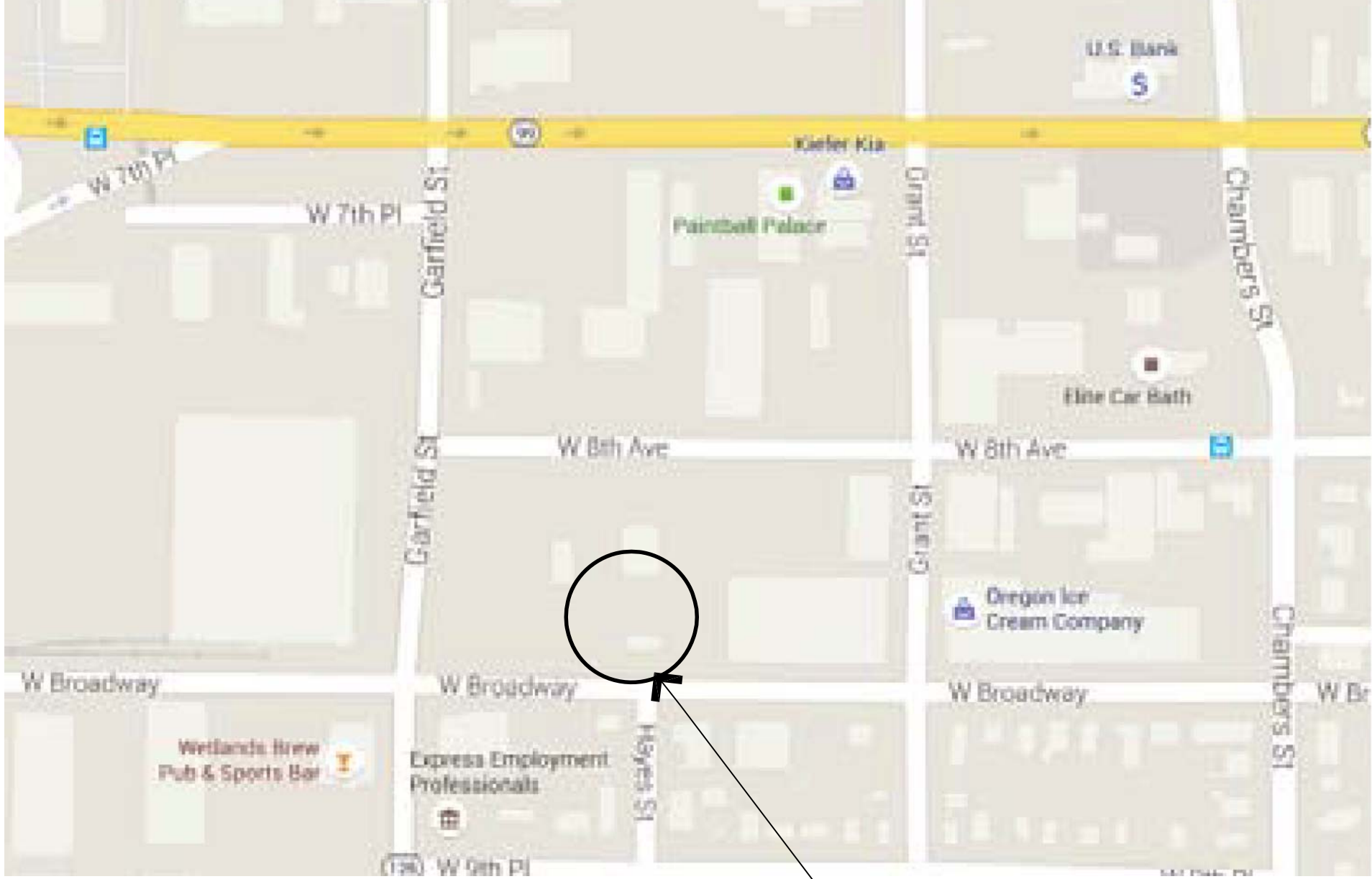
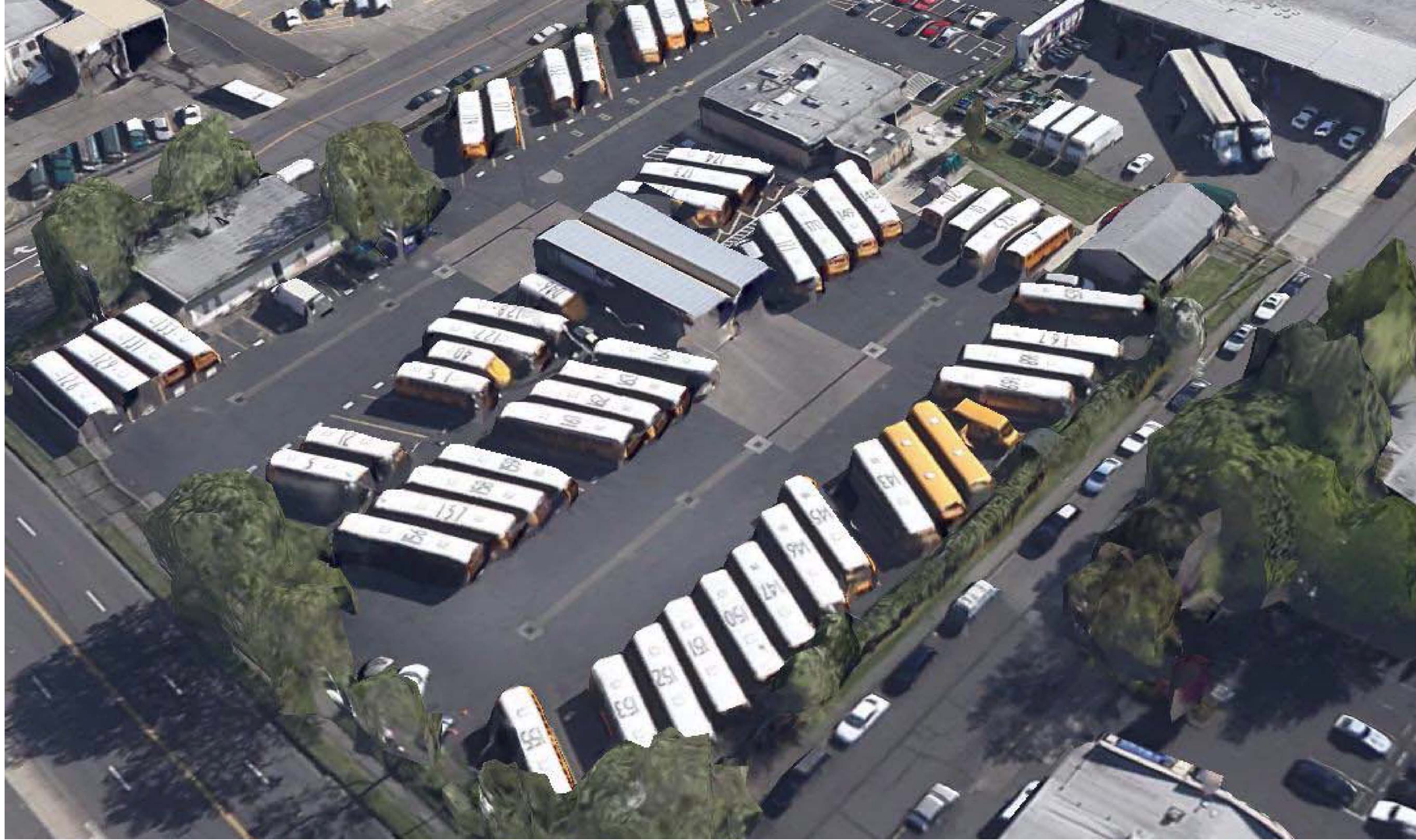


# 4J BUS GARAGE PROPANE FUELING SYSTEM



5 VICINITY MAP



11 PROJECT INFORMATION

**OWNERS REPRESENTATIVE:**  
EUGENE SCHOOL DISTRICT 4J  
KIRK GEBB, PROJECT MANAGER  
715 W. 4TH AVENUE  
EUGENE, OR 97402  
541.968.0950

**MECHANICAL DESIGN:**  
SOLARC ARCHITECTURE + ENGINEERING, INC.  
GENE JOHNSON, PE  
223 WEST 12TH AVENUE  
EUGENE, OR 97401  
TEL: 541.349.0966

**ELECTRICAL DESIGN:**  
PARADIGM ENGINEERING, INC.  
JIM KRUMSICK, PE  
EUGENE, OR 97405  
TEL: 541.285.1680

**STRUCTURAL DESIGN:**  
JOHNSON BRODERICK ENGINEERING  
ROBERT JOHNSON, PE  
325 W. 13TH AVE.  
EUGENE, OR 97401  
TEL: 541.338.9488

9 PROJECT TEAM

**PROJECT DESCRIPTION:**  
DEMOLITION OF EXISTING STORAGE SHED AND CONSTRUCTION OF A PROPANE FUEL STORAGE & DISPENSING SYSTEM AT 4J BUS GARAGE FACILITY. SYSTEM INCLUDES 3900 GALLON VERTICAL PROPANE STORAGE TANK, DUPLEX PROPANE PUMPS, AND DUAL-HOSE DISPENSER MOUNTED ON SOUTH END OF EXISTING FUELING ISLAND. SCOPE OF WORK INCLUDES ELECTRICAL MODIFICATIONS, EMERGENCY SHUTDOWN SYSTEM INTEGRATED WITH EXISTING, AND INTEGRATION OF NEW PUMP DISPENSING METERS TO EXISTING FUELMASTER 2500 FUEL MANAGEMENT SYSTEM.

**SHEET INDEX:**

SHT #	NAME
01	C001 COVER SHEET
02	C101 CIVIL SITE PLAN - DEMOLITION
03	C102 CIVIL SITE PLAN - NEW
04	S1.0 STRUCTURAL SPECIFICATIONS
05	S1.1 STRUCTURAL DETAILS
06	M001 MECHANICAL LEGEND
07	M101 MECHANICAL AREA PLAN
08	M201 PIPING SCHEMATIC
09	M501 MECHANICAL DETAILS, DIAGRAMS & SCHEDULES
10	E101 ELECTRICAL PLAN, DEMO & NEW
11	E501 ELECTRICAL PANEL SCHEDULES AND DIAGRAMS

12 SHEET INDEX

**BUS GARAGE PROPANE  
FUELING SYSTEM**  
1944 W. 8TH AVE.  
EUGENE, OREGON  
EUGENE SCHOOL DISTRICT 4J

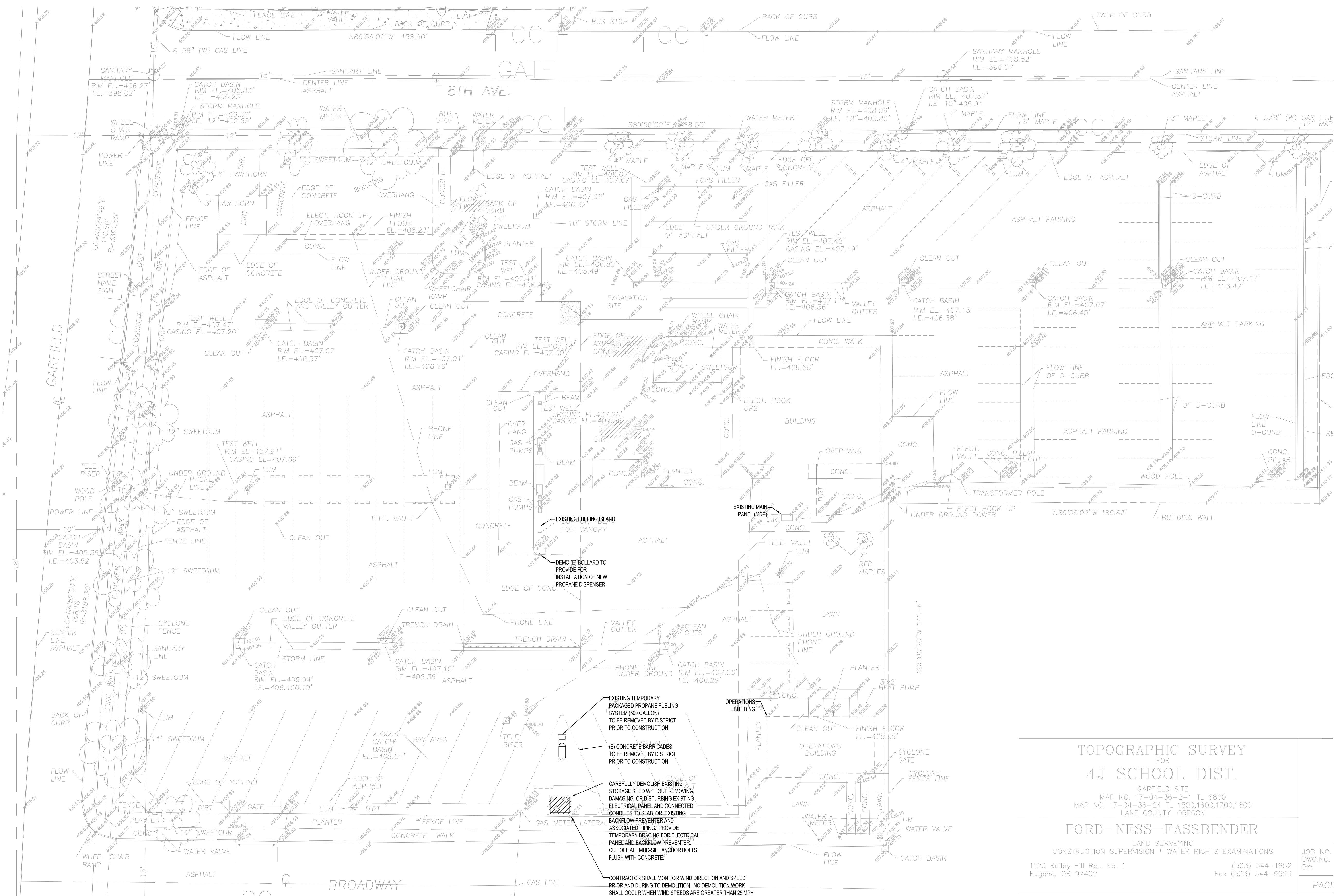


PROJECT NO: 15-068  
ISSUE DATE: 02 MAY 2016  
DRAWN BY: KC  
CHECKED BY: GJ

REVISED:

COVER SHEET

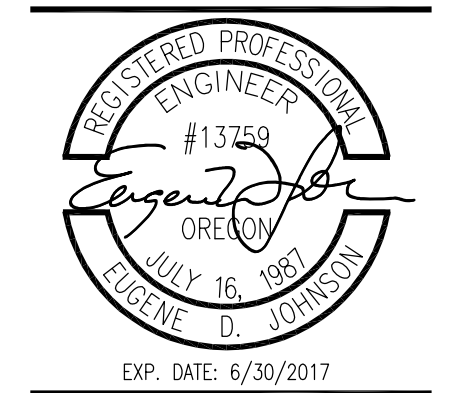
**C001**  
SHEET 1 OF 11



**13 CIVIL SITE DEMO PLAN**  
 SCALE: 1" = 20'

<b>TOPOGRAPHIC SURVEY</b> FOR <b>4J SCHOOL DIST.</b> GARFIELD SITE MAP NO. 17-04-36-2-1 TL 6800 MAP NO. 17-04-36-24 TL 1500,1600,1700,1800 LANE COUNTY, OREGON	
<b>FORD-NESS-FASSBENDER</b> LAND SURVEYING CONSTRUCTION SUPERVISION * WATER RIGHTS EXAMINATIONS 1120 Bailey Hill Rd., No. 1 Eugene, OR 97402	
JOB NO. DWG. NO. By:	(503) 344-1852 Fax (503) 344-9923
PAGE	

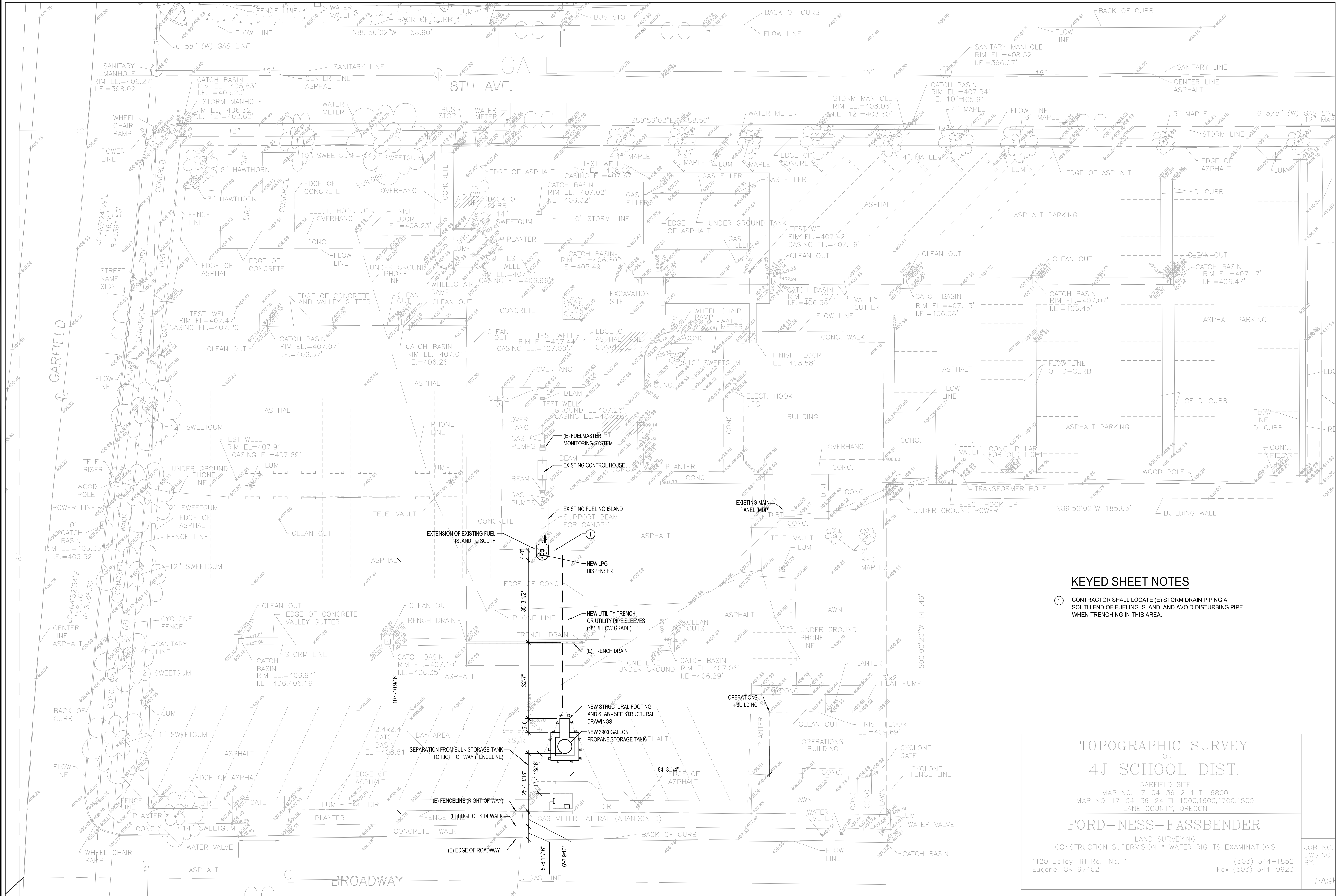
**BUS GARAGE PROPANE FUELING SYSTEM**  
 1944 W. 8TH AVE.  
 EUGENE, OREGON  
 EUGENE SCHOOL DISTRICT 4J



PROJECT NO: 15-068  
 ISSUE DATE: 02 MAY 2016  
 DRAWN BY: KC  
 CHECKED BY: GJ

REVISED:

**CIVIL SITE PLAN - DEMO -**



**KEYED SHEET NOTES**

- ① CONTRACTOR SHALL LOCATE (E) STORM DRAIN PIPING AT SOUTH END OF FUELING ISLAND, AND AVOID DISTURBING PIPE WHEN TRENCHING IN THIS AREA.

