

# CITY OF ANN ARBOR, MICHIGAN ARBOR LANDING LIFT STATION STANDBY GENERATOR INSTALLATION AND CONTROL IMPROVEMENTS

## DRAWING LIST

- E-00 SITE LOCATION PLAN
- E-01 SITE PLAN AND DETAILS
- E-02 LIFT STATION SCHEMATICS
- E-03 TELEMETRY CONTROL PANEL
- E-04 TELEMETRY PANEL
- E-05 TYPICAL DETAILS
- S-01 NOTES, SYMBOLS, ABBREVIATIONS, GENERATOR PAD PLAN, SECTION

## SITE ADDRESS

410 PARKWOOD STREET  
49 S. OLD DIXBORO ROAD - WWTP

**MALCOLM  
PIRNIE**  
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REVISIONS			
NO.	BY	DATE	REMARKS

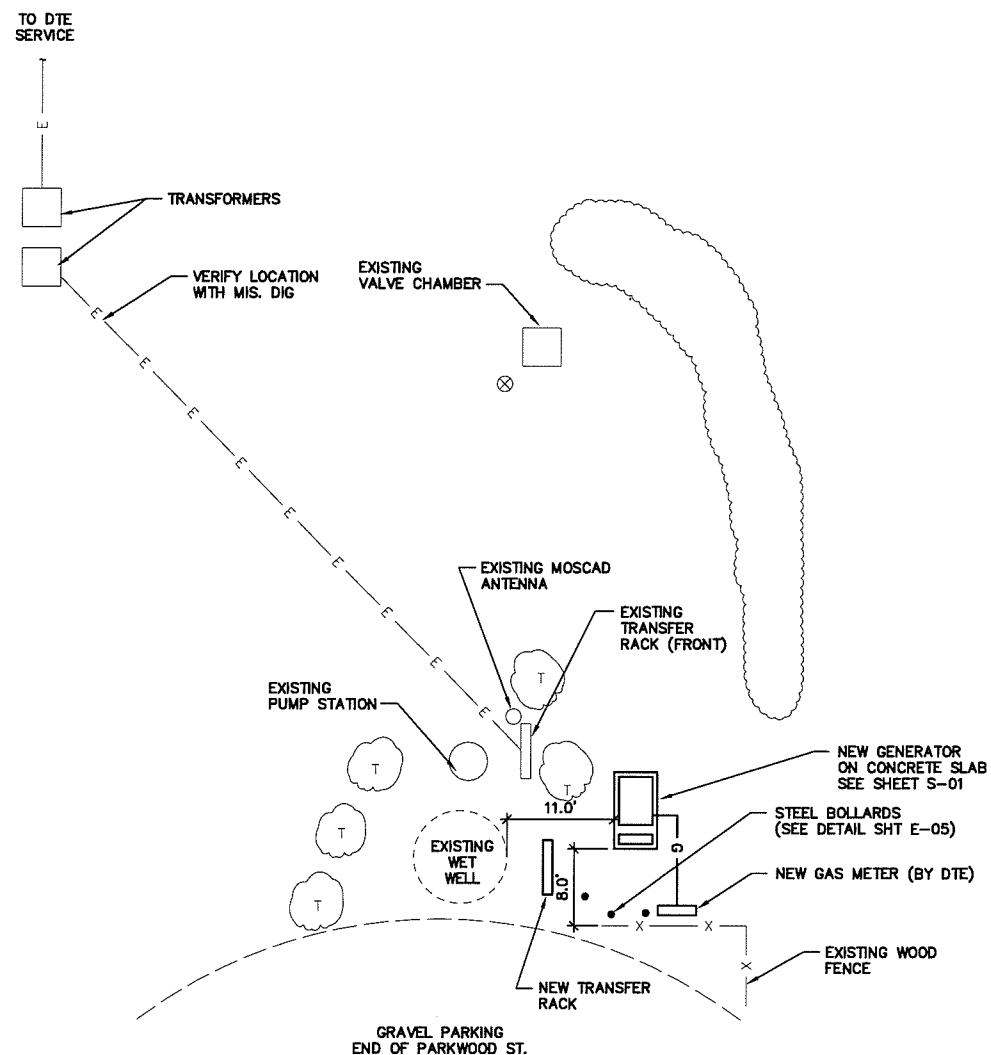
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CITY OF ANN ARBOR, MICHIGAN  
**ARBOR LANDING LIFT STATION  
STANDBY GENERATOR INSTALLATION  
AND CONTROL IMPROVEMENTS**

**SITE LOCATION PLAN**

SCALE: NONE

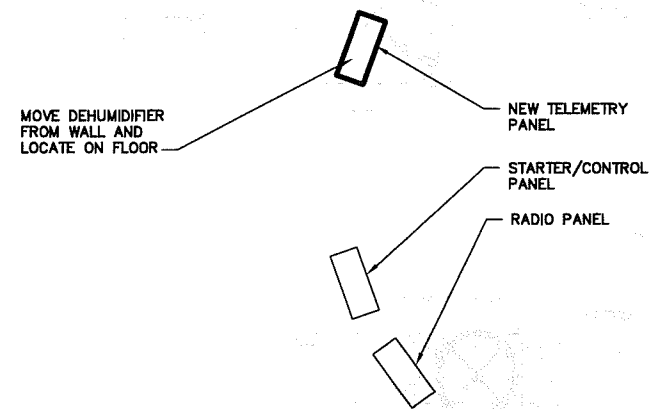
ISSUED STATUS: REVIEW  
DATE SEPTEMBER 2008  
SHEET E-00  
CAD REF. NO. 3185008\_000



