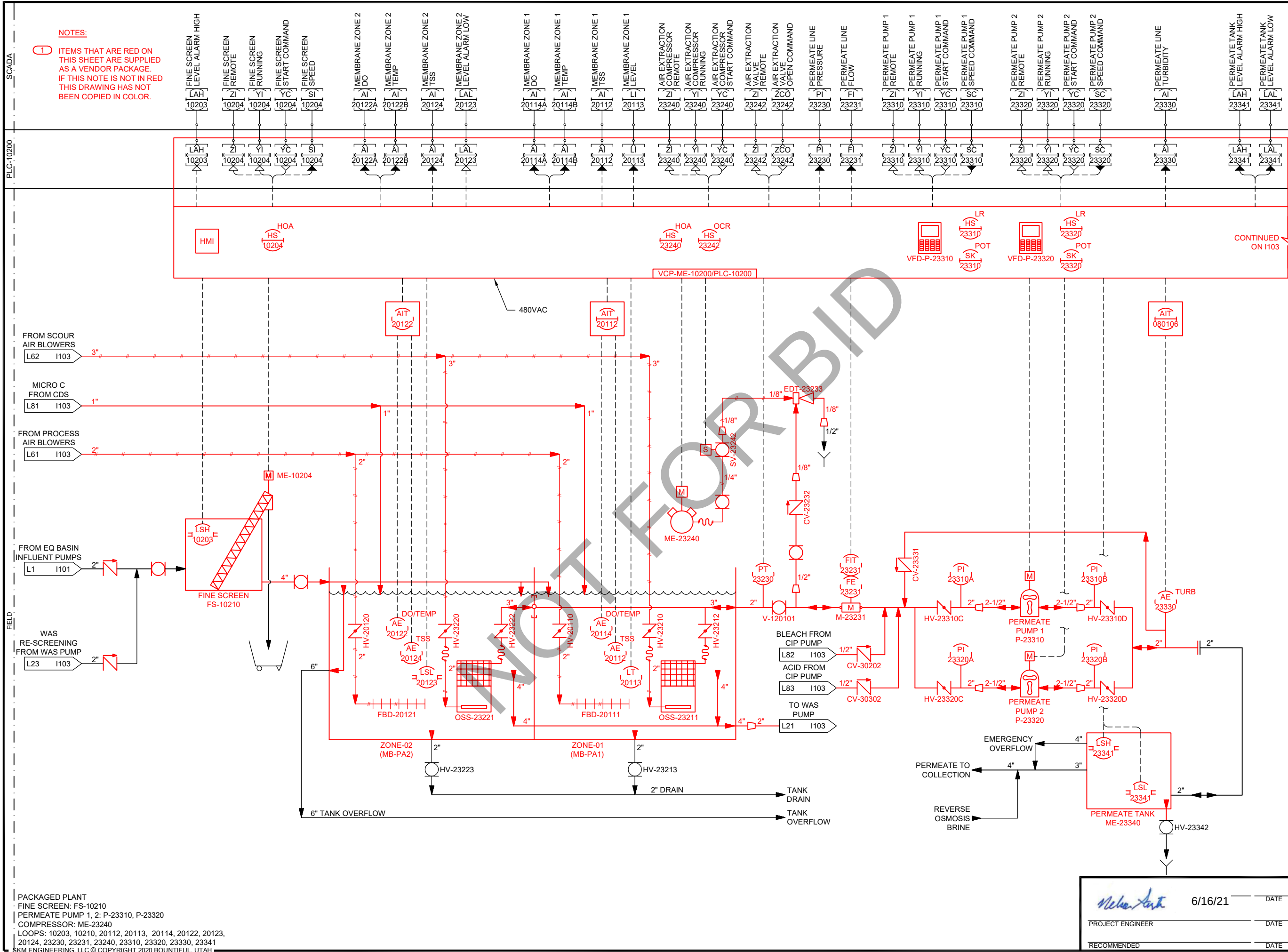
AQUA ENGINEERING
533 W 2600 S, SUITE 275, BOUNTIFUL, UT 84010
PHONE (801) 298-1327 FAX (801) 298-0153