<p>TOPOGRAPHIC SURVEY FOR 4J SCHOOL DIST.</p> <p>GARFIELD SITE MAP NO. 17-04-36-2-1 TL 6800 MAP NO. 17-04-36-24 TL 1500,1600,1700,1800 LANE COUNTY, OREGON</p> <p><b>FORD-NESS-FASSBENDER</b> LAND SURVEYING CONSTRUCTION SUPERVISION * WATER RIGHTS EXAMINATIONS</p> <p>1120 Bailey Hill Rd., No. 1 Eugene, OR 97402</p> <p>(503) 344-1852 Fax (503) 344-9923</p>		<p>JOB NO. DWG. NO. BY:</p> <p>PAGE</p>
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**13 CIVIL SITE PLAN**  
SCALE: 1" = 20'



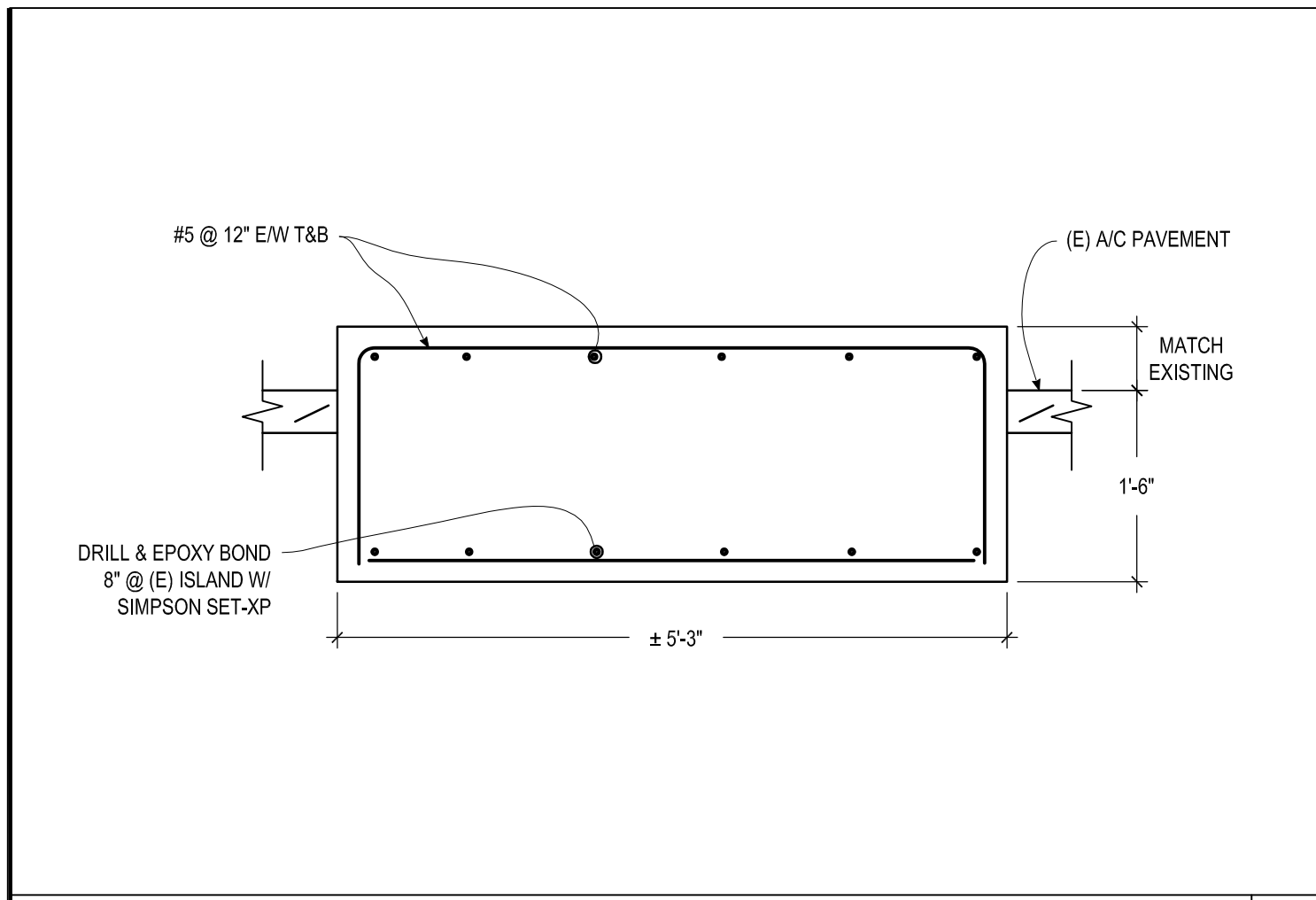
**BUS GARAGE PROPANE FUELING SYSTEM**  
 1944 W. 8TH AVE.  
 EUGENE, OREGON  
 EUGENE SCHOOL DISTRICT 4J



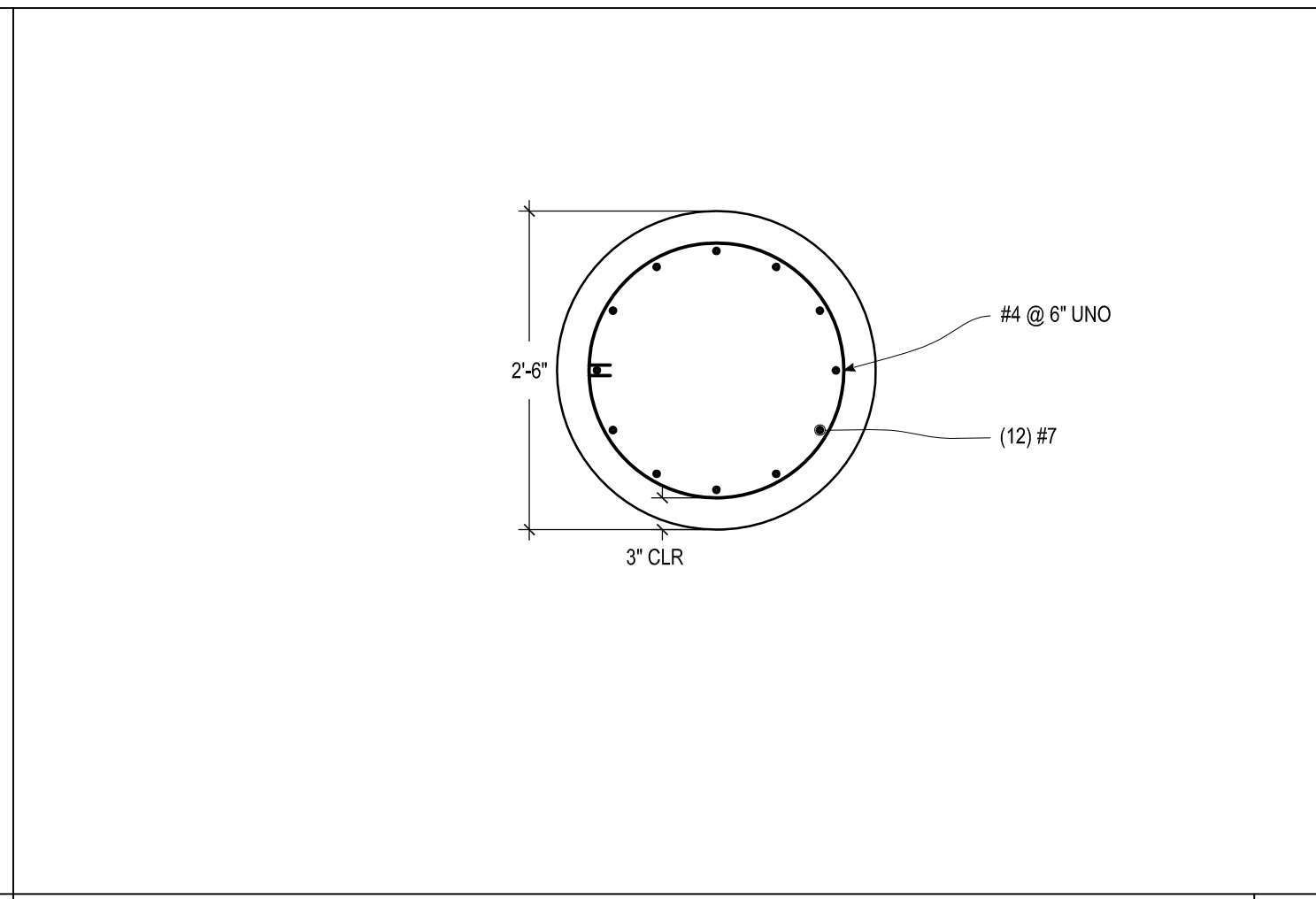
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 ISSUE DATE: 02 MAY 2016  
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REVISED:

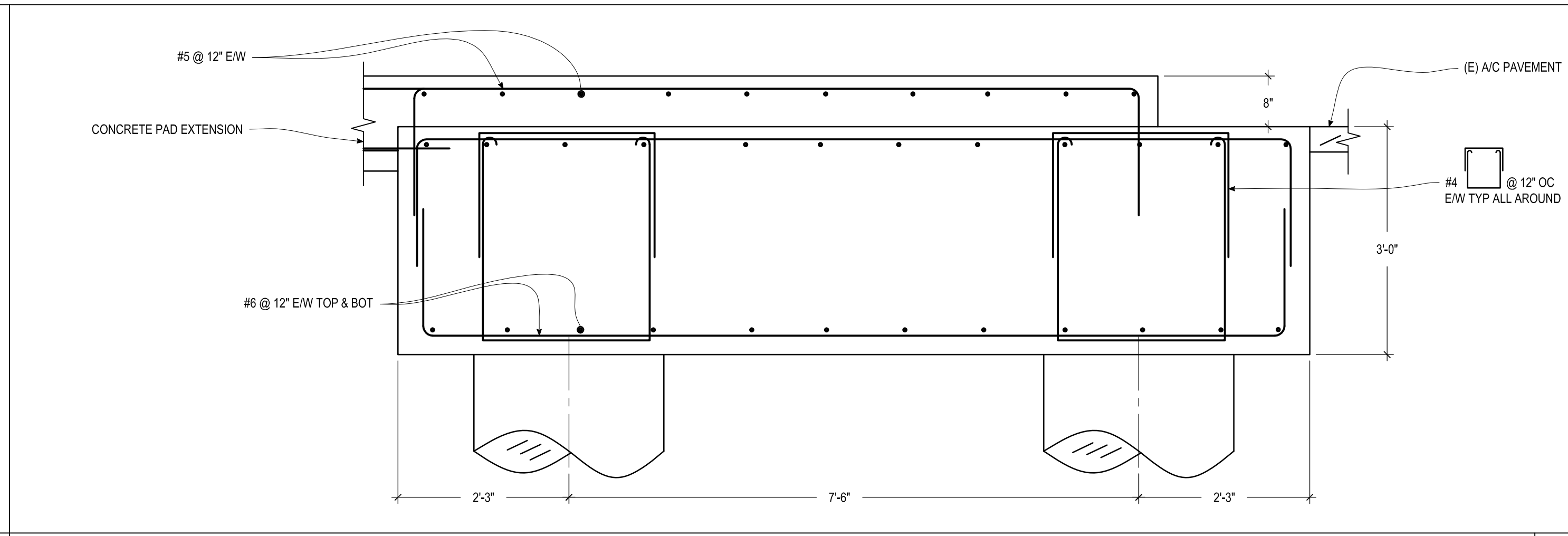
**CIVIL SITE PLAN - NEW -**



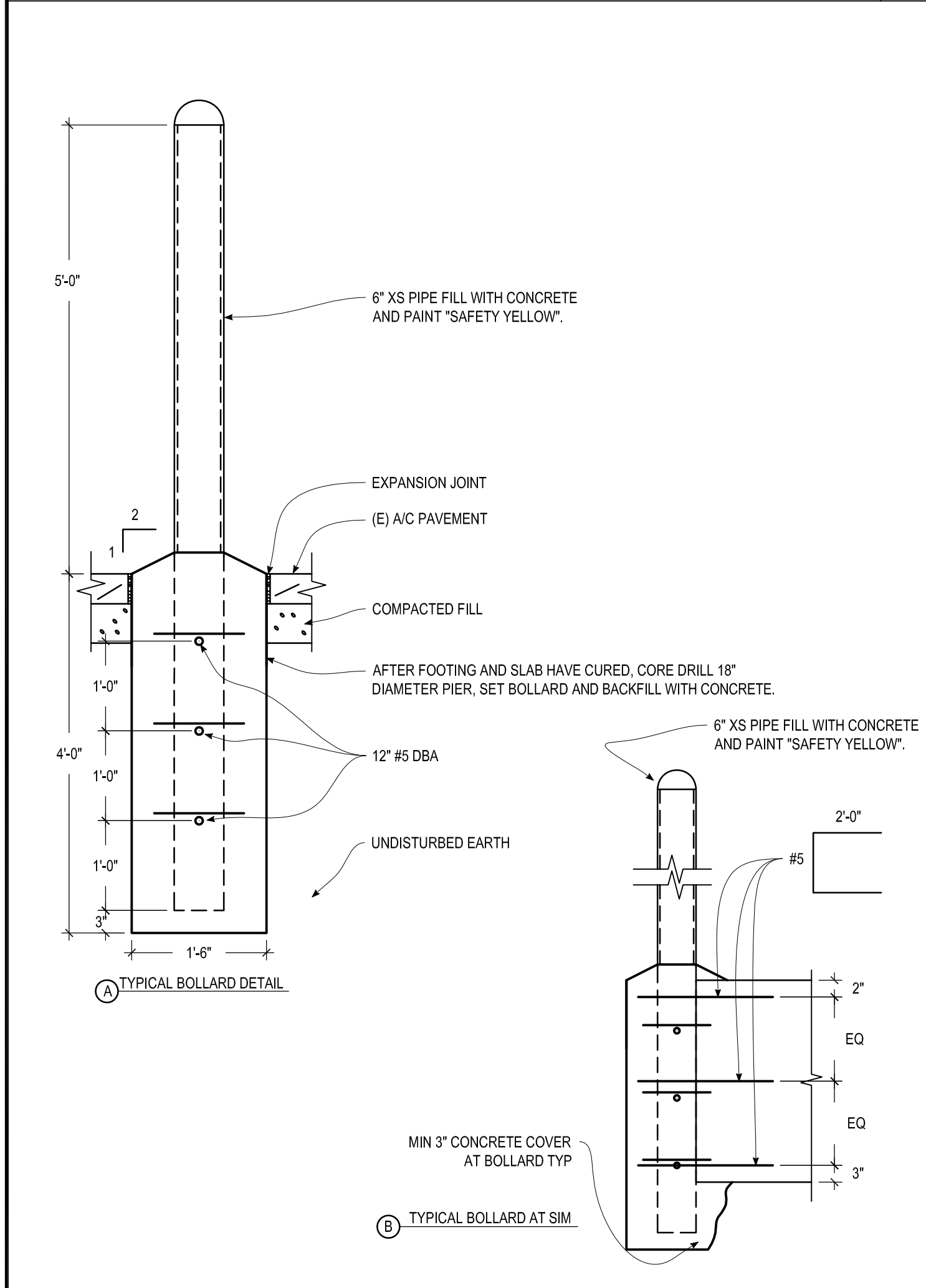
FUEL PUMPING ISLAND Scale: 3/4" = 1'-0" 16



