

277/480 VOLTS, 3-PHASE, 4-WIRE, WYE CONNECTED, 4 LUG / PHASE					PANEL "MDP"			MAIN BKR. 1200 AMP M.L.O.				
POLE NO.	BKR. NO.	TRIP AMP.	BKR. POLE	SERVES	LOAD V. A.			POLE NO.	BKR. NO.	TRIP AMP.	BKR. POLE	SERVES
1	1	400		EXISTING PUMP (*)	84,000			2	2	400		EXISTING PUMP (*)
3	3				84,000			4	4			
5	5		3		84,000			6	6		3	
7	7	400		EXISTING PUMP (*)	84,000			8	8	400		FUTURE PUMP
9	9					84,000		10	10			
11	11		3				84,000	12	12		3	
13	13	150		EXISTING PANEL	25,000			14	14	600		SPACE
15	15		2	VIA 50 KVA TRANSFORMER		25,000		16	16			
17	17	--	--	PROVISION				18	18		3	
FLUSH MTD. _____				CONNECTED V. A. / PHASE	277,000	277,000	252,000	"A.L.C." RATING: 42,000 AMPS.				NOTES:
SURFACE MTD. <u>X</u>				CONNECTED AMP. / PHASE	1000.0	1000.0	904.1					
1. (*) TRIP AMPS SHOWN FOR PUMP MOTORS SHALL BE APPROXIMATE ONLY. CONTRACTOR SHALL VERIFY & SIZE BREAKER/FUSES IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S LABEL IN ACCORDANCE WITH NEC ARTICLE 430. ALL AIR CONDITIONING EQUIPMENT BREAKERS SHALL BE "HACR" TYPE.												

HUB WWTP EFFLUENT PUMPS									
BREAKER SETTING	PUMP #1			PUMP #2			PUMP #3		
	A	B	C	A	B	C	A	B	C
START AMP	LO	LO	LO	LO	LO	LO	6	6	6
	840	838	840	854	852	852	777	784	783
RUN AMP	245	244	244	245	244	245	230	231	232
	256	254	254	258	255	255	230	230	231
MOTOR RUN VOLT	A-B	B-C	A-C	A-B	B-C	A-C	A-B	B-C	A-C
	460	462	464	460	460	462	459	460	463

- SPECIFICATION NOTES
- INCLUDE WIRING FOR LIGHTING, OUTLETS, MECHANICAL WORK AND TELEPHONE AS SHOWN ON THE DRAWINGS. INCLUDE LIGHTING FIXTURES, LAMPS, PANELBOARDS, WIRING DEVICES, SWITCHES, ETC. NECESSARY FOR A COMPLETE AND OPERATING INSTALLATION WITH NO SHORT CIRCUITS OR OPEN GROUNDS.
 - POWER TO THE BUILDING IS 277/480 VOLTS, 3-PHASE, 4-WIRE ENTERING THE BUILDING UNDERGROUND.
 - MAIN PANEL SHALL BE SQUARE D COMPANY I-LINE WITH MAIN AND BRANCH BREAKER AIC RATINGS AS REQUIRED BY UTILITY COMPANY.
 - WIRING DEVICES SHALL BE PLASTIC SPECIFICATION GRADE, MINIMUM RATING OF 20 AMPERES. COLORS SHALL BE AS SELECTED BY ARCHITECT.
 - TYPES OF WIRING AND RACEWAYS:
 - THE TYPES AND GRADES OF MATERIALS TO BE EMPLOYED IN THE WIRING SYSTEMS ARE SUBJECT TO BUILDING STRUCTURAL CONDITIONS AND THE GOVERNING CODES. ALL CONDUCTORS SHALL BE TYPE "THIN" COPPER.
 - UNLESS OTHERWISE NOTED, ALL WIRING SHALL BE RUN CONCEALED AND OUTLETS SHALL BE FLUSH MOUNTED IN WALLS AND CEILINGS.
 - SCHEDULE 40 PVC CONDUIT SHALL BE USED IN THE FOLLOWING LOCATIONS:
 - TELEPHONE AND TV SERVICES
 - UNDERGROUND
 - IN CONCRETE SLABS AND MASONRY
 - RIGID STEEL CONDUIT SHALL BE INSTALLED IN ALL EXTERIOR EXPOSED LOCATIONS.
 - EMT CONDUIT WITH STEEL CITY CONNECTORS AND COUPLINGS SHALL BE USED IN THE FOLLOWING LOCATIONS:
 - ALL LOCATIONS EXCEPT AS INDICATED IN "c" AND "d" ABOVE.
 - PROVIDE A CODE SIZE GREEN GROUND CONDUCTOR IN ALL CONDUIT. INCREASE CONDUIT SIZE, IF REQUIRED, TO ACCOMMODATE THIS GROUND CONDUCTOR.
 - REMOVE THE WIRING, WHERE NEW WORK IS SHOWN IN THE BUILDING.
 - VISIT THE SITE SO AS TO HAVE A FULL UNDERSTANDING OF THE WORK IN CONNECTION WITH THE EXISTING BUILDING AND EXISTING WIRING.
 - GUARANTEE WORK TO BE FREE FROM DEFECTS OF MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE YEAR AFTER DATE OF FINAL ACCEPTANCE OF THE WORK.
 - FLUORESCENT LAMPS SHALL BE SYLVANIA OR G.E. COMPANY T8 TYPE, WARM WHITE COLOR. INCANDESCENT LAMPS SHALL BE 130 VOLTS, INSIDE FROSTED. HIGH PRESSURE SODIUM LAMPS SHALL BE "LUMALUX" AS MANUFACTURED BY GTE SYLVANIA. METAL HALIDE LAMPS SHALL BE G.E. CO. "MULTI-VAPOR" OR SYLVANIA CO. "METALARC".
 - FLUORESCENT FIXTURES SHALL BE PROVIDED WITH ELECTRONIC BALLASTS.
 - FURNISH CATALOG SHEETS OR CUTS (6 SETS) OF THE FOLLOWING:
 - LIGHTING FIXTURES
 - PANELBOARDS
 - WIRING DEVICES
 - STARTERS AND CONTROL EQUIPMENT
 - CONFORM TO ALL STATE, NATIONAL AND LOCAL CODES.
 - SECURE AND PAY ALL NECESSARY FEES AND PERMITS.
 - ALL MATERIALS EMPLOYED SHALL BE UL LISTED AND APPROVED AND BEAR THE UL OFFICIAL LABEL.
 - THE SERVICE ENTRANCE SHALL BE GROUNDED WITH A #3/0 AWG SOFT DRAWN COPPER, STRANDED AND BARE CONDUCTOR. THE SERVICE GROUNDING CONDUCTOR SHALL EXTEND TO A DRIVEN GROUND WAT CONSISTING OF THREE DRIVEN 8'-0" X 5/8" DIAMETER COPPER CLAD GROUND RODS SEPARATED BY NO LESS THAN 6'. EXTEND CONDUCTOR ALSO TO NEAREST COLD WATER PIPE GROUNDED, STRUCTURAL STEEL, AND INTERIOR METAL NATURAL GAS PIPING, BONDING THERETO. PROVIDE CODE SIZE BONDING JUMPER AROUND WATER METER.
 - CONTRACTOR SHALL PROVIDE FIVE (5) SETS OF AS-BUILD PLANS AND ONE COMPACT DISC WITH ONE COPY OF AS-BUILD PLANS IN ELECTRONIC PDF FORMAT. ALL AS-BUILD PLANS MUST BE TURNED OVER TO OWNER PRIOR TO FINAL PAYMENT BEING PROCESSED.

