

NO.	DESCRIPTION	BY	DATE

**SEWRF
DEDICATED REJECT LINE**



MANATEE COUNTY
DEPARTMENT OF PUBLIC WORKS
UTILITIES DEPARTMENT
4410 66th Street West Bradenton, Florida 34210
(941) 792-8811



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Q.C. _____
APPROVED _____
DATE _____
LIC. NO.: 56803

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DRAWN ALS
Q.C.
APPROVED

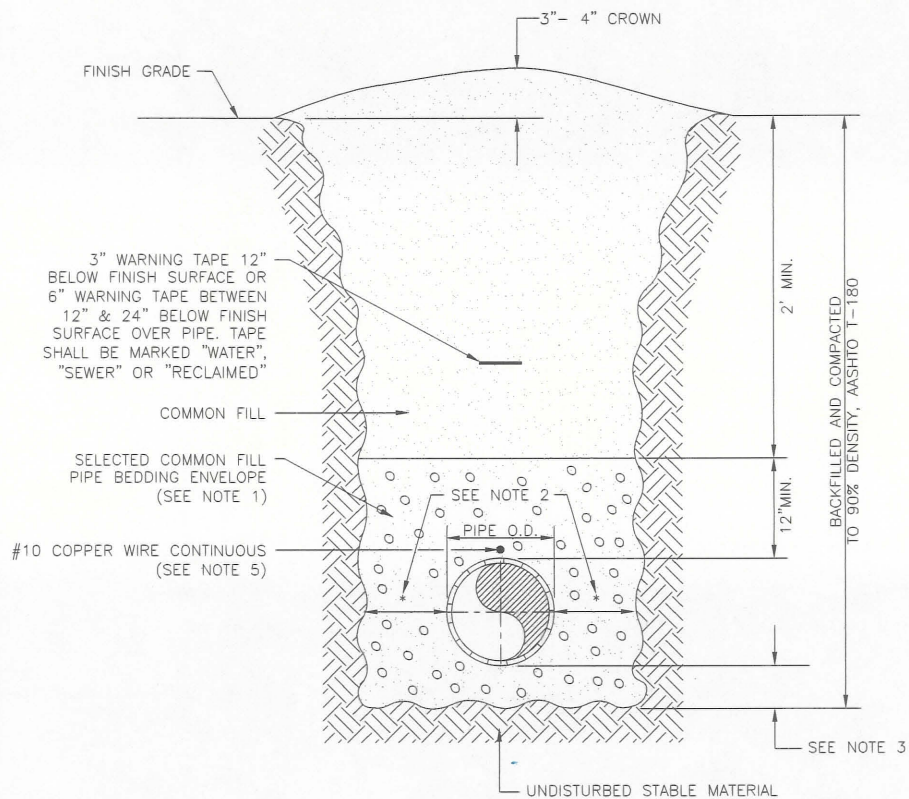
PROFILE SHEET (2)

PROJECT NO:
00193-009-01
DATE:
NOVEMBER 2013
SHEET NO:
C-5

FILE: J:\00193\00193009\01\CAD\dwg\Sheets\YARD PIPING.dwg LAST SAVED: Fri, 11/08/13 2:46p PLOTTED: Fri, 11/08/13 3:06p BY: alan.schaffer

NOTES:

1. USE OF TYPE A-2 AND A-3 PIPE BEDDING TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
2. PROVIDE ADEQUATE CLEARANCE TO PLACE AND COMPACT STAGE 1 BEDDING MATERIAL IN TRENCH AREA BELOW PIPE SPRINGLINE. PIPE EMBEDMENT MUST BE COMPACTED OUT TO THE TRENCH WALL OR 2.5 TIMES THE PIPE OD, WHICHEVER IS LESS.
3. TYPICALLY 4" TO 6".
4. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
5. TRACER WIRE NOT REQUIRED FOR GRAVITY SEWERS.



MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV. BY	DATE
WRT/KE	03/11
	MAY 10, 2011
	DATE OF APPROVAL

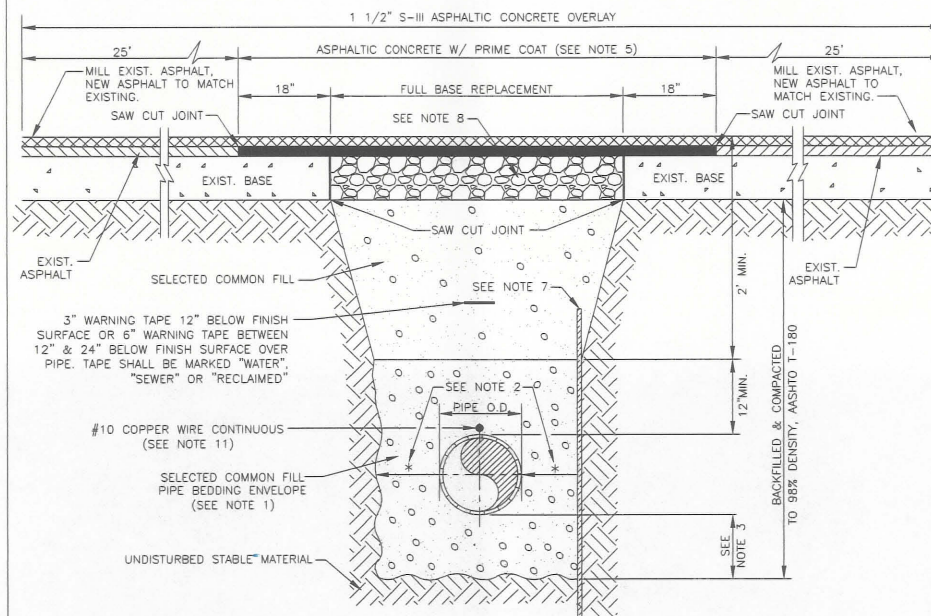
TRENCH WITH
UNIMPROVED SURFACE
TYPE A-1 PIPE BEDDING

UG-11

PAGE 111

NOTES:

1. USE OF TYPE A-2 AND A-3 PIPE BEDDING TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
2. PROVIDE ADEQUATE CLEARANCE TO PLACE AND COMPACT STAGE 1 BEDDING MATERIAL IN TRENCH AREA BELOW PIPE SPRINGLINE. PIPE EMBEDMENT MUST BE COMPACTED OUT TO THE TRENCH WALL OR 2.5 TIMES THE PIPE OD, WHICHEVER IS LESS.
3. TYPICALLY 4" TO 6".
4. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
5. ASPHALTIC CONCRETE STRUCTURE COURSE WITH PRIME COAT SHALL BE THE SAME DEPTH AND TYPE AS EXISTING OR A MINIMUM OF 1 1/4 INCH, WHICHEVER IS GREATER.
6. MILL 25' BACK FROM TRENCH SAW CUT. ADJUST MILLING PER INDIVIDUAL SITE TO NOT IMPACT BASE. BUTT JOINT TO EXIST ASPHALT. FINAL OVERLAY LIMITS ARE FROM EDGE OF PAVEMENT TO EDGE OF PAVEMENT. FINAL OVERLAY TO MATCH EXISTING WITH NO DISCERNABLE "BUMP" AT JOINT. MILLING LIMITS THAT IMPACT INTERSECTION SHALL BE ADDRESSED ON A CASE BY CASE BASIS AND APPROVED BY MANATEE COUNTY.
7. SHEETING ORDERED LEFT IN PLACE TO BE CUT OFF 24" BELOW FINISHED GRADE OR 12" BELOW SUBGRADE.
8. BASE SHALL BE 8" MINIMUM THICKNESS CRUSHED CONCRETE.
9. TEMPORARY PATCHES WILL BE INSTALLED TO PROVIDE A SMOOTH ALL WEATHER SURFACE AT ALL TIMES. PERMANENT REPLACEMENT TO BE MADE AS SOON AS POSSIBLE.
10. RESTORE SIGNAGE & MARKING WITH THERMOPLASTIC PER FDOT STANDARDS, LATEST EDITION.
11. TRACER WIRE NOT REQUIRED FOR GRAVITY SEWERS.
12. NOTES 5. THRU 10. ARE MINIMUM REQUIREMENTS FOR A TRENCH IN A ROAD. REFER TO LATEST EDITION OF MANATEE COUNTY HIGHWAY AND TRAFFIC STANDARDS FOR ADDITIONAL REQUIREMENTS.