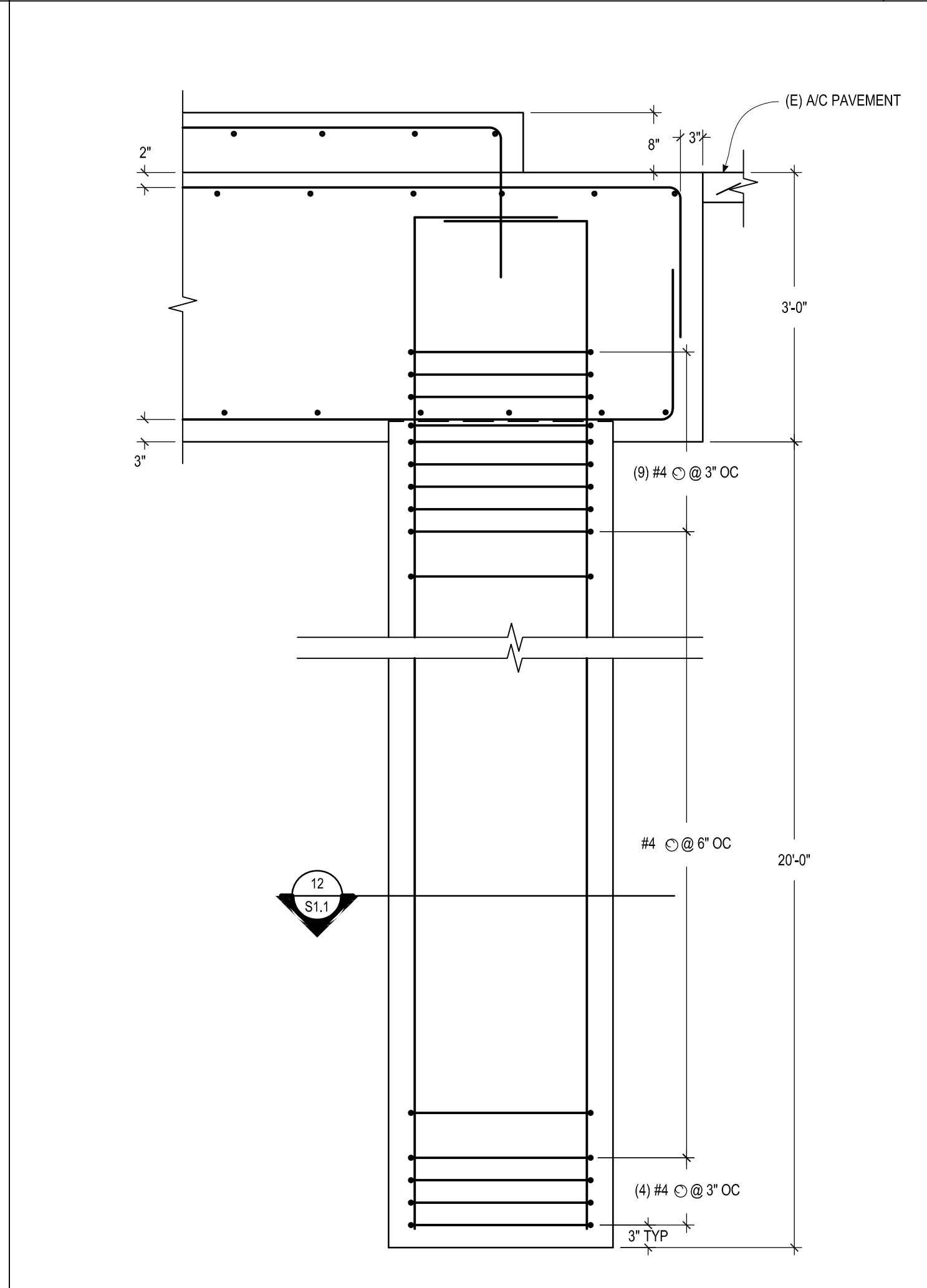
PILE SECTION Scale: 3/4" = 1'-0" 12



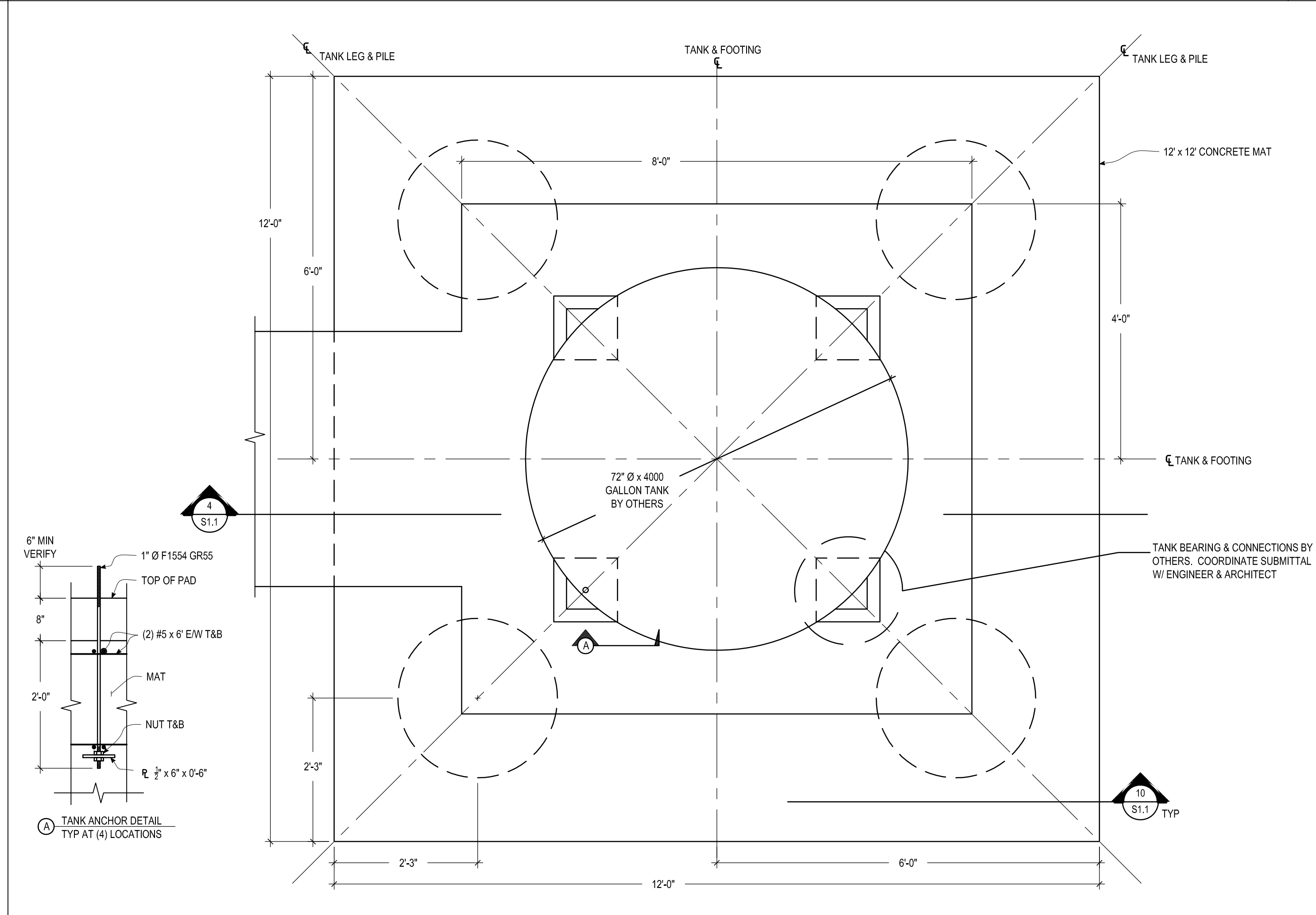
MAT / PILE CAP SECTION Scale: 3/4" = 1'-0" 4



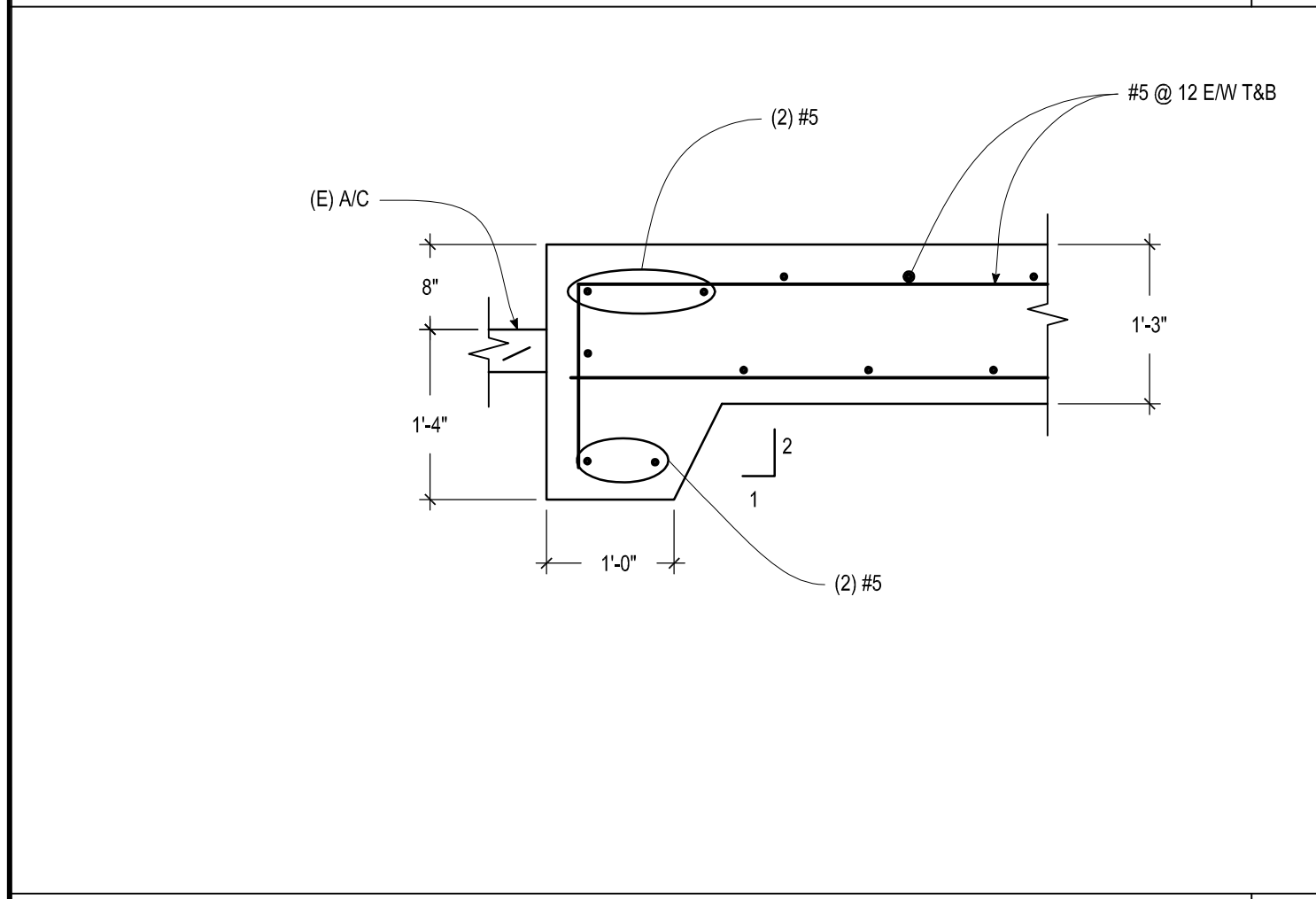
BOLLARD Scale: 3/4" = 1'-0" 14



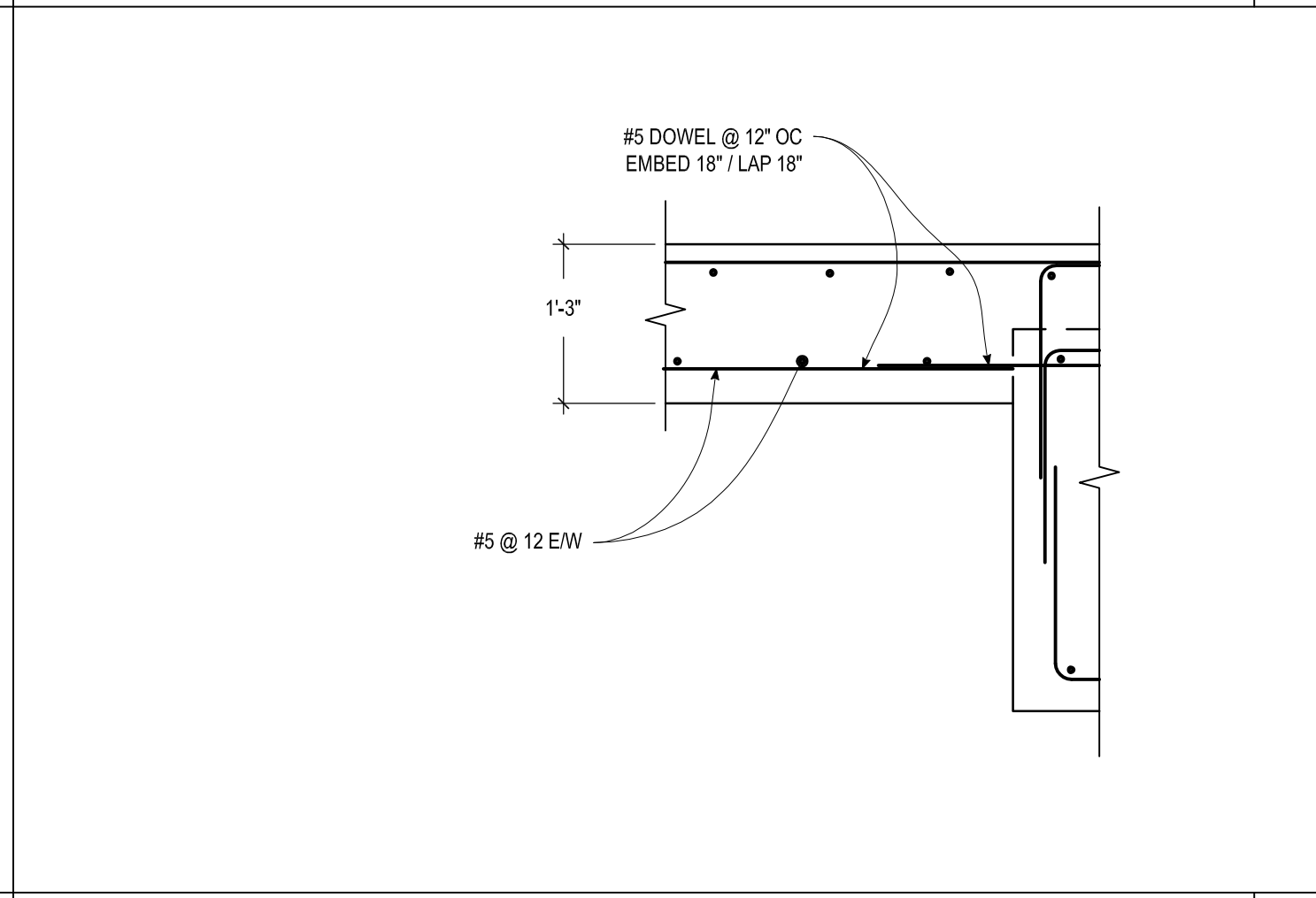
TYPICAL PILE Scale: 3/4" = 1'-0" 10



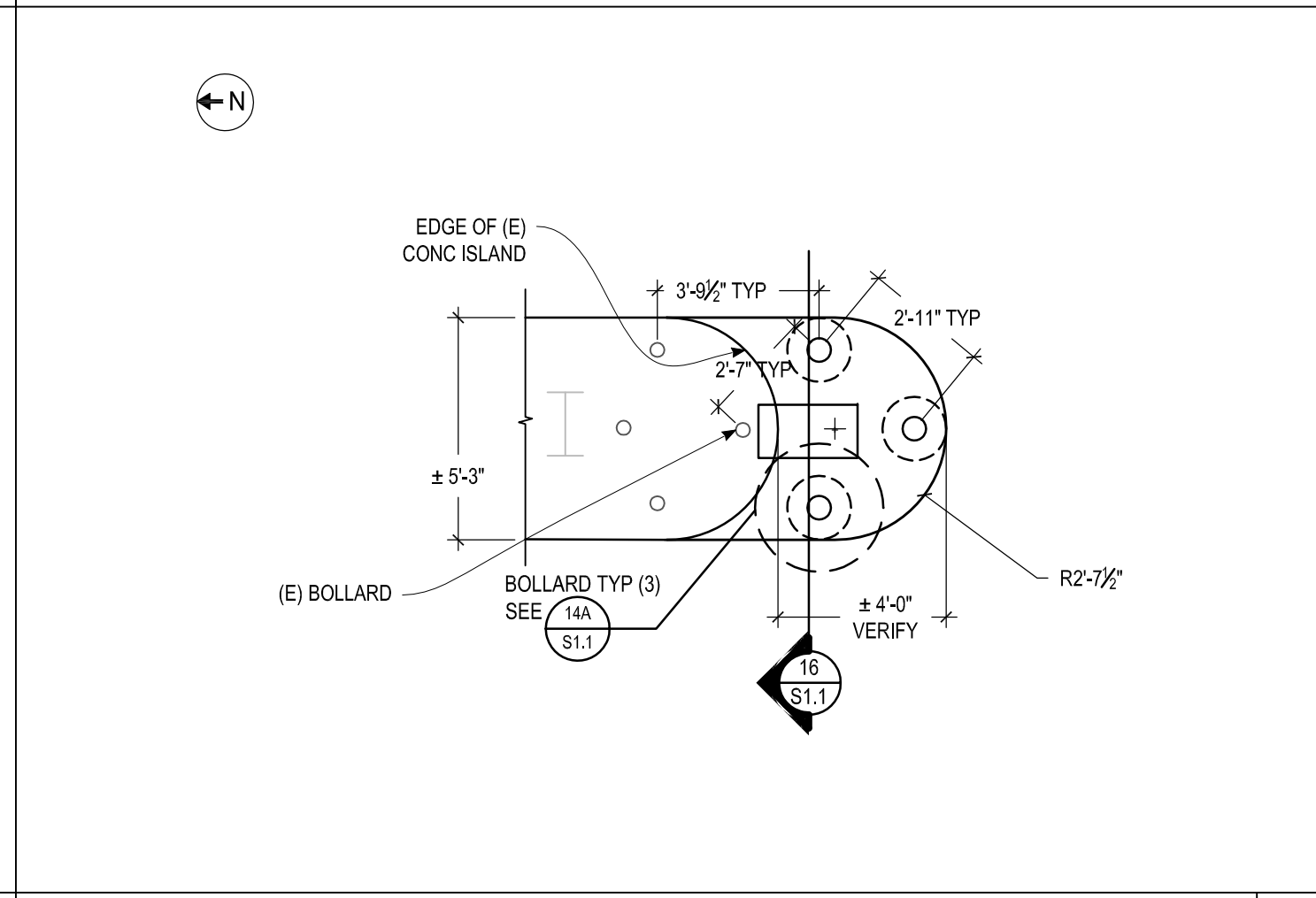
MAT / PILECAP PLAN Scale: 3/4" = 1'-0" 2



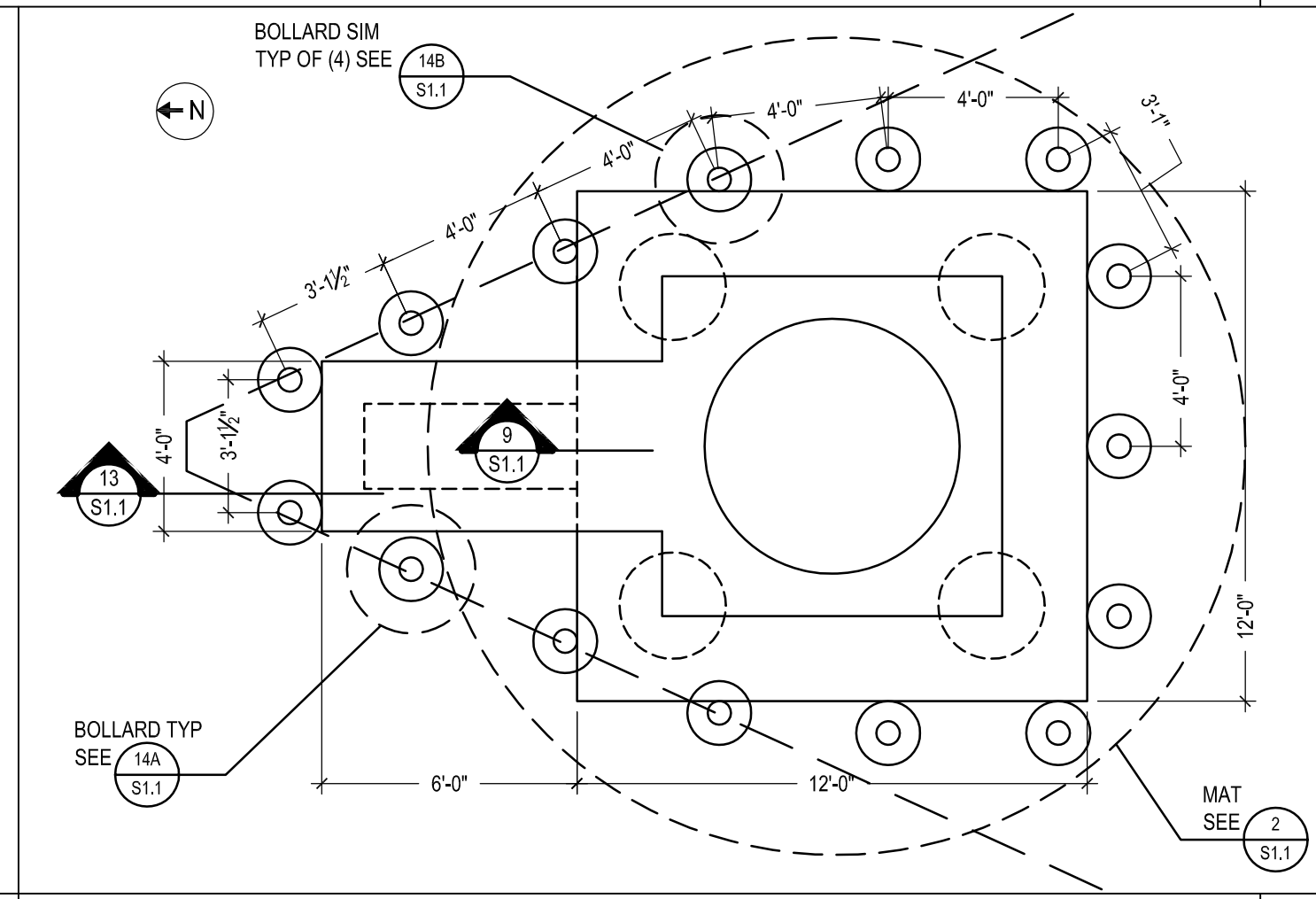
PAD EDGE DETAIL Scale: 3/4" = 1'-0" 13



MAT TO PAD DETAIL Scale: 3/4" = 1'-0" 9



PLAN VIEW PUMP ISLAND Scale: NO SCALE 5



PLAN VIEW MAT / PILECAP Scale: NO SCALE 1

## 01 GENERAL STRUCTURAL NOTES

1. ALL WORK SHALL COMPLY WITH THE 2014 EDITION OF THE OREGON STRUCTURAL SPECIALTY CODE (2014 OSSC - THE 2012 INTERNATIONAL BUILDING CODE AS AMENDED BY THE STATE OF OREGON).
2. VERIFY ALL EXISTING CONDITIONS PRIOR TO BEGINNING WORK.
3. NOTIFY OWNER AND ENGINEER OF ANY DISCREPANCIES IN DRAWINGS OR FIELD CONDITIONS.
4. WHERE SPECIFIC DETAILS OF CONSTRUCTION ARE NOT SHOWN ON THE PLANS OR DETAILS, CONSTRUCTION SHALL BE SIMILAR TO THOSE DETAILS HEREIN AND SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER AND ENGINEER.
5. CONTRACTOR IS RESPONSIBLE FOR VERIFYING AND COORDINATING WORK BETWEEN ENGINEERING DRAWINGS AND OTHER AND ALL TRADES. NOTIFY OWNER OF ANY DISCREPANCIES.
6. MINOR PORTIONS OF STRUCTURE WITH STRUCTURAL DAMAGE (DECAY, DISTRESS ETC) SHALL BE REPAIRED IN KIND. SIGNIFICANT AREAS SHALL BE OBSERVED BY THE ENGINEER AND REPAIRED OR REBUILT TO CURRENT CODE REQUIREMENTS PER THE ENGINEER.

