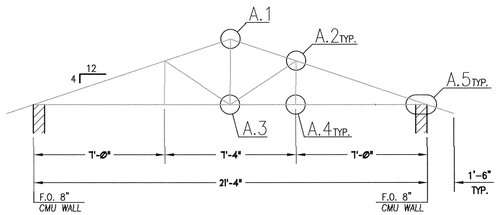
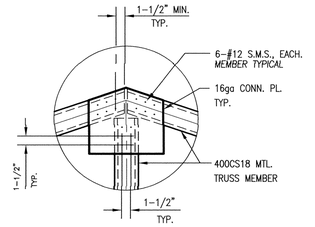
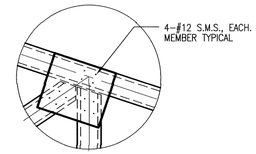


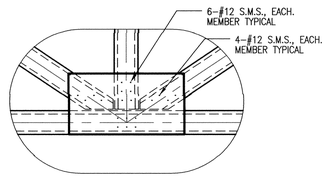
A METAL TRUSS PROFILE
1/4"=1'-0"



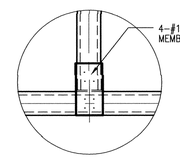
A.1
1"=1'-0"



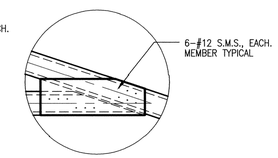
A.2
1"=1'-0"



A.3
1"=1'-0"



A.4
1"=1'-0"



A.5
1"=1'-0"

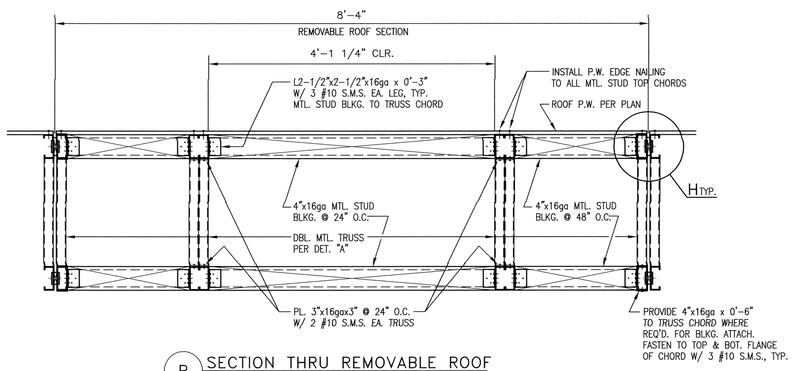
TRUSS MEMBER REQUIREMENTS	
TOP CHORD:	CONT. 400CS18 NON-PUNCHED MTL. STUD (TYP. OF 2)
BOT. CHORD:	CONT. 400CS18 NON-PUNCHED MTL. STUD
WEB:	400CS18 NON-PUNCHED MTL. STUD (TYP. OF 5)
CONN. PL.:	16ga SHEET MTL.
FASTENERS:	#12 SHEET METAL SCREWS (S.M.S.)

MTL. STUD MANUFACTURER: CEMCO, CITY OF INDUSTRY, CA (818) 369-3564

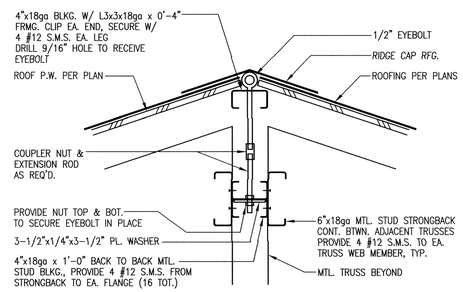
OTHER MANUF. OF EQ. STRENGTH & SECTION PROPERTIES MAY BE SUBSTITUTED W/ WRITTEN APPROVAL OF ENGINEER OF RECORD: THICKNESS = 0.0451 in. MIN., AREA = 0.363 in.^2, Ix = 0.907 in.^4

FABRICATION GENERAL NOTES

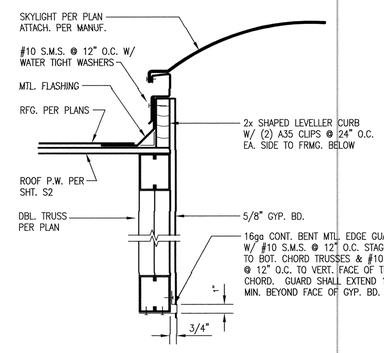
1) POSITION TRUSS MEMBERS SUCH THAT PROJECTED MEMBER CENTERLINES INTERSECT AT COMMON POINT AS SHOWN IN DETAILS A1 THRU A5
2) SCREW PATTERNS SHALL BE CENTERED ON MEMBER CENTERLINES.
3) SCREW SPACINGS SHALL BE 3/4" EACH SIDE OF MEMBER CENTERLINE & 1-1/2" O.C. IN DIRECTION OF MEMBER LENGTH.
4) SCREW PATTERNS SHALL START 1-1/2" FROM END OF TRUSS MEMBER WHERE OCCURS & SHALL BE NO CLOSER THAN 1-1/2" TO EDGE OF CONNECTOR PLATE.
5) IF TRUSSES ARE FABRICATED BY TRUSS MANUF., CONTRACTOR SHALL FURNISH SHOP DRAWINGS TO ENGINEER OF RECORD FOR REVIEW & APPROVAL PRIOR TO FABRICATION.
   IF TRUSSES ARE TO BE FABRICATED ON SITE, CONTRACTOR SHALL LAYOUT FIRST TRUSS FOR FABRICATION & MARK SCREW HOLE LOCATIONS AT ALL CONNECTION POINTS PRIOR TO FABRICATION. STRUCTURAL ENGINEER OR APPOINTED REPRESENTATIVE SHALL INSPECT FOR COMPLIANCE WITH PLANS AND ISSUE WRITTEN APPROVAL TO PROCEED PRIOR TO FABRICATION.



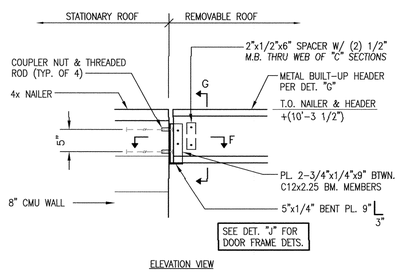
B SECTION THRU REMOVABLE ROOF
1-1/2"=1'-0"



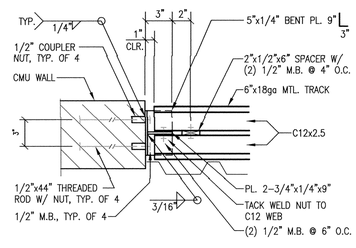
C REMOVABLE ROOF LIFT POINT
1-1/2"=1'-0"



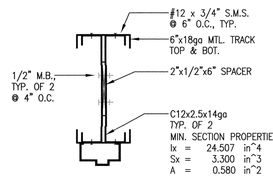
D TYP. CURB @ REMOVABLE ROOF HATCH
1-1/2"=1'-0"

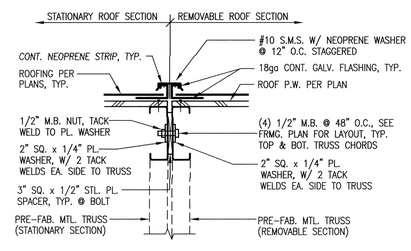


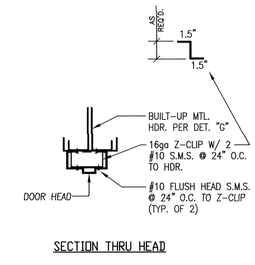
ELEVATION VIEW



PLAN VIEW SECTION

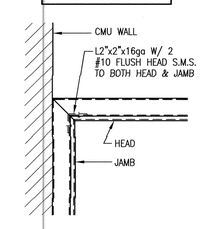






SECTION THRU HEAD

INSTALL HEAD & JAMB AS SEPERATE ELEMENTS FOR FUTURE HEAD REMOVAL



HEAD/JAMB CONNECTION

E MTL. HDR. ATTACHMENT
3/4"=1'-0"

F MTL. HDR. ATTACHMENT
1-1/2"=1'-0"

G MTL. HDR. SECTION
1-1/2"=1'-0"

H SECT. @ REMOVABLE ROOF
1-1/2"=1'-0"

J SECT. @ REMOVABLE DOOR FRAME
1-1/2"=1'-0"

REGISTERED PROFESSIONAL ENGINEER
WILLIAM H MERGLER
NO. 1993
STRUCTURAL
STATE OF CALIFORNIA
LICENSE FEE DUE 9-30-17

REMOVABLE ROOF DETAILING
Construction of Pump Station
East Main Ave. Well No. 1
City of Morgan Hill
Morgan Hill, California

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

REVISIONS		
NO.	DATE	REVISION

DATE: DECEMBER 2016
JOB NO.: 15-5-068
DESIGN BY: WHM
DRAWN BY: WHM
CHECKED BY: WHM
FILE: S-5.dwg

S-5

CAD FILE: G:/Projects/City of Morgan Hill/15-5-068/Structural 121416/16030-S5.dwg CFG FILE: LSCE2500.PCP_MRG DATE: 05-24-17 10:14am

MAWA EPPT and ETWU Calculations

Project Name:	Main Avenue Pump Station
Project Location:	East Main Ave., Well #1, Morgan Hill
Total Landscape Area:	3,121.0 sq. ft.
Date:	11/30/16