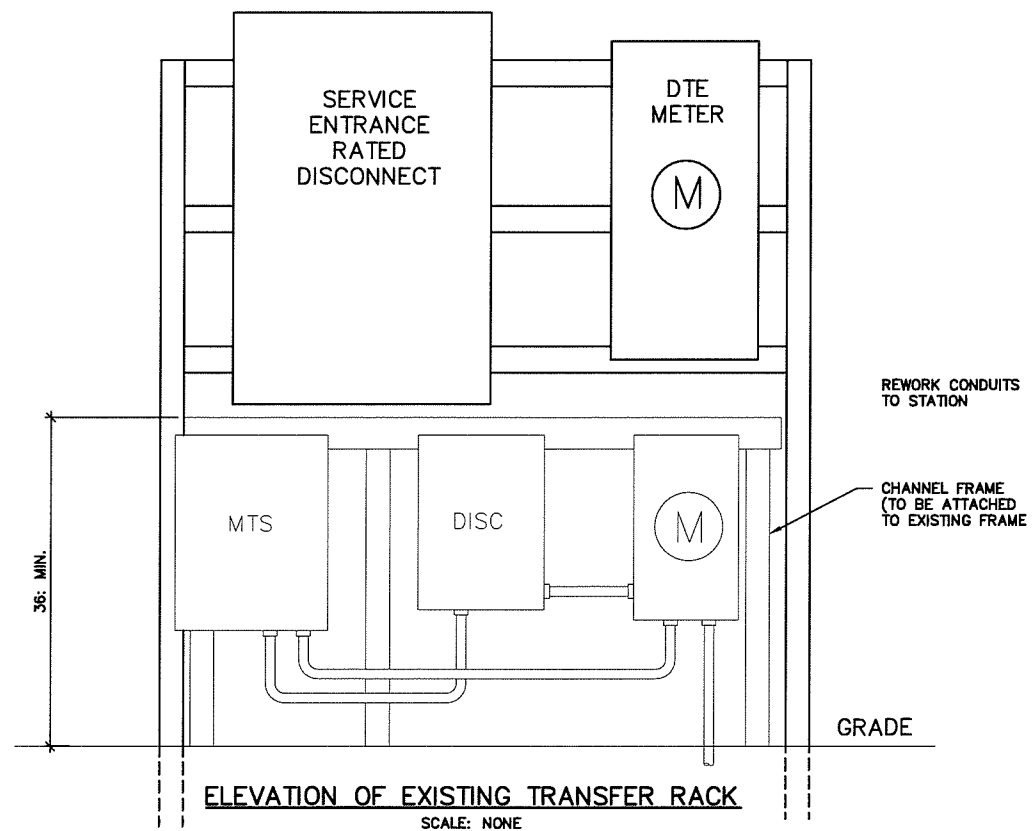
**SITE PLAN**  
SCALE: 1" = 10'-0"

**LEGEND**

- EXISTING TREE
- BURIED ELECTRIC
- BURIED GAS



**PLAN OF PUMPING STATION**  
SCALE: NONE



**ELEVATION OF EXISTING TRANSFER RACK**  
SCALE: NONE



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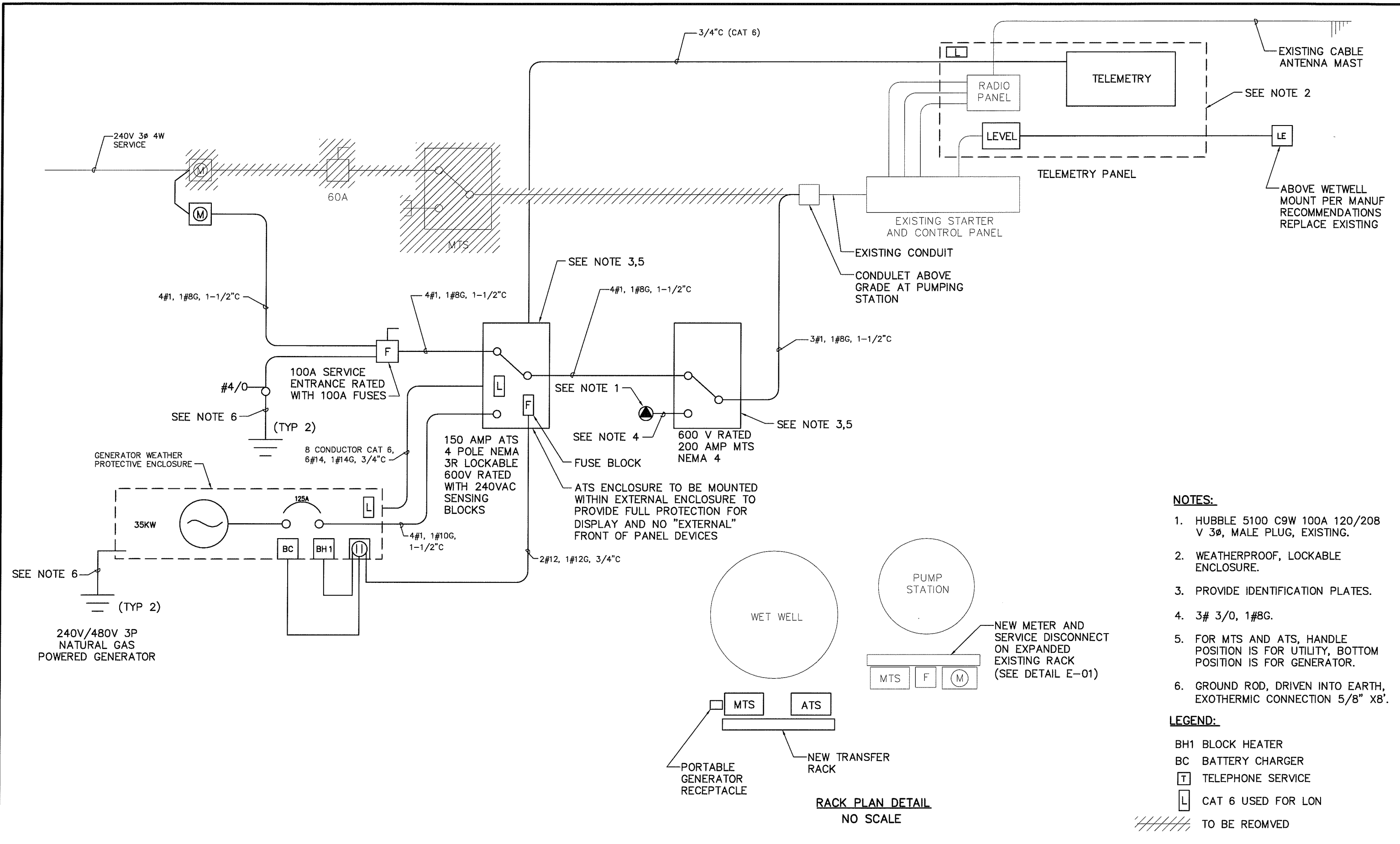
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CITY OF ANN ARBOR, MICHIGAN  
**ARBOR LANDING LIFT STATION  
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**SITE PLAN AND DETAILS**