## 02 DESIGN CRITERIA

2014 OREGON STRUCTURAL SPECIALTY CODE (2014 OSSC)  
(2012 INTERNATIONAL BUILDING CODE AS AMENDED BY THE STATE OF OREGON).

STRUCTURAL CRITERIA PER OSSC CHAPTER 16

1603.1.1 FLOOR LIVE LOAD: N/A

1603.1.2 ROOF LIVE LOAD: N/A

1603.1.3 ROOF SNOW LOAD: N/A

1603.1.4 WIND DESIGN DATA:

BASIC WIND SPEED (3-SECOND GUST), 145 MPH  
WIND IMPORTANCE FACTOR,  $IW = 1.00$   
WIND EXPOSURE, B

1603.1.5 EARTHQUAKE DESIGN DATA:

1. SEISMIC IMPORTANCE FACTOR,  $IE = 1.5$
2. OCCUPANCY CATEGORY: IV
3. MAPPED SPECTRAL RESPONSE ACCELERATION,  $SS = 0.789g$   
MAPPED SPECTRAL RESPONSE ACCELERATION,  $S1 = 0.412g$
4. SITE CLASS: D
5. SPECTRAL RESPONSE COEFFICIENT,  $SDS = 0.623$   
SPECTRAL RESPONSE COEFFICIENT,  $SD1 = 0.436$
6. SEISMIC DESIGN CATEGORY: D
7. BASIC SEISMIC-FORCE-RESISTING SYSTEM:  
CONCRETE FLE CAP ON CAST IN PLACE CONCRETE PILES
5. SEISMIC RESPONSE COEFFICIENT,  $CS = 0.047$
6. RESPONSE MODIFICATION FACTOR,  $R = 2$

## 03 SUBMITTALS

1. CONCRETE DESIGN MIX AND SUBSTRATE DATA
2. REINFORCING STEEL SHOP DRAWINGS
3. TANK DESIGN
4. ANCHOR ROD DESIGN
5. REPRESENTATIVE SAMPLES AND / OR DOCUMENTATION FOR ALL MATERIAL AND FASTENER SUBSTITUTIONS PRIOR TO INCLUSION IN THE PROJECT AND SUBJECT TO ENGINEER'S APPROVAL.

## 04 OBSERVATION

1. SITE PREPARATION - BY GEOTECH
2. DRILLING - CONTINUOUS BY GEOTECH
3. REINFORCING - CONTINUOUS DURING CAISSON PLACEMENT
4. REINFORCING - PERIODIC DURING PLACEMENT
5. CONCRETE - CONTINUOUS DURING PLACEMENT

## 05 EXCAVATION NOTICE

ATTENTION:  
OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. (NOTE: THE ADMINISTRATIVE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-232-1987).

## 06 SITE AND SOILS

1. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL INVESTIGATION REPORT (EEI REPORT NO 16-018-01) DATED FEBRUARY 15, 2016
2. GEOTECHNICAL ENGINEER SHALL VERIFY CONDITION AND/OR ADEQUACY OF ALL SUBGRADES, FILLS AND BACKFILLS BEFORE PLACEMENT OF FOOTINGS, SLABS, FILLS AND BACKFILLS, ETC.
3. SIDES OF FOUNDATIONS SHOWN STRAIGHT ARE FORMED. FOUNDATIONS POURED AGAINST THE EARTH AT CONTRACTOR'S OPTION REQUIRE THE FOLLOWING PRECAUTIONS: SLOPE SIDES OF EXCAVATIONS AS APPROVED BY SOILS ENGINEER AND BE RESPONSIBLE FOR CLEANUP OF SLOUGHING BEFORE, DURING AND AFTER PLACING CONCRETE. INCREASE FOOTING DIMENSION BY 2 INCHES MINIMUM.
4. CONTRACTOR TO PROVIDE FOR DE-WATERING OF EXCAVATION FOR EITHER SURFACE WATER, GROUND WATER OR SEEPAGE, IF REQUIRED.
5. BACKFILL OVER-EXCAVATED FOOTINGS WITH LEAN CONCRETE SUBJECT TO APPROVAL OF GEOTECHNICAL ENGINEER.
6. NO CONCRETE SHALL BE PLACED IN ANY FOUNDATION UNTIL EXCAVATION HAS BEEN INSPECTED AND APPROVED BY THE GEOTECHNICAL ENGINEER.
7. ALL FOOTINGS SHALL BEAR OF FIRM, UNDISTURBED SOIL. BOTTOM OF FOOTINGS SHOWN ON THE DRAWINGS ARE MINIMUM AND SHALL BE LOWERED AS REQUIRED TO REMOVE SOFT AND LOOSE MATERIAL.
8. GEOTECHNICAL ENGINEER SHALL BE RETAINED TO PROVIDE OBSERVATION AND TESTING SERVICES DURING THE GRADING AND FOUNDATION PHASES OF CONSTRUCTION PER SOIL REPORT RECOMMENDATIONS. SUBMIT INSPECTION AND TESTING REPORT TO BUILDING DEPARTMENT AS NEEDED.
9. ALL FILL AND BACKFILL SHALL BE COMPACTED PER GEOTECHNICAL REPORT.
10. SUBGRADE PREPARATION SHALL BE INSPECTED AND APPROVED BY THE GEOTECHNICAL ENGINEER.

## 07 REINFORCING

1. ALL REINFORCING STEEL SHALL BE PLACED IN CONFORMANCE TO "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318, LATEST APPROVED EDITION), AND THE "ACI DETAILING MANUAL" AS MODIFIED BY THE PROJECT DRAWINGS AND SPECIFICATIONS.
2. REINFORCING STEEL TO BE ASTM A615, GRADE 60 DEFORMED BARS UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC TO BE ASTM A185, ASTM A706 WHERE WELDING IS REQUIRED.
3. ALL LAP SPICES SHALL BE CLASS B SPICE AND 2'-0" MINIMUM UNLESS OTHERWISE NOTED. MAINTAIN 1'-1/2" CLEAR MINIMUM BETWEEN PARALLEL BARS.
4. ALL REINFORCING STEEL AND EMBEDMENTS TO BE HELD SECURELY IN PLACE PRIOR TO PLACING CONCRETE. PROVIDE SUFFICIENT SUPPORTS TO ALLOW WALKING ON REINFORCEMENT. NO BRICK OR POROUS MATERIAL SHALL BE USED TO SUPPORT REINFORCING.
5. WELDING OF REINFORCING IS ALLOWING ONLY WHERE SPECIFIED ON DRAWING. PROVIDE PRE-HEAT OF BARS AS REQUIRED.
6. REINFORCEMENT SHALL BE PLACED IN RELATIVE POSITION SHOWN ON THE DRAWINGS. NO SPICES IN REINFORCING WILL BE PERMITTED UNLESS SHOWN ON THE STRUCTURAL DRAWING OR APPROVED BY THE STRUCTURAL ENGINEER.
7. PROVIDE FOUNDATION DOWELS TO MATCH SIZE AND SPACING OF WALL OR COLUMN REINFORCEMENT. EXTEND DOWELS LAP-SPICE LENGTH INTO WALL OR COLUMN AND TERMINATE WITH STANDARD HOOK 3" ABOVE BOTTOM OF FOOTING, UNLESS OTHERWISE NOTED. PROVIDE CONTINUOUS REINFORCEMENT WHEREVER POSSIBLE.
8. LOW HYDROGEN E70XX WELDING RODS SHALL BE USED FOR ALL WELDING OF REINFORCING BARS. ALL WELDING SHALL BE DONE BY AN APPROVED WELDER AND HAVE CONTINUOUS INSPECTION BY A QUALIFIED INSPECTOR.
9. REINFORCING BARS SHALL NOT BE REBENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER.
10. MECHANICAL SPICES IN REINFORCING SHALL DEVELOP 125% OF THE REINFORCING. MECHANICAL SPICES SHALL NOT BE USED WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER.
11. ALL REINFORCING, ANCHOR BOLTS AND OTHER INSERTS SHALL BE SECURED IN PLACE PRIOR TO PLACING CONCRETE.

## 08 CONCRETE

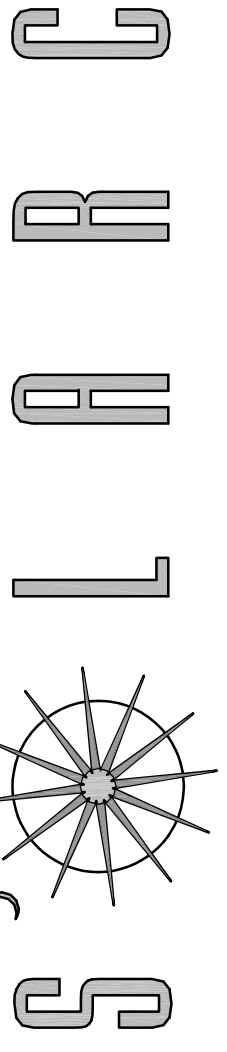
1. ALL CONCRETE SHALL BE MIXED AND PLACED IN ACCORDANCE ACI 318 MOST RECENT EDITION. USE MIXES WITH MAXIMUM AGGREGATE SIZE APPROPRIATE FOR FORM AND REBAR CLEARANCES TO BE ENCOUNTERED.
2. THE PROPOSED MATERIALS AND MIX DESIGN SHALL BE FULLY DOCUMENTED. RESPONSIBILITY FOR OBTAINING THE REQUIRED DESIGN STRENGTH IS THE CONTRACTOR'S RESPONSIBILITY. SUBMIT TEST DATA ON EACH PROPOSED MIX FOR REVIEW IN ACCORDANCE WITH ACI REQUIREMENTS.
3. ALL CONCRETE SHALL BE 4000 PSI
4. CONCRETE SHALL BE MECHANICALLY CONSOLIDATED.
5. THE PROPOSED MATERIALS AND MIX DESIGN SHALL BE FULLY DOCUMENTED AND SUBMITTED FOR THE ENGINEERS REVIEW.
6. SCHEDULING OF WORK MAY REQUIRE DESIGN STRENGTH IN LESS THAN 28 DAYS.
7. CEMENT SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PORTLAND CEMENT PER ASTM DESIGNATION C150, TYPE II.
8. CONSTRUCTION JOINTS SHALL BE THOROUGHLY ROUGHENED BY SAND BLASTING OR MECHANICAL MEANS. CLEAN BEFORE NEW POUR. LOCATION TO BE APPROVED BY THE STRUCTURAL ENGINEER.
9. ALL CONCRETE TO BE REINFORCED UNLESS SPECIFICALLY NOTED "NOT REINFORCED".
10. CONDUIT OR PIPE SIZE SHALL (OD) SHALL NOT EXCEED 30% OF SLAB THICKNESS, AND SHALL BE PLACED FOUR DIAMETERS MINIMUM APART, UNLESS SPECIFICALLY DETAILED OTHERWISE.
11. PRIOR TO PLACING CONCRETE, THE CONTRACTOR SHALL ENSURE THAT ALL EMBEDMENTS, INCLUDING COLUMN ANCHOR BOLTS, ARE PROPERLY LOCATED AND SECURELY TIED INTO PLACE. WET SETTING OF ANY APPURTENANCES IS NOT ALLOWED.
12. CONTRACTOR RESPONSIBLE FOR DEWATERING DURING CONSTRUCTION.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF CONCRETE FROM FREEZING BEFORE CURING WHEN POURED IN COLD WEATHER.
14. DIMENSIONS SHOWN OR NOT SHOWN ON PLANS REGARDING CURBS, SLOPES AND DEPRESSED AREAS AT CONCRETE SLABS SHALL BE VERIFIED WITH ARCHITECTURAL DRAWINGS BEFORE PLACING CONCRETE.
15. ALL CONCRETE SHALL HAVE CONTINUOUS INSPECTION.
16. STRIPPING OF FORMS AND SHORING SHALL BE IN STRICT ACCORDANCE WITH ACI 318, LATEST EDITION.
17. PIPES OR DUCTS SHALL NOT BE PLACED IN STRUCTURAL CONCRETE UNLESS SPECIFICALLY DETAILED. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATIONS OF ALL PIPES, CONDUITS, ETC.

## 09 CONCRETE - DRILLED PIERS

1. DRILLED PIERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ACI STANDARD 308, LATEST APPROVED EDITION OF "SPECIFICATION FOR THE CONSTRUCTION OF DRILLED PIERS".
2. FREE FALL OF CONCRETE SHALL NOT EXCEED FOUR FEET.
3. GEOTECHNICAL ENGINEER SHALL BE PRESENT DURING DRILLING.

## 10 ANCHOR RODS

1. ANCHOR RODS SHALL CONFORM TO F1554 GR 55.
2. NUTS SHALL BE ASTM A563 HEAVY HEX GRADE A WITH F436 WASHER.
3. ALL ANCHOR RODS AND ASSOCIATED COMPONENTS EXPOSED TO WEATHERING SHALL BE HOT DIPPED GALVANIZED.
4. RODS SHALL BE SECURELY TEMPLATED IN PLACE. TEMPLATES SHALL MATCH COLUMN OR EQUIPMENT BASE.



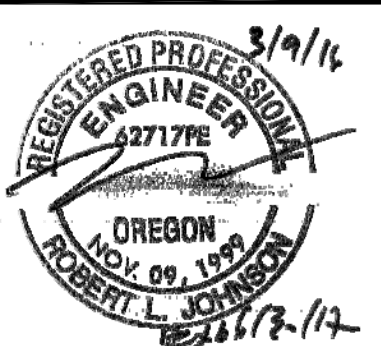
architecte and engineering inc  
223 West Twelfth Avenue - Eugene Oregon 97401 - Telephone 541.489.0966 Facsimile 541.343.1533

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www.johnsonbroderickengineering.com

15090.03

BUS GARAGE PROPANE  
FUELING SYSTEM  
1944 W. 8TH AVE.  
EUGENE, OREGON  
EUGENE SCHOOL DISTRICT 4J



PROJECT NO: 15-068  
ISSUE DATE: 02 MAY 2016  
DRAWN BY: TLB  
CHECKED BY: RLJ

REVISED:

STRUCTURAL  
SPECS

S 1.0

SHEET 4 OF 11

**PIPING LABELS**

— HWS —	HEATING WATER SUPPLY
— HWR —	HEATING WATER RETURN
— CWS —	CHILLED WATER SUPPLY
— CWR —	CHILLED WATER RETURN
— CS —	CONDENSER WATER SUPPLY
— CR —	CONDENSER WATER RETURN
— RL —	REFRIGERANT LIQUID
— RS —	REFRIGERANT SUCTION
— RD —	REFRIGERANT DISCHARGE (HOT GAS)
— HGBP —	REFRIGERANT HOT GAS BYPASS
— LPS —	LOW PRESSURE STEAM SUPPLY
— LPC —	LOW PRESSURE CONDENSATE
— MPS —	MEDIUM PRESSURE STEAM SUPPLY
— MPC —	MEDIUM PRESSURE CONDENSATE
— HPS —	HIGH PRESSURE STEAM SUPPLY
— HPC —	HIGH PRESSURE CONDENSATE
— GLS —	GROUND LOOP SUPPLY
— GLR —	GROUND LOOP RETURN
— HCS —	HEATING/CHILLED WATER SUPPLY
— HCR —	HEATING/CHILLED WATER RETURN
— PC —	PUMPED CONDENSATE
— FOS —	FUEL OIL SUPPLY
— FOR —	FUEL OIL RETURN
— FOV —	FUEL OIL VENT
— MU —	MAKEUP WATER
— D —	EQUIPMENT DRAIN
— NAME —	MISCELLANEOUS
— (E) NAME —	EXISTING PIPING
— X (R) NAME — X —	EXISTING PIPING TO BE REMOVED
— (R) NAME — —	EXISTING PIPING TO BE REMOVED
— 1-1/4" PIPE —	PIPE WITH SIZE CALLOUT

**VALVES**

	TWO WAY CONTROL VALVE
	THREE WAY CONTROL VALVE
	BALL VALVE
	GATE VALVE
	GLOBE VALVE
	BUTTERFLY VALVE
	NEEDLE VALVE
	GAS COCK
	CHECK VALVE
	SOLENOID VALVE
	PRESSURE REDUCING VALVE
	RELIEF (R), OR SAFETY (S) VALVE
	BALANCING VALVE
	AUTOMATIC FLOW LIMITING VALVE
	STRAINER, STRAINER W/BLOWOFF
	HOSE END DRAIN VALVE
	VALVE IN RISER
	REDUCED PRESSURE BACKFLOW PREVENTER
	DOUBLE CHECK VALVE