MAWA CALCULATION

MAWA = (Eto)(.62)[(0.55xLA) + (1-ETAF x SLA)]

MAWA = Maximum Applied Water Allowance (gallons per year)
Eto = Reference Evapotranspiration (inches per year)
.62 = Conversion Factor (to gallons)
0.55 = Et Adjustment Factor (ETAF)
LA = Landscape Area including SLA (square feet)
0.45 = Additional Water Allowance for SLA
SLA = Special Landscape Area (square feet)

Eto =	43.6
Conversion	0.62
ETAF	0.55
LA =	3,121
SLA =	0
MAWA =	46,401.8 gallons per year
	6,203.4 cubic feet per year

MAWA with EPPT

MAWA = (Eto-Eppt)(.62)[(0.55xLA) + (1-ETAF x SLA)]
Eppt= 25% of Annual precipitation

Eto =	43.6
Eppt=	7.7
ETAF=	0.55
LA =	3,121
SLA =	0
MAWA w/ EPPT =	38,229.2 gallons per year
	5,110.9 cubic feet

ETWU CALCULATION

ETWU = (Eto)(.62)((PF/IE)(LA)

ETWU = Estimated Total Water Use Per Year (gallons)
ETo = Reference Evapotranspiration
PF = Plant Factor from WUCOLS (Region 2, Water Use: H 0.7 - 0.9, M 0.4 - 0.6, L 0.1 - 0.3, VL < 0.1, All Turf 0.8)
LA = Landscape Area (High, Medium, and low water use areas)(square feet)
SLA = Special Landscape Area
.62 = Conversion Factor
IE = Irrigation Efficiency (drip spray and bubblers .81, sub surface .81, spray sprinklers .75
ET Adjustment Factor (ETAF) .55 for Residential and .45 for Non Residential

Reference Evapotranspiration (Eto)	43.6	Gilroy, Ca

REGULAR LANDSCAPE AREAS

Hydrozone #/ Plant Description	Irrigation Method	Plant Factor (PF)	Irrigation Efficiency (IE)	ETAF (PF/IE)	Landscape Area (sq. ft)	ETAF x Area	ETWU
1.) Low Water Use Shrubs	Drip	0.2	0.81	0.246913580246914	798.0	197.0	5,326.3
2.) Low water use planting	Drip	0.2	0.81	0.246913580246914	940.0	232.1	6,274.1
3.) Low water use planting	Drip	0.2	0.81	0.246913580246914	112.0	27.7	747.6
4.) Low Water Use Shrubs	Drip	0.3	0.81	0.370370370370370	78.0	28.9	780.9
5.) Low Water Use Shrubs	Drip	0.2	0.81	0.246913580246914	106.0	26.2	707.5
6.) Low Water Use Shrubs	Drip	0.2	0.81	0.246913580246914	1,087.0	268.4	7,255.3
					Total sf ft.	Totals	Totals
					3,121.0	780.2	21,091.6

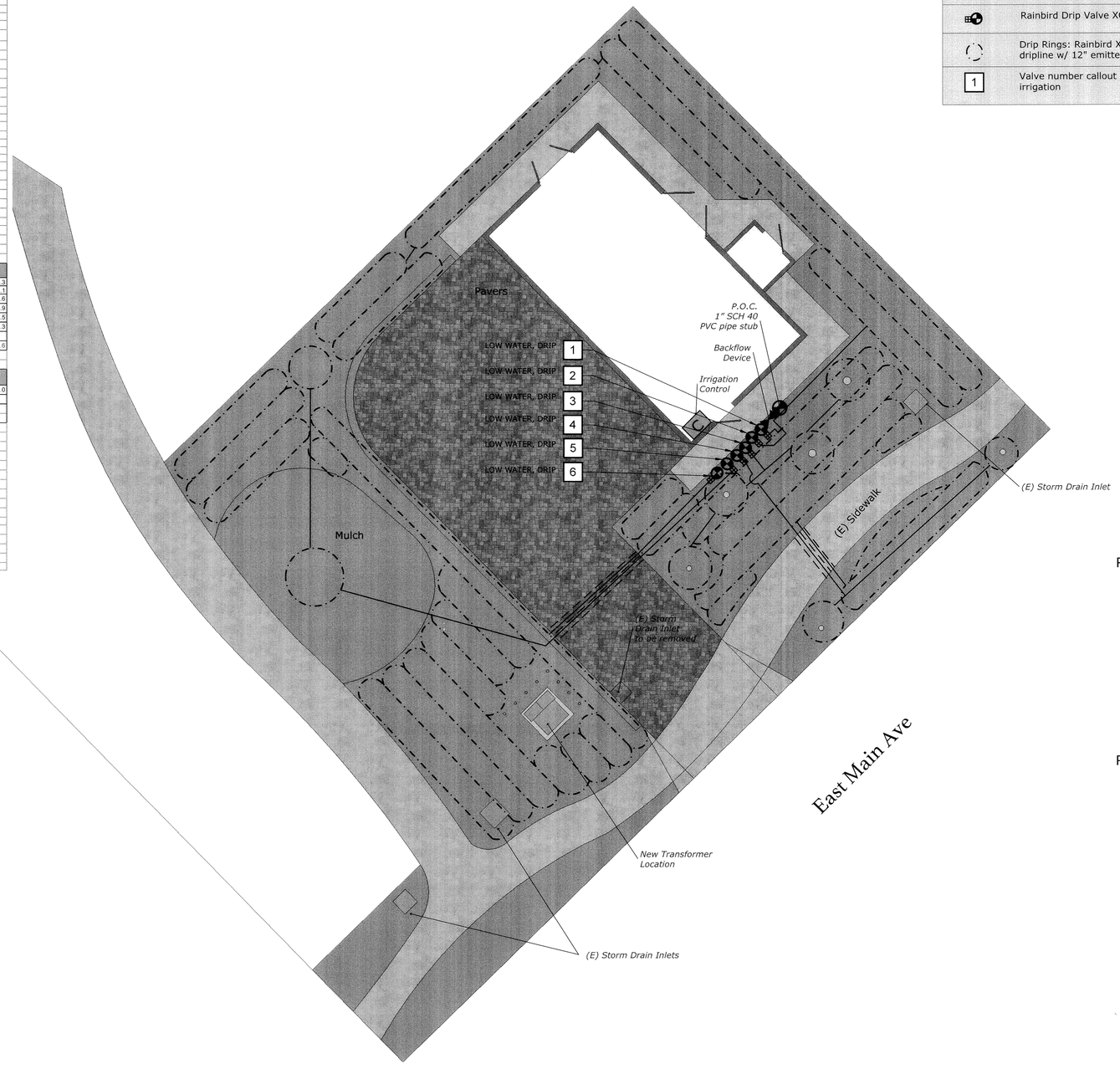
SPECIAL LANDSCAPE AREAS

Hydrozone #/ Plant Description	Irrigation Method	Plant Factor (PF)	Irrigation Efficiency (IE)	ETAF (PF/IE)	Landscape Area (sq. ft)	ETAF x Area	ETWU
				1	0	0	0.0
					Totals	Totals	Totals
					0	0	0.0
						ETWU TOTAL	21,091.6
						MAWA	46,401.8

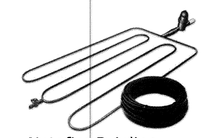
ETAF CALCULATIONS

Regular Landscape Areas	
Total ETAF x Area	780.2
Total Area	3,121.0
Average ETAF	0.2
Special Landscape Areas	
Total ETAF x Area	780.2
Total Area	3,121.0
Sitewide ETAF	0.2

Average ETAF for Regular Landscape Areas must be .55 or below for residential areas, and .45 or below for non residential areas.

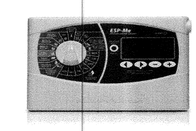


IRRIGATION KEY	
	Main Line:SCH 40 1" Use existing when possible
C	Controller: Rainbird ESP-Me series Smart modular 4-22 Stations with Water Sense Meter
	Point of Connection
	Backflow Device
	Sleeves: SCH 40 4"
	Lateral Line SCh 40 1"
	Dripline: Rainbird XFD on surface dripline w/ 24" emitter spacing.
	Rainbird Drip Valve XCS-100-PRF
	Drip Rings: Rainbird XFD on surface dripline w/ 12" emitter spacing.
1	Valve number callout and type of irrigation


Netafim Dripline

Rainbird PEB VALVE

Rainbird Drip Valve XCS-100-PRF


Rainbird Controller 22 station ESP-Me

Netafim Flush Valve

N

SCALE 1/8" = 1'-0"
0 8 16

*** NOTES (E) = Existing Landsacpe Element**

LICENSED LANDSCAPE ARCHITECT
KAREN JONES AITKEN
No. 2239
Exp. 6-31-17
STATE OF CALIFORNIA

Karen Aitken & ASSOCIATES
LANDSCAPE ARCHITECTURE & DESIGN

IRRIGATION PLAN
Construction of Pump Station East
Main Ave. Well No.1

AITKEN ASSOCIATES
LANDSCAPE ARCHITECTS
8262 Rancho Real Gilroy Ca. 95020
Calif. Reg.#2239 (408) 842-0245
aitkenassociates@gmail.com