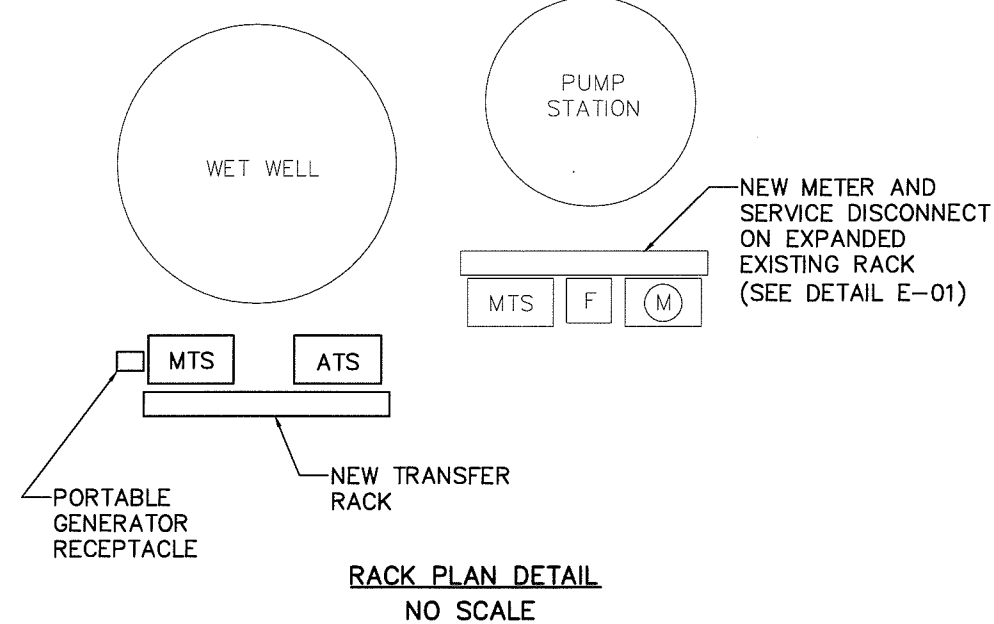
SCALE: AS SHOWN

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CAD REF. NO. 3185008\_001



- NOTES:**
- HUBBLE 5100 C9W 100A 120/208 V 3Ø, MALE PLUG, EXISTING.
  - WEATHERPROOF, LOCKABLE ENCLOSURE.
  - PROVIDE IDENTIFICATION PLATES.
  - 3# 3/0, 1#8G.
  - FOR MTS AND ATS, HANDLE POSITION IS FOR UTILITY, BOTTOM POSITION IS FOR GENERATOR.
  - GROUND ROD, DRIVEN INTO EARTH, EXOTHERMIC CONNECTION 5/8" X8'.

- LEGEND:**
- BH1 BLOCK HEATER
  - BC BATTERY CHARGER
  - T TELEPHONE SERVICE
  - L CAT 6 USED FOR LON
  - ////// TO BE REMOVED



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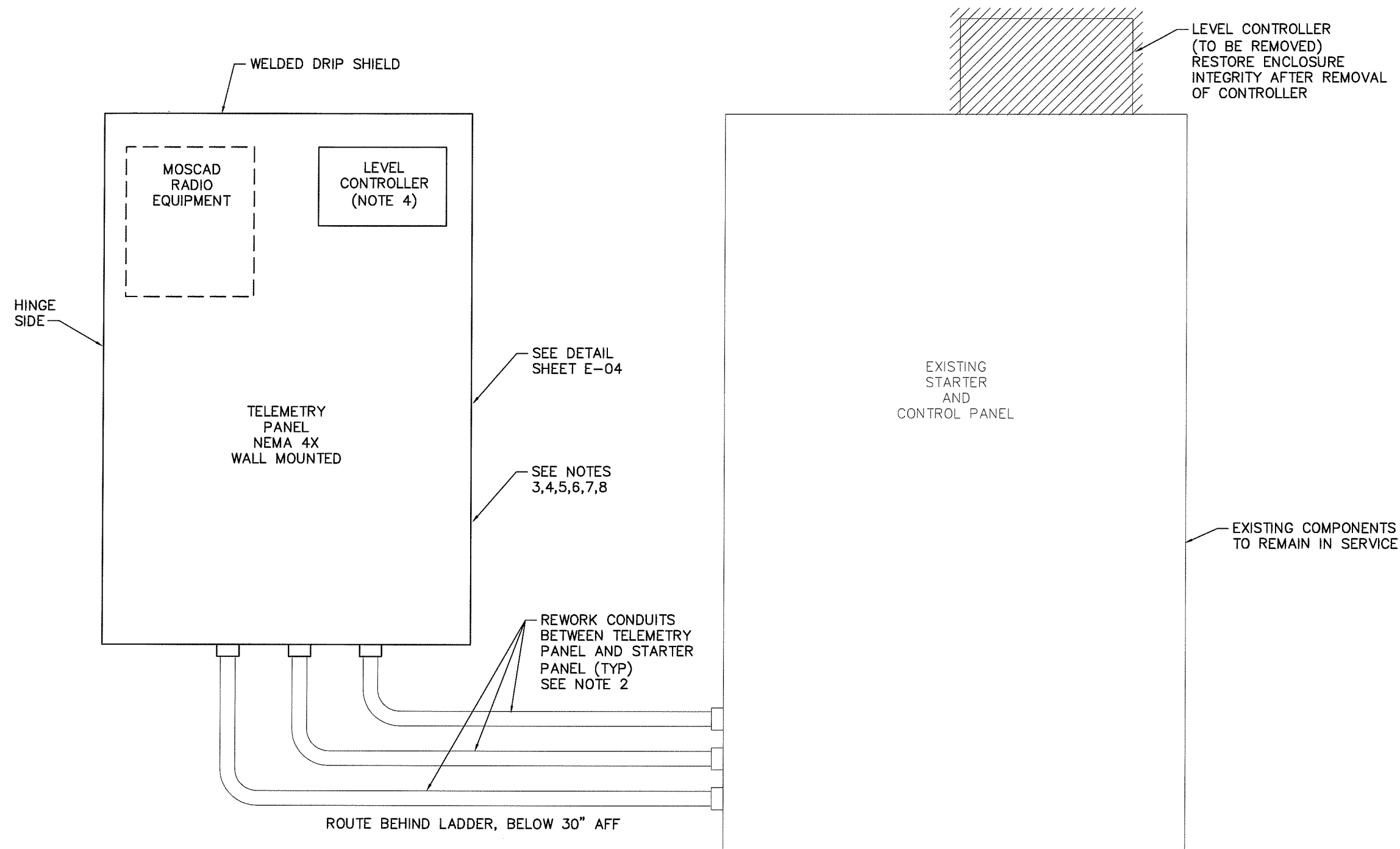
CITY OF ANN ARBOR, MICHIGAN  
**ARBOR LANDING LIFT STATION  
STANDBY GENERATOR INSTALLATION  
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**ARBOR LANDING LIFT STATION  
SCHEMATICS**  
SCALE: AS SHOWN

ISSUED STATUS: REVIEW
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SHEET: E-02
CAD REF. NO. 3185008_002