DRAWING NO.
I101
SHEET 39 of 58

6/16/21 DATE
PROJECT ENGINEER DATE
RECOMMENDED DATE

C:\USERS\DAVID\AQUA ENGINEERING\SAN BERNARDINO COUNTY - 001817.C CALICO WWTP PRELIMINARY\DESIGN\050 DRAFTING\998 INSTRUMENTATION\998-1101.DWG

5/27/2021



REGISTERED PROFESSIONAL ENGINEER

Mark P. Jeppese

NO. E16627

EXP. 12-31-22

05/27/2021

ELECTRICAL

STATE OF CALIFORNIA

DRAWING IS TO SCALE

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1/2" = HALF SCALE

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DESIGN

DRAWN

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DATE

NO.

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06/01/2021

MPJ

DCL

MPJ

REVISIONS

COUNTY OF SAN BERNARDINO

DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS

CALICO GHOST TOWN PH 2 AWWT

INSTRUMENTATION - P&ID

PACKAGED PLANT PRIMARY TREATMENT

skm

533 W 2600 S, Suite 25

Bountiful, Utah 84010

Phone: (801) 677-0011

www.skmeng.com

ALBERT A. WEBB ASSOCIATES

CIVIL ENGINEERS

3788 McCray Street

Riverside, CA 92506

PH: (951) 686-0707

FAX: (951) 788-1266

AQUA ENGINEERING

533 W 2600 S, SUITE 275, BOUNTIFUL, UT 84010

PHONE (801) 299-1327 FAX (801) 299-0153

DRAWING NO.

