

ELKRIDGE WATER PUMPING STATION IMPROVEMENTS

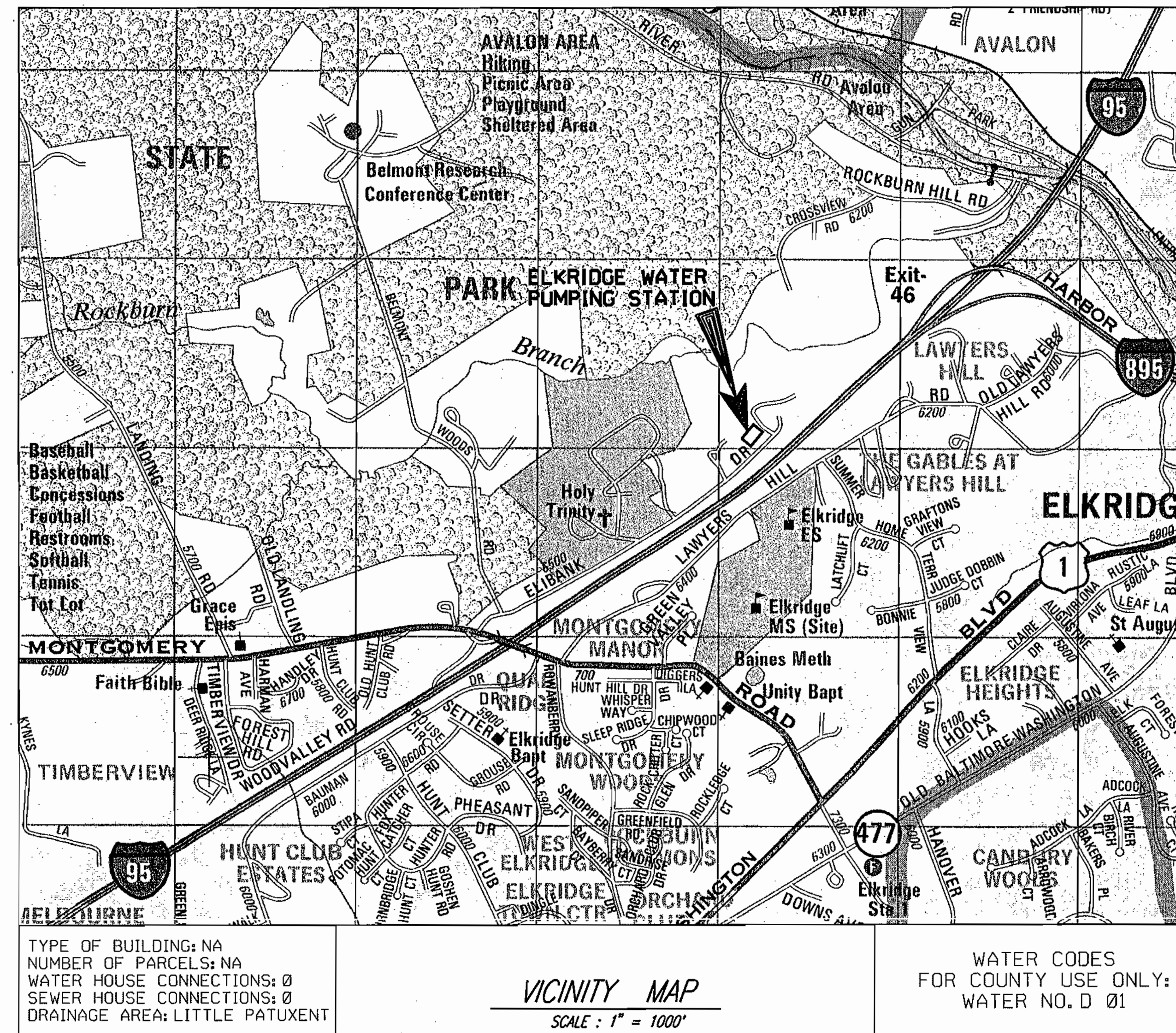
CONTRACT NO. 44-4085

CAPITAL PROJECT NO. W-8228

HOWARD COUNTY, MARYLAND

INDEX OF DRAWINGS

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DIRECTIONS: TAKE I-195 EAST FROM I-95 TO ROUTE 1 SOUTH. TURN RIGHT ON MONTGOMERY ROAD. TURN RIGHT ON ELIBANK DRIVE. PUMPING STATION IS LOCATED ON LEFT HAND SIDE AT END OF ROAD.

AS-BUILT 3/15/05

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 HOWARD COUNTY, MARYLAND.

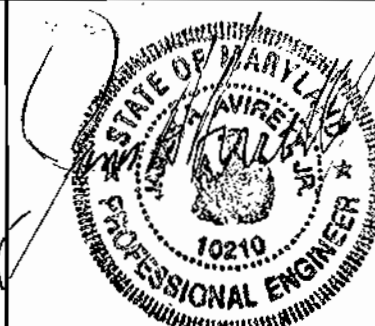
[Signature] 4/16/03
 DIRECTOR OF PUBLIC WORKS DATE

[Signature] 4/8/03
 CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 4-10-03
 CHIEF, BUREAU OF UTILITIES DATE

[Signature] 4-8-03
 CHIEF, UTILITY DESIGN DIVISION DATE

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 410-235-3450



DES: CAT			
DRN: CAT			
CHK: HWL			
DATE: 3/25/03	BY	NO.	REVISION

TITLE SHEET- VICINITY MAP
 AND INDEX OF DRAWINGS

600' SCALE MAP NO. 32 BLOCK NO. 20

ELKRIDGE WATER PUMPING STATION
 IMPROVEMENTS
 CONTRACT NO. 44-4085
 CAPITAL PROJECT NO. W-8228
 HOWARD COUNTY, MARYLAND

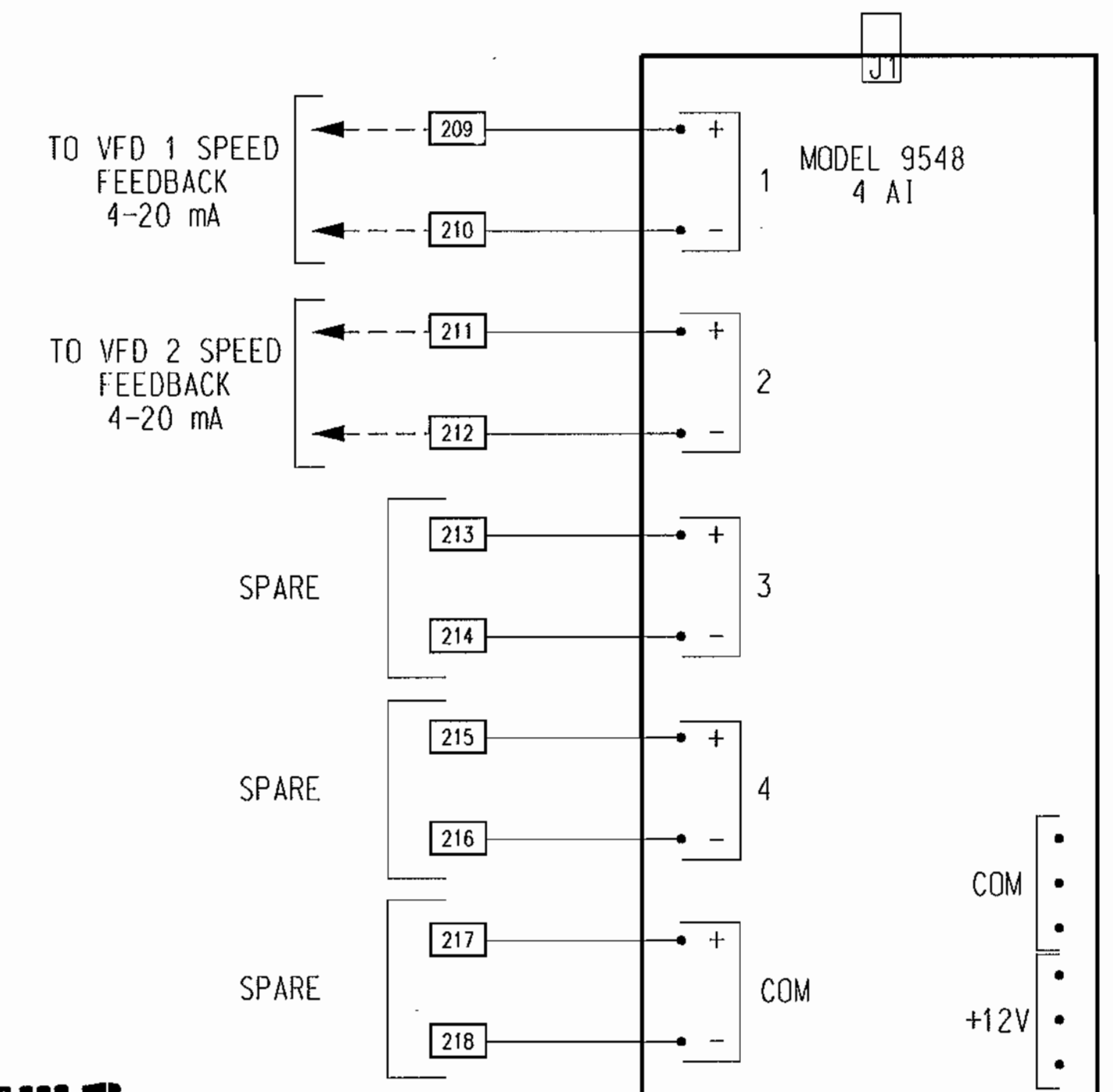
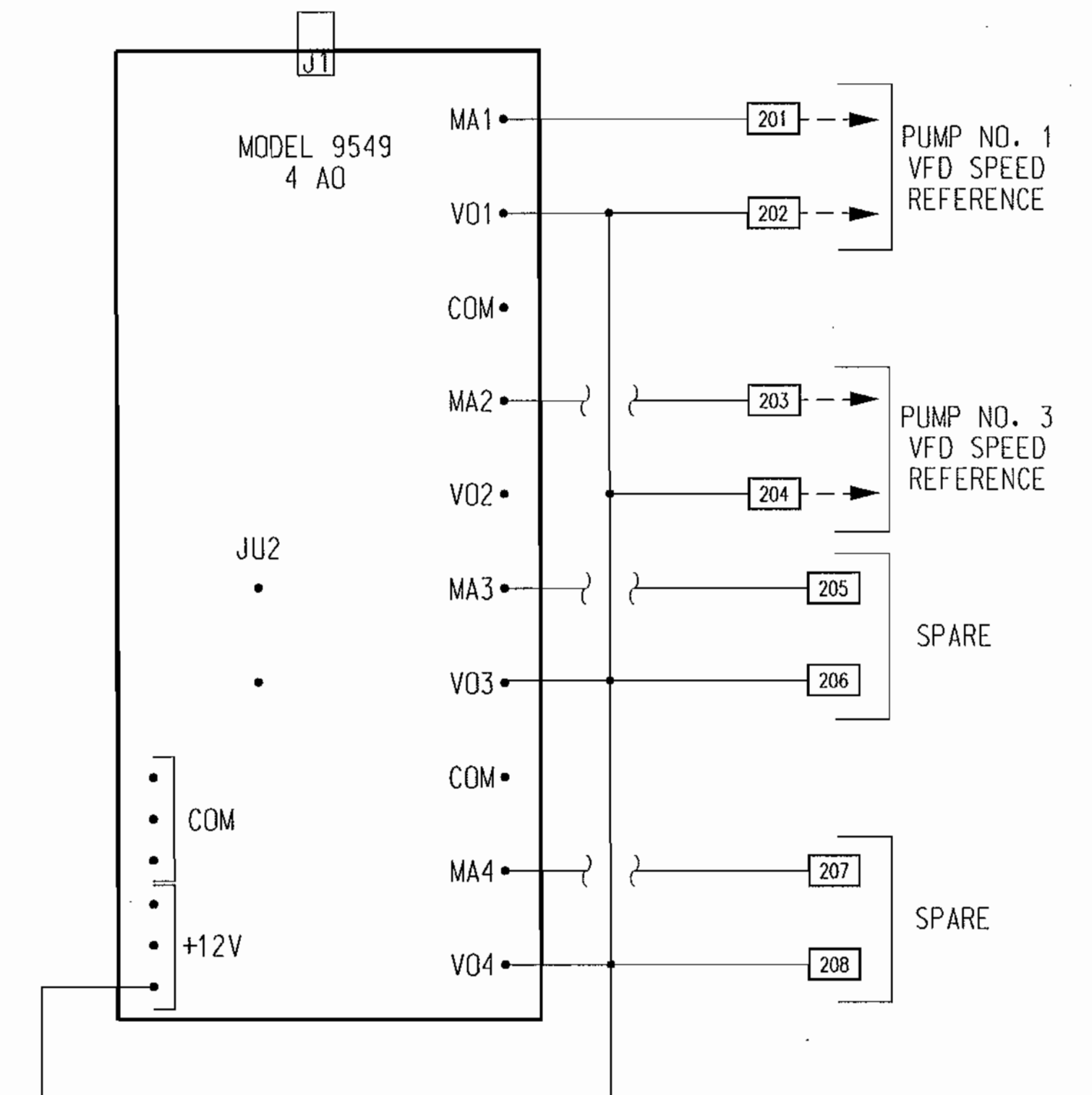
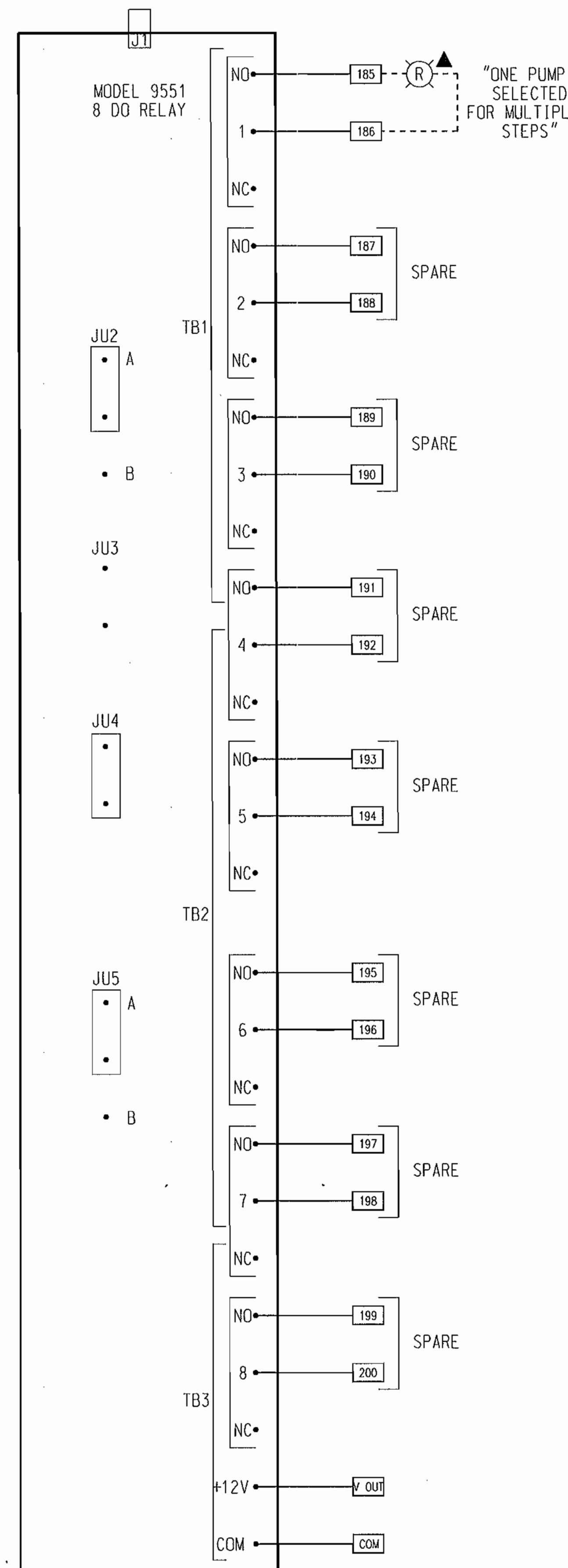
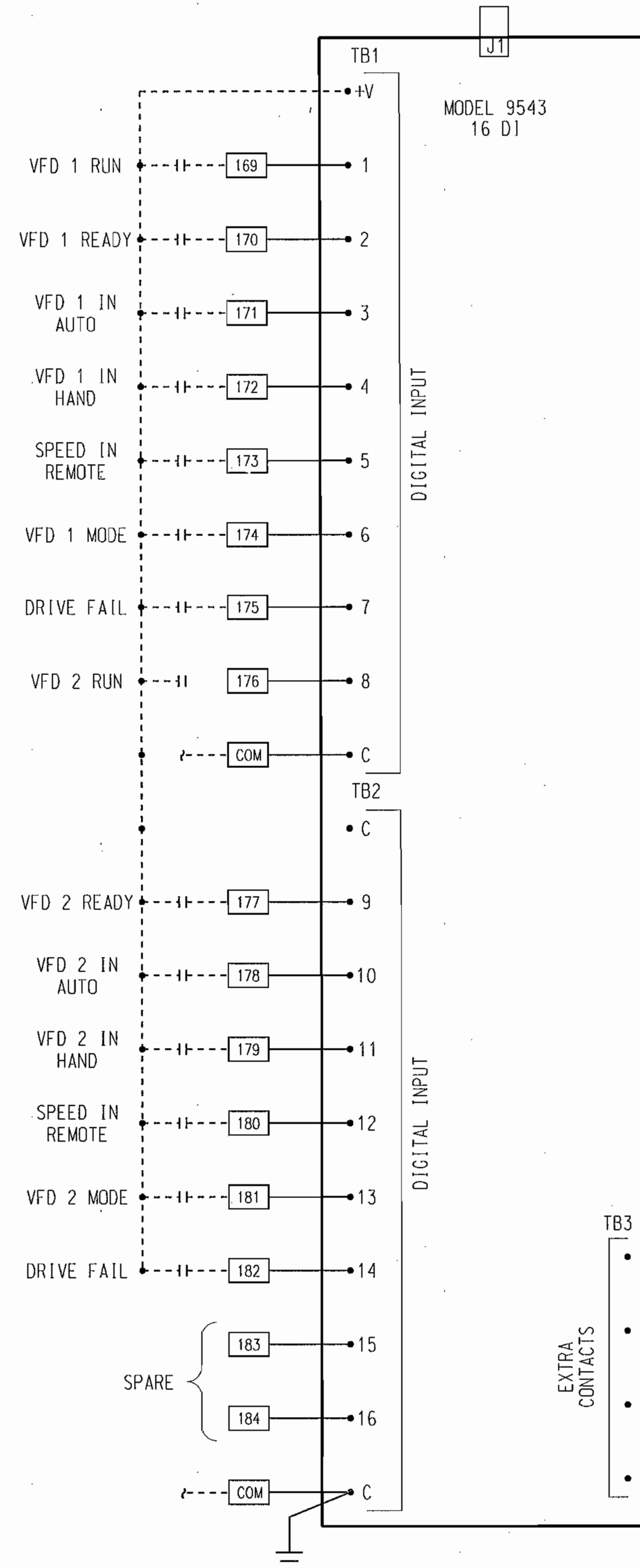
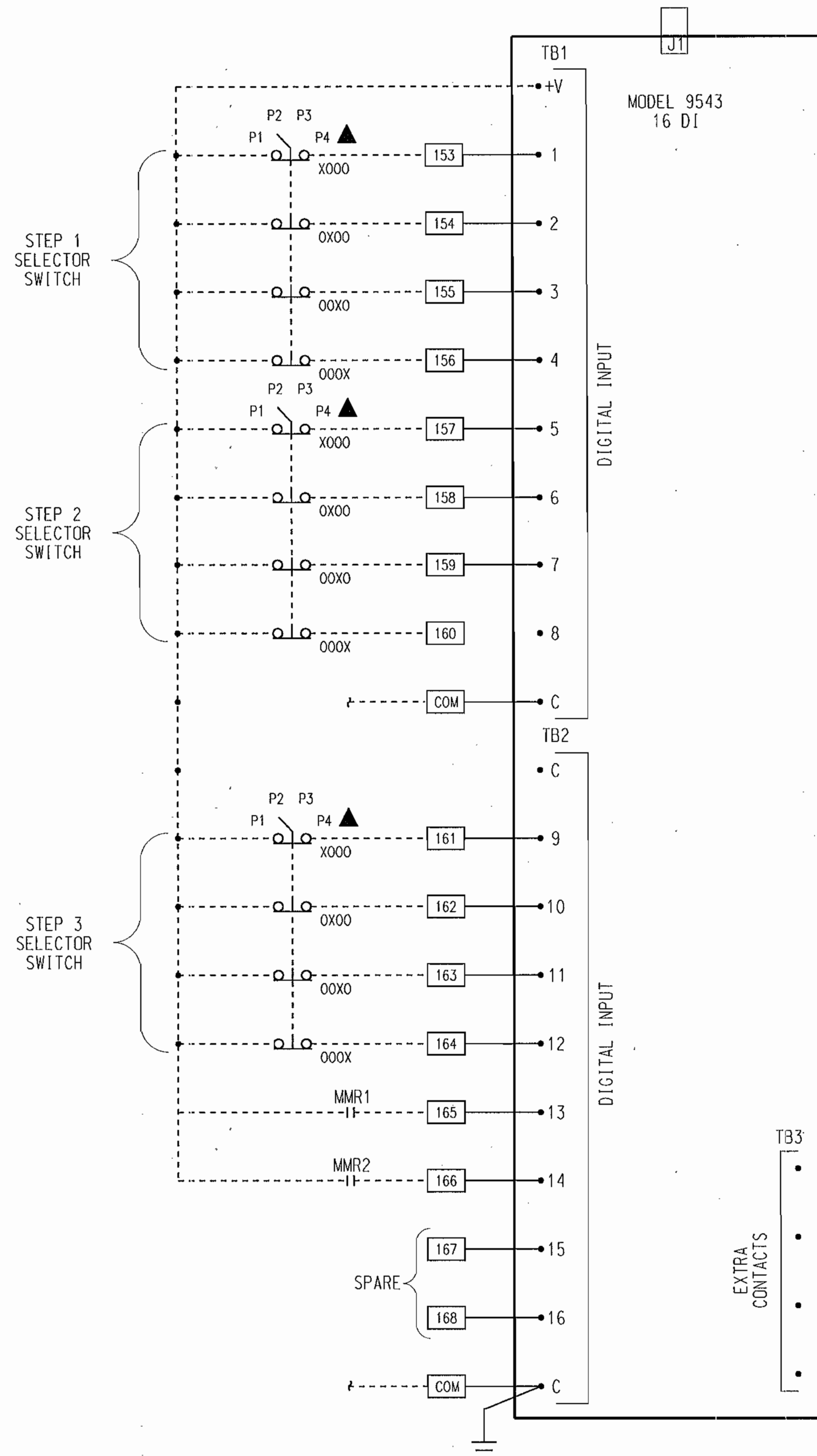
G-1
 SCALE AS SHOWN
 SHEET 1 OF 12