LIGHTING FIXTURE SCHEDULE	
DESIGNATION	DESCRIPTION
A	INDUSTRIAL SURFACE MOUNTED FLUORESCENT WITH REFLECTORS 1x 48(18cm)x22cm) SIZE WITH 2-32 WATT T8 ENERGY SAVING LAMPS AND ELECTRONIC BALLAST, LITHONIA CO. NO.1252.
LEGEND	
SYMBOL	DESCRIPTION
	INCANDESCENT, "H.I.D." OR ROUND THIN TUBE FLUORESCENT TYPE FIXTURE; "A" REFERS TO DESIGNATION IN THE FIXTURE SCHEDULE, "b" REFERS TO SWITCH CONTROL; "3" REFERS TO CIRCUIT NUMBER.
	FLUORESCENT FIXTURE, NOTATIONS SAME AS ABOVE.
	WALL SWITCH, SINGLE POLE UNLESS NOTED 3-OR-4 WAY, MOUNT 48"(1.2m) TO CENTERLINE ABOVE FLOOR, "P" INDICATES WITH PILOT LIGHT, "M" INDICATES "MULLION TYPE".
	DUPLEX RECEPTACLE, 120 VOLT, 20 AMP, MOUNT 8"(20cm) +/- TO BOTTOM OF BOX ABOVE FLOOR, "P" INDICATES WITH PILOT LIGHT, "M" INDICATES "MULLION TYPE".
	6P TYPE DUPLEX PLUS RECEPTACLE, 120 VOLT, 20 AMP. MOUNTING SIMILAR TO STANDARD DUPLEX RECEPTACLE ABOVE, P45 CO. NO.2091-S-1. "WP" INDICATES WEATHERPROOF.
	PANELBOARD, RECESSED OR SURFACE MOUNTED AS INDICATED, TOP 6'-0"(1.8m) ABOVE FLOOR ADJUSTED TO OCCUR AT MASONRY JOINT; SEE PANELBOARD SCHEDULE.
	CONDUIT EXTENDED TO PANELBOARD, PANEL "A", CIRCUITS 143; CROSS LINES INDICATE NUMBER OF NO. 12 AWG. CONDUCTORS WHEN MORE THAN TWO; CIRCUITS SHARING A COMMON NEUTRAL SHALL BE CONNECTED TO DIFFERENT LINES OR PHASES WITHIN THE PANELBOARD REGARDLESS OF THE NUMBERING ON THE DRAWINGS.
	CONDUIT RUN IN THE FLOOR CONSTRUCTION OR UNDERGROUND. FULL A SEPARATE CODE SIZE EQUIPMENT GROUND CONDUCTOR IN ALL PVC CONDUIT RUNS IN ADDITION TO CONDUCTORS INDICATED. INCREASE CONDUIT SIZE IF REQUIRED TO ACCOMMODATE THIS CONDUCTOR.
	CONDUIT RUN IN WALL OR CEILING CONSTRUCTION.
	JUNCTION BOX, SIZE AND USE, REQUIRED; COVERPLATE SHALL OVERLAP BOX EDGE BY 1/2"(1.3cm) WHERE RECESSED IN WALL WITH CONCEALED WIRING.
	ELECTRIC MOTOR REQUIRING CONNECTION; SIZE, USE AND LOCATION AS INDICATED. VERIFY LOCATION AND CONNECTIONS REQUIRED WITH MECHANICAL TRADE PRIOR TO ROUGH-IN. USE FLEXIBLE CONDUIT WITHIN 18"(46cm) OF EQUIPMENT. PROVIDE DISCONNECT SWITCH WHEN OUT OF SIGHT OF PANELBOARD.
	MANUAL MOTOR STARTER, MOUNTING HEIGHT SAME AS FOR LIGHT SWITCH.
	MAGNETIC MOTOR STARTER, MOUNT 5'-6"(1.7m) ABOVE FLOOR. PROVIDE DISCONNECT SWITCH WHEN OUT OF SIGHT OF SUPPLYING PANELBOARD.
	FUSED DISCONNECT SWITCH, GENERAL DUTY TYPE, SQUARE D CO., WEATHERPROOF OUTDOORS. PROVIDE FUSING OF SIZE AS IT APPEARS ON THE LABEL OF EQUIPMENT IN ACCORDANCE WITH NEC.
	EXIT SIGN WITH BUILT-IN BATTERY, DIE CAST ALUMINUM, "M" INDICATES WALL MOUNTED; "S" INDICATES SINGLE FACE; "D" INDICATES DOUBLE-FACE; "C" INDICATES CEILING MOUNTED; DIRECTIONAL ARROWS AS SHOWN, LITHONIA CO. NO. LE-S-14-(2)-R-120/277-ELN, LED OPERATION. UNIT SHALL BE MAXIMUM OF 4 7/16" WIDE.
	THIN HEAD CYLINDER EMERGENCY LIGHT WITH BATTERY, DUAL LITE CO. NO. E2-2. MOUNT 7'-6" ABOVE FLOOR, BUT NOT CLOSER THAN 3" (7.6cm) TO CEILING.