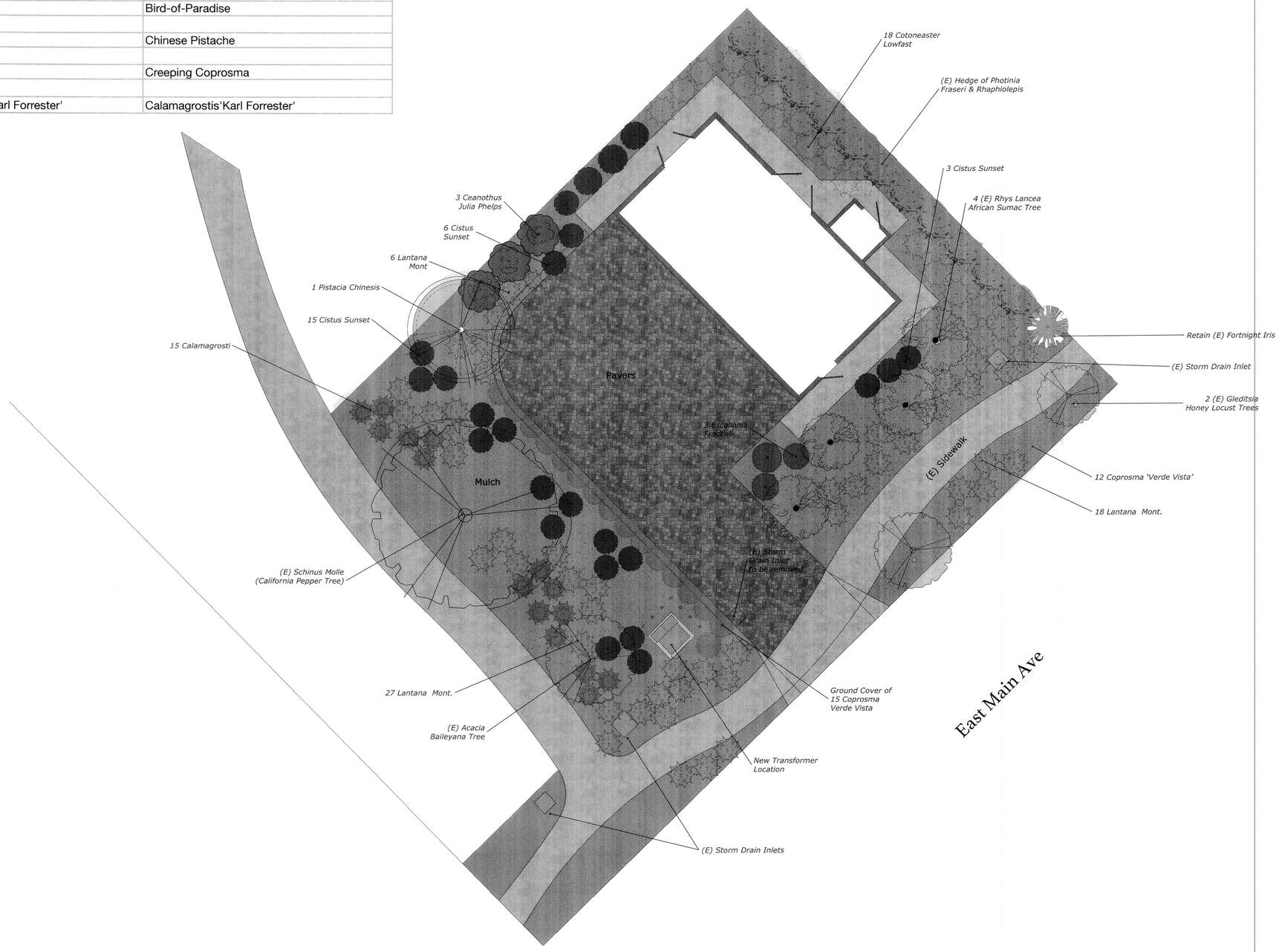
REVISIONS		
NO.	DATE	REVISION

DATE: MARCH 2017
JOB NO. : 15-3-053
DESIGN BY:
DRAWN BY:
CHECKED BY:
FILE: L-1.DWG

SHEET: L-1

PLANT LEGEND

Qty	Size	Botanical Name	Common Name
		SHRUBS, VINES & HERBACEOUS	
3	5 gal.	Ceanothus 'Julia Phelps'	California Lilac
24	1 gal.	Cistus 'Sunset'	Magenta Rockrose
18	1 gal.	Cotoneaster 'Lowfast'	
3	5 gal.	Escallonia Fradesii	Escallonia Fradesii
50	5 gal.	Lantana montevidensis	Lavender Lantana
3	5 gal.	Strelitzia reginae	Bird-of-Paradise
		TREES	
1	15 gal.	Pistacia chinensis	Chinese Pistache
		GROUNDCOVERS	
27	1 gal.	Coprosma 'Verde Vista'	Creeping Coprosma
		GRASSES	
15	1 gal	Calamagrostis arundinacer 'Karl Forrester'	Calamagrostis'Karl Forrester'



LICENSED LANDSCAPE ARCHITECT
KAREN JONES AITKEN
No. 2239
Exp. 8-31-17
STATE OF CALIFORNIA

N

SCALE 1/8" = 1'-0"

0 8 16

*** NOTES (E) = Existing Landsacpe Element**

Karen Aitken & ASSOCIATES
LANDSCAPE ARCHITECTURE & DESIGN

LANDSCAPE PLAN

Construction of Pump Station East
Main Ave. Well No.1

AITKEN ASSOCIATES
LANDSCAPE ARCHITECTS
8262 Rancho Real Gilroy Ca. 95020
Calif. Reg.#2239 (408) 842-0245
aitkenassociates@gmail.com

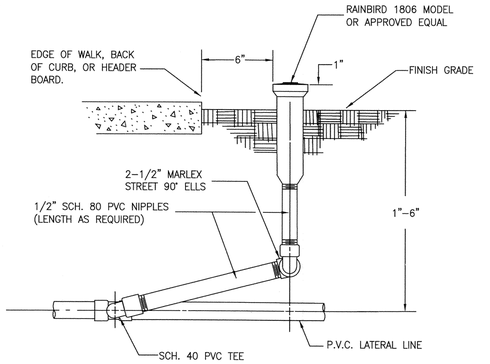
REVISIONS

NO.	DATE	REVISION

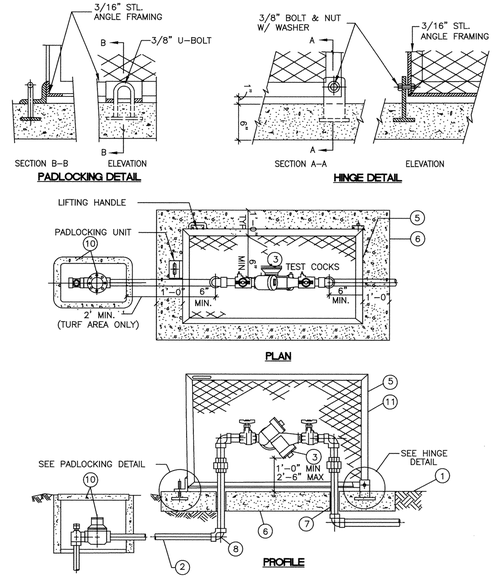
DATE: MARCH 2017
JOB NO. : 15-3-053
DESIGN BY:
DRAWN BY:
CHECKED BY:
FILE: L-1.DWG

SHEET:

L-2

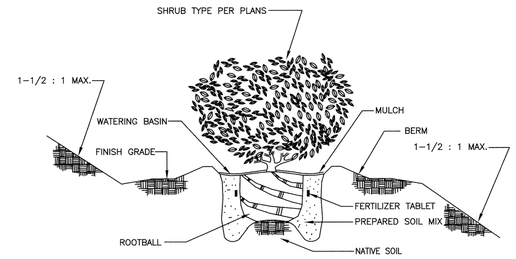


City of Morgan Hill Public Works Department CITY ENGINEER	8/6/98 DATE	REVISED	6" POP-UP SPRAY HEAD	DRAWING NO. L-4



FOR MEDIAN ISLANDS AND PUBLIC PARKS/FACILITIES
(SIZES 1" TO 2")

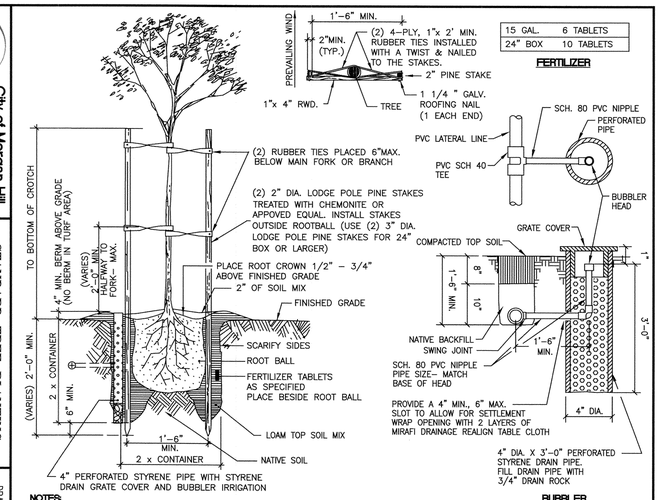
City of Morgan Hill Public Works Department CITY ENGINEER	8/1/97 DATE	3/15/07 REVISED	R.P. BACKFLOW PREVENTER WITH SINGLE-SWING HINGED ENCLOSURE	DRAWING NO. L-10



NOTES:

1. SET CROWN 1-1/2" ABOVE FINISH GRADE TO ALLOW FOR SETTLEMENT.
2. WELL DEVELOPED SHRUB ROOTBALL; LIGHTLY SCARIFY PERIMETER.
3. SLOW RELEASE FERTIZER TABLET AS PERSPECIFICATIONS.
4. 4" HIGH BERM TEMPORARY WATER BASIN. INSIDE DIAMETER TO EQUAL ROOTBALL DIAMETER.
5. PLANTING HOLE; TWO TIMES DIAMETER AND DEPTH OF SHRUB ROOTBALL. SCARIFY SIDES AND BOTTOM.
6. MULCH AS PER SPECIFICATIONS.
7. BACKFILL MIXTURE AS PER SPECIFICATIONS.