I102

SHEET 40 of 58

PACKAGED PLANT

FINE SCREEN: FS-10210

PERMEATE PUMP 1, 2: P-23310, P-23320

COMPRESSOR: ME-23240

LOOPS: 10203, 10210, 20112, 20113, 20114, 20122, 20123, 20124, 23230, 23231, 23240, 23310, 23320, 23330, 23341

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6/16/21

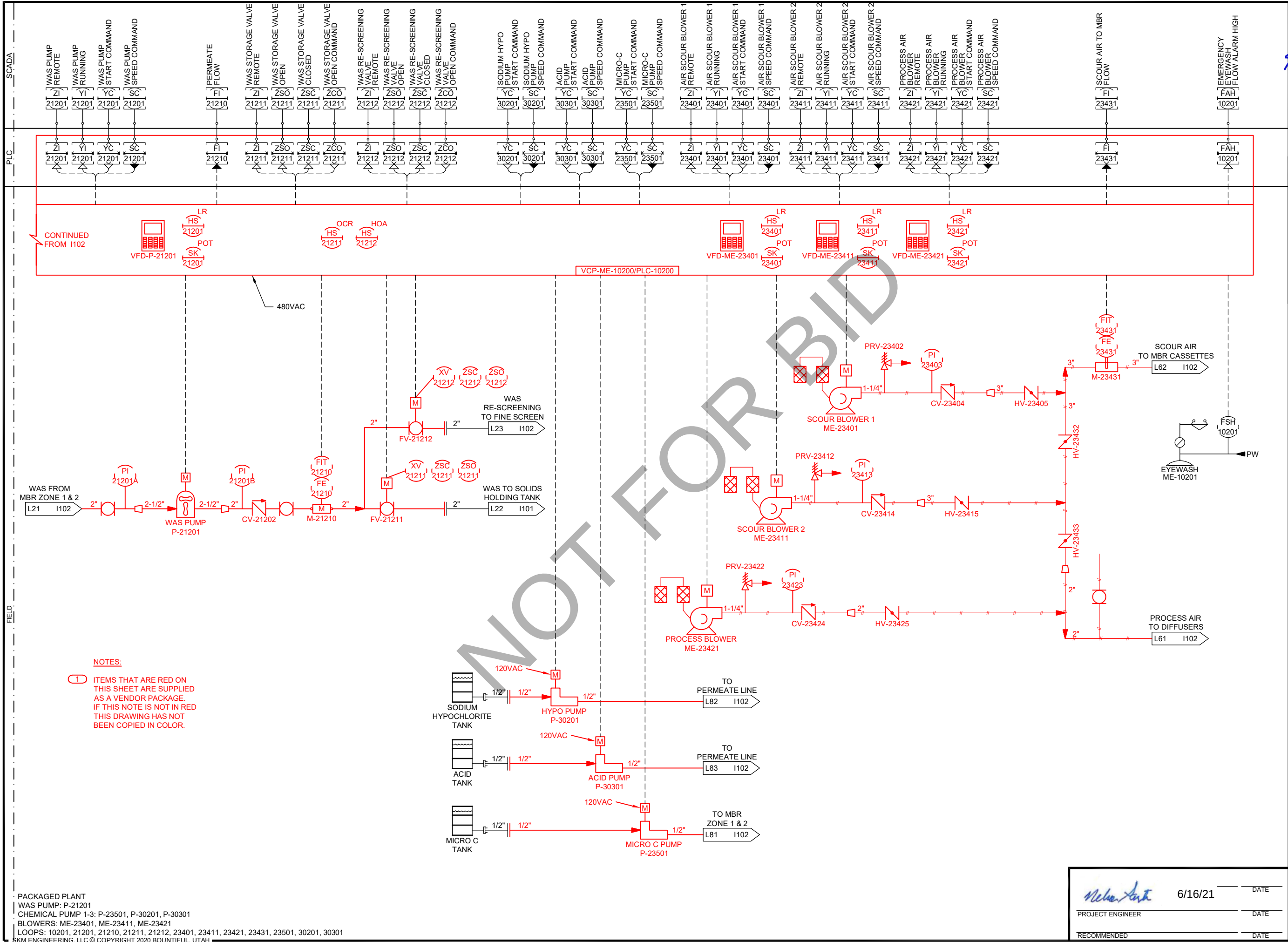
DATE

PROJECT ENGINEER

DATE

RECOMMENDED

DATE



NO.	DATE	DESIGN	DRAWN	CHECKED	MPJ	DCL	MPJ
B	06/01/2021						
REVISIONS							

COUNTY OF SAN BERNARDINO

DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS

CALICO GHOST TOWN PH 2 AWWT

INSTRUMENTATION - P&ID

PACKAGED PLANT SECONDARY & AUXILIARY TREATMENT

skm

533 W 2600 S, Suite 25
Bountiful, Utah 84010
Phone: (801) 677-0011
www.skmeng.com

ALBERT A. WEBB ASSOCIATES

CIVIL ENGINEERS

3788 MCCRAY STREET
RIVERSIDE CA 92506
PH: (951) 686-0707
FAX: (951) 788-1266

AQUA ENGINEERING

533 W 2600 S, SUITE 275, BOUNTIFUL, UT 84010
PHONE (801) 299-1327 FAX (801) 299-0153

DRAWING NO.

I103

SHEET 41 of 58

6/16/21

DATE

PROJECT ENGINEER

DATE

RECOMMENDED

DATE

5/24/2021 C:\USERS\MICHAEL_JOHNSON\AQUA_ENGINEERING\3\SAN_BERNARDINO_COUNTY_-_001817.C CALICO WWTP PRELIMINARY DESIGN\050 DRAFTING\988 INSTRUMENTATION\988-1301.DWG