HARRIMAN UTILITY BOARD
WASTE WATER PLANT
EFFLUENT PUMP REPAIRS
SCHEDULES AND NOTES

506 BULLORD FORD ROAD, HARRIMAN, TENNESSEE 37748

REVISIONS	BY

DRAWN BY JDD
CHECKED BY KEN
DATE January 22, 2007
SCALE AS NOTED
JOB NO. 06115
SHEET E-4.1

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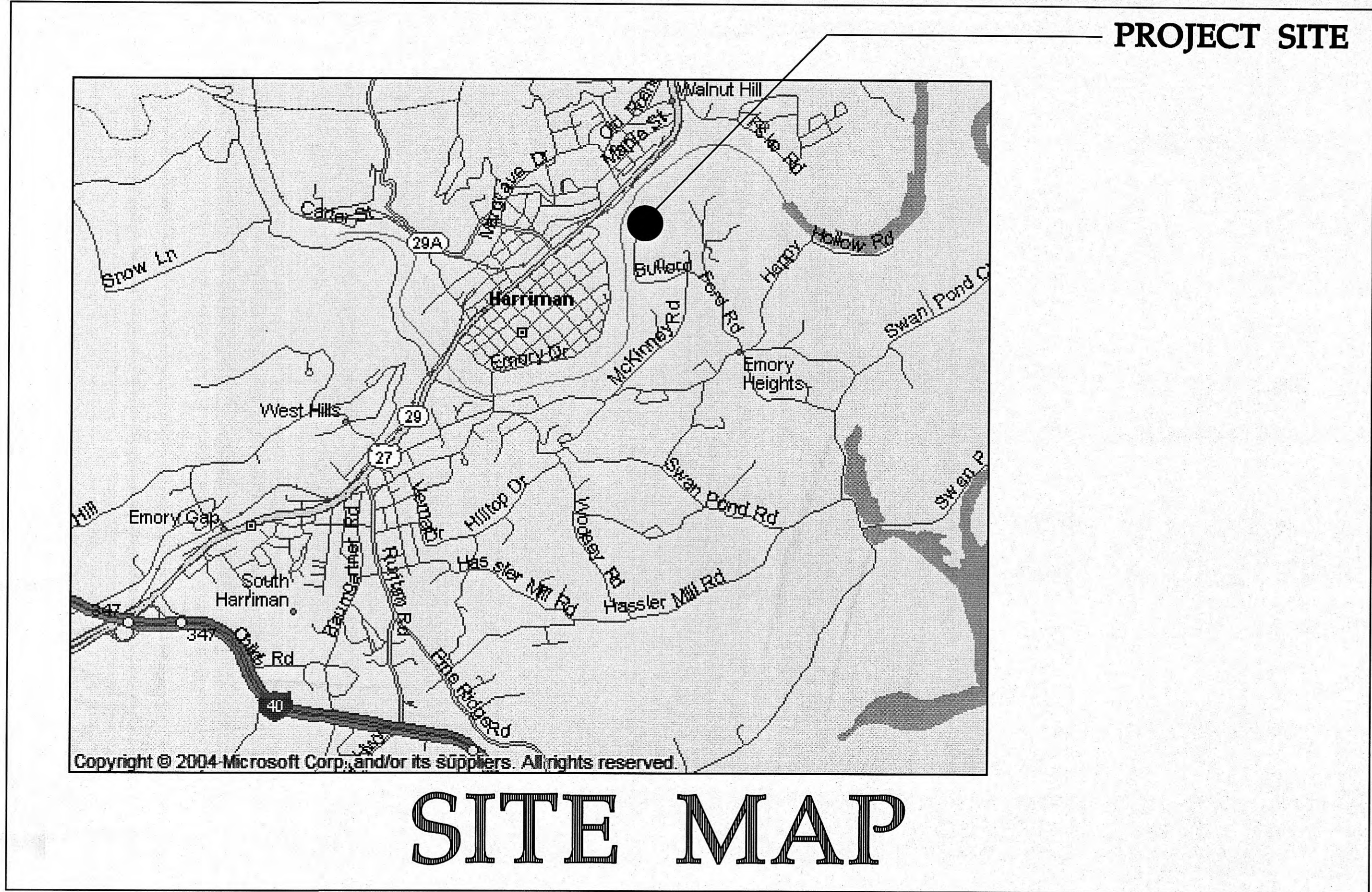
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HARRIMAN UTILITY BOARD
WASTE WATER PLANT
EFFLUENT PUMP REPAIRS
506 BULLORD FORD ROAD
HARRIMAN, TENNESSEE 37748



DRAWING LIST:	
SHEET NUMBER	SHEET TITLE
E-0.0	TITLE SHEET
E-1.1	LOWER LEVEL PLAN
E-2.1	UPPER LEVEL PLAN
E-3.1	STARTER PANEL DETAILS
E-4.1	SCHEDULE AND NOTES

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HARRIMAN UTILITY BOARD EFFLUENT PUMP REPAIRS
WASTE WATER PLANT TITLE SHEET
506 BULLORD FORD ROAD, HARRIMAN, TENNESSEE 37748

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SHEET E-0.0

CONTRACTOR SHALL COORDINATE WITH HARRIMAN UTILITY BOARD ELECTRICAL DEPARTMENT THE EXACT LOCATION OF EXISTING UNDERGROUND PRIMARY PRIOR TO STARTING ANY DIGGING. ALL DIGGING WITH IN 24" OF EXISTING UNDERGROUND PRIMARY SHALL BE DONE BY HAND. DO NOT USE ANY DIGGING EQUIPMENT WITH IN 5'-0" OF EXISTING PAD-MOUNTED TRANSFORMER.

PROVIDE AND INSTALL A WEATHERPROOF 24"x24"x6" DEEP JUNCTION BOX WITH COVER.

CONNECT PUMP MOTOR 120 VOLT HEATER CIRCUITS AS REQUIRED, 3/4", 2#12 & 1#12 GRND.

EXISTING 250 HP PUMPS TO REMAIN.

CAP FOR FUTURE

FUTURE PUMP

CONTRACTOR SHALL DEMO THE EXISTING FEEDERS INCLUDING CONDUITS FROM, EXISTING SWITCHGEAR AND PUMPS AFTER NEW PUMP SERVICE HAS BEEN TRANSFERED FROM EXISTING SWITCHGEAR.