**NOTES:**

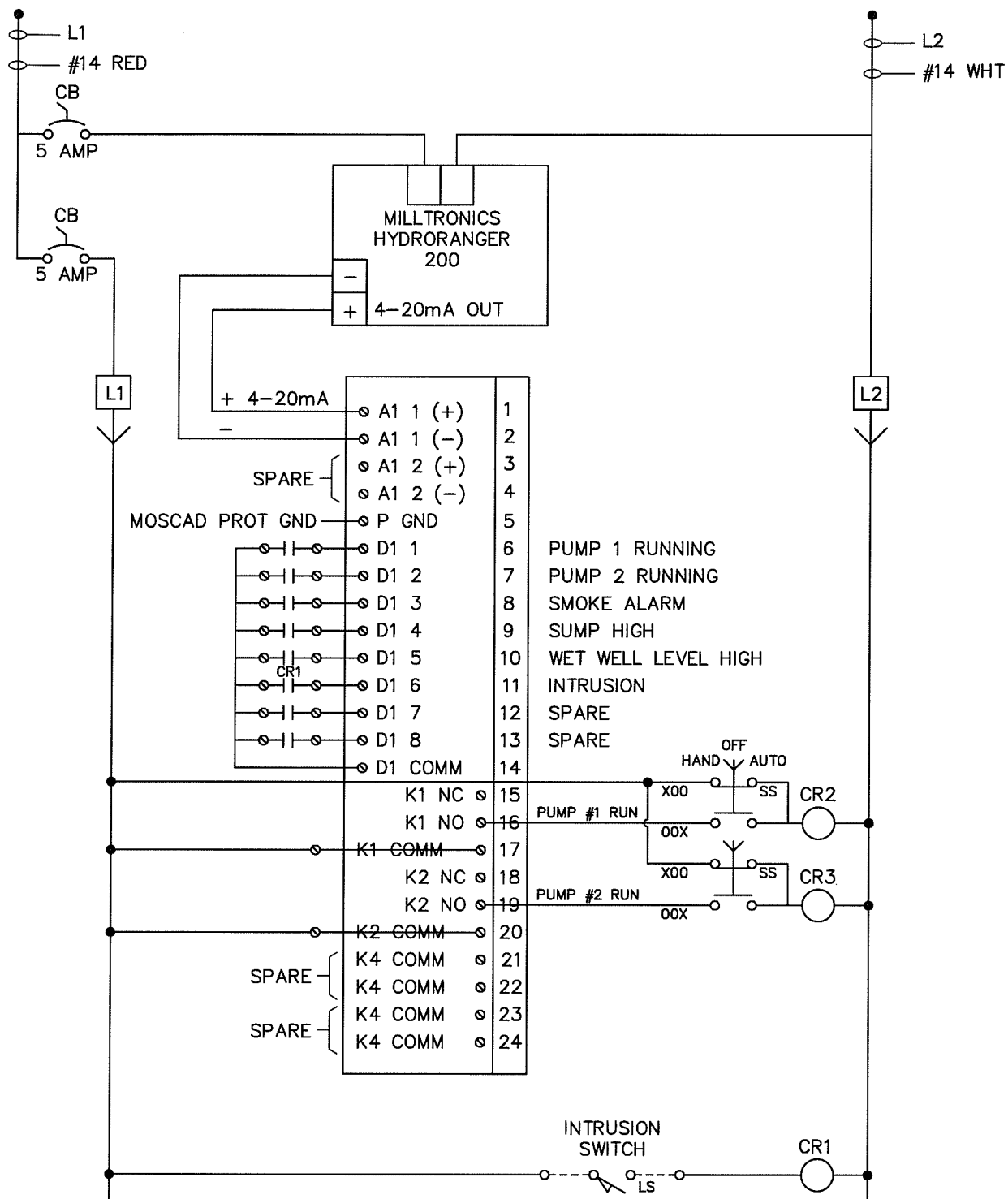
1. CONTRACTOR TO DETERMINE TERMINAL ROTATION.
2. RECONNECT FIELD DEVICES AND INPUTS.
3. MAXIMUM PANEL SIZE 30"H x 24"W x 12" DEEP, WITH OVERSIZED WELDED MOUNTING FEET.
4. NEW HYDRORANGER 200 TO REPLACE EXISTING. MOUNT ON FRONT OF PANEL.
5. INCORPORATES STATION MONITORING AND RADIO FUNCTIONALITY.
6. RADIO PROVIDED BY OWNER, CONFIGURED AND PROGRAMMED BY CONTRACTOR.
7. FIELD VERIFY SPACE AND CONNECTION REQUIREMENTS.
8. ALL HARDWARE SHALL BE STAINLESS STEEL.
9. PANEL ENCLOSURE SHALL BE NEMA 4X, STAINLESS STEEL, GASKETED, WITH CONTINUOUS PIANO HINGE.
10. WIRING SHALL BE COLOR CODED PER CODES, INSTALLED IN WIRE DUCT.
11. CONDUIT INSIDE STATION SHALL BE PVC SCHEDULE 40, 3/4" MINIMUM.
12. THHN/THWN WIRE SHALL BE STRANDED COPPER, 600VAC RATED.
13. TERMINAL STRIPS SHALL BE 600VAC RATED, MOUNTED ON DIN RAILS, ALLEN BRADLEY TYPE 1492.
14. ISOLATE POWER, SIGNAL, AND CONTROL WIRING.