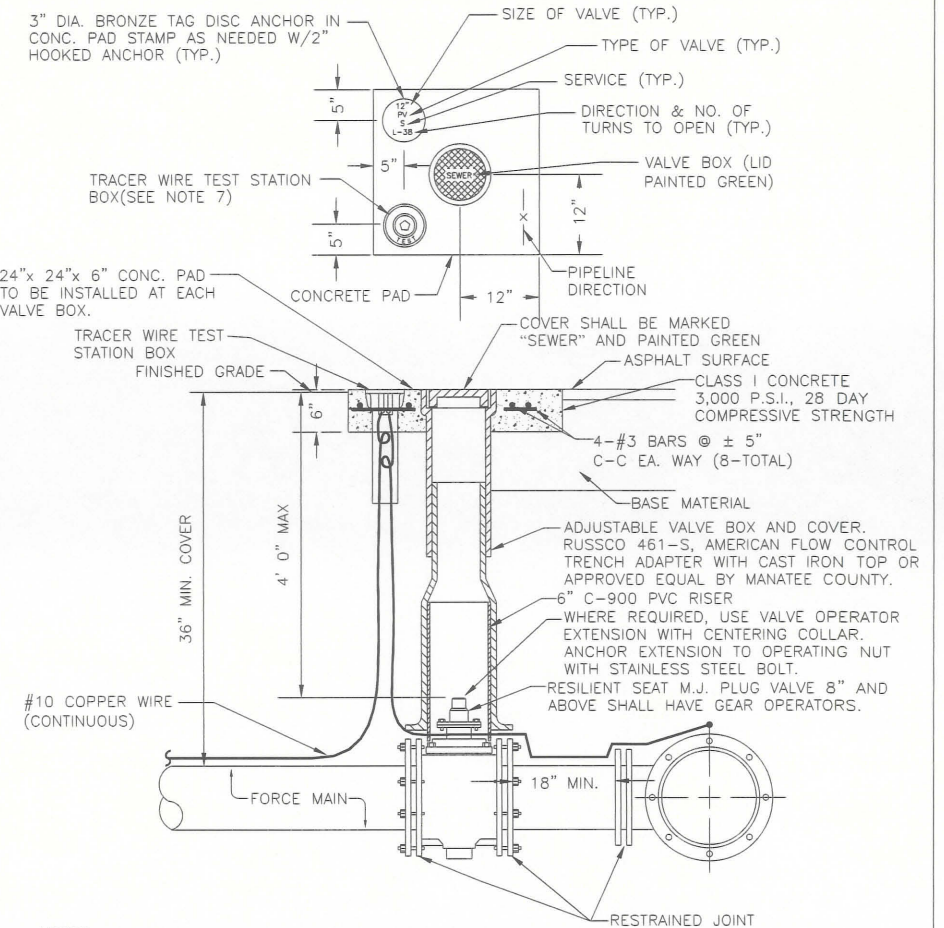
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TRENCH WITH ASPHALT
PAVEMENT SURFACE TYPE
A-1 PIPE BEDDING

UG-12

PAGE 112



NOTES:

1. "SV" TO BE IMPRESSED INTO THE NEWLY-POURED CONCRETE CURB, ALONG WITH DISTANCE IN FEET TO THE VALVE. IF NO CURB, INSTALL A GREEN DISC WITH "SV" AND A 1/8"x1" GALVANIZED STEEL SCREW IN THE EDGE OF PAVEMENT WITH THE DISTANCE (FT.) FROM THE DISC TO THE VALVE.
2. ALL EXISTING AND PROPOSED VALVE BOXES SHALL BE ADJUSTED TO FINISHED GRADES AS ESTABLISHED IN THE FIELD.
3. SEWER VALVES SHALL NOT BE PLACED IN HANDICAPPED RAMPS.
4. PRECAST CONCRETE PADS SHALL NOT BE USED.
5. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1/2".
6. PLUG VALVES SHALL NOT BE USED AS A TAPPING VALVE. WHERE AN EXISTING FORCE MAIN IS TO BE TAPPED, USE A TAPPING GATE VALVE PER THE TAPPING SLEEVE AND VALVE DETAIL.
7. TEST BOX TO BE BINGHAM & TAYLOR P200NFG OR EQUAL FOR NORMAL YARD SERVICE. WHERE VALVE WILL BE IN STREET OR UNDER VEHICLE TRAFFIC, USE P525RD CENTERED IN SEPARATE CONCRETE PAD SIMILAR TO STANDARD VALVE BOX PAD.