GENERAL NOTES:

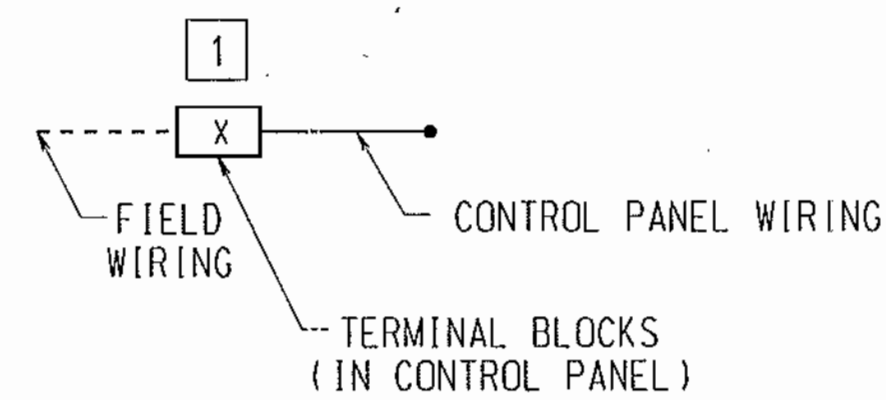
- CONTRACTOR SHALL UTILIZE THE SERVICES OF THE AUTOCON (U.S. FILTER) FACTORY TRAINED AND AUTHORIZED REPRESENTATIVE TO PROVIDE, INSTALL AND CONFIGURE THE DEVICES AS SHOWN.
- PROVIDE AND INSTALL WIRING AND TERMINALS TO ALL NEW I/O POINTS PROVIDED AS SHOWN.

SPECIFIC NOTES:

- CONTRACTOR SHALL FIELD VERIFY TERMINAL NUMBERING SEQUENCE AND ASSIGNMENTS WITH EXISTING RTU.



AS-BUILT 3/15/05



▲ DEVICE LOCATED ON SCADA ENCLOSURE DOOR

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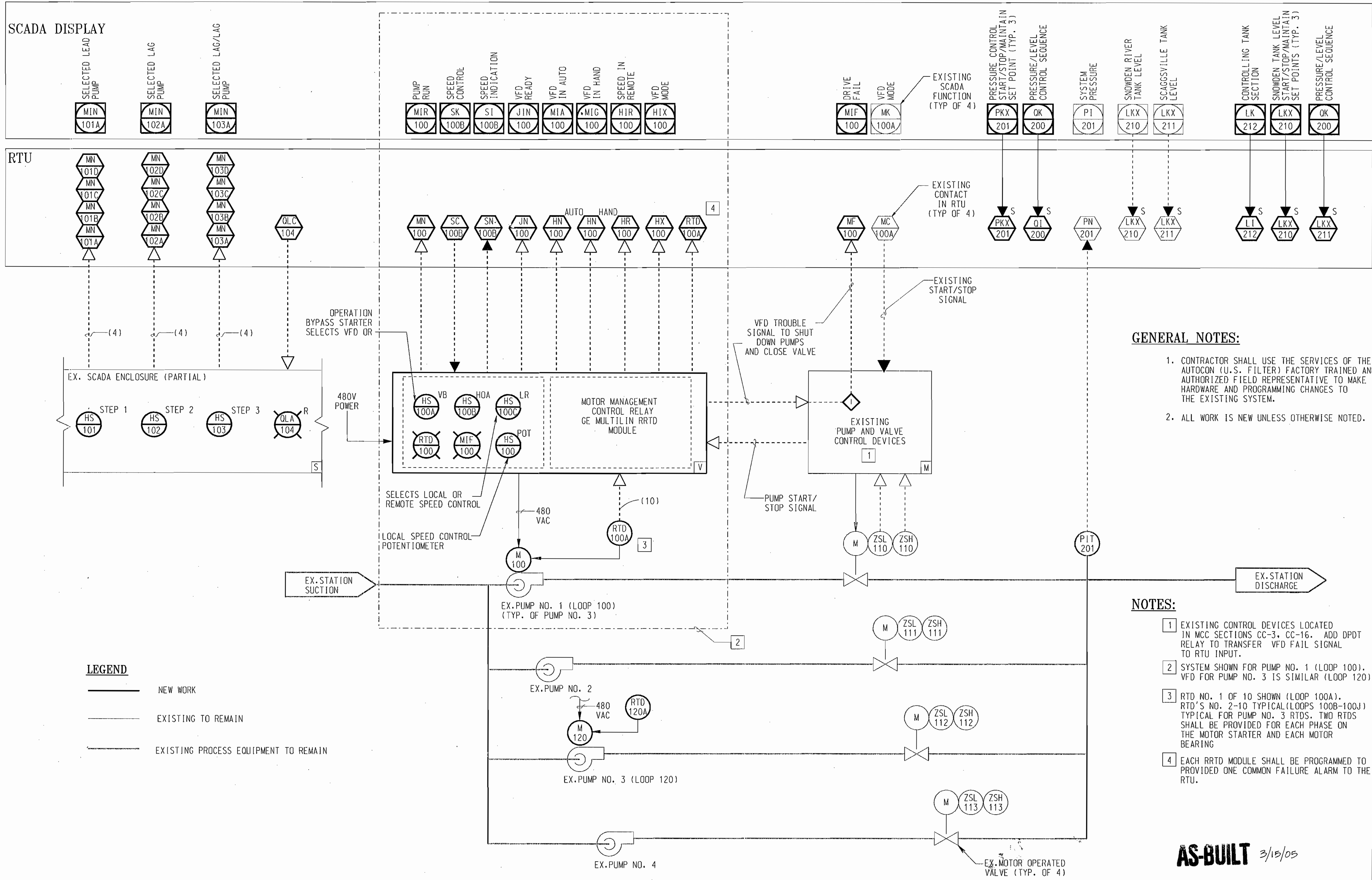
DES: JMV					
DRN: JMV					
CHK: PWG					
DATE: 3/25/03					
BY	NO.	REVISION	DATE	600' SCALE MAP NO.	32 BLOCK NO.

RTU I/O MODULES

ELKRIDGE WATER PUMPING STATION
IMPROVEMENTS
CONTRACT NO. 44-4085
CAPITAL PROJECT NO. W-8228
HOWARD COUNTY, MARYLAND

I-3

SCALE AS SHOWN
SHEET 12 OF 12



- GENERAL NOTES:**
1. CONTRACTOR SHALL USE THE SERVICES OF THE AUTOCON (U.S. FILTER) FACTORY TRAINED AND AUTHORIZED FIELD REPRESENTATIVE TO MAKE HARDWARE AND PROGRAMMING CHANGES TO THE EXISTING SYSTEM.
 2. ALL WORK IS NEW UNLESS OTHERWISE NOTED.