City of Morgan Hill Public Works Department CITY ENGINEER	8/6/98 DATE	3/15/07 REVISED	SHRUB PLANTING	DRAWING NO. L-17



15 GAL.	6 TABLETS
24" BOX	10 TABLETS

NOTES:

1. USE 2 PIPES IN CONCRETE CUT-OUT AREAS. PUT PIPE ON UPHILL SIDE OF TREE, LEVEL SITE NORTH OF TREE
2. INSTALL LINEAR ROOT BARRIER ADJACENT TO PAVEMENT, CURB, OR SIDEWALK, WHERE PAVEMENT EDGE IS WITHIN 3' OF TREE TRUNK (6' LENGTH ON CENTER 3' EACH SIDE OF TREE).

City of Morgan Hill Public Works Department CITY ENGINEER	8/1/97 DATE	3/15/07 REVISED	STANDARD TREE PLANTING & STAKING WITH WITH BUBBLER IRRIGATION	DRAWING NO. L-15

LICENSED LANDSCAPE ARCHITECT
KAREN JONES AITKEN
No. 2239
Exp. 8-31-17
STATE OF CALIFORNIA

Karen Aitken
& ASSOCIATES
LANDSCAPE ARCHITECTURE & DESIGN

DETAIL SHEET

Construction of Pump Station East
Main Ave. Well No.1

AITKEN ASSOCIATES
LANDSCAPE ARCHITECTS
8262 Rancho Real Gilroy Ca. 95020
Calif. Reg.#2239 (408) 842-0245
aitkenassociates@gmail.com

REVISIONS

NO.	DATE	REVISION

DATE: MARCH 2017
JOB NO. : 15-3-053
DESIGN BY:
DRAWN BY:
CHECKED BY:
FILE: L-1.DWG

SHEET:
L-3

ELECTRICAL CONSTRUCTION MATERIAL NOTES

ABOVE GRADE – HOT DIPPED GALVANIZED RIGID STEEL CONDUIT TO BE USED FOR ALL EXTERIOR AND INTERIOR LOCATIONS ABOVE GRADE OR ELSEWHERE SHOWN ON PLANS. ALL RIGID CONDUIT AND FITTINGS TO BE THREADED. USE OF SET SCREW OR COMPRESSION TYPE CONNECTOR IS PROHIBITED. MEYERS HUBS TO BE USED ON ALL EXTERIOR PANEL CONNECTIONS.

BELOW GRADE – RIGID PVC NONMETALLIC CONDUIT SCHEDULE 40 TO BE USED FOR ALL UNDERGROUND LOCATIONS AND BELOW VAPOR BARRIER OF SLAB. NO CONDUITS SHALL BE INSTALLED TO REDUCE THE STRUCTURAL INTEGRITY OF FOOTINGS.

CHEMICAL BUILDINGS AND CORROSIVE ATMOSPHERES – RIGID PVC NONMETALLIC CONDUIT SCHEDULE 80 TO BE USED FOR ALL INTERIOR LOCATIONS ABOVE GRADE IN CHEMICAL BUILDINGS AND CORROSIVE ENVIRONMENTS.

THROUGH CONCRETE SLABS AND EXTERIOR CORROSIVE ATMOSPHERES – PVC COATED GALVANIZED RIGID STEEL CONDUIT MINIMUM 40 MIL FACTORY COATING TO BE USED FOR ALL EXPOSED CONDUITS THROUGH CONCRETE SLABS (MINIMUM 12" ABOVE AND BELOW SLAB) AND ALL EXTERIOR LOCATION CORROSIVE ATMOSPHERES. USE MANUFACTURERS' SPECIFIED TOOLS AND PROCEDURES FOR INSTALLATION.

MOTORS AND SENSOR CONNECTIONS – LIQUID TIGHT FLEXIBLE METAL CONDUIT (UV RESISTANT) TO ONLY BE USED ON CONNECTIONS TO MOTORS AND SENSORS OR TO ISOLATE VIBRATION. MAXIMUM LENGTH TO BE 30".

JUNCTION BOXES – MINIMUM SIZE PER NEC. EXPOSED LOCATION, 1 AND 2 GANG TO BE CAST IRON DEVICE BOXES TYPE FS/FD SUITABLE FOR WET LOCATIONS. EXPOSED LOCATION EXTERIOR LARGER SIZES CONTINUOUS HINGE TYPE 4, CORROSIVE LOCATIONS CONTINUOUS HINGE TYPE 4X STAINLESS STEEL.

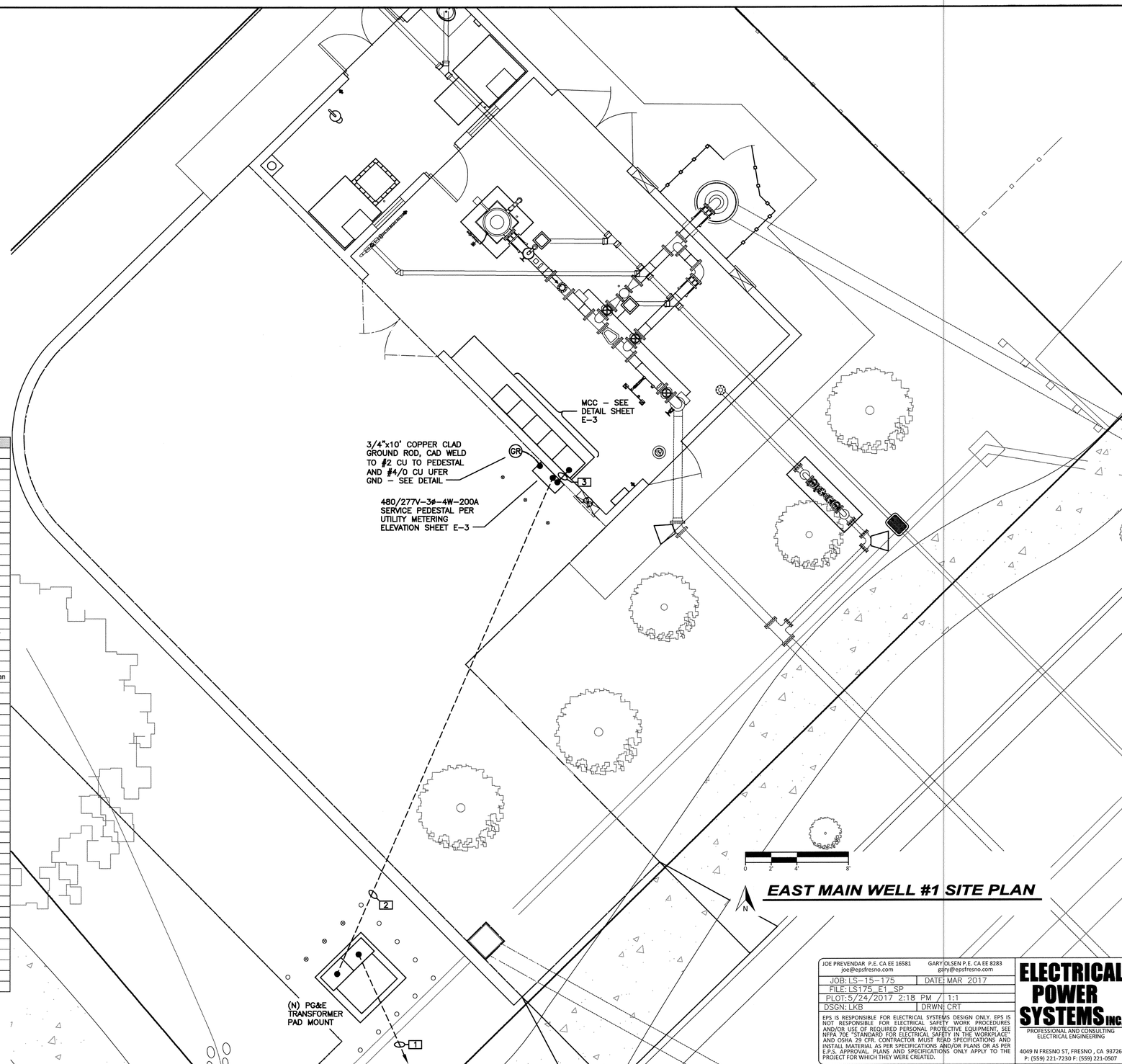
GROUND CONNECTIONS – GROUND CONNECTIONS TO BE EXOTHERMIC CADWELD (ALL 600 AMP OR LARGER SERVICE) OR BURNDY HYDRAULIC COMPRESSION CONNECTORS. GROUND BUS CONNECTIONS TO BE CRIMP LUG TYPE WITH BOLTED CONNECTION TO GROUND BUS.