SCHEMATIC LINETYPES		ABBREVIATIONS		NOTES	
————— MANUFACTURER/SHOP WIRE TYPICALLY INSTALLED OFF-SITE ----- EXISTING OR FUTURE MANUFACTURER/SHOP WIRE ----- EXISTING OR FUTURE FIELD/CONTRACTOR INSTALLED WIRE ----- FIELD/CONTRACTOR INSTALLED WIRE		A AMPERE AFF ABOVE FINISHED FLOOR AI ANALOG INPUT AIC AMPS INTERRUPTING CAPACITY AO ANALOG OUTPUT AS AIR SUPPLY ATS AUTOMATIC TRANSFER SWITCH C CONDUIT CB CIRCUIT BREAKER CL2 CHLORINE CPT CONTROL POWER TRANSFORMER CTC COMMUNICATIONS TERMINATION CABINET CU COPPER, BARE CV CONTROL VALVE DCS DISTRIBUTED CONTROL SYSTEM DI DISCRETE INPUT DO DISCRETE OUTPUT DP DISTRIBUTION PANEL DS DISCONNECT SWITCH DV/DT DIFFERENTIAL VOLTAGE/TIME DWG DRAWING ETM ELAPSED TIME METER EOL ELECTRONIC OVERLOAD FE FLOW ELEMENT FLA FULL LOAD AMPS FOC FIBER OPTIC CABLE FOR FORWARD-OFF-REVERSE FS FLOW SWITCH FVNR FULL VOLTAGE NON-REVERSING GFCI GROUND FAULT CIRCUIT INTERRUPTER GFP GROUND FAULT PROTECTION GND GROUND GPM GALLONS PER MINUTE GRS GALVANIZED RIGID STEEL H2S HYDROGEN SULFIDE HMI HUMAN MACHINE INTERFACE HOA HAND-OFF-AUTO HOR HAND-OFF-REMOTE I CURRENT IC INSTRUMENTATION CABLE IO INPUT/OUTPUT ISC SHORT CIRCUIT CURRENT J JUNCTION BOX LAN LOCAL AREA NETWORK LCP LOCAL CONTROL PANEL LOS LOCK-OUT-STOP LP LIGHTING PANEL LR LOCAL/REMOTE LS LEVEL SWITCH LTC LIQUIDTIGHT FLEXIBLE METAL CONDUIT MOTOR M MANUAL/AUTO, MILLIAMPER MA MANUFACTURER'S CABLE MC MAIN CIRCUIT BREAKER MCB MOTOR CONTROL CENTER MCC MOTOR CIRCUIT PROTECTOR MCP MANUFACTURER(S) MFR(S) MILLION GALLONS PER DAY MGD MANHOLE MH MOTOR OPERATED VALVE MOV MASTER TELEMETRY UNIT MTU NATIONAL ELECTRICAL CODE NEC NORMALLY OPEN TIMED CLOSED NOTC NON-POTABLE WATER NPW NOT TO SCALE NTS TURBIDITY NTU OPERATOR INTERFACE TERMINAL OIT OVERLOAD OL ON/OFF (MAINTAINED) OO OFF-REMOTE OR PULL BOX PB PERSONAL COMPUTER PC PHASE/POWER FAILURE RELAY PFR PROGRAMMABLE LOGIC CONTROLLER PLC PANEL PNL PARTS PER MILLION PPM PAIR PR PRESSURE P PRESSURE SWITCH PS POUNDS PER SQUARE INCH PSI PROCESS VARIABLE PV REMOTE CONTROL PANEL RCP RADIO FREQUENCY RF REMOTE INPUT OUTPUT RIO RESET RST RESISTANCE TEMPERATURE DETECTOR RTD REMOTE TELEMETRY UNIT RTU REDUCED VOLTAGE SOFT STARTER RVSS SERVICE ENTRANCE EQUIPMENT SEQ SERVICE ENTRANCE SECTION SES START-LOCK-OFF-STOP SLOS SUBMERSIBLE MANUFACTURER CABLE SMC SULFUR DIOXIDE SO2 SET POINT/SPARE SP SURGE PROTECTION DEVICE SPD START/STOP SS SHUNT TRIP ST TELEPHONE CABLE TC TEMPERATURE SWITCH TS		TYP TYPICAL UG UNDERGROUND V VOLT VA VOLTAMP VFD VARIABLE FREQUENCY DRIVE W WATT, WIRE WP WEATHERPROOF XFMR TRANSFORMER ZS POSITION SWITCH	1. THE COMPLETED INSTALLATION SHALL COMPLY WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, AND REGULATIONS. ALL WORK SHALL BE COMPLETED IN A NEAT, WORKMANLIKE MANNER IN ACCORDANCE WITH THE LATEST NEC STANDARDS OF INSTALLATION UNDER COMPETENT SUPERVISION. INSTALL GROUNDING PER NEC. 2. ALL MATERIALS SHALL BE NEW AND OF THE BEST QUALITY, MANUFACTURED IN ACCORDANCE WITH NEMA, ANSI, UL, OR OTHER APPLICABLE STANDARDS. THE USE OF MANUFACTURERS' NAMES, MODELS, AND NUMBERS IS INTENDED TO ESTABLISH STYLE, QUALITY, APPEARANCE, USEFULNESS, AND BID PRICE. 