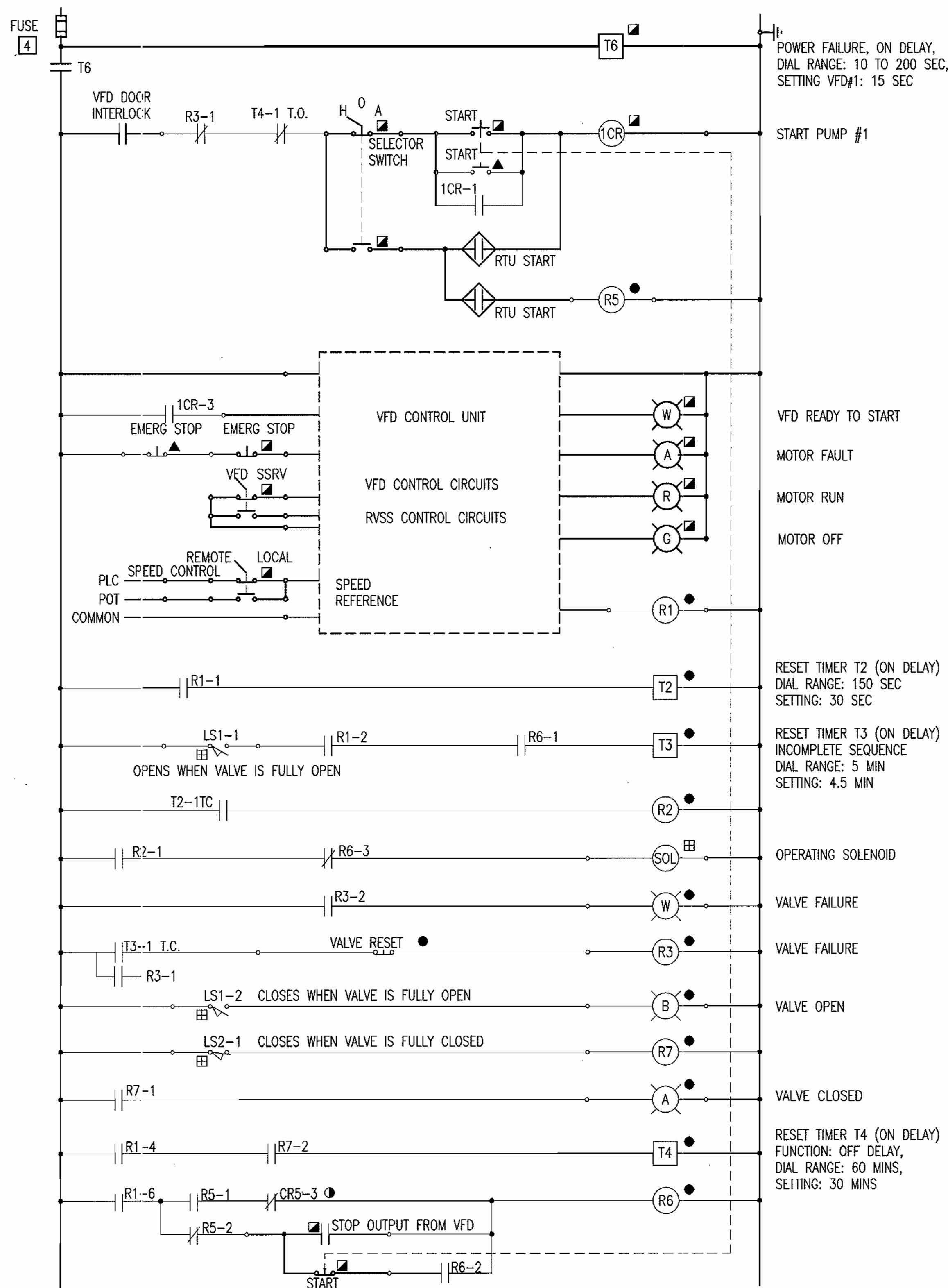
- NOTES:**
- 1 EXISTING CONTROL DEVICES LOCATED IN MCC SECTIONS CC-3, CC-16. ADD DPDT RELAY TO TRANSFER VFD FAIL SIGNAL TO RTU INPUT.
 - 2 SYSTEM SHOWN FOR PUMP NO. 1 (LOOP 100). VFD FOR PUMP NO. 3 IS SIMILAR (LOOP 120).
 - 3 RTD NO. 1 OF 10 SHOWN (LOOP 100A). RTD'S NO. 2-10 TYPICAL (LOOPS 100B-100J) TYPICAL FOR PUMP NO. 3 RTDS. TWO RTDS SHALL BE PROVIDED FOR EACH PHASE ON THE MOTOR STARTER AND EACH MOTOR BEARING
 - 4 EACH RRTD MODULE SHALL BE PROGRAMMED TO PROVIDED ONE COMMON FAILURE ALARM TO THE RTU.

LEGEND

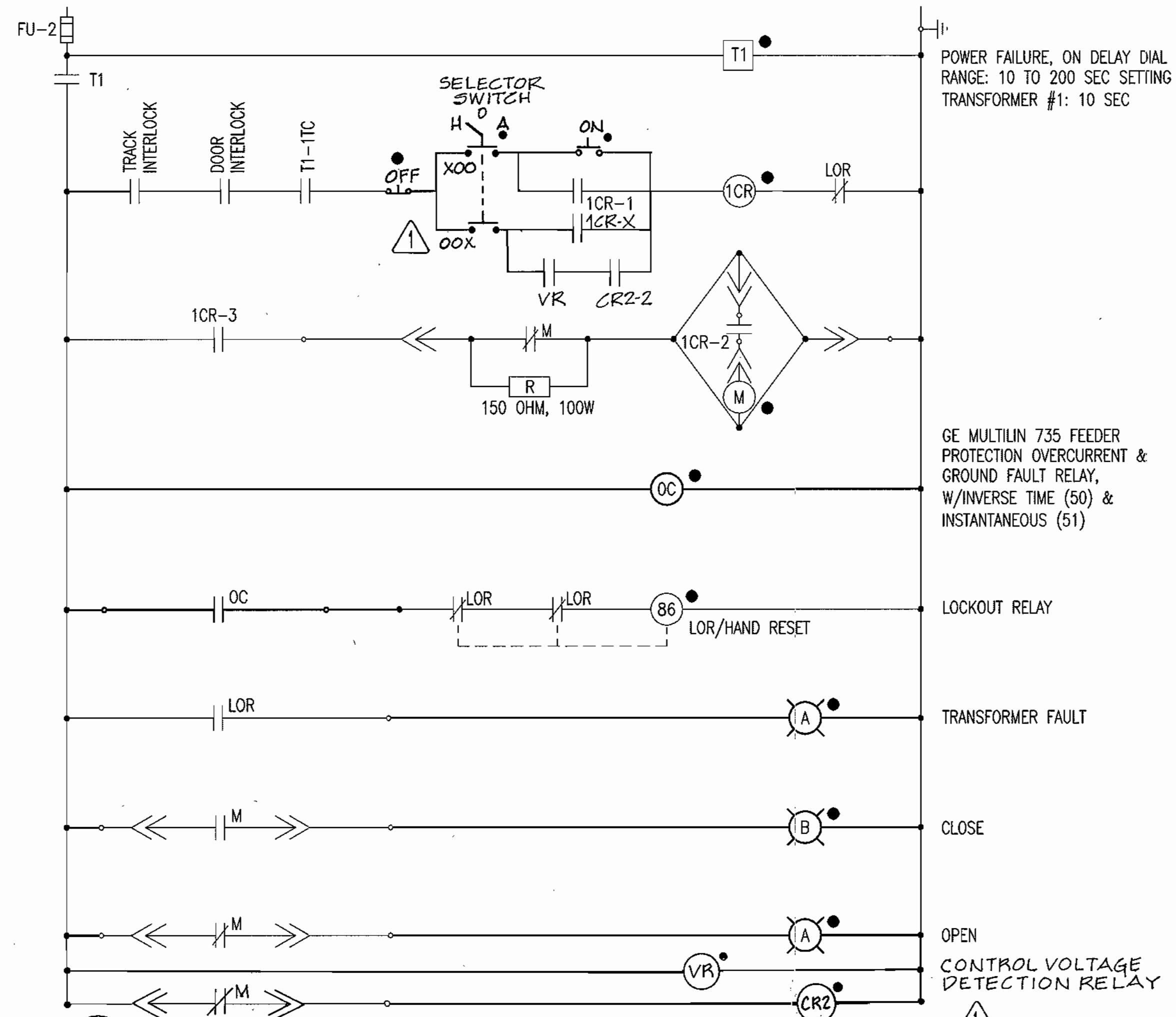
- NEW WORK
- EXISTING TO REMAIN
- EXISTING PROCESS EQUIPMENT TO REMAIN

AS-BUILT 3/15/05

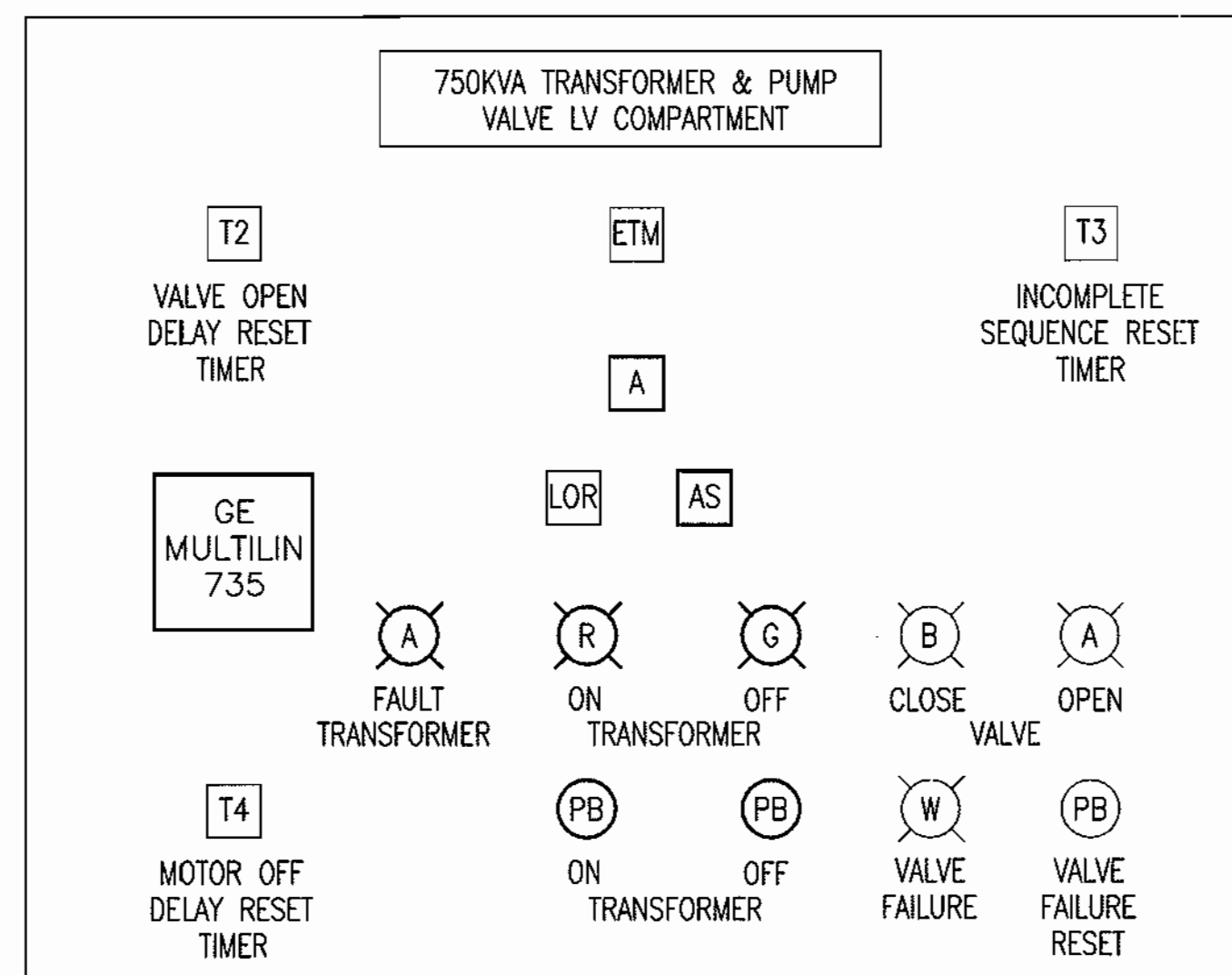
<p>DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND.</p> <p><i>Jay A. Shiles</i> DIRECTOR OF PUBLIC WORKS DATE: 4-10-03</p> <p><i>Mark Seaman</i> CHIEF, BUREAU OF ENGINEERING DATE: 4-8-03</p> <p><i>Ch. Donlin</i> CHIEF, UTILITY DESIGN DIVISION DATE: 4-8-03</p>	<p>PREPARED BY:</p> <p>WMR&A</p> <p>Whitman, Reardon and Associates, LLP. 801 SOUTH CAROLINE ST. BALTIMORE, MD. 21231 410-235-3450</p>	<p>DES: PWG</p> <p>DRN: JMV</p> <p>CHK: PWG</p> <p>DATE: 3/25/03</p>	<p>BY: NO.</p> <p>REVISION</p> <p>DATE</p>	<p style="text-align: center;">PROCESS AND INSTRUMENTATION DIAGRAM</p> <p>600' SCALE MAP NO. 32 BLOCK NO. 20</p>	<p style="text-align: center;">ELKRIDGE WATER PUMPING STATION IMPROVEMENTS CONTRACT NO. 44-4085 CAPITAL PROJECT NO. W-8228 HOWARD COUNTY, MARYLAND</p>	<p>SCALE AS SHOWN</p> <p>SHEET 11 OF 12</p>
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1 ELEMENTARY CONTROL DIAGRAM FOR VFD RUN PUMP #1 (PUMP #3 SIMILAR)



2 ELEMENTARY CONTROL DIAGRAM FOR 750KVA, 2400V-480V TRANSFORMER FOR PUMP #1 (PUMP #3 SIMILAR)



3 ELEVATION DETAILS FOR UNIT CC1-3, MCC1 (UNIT CC1-16 SIMILAR)

SPECIFIC NOTES:

- 1 MODIFY CONTROLS AT MCC CUBICLES CC1-16 & 18 FOR TRANSFORMER FOR PUMP #1. INCREASE OL RELAY SETTINGS TO 5A. REPEAT ABOVE STEPS AT MCC CUBICLES CC1-3 & 5 FOR TRANSFORMER FOR PUMP #3.
- 2 PROVIDE NEW CONTROLS, RELOCATE AND MODIFY EX. CONTROLS OF PUMP #1 AS SHOWN FROM CC1-16 TO VFD #1 CONTROL UNIT. REPEAT ABOVE STEPS FOR PUMP #3 FROM MCC CC1-3 TO VFD #2.
- 3 EXTEND CONTROL WIRING BETWEEN CC1-16 & 18 TO VFD #1 AND CC1-3 & 5 TO VFD #2.
- 4 PROVIDE TWO NEW CONTROL POWER SUPPLY FUSES IN MCC1 CUBICLE CC1-21. PROVIDE NEW CONTROL CABLES, ONE EACH FOR CONTROL POWER SUPPLY TO NEW PUMP CONTROLS LOCATED IN RESPECTIVE VFD'S AND LV CABINETS FOR PUMP #1 & 3.
- 5 INSTALL BLANK PLATES TO COVER BLANK HOLES, REMOVE UNUSED NAME PLATES. PAINT TO MATCH EX. PANEL.