**HVAC SPECIALTIES**

	MOTORIZED CONTROL DAMPER
	FIRE/SMOKE DAMPER
	FIRE DAMPER
	DUCT LINER
	SUPPLY DIFFUSER - TYPE, NECK SIZE AND CFM
	RETURN GRILL - TYPE, NECK SIZE AND CFM
	RETURN AIR GRILLE WITH SOUND BOOT (SEE DETAIL)
	EXHAUST GRILL - TYPE, NECK SIZE AND CFM
	DIFFUSER - LIGHT SECTIONS INDICATE DIRECTION OF AIR FLOW
	DUCT OR PIPE MOUNTED TEMPERATURE SENSOR
	THERMOSTAT OR TEMPERATURE SENSOR
	WALL MOUNTED CARBON DIOXIDE SENSOR
	DUCT SMOKE DETECTOR
	DDC BINARY INPUT
	DDC BINARY OUTPUT
	DDC ANALOG INPUT
	DDC ANALOG OUTPUT
	REHEAT COIL AIR TERMINAL UNIT CONTROLLER

**PIPING SPECIALTIES**

	FLEXIBLE PIPE CONNECTOR
	EXPANSION JOINT
	PRESSURE GAUGE
	THERMOMETER
	AUTOMATIC AIR VENT
	MANUAL AIR VENT
	TEMPERATURE/PRESSURE TEST PORT
	SENSOR WELL
	HOSE BIBB
	PUMP, IN SCHEMATIC PRESENTATION
	STEAM TRAP
	POINT OF CONNECTION

**DUCTWORK**

	WYE BRANCH
	CONICAL TAP
	HEEL TAP (RECT)
	RADIUS ELBOW
	EXHAUST AIR UP
	EXHAUST AIR DOWN
	RETURN AIR UP
	RETURN AIR DOWN
	SUPPLY OR OSA UP
	SUPPLY OR OSA DOWN
	MITER ELBOW
	MITER TEE
	MITER ELBOW BRANCH
	OFFSET
	OFFSET UP (RISE)
	OFFSET DOWN (DROP)
	TRANSITION
	RECTANGULAR TO ROUND TRANSITION
	RECTANGULAR DUCT WITH SIZE IN INCHES
	ROUND DUCT WITH SIZE IN INCHES
	DUCTWORK TO BE DEMOLISHED

**ABBREVIATIONS**

AC	AIR CONDITIONING	F	FAHRENHEIT	(R)	REMOVE
ACH	AIR CHANGES PER HOUR	FC	FORWARD CURVED	R	RADIUS
AD	ACCESS DOOR	FCU	FAN COIL UNIT	RA	RETURN AIR
AF	AIR FOIL	FLA	FULL LOAD AMPS	RAD	RETURN AIR DAMPER
AFF	ABOVE FINISHED FLOOR	FLR	FLOOR	(RL)	RELOCATE
AH	AIR HANDLING UNIT	FPM	FEET PER MINUTE	REQD	REQUIRED
ALT	ALTERNATE	FPS	FEET PER SECOND	RF	RETURN FAN
AMP	AMPERE	FT	FEET	RM	ROOM
AP	ACCESS PANEL	G	NATURAL GAS	RPM	REVOLUTIONS PER MINUTE
ARCH	ARCHITECTURAL	GA	GAUGE	SA	SUPPLY AIR
ASSY	ASSEMBLY	GAL	GALLON	SAD	SUPPLY AIR DAMPER
B	BOILER	GALV	GALVANIZED	SCH	SCHEDULE
BG	BELOW GRADE	GPM	GALLONS PER MINUTE	SF	SQUARE FEET
BHP	BRAKE HORSEPOWER	GSM	GALVANIZED SHEET METAL	SHT	SHEET
BI	BASKWARD INCLINED	HC	HEATING COIL	SP	STATIC PRESSURE
BLDG	BUILDING	HP	HORSEPOWER, OR HEAT PUMP	SQ	SQUARE
BOP	BOTTOM OF PIPE	HZ	HERTZ	SR	SPRING RANGE
BS	BELOW SLAB	ID	INSIDE DIAMETER	SS	STAINLESS STEEL
BTU	BRITISH THERMAL UNIT	IN	INCHES	STD	STANDARD
BTUH	BRITISH THERMAL UNITS PER HOUR	IN	INCHES	TDH	TOTAL DYNAMIC HEAD
C	COMMON	KW	KILOWATTS	TEMP	TEMPERATURE, OR TEMPORARY
CA	COMPRESSED AIR, COMBUSTION AIR	KWH	KILOWATT HOURS	TOS	TOP OF SLAB
CAP	CAPACITY	L	LENGTH	TSP	TOTAL STATIC PRESSURE
CB	CIRCUIT BREAKER	LAT	LEAVING AIR TEMPERATURE	TTC	TIGHT TO CEILING
CC	COOLING COIL	LBS	POUNDS	TYP	TYPICAL
CD	CEILING DIFFUSER	LRA	LOCKED ROTOR AMPS	UNO	UNLESS NOTED OTHERWISE
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED	LTG	LEAVING WATER TEMPERATURE	V	VOLTS
CFM	CUBIC FEET PER MINUTE	LWT	LEAVING WATER TEMPERATURE	VA	VOLT-AMPERE
CH	CHILLER	MAX	MAXIMUM	VAV	VARIABLE AIR VOLUME
CLG	CEILING	MBH	THOUSAND BTUH	VEL	VELOCITY
CMU	CONCRETE MASONRY UNIT	MCA	MINIMUM CIRCUIT AMPACITY	VFD	VARIABLE FREQUENCY DRIVE
COND	CONDENSER, CONDENSATE	MEZZ	MEZZANINE	VOL	VOLUME
CONT	CONTINUATION	MFR	MANUFACTURER	VV	VARIABLE VOLUME
COP	COEFFICIENT OF PERFORMANCE	MIN	MINIMUM	W/	WITH
CTE	CONNECT TO EXISTING	MISC	MISCELLANEOUS	WB	WET BULB
CU	CONDENSING UNIT	MTD	MOUNTED	WC	WATER COLUMN
DB	DRY BULB, OR DECIBEL	MTG	MEETING	WG	WATER GAGE
DDC	DIRECT DIGITAL CONTROL	(N)	NEW	W/O	WITHOUT
DET	DETAIL	NC	NORMALLY CLOSED		
DIA	DIAMETER	NO	NORMALLY OPEN, OR NUMBER		
DIM	DIMENSION	NPT	NATIONAL PIPE THREAD		
DN	DOWN	NTS	NOT TO SCALE		
DWG	DRAWING	OC	ON CENTER		
(E)	EXISTING	OD	OUTSIDE DIAMETER		
EA	EACH, OR EXHAUST AIR	OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED		
EAD	EXHAUST AIR DAMPER	OFOI	OWNER FURNISHED, OWNER INSTALLED		
EAT	ENTERING AIR TEMPERATURE	OSA	OUTSIDE AIR		
EF	EXHAUST FAN	OSAD	OUTSIDE AIR DAMPER		
EFF	EFFICIENCY	P	PUMP		
EG	EXHAUST GRILLE	PD	PRESSURE DROP		
ELEV	ELEVATION	PH	PHASE		
ENT	ENTERING	PLBG	PLUMBING		
EQUIP	EQUIPMENT	PLC	PROGRAMMABLE LOGIC CONTROL		
ESP	EXTERNAL STATIC PRESSURE	PRV	PRESSURE REDUCING VALVE		
ET	EXPANSION TANK	PSI	POUNDS PER SQUARE INCH		
ETR	EXISTING TO REMAIN	PSIG	POUNDS PER SQUARE INCH GAGE		
EWT	ENTERING WATER TEMPERATURE				
EXT	EXTERIOR				

**GENERAL SYMBOLS**

	AT
	DIAMETER
	INCHES
	AND
	X DEGREES (ANGLE)
	KEYED NOTE DESIGNATION
	OWNER'S EQUIPMENT NUMBER
	DETAIL OR DETAIL REFERENCE
	ELEVATION
	SECTION TAKEN AT
	EQUIPMENT TAG

**PIPE FITTINGS**

	FLANGE
	UNION
	PIPING REDUCER
	PIPE SLEEVE
	PIPE ANCHOR
	ELBOW INTO PAPER PLANE
	ELBOW OUT OF PAPER PLANE
	TEE OUT OF PAPER PLANE
	TEE INTO PAPER PLANE
	PIPE CAP OR PLUG
	FLOW ARROW
	BREAK IN LINE

**GENERAL NOTES - MECHANICAL**

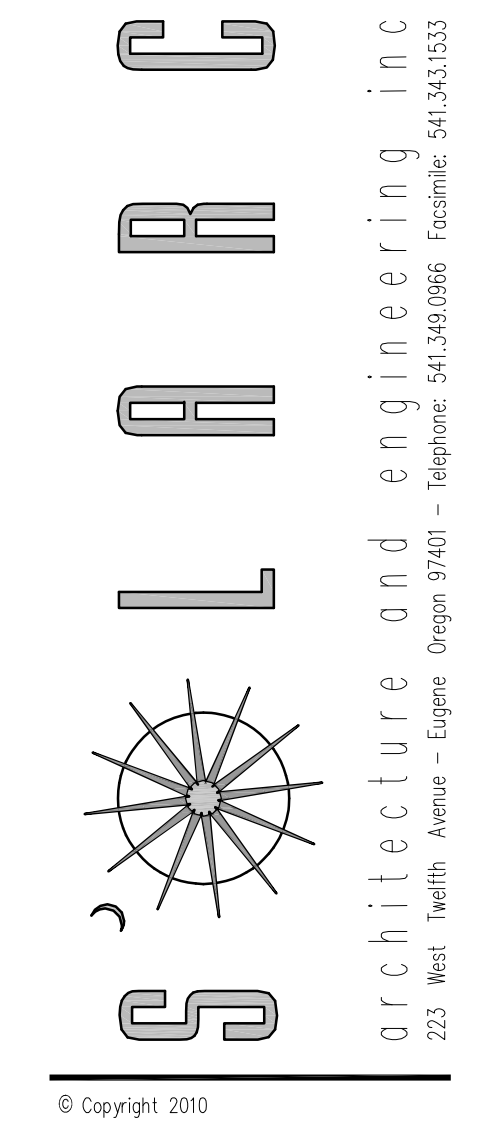
- COORDINATE VOLTAGE AND PHASE REQUIREMENTS FOR SCHEDULED MECHANICAL EQUIPMENT WITH DIVISION 26. REPORT CONFLICTS TO ENGINEER PRIOR TO SUBMITTAL REVIEW AND PURCHASE OF EQUIPMENT.

**MECHANICAL EQUIPMENT INSTALLATION NOTES**

- VERIFY LAYOUT, INSTALLATION REQUIREMENTS, AND PHYSICAL DIMENSIONS OF ACTUAL EQUIPMENT PROVIDED TO ENSURE THAT ACCESS CLEARANCES CAN BE MET.

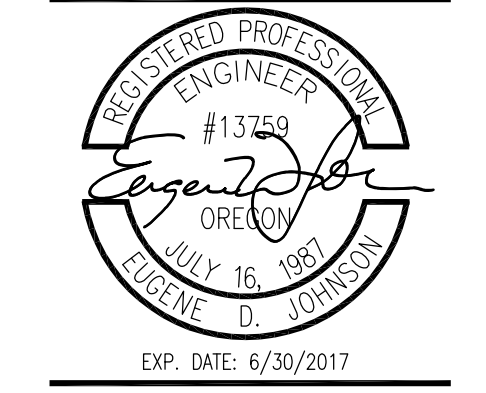
**PIPING NOTES**

- PROVIDE UNIONS OR FLANGES AT PIPING CONNECTIONS FOR EQUIPMENT AS REQUIRED TO ALLOW DISASSEMBLY FOR MAINTENANCE.
- PROVIDE DIELECTRIC UNIONS SEPARATING BELOW GRADE PIPING FROM ABOVE GRADE.
- PROVIDE CATHODIC PROTECTION FOR BURIED FERROUS PIPING. REFER TO DRAWING DETAILS AND/OR SPECIFICATIONS.
- PIPE ROUTING INDICATED IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO SHOW LOCATION AND CONFIGURATION OF MAJOR EQUIPMENT ONLY. CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF PIPING TO BEST ACCOMMODATE SITE CONDITIONS AND ACTUAL EQUIPMENT DIMENSIONS WHILE MINIMIZING FLUID TURBULENCE INSIDE PIPING. OFFSETS SHALL BE KEPT TO A MINIMUM AND STRAIGHT-PIPE DISTANCES SHOWN ON DRAWINGS SHALL BE MAINTAINED.



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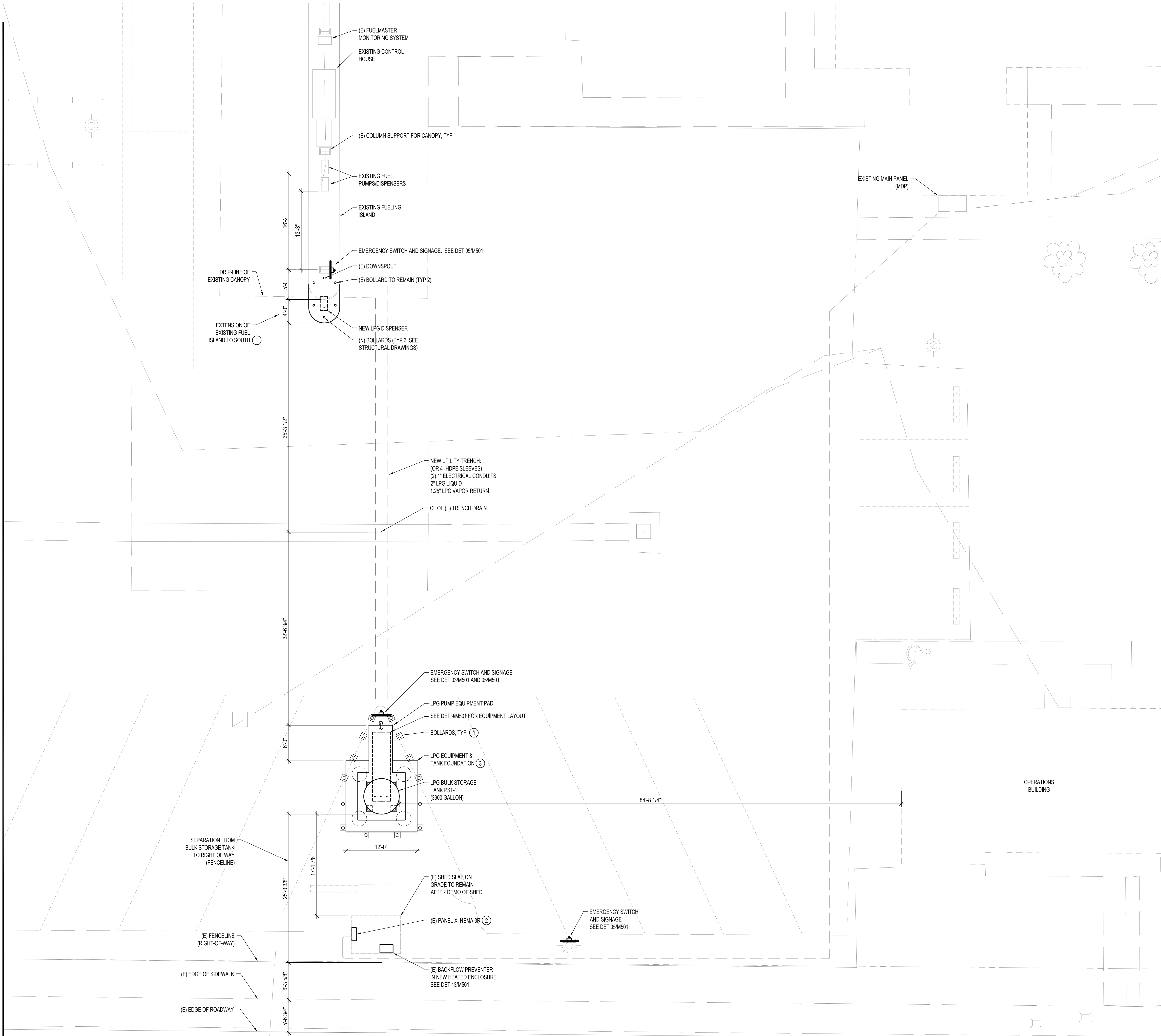
**BUS GARAGE PROPANE FUELING SYSTEM**  
1944 W. 8TH AVE.  
EUGENE, OREGON  
EUGENE SCHOOL DISTRICT 4J



EXP. DATE: 6/30/2017  
PROJECT NO: 15-068  
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DRAWN BY: KC  
CHECKED BY: GJ

REVISED:

**MECHANICAL LEGEND**

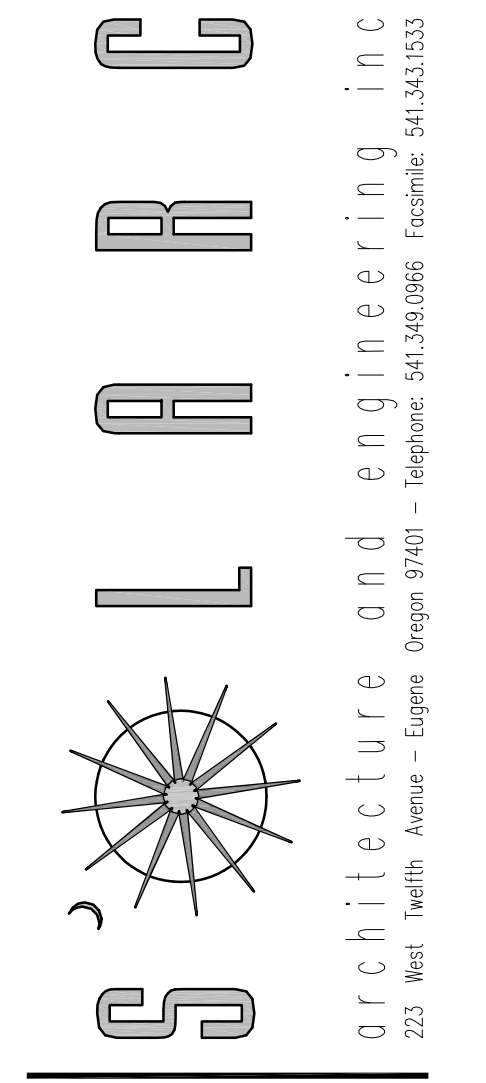


**GENERAL SHEET NOTES**

1. ALL COMPONENTS SHALL CONFORM TO ALL STATE AND LOCAL CODES, AND TO REQUIREMENTS OF NFPA 58, 2014 EDITION.
2. ALL "REDUNDANT AND FAILSAFE" PROVISIONS AND REQUIREMENTS OF NFPA 58 CHAPTER 6.3 AND 6.28 PERTAINING TO REDUCED HORIZONTAL SEPARATION DISTANCES FOR ABOVE GROUND TANKS SHALL BE MET.

**KEYED SHEET NOTES**

- ① REFER TO STRUCTURAL DRAWING DETAIL 14B/S1.1
- ② (E) PANEL X TO REMAIN UNDISTURBED THROUGH DEMOLITION OF (E) SHED STRUCTURE. FOLLOWING DEMOLITION, PANEL WILL BE ATTACHED TO NEW STRUCTURAL STEEL FRAME. REFER TO STRUCTURAL AND ELECTRICAL DRAWINGS.
- ③ REFER TO STRUCTURAL DRAWING S1.1.