3. PROTECT ALL ELECTRICAL MATERIAL AND EQUIPMENT INSTALLED AGAINST DAMAGE BY OTHER TRADES, WEATHER CONDITIONS, OR ANY OTHER PREVENTABLE CAUSES. EQUIPMENT DAMAGED DURING SHIPPING OR CONSTRUCTION, PRIOR TO ACCEPTANCE BY THE ENGINEER OR THE OWNER, WILL BE REJECTED AS DEFECTIVE. 4. ALL COMPONENTS SHALL BE FREE OF DUST, GRIT AND FOREIGN MATERIALS, LEFT AS NEW BEFORE FINAL ACCEPTANCE OF WORK. DAMAGED PAINT AND FINISHES SHALL BE TOUCHED UP OR REPAINTED WITH MATCHING COLOR PAINT AND FINISH. 5. CIRCUIT CONDUCTORS #6 AWG OR SMALLER SHALL BE THWN STRANDED COPPER. #4 AWG THROUGH #2 AWG SHALL BE XHHW STRANDED COPPER. #1 AWG OR LARGER SHALL BE XHHW-2 STRANDED COPPER. MINIMUM POWER CONDUCTOR SIZE SHALL BE #12 AWG WITH #12 AWG GROUND. ALL WIRE TO BE SIZED PER NEC TABLE 316-10, 75° C BASED ON A 30° C AMBIENT. 6. SAFETY SWITCHES, ELECTRICAL DISTRIBUTION EQUIPMENT, CONTROL PANELS, AND OTHER ELECTRICAL DEVICES SHALL BE UL LISTED, AND RATED FOR HEAVY DUTY SERVICE. 7. WIRING DEVICES SHALL BE SPECIFICATION GRADE. 8. TYPICAL DETAILS SHALL APPLY IN ALL CASES, WHETHER SPECIFICALLY REFERRED TO OR NOT.
SCHEMATIC SYMBOLS	TB'S & PLC SYMBOLS				
○ DEVICE CONNECTION LUG OR TERMINAL • SCHEMATIC POINT OF CONNECTION CIRCUIT BREAKER ○ 100AF ○ 50AT ○ MCP ← FRAME SIZE ← TRIP RATING ← BREAKER TYPE FUSE □ 30A R ← AMPERE RATING ← FUSE TYPE ⏏ GROUND CONNECTION Ⓜ MOTOR STARTER, CONTACTOR, RELAY OR TIMER COIL ⏏ NORMALLY OPEN CONTACT ⏏ NORMALLY CLOSED CONTACT ⏏ SOLENOID VALVE EQUIPMENT PROGRAMMING CONSOLE OFF ON ○ ○ X O 2 POSITION SELECTOR SWITCH POSITION LEGEND: X=CLOSED O=OPEN H O A ○ ○ X O O 3 POSITION SELECTOR SWITCH HAND - OFF - AUTO POSITION LEGEND: X=CLOSED O=OPEN O C A ○ ○ X O O 3 POSITION SELECTOR SWITCH OPEN - CLOSE - AUTO POSITION LEGEND: X=CLOSED O=OPEN F O R ○ ○ X O O 3 POSITION SELECTOR SWITCH FORWARD - OFF - REVERSE POSITION LEGEND: X=CLOSED O=OPEN STOP ○ ○ NORMALLY CLOSED PUSH BUTTON START ○ ○ NORMALLY OPEN PUSH BUTTON TYPICAL SWITCH CONFIGURATION ⏏ FLOAT SWITCH - MAKE ON FALL ⏏ FLOAT SWITCH - MAKE ON RISE ⏏ FLOAT SWITCH - BREAK ON FALL ⏏ FLOAT SWITCH - BREAK ON RISE SWITCH TYPE SYMBOL (SEE BELOW) ○ LEVEL SWITCH △ PRESSURE SWITCH ⌋ FLOW OR TORQUE SWITCH ⌋ TEMPERATURE SWITCH ✓ LIMIT SWITCH NOTC TIMER RELAY CONTACT NORMALLY OPEN TIME DELAY CLOSE	LOCAL PANEL OR DEVICE TERMINAL BLOCK ↖ TERMINAL LABEL X □ PLC PANEL TERMINAL BLOCK ↖ TERMINAL LABEL X □ MCC TERMINAL BLOCK ↖ TERMINAL LABEL X □ DEVICE TERMINAL BLOCK ↖ TERMINAL LABEL X ○				