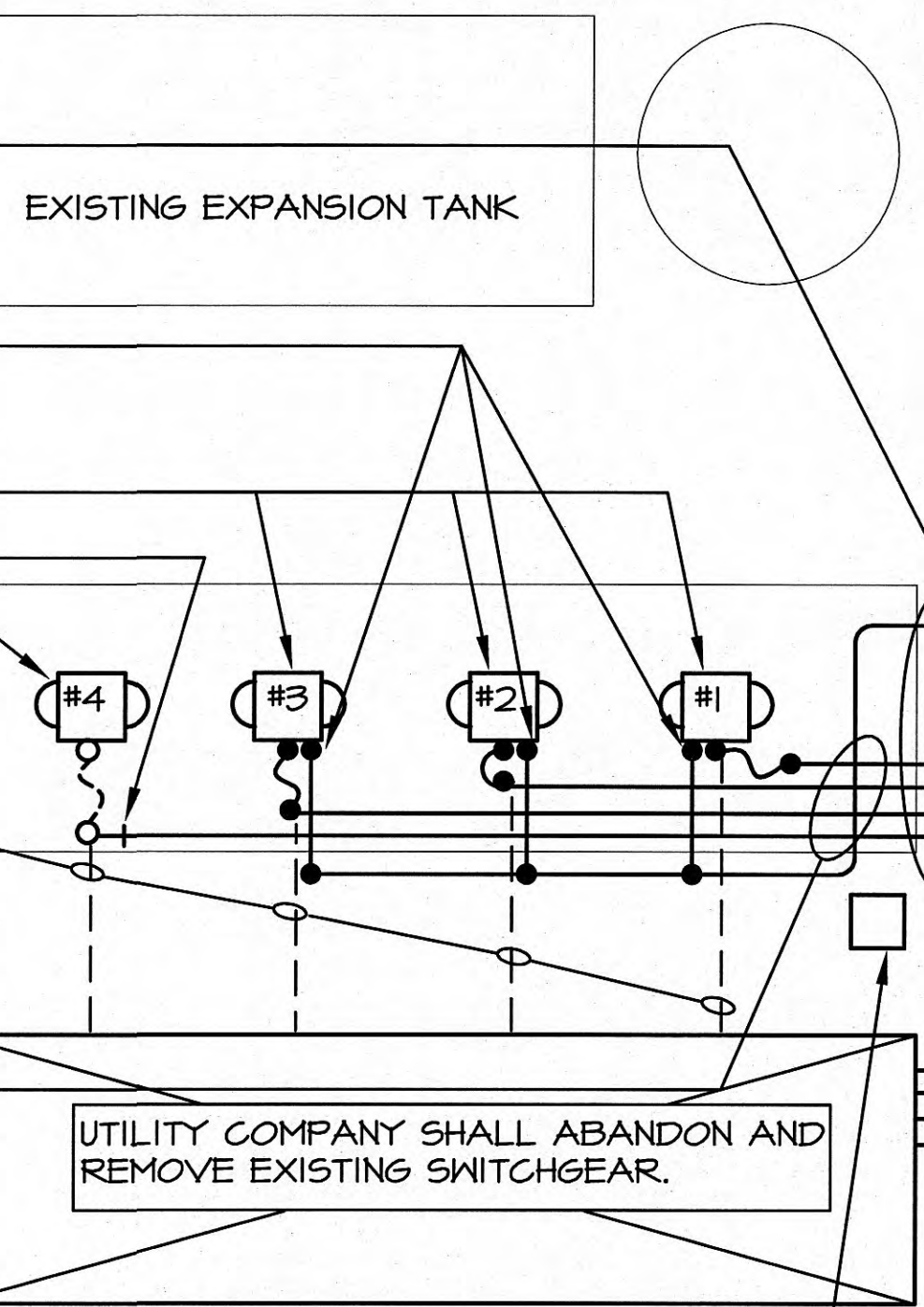
RUN NEW 4" CONDUITS WITH 3#500 MCM CU & 1#3 GRND CU TO EACH PUMP. MAKE NEW WEATHERPROOF CONNECT IN TERMINAL BOX ON PUMP AS REQUIRED.

CORE DRILL 6" DIA HOLE THRU CONCRETE LID OF SUMP FOR LEVEL SENSORS CONTROLS BY CONTROL CONTRACTOR.

EXISTING UNDERGROUND SECONDARY TO BE ABANDONED AND REMOVED.

EXISTING PAD-MOUNTED TRANSFORMER TO REMAIN.

CONTRACTOR SHALL INSTALL NEW CONDUITS AND CONDUCTORS INTO EXISTING PAD-MOUNTED TRANSFORMER AS DIRECTED BY HARRIMAN UTILITIES BOARD ELECTRICAL DEPARTMENT. CONTRACTOR SHALL COORDINATE CONNECTION IN EXISTING TRANSFORMER WITH ELECTRIC DEPARTMENT TO MINIMIZE DOWN TIME OF PUMPS. MAXIMUM POWER OUTAGE FOR PUMPS IS FOUR (4) HOURS. PROVIDE A MINIMUM OF 10'-0" OF SLACK FOR THE ELECTRIC DEPARTMENT TO MAKE FINAL CONNECTION.



FOUR 4" CONDUITS WITH 4#350 MCM COPPER FROM EXISTING PAD-MOUNTED TRANSFORMER TO NEW MAIN DISTRIBUTION PANEL.

EXISTING SECONDARYELECTRIC SERVICE TO OTHER BUILDINGS ON SITE.

SEE DETAIL #1

PROVIDE AND INSTALL ONE 1" AND ONE 2 1/2" EMPTY CONDUITS BETWEEN LOWER ELECTRICAL ROOM AND PUMP SUMP FOR CONTROLS WIRING BY CONTROLS CONTRACTOR.

4" CONDUITS WITH 3#500 MCM CU & 1#3 GRND. IN EACH TO PUMPS FROM STARTERS.

EXISTING CONCRETE SIDEWALK TO BE REMOVED BEFORE INSTALLING NEW CONDUITS AND REPLACED AFTER CONDUITS HAS BEEN COMPLETED.

ROUTE ALL NEW CONDUITS AND CONDUCTORS THRU EXISTING CONCRETE VAULT OWNED BY HARRIMAN UTILITIES BOARD.

CONTRACTOR SHALL INSTALL WIRING AROUND THE SIDE OF THE EXISTING VAULT. INSTALL SUPPORT BRACKETS AS NECESSARY. ALL CONDUCTORS SHALL BE LABELED EITHER "SERVICE CONDUCTORS" OR "PUMP FEEDERS".

PENETRATE EXISTING CONCRETE WALL AND WEATHERPROOF AS REQUIRED.

NEW 277/480 VOLTS, 1200 AMPS, 3-PHASE, 4-WIRE DISTRIBUTION PANEL, SEE SCHEDULE ON SHEET E-4.1.

EXTEND 3/4" 3#12 & 1#12 GRND TO TWO SPARE 20/1 BREAKERS IN PANEL ON UPPER LEVEL ABOVE

NEW SOFT-START / SOFT STOP STARTERS FOR EXISTING PUMPS.

4" EMPTY CONDUIT FROM FUTURE STARTER TO FUTURE PUMP AS REQUIRED.

FUTURE STARTER

3/4" EMPTY CONDUITS FOR CONTROLS CABLES FROM STARTER TO "P.L.C."

4" CONDUITS WITH 3#500 MCM CU & 1#3 GRND. IN EACH FROM PANEL "MDP" TO STARTERS. INSTALLED OVERHEAD AS REQUIRED.

EXTEND 3/4" CONDUIT TO NEW PLC.