DEVICE LOCATION SYMBOL:

- DEVICE LOCATED IN REMOTE TERMINAL UNIT
- DEVICE LOCATED IN RESPECTIVE 750KVA TRANSFORMER & PUMP VALVE LV COMPARTMENT
- ▲ DEVICE LOCATED NEAR RESPECTIVE MOTOR
- DEVICE LOCATED IN RESPECTIVE STARTER
- ▣ DEVICE LOCATED AT RESPECTIVE VALVE
- DEVICE LOCATED IN RESPECTIVE VFD

AS-BUILT 3/15/05

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DES: SS
DRN: AS
CHK: AM
DATE: 03/25/03

ELEMENTARY CONTROL DIAGRAM

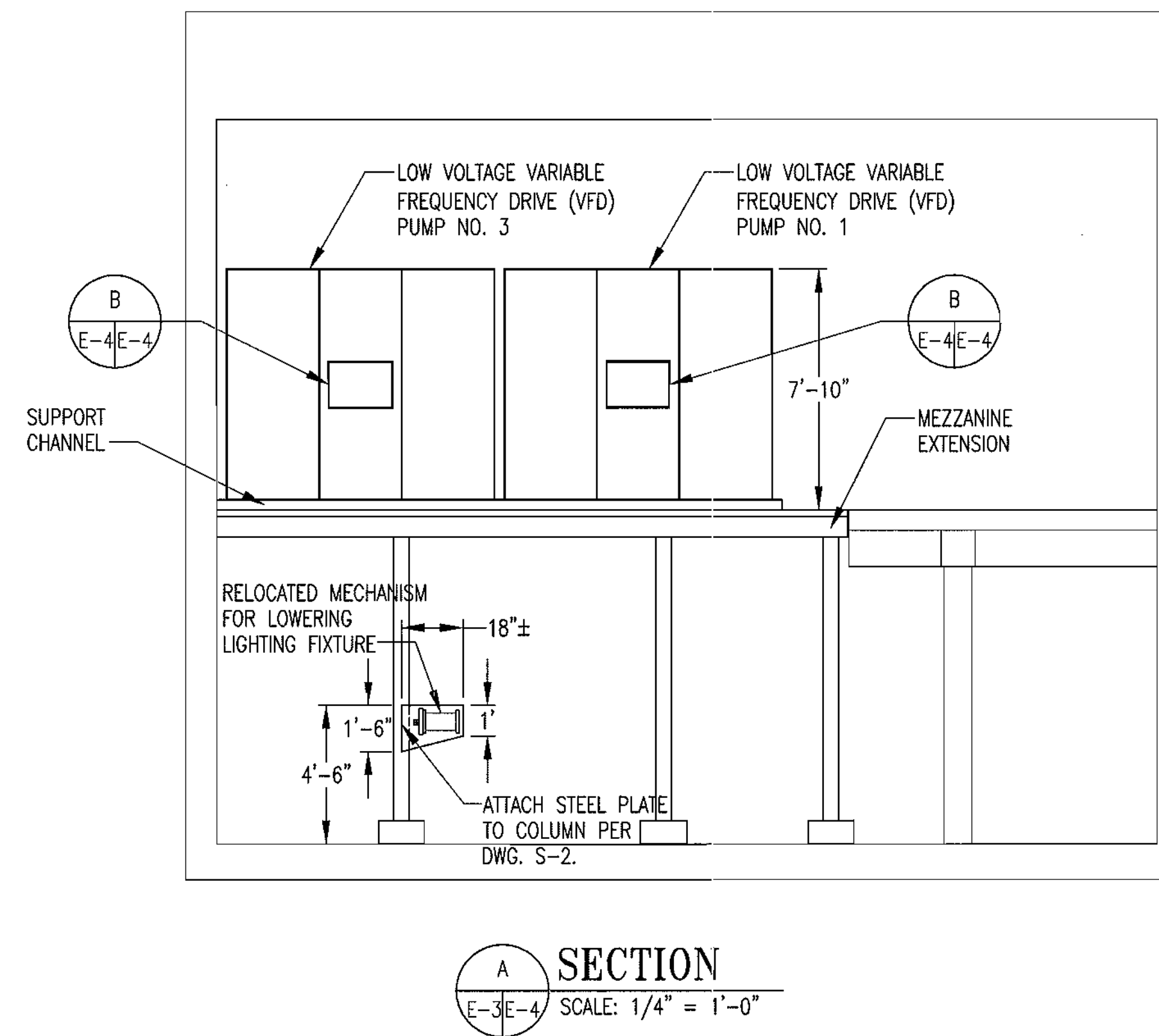
ELKRIDGE WATER PUMPING STATION
IMPROVEMENTS
CONTRACT NO. 44-4085
CAPITAL PROJECT NO. W-8228
HOWARD COUNTY, MARYLAND

E-5

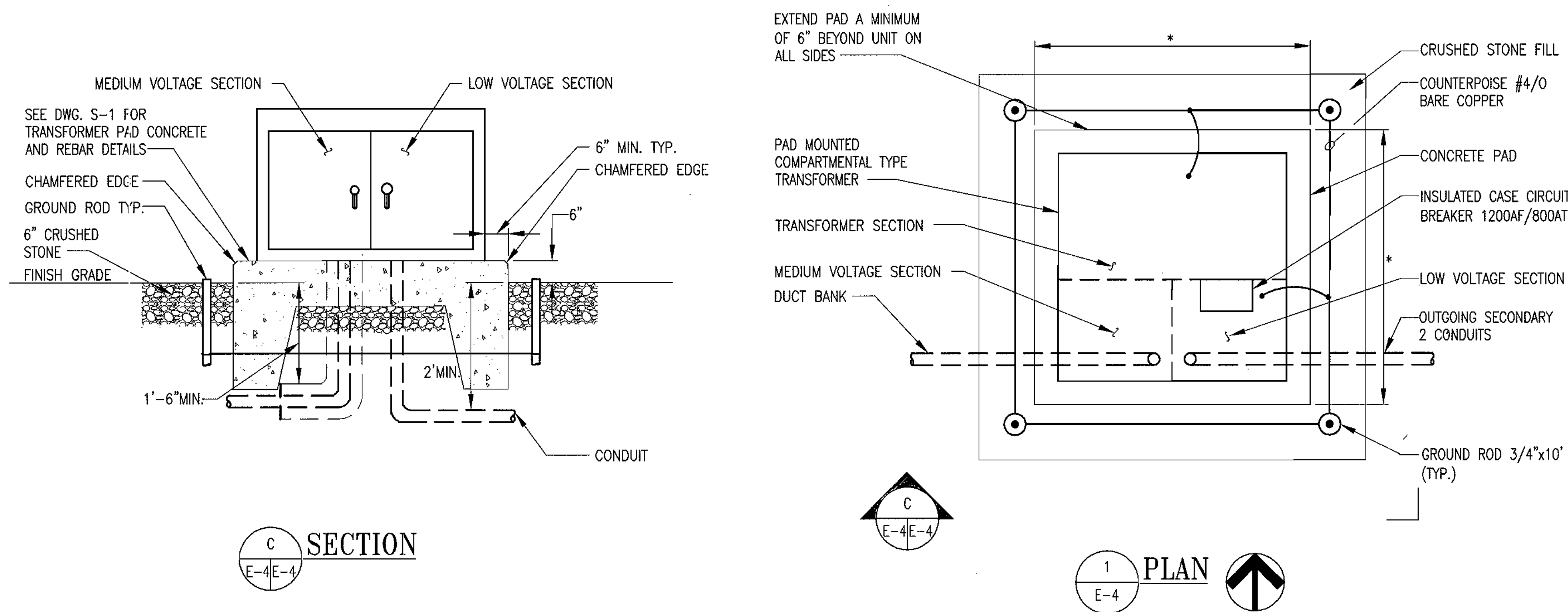
SCALE AS SHOWN
SHEET 9 OF 12

CABLE/WIRE AND CONDUIT SCHEDULE									
SERIAL NUMBER	EQUIPMENT FROM	EQUIPMENT TO	COPPER WIRE				GROUND WIRE SIZE AWG	CONDUIT SIZE INCH	REMARKS
			NO. OF SETS	NO.	SIZE AWG	TYPE			
P01	MCC CC1-5a	750KVA TRANSFORMER T-1	1	3	#2/0	MV90/5KV	#4	4	
P02	MCC CC1-18a	750KVA TRANSFORMER T-2	1	3	#2/0	MV90/5KV	#4	4	
P03	750KVA TRANSFORMER T-1	VFD-1 (PUMP NO. 1)	2	3	500 kcmil	THHN/600V	#2/0	4	
P04	750KVA TRANSFORMER T-2	VFD-2 (PUMP NO. 3)	2	3	500 kcmil	THHN/600V	#2/0	4	
P05	VFD-1	PUMP NO. 1	2	3	500 kcmil	THHN/600V	#2/0	4	
P06	VFD-2	PUMP NO. 3	2	3	500 kcmil	THHN/600V	#2/0	4	
P07	MCC CC2-6b	PUMP #1 TERMINAL BOX HEATER	1	2	#12	THHN/600V	#12	3/4	
P08	MCC CC2-6a	PUMP #3 TERMINAL BOX HEATER	1	2	#12	THHN/600V	#12	3/4	

LIGHTING FIXTURE SCHEDULE						
SYMBOL	LAMP		FIXTURE VOLTAGE	DESCRIPTION	MOUNTING	REMARKS
	NO.	WATTS				
	3	32	2850	120	PENDENT MOUNTED 20"x4"x6" INDUSTRIAL FLUORESCENT FIXTURE, PORCELAIN ENAMEL FINISH REFLECTOR, 0.026" THICK STEEL, WITH 10% UPLIGHT, 85% REFLECTANCE WITH RAPID START, HIGH POWER FACTOR ELECTRONIC BALLAST, SIMILAR TO EX. FIXTURES WITH SAME VOLTAGE RATING.	HUNG FROM ROOF JOISTS ABOVE
	2	32	2850	120	FLUORESCENT 16"x53" VAPOR TIGHT INDUSTRIAL FIXTURE WITH .125" THICK ACRYLIC LENS, PORCELAIN ENAMEL FINISH REFLECTOR, 0.026" THICK STEEL, 85% REFLECTANCE WITH RAPID START, HIGH POWER FACTOR ELECTRONIC BALLAST MOUNTED BELOW STEEL GRATINGS, SIMILAR TO EX. FIXTURE WITH SAME VOLTAGE RATING.	MOUNTED UNDER THE NEW MEZZANINE

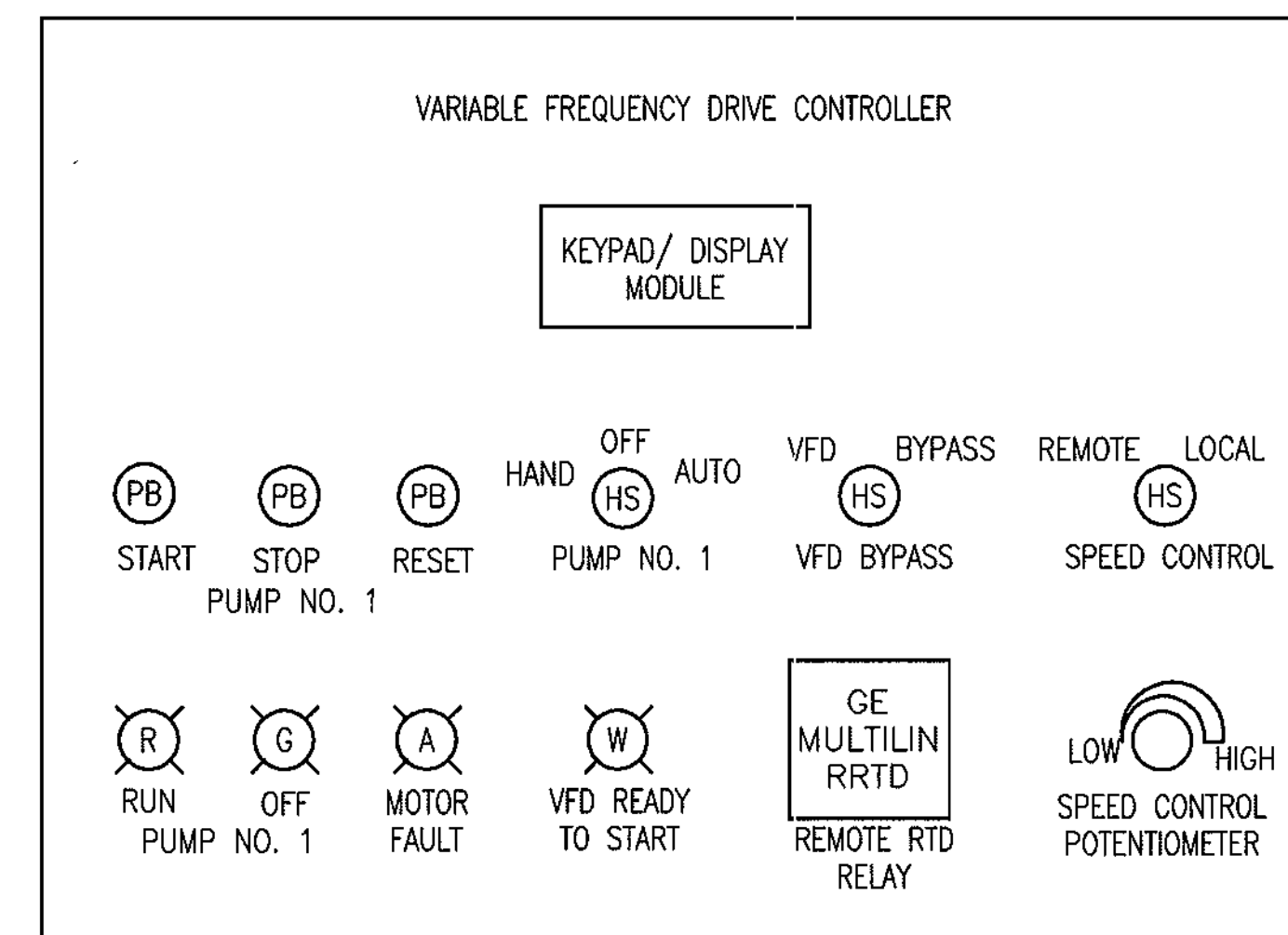


SECTION A-E-4 SCALE: 1/4" = 1'-0"



TRANSFORMER DETAIL N.T.S.

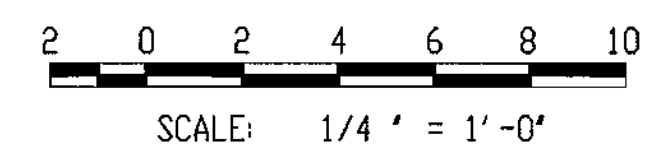
* DIMENSION TO SUIT EQUIPMENT SUPPLIED



VFD MOUNTED CONTROL SWITCHES & INDICATORS FOR PUMP NO. 1 (PUMP NO. 3 SIMILAR)

DETAIL B-E-4 NTS

GRAPHIC SCALE



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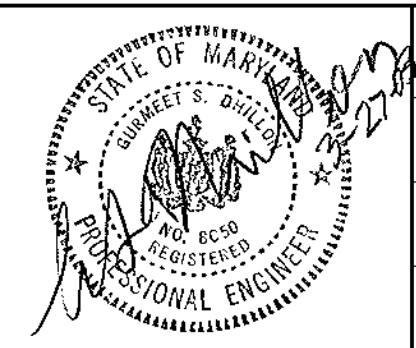
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DES:	SS				
DRN:	AS				
CHK:	AM				
DATE:	03/25/03				
BY:	NO.	REVISION	DATE	600' SCALE MAP NO.	32 BLOCK NO.