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PLUG VALVE, BOX,
COVER AND TAG

US-12

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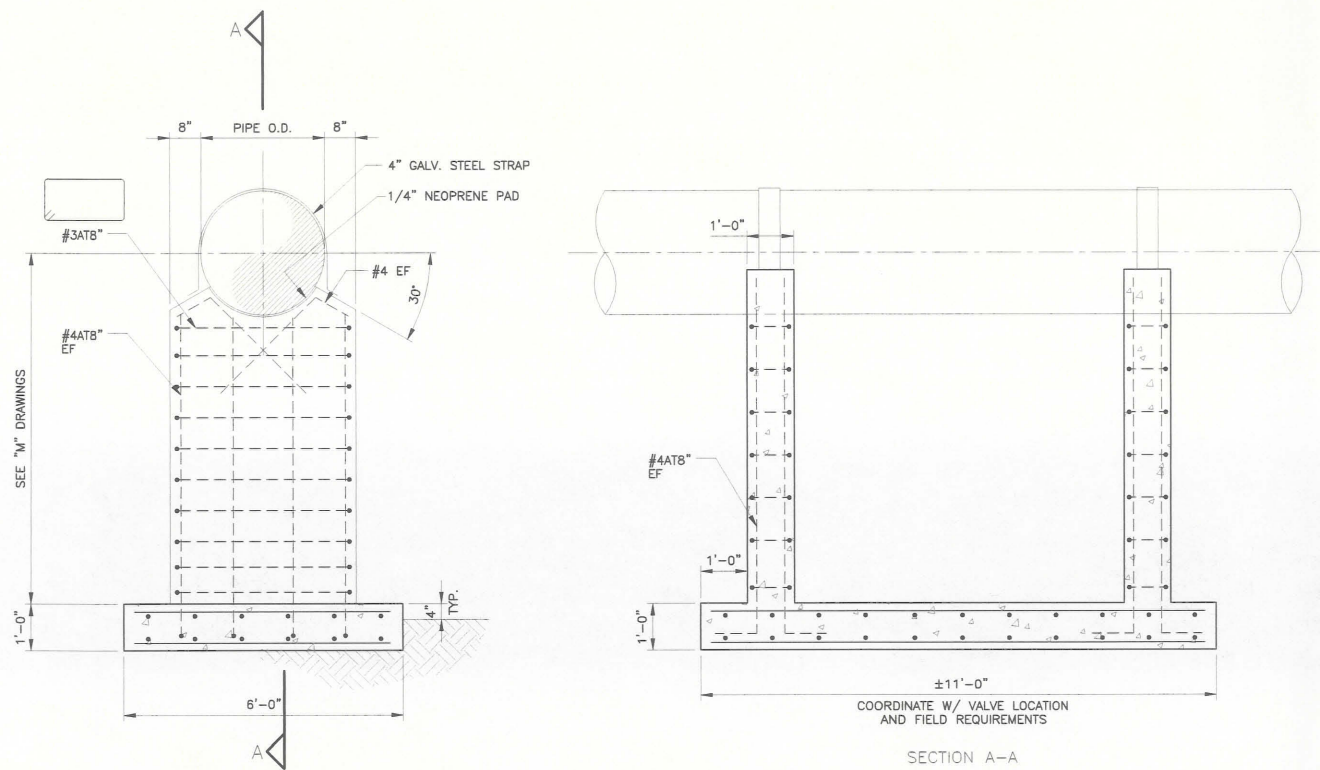
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DAVID A. O'CONNOR, PE
LIC. NO.: 56803

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DOC
DRAWN
ALS
Q.C.