NOT FOR BIDDING

5/27/2021

REGISTERED PROFESSIONAL ENGINEER

MARK P. JENSEN

NO. E19627

EXP. 12-31-22

ELECTRICAL

STATE OF CALIFORNIA

DRAWING IS TO SCALE

IF BAR MEASURES:

1" = FULL SCALE

1/2" = HALF SCALE

0 1/2 1

ORIGINAL

DESIGN DRAWN CHECKED

NO. DATE

B 06/01/2021

MPJ DCL MPJ

REVISIONS

NO. DATE

B 06/01/2021

MPJ DCL MPJ

COUNTY OF SAN BERNARDINO

DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS

CALICO GHOST TOWN PH 2 AWWT

INSTRUMENTATION - PLC DRAWINGS

PANEL LEGEND

skm

533 W 2600 S, Suite 25

Bountiful, Utah 84010

Phone: (801) 677-0011

www.skmeng.com

ALBERT A. WEBB

ASSOCIATES

ENGINEERING CONSULTANTS

CIVIL ENGINEERS

3780 MCCRAY STREET

RIVERIDGE CA 92506

PH. (951) 886-1070

FAX (951) 788-1268

AQUA

ENGINEERING

533 W 2600 S, SUITE 275, BOUNTIFUL, UT 84010

PHONE (801) 299-1327 FAX (801) 299-0153

6/16/21

DATE

PROJECT ENGINEER

DATE

RECOMMENDED

DATE

DRAWING NO.

I301

SHEET

42 of 58



DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE		ORIGINAL		DESIGN		DRAWN		CHECKED		MPJ	
NO.	DATE	DESIGN	DRAWN	CHECKED	MPJ	DCL	MPJ	MPJ	MPJ	MPJ	MPJ
B	06/01/2021										

COUNTY OF SAN BERNARDINO
DEPT OF PUBLIC WORKS - SPECIAL DISTRICTS
CALICO GHOST TOWN PH 2 AWWT
INSTRUMENTATION - PLC DRAWINGS
PANEL LEGEND

skm 533 W 2600 S, Suite 275
Bountiful, Utah 84010
Phone: (801) 677-0011
www.skmeng.com

ALBERT A. WEBB CIVIL ENGINEERS
3788 McCRAY STREET
RIVERSIDE CA 92506
PH. (951) 588-1070 FAX (951) 788-1266
ENGINEERING CONSULTANTS

AQUA ENGINEERING
533 W 2600 S, SUITE 275, BOUNTIFUL, UT 84010
PHONE (801) 298-1327 FAX (801) 298-0153

6/16/21 DATE
PROJECT ENGINEER DATE
RECOMMENDED DATE

DRAWING NO.
I301
SHEET 42 of 58