NEW PLC CONTROL CABINET

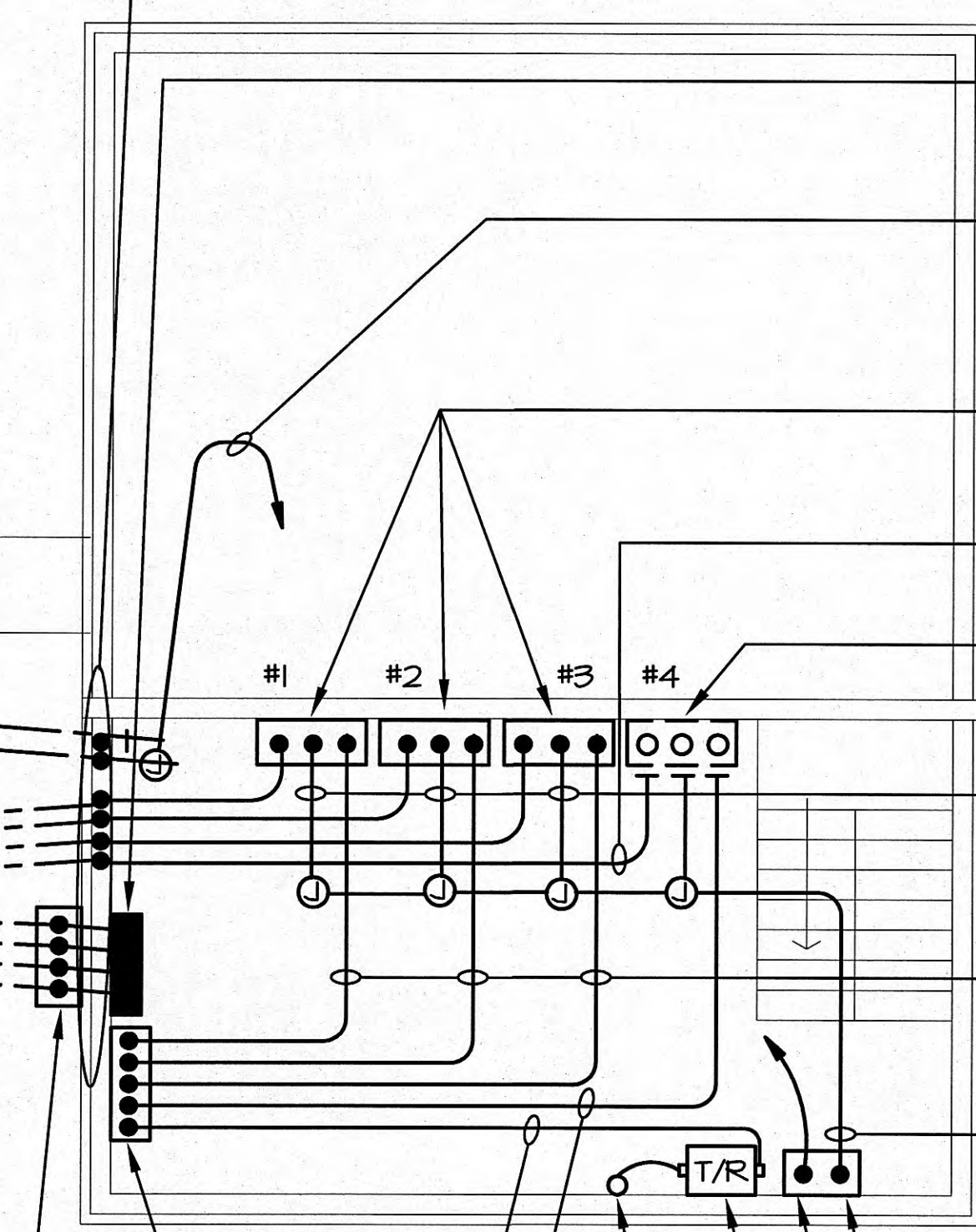
EXTEND 1/2", 2#12 & 1#12 GRND TO SPARE 20/1 BREAKER IN PANEL ON UPPER LEVEL ABOVE.

NEW 50 KVA DRY TYPE TRANSFORMER, 480 VOLTS, 1-PHASE PRIMARY TO 120/240 1-PHASE, 3-WIRE SECONDARY. MOUNT ON 4" THICK HOUSE KEEPING PAS AS REQUIRED.

2 1/2", 3#3/0 & 1#6 GRND. UP TO PANEL ABOVE.

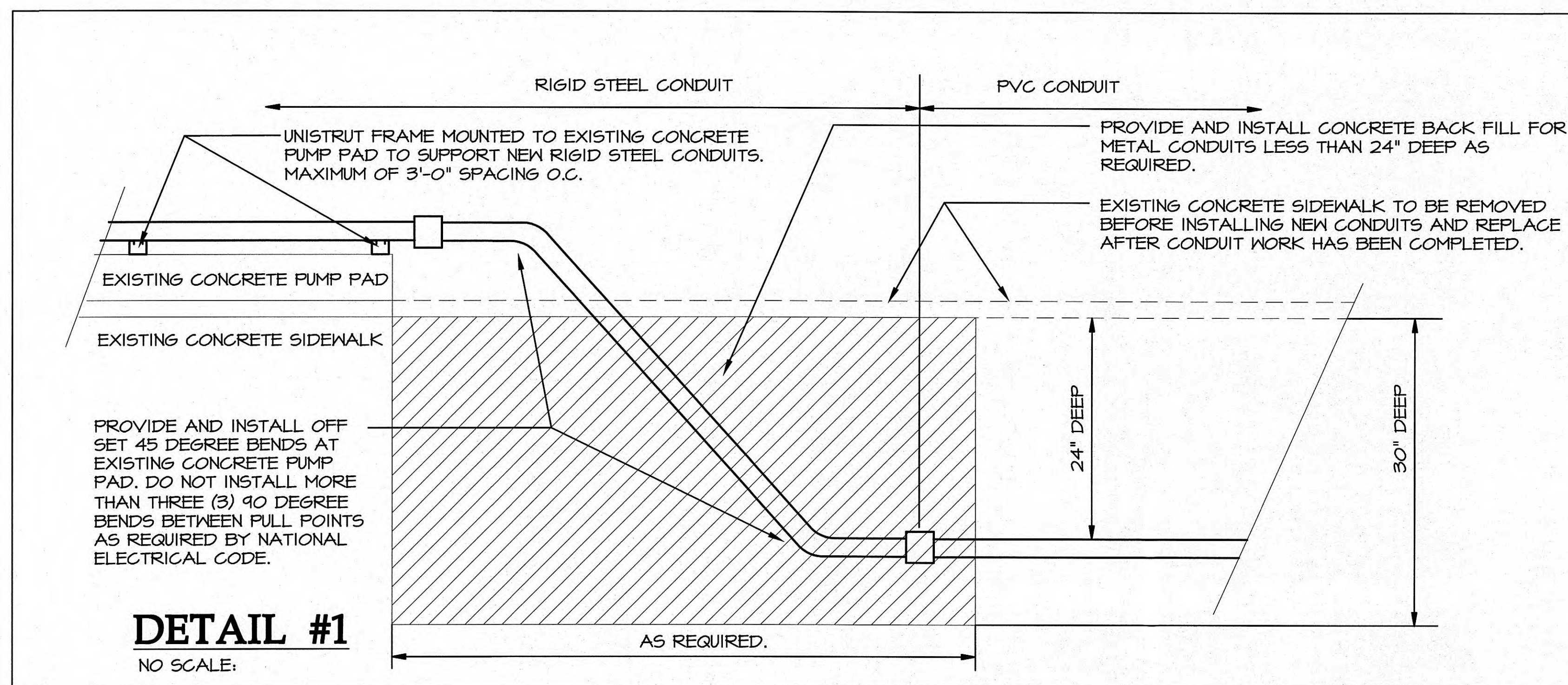
2 1/2", 3#1/0 & 1#6 GRND

4" EMPTY CONDUIT FOR FUTURE STARTER AND PUMP.