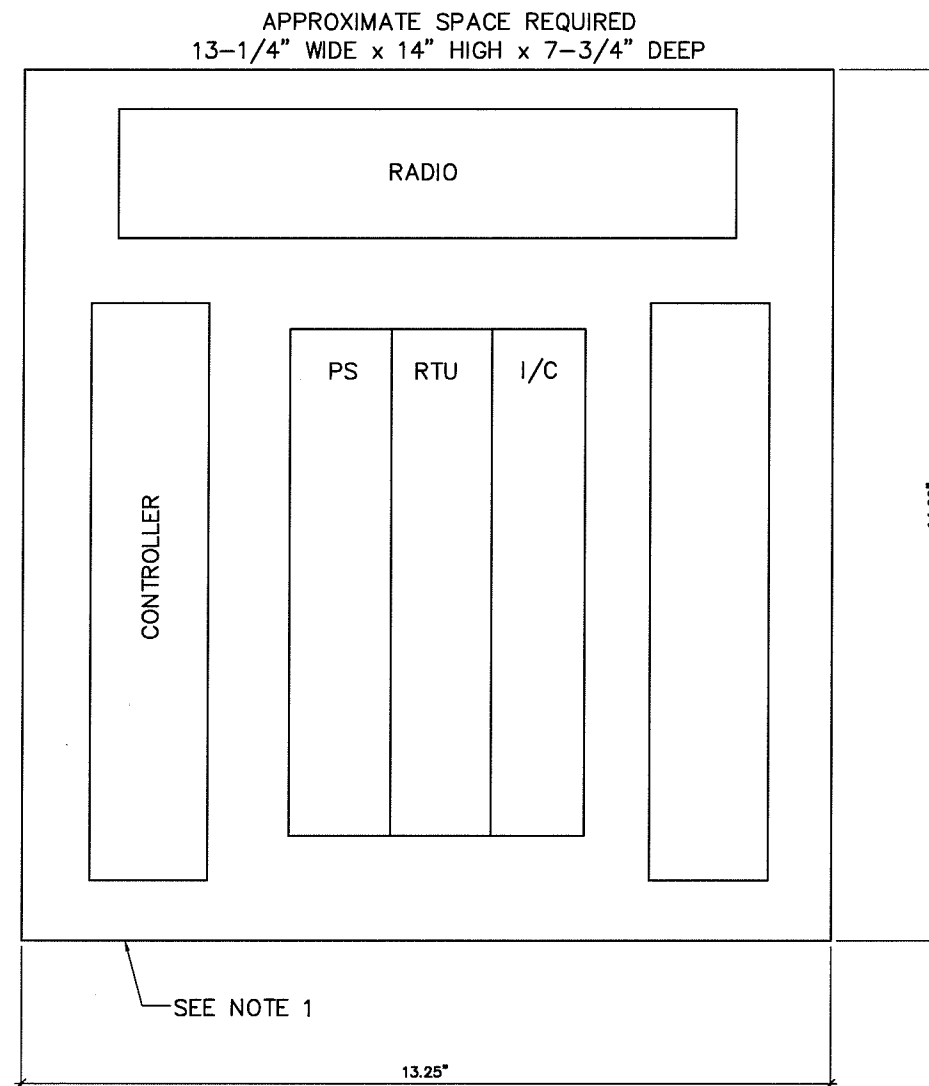
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PARTIAL PANEL SCHEMATIC



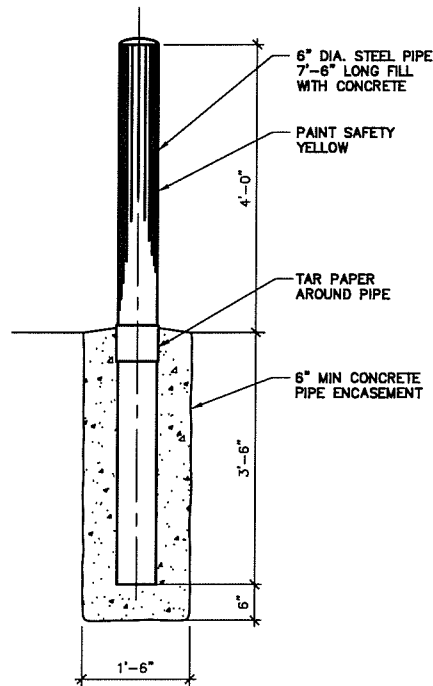
MOSCAD RADIO EQUIPMENT

**NOTES:**

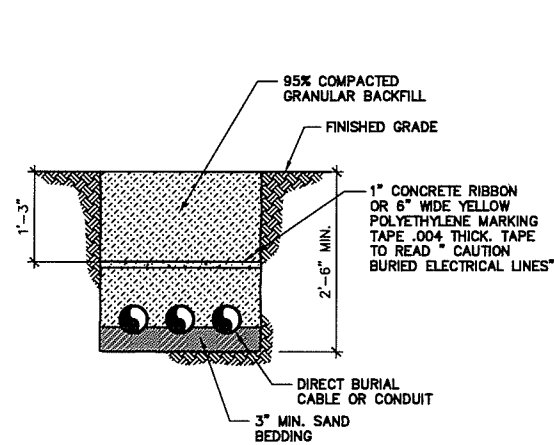
1. PROVIDED BY OWNER, INSTALLED AND WIRED BY CONTRACTOR.
2.
  - a. 1ST PUMP ON 5'-0"
  - b. 2ND PUMP ON 7'-0"
  - c. PUMPS OFF 3'-0"
  - d. HIGH LEVEL 9'-0"
3. HANDSWITCHES SHALL BE ALLEN BRADLEY 800T/800H, 30.5MM, OIL TIGHT, HEAVY DUTY, ROUND.
4. CONTROL RELAYS SHALL BE DPDT, 10A RATED AT 120VAC, USING 8 PIN SOCKET MOUNT, WITH PILOT INDICATING LIGHT.
5. THERMAL CIRCUIT BREAKERS SHALL BE TERMINAL STRIP MOUNTED WITH PUSH BUTTON ACTUATOR FOR RESET AND TRIP INDICATION.
6. INTERCONNECTION WIRING REQUIRED FOR STARTER PANEL INTERFACE NOT SHOWN.

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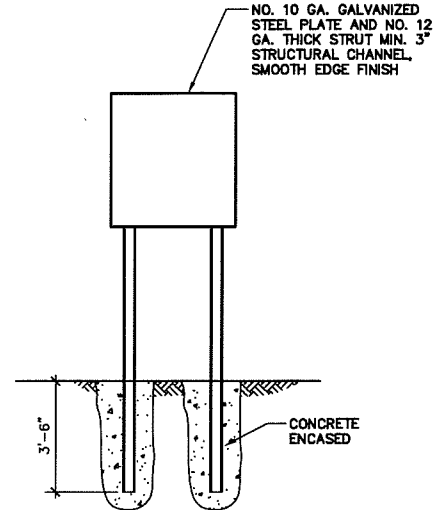
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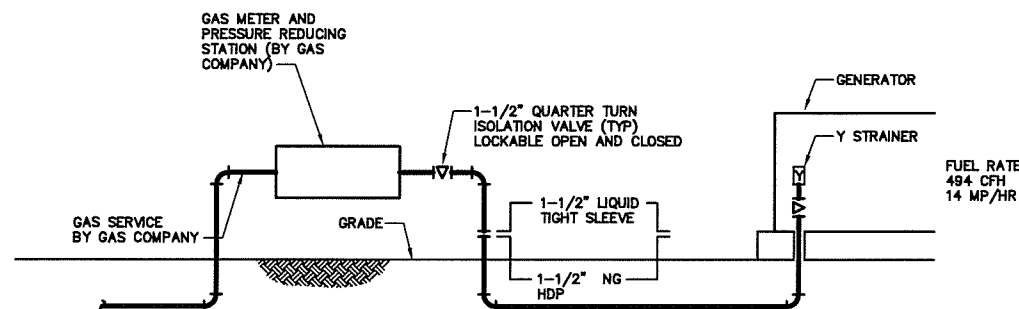
**STEEL BOLLARD DETAIL**  
SCALE: 3/4" = 1'-0"