480 VOLT AND BELOW POWER WIRING TO BE THWN–2 600 VOLT, ALL POWER CONNECTIONS TO BE TREATED WITH ANTIOXIDANT COMPOUND.

CONTACT EPS TO SCHEDULE AN ELECTRICAL PRECONSTRUCTION MEETING PRIOR TO COMMENCING CONSTRUCTION

WELL SITE CABLE AND CONDUIT SCHEDULE:

NO.	QTY	SIZE	NO. WIRES	WIRE SIZE	GND	FUNCTION	FROM	TO
1						**PGE Pri**		
2	Per	PGE	Per PGE	Per PGE		PGE Sec	Pad mount Tfr	Meter Main
3	1	4"	3	#4/0	#1	**MCC Main Feed**	Meter Main	MCC Main
4	1	2"	Per Telco	Per Telco		Telco	Telco	MCC Meter Main
5								
6	1	2"	3	#2	#6	**Pump Motor**	VFD	Pump Motor
7	1	3/4"	4	#12		Motor Thermoswitch/Winding HTR	Pump Motor	MCC
8	1	3/4"	2	#12	#12	Pump Lube Solenoid	VFD	Pump Motor
9								
10	1	3/4"	1	#18 TSP		Pump Pressure Transmitter	PLC	PIT
11	1	1"	10	#14	#14	Pump to Waste Valve	PLC/VFD/SSRV	PTW Valve
12	1	3/4"	2	#18 TSP		Flow 4-20ma/Totalizer	PLC	Flow Transmitter
13	1	1"	1	1/4" Poly		Reactive Air Level Sensing	PLC	Well Sounding Tube
14	1	1 1/2"	1	Com Cable		Radio antenna	Radio	Antenna
15	1	3/4"	2	#10	#10	Outside Lighting	LP	Outside Lighting
16	1	3/4"	2	#12	#12	GFI Outlets	LP	GFI Outlets
17	1	3/4"	2	#14		Intrusion Alarm Reset	PLC	Reset PB inside door
18	1	3/4"	2	#14		Intrusion Alarm	PLC	Intrusion Switch on door
19								
20	1	3/4"	2	#10	#10	Building Lighting	LP	Building Lighting
21	1	3/4"	2	#10	#10	Emergency Lighting	LP	Emergency Lighting
22	1	3/4"	2	#10	#10	Chem Room Exhaust Fan	LP	Chem Room Exhaust Fan
23	1	3/4"	2	#12	#12	Chlorine Metering Power	LP	CPP
24	1	3/4"	2	#12	#12	Chlorine Metering Pump Enable	PLC-CR	CPP
25	1	3/4"	1	#18 TSP		Chlorine Pump Rate	PLC	CL Pump
26	1	3/4"	2	#10	#10	Vent Fan	LP	Vent Fan
27	1	3/4"	2	#8	#8	Heaters	LP	Heater
28	1	3/4"	2	#12	#12	Irrigation Controller	LP	Irrigation Controller
29	1	2"	1	Pullcord		Irrigation Valves	Irrigation Controller	Stubout 2'
30	1	3/4"	2	#14		Fire Flow Switch	Fire Flow Switch	PLC
31	1	3"	1	Pullcord		Spare	Well Pump Area	MCC
32	1	3/4"	1	Pullcord		Spare	Chemical Room	MCC
33	1	3/4"	1	Pullcord		Spare	Chemical Room	MCC
34	1	3/4"	1	Pullcord		Spare	Chemical Room	MCC
35	1	3/4"	1	Pullcord		Spare	Pump Area	MCC
36	1	3/4"	2	#14		High Pressure Switch	Pump Area HPS	PLC
37	1	3/4"	1	Pullcord		Spare	Pump Area	MCC
38	1	3/4"	2	#14		Fire Flow Beacon	PLC	Fire Flow Beacon
39	1	3/4"	2	#14		Sump Level Switch	CMP Area	PLC
40	1	3/4"	1	Pullcord		Spare	CMP Area	MCC
41	1	3/4"	2	#12	#12	Chlorine Metering Power (Future)	LP	CPP
42	1	3/4"	2	#12	#12	Chlorine Metering Pump Enable(Future)	PLC-CR	CPP
43	1	3/4"	1	#18 TSP		Chlorine Pump Rate (Future)	PLC	CL Pump
44	1	3/4"	1	Pullcord		Spare	Chemical Room	PLC
45	1	3/4"	2	#14		Sump Level Switch	CMP Area	PLC
46	1	3/4"	1	#18 TSP		Drum Scale	Chemical Room	PLC
47	1	3/4"	2	#14		Flow Switch	CMP Area	PLC
48	1	3/4"	1	Pullcord		Spare	Chemical Room	PLC
49								
50								
51								



EAST MAIN WELL #1 SITE PLAN

JOE PREVENDAR P.E. CA EE 16581
joe@epsfresno.com

GARY OLSEN P.E. CA EE 8283
gary@epsfresno.com

JOB: LS–15–175 DATE: MAR 2017
FILE: LS175_E1_SP
PLOT: 5/24/2017 2:18 PM / 1:1
DSGN: LKB DRWN: CRT

EPS IS RESPONSIBLE FOR ELECTRICAL SYSTEMS DESIGN ONLY. EPS IS NOT RESPONSIBLE FOR ELECTRICAL SAFETY WORK PROCEDURES AND/OR USE OF REQUIRED PERSONAL PROTECTIVE EQUIPMENT, SEE NFPA 70E "STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE" AND OSHA 29 CFR. CONTRACTOR MUST READ SPECIFICATIONS AND INSTALL MATERIAL AS PER SPECIFICATIONS AND/OR PLANS OR AS PER E.P.S. APPROVAL. PLANS AND SPECIFICATIONS ONLY APPLY TO THE PROJECT FOR WHICH THEY WERE CREATED.

ELECTRICAL POWER SYSTEMS INC.
PROFESSIONAL AND CONSULTING ELECTRICAL ENGINEERING
4049 N FRESNO ST, FRESNO , CA 93726
P: (559) 221-7230 F: (559) 221-0507

REGISTERED PROFESSIONAL ENGINEER JOSEPH P. PREVENDAR No. 16581 ELECTRICAL
DATE: 5-24-2017

SITE ELECTRICAL PLAN
Construction of Pump Station
East Main Ave. Well #1
City of Morgan Hill
Morgan Hill, California

LUHDORFF & SCALMANINI CONSULTING ENGINEERS
500 FIRST STREET
WOODLAND, CALIFORNIA
PHONE: (530) 661-0109

REVISIONS

NO.	DATE	REVISION

DATE: MARCH 2017
JOB NO.: 15-6-068
DESIGN BY:
DRAWN BY:
CHECKED BY:
FILE:

SHEET:
E-1

CAD FILE: G:/Projects/City of Morgan Hill/15-5-068/Electrical 031517/LS175_E1_SP.dwg CFG FILE: LSCE2500.PCP_MRG DATE: 05-24-17 2:17pm

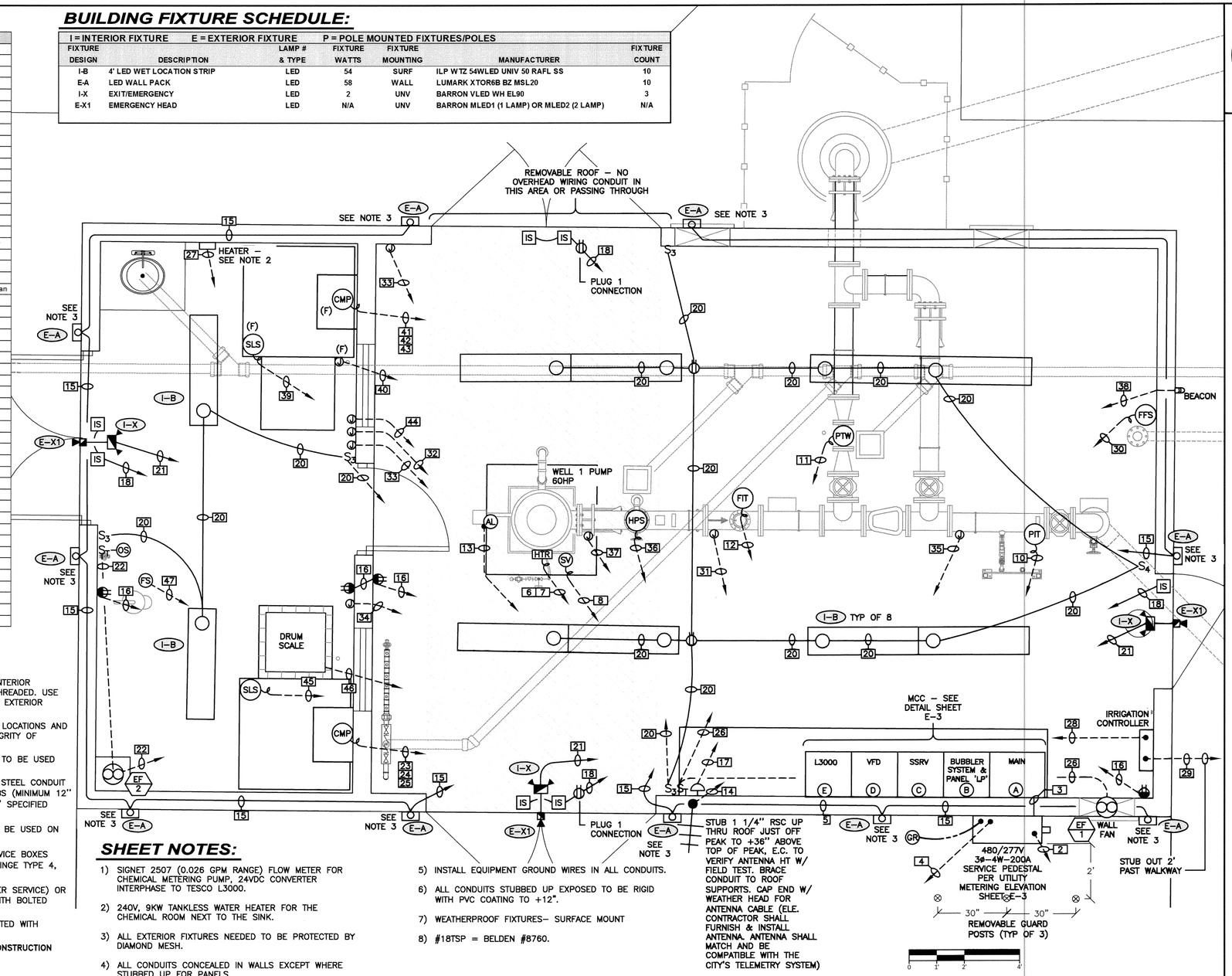
WELL SITE CABLE AND CONDUIT SCHEDULE:

NO.	QTY	SIZE	NO. WIRES	WIRE SIZE	GND	FUNCTION	FROM	TO
1						PGE Pri		
2	Per	PGE	Per PGE	Per PGE		PGE Sec	Pad mount Tfr	Meter Main
3	1	4"	3	#4/0	#1	**MCC Main Feed**	Meter Main	MCC Main
4	1	2"	Per Telco	Per Telco		Telco	Telco	MCC Meter Main
5								
6	1	2"	3	#2	#6	**Pump Motor**	VFD	Pump Motor
7	1	3/4"	4	#12		Motor Thermoswitch/Winding HTR	Pump Motor	MCC
8	1	3/4"	2	#12	#12	Pump Lube Solenoid	VFD	Pump Motor
9								
10	1	3/4"	1	#18 TSP		Pump Pressure Transmitter	PLC	PIT
11	1	1"	10	#14	#14	Pump to Waste Valve	PLC/VFD/SSRV	PTW Valve
12	1	3/4"	2	#18 TSP		Flow 4-20ma/Totalizer	PLC	Flow Transmitter
13	1	1"	1	1/4" Poly		Reactive Air Level Sensing	PLC	Well Sounding Tube
14	1	1 1/2"	1	Com Cable		Radio antenna	Radio	Antenna
15	1	3/4"	2	#10	#10	Outside Lighting	LP	Outside Lighting
16	1	3/4"	2	#12	#12	GFI Outlets	LP	GFI Outlets
17	1	3/4"	2	#14		Intrusion Alarm Reset	PLC	Reset PB inside door
18	1	3/4"	2	#14		Intrusion Alarm	PLC	Intrusion Switch on door
19								
20	1	3/4"	2	#10	#10	Building Lighting	LP	Building Lighting
21	1	3/4"	2	#10	#10	Emergency Lighting	LP	Emergency Lighting
22	1	3/4"	2	#10	#10	Chem Room Exhaust Fan	LP	Chem Room Exhaust Fan
23	1	3/4"	2	#12	#12	Chlorine Metering Power	LP	CPP
24	1	3/4"	2	#12	#12	Chlorine Metering Pump Enable	PLC-CR	CPP
25	1	3/4"	1	#18 TSP		Chlorine Pump Rate	PLC	CL Pump
26	1	3/4"	2	#10	#10	Vent Fan	LP	Vent Fan
27	1	3/4"	2	#8	#8	Heaters	LP	Heater
28	1	3/4"	2	#12	#12	Irrigation Controller	LP	Irrigation Controller
29	1	2"	1	Pullcord		Irrigation Valves	Irrigation Controller	Stubout 2
30	1	3/4"	2	#14		Fire Flow Switch	Fire Flow Switch	PLC
31	1	3"	1	Pullcord		Spare	Well Pump Area	MCC
32	1	3/4"	1	Pullcord		Spare	Chemical Room	MCC
33	1	3/4"	1	Pullcord		Spare	Chemical Room	MCC
34	1	3/4"	1	Pullcord		Spare	Chemical Room	MCC
35	1	3/4"	1	Pullcord		Spare	Pump Area	MCC
36	1	3/4"	2	#14		High Pressure Switch	Pump Area HPS	PLC
37	1	3/4"	1	Pullcord		Spare	Pump Area	MCC
38	1	3/4"	2	#14		Fire Flow Beacon	PLC	Fire Flow Beacon
39	1	3/4"	2	#14		Sump Level Switch	CMP Area	PLC
40	1	3/4"	1	Pullcord		Spare	CMP Area	MCC
41	1	3/4"	2	#12	#12	Chlorine Metering Power (Future)	LP	CPP
42	1	3/4"	2	#12	#12	Chlorine Metering Pump Enable(Future)	PLC-CR	CPP
43	1	3/4"	1	#18 TSP		Chlorine Pump Rate (Future)	PLC	CL Pump
44	1	3/4"	1	Pullcord		Spare	Chemical Room	PLC
45	1	3/4"	2	#14		Sump Level Switch	CMP Area	PLC
46	1	3/4"	1	#18 TSP		Drum Scale	Chemical Room	PLC
47	1	3/4"	2	#14		Flow Switch	CMP Area	PLC
48	1	3/4"	1	Pullcord		Spare	Chemical Room	PLC
49								
50								
51								

BUILDING FIXTURE SCHEDULE:

I = INTERIOR FIXTURE E = EXTERIOR FIXTURE P = POLE MOUNTED FIXTURES/POLES

FIXTURE DESIGN	DESCRIPTION	LAMP # & TYPE	FIXTURE WATTS	FIXTURE MOUNTING	MANUFACTURER	FIXTURE COUNT
I-B	4' LED WET LOCATION STRIP	LED	54	SURF	ILP WTZ 54WLED UNIV 50 RAFL SS	10
E-A	LED WALL PACK	LED	58	WALL	LUMARK XTOR6B BZ MSL20	10
I-X	EXIT/EMERGENCY	LED	2	UNV	BARRON VLED WH EL90	3
E-X1	EMERGENCY HEAD	LED	N/A	UNV	BARRON MLED1 (1 LAMP) OR MLED2 (2 LAMP)	N/A



ELECTRICAL CONSTRUCTION MATERIAL NOTES

ABOVE GRADE – HOT DIPPED GALVANIZED RIGID STEEL CONDUIT TO BE USED FOR ALL EXTERIOR AND INTERIOR LOCATIONS ABOVE GRADE OR ELSEWHERE SHOWN ON PLANS. ALL RIGID CONDUIT AND FITTINGS TO BE THREADED. USE OF SET SCREW OR COMPRESSION TYPE CONNECTOR IS PROHIBITED. MEYERS HUBS TO BE USED ON ALL EXTERIOR PANEL CONNECTIONS.

BELOW GRADE – RIGID PVC NONMETALLIC CONDUIT SCHEDULE 40 TO BE USED FOR ALL UNDERGROUND LOCATIONS AND BELOW VAPOR BARRIER OF SLAB. NO CONDUITS SHALL BE INSTALLED TO REDUCE THE STRUCTURAL INTEGRITY OF FOOTINGS.

CHEMICAL BUILDINGS AND CORROSIVE ATMOSPHERES – RIGID PVC NONMETALLIC CONDUIT SCHEDULE 80 TO BE USED FOR ALL INTERIOR LOCATIONS ABOVE GRADE IN CHEMICAL BUILDINGS AND CORROSIVE ENVIRONMENTS.

THROUGH CONCRETE SLABS AND EXTERIOR CORROSIVE ATMOSPHERES – PVC COATED GALVANIZED RIGID STEEL CONDUIT MINIMUM 40 MIL FACTORY COATING TO BE USED FOR ALL EXPOSED CONDUITS THROUGH CONCRETE SLABS (MINIMUM 12" ABOVE AND BELOW SLAB) AND ALL EXTERIOR LOCATION CORROSIVE ATMOSPHERES. USE MANUFACTURERS' SPECIFIED TOOLS AND PROCEDURES FOR INSTALLATION.

MOTORS AND SENSOR CONNECTIONS – LIQUID TIGHT FLEXIBLE METAL CONDUIT (UV RESISTANT) TO ONLY BE USED ON CONNECTIONS TO MOTORS AND SENSORS OR TO ISOLATE VIBRATION. MAXIMUM LENGTH TO BE 30".

JUNCTION BOXES – MINIMUM SIZE PER NEC. EXPOSED LOCATION, 1 AND 2 GANG TO BE CAST IRON DEVICE BOXES TYPE FS/FD SUITABLE FOR WET LOCATIONS. EXPOSED LOCATION EXTERIOR LARGER SIZES CONTINUOUS HINGE TYPE 4, CORROSIVE LOCATIONS CONTINUOUS HINGE TYPE 4X STAINLESS STEEL.

GROUND CONNECTIONS – GROUND CONNECTIONS TO BE EXOTHERMIC CADWELD (ALL 600 AMP OR LARGER SERVICE) OR BURNDY HYDRAULIC COMPRESSION CONNECTORS. GROUND BUS CONNECTIONS TO BE CRIMP LUG TYPE WITH BOLTED CONNECTION TO GROUND BUS.