LOWER LEVEL POWER PLAN

SCALE: 3/16" = 1'-0"



DETAIL #1

NO SCALE:

ADD ALTERNATE PRICING:

CONTRACTOR SHALL PROVIDE ADD ALTERNATE PRICING TO INSTALL OWNER FURNISHED STARTER AND TEMPORARY WITH TO PUMP#3 IN THE EVENT THAT THERE OF A EXISTING SWITCHGEAR FAILURE DURING THE CONSTRUCTION PHASE OF THIS CONTACT. NEW TEMPORARY WIRING SHALL BE INSTALLED WITH-IN A 8 HOUR NOTICE OF HARRIMAN UTILITY BOARD REP.

PHASING NOTE:

CONTRACTOR SHALL PROVIDE A PHASING PHASE PLAN / CONSTRUCTION SCHEDULE AT THE TIME OF BID TO HARRIMAN UTILITY BOARD.



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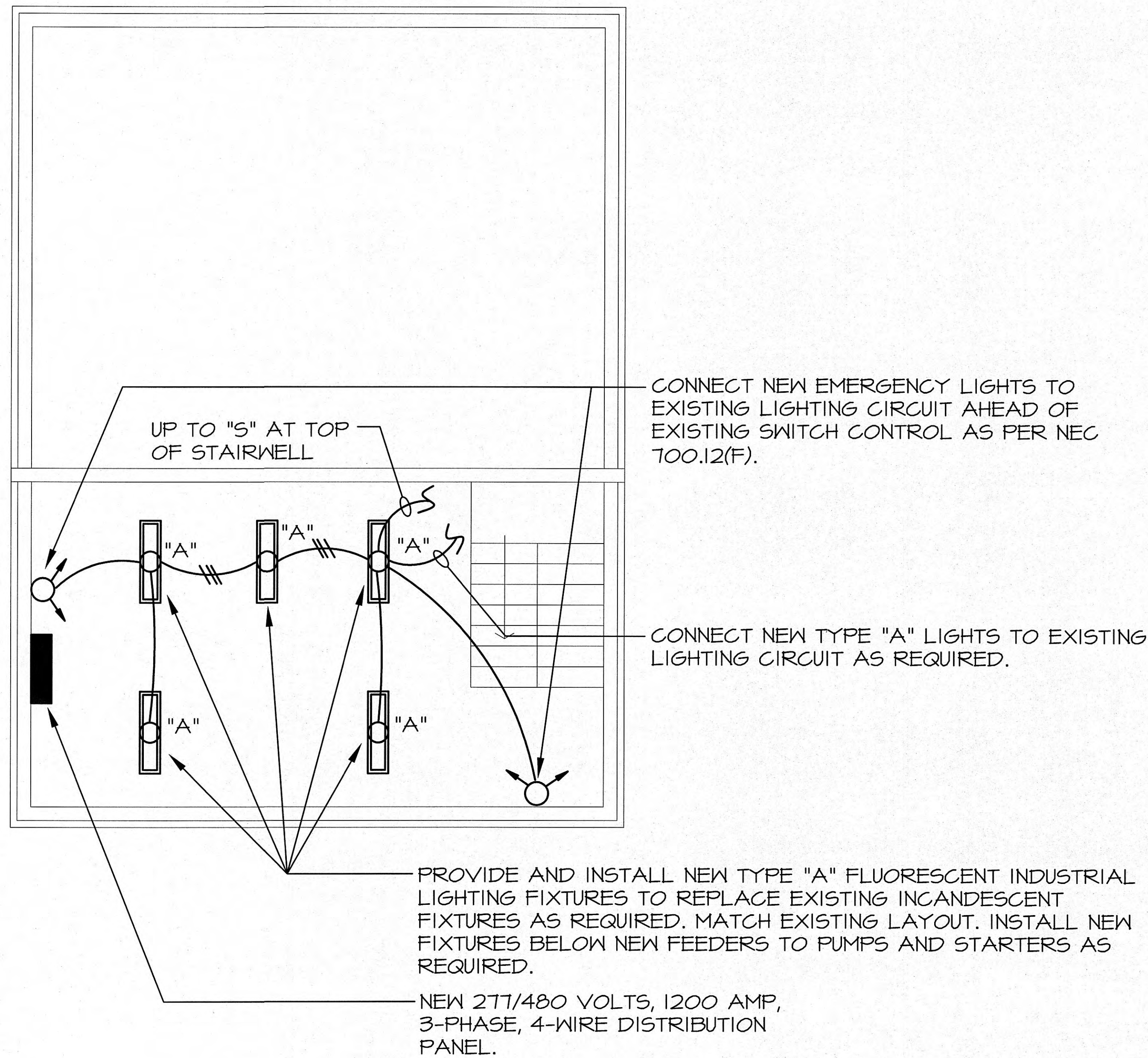
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AS BUILT REVISION	DD

HARRIMAN UTILITY BOARD WASTE WATER PLANT EFFLUENT PUMP REPAIRS LOWER FLOOR PLAN

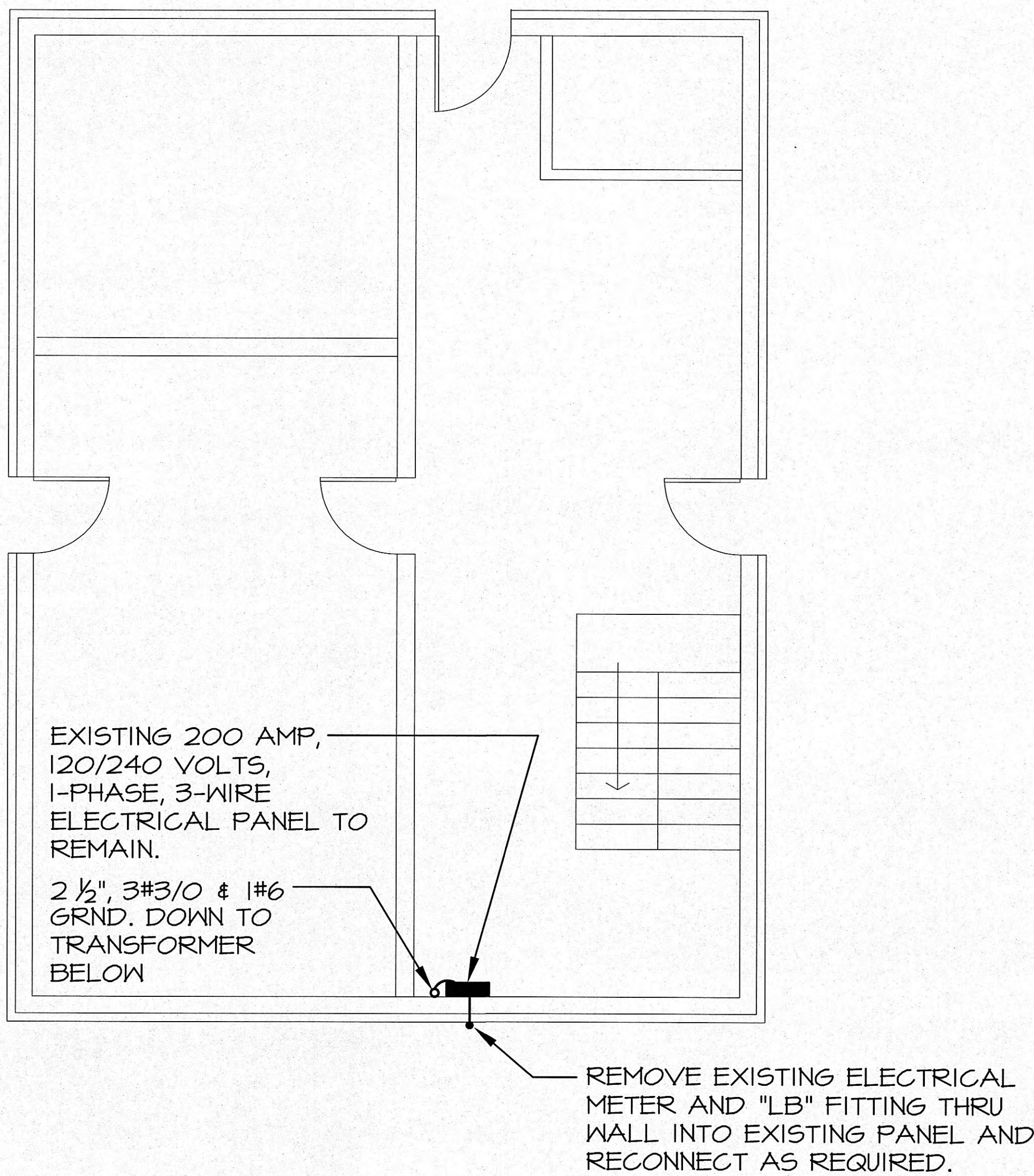
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LOWER LEVEL PLAN - LIGHTING