**TRENCHING DETAIL**  
SCALE: NONE



**RACK MOUNTED EQUIPMENT DETAIL**  
SCALE: NONE



**NATURAL GAS (NG) DETAILS**  
SCALE: NONE

**GENERAL NOTES:**

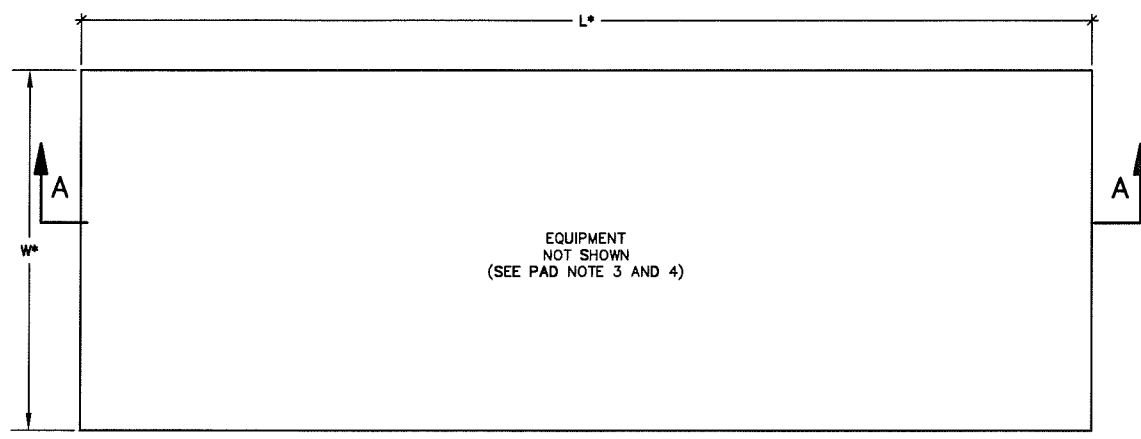
1. MOUNT METER, DISCONNECT ATS, AND OTHER ELECTRICAL GEAR ON CHANNEL STRUT FRAME.
2. ABOVE GROUND PIPING TO BE SCHEDULE 40 BLACK STEEL WITH SCREWED FITTINGS.
3. QUARTER TURN ISOLATION VALVE.
4. COORDINATE NATURAL GAS PIPING TO MATCH GENERATOR EQUIPMENT SUPPLIER REQUIREMENTS AND LOCATION.

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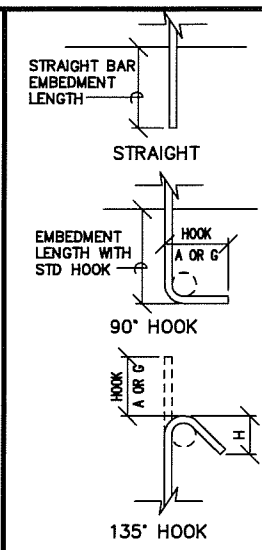
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**GENERAL**

- THE SYMBOLS, ABBREVIATIONS, AND LAP SPLICE AND EMBEDMENT TABLE ON THIS SHEET IS A COMPREHENSIVE STANDARD GUIDE FOR GENERAL USE ON ALL PROJECTS. THEREFORE NOT ALL THE SYMBOLS AND ABBREVIATIONS CONTAINED IN THIS LIST ARE NECESSARILY USED ON THIS PARTICULAR PROJECT AND SHOULD BE USED FOR CLARIFICATION ONLY.
- QUALITY OF CONSTRUCTION REQUIRED, PERFORMANCE LEVELS OF WORKMANSHIP, MANUFACTURING AND INDUSTRY STANDARDS, STRENGTH AND PHYSICAL REQUIREMENTS OF MATERIALS, CONFORMANCE TO CODES AND REGULATIONS, GUARANTEES AND OTHER PROJECT REQUIREMENTS ARE SPECIFIED IN THE PROJECT MANUAL.
- IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED, OR NOTED SHALL BE PROVIDED.
- PERFORM ALL WORK IN COORDINATION WITH ALL DRAWINGS AND INFORMATION RELATED TO STRUCTURAL WORK.
- FACILITIES HAVE BEEN DESIGNED FOR DESIGN LOADS SHOWN OR SPECIFIED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FACILITIES SUBJECT TO CONSTRUCTION LOADS EXCEEDING THE DESIGN LOADS AND SHALL NOTIFY THE ENGINEER OF ANY SUCH ADDITIONAL LOADS.
- ALL DIMENSIONS AND ELEVATIONS NOTED THUS (\*) ON STRUCTURES SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR IN THE FIELD OR WITH THE EQUIPMENT MANUFACTURER AND SHALL CONFORM TO THOSE SHOWN ON OTHER DRAWINGS.



PLAN



BAR SIZE	MIN. LAP LENGTHS FOR BEAMS *		MIN. LAP LENGTHS FOR SLABS AND WALLS **		MIN. LAP LENGTHS FOR COLUMNS	MIN. EMBEDMENT LENGTHS		MIN. STD. HOOKS			
	CLASS B		CLASS B			STRAIGHT BARS*	WITH STANDARD HOOKS	90°		135°	
	TOP***	OTHERS	TOP***	OTHERS				A OR G	A OR G		H
#3	25	19	16	16	12	19	15	5	6	4	2.5
#4	33	25	20	16	15	25	19	7	8	4.5	3
#5	41	31	25	19	19	31	24	9	10	5.5	3.75
#6	49	37	29	23	23	37	29	10	12	8	4.5
#7	71	54	43	33	27	54	42	12	14	9	5.25
#8	81	62	49	37	30	62	48	14	16	10.5	6
#9	91	70	60	46	34	70	54	15	19	-	-
#10	102	79	74	57	39	79	61	17	22	-	-
#11	114	87	89	69	43	87	67	19	24	-	-

REINFORCEMENT LAP SPLICE, EMBEDMENT LENGTH AND STANDARD HOOKS TABLE IS BASED ON A MINIMUM CONCRETE COMPRESSIVE STRENGTH OF 4000 PSI AND 60000 PSI REINFORCEMENT (WITH NO EPOXY COATING). ALL LAPS SPLICES SHALL BE CLASS B SPLICES.

\* THE MINIMUM LAP LENGTH FOR BEAMS AND STRAIGHT EMBEDMENTS ARE BASED ON A 3 BAR DIAMETER MINIMUM CENTER TO CENTER BAR SPACING AND A 2 INCH BAR COVER. IF THE SPLICE AND/OR EMBEDMENT DOES NOT CONFORM TO THESE REQUIREMENTS, THEN CONTRACTOR SHALL FOLLOW COMPLIANCE WITH ACI 318 WITH APPROVAL BY ENGINEER.