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**BUS GARAGE PROPANE FUELING SYSTEM**  
 1944 W. 8TH AVE.  
 EUGENE, OREGON  
 EUGENE SCHOOL DISTRICT 4J



EXP. DATE: 6/30/2017  
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 DRAWN BY: KC  
 CHECKED BY: GJ

REVISED:

**MECHANICAL AREA PLAN**

**M101**  
 SHEET 7 OF 11

**KEYED SHEET NOTES**

- 1 2", 3000# TANK CONNECTION FOR RELIEF VALVES. PROVIDE REGO 8533AG MANIFOLD, WITH THREE (3) REGO 3135MG 1-1/4" RELIEF VALVES, AND ONE SPARE 2" CONNECTION, PLUGGED FOR FUTURE USE.
- 2 1" 3000# TANK CONNECTION FOR UPPER FLOAT GAUGE. PROVIDE MARSHAL EXCELSIOR ACCU-MAX ME830 SERIES, AND ADJUST TO READ 100% ON DIAL AT MAXIMUM FILL (3900 GALLONS WATER CAPACITY).
- 3 3/4" VAPOR RETURN TANK CONNECTION (CONTAINER FILLING). PROVIDE REGO L3148 BACK-CHECK VALVE.
- 4 1/4" BLEED LINE TANK CONNECTION (CONTAINER FILLING). PROVIDE REGO 3165C BLEED/VENT/FIXED LIQUID LEVEL GAUGE, CONNECTED TO INTERNAL DIP TUBE TO LIQUID LEVEL CORRESPONDING TO 85% TANK CAPACITY. PROVIDE WITH OPTIONAL INSTRUCTION PLATE "STOP FILLING WHEN LIQUID APPEARS".
- 5 1-1/4" FILL TRANSFER TANK CONNECTION (CONTAINER FILLING). PROVIDE REGO 3282C EXCESS FLOW VALVE.
- 6 1", 3000# TANK CONNECTION FOR LOWER FLOAT GAUGE. PROVIDE MARSHAL EXCELSIOR ACCU-MAX ME830 SERIES. A "0%" INDICATION WILL CORRESPOND TO THE TANK CAPACITY AT THE CENTERLINE OF THE GAUGE CONNECTION.
- 7 1-1/4", 3000# TANK CONNECTION AND 1-1/2", 3000# TANK CONNECTION FOR LIQUID PUMP FEED. PROVIDE REGO A3209DT050 INTERNAL VALVE WITH REGO A3209PAF PNEUMATIC ACTUATOR ON 1-1/4" CONNECTION. PROVIDE PLUG FOR FUTURE USE ON 1-1/2" CONNECTION.
- 8 1-1/4", 3000# TANK CONNECTION FOR LIQUID PUMP BYPASS. PROVIDE REGO A3209DT050 INTERNAL VALVE WITH REGO A3209PAF PNEUMATIC ACTUATOR.
- 9 1-1/4", 3000# TANK CONNECTION FOR VAPOR RETURN. PROVIDE REGO A3209DT080 INTERNAL VALVE WITH REGO A3209PAF PNEUMATIC ACTUATOR.
- 10 EMERGENCY SHUTDOWN SOLENOID VALVE. PROVIDE ASCO 8320 3-WAY, NORMALLY CLOSED (DE-ENERGIZED), WITH 120VAC NEMA 7 (EXPLOSION-PROOF) SOLENOID ENCLOSURE. INSTALL VALVE AT PROPANE TANK AS CLOSE AS POSSIBLE TO ACTUATORS.
- 11 EMERGENCY SHUTDOWN SWITCH
- 12 1/2" 3000# TANK CONNECTION FOR DIAL THERMOMETER. PROVIDE 3" DIAMETER DIAL, STAINLESS STEEL TRIM, POLYCARBONATE LENS, AND MATCHED STEM AND THERMOWELL, 1/2" MNPT/MIN, 6" LENGTH. THERMOMETER SHALL HAVE RANGE OF -10F TO 160F, AND SHALL BE SEALED, DUST AND WATERPROOF. TARANTIN INDUSTRIES MSCP-SSBT-3-6, OR EQUAL.

**KEYED SHEET NOTES (CONT.)**

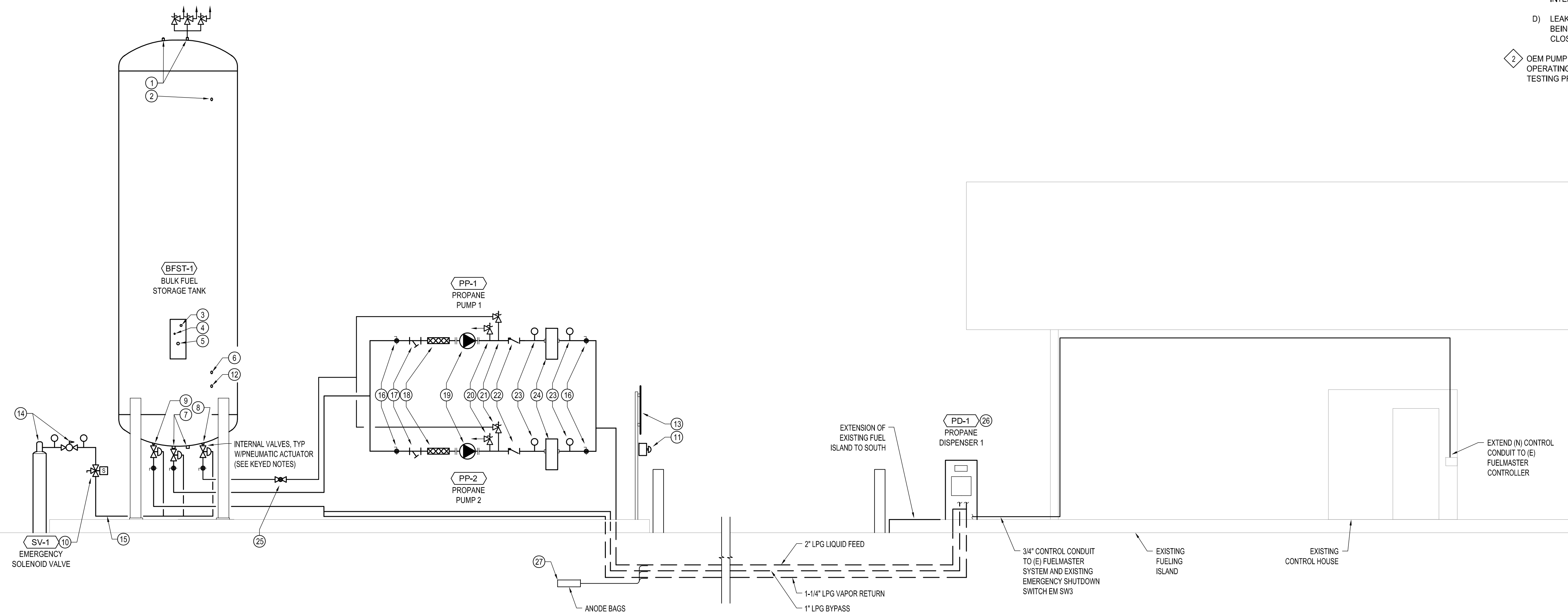
- 13 SIGNAGE (SEE DETAILS 03/M501 AND 05/M501)
- 14 NITROGEN BOTTLE (6 CUFT) AND REGULATOR (30 TO 40 PSIG ADJUSTABLE)
- 15 PNEUMATIC TUBING 1/4" HDPE, PARKER HANNEFIN, OR EQUAL, WITH MELTING TEMPERATURE OF 350 DEGREES F OR LESS.
- 16 MANUAL BALL VALVE, TYP. SIZE TO MATCH LINE. UL LISTED FOR USE WITH PROPANE LIQUID AND VAPOR, 2-PIECE, FULL-PORT, 600 WOG, JOMAR OR EQUAL.
- 17 STRAINER, TYP OF 2. SIZE TO MATCH PIPE, THREADED CONNECTIONS, CLASS 250, 304 STAINLESS SCREENS. MUELLER 11M OR EQUAL.
- 18 FLEXIBLE METAL HOSE. PROVIDE STAINLESS STEEL CORRUGATED METAL HOSE, LPG DUTY, 18" ACTIVE LENGTH, WITH 3000# FORGED STEEL FITTINGS, TWIN CITY HOSE "LPG HOSE", OR EQUAL.
- 19 LIQUID PROPANE PUMP, TYP OF 2. SEE EQUIPMENT SCHEDULES.
- 20 EXTERNAL HYDROSTATIC RELIEF VALVE. PROVIDE REGO 3125L, 1/4". INSTALL PER MANUFACTURER RECOMMENDATIONS.
- 21 BYPASS VALVE, TYP OF 2. PROVIDE BYPASS VALVE MATCHED TO PUMP. BLACKMER BV1.25 OR EQUAL.
- 22 CHECK VALVE, TYP OF 2.
- 23 PUMP DISCHARGE PRESSURE GAUGES, TYP OF 4. 3" DIAL, 0-400 PSIG.
- 24 PROPANE FILTER, TYP OF 2. PROVIDE BLUE MOON FST-634 FILTER VESSEL AND RF-6 REPLACEABLE CARTRIDGES, OR EQUAL.
- 25 MANUAL GLOBE VALVE. PROVIDE REGO A7513FP OR EQUAL, AND TSS3169 VENT VALVES.
- 26 COMMERCIAL DISPENSER. PROVIDE IPS-8899KX0, OR EQUAL. DISPENSER SHALL BE DUAL-HOSE, SIDE-LOAD TYPE COMPLETE WITH LP HOSES (PARKER SERIES 7132.75X10', OR EQUAL), PULLAWAY FITTINGS (REGO A2141), FLOW METER (LIQUID CONTROLS MA4CX10 OR EQUAL), PULSE OUTPUT TO EXISTING FUELMASTER MONITORING SYSTEM, NOZZLES (ELAFLEX GASGUARD GG-20), FACTORY ASSEMBLED, UL LISTED.
- 27 CATHODIC PROTECTION FOR BURIED PIPING. PROVIDE 15# ANODE BAG FOR EACH BURIED PIPELINE. PROVIDE MONITORING WIRING FROM POINT OF ATTACHMENT TO PIPE, TERMINATING NEAR PROPANE FUEL PUMP PAD. PROVIDE INTERCONNECTING 8 GAUGE COPPER WIRE FROM BAG BURIAL LOCATION TO POINT OF CONNECTION TO PIPE. PROVIDE PERMANENT MARKER LOCATING ANODE BAG BURIAL LOCATION.

**GENERAL SHEET NOTES**

1. ALL COMPONENTS SHALL CONFORM TO ALL STATE AND LOCAL CODES, AND TO REQUIREMENTS OF NFPA 58, 2014 EDITION.
2. ALL "REDUNDANT AND FAILSAFE" PROVISIONS AND REQUIREMENTS OF NFPA 58 CHAPTER 6.3 AND 6.28 PERTAINING TO REDUCED HORIZONTAL SEPARATION DISTANCES FOR ABOVE GROUND TANKS SHALL BE MET.
3. ALL PROPANE TRANSFER GAUGES AND TANK CONNECTIONS SHALL BE INSTALLED ON THE NORTH SIDE OF THE TANK IN VIEW OF THE TRANSFER TRUCK LOCATION.
4. PROVIDE LINE SIZED UNIONS WHERE REQUIRED FOR INSTALLATION AND FUTURE DISMANTLING OF THREADED PIPING. UNIONS SHALL BE FORGED STEEL, CLASS 3000, BONNEY FORGE SP-83 OR EQUAL.

**CONTROL NOTES**

- 1 EMERGENCY SHUTDOWN IS DESIGNED TO BE FAIL-SAFE AND REDUNDANT, MEETING REQUIREMENTS OF NFPA 58 2014, CHAPTER 6.3 AND 6.28.
  - A) EMERGENCY SHUTDOWN SWITCHES ARE LOCATED AT: FUELING ISLAND ADJACENT TO DISPENSER; LPG PUMP STATION ADJACENT TO PROPANE STORAGE TANK; AND AT OPERATIONS BUILDING.
  - B) 3-WAY SOLENOID VALVE SV-1 IS NORMALLY CLOSED, AND FAILS CLOSED UPON LOSS OF ELECTRICAL POWER TO ACTUATOR. EMERGENCY SHUTDOWN SWITCHES ARE WIRED IN SERIES SO THAT WHEN ANY SWITCH IS PRESSED POWER TO SV-1 IS REMOVED, CAUSING VALVE TO CLOSE TO NITROGEN GAS, AND OPEN VENT TO DISCHARGE LINE.
  - C) EMERGENCY SHUTDOWN (INTERNAL) VALVES ARE ACTUATED WITH NITROGEN GAS, AND FAIL CLOSED ON LOSS OF PRESSURE TO ACTUATOR. WHEN ANY EMERGENCY SHUTDOWN SWITCH IS PRESSED, NITROGEN PRESSURE IS REMOVED FROM ACTUATOR, CAUSING ALL INTERNAL VALVES TO CLOSE.
  - D) LEAKAGE FROM NITROGEN TUBING OR NITROGEN TANK BEING EMPTIED WILL CAUSE ALL INTERNAL VALVES TO CLOSE.
- 2 OEM PUMP CONTROL PANEL SHALL PROVIDE ALL NORMAL OPERATING MODES, MANUAL SHUTDOWN OF SYSTEM, AND TESTING PROCEDURES AS APPLICABLE.



**13 PIPING SCHEMATIC**  
SCALE: NONE

**BUS GARAGE PROPANE FUELING SYSTEM**  
 1944 W. 8TH AVE.  
 EUGENE, OREGON  
 EUGENE SCHOOL DISTRICT 4J



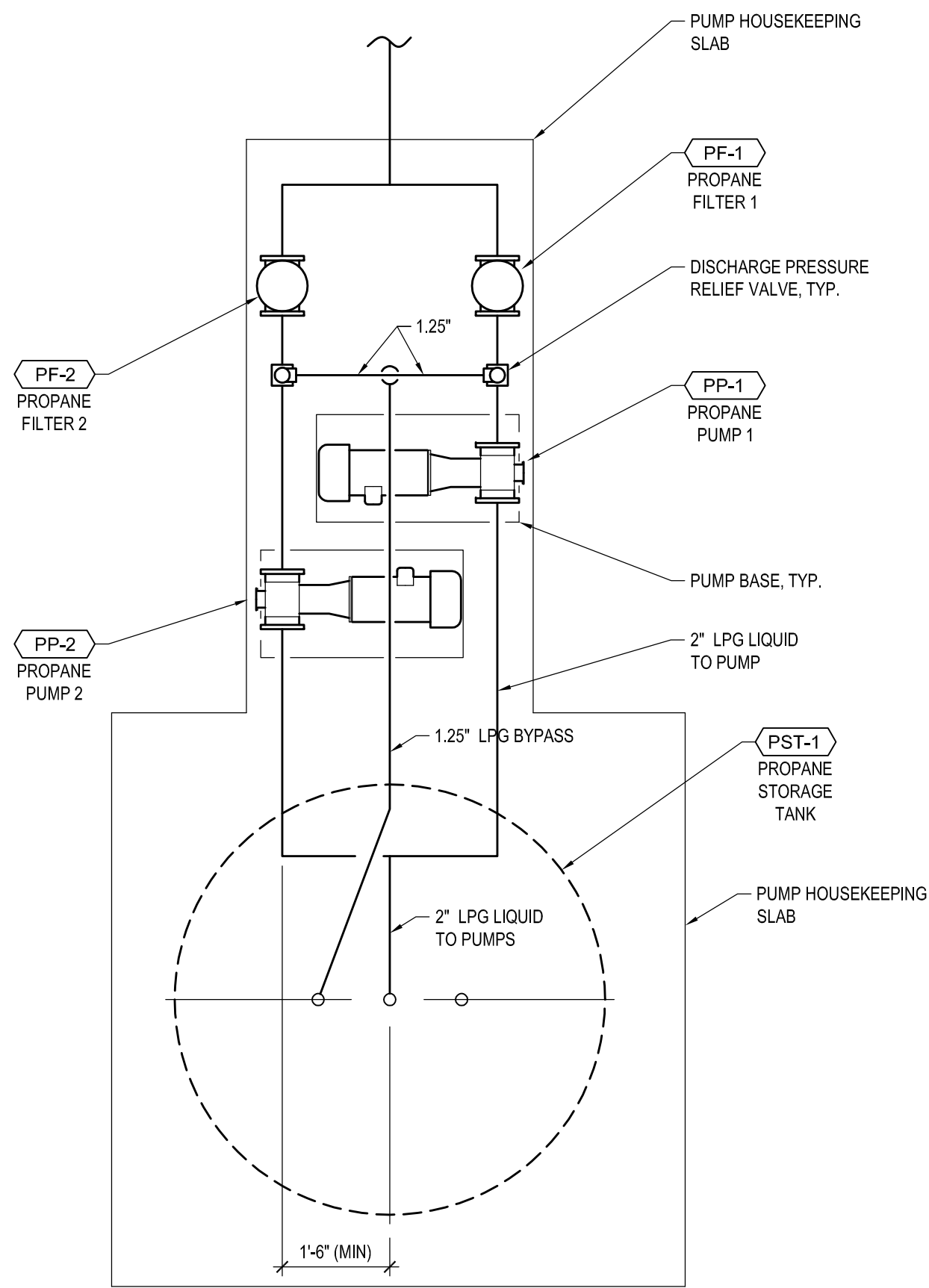
EXP. DATE: 6/30/2017  
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**DRAWN BY:** KC  
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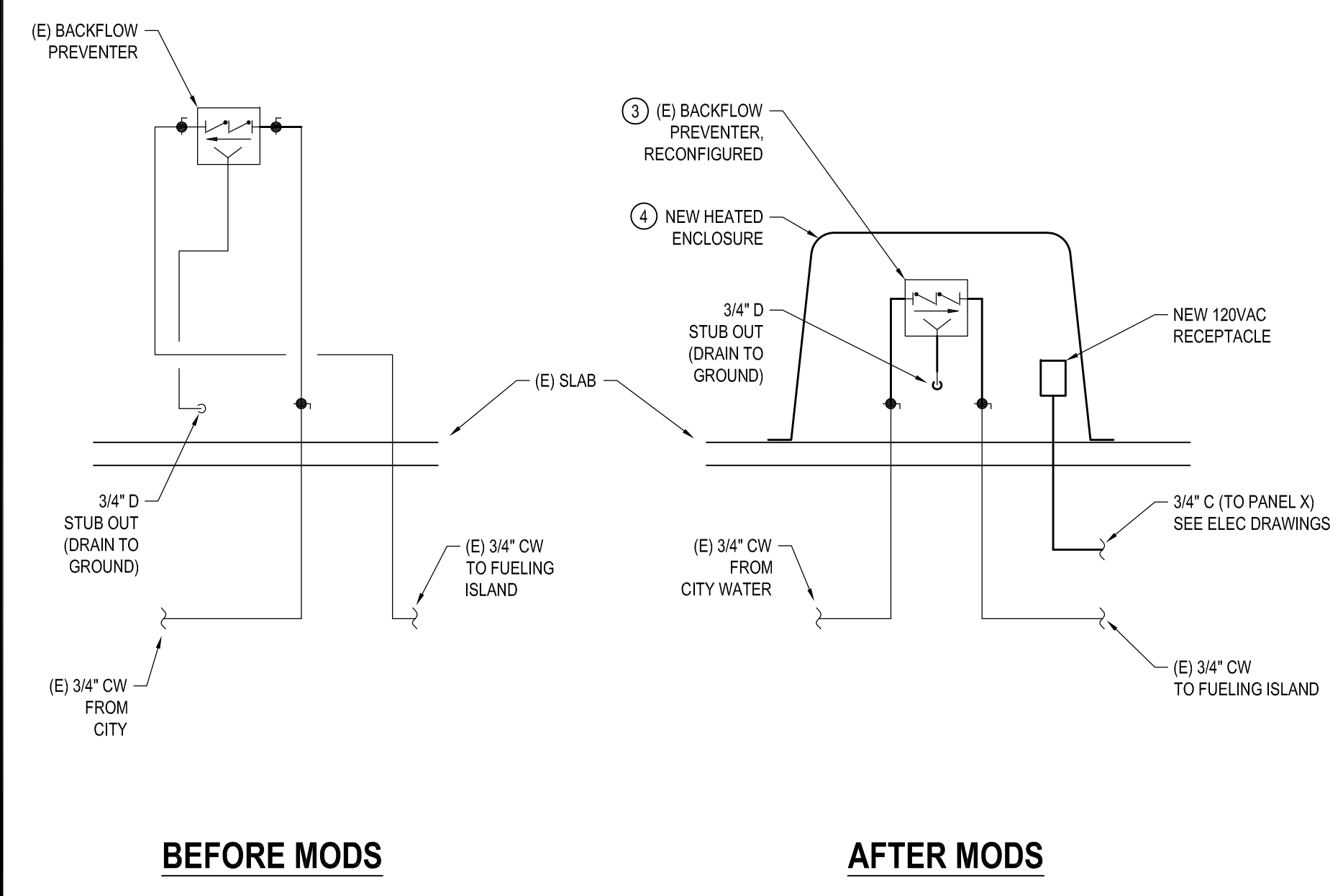
PIPING SCHEMATIC