SCALE: 1/4" = 1'-0"



UPPER LEVEL PLAN - POWER

SCALE: 1/4" = 1'-0"

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HARRIMAN UTILITY BOARD
WASTE WATER PLANT

EFFLUENT PUMP REPAIRS
UPPER FLOOR PLAN

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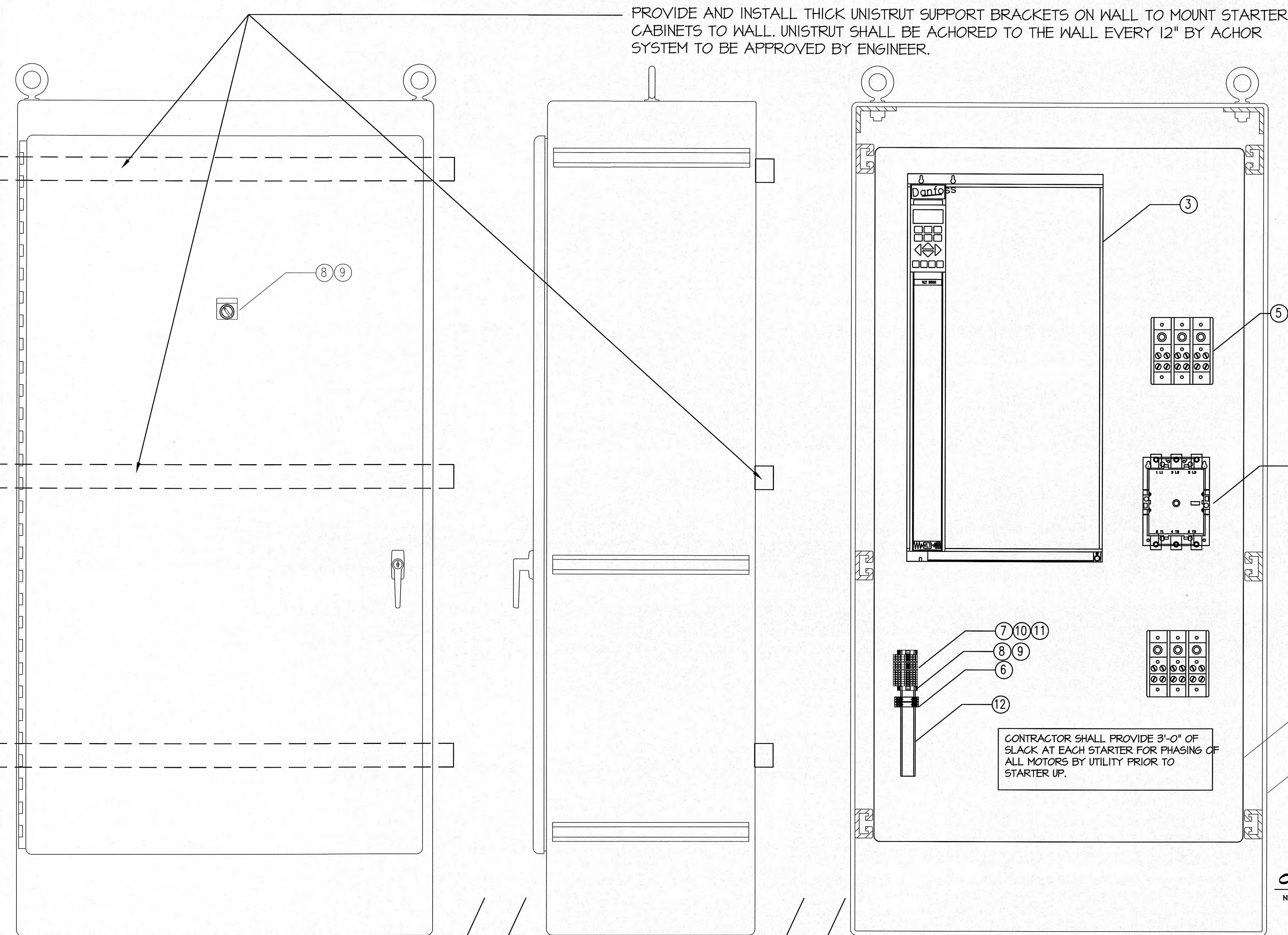
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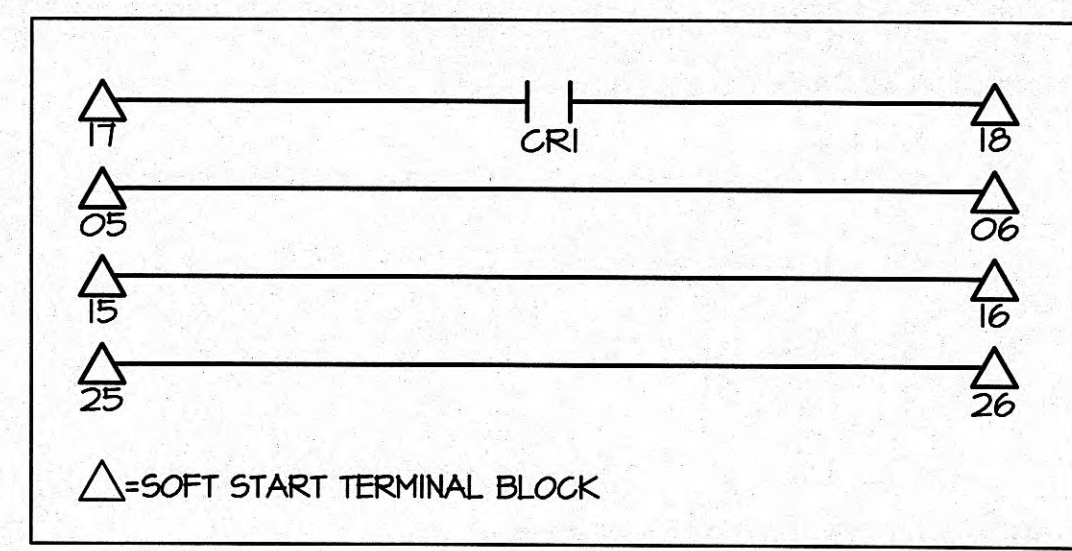
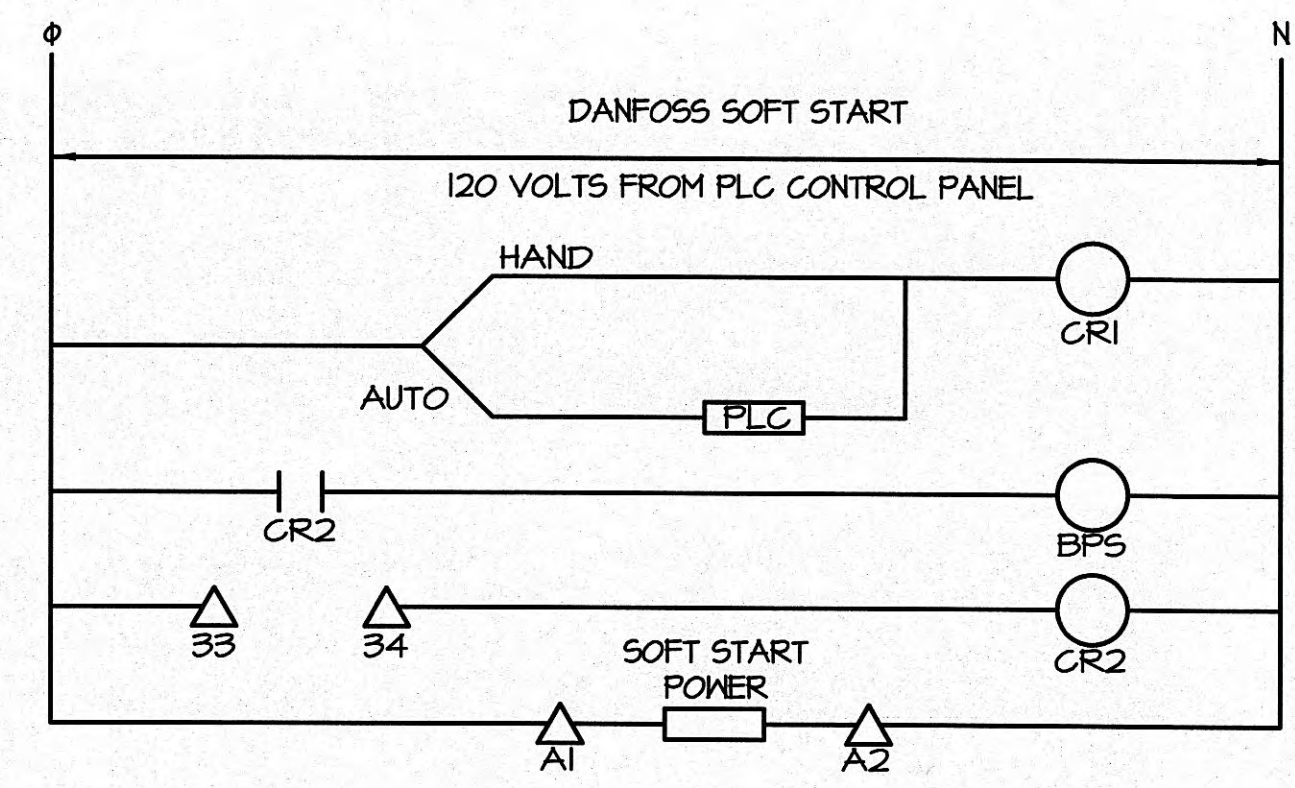
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BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	MFG PART #	MFG	
1	1	NEMA 12 ENCLOSURE 72"H X 36"W X 18"D	FDA723618N12	E-BOX	
2	1	SUB PANEL FOR ABOVE ENCLOSURE	F7236P	E-BOX	
3	1	DANFOSS SOFT START - 250 HP	MCD318.5	DANFOSS	
4	1	IDEC BASSPASS CONTACTOR	YS1N-300F22A120	IDEC	
5	6	POWER DISTRIBUTION BLOCK	FSPDB4A	FERRAZ SHAWMUT	
6	2	CONTROL RELAYS		IDEC	
7	A/R	TERMINAL BLOCK	280-901	WAGO	
8	2	TERMINAL BLOCK END PLATE	280-309	WAGO	
9	4	SCREWLESS END STOP	249-116	WAGO	
10	A/R	PUSH TYPE WIRE JUMPER	281-125	WAGO	