\*\* THE MINIMUM LAP LENGTH FOR SLABS AND WALLS IS BASED ON A 6 INCH BAR SPACING AND A 2 INCH BAR COVER. IF THE LAP CONDITION DOES NOT CONFORM TO THESE REQUIREMENTS, THEN USE BEAM LAP LENGTHS; OR COMPLY WITH LAP REQUIREMENTS OF ACI 318 WITH APPROVAL BY ENGINEER.

\*\*\* TOP BARS ARE DEFINED AS ALL HORIZONTAL BARS, EXCLUDING WALL BARS, WITH 12" OR MORE FRESH CONCRETE BENEATH.

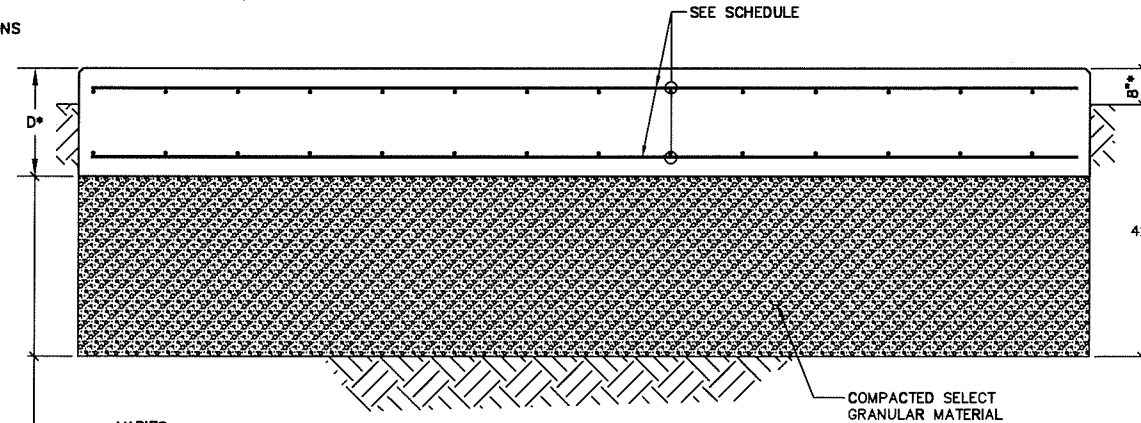
IN CIRCULAR TANKS DESIGNED FOR RING TENSION, THE LOCATION OF SPLICES SHOULD BE STAGGERED. ADJACENT HOOP REINFORCING SPLICES SHOULD BE STAGGERED HORIZONTALLY (CENTER OF LAP TO CENTER OF LAP) BY NOT LESS THAN ONE LAP LENGTH NOR 3 FEET AND SHOULD NOT COINCIDE IN VERTICAL ARRAYS MORE FREQUENTLY THAN EVERY THIRD BAR.

WHERE SPLICES ARE INDICATED BETWEEN BARS OF DIFFERENT SIZES, THE SPLICE LENGTH SHALL BE BASED ON THE SMALLER BAR SIZE.

LAP SPLICE AND EMBEDMENT LENGTH TABLE

**FOUNDATIONS**

- THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE SITE CONDITIONS BEFORE BEGINNING CONSTRUCTION.
- NOTIFY THE ENGINEER AS SOON AS POSSIBLE OF ANY UNUSUAL SOIL CONDITIONS OR SOIL CONDITIONS IN VARIANCE WITH THE SOIL CONDITIONS SUCH AS UNEXPECTED SPRING OR SEEPAGE WATER, OR SOIL OF QUESTIONABLE BEARING CAPACITY.
- SET FOUNDATIONS AT ELEVATIONS SHOWN. THE CONTRACTOR SHALL VERIFY WITH THE ENGINEER THAT EACH FOOTING PLACED IS BEARING ON DESIGN MATERIAL.
- SOIL CONDITIONS DESIGN BASIS:  
GROSS ALLOWABLE BEARING CAPACITY AS FOLLOWS:  
FRANKLIN SITE: 1500 PSF  
SEQUOIA SITE: 1500 PSF
- CONCRETE GENERAL NOTES APPLY TO FOUNDATIONS.



SECTION A-A  
PAD DETAIL

**CAST-IN-PLACE CONCRETE**

- CONCRETE SHALL HAVE THE FOLLOWING MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS:  
A. 4,500 POUNDS PER SQUARE INCH (PSI) WITH ENTRAINED AIR FOR ALL CONCRETE UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALL CONCRETE WORK NOT COVERED UNDER ACI 350 SHALL BE IN ACCORDANCE WITH "THE BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" ACI 318. TOLERANCES SHALL BE IN ACCORDANCE WITH ACI 347, SECTION 3.3.1, TOLERANCES FOR REINFORCED CONCRETE BUILDINGS.
- ALL REINFORCING STEEL SHALL BE NEW DOMESTIC DEFORMED BILLET STEEL CONFORMING TO ASTM A-615 GRADE 60.
- ALL REINFORCING DETAILS SHALL CONFORM TO "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT", ACI 315, UNLESS DETAILED OTHERWISE ON THE STRUCTURAL DRAWINGS.
- CONTRACTOR SHALL REVIEW ALL DRAWINGS FOR SIZE AND LOCATION OF EMBEDDED ITEMS, SLEEVES, SLAB DEPRESSIONS, REQUIRED. THESE ITEMS SHALL BE FURNISHED AND INSTALLED PRIOR TO PLACEMENT OF CONCRETE.
- CONTRACTOR SHALL PROVIDE 3/4 INCH CHAMFER USING WOOD CHAMFER STRIPS ON ALL EXPOSED CORNERS.
- CLEARANCES FOR REINFORCING STEEL SHALL CONFORM TO THE FOLLOWING:  
TYPICAL REINFORCING BAR CLEARANCE TABLE  
CONCRETE CAST AGAINST EARTH. . . . . 3"  
SURFACES EXPOSED TO EARTH OR WEATHER . . . . . 2"
- WELDING OF REINFORCING STEEL IS NOT PERMITTED.
- CALCIUM CHLORIDE SHALL NOT BE PERMITTED NOR SHALL ANY ADMIXTURE CONTAINING CALCIUM CHLORIDE BE PERMITTED THAT RESULTS IN A TOTAL CONCRETE MIX IN WHICH THE PRESENCE OF CHLORIDE IONS EXCEED 0.15 PERCENT BY WEIGHT OF CEMENT.
- ALUMINUM PIPE SHALL NOT BE USED WITH CONCRETE PUMPS.
- CONCRETE SHALL BE DISCHARGED AT THE SITE WITHIN 90 MINUTES AFTER WATER HAS BEEN ADDED TO THE CEMENT AND AGGREGATES. ADDITION OF WATER TO THE MIX AT THE PROJECT SITE WILL NOT BE ALLOWED. ALL WATER MUST BE ADDED AT THE BATCH PLANT.
- REINFORCING BARS REQUIRED FOR PROPER SUPPORT OF PRINCIPAL REINFORCING SHALL BE DETAILED AND SUPPLIED BY THE CONTRACTOR WHETHER OR NOT THEY ARE INDICATED ON THE DRAWINGS.
- REINFORCING BAR LAP SPLICES AND ANCHORAGE LENGTH SHALL CONFORM WITH "LAP SPLICE AND EMBEDMENT LENGTH TABLE."