**M201**





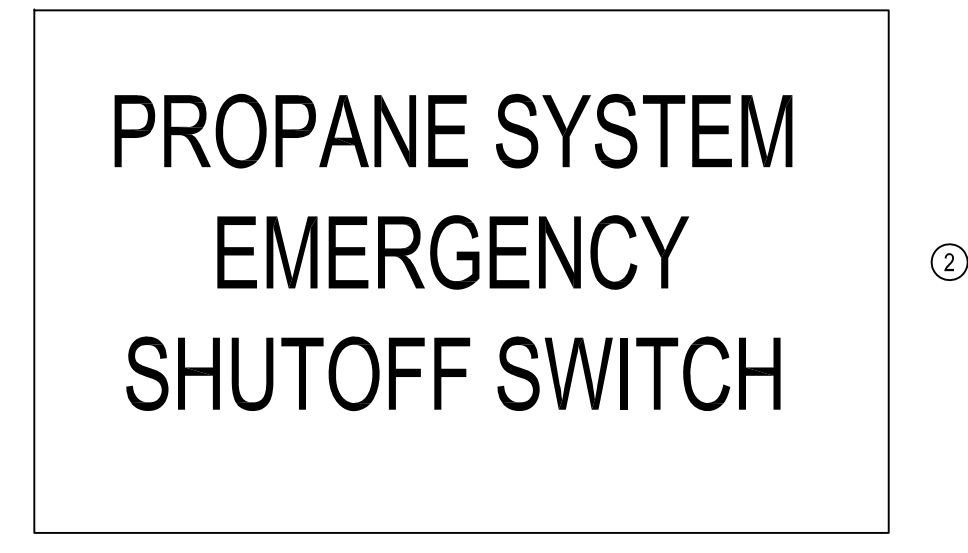
**9 LPG PUMP GENERAL CONFIGURATION - DETAIL**  
SCALE: 1/2" = 1'-0"



**13 BACKFLOW PREVENTER MODIFICATIONS**  
SCALE: 1/2" = 1'-0"



**3 SIGNAGE - DETAIL**  
SCALE: NO SCALE



**5 SIGNAGE - DETAIL**  
SCALE: NO SCALE

**PROPANE PUMPS**

TAG	SERVICE	BASIS OF DESIGN		TYPE	DIFF. PRESS.	FLOW	MOTOR NOM. CAP.	NOMINAL SPEED	ELECTRICAL			WT	NOTES
		MANUFACTURER	MODEL						VOLTS	PH	LOAD		
PP-1	PROPANE PUMP 1	BLACKMER	LGL158C	BASE-MOUNTED	160	32.50	7 1/2	1750	208	3	19.7	425	[1]
PP-2	PROPANE PUMP 2	BLACKMER	LGL158C	BASE-MOUNTED	160	32.50	7 1/2	1750	208	3	19.7	425	[1]

NOTES:  
[1] PROVIDE WITH EXPLOSION PROOF MOTOR.

**PROPANE TANKS**

TAG	SERVICE	BASIS OF DESIGN		TYPE	PHYSICAL DATA			WT. (EMPTY)	NOTES
		MANUFACTURER	MODEL		VOLUME	HEIGHT	DIAMETER		
PST-1	PROPANE STORAGE TANK	ROY E. HANSON JR. MFG	ASME	VERTICAL	3,900	20'-6"	72	9300	[1] [2] [3] [4] [5] [6] [7]

NOTES:  
 [1] TANK SHALL BE ASME STAMPED, 250 PSIG RATED, WITH 4 ANGLE LEGS, DESIGNED FOR SEISMIC ZONE REQUIREMENTS AT SITE LOCATION IN EUGENE, OREGON.  
 [2] TANK SHALL INCLUDE 2" FPT CONNECTION ON TOP OF TANK, AND REGO DELTA PORT RELIEF VALVE MANIFOLD (REGO PART# 8533AG) AND THREE RELIEF VALVES (REGO PART#3135MG).  
 [3] TANK SHALL INCLUDE INTERNAL VALVES WITH ROTARY PNEUMATIC ACTUATORS FOR ALL PIPING CONNECTIONS TO PUMPING AND DISPENSING SYSTEM. SEE DRAWINGS FOR PIPE/VALVE SIZES AND MFR/MODEL.  
 [4] TANK SHALL INCLUDE REMOTE LEVEL SENSOR AND TRANSMITTER, PROVIDING 4-20MA PROPORTIONAL SIGNAL CALIBRATED TO LIQUID LEVEL IN TANK.  
 [5] TANK SHALL INCLUDE MANUAL LEVEL GAUGES, MINIMUM OF TWO (UPPER AND LOWER).  
 [6] PROVIDE TANK WITH EXTRA HEAVY DUTY EPOXY PAINT AND PRIMER COATING SYSTEM. COLOR TO BE CHOSEN BY DISTRICT 4J.  
 [7] PROVIDE TANK WITH INTERNAL PIPING AND EXTERNAL HOSE CONNECTIONS AS REQUIRED FOR TANK FILLING FROM BULK DELIVERY TANKER.

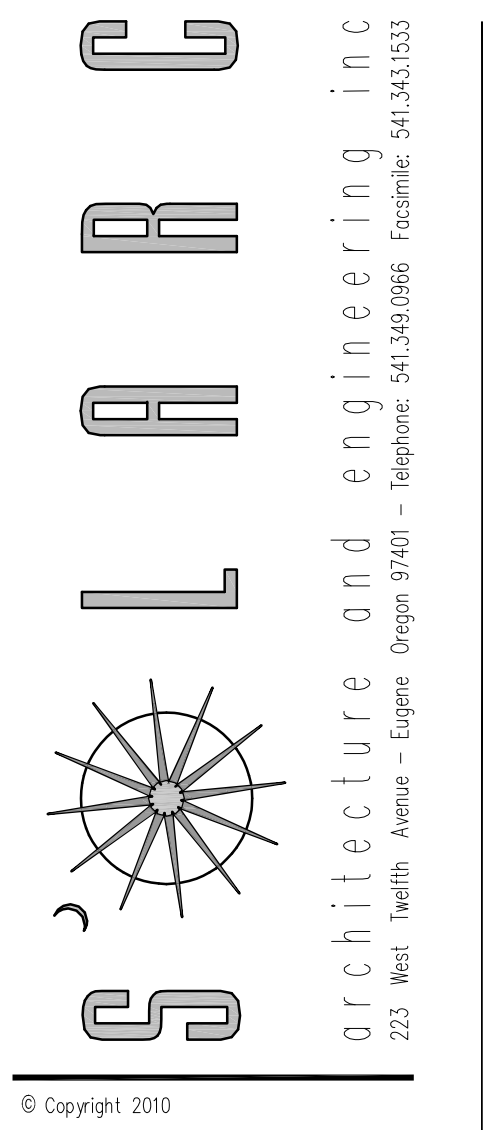
**15 MECHANICAL SCHEDULES**  
SCALE: NONE

**GENERAL SHEET NOTES**

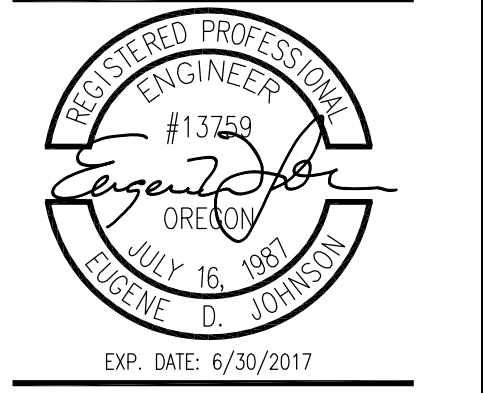
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- ALL "REDUNDANT AND FAILSAFE" PROVISIONS AND REQUIREMENTS OF NFPA 58 CHAPTER 6.3 AND 6.28 PERTAINING TO REDUCED HORIZONTAL SEPARATION DISTANCES FOR ABOVE GROUND TANKS SHALL BE MET.
- ARRANGE PROPANE PIPING TO MINIMIZE TURBULENCE IN PIPING, MINIMIZING FITTINGS AND OFFSETS.

**KEYED SHEET NOTES**

- INSTALL "LOW EMISSION TRANSFER SITE" SIGN IN AREA OF BULK TRANSFER ACTIVITY AS REQUIRED BY NFPA 58 6.28.5.2. USE 3" HIGH BLOCK LETTERING, RED ON WHITE BACKGROUND.
- INSTALL "PROPANE SYSTEM EMERGENCY SHUTOFF SWITCH" SIGN AT EACH EMERGENCY SWITCH SHOWN ON THE DRAWINGS. USE 3" HIGH BLOCK LETTERING, RED ON WHITE BACKGROUND.
- HEAT TAPE AND INSULATE ABOVE-SLAB 3/4" COPPER PIPING, EXCEPT DRAIN. HEAT TAPE SHALL BE 120VAC, SELF-REGULATING TYPE, CHROMOLOX #30 OR EQUAL (SAFE-T-COVER.COM).
- PROVIDE NEW BACKFLOW PREVENTER COVER, DESIGNED TO MOUNT ON CONCRETE SLAB. ENCLOSURE SHALL PROVIDE LOCK TABS FOR OWNER-FURNISHED PADLOCK, AND SHALL BE INSULATED TO A MINIMUM OF R13. SAFE-T-COVER MODEL 75AN-SL, OR EQUAL (SAFE-T-COVER.COM).



**BUS GARAGE PROPANE FUELING SYSTEM**  
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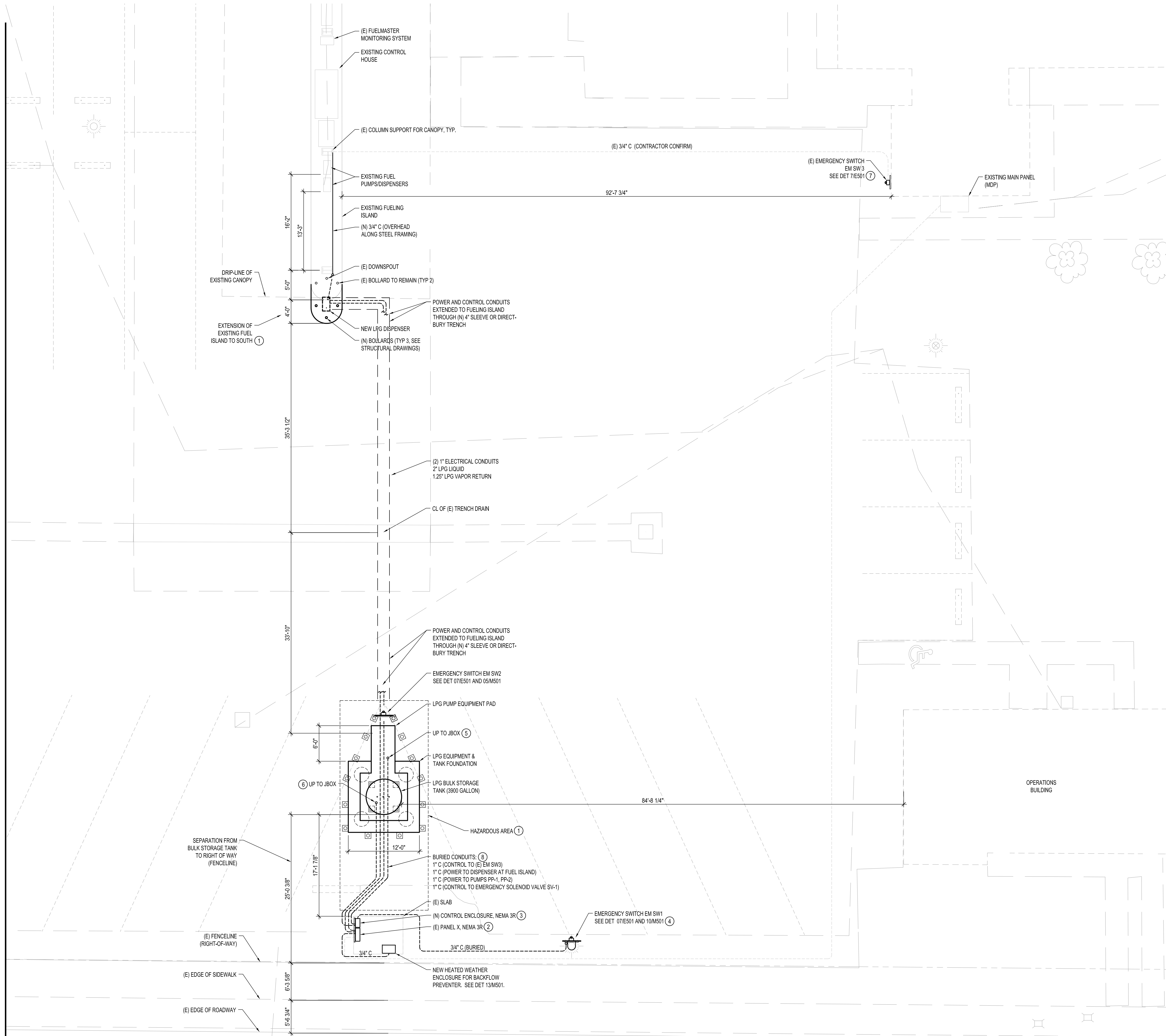


PROJECT NO: 15-068  
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CHECKED BY: GJ

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DETAILS,  
DIAGRAMS  
AND  
SCHEDULES

**M501**  
SHEET 9 OF 11

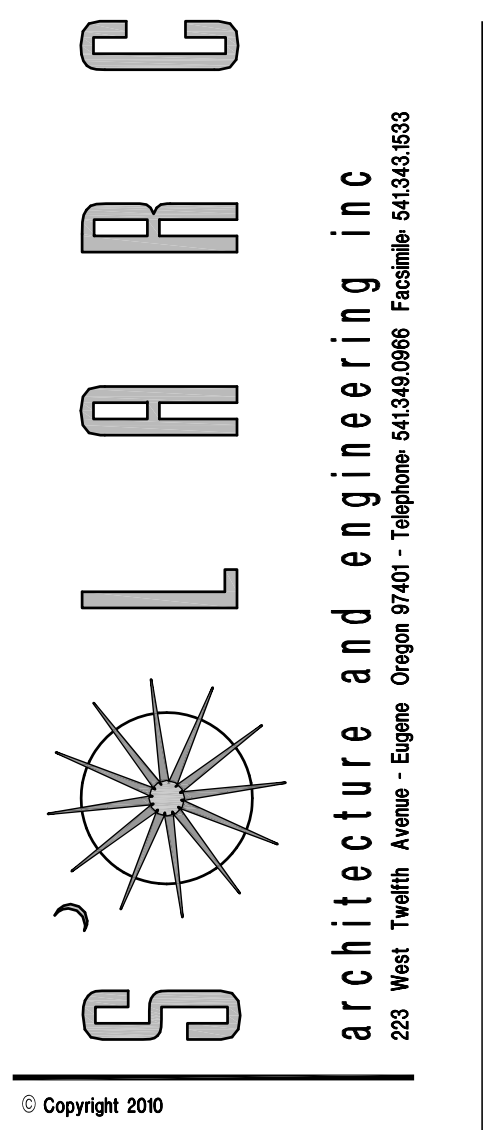


**GENERAL SHEET NOTES**

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2. ALL "REDUNDANT AND FAIL SAFE" PROVISIONS AND REQUIREMENTS OF NFPA 58 CHAPTER 6.3 AND 6.28 PERTAINING TO REDUCED HORIZONTAL SEPARATION DISTANCES FOR ABOVE GROUND TANKS SHALL BE MET.
3. MINOR DEMOLITION (NOT SHOWN) IN SHED STRUCTURE INCLUDES:
  - 3.1. SHED LIGHTING FIXTURE AND CIRCUIT
  - 3.2. SHED RECEPTACLE (ONE) AND CIRCUIT
  - 3.3. 12X12 NEMA 12 PANEL AND CONTACTOR (ABANDONED)
  - 3.4. (E) EMERGENCY SHUTDOWN SWITCH (RETAIN CIRCUIT IF POSSIBLE FOR USE IN NEW EMERGENCY SHUTDOWN CIRCUIT).

**KEYED SHEET NOTES**

- ① ALL ELECTRICAL COMPONENTS IN THIS AREA SHALL CONFORM TO NFPA AND NEC CODE REQUIREMENTS FOR CLASS 1 DIV 2 HAZARDOUS AREAS.
- ② EXISTING PANEL X TO REMAIN IN ORIGINAL POSITION AND LOCATION. EXISTING CIRCUITS TO REMAIN UNDISTURBED DURING DEMOLITION OF SHED STRUCTURE. FOLLOWING DEMO OF SHED STRUCTURE, REPLACE TEMPORARY PANEL SUPPORTS WITH NEW STEEL FRAME, UNISTRUT P1000 OR EQUAL.
- ③ NEW CONTROL ENCLOSURE, NEMA 3R. ATTACH TO SIDE OF (E) PANEL X.
- ④ MOUNT NEW EMERGENCY SWITCH AND SIGN ON NEW STRUT FRAME. ATTACH TO (E) LIGHT POLE.
- ⑤ UP TO PUMPS PP-1 AND PP-2
- ⑥ UP TO EMERGENCY SOLENOID VALVE SV-1
- ⑦ EXTEND (E) EMERGENCY SHUTDOWN CIRCUIT TO FUELING ISLAND USING (E) CONDUIT.
- ⑧ PROVIDE SEAL OFFS AT EACH END OF EACH OF THESE CONDUITS, AND AT EACH END OF ANY CONDUIT INSTALLED UNDER THIS PROJECT IN AN AREA DEFINED AS HAZARDOUS BY CURRENT VERSIONS OF NEC AND NFPA.