ELECTRICAL DETAILS AND CABLE SCHEDULE

ELK RIDGE WATER PUMPING STATION IMPROVEMENTS
CONTRACT NO. 44-4085
CAPITAL PROJECT NO. W-8228
HOWARD COUNTY, MARYLAND

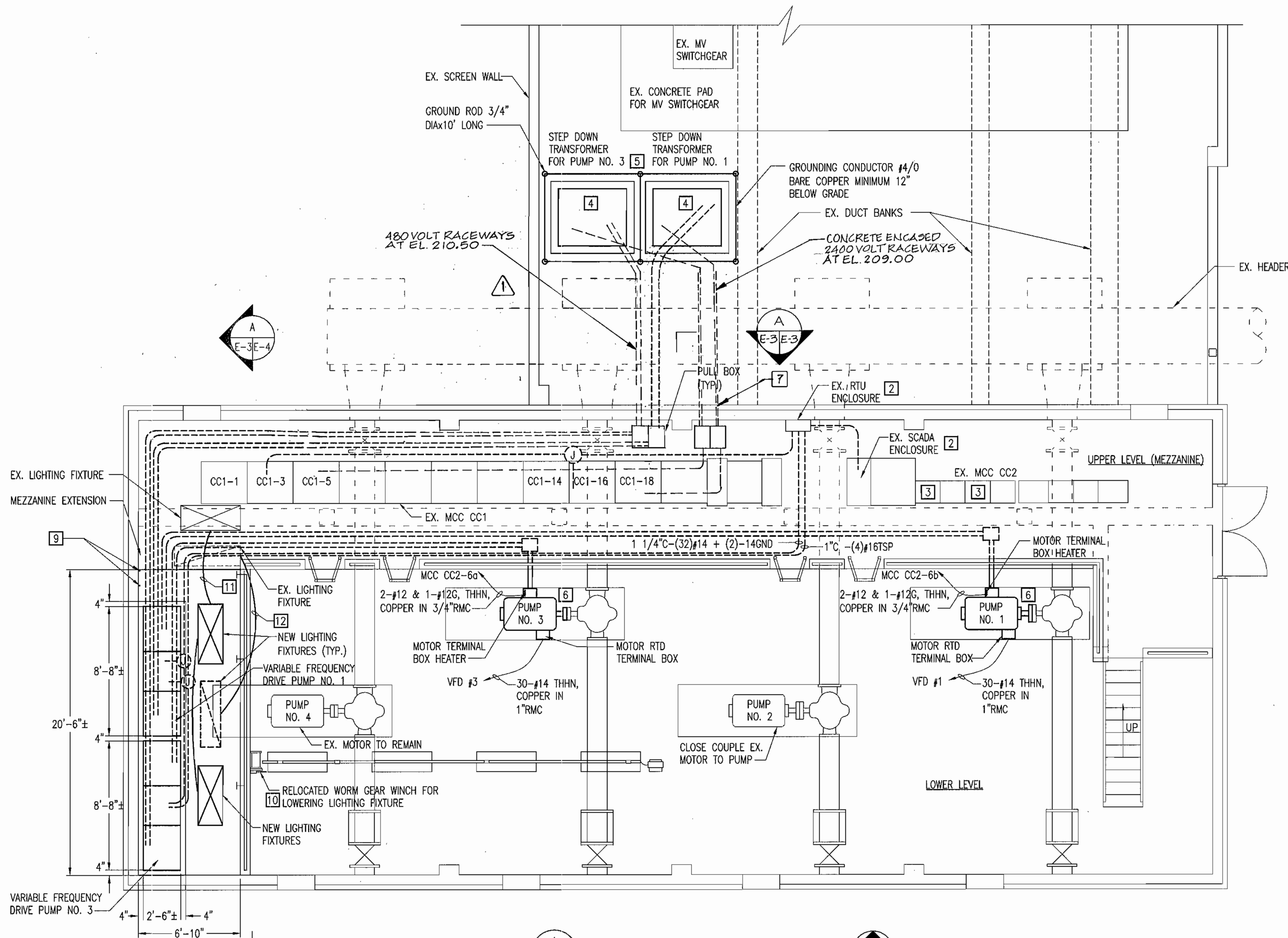
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SCALE AS SHOWN
SHEET 8 OF 12

GENERAL NOTES:

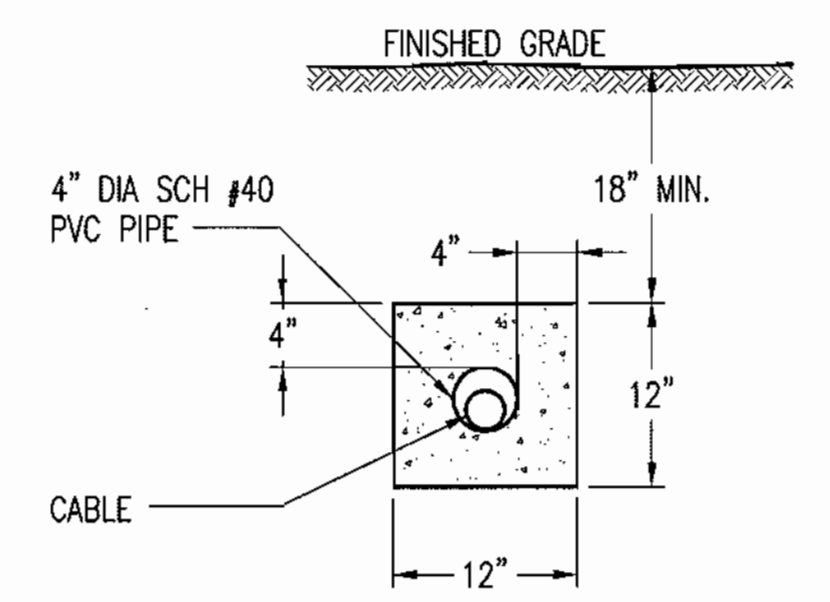
- ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND APPLICABLE STATE AND LOCAL CODES, RULES AND REGULATIONS.
- ALL CONDUITS AND EQUIPMENT SHALL BE INSTALLED, WIRED AND GROUNDED IN ACCORDANCE WITH THE LATEST RULES AND REGULATIONS OF THE NATIONAL ELECTRICAL CODE (NEC).
- THIS IS A REHABILITATION PROJECT, CONTRACTOR SHALL VERIFY EXISTING DIMENSIONS IN THE FIELD.
- CONDUIT RUNS ARE SHOWN DIAGRAMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH OTHER EQUIPMENT. EXPOSED CONDUITS SHALL BE RUN ON THE WALLS HORIZONTALLY AND VERTICALLY.
- CONDUITS SHALL BE TERMINATED SO AS TO PERMIT NEAT CONNECTION TO EQUIPMENT.
- CONDUIT ENDS SHALL BE SUITABLY SEALED TO PREVENT TRANSGRESS OF MOISTURE THROUGH CONDUITS FROM ONE EQUIPMENT TO OTHER.
- INSULATED GROUND TYPE BUSHINGS SHALL BE INSTALLED ON ALL CONDUITS ENTERING MCC'S, VFD'S ETC. BUSHING SHALL BE CONNECTED TO GROUND BUS.
- CONDUITS AND WIRES SHALL BE SIZED IN ACCORDANCE WITH NEC LATEST EDITION UON.
- CONDUITS INSTALLED EXPOSED ON EXTERIOR/INTERIOR OF BUILDING SHALL BE RMC. PULL/JUNCTION BOXES REQUIRED AS PART OF CONDUIT RUN SHALL BE NEMA-3R UON.
- PROVIDE PULL BOXES AT SUITABLE DISTANCES ALONG THE LENGTH OF CONDUIT FOR PULLING OF WIRES/CABLES.
- ALL WALL AND FLOOR PENETRATIONS FOR ELECTRICAL CONDUITS SHALL BE CORE DRILLED. PROVIDE SEGMENTED RUBBER COMPRESSION SEALS ON BOTH SIDES.
- CONTRACTOR SHALL REPAIR EXISTING STRUCTURE/CONCRETE TO MATCH THE ORIGINAL CONDITION IN CASE OF DAMAGE DUE TO DRILLING, CUTTING OR OTHER OPERATIONS.
- ALL WORK IS NEW UNLESS OTHERWISE NOTED OR INDICATED.
- AREAS EXCAVATED FOR DUCT BANKS AND UNDERGROUND CONDUITS SHALL BE BACK FILLED, COMPACTED AND RESTORED TO MATCH THE EXISTING. RESOD DISTURBED GRASS AREAS AND REPLACE STONE IN EXTERIOR EQUIPMENT AREA.
- RELOCATE EXISTING CONDUITS AT SOUTHWEST AND SOUTHEAST WALLS AS REQUIRED FOR INSTALLATION OF MEZZANINE.
- ALL WORKING CLEARANCES AND ACCESS REQUIREMENTS IN SECTION II & III OF ARTICLE 110 OF NATIONAL ELECTRIC CODE SHALL BE MET.
- ALL EQUIPMENT, REGARDLESS OF VOLTAGE, SHALL BE LISTED AND/OR LABELED BY A NATIONALLY RECOGNIZED LABORATORY.

SPECIFIC NOTES:

- 2-4" DIA PVC SCH #40 PIPES DIRECT BURIED, 18" BELOW FINISHED GRADE EACH WITH 3-#500kcmil & 1-2/0AWG GRD WIRES.
- REFER TO DWG I-1 FOR MODIFICATIONS TO EXISTING SCADA AND RTU ENCLOSURES.
- REPLACE EXISTING O/L RELAYS FOR ROOF VENTILATION FANS EF-1 THRU EF-4 IN CUBICLES CC2-2, 5, 12, & 15 BY NEW O/L RELAYS SUITABLE FOR NEW 2HP FAN MOTORS.
- PROVIDE CONCRETE PAD TO SUIT NEW TRANSFORMERS. SEE TYPICAL DETAIL DWGS. E-4 & S-1.
- CONNECT TRANSFORMER BODY TO GROUNDING GRID WITH #2/0 GROUNDING CONDUCTORS.
- PROVIDE NEW 450HP, 460V CLOSE COUPLED MOTOR WITH EX. PUMP, MODIFY EX. STEEL MOUNTING BASE TO SUIT NEW MOTORS TO BE PROVIDED UNDER DIVISION 15.
- FOR PENETRATIONS THROUGH PUMPING STATION WALL, SEE THE STRUCTURAL DWG S-1 FOR PENETRATION DETAIL.
- DUCT BANKS PASSING BELOW THE SCREEN WALL SHALL BE INSTALLED BELOW THE SCREEN WALL FOOTING (APPROXIMATELY 3'-6" BELOW GRADE). ALL OTHER DUCT BANKS SHALL BE INSTALLED PER THE "TYPICAL CONCRETE DUCT BANK" DETAIL. STAGE DUCT BANK INSTALLATION AND TAKE CARE NOT TO UNDERMINE THE WALL FOUNDATION DURING DUCT BANK INSTALLATION.
- EX. 1" C FOR COMMUNICATION & EX. 1" C FOR EMERGENCY LIGHT TO REMAIN, CONTRACTOR TO PROVIDE SLOTS IN GRATING FOR THESE CONDUITS (SEE STRUCTURAL DRAWINGS).
- RELOCATE THE EX. WORM GEAR WINCH USED FOR LOWERING LIGHTING FIXTURES PER DWG. E-4 SECTION 'A'. PROVIDE ANGLE SUPPORT BETWEEN ROOF JOISTS (SIMILAR TO EX. SUPPORTS). RELOCATE ONE SUPPORT PULLEY MOUNTED AT ROOF JOISTS, WIRE ROPE, AND FIXTURE MOUNTING HARDWARE TO SUIT NEW LOCATION.
- CONTRACTOR SHALL EXTEND THE LIGHTING CIRCUIT FROM EX. LIGHTING FIXTURES TO NEW LIGHTING FIXTURES (TWO) HUNG FROM ROOF JOISTS SIMILAR TO EXISTING FIXTURES, USING 2#12 & 1#12G IN 3/4" C MIN.
- CONTRACTOR SHALL EXTEND THE LIGHTING CIRCUIT FROM EX. LIGHTING FIXTURE MOUNTED/HUNG UNDER THE EX. MEZZANINE TO NEW FIXTURE MOUNTED UNDER NEW MEZZANINE AS SHOWN ON THIS SHEET, USING 2#12 & 1#12G IN 3/4" C MIN.

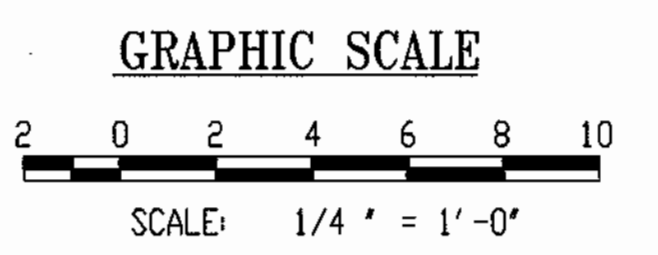


1 PLAN - UPPER AND LOWER LEVELS
SCALE: 1/4" = 1'-0"



A TYPICAL CONCRETE DUCT BANK
NTS

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DES: SS	
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BY: ND	
REVISION	
AS-BUILT REVISION	3/15/05

ELECTRICAL PLAN - NEW WORK	
600' SCALE MAP NO. 32	BLOCK NO. 20

ELKRIDGE WATER PUMPING STATION
IMPROVEMENTS
CONTRACT NO. 44-4085
CAPITAL PROJECT NO. W-8228
HOWARD COUNTY, MARYLAND

E-3
SCALE AS SHOWN
SHEET
7 OF 12

UNDERGROUND SERVICE FDR1
BY POWER CO.

UNDERGROUND SERVICE FDR2
BY POWER CO.

13.2KV SWITCHGEAR AND KEY INTERLOCKS, SYSTEM NORMALLY OPERATES IN TWO INDEPENDENT HALVES.

2.4KV SWITCHGEAR AND KEY INTERLOCKS, SYSTEM NORMALLY OPERATES IN TWO INDEPENDENT HALVES.

TRANSFORMER #1,
1500/1725KVA, 0A/FA 65°C,
13.2KV-2400Y/1385V, 3ø,
60HZ, 5.39% IMPEDANCE

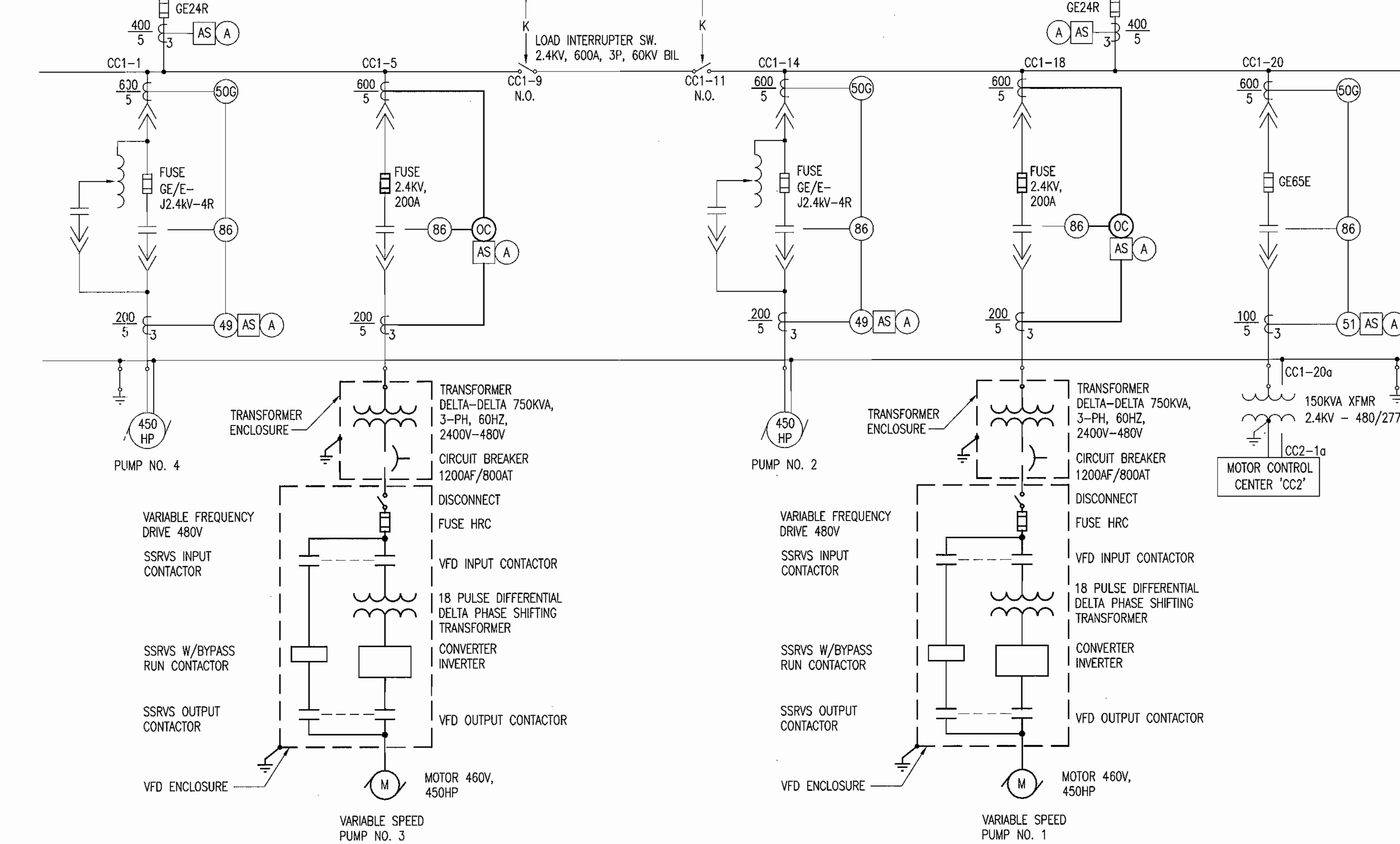
TRANSFORMER #2
1500/1725KVA, 0A/FA 65°C,
13.2KV-2400Y/1385V, 3ø,
60HZ, 5.48% IMPEDANCE

LOAD INTERRUPTER
SWITCH (CC1-7) 2.4KV,
600A, 3P, 60KV BIL

AUTOMATIC TRANSFER
SWITCH (CC1-17)

CONTROL
PANEL 'CC1'
(CC1-21)

LOAD INTERRUPTER
SWITCH (CC1-13) 2.4KV,
600A, 3P, 60KV BIL



1 SINGLE LINE POWER DIAGRAM-PARTIAL
E-2

NOTES:

- FOR GENERAL NOTES REFER DWG E-3.
- NEW ITEMS ARE SHOWN IN HEAVY LINE AND EX. IN LIGHT LINE.