DETAILS (1)

PROJECT NO:
00193-009-01
DATE:
NOVEMBER 2013
SHEET NO:
C-6



TYPICAL PIPE SUPPORT
DETAIL A
 1/2"=1'-0"

GENERAL CONDITIONS

ALL STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE MECHANICAL, CIVIL, ELECTRICAL, AND SHOP DRAWINGS AND SPECIFICATIONS.

THE CONTRACTOR SHALL REVIEW AND VERIFY DIMENSIONS SHOWN IN ALL PLANS AND REVIEW ALL FIELD CONDITIONS THAT MAY AFFECT THE INSTALLATION OF THE FACILITY. SHOULD DISCREPANCIES APPEAR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING TO OBTAIN ENGINEER'S CLARIFICATION BEFORE COMMENCING WITH THE WORK.

FOR ALL ITEMS EMBEDDED IN OR PASSED THROUGH CONCRETE, THE CONTRACTOR SHALL INITIALLY REFER TO MECHANICAL, HEATING, AND VENTILATION DRAWINGS FOR TYPE, SIZE, LOCATION, AND SPECIAL INSTALLATION REQUIREMENTS FOR THESE ITEMS.

THE CONTRACTOR SHALL TAKE ANY AND ALL NECESSARY MEASURES TO PROTECT EXISTING STRUCTURES FROM DAMAGE WHEN WORKING IN AND AROUND EXISTING STRUCTURES PERFORMING WORK SUCH AS DEMOLITION, FOUNDATION EXCAVATION, AND OTHERS.

SIZE AND LOCATION OF EQUIPMENT PADS AND ANCHOR BOLTS SHALL BE PER EQUIPMENT MANUFACTURERS REQUIREMENTS.

ANY EQUIPMENT THAT MAY INDUCE VIBRATION TO THE STRUCTURE SHALL BE ADEQUATELY ISOLATED FROM THE STRUCTURES.

ALL DETAILS AND SECTIONS SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL BE CONSTRUED TO APPLY TO ANY SIMILAR SITUATION ELSEWHERE ON THE PROJECT, EXCEPT WHERE A DIFFERENT DETAIL IS SHOWN.

STANDARD DETAILS APPLY TO ALL SIMILAR SITUATIONS ON THE PROJECT EXCEPT WHERE A DIFFERENT DETAIL IS SHOWN.

REINFORCING STEEL

REINFORCEMENT SHALL CONFORM TO ASTM A615, GRADE 60 REQUIREMENTS. WELDED WIRE FABRIC, ASTM A185. ALL ACCESSORIES SHALL BE IN CONFORMANCE WITH ACI 315 REQUIREMENTS. REINFORCING STEEL SHALL HAVE THE FOLLOWING CLEAR COVER UNLESS OTHERWISE NOTED:

- CONCRETE CAST AGAINST EARTH
- FORMED SURFACES IN CONTACT WITH SOIL, SEWAGE, WATER OR EXPOSED TO WEATHER
- FORMED SURFACES NOT EXPOSED TO WEATHER OR IN CONTACT WITH SOIL:
 - SLABS, WALLS, AND JOIST
 - BEAMS AND COLUMNS

LAP SPLICES SHALL BE AS SHOWN ON THE DRAWINGS. FOR LAP SPLICES NOT SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL OBTAIN ENGINEERS APPROVAL.

THE CONTRACTOR SHALL PREPARE PLACING DRAWINGS AND SCHEDULES IN CONFORMANCE WITH ACI 315 REQUIREMENTS.

UNLESS OTHERWISE NOTED, THE MINIMUM REINFORCING FOR ALL CONCRETE WALL AND SLABS SHALL BE AS FOLLOWS:

CONCRETE

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH ACI 318 REQUIREMENTS (LATEST EDITION)

ALL CONCRETE SHALL BE AIR-ENTRAINED WITH 4000 PSI COMPRESSIVE STRENGTH AT 28 DAYS UNLESS OTHERWISE NOTED.