SITE	QUANTITY	L	W	D	REINFORCING	GENERATOR WT.	COMMENTS
ARBOR LANDING	1	7'-10"	4'-4"	16"	#5@12"	1637 lbs.	WET WEIGHT

- PAD NOTES:
- THE EXPOSED GRANULAR SUBGRADE SOILS WITHIN THE GENERATOR PAD AREA SHALL THOROUGHLY PROOF-COMPACTED USING A VIBRATORY ROLLER.
  - REMOVE EXISTING SUBGRADE MATERIAL TO A MINIMUM DEPTH OF 42" BELOW FINISHED SUBGRADE. PREPARE SUBGRADE AS SPECIFIED PRIOR TO PLACING COMPACTED SELECT MATERIAL UP TO UNDERSIDE OF GENERATOR PAD.
  - COORDINATE OPENINGS AND/OR CONDUIT STUB-UP LOCATIONS WITH GENERATOR PROVIDED. PROVIDE AND COORDINATE ANCHOR BOLT SIZES AND LOCATIONS.
  - CONTRACTOR SHALL VERIFY ACTUAL GENERATOR ENCLOSURE DIMENSIONS WITH MANUFACTURER. CONCRETE PAD SHALL BE AT LEAST 1'-0" LARGER IN LENGTH AND WIDTH THAN GENERATOR.

	GRATING
	STEEL
	BRICK
	CMU
	CONCRETE
	GROUT
	COMPACTED SUBBASE
	SELECT FILL
	EARTH
	ROCK

AB - ANCHOR BOLT	EQ - EQUAL	OC - ON CENTER
ADD'L - ADDITIONAL	EXIST. - EXISTING	OD - OUTSIDE DIAMETER
ADJ. - ADJUSTABLE	EXP. - EXPANSION	OF - OUTSIDE FACE
ALT. - ALTERNATE	EXT. - EXTERIOR	OH. - OVERHEAD
ALUM. - ALUMINUM	FCO - FLOOR CLEAN OUT	OPNG. - OPENING
ANCH. - ANCHOR	FD - FLOOR DRAIN	OPP. - OPPOSITE
& - AND	FDN. - FOUNDATION	P - PLATE
ARCH. - ARCHITECT OR ARCHITECTURAL	FE - FIRE EXTINGUISHER	PC - PRECAST
ASTM - AMERICAN SOCIETY FOR TESTING MATERIALS	FIN. - FINISH	PCPS - PRECAST PRESTRESSED
AT - AT	FL. - FINISH LINE	PSF - POUNDS PER SQUARE FOOT
BSMT. - BASEMENT	FLR. - FLOOR	RAD. - RADIUS
BITUM. - BITUMINOUS	FRP - FIBERGLASS REINFORCED PLASTIC	R. - RISER
B/B - BOTTOM OF	FF - FAR FACE	REIN. - REINFORCING
BOT. - BOTTOM	FTG. - FOOTING	REQ'D. - REQUIRED
BLDG. - BUILDING	GA. - GAGE	REQ'MTS. - REQUIREMENTS
BLK. - BLOCK	GALV. - GALVANIZED	RM. - ROOM
BM - BEAM	GR. - GRADE	RO - ROUGH OPENING
B PL - BASE PLATE	GRD. - GROUND	S. - SOUTH
BRG. - BEARING	GYP BD - GYPSUM BOARD	SCHED. - SCHEDULE
BT PL - BENT PLATE	HORIZ. - HORIZONTAL	SECT. - SECTION
C/C - CENTER TO CENTER	HP - HIGH POINT	SF - SQUARE FEET
CJ - CONSTRUCTION JOINT	HHP - HIGH HIGH POINT	SHT. - SHEET
CL. - CLEAR	HR. - HANDRAIL	SIM. - SIMILAR
CMU - CONCRETE MASONRY UNIT	HT. - HEIGHT	SJ - STEEL JOIST
COL. - COLUMN	HS. - HIGH STRENGTH	SLBB - SHORT LEG BACK-TO-BACK
CTR. - CENTER	ID - INSIDE DIAMETER	SLV - SHORT LEG VERTICAL
CONC. - CONCRETE	IF - INSIDE FACE	SPA. - SPACES OR SPACING
CONST. - CONSTRUCTION	INT. - INTERIOR	SPRD. - SPREAD
CONT. - CONTINUOUS	INV. - INVERT	ST STL - STAINLESS STEEL
CONTR. - CONTROL	INSUL. - INSULATION	STA. - STATION
DEPR. - DEPRESSION	JT. - JOINT	STD. - STANDARD
DET. - DETAIL	K. - KIP (1000 POUNDS)	STL. - STEEL
DI - DUCTILE IRON	LB. - POUNDS	STR. - STRUCTURAL
DIA. - DIAMETER	LL - LIVE LOAD	SUP. - SUPPORT
DIM. - DIMENSION	LLBB - LONG LEG BACK-TO-BACK	SYM. - SYMMETRICAL
DL - DEAD LOAD	LG. - LONG	T. - TREAD
DIST. - DISTANCE	LLH - LONG LEG HORIZONTAL	T/O - TOP OF
DWG. - DRAWING	LLV - LONG LEG VERTICAL	T&B - TOP AND BOTTOM
DWL. - DOWEL	LONG. - LONGITUDINAL	TEMP. - TEMPORARY
EA. - EACH	LP - LOW POINT	THK. - THICK
EE - EACH END	LW - LIGHT WEIGHT	TOM - TOP OF MASONRY
EF - EACH FACE	MFG. - MANUFACTURER	TOS - TOP OF STEEL
EJ - EXPANSION JOINT	MAS. - MASONRY	TYP. - TYPICAL
EL - ELEVATION	MAX. - MAXIMUM	UON - UNLESS OTHERWISE NOTED
ELEC. - ELECTRICAL	MID. - MIDDLE	VERT. - VERTICAL
E. - EAST	MIN. - MINIMUM	W/ - WITH
EMBD. - EMBEDDED	MK. - MARK	W/O - WITHOUT
EW - EACH WAY	MO - MASONRY OPENING	WP - WORK POINT
	NA - NOT APPLICABLE	WS - WATER STOP
	N. - NORTH	WT - WEIGHT
	NF - NEAR FACE	WWF - WELDED WIRE FABRIC
	NTS - NOT TO SCALE	



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