**BUS GARAGE PROPANE FUELING SYSTEM**  
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 EUGENE SCHOOL DISTRICT 4J



PROJECT NO: 15-068  
 ISSUE DATE: 02 MAY 2016  
 DRAWN BY: KC/GJ  
 CHECKED BY: JK

REVISED:

**ELECTRICAL PLAN DEMO & NEW**

**E101**  
 SHEET 10 OF 11

**GENERAL SHEET NOTES**

- EXISTING CONDITIONS AS REPRESENTED ARE BASED ON BEST AVAILABLE INFORMATION. CONTRACTOR SHALL CONFIRM ALL EXISTING CONDITIONS AS NECESSARY FOR BIDDING AND CONSTRUCTION, AND SHALL NOTIFY PROJECT OWNER AND ENGINEER IMMEDIATELY OF ANY DISCREPANCY BETWEEN PROJECT DOCUMENTS AND ACTUAL SITE CONDITIONS.
- ALL COMPONENTS SHALL CONFORM TO APPLICABLE STATE AND LOCAL CODES AND THE REQUIREMENTS OF NFPA 58, 2014 EDITION.
- ALL "REDUNDANT AND FAILSAFE" PROVISIONS AND REQUIREMENTS OF NFPA 58 CHAPTER 6.3 AND 6.28 PERTAINING TO REDUCED HORIZONTAL SEPARATION DISTANCES FOR ABOVE GROUND TANKS SHALL BE MET.

**KEYED SHEET NOTES**

- EXTEND EXISTING EMERGENCY SWITCH CIRCUIT FROM EXISTING SWITCH (ON WEST EXTERIOR OF TRANSPORTATION BUILDING) THROUGH EXISTING CONDUIT TO AN EXISTING JBOX AT FUELING ISLAND, AND THEN THROUGH NEW CONTROL CONDUIT TO PANEL XC LOCATED SOUTH OF NEW PROPANE STORAGE TANK.
- SEE DRAWING 13/E101 FOR LOCATION OF (E) EMERGENCY SWITCH EM SW3.

**CONTROL NOTES**

- DEPRESSING ANY EXISTING OR NEW EMERGENCY SWITCHES SHALL ENERGIZE RELAY R1, CLOSING NORMALLY OPEN CONTACTS AND THEREBY ENERGIZING SHUNT TRIP BREAKER CIRCUIT IN PANEL X AND DE-ENERGIZING THE ENTIRE PROPANE FUELING SYSTEM.  
AN EMERGENCY EVENT THUS INITIATED SHALL REQUIRE A MANUAL RESET OF SHUNT TRIP BREAKERS TO RE-ESTABLISH POWER TO PROPANE FUELING SYSTEM.
- BREAKAWAY HOSE DETECTION AT DISPENSER HOSES AT FUELING ISLAND SHALL ALSO BE WIRED TO PROVIDE AUTOMATIC ACTUATION OF EMERGENCY RELAY R1 AND SUBSEQUENT EMERGENCY SHUTDOWN OF ENTIRE FUELING SYSTEM.
- FOLLOWING ACTIVATION OF SHUTDOWN AS DESCRIBED ABOVE, SHUNT TRIP BREAKER SUPPLYING POWER TO SOLENOID VALVE SV-1 SHALL OPEN, AND NORMALLY CLOSED SPRING-RETURN SOLENOID VALVE SV-1 SHALL CLOSE INLET PORT, OPEN OUTLET PORT, AND OPEN VENT PORT, DEPRESSURIZING ACTUATORS ON EACH PROPANE VALVE, CAUSING THE VALVES TO CLOSE.
- CONTROLS SHALL INCLUDE A NORMAL SYSTEM START/STOP SWITCH FOR USE BY OPERATORS. SWITCH SHALL BE INSTALLED ON CONTROL ENCLOSURE LOCATED AT PANEL X, AND SHALL BE CLEARLY MARKED WITH "PROPANE SYSTEM ON" AND "PROPANE SYSTEM OFF" ON PANEL FACE.

**PANEL SCHEDULE**

**PANEL:** Panel X Existing  
**VOLTS:** 120/208  
**LOCATION:** MECHANICAL SHED  
**MOUNTING:** SURFACE  
**NOTES:** Square Existing Panel X is mounted in wood framed structure that is to be demolished. Panel to be braced during demo, and a new structural support built, to which Panel will then be connected.  
**NEMA TYPE:** 3R  
**BUS RATING:** 100  
**FEEDER AMPS:**  
**MAIN:** BREAKER  
**WIRE:** 4  
**PHASE:** 3  
**DATE:** March 15, 2016  
**PROJECT:** 4j Bus Garage Propane Fueling Station

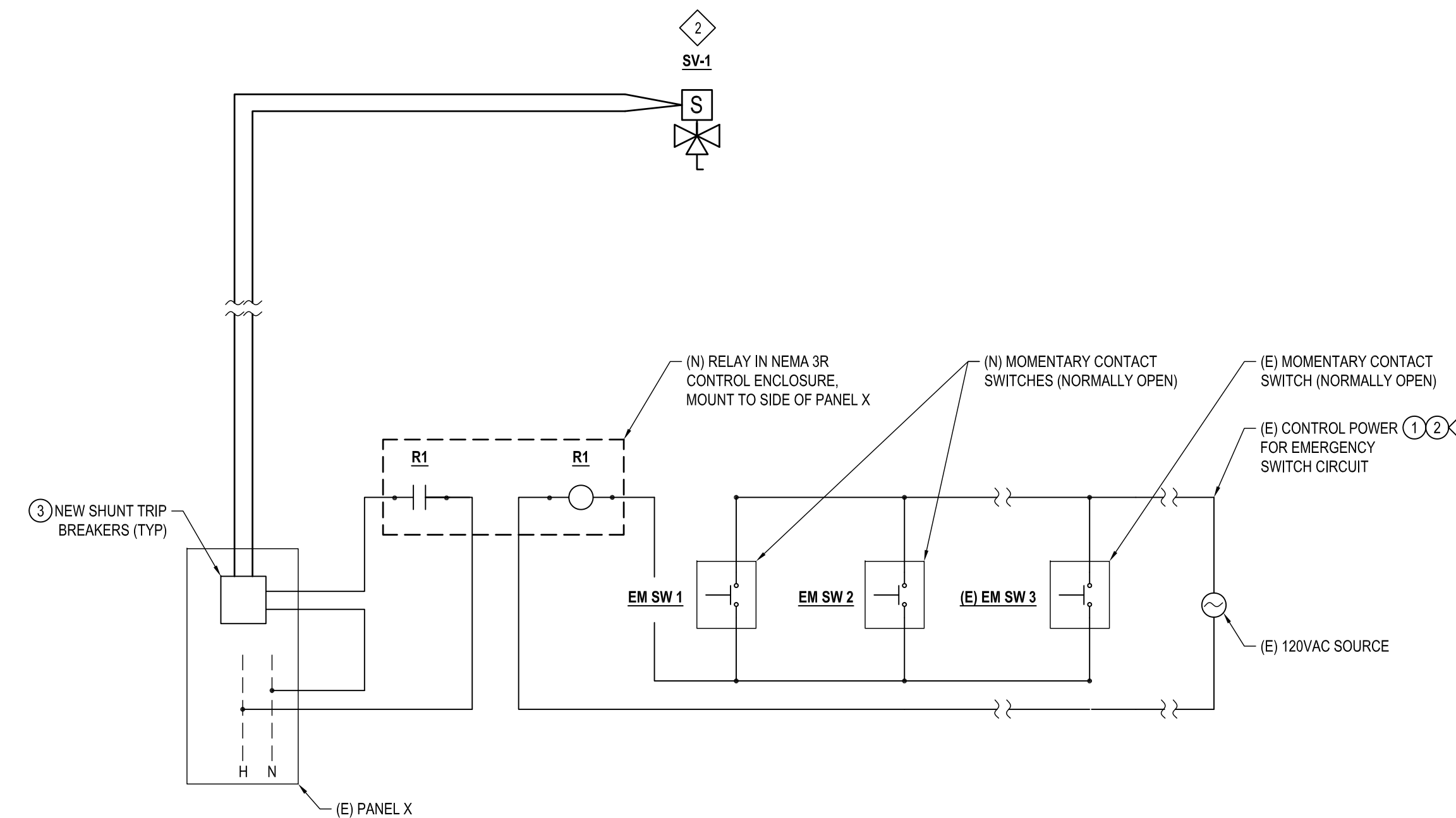
LOAD CLASS	Conn. VA	Demand Factor	Demand Load VA
LIGHTING	300	125%	375
OUTLETS	11160	*	10580
MOTOR LOADS	7100	**	8600
RESISTANCE LOADS	2000	100%	2000
MISC. LOADS	0	100%	0
SUBFEED	0	100%	0
PHOTOVOLTAIC	0	100%	0

	Connected	Demand
TOTAL VOLT-AMPS	20,560	21,555
MAXIMUM PHASE AMPS	73.0	74.7

SWITCH/FUSE A P	WIRE SIZE	DESCRIPTION	WATTS	CIR. NO.	PHASE	CIR. NO.	WATTS	DESCRIPTION	WIRE SIZE	SWITCH/FUSE P A
40	3	8	Spare	0	1	A	2	360	Plugs on Building In and Out	12 1 20
40	3	8	Spare	0	3	B	4		Spare	
40	3	8	Spare	0	5	C	6	300	Lights In and Out	12 1 20
20	2	12	Cadet Heater	1000	7	A	8	1800	Plug Ped A	12 1 20
20	2	12	Cadet Heater	1000	9	B	10	1800	Plug Ped A	12 1 20
			Spare		11	C	12	1100	Propane Dispenser	12 1 20
20	1	12	Plug Ped C	1800	13	A	14	1800	Plug Ped B	12 1 20
20	1	12	Plug Ped C	1800	15	B	16	1800	Plug Ped B	12 1 20
					17	C	18	2000	Propane Pump Motor	6 3 30
					19	A	20	2000	Propane Pump Motor	6 3 30
					21	B	22	2000	Propane Pump Motor	6 3 30
					23	C	24			
					25	A	26			
					27	B	28			
					29	C	30			
					31	A	32			
					33	B	34			
					35	C	36			
					37	A	38			
					39	B	40			
					41	C	42			

PHASE TOTALS	Connected VA	Demand VA	Connected Amps	Demand Amps
A	8760	8961	73.0	74.7
B	8400	8619	70.0	71.8
C	3400	3975	28.3	33.1

\* 10kVA at 100%, remainder at 50%  
 \*\* 100% plus 25% of the largest Motor



**7 EMERGENCY SHUTDOWN SCHEMATIC DIAGRAM**

NO SCALE

**5 ELECTRICAL PANEL SCHEDULE, EXISTING**

SCALE: NO SCALE

**PANEL SCHEDULE**

**PANEL:** Panel X Proposed  
**VOLTS:** 120/208  
**LOCATION:** Mount panel permanently to new steel frame at same location.  
**MOUNTING:** SURFACE  
**NOTES:**  
 1. Provide new 40/3 shunt trip circuit breaker for new pump.  
 2. Connect new pump PP-2 to new 40/3 shunt trip circuit breaker.  
 3. Move Plug Pedestal circuit to Phase "C" breaker. Revise phase labeling at pedestal and at panel. Replace existing 20/1 circuit breakers with new 20/1 shunt trip circuit breakers.  
 4. Replace existing 20/1 circuit breaker with new 20/1 shunt trip circuit breaker.  
**NEMA TYPE:** 1  
**BUS RATING:** 100  
**FEEDER AMPS:**  
**MAIN:** BREAKER  
**WIRE:** 4  
**PHASE:** 3  
**DATE:** March 15, 2016  
**PROJECT:** 4j Bus Garage Propane Fueling Station

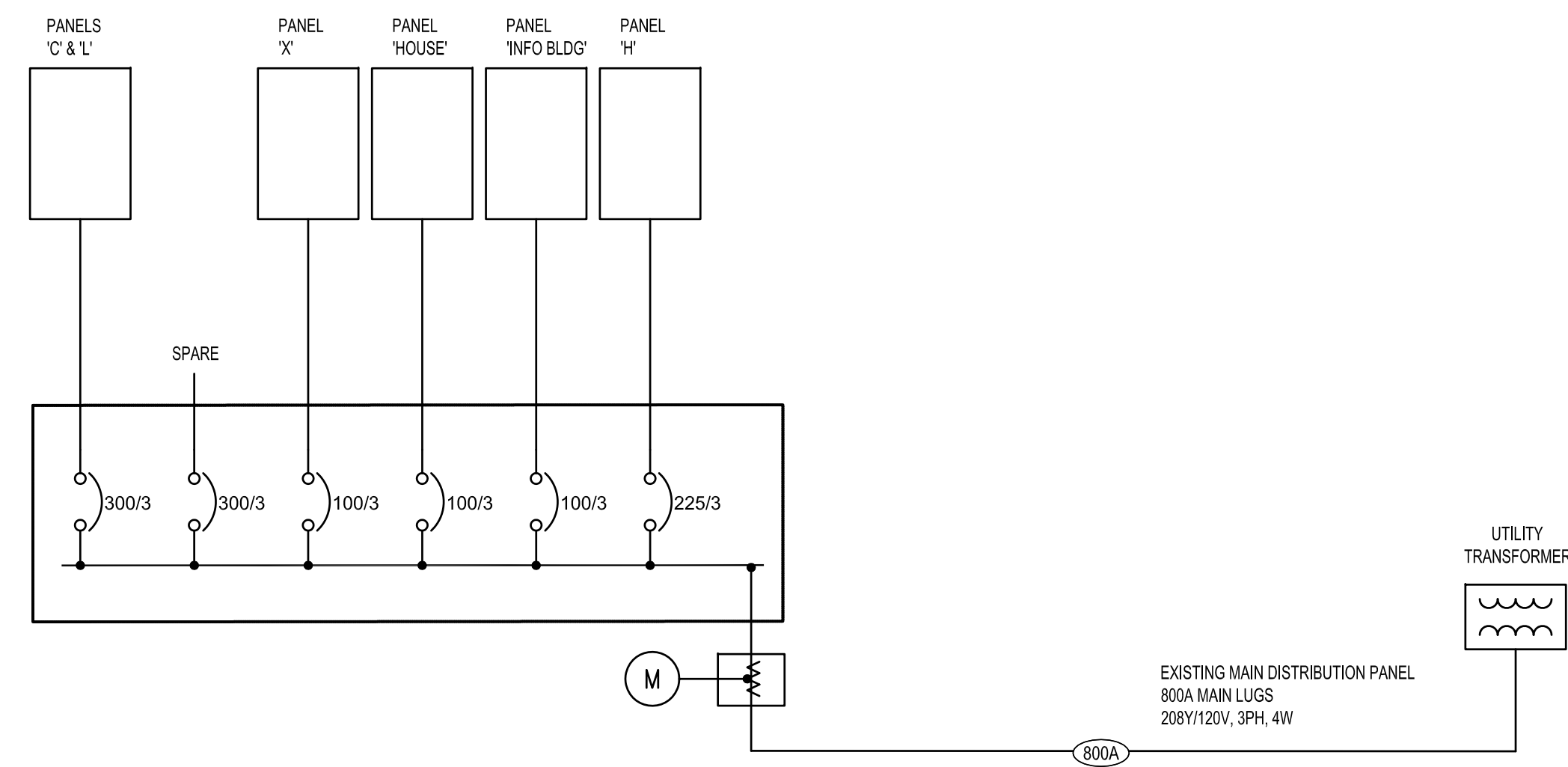
LOAD CLASS	Conn. VA	Demand Factor	Demand Load VA
LIGHTING	0	125%	0
OUTLETS	100	100%	100
MOTOR LOADS	18280	100%	20440
RESISTANCE LOADS	10800	125%	13500
MISC. LOADS	0	100%	0
SUBFEED	0	100%	0
PHOTOVOLTAIC	0	100%	0

	Connected	Demand
TOTAL VOLT-AMPS	29,180	34,040
MAXIMUM PHASE AMPS	86.3	94.5

SWITCH/FUSE A P	WIRE SIZE	DESCRIPTION	WATTS	CIR. NO.	PHASE	CIR. NO.	WATTS	DESCRIPTION	WIRE SIZE	SWITCH/FUSE P A
40	3	8	Pump PP-2 Motor (see Note 2)	2880	1	A	2	100	Control Power to SV-1 (see Note 4)	12 1 20
40	3	8	Pump PP-2 Motor (see Note 2)	2880	3	B	4		Space	
40	3	8	Pump PP-2 Motor (see Note 2)	2880	5	C	6	1800	Plug Ped A (see Note 3)	12 1 20
20	2	12	Spare	0	7	A	8		Space	
20	1	12	Spare	0	9	B	10	1800	Plug Ped A (see Note 3)	12 1 20
20	1	12	Plug Ped C (see Note 3)	1800	11	C	12	1000	Propane Dispenser (see Note 4)	12 1 20
20	1	12	Plug Ped C (see Note 3)	1800	13	A	14	1800	Plug Ped B	12 1 20
			Space		15	B	16	1800	Plug Ped B	12 1 20
40	3	8	Pump PP-1 Motor (see Note 1)	2880	17	C	18	0	Spare	6 3 50
40	3	8	Pump PP-1 Motor (see Note 1)	2880	19	A	20	0	Spare	6 3 50
40	3	8	Pump PP-1 Motor (see Note 1)	2880	21	B	22	0	Spare	6 3 50
					23	C	24			
					25	A	26			
					27	B	28			
					29	C	30			
					31	A	32			
					33	B	34			
					35	C	36			
					37	A	38			
					39	B	40			
					41	C	42			

PHASE TOTALS	Connected VA	Demand VA	Connected Amps	Demand Amps
A	9460	11080	78.8	92.3
B	9360	10980	78.0	91.5
C	10360	11980	86.3	99.8

\* 10kVA at 100%, remainder at 50%  
 \*\* 100% plus 25% of the largest Motor



**15 ELECTRICAL ONE LINE - ALL PANELS AND FEEDERS ARE EXISTING**

SCALE: NO SCALE

**13 ELECTRICAL PANEL SCHEDULE, PROPOSED**

SCALE: NO SCALE

**BUS GARAGE PROPANE FUELING SYSTEM**  
 1944 W. 8TH AVE.  
 EUGENE, OREGON  
 EUGENE SCHOOL DISTRICT 4J



PROJECT NO: 15-068  
 ISSUE DATE: 02 MAY 2016  
 DRAWN BY: KC  
 CHECKED BY: GJ  
 EE

REVISED:

**ELECTRICAL PANEL SCHEDULE AND ONE LINE**