11	A/R	SEPARATOR PLATES	280-311	WAGO	
12	A/R	DIN 35 RAIL, 35 X 7.5 MM	210-196	WAGO	
13	1	2 POSITION SELECTOR SWITCH		ALLEN BRADLEY	
14	1	LEGION PLATE	210-196	ALLEN BRADLEY	

- STARTER SCHEDULE NOTES:
- CONTRACTOR SHALL PROVIDE COMPLETE STARTERS AS SCHEDULED ON THIS SHEET FOR STARTERS #1, #2 AND #3. STARTER 4 IS FOR FUTURE PUMP ONLY. INSTALL ALL STARTERS AND PROVIDE SPACE ON WALL FOR FUTURE STARTER CABINET AS SHOWN ON THE PLANS.
 - PROVIDE EIGHT (8) HOURS OF ON SITE FACTORY TRAINING TO OWNER'S STAFF FOR NEW PUMP STARTERS AS PART OF THIS PROJECT.
 - NO SUBSTITUTIONS WILL BE ALLOWED FOR ANY PARTS LISTED IN THIS SCHEDULE.



CONTROL WIRING DIAGRAM FOR MOTOR STARTERS

NTS

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HARRIMAN UTILITY BOARD

EFFLUENT PUMP REPAIRS

WASTE WATER PLANT

STARTER PANEL DETAILS

506 BULLORD - FORD ROAD, HARRIMAN, TENNESSEE 37748

DRAWN BY	JDD
CHECKED BY	KEN
DATE	January 22, 2007
SCALE	AS NOTED
JOB NO.	06115
SHEET	E-3.1

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