480 VOLT AND BELOW POWER WIRING TO BE THWN–2 600 VOLT, ALL POWER CONNECTIONS TO BE TREATED WITH ANTIOXIDANT COMPOUND.

CONTACT EPS TO SCHEDULE AN ELECTRICAL PRECONSTRUCTION MEETING PRIOR TO COMMENCING CONSTRUCTION

SHEET NOTES:

1) SIGNET 2507 (0.026 GPM RANGE) FLOW METER FOR CHEMICAL METERING PUMP, 24VDC CONVERTER INTERPHASE TO TESCO L3000.
2) 240V, 9KW TANKLESS WATER HEATER FOR THE CHEMICAL ROOM NEXT TO THE SINK.
3) ALL EXTERIOR FIXTURES NEEDED TO BE PROTECTED BY DIAMOND MESH.
4) ALL CONDUITS CONCEALED IN WALLS EXCEPT WHERE STUBBED UP FOR PANELS.
5) INSTALL EQUIPMENT GROUND WIRES IN ALL CONDUITS.
6) ALL CONDUITS STUBBED UP EXPOSED TO BE RIGID WITH PVC COATING TO +12".
7) WEATHERPROOF FIXTURES– SURFACE MOUNT
8) #18TSP = BELDEN #8760.

SYMBOL LEGEND:

- = CONDUIT, EXPOSED; OR CONCEALED IN WALL OR CEILING
- = CONDUIT, UNDERGROUND
- = GROUND WIRE
- (AL) = BUBBLER TUBING
- (FS) = FLOW SWITCH
- (SV) = SOLENOID SWITCH
- (CMP) = CHLORINE METERING PUMP
- (FFS) = FIRE FLOW SWITCH
- (FIT) = FLOW INDICATING TRANSMITTER
- (PIT) = PRESSURE INDICATING TRANSMITTER
- (PTW) = PUMP TO WASTE
- (SLS) = SUMP LEVEL SWITCH
- [IS] = INTRUSION SWITCH
- [HTR] = MOTOR HEATER
- = YAGI ANTENNA
- = DUPLEX RECEPTACLE, GFI, 20A, 120V
- = DUPLEX RECEPTACLE, 20A, 120V
- = J–BOX
- = EXHAUST FAN
- (OS) = OCCUPANCY SENSOR
- ⊗ = REMOVABLE GUARD POST
- (GR) = 3/4"x10' COPPER CLAD GROUND ROD, CAD WELD TO #2 CU TO PEDESTAL AND #4/0 CU UFER GND
- = LIGHT FIXTURE – SEE FIXTURE SCHEDULE
- = LIGHT FIXTURE – SEE FIXTURE SCHEDULE
- = EXIT LIGHT FIXTURE – SEE FIXTURE SCHEDULE
- = EXIT LIGHT FIXTURE – SEE FIXTURE SCHEDULE
- (I–X) = FIXTURE DESIGNATION WHEN NEXT TO OR ON LIGHT FIXTURE
- S = SWITCH, SINGLE POLE
- S_3 = SWITCH, 3–WAY
- S_4 = SWITCH, 4–WAY
- S_T = SWITCH, THERMAL
- = PUSH BUTTON SWITCH
- [7] = INDICATES CABLE & CONDUCTOR SCHEDULE NUMBER
- GFI = GROUND FAULT INTERRUPTER ON OUTLET OF CIRCUIT
- (F) = FUTURE

BUILDING ELECTRICAL PLAN

JOE PREVENDAR P.E. CA EE 16581 joe@epsfresno.com
GARY OLSEN P.E. CA EE 8283 gary@epsfresno.com

JOB: LS–15–175 DATE: MAR 2017
FILE: LS175_E2_BP
PLOT: 5/24/2017 2:15 PM / 1:1
DSGN: LKB DRWN: CRT

EPS IS RESPONSIBLE FOR ELECTRICAL SYSTEMS DESIGN ONLY. EPS IS NOT RESPONSIBLE FOR ELECTRICAL SAFETY WORK PROCEDURES AND/OR USE OF REQUIRED PERSONAL PROTECTIVE EQUIPMENT. SEE NFPA 70E "STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE" AND OSHA 29 CFR. CONTRACTOR MUST READ SPECIFICATIONS AND INSTALL MATERIAL AS PER SPECIFICATIONS AND/OR PLANS OR AS PER E.P.S. APPROVAL. PLANS AND SPECIFICATIONS ONLY APPLY TO THE PROJECT FOR WHICH THEY WERE CREATED.

ELECTRICAL POWER SYSTEMS INC.
PROFESSIONAL AND CONSULTING ELECTRICAL ENGINEERING
4049 N FRESNO ST, FRESNO , CA 93726
P: (559) 221-7230 F: (559) 221-0507

REGISTERED PROFESSIONAL ENGINEER JOSEPH P. PREVENDAR No. 16581 ELECTRICAL STATE OF CALIFORNIA
DATE: 5-30-2017

BUILDING ELECTRICAL PLAN
Construction of Pump Station
East Main Ave. Well #1
City of Morgan Hill
Morgan Hill, California

LUHDORFF & SCALMANINI CONSULTING ENGINEERS
500 FIRST STREET
WOODLAND, CALIFORNIA
PHONE: (530) 661-0109

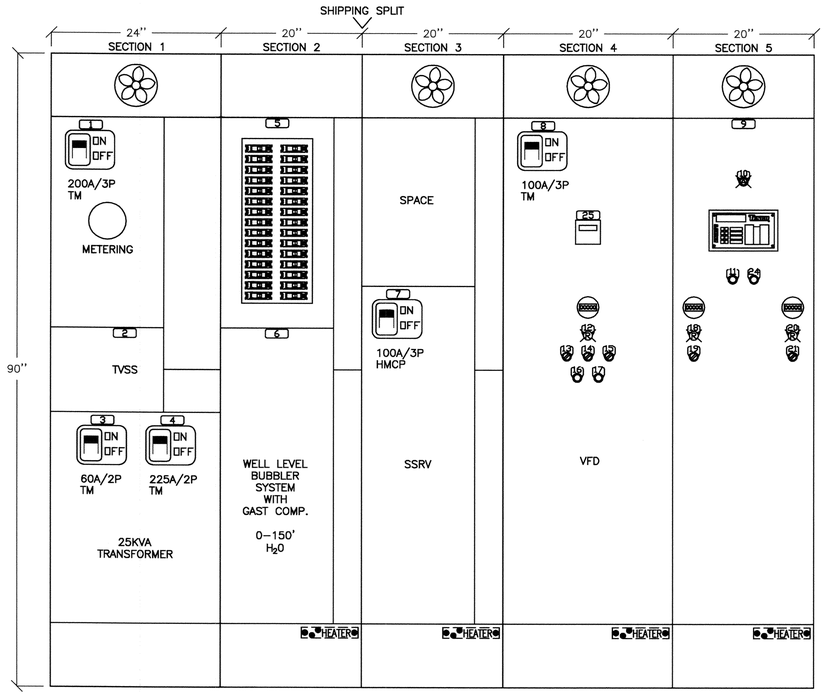
NO.	DATE	REVISION

REVISIONS

DATE: MARCH 2017
JOB NO.: 15-6-068
DESIGN BY:
DRAWN BY:
CHECKED BY:
FILE:

SHEET:
E-2

CAD FILE: G:/Projects/City of Morgan Hill/15-5-068/Electrical 031517/LS175_E2_BP.dwg CFG FILE: LSCE2500.PCP_MRG DATE: 05-24-17 2:13pm



MOTOR CONTROL CENTER (MCC) ELEVATION

NOT TO SCALE

NOTE:

1) NEMA 1G ENCLOSURE.

WELL CONTROLS

A. GENERAL

THE WELL PUMP HAS 2 MODES OF OPERATION: AUTO AND HAND FOR THE VFD AND ALSO THE SSRV. THESE MODES ARE SELECTED BY A SELECTOR SWITCH ON THE PUMP STARTER. THE PUMP STARTER IS A VARIABLE FREQUENCY DRIVE WHICH VARIES PUMP SPEED TO MAINTAIN A PRESSURE SET POINT. AN EMERGENCY BACKUP SOLID STATE REDUCED VOLTAGE STARTER IS AVAILABLE.

THE STARTUP SEQUENCE IS AS FOLLOWS:

1. A USER ADJUSTABLE LOW PRESSURE SET POINT IS REACHED AND WELL LEVEL IS HIGH ENOUGH TO PUMP. AN ANALOG PRESSURE TRANSMITTER INDICATES THE WELL DISCHARGE PRESSURE.
2. PRE LUBE SOLENOID ENERGIZES
3. WELL PUMP VFD STARTS AFTER A USER ADJUSTABLE TIME DELAY
4. THE PUMP RAMPS UP TO THE PRESSURE SET POINT. PUMP SPEED IS MODULATED THROUGH A PI CONTROLLER TO MAINTAIN PRESSURE. A MINIMUM SPEED PARAMETER IS PROGRAMMED. THE WELL LEVEL IS MONITORED. PUMP SPEED IS MODULATED THROUGH A PI CPNTROLLER TO SLOW DOWN AS THE WELL LEVEL DROPS TO ENSURE THE WELL DOES NOT BREAK SUCTION. ALL PRESSURE AND LEVEL SET POINTS ARE USER ADJUSTABLE.