ELECTRICAL ABBREVIATIONS:

A, AMP	AMPERE
A	AMBER COLOR LENS
AC	ALTERNATING CURRENT
AFF	ABOVE FINISHED FLOOR
AUTO	AUTOMATIC
B	BLUE COLOR LENS
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CONN	CONNECTION OR CONNECT
DET	DETAIL
DWG	DRAWING
ELECT	ELECTRICAL
EX	EXISTING
G	GREEN COLOR LENS
GND, G	GROUND
HS	HAND SWITCH
HZ	HERTZ
J	JUNCTION BOX
KW	KILOWATT
KVA	KILOVOLT AMPERE
MAX	MAXIMUM
MIN	MINIMUM
O/L	OVER LOAD
P	POLE
PB	PUSH BUTTON
PL	PANEL
PH	PHASE
PWR	POWER
PVC	POLYVINYL CHLORIDE
R	RED COLOR LENS
RECP	RECEPTACLE
RMC	RIGID METAL CONDUIT
RTU	RESISTANCE TEMPERATURE DETECTOR
SSRVS	SOLID STATE REDUCED VOLTAGE STARTER
STR	STARTER
SW	SWITCH
UON	UNLESS OTHERWISE NOTED
V	VOLTS
VA	VOLT AMPERE
W	WHITE COLOR LENS
X	DESIGNATION OF SECTION/ DETAIL (A, B, C...)
X	SHEET SECTION OR DETAIL IS LOCATED ON
X	SHEET PLAN IS LOCATED ON
⊠	INDUSTRIAL FLUORESCENT WITH 3 LAMPS
⊠	VAPOR TIGHT INDUSTRIAL FLUORESCENT WITH 2 LAMPS

LEGEND:

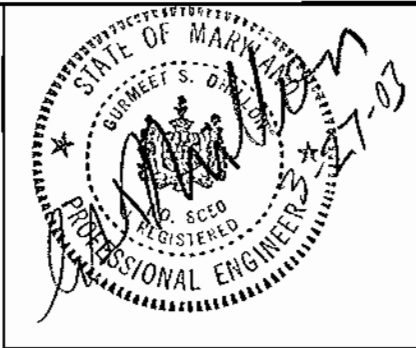
EX. TO REMAIN	NEW
(49) / OL	THERMAL OVERLOAD RELAY
(50G)	INSTANTANEOUS GROUND OVERCURRENT RELAY
(51)	TIME DELAY OVERCURRENT RELAY
(86) / LOR	LOCKOUT TRIPPING RELAY, HAND RESET
(A)	AMMETER
(AS)	AMMETER SWITCH
(T)	TIMER
(V)	VOLTMETER
(VS)	VOLTMETER SWITCH
(C)	CONTACTOR
(CR)	CONTROL RELAY
(R)	RUN RELAY
(S)	START RELAY
(GF)	GROUND FAULT RELAY
(GFR)	GROUND FAULT RESET RELAY
(M)	MASTER CONTACTOR
(SOL)	SOLENOID
(A)	INDICATING LIGHT, LETTER INDICATES COLOR
(J)	JUNCTION BOX
(OC)	TIME INVERSE, INSTANTANEOUS OVERCURRENT & GROUND FAULT RELAY GE MULTILIN 735
(M)	MOTOR
⊠	CURRENT TRANSFORMER
⊠	POTENTIAL TRANSFORMER
⊠	POWER TRANSFORMER
⊠	GROUND/GROUND ROD
⊠	FUSE
⊠	NORMALLY OPEN CONTACT
⊠	NORMALLY CLOSE CONTACT
⊠	RTU CONTACT
⊠	DRAWOUT DEVICE CONTACT
⊠	AUTO TRANSFORMER
⊠	ELECTRICAL INTERLOCK
⊠	KEY INTERLOCK
⊠	CONCRETE DUCTBANK
⊠	CONDUIT UNDER FLOOR/GRADE
⊠	STRUCTURAL BEAMS/PIPES BELOW FLOOR/GRADE
⊠	EX. EQUIPMENT/CABLES TO REMAIN
⊠	NEW EQUIPMENT/CABLES
⊠	CIRCUIT HOME RUN
⊠	2#12 & #12G COPPER THHN IN 3/4" RMC, UON

AS-BUILT 3/15/05

DHILLON ENGINEERING, INC.
10902 REISTERSTOWN ROAD, SUITE 204
OWINGS MILLS, MD 21117
PH: 410-356-1095 FAX: 410-363-4675
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

PREPARED BY:
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Whitman, Reardon and Associates, LLP.
801 South Caroline Street
Baltimore, Md. 21231
410-235-3450

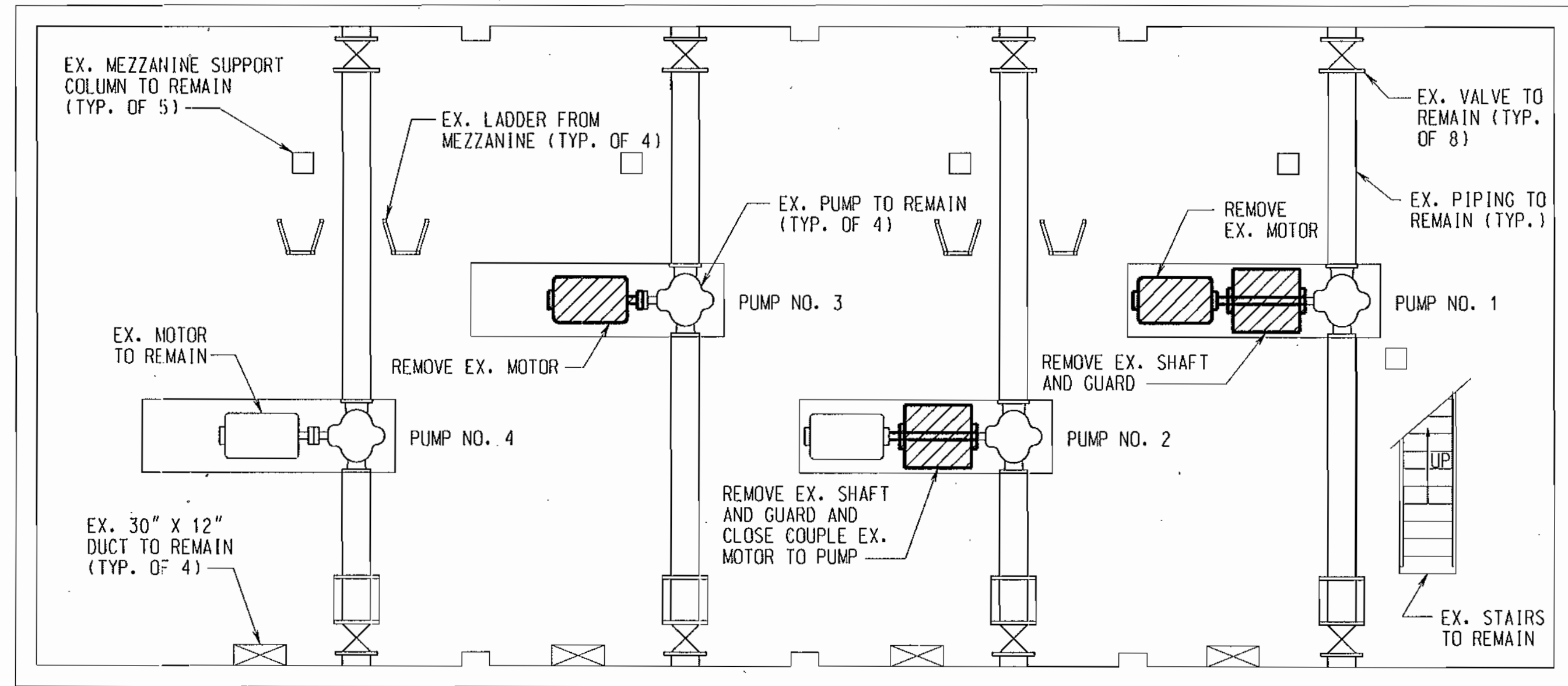


DES: SS			
DRN: AS			
CHK: AM			
DATE: 03/25/03	BY: NO.	REVISION	DATE

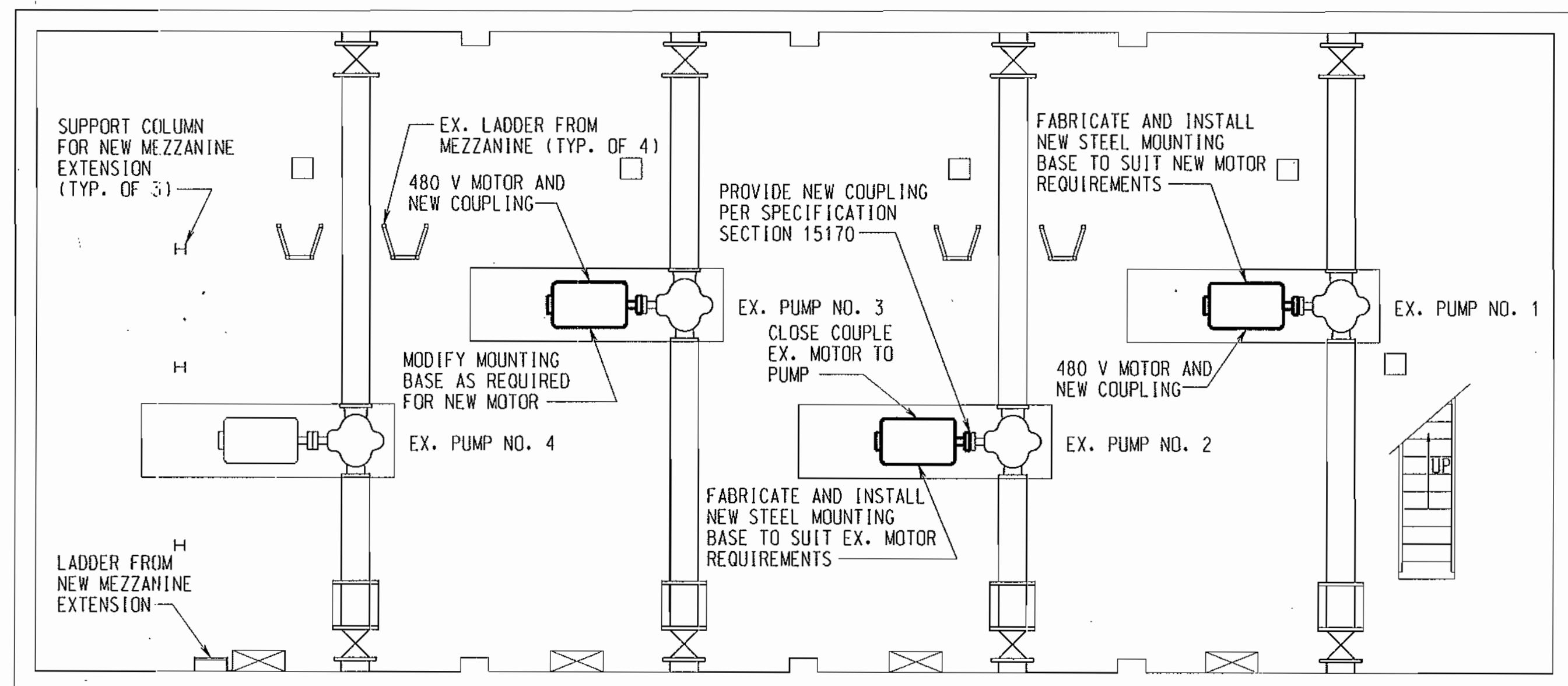
**ELECTRICAL SINGLE LINE DIAGRAM,
LEGEND AND ABBREVIATIONS**

ELKRIDGE WATER PUMPING STATION
IMPROVEMENTS
CONTRACT NO. 44-4085
CAPITAL PROJECT NO. W-8228
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET
6 OF 12



1 **PUMP ROOM REMOVAL PLAN**
M-1 SCALE: 3/16" = 1'-0"



2 **PUMP ROOM NEW WORK PLAN**
M-1 SCALE: 3/16" = 1'-0"

LEGEND:

- NEW WORK
- EXISTING FEATURES
- ▨ EXISTING FEATURES TO BE REMOVED

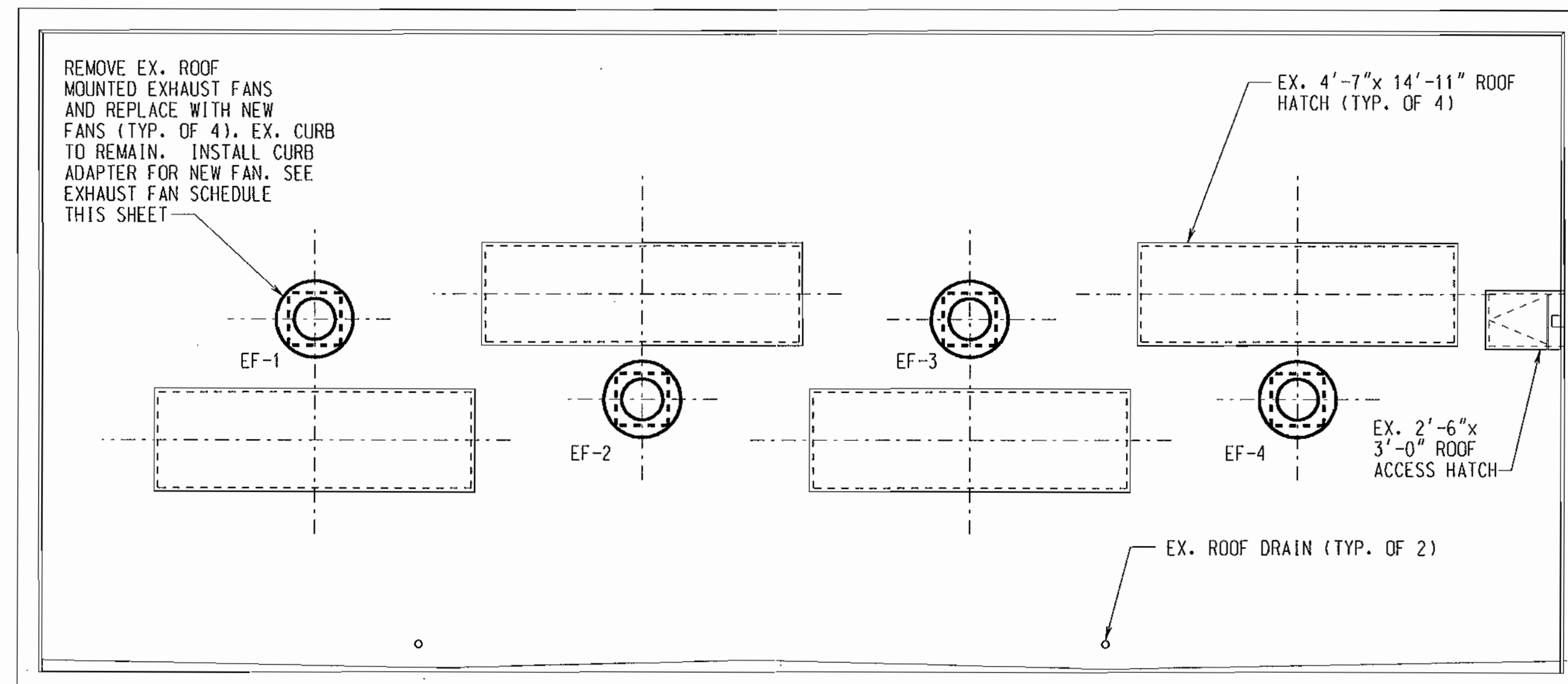
ABBREVIATIONS:

- EF EXHAUST FAN
- EX. EXISTING
- HP HORSEPOWER
- HZ HERTZ
- I.D. IDENTIFICATION
- IN. INCHES
- PH PHASES
- RPM REVOLUTIONS PER MINUTE
- TYP. TYPICAL
- V VOLTAGE
- W.G. WATER GAUGE

GENERAL NOTES:

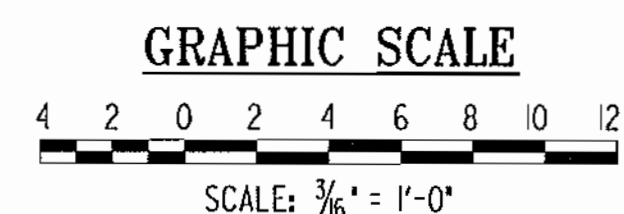
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS SHOWN.
2. CONTRACTOR SHALL COORDINATE ALL EQUIPMENT INSTALLATION REQUIREMENTS WITH OTHER PORTIONS OF CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO ELECTRICAL AND INSTRUMENTATION DRAWINGS AND SPECIFICATIONS.
3. ALL WORK IS NEW UNLESS OTHERWISE NOTED
4. ALL PUMPS (4) AND PIPING TO REMAIN
5. ALL STEEL FABRICATIONS, INCLUDING NEW PUMP BASES AND MODIFICATIONS TO EXISTING BASES, SHALL BE IN ACCORDANCE WITH APPLICABLE STRUCTURAL DRAWING NOTES AND SPECIFICATIONS.

UNIT I.D.	CFM	SERVICE	TYPE	ELECTRICAL CHARACTERISTICS					STATIC PRESS (IN. WG.)	NOTES
				HP	RPM	V	PH	HZ		
EF-1	7046	PUMP ROOM/ELECTRICAL ROOM	ROOF EXHAUST	2	5755	480	3	60	0.750	CURB ADAPTER
EF-2	7046	PUMP ROOM/ELECTRICAL ROOM	ROOF EXHAUST	2	5755	480	3	60	0.750	CURB ADAPTER
EF-3	7046	PUMP ROOM/ELECTRICAL ROOM	ROOF EXHAUST	2	5755	480	3	60	0.750	CURB ADAPTER
EF-4	7046	PUMP ROOM/ELECTRICAL ROOM	ROOF EXHAUST	2	5755	480	3	60	0.750	CURB ADAPTER



3 **ROOF PLAN - REMOVAL AND NEW WORK**
M-1 SCALE: 3/16" = 1'-0"

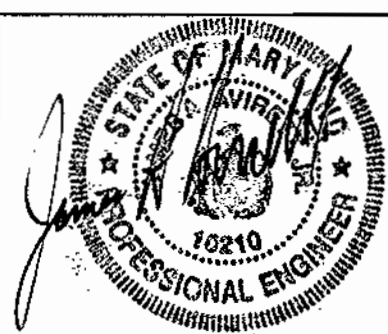
AS-BUILT 3/15/05



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

Director of Public Works: *John J. ...* DATE: 4-10-03
 Chief, Bureau of Engineering: *Robert J. ...* DATE: 4/8/03
 Chief, Utility Design Division: *...* DATE: 4-8-03

PREPARED BY: **WR&A**
 Whitman, Requardt and Associates, LLP.
 801 SOUTH CAROLINE ST.
 Baltimore, Md. 21231
 410-235-3450



DES: CAT			
DRN: MMH			
CHK: HWL			
DATE: 3/25/03			
BY: NO.		REVISION	
DATE	600' SCALE MAP NO. 32	BLOCK NO. 20	

MECHANICAL LEGEND,
ABBREVIATIONS,
NOTES AND PLANS

ELKRIDGE WATER PUMPING STATION
IMPROVEMENTS
CONTRACT NO. 44-4085
CAPITAL PROJECT NO. W-8228
HOWARD COUNTY, MARYLAND

M-1
SCALE AS SHOWN
SHEET 4 OF 12

STRUCTURAL GENERAL NOTES

GENERAL NOTES

- UNLESS OTHERWISE SPECIFIED, ALL MANUALS AND SPECIFICATIONS REFERENCED IN THESE NOTES AND DRAWINGS SHALL BE THE CURRENT EDITION.
- THE CONTRACT DRAWINGS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- THE SIZES AND LOCATIONS OF EQUIPMENT PADS AND PEDESTALS, AS WELL AS EQUIPMENT RELATED FLOOR AND SLAB OPENINGS ARE DEPENDENT UPON THE ACTUAL EQUIPMENT FURNISHED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND COORDINATE ALL SUCH ITEMS. NO DIMENSIONS INDICATED ON THESE DRAWINGS SHALL BE ALTERED WITHOUT THE ENGINEER'S APPROVAL. ALL EQUIPMENT PADS AND OTHER EQUIPMENT SUPPORTS REQUIRED MAY NOT HAVE BEEN SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR SIZES AND LOCATIONS OF SUCH PADS AND SUPPORTS.

STRUCTURAL STEEL NOTES

- FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, (AISC) "MANUAL OF STEEL CONSTRUCTION".
- THE CONTRACTOR SHALL SUBMIT ERECTION PLANS AND SHOP DETAILS BEFORE PROCEEDING WITH FABRICATION.
- ALL W-SHAPE STRUCTURAL STEEL SHALL COMPLY WITH ASTM A992. ALL OTHER STRUCTURAL STEEL AND PLATES SHALL COMPLY WITH ASTM A36.
- ANCHOR BOLTS (A.B.) SHALL COMPLY WITH ASTM A307.
- HIGH STRENGTH BOLTS (HS) SHALL COMPLY WITH ASTM A325.
- ALL WELDING SHALL COMPLY WITH AMERICAN WELDING SOCIETY, (AWS D1.1) "STRUCTURAL WELDING CODE".
- ALL SHOP CONNECTIONS SHALL BE WELDED WITH CLASS E-70 SERIES ELECTRODES. FIELD CONNECTIONS SHALL BE HIGH STRENGTH BOLTED EXCEPT WHERE OTHERWISE NOTED.
- CONNECTIONS NOT INDICATED SHALL BE DESIGNED BY THE FABRICATOR. BEAM CONNECTIONS SHALL BE DESIGNED FOR ONE-HALF THE TOTAL ALLOWABLE UNIFORM LOAD GIVEN IN PART 2 OF THE AISC "MANUAL OF STEEL CONSTRUCTION". OTHER CONNECTIONS SHALL BE DESIGNED FOR THE LOADS INDICATED. ALL CONNECTIONS SHALL BE A MINIMUM OF TWO 3/4" H.S. BOLTS OR WELDS OF EQUAL STRENGTH.
- MILL BOTTOM OF ALL COLUMNS AND FINISH TOP OF ALL BASE PLATES IN ACCORDANCE WITH AISC SPECIFICATIONS. BASE PLATES SHALL BE WELDED TO BOTTOM OF COLUMNS.
- SPECIFIED GROUT THICKNESS INCLUDES 1/4" THICK LEVELING PLATES WHICH SHALL BE USED UNDER ALL BEAMS AND COLUMNS RESTING ON CONCRETE.
- ALL STEEL GRATING SHALL COMPLY WITH ASTM A569 AND SHALL SUPPORT A LIVE LOAD OF 250 PSF.
- ALL OUTSIDE EDGES OF GRATING AND OPENINGS IN GRATING SHALL BE Banded.

FOUNDATION NOTES

- FOR MECHANICAL AND ELECTRICAL WORK TO BE INCORPORATED IN FOUNDATION WORK, SEE MECHANICAL AND ELECTRICAL DRAWINGS.
- ALL EXCAVATION SHALL BE KEPT DRY. STANDING WATER SHALL NOT BE ALLOWED IN EXCAVATIONS.
- BEFORE PLACING ANY POROUS FILL OR CONCRETE ON SUBGRADE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
- A SIX INCH LAYER OF POROUS FILL STONE SHALL BE PROVIDED UNDER ALL SLABS ON GRADE.

ALUMINUM NOTES

- ALL ALUMINUM IS DESIGNED AND SHALL BE FABRICATED IN ACCORDANCE WITH THE CURRENT SPECIFICATION OF THE ALUMINUM ASSOCIATION.
- ALL ALUMINUM SHALL BE ALLOY 6061-T6.
- ALL ALUMINUM IN CONTACT WITH CONCRETE AND DISSIMILAR METALS SHALL, BEFORE ERECTION, BE HEAVILY COATED AS SPECIFIED.
- FOR OTHER MISCELLANEOUS METALS SEE SPECIFICATIONS.

CONCRETE NOTES

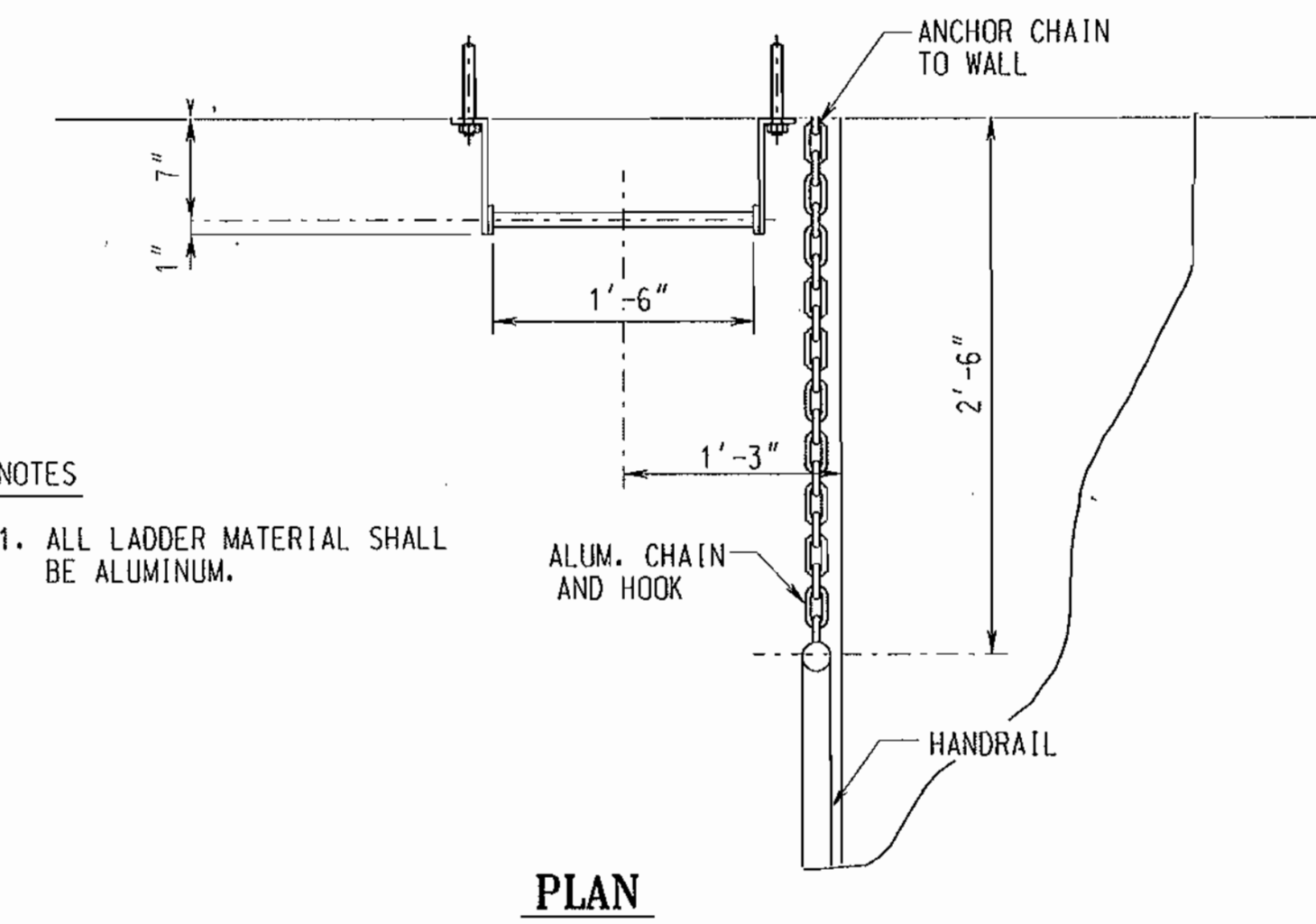
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
- REINFORCED CONCRETE SHALL BE DETAILED AND CONSTRUCTED IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE, (ACI 301) "SPECIFICATION FOR STRUCTURAL CONCRETE".
- ALL REINFORCEMENT SHALL CONFORM TO ASTM SPECIFICATION A615, DEFORMED, GRADE 60. ALL REINFORCEMENT IS DESIGNATED IN SOFT METRIC SIZES.
- UNLESS OTHERWISE NOTED ON THE DRAWINGS, CONCRETE COVER FOR REINFORCEMENT SHALL BE AS FOLLOWS:
 - A. UNFORMED CONCRETE BOTTOM BARS IN FOOTINGS AND SLABS ON EARTH, OR GRAVEL - 3"
 - B. BEAMS, SLABS, COLUMNS AND WALLS EXPOSED TO GROUND, WEATHER OR PROCESS LIQUID AFTER THE REMOVAL OF FORMS - 2"
 - C. BEAMS, COLUMNS AND PIERS NOT EXPOSED TO WEATHER OR PROCESS LIQUID - 1 1/2"
- ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL SUBMIT SHOP DETAILS OF REINFORCING STEEL BEFORE PROCEEDING WITH FABRICATION.
- REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH ACI DETAILING MANUAL.
- ANCHOR BOLTS AND EQUIPMENT PEDESTALS SHALL BE SIZED AND LOCATED AS REQUIRED TO SUIT EQUIPMENT FURNISHED.