WATER REDUCING AGENT SHALL BE IN ACCORDANCE WITH ASTM C494

ALL CONCRETE SURFACES EXPOSED TO AIR, UNLESS OTHERWISE NOTED IN SPECIFICATIONS, SHALL BE TREATED WITH AN APPROPRIATE CURING COMPOUND AS SOON AS CEMENT FINISHING IS COMPLETED OR FORMS ARE REMOVED.

ALL EXPOSED CORNERS SHALL HAVE A MINIMUM CHAMFER OF 3/8" UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL OBTAIN ENGINEER'S APPROVAL FOR THE LOCATIONS OF CONSTRUCTION JOINTS THAT ARE NOT SHOWN ON THE DRAWINGS.

e/T ENGINEERING TECHNOLOGIES, INC.
 3551 W. LAKE MARY BLVD., SUITE 210
 LAKE MARY, FL 32746
 PHONE: (407) 322-0500 FAX: (407) 322-0023
 ET PROJECT NO. - 10-104

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PIPE SUPPORTS

PROJECT NO: 00193-009-01
 DATE: NOVEMBER 2013
 SHEET NO: **S-1**

- CONDUIT RUN EXPOSED
- CONDUIT RUN CONCEALED UNDERGROUND
- CONDUIT RUN CONCEALED IN FLOOR OR SLAB
- GROUNDING ELECTRODE CONDUCTOR
- CONDUIT STUB OUT AND CAP
- GROUND ROD
- JUNCTION BOX
- JUNCTION BOX WITH FLEXIBLE CONNECTION

- UTILITY METER
- TRANSFER SWITCH
- ELECTRIC PANELBOARD
- DISCONNECT OR SAFETY SWITCH

- FIELD WIRING
- FLOAT SWITCH. OPENS ON LOW LEVEL.
- FLOAT SWITCH. CLOSES ON LOW LEVEL.
- NORMALLY OPEN (N.O.) CONTACT
- NORMALLY CLOSED (N.C.) CONTACT
- FUSE
- GROUND CONNECTION

ABBREVIATIONS:

A	AMPS
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
C	CONDUIT
EX	EXISTING
ELEC	ELECTRICAL
EXP	EXPLOSION PROOF
GFI	GROUND FAULT INTERRUPTER
GND	GROUNDING CONDUCTOR
HP	HORSEPOWER
HZ	HERTZ
IG	ISOLATED GROUND
KVA	KILOVOLT AMPERES
KW	KILOWATTS
MAX	MAXIMUM
MIN	MINIMUM
N/A	NOT APPLICABLE
PH	PHASE
RECP	RECEPTACLE
RPM	REVOLUTIONS PER MINUTE
RTU	REMOTE TERMINAL UNIT
SS	STAINLESS STEEL
SPD	SURGE PROTECTION DEVICE
TYP	TYPICAL
V	VOLTS
WP	WEATHERPROOF

480V
15 KVA, 1*
120/240V

TRANSFORMER, 480V INDICATED PRIMARY VOLTAGE, 120/240V INDICATES SECONDARY VOLTAGE, 15 KVA REPRESENTS POWER RATING, AND 1* INDICATES SINGLE PHASE (THREE PHASE IF NOT INDICATED)

NEW CLASS 1, DIVISION 2 HPS LIGHTING FIXTURE. REFER TO FIXTURE SCHEDULE.

3P
30A

THERMAL MAGNETIC CIRCUIT BREAKER WITH NUMBER OF POLES AND AMPERE RATING

- SINGLE POLE SWITCH, 20A, 120/277V. MOUNT 44" AFF OR AS NOTED.
- 3-WAY SWITCH, 20A, 120/277V. MOUNT 44" AFF OR AS NOTED.
- DUPLEX RECEPTACLE, 20A 125VAC. MOUNT 18" AFF OR AS NOTED.
- LB CONDUIT BODY/FITTING.

COMBINATION MAGNETIC STARTER WITH CONTROL POWER TRANSFORMER (SIZED FOR LOAD). LETTERS INDICATE TYPE:

- N - NON-REVERSING
- R - REVERSING
- 2S - TWO-SPEED
- C - CONTACTOR
- SS - SOLID STATE SOFT START