THE SHUTDOWN SEQUENCE IS AS FOLLOWS:

5. PUMP WILL RUN UNTIL AN ADJUSTABLE LOW FLOW RATE IS RUN AT FOR AN ADJUSTABLE TIME PERIOD OR IF THE PRESSURE SWITCH SEES HIGH HIGH PRESSURE OR IF LOW WELL LEVEL CUTOFF IS REACHED.
6. AN ADJUSTABLE BACKSPIN TIMER STARTS TIMING ON PUMP SHUTDOWN PREVENTING PUMP RESTART UNTIL THE WATER COLUMN HAS SETTLED.

B. MODES OF OPERATION

1. AUTO MODE: THE AUTO MODE IS CONTROL USING THE PRESSURE SETPOINT TO START THE PUMP AND MODULATE SPEED TO CONTROL PRESSURE.
2. HAND MODE: THE HAND MODE IS A MAINTENANCE TEST MODE TO RUN THE PUMP LOCALLY WITH A MANUAL POTENTIOMETER. NO PLC CONTROL.
3. A REDUCED VOLTAGE STARTER BACKUP CAN BE SWITCHED TO WITH THE SELECTOR SWITCH. THE WELL WILL START ON A USER ADJUSTABLE TANK LEVEL AND STOP ON USER ADJUSTABLE OR LOW WELL LEVEL.

C. CHLORINATION INJECTION

1. AUTO FLOW MODE: AUTO INJECTS CHEMICAL WHENEVER THE WELL PUMP MOTOR IS RUNNING. THE RATE IS RATIOED TO MEASURED WELL FLOW.
2. AUTO FIXED MODE: AUTO INJECTS CHEMICAL WHENEVER THE WELL PUMP MOTOR IS RUNNING. THE RATE IS MANUALLY SET.
3. JOG MODE: JOG OPERATION IS A MAINTENANCE TEST MODE THAT RUNS THE CHEMICAL PUMP WHEN THE BUTTON IS PRESSED.

NAMEPLATE SCHEDULE

Tag	QTY	TYPE	Inscription
1	1	Plate	Main Disconnect
2	1	Plate	TVSS
3	1	Plate	Transformer Primary Disconnect
4	1	Plate	Transformer Secondary Disconnect
5	1	Plate	Panelboard "LP"
6	1	Plate	Well Bubbler Air System
7	1	Plate	Pump Disconnect (RVAT)
8	1	Plate	Pump Disconnect (VFD)
9	1	Ring	Pump Controls
10	1	Ring	Common Alarm
11	1	Ring	Alarm Acknowledge/Reset
12	1	Ring	Pump Running
13	1	Ring	SSRV VFD
14	1	Ring	Pump Hand Off Auto
15	1	Ring	Valve Auto Open
16	1	Ring	Pump Manual Start
17	1	Ring	Pump Reset
18	1	Ring	Chlorine Pump Hand Off Auto
19	1	Ring	Chlorine Pump Reset (Future)
20	1	Ring	Chlorine Pump (Future) Hand Off Auto
21	1	Ring	Chlorine Pump Reset
22	1	Plate	Service Pedestal
23	1	Plate	CT Pedestal
24	1	Ring	Constant Bubbler
25	1	Plate	Power Monitor

PANEL SCHEDULE

PANEL LP
225 AMP,240/120V,1PH

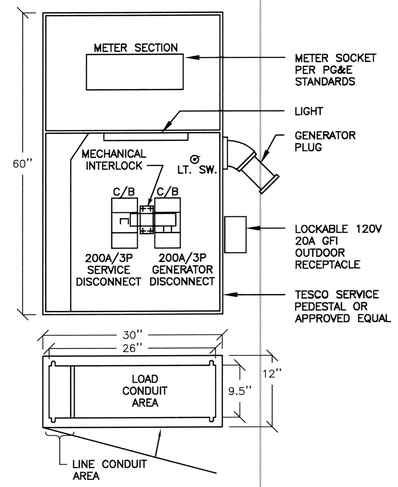
CKT	DESCRIPTION / LOCATION	BRKR	PLS	Aph	Bph
1	Pump Motor Heater	20	1	2.00	
3	Radio	20	1		4.00
5	Building Receptacles	20	1	5.00	
7	Building Inside Lights	20	1		5.00
9	Tankless Heater	50	2	20.00	
11	"	"	"		20.00
13	Spare	20	1		
15	Spare	20	1		
17	Spare	20	1		
19	Spare	20	1		
21	Spare	20	1		
23	Spare	20	1		
2	Outside lighting	20	1	5.00	
4	CCP at Chem Room # 1	20	1		10.00
6	Emergency Lights	20	1	5.00	
8	Irrigation Control	20	1		5.00
10	CCP at Chem Room # 1	20	1	10.00	
12	Exhaust Fan	20	1		5.00
14	Vent Fan	20	1	3.00	
16	Spare	20	1		
18	Spare	20	1		
20	Spare	20	1		
22	Spare	20	1		
24	Spare	20	1		
PANEL CONNECTED LOAD / PHASE				50.0	49.0
PANEL CONNECTED LOAD				99.0 AMP	11.9 KW

MORGAN HILL PUMP STATION MOTOR & LOAD LIST:

MCC Motor List

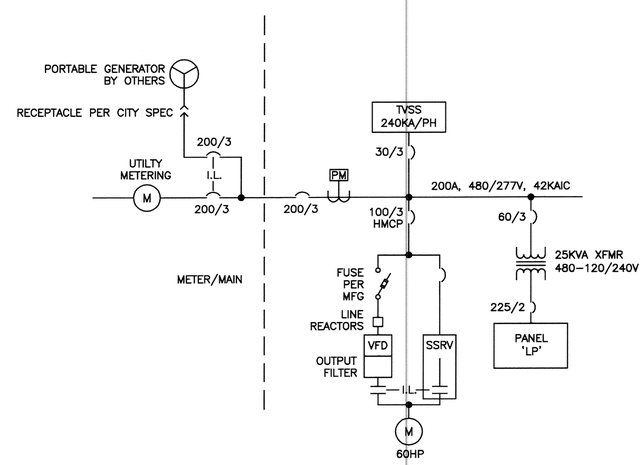
Item	Name	ID	Timing	Type	HP	FLA	Voltage	Starter typ	VFD	HOA	Hock	Power on	Running	Fail	ETM	Remarks
1	Well Pump		New	WP1	60	77	460	VFD	Y	Y	HP	Y	Y	Y	Y	
2	Chemical Pump		New		0.5	10	120			Y	Flow					
3	Vent Fan		New		1	16	120			N	N			Y		
4																
5																
6																

Load Calculations		480V
Item	Name	FLA
1	Well Pump	77
2	25% of largest motor	19.25
3		
4		
5	Lts. & misc.	10
	Total	106
	80% rating	133
	Main Size	200



UTILITY METERING ELEVATION

NOT TO SCALE



MORGAN HILL PUMP STATION SINGLE LINE DIAGRAM

VFD RATED 150% FOR 60 SEC

SSRV – 125% FLA

PM – ELECTRO INDUSTRIES SHARK

JOE PREVENDAR P.E. CA EE 16581
joe@epsfresno.com

GARY OLSEN P.E. CA EE 8283
gary@epsfresno.com

JOB: LS–15–175 DATE: MAR 2017
FILE: LS175_E3_SL
PLOT: 5/24/2017 2:12 PM / 1:1
DSGN: LKB DRWN: CRT

EPS IS RESPONSIBLE FOR ELECTRICAL SYSTEMS DESIGN ONLY. EPS IS NOT RESPONSIBLE FOR ELECTRICAL SAFETY WORK PROCEDURES AND/OR USE OF REQUIRED PERSONAL PROTECTIVE EQUIPMENT. SEE NFPA 70E "STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE" AND OSHA 29 CFR. CONTRACTOR MUST READ SPECIFICATIONS AND INSTALL MATERIAL AS PER SPECIFICATIONS AND/OR PLANS OR AS PER E.P.S. APPROVAL. PLANS AND SPECIFICATIONS ONLY APPLY TO THE PROJECT FOR WHICH THEY WERE CREATED.

ELECTRICAL POWER SYSTEMS INC.
PROFESSIONAL AND CONSULTING ELECTRICAL ENGINEERING
4049 N FRESNO ST, FRESNO , CA 93726
P: (559) 221-7230 F: (559) 221-0507

REGISTERED PROFESSIONAL ENGINEER JOSEPH P. PREVENDAR No. 16581 ELECTRICAL STATE OF CALIFORNIA
DATE: 5-30-2017

SINGLE LINE DIAGRAM & ELEVATION
Construction of Pump Station
East Main Ave. Well #1
City of Morgan Hill
Morgan Hill, California

LUHDORFF & SCALMANINI CONSULTING ENGINEERS
500 FIRST STREET
WOODLAND, CALIFORNIA
PHONE: (530) 661-0109

REVISIONS

NO.	DATE	REVISION

DATE: MARCH 2017
JOB NO.: 15-6-068
DESIGN BY:
DRAWN BY:
CHECKED BY:
FILE:

SHEET:
E-3

CAD FILE: G:/Projects/City of Morgan Hill/15-5-068/Electrical 031517/LS175_E3_SL.dwg CFG FILE: LSCE2500.PCP MRG DATE: 05-24-17 2:11pm