DESIGN LOADS

- DEAD LOADS - ACTUAL WEIGHT OF STRUCTURE.
- LIVE LOADS - MEZZANINE - 250 P.S.F. INCLUDING AREAS OCCUPIED BY EQUIPMENT. - EQUIPMENT - ACTUAL WEIGHT.
- SEISMIC LOAD - SEISMIC GROUP 2, CATEGORY A, PER BOCA 1999 BUILDING CODE

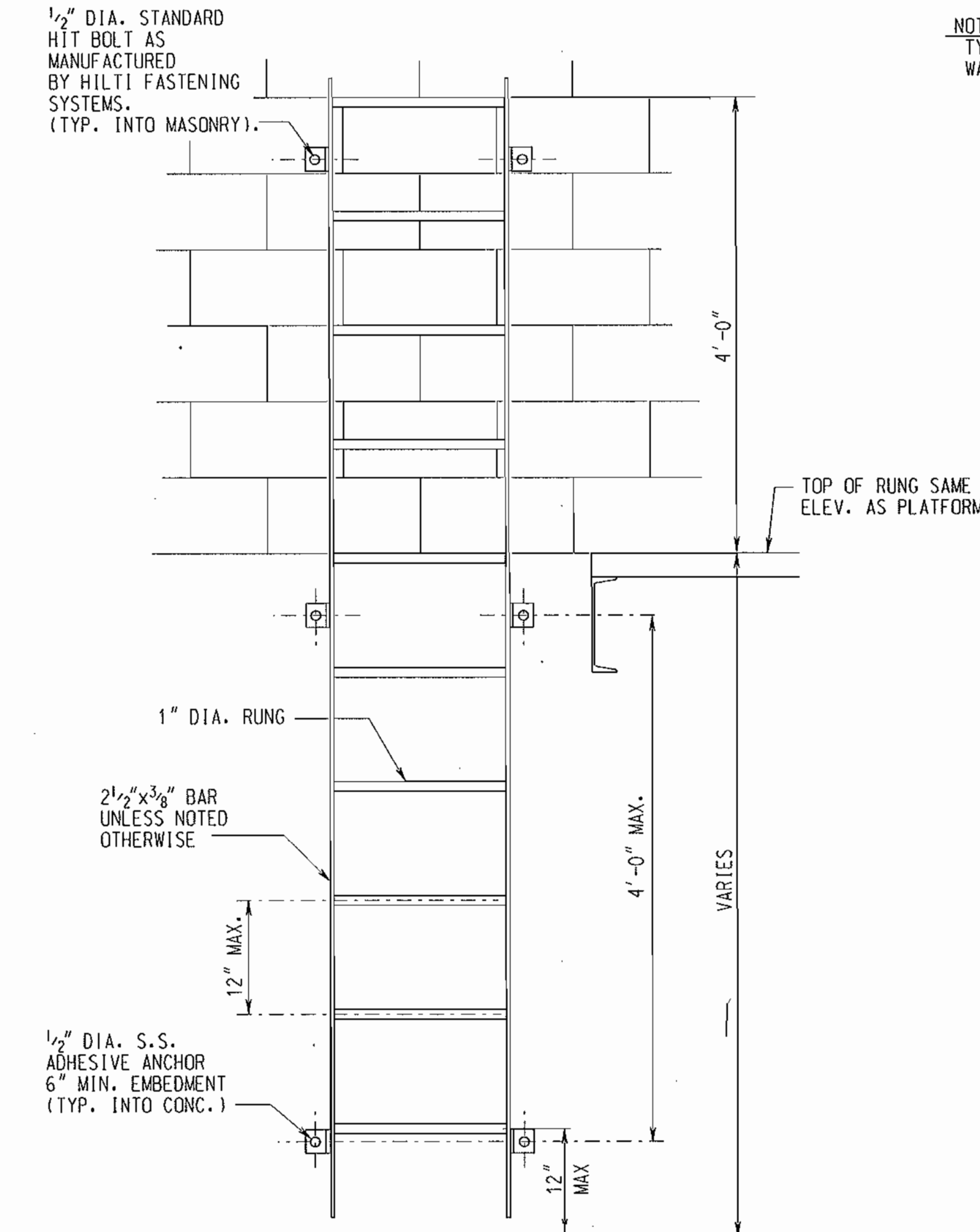
CODES

- BUILDING OFFICIALS AND CODE ADMINISTRATORS, "BOCA BUILDING CODE"
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION, (AISC) "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS - ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN".
- AMERICAN CONCRETE INSTITUTE, (ACI-318) "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE".



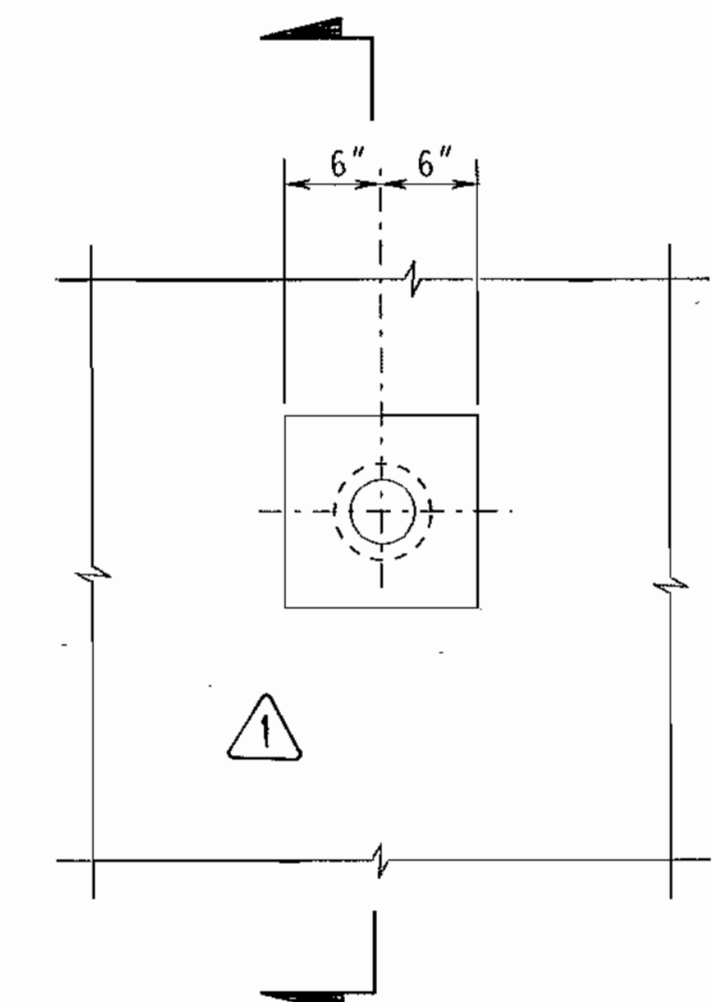
NOTES

- ALL LADDER MATERIAL SHALL BE ALUMINUM.



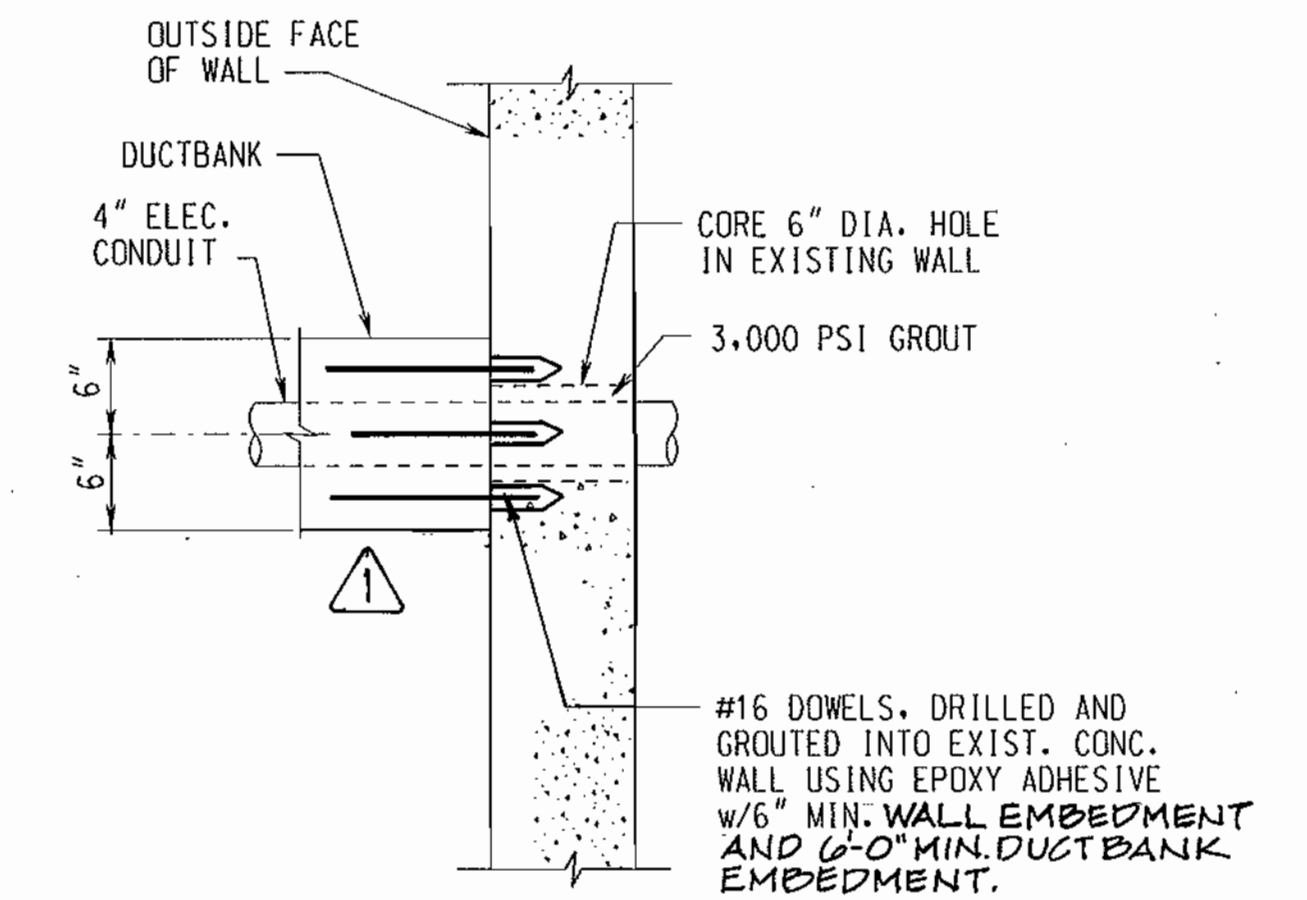
TYPICAL LADDER DETAILS

SCALE: NONE



NOTE: TYPICAL AT ALL DUCTBANKS PENETRATING EXISTING WALLS. SEE ELECTRICAL DWGS. FOR LOCATIONS

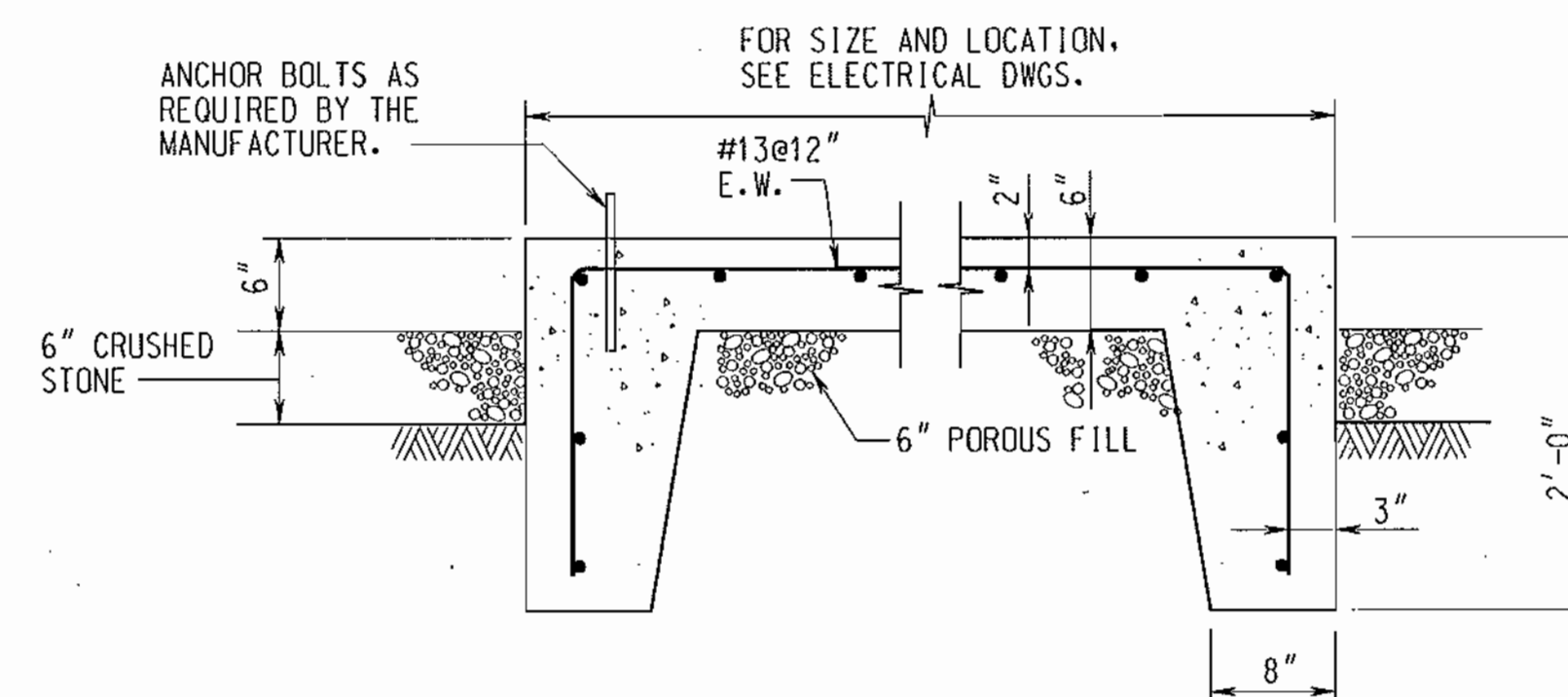
ELEVATION



SECTION

DUCTBANK/PENETRATION DETAIL

SCALE: NONE



TRANSFORMER PAD DETAIL

SCALE: NONE

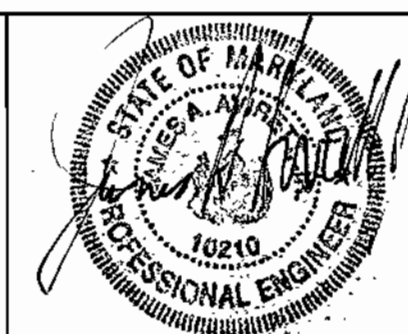
AS-BUILT 3/15/05

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

Director of Public Works: *[Signature]* 4/10/03
Chief, Bureau of Utilities: *[Signature]* 4-8-03
Chief, Bureau of Engineering: *[Signature]* 4/8/03
Chief, Utility Design Division: *[Signature]* 4-8-03

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801 SOUTH CAROLINE ST.
Baltimore, Md. 21231
410-235-3450



DES: RBG

DRN: LAR

CHK: SVD

DATE: 3/25/03

BY: *[Signature]* NO. AS-BUILT REVISION

REVISION

DATE: 3/15/05

STRUCTURAL NOTES
AND TYPICAL DETAILS

600' SCALE MAP NO. 32 BLOCK NO. 20

ELKRIDGE WATER PUMPING STATION
IMPROVEMENTS
CONTRACT NO. 44-4085
CAPITAL PROJECT NO. W-8228
HOWARD COUNTY, MARYLAND

S-1

SCALE AS SHOWN

SHEET

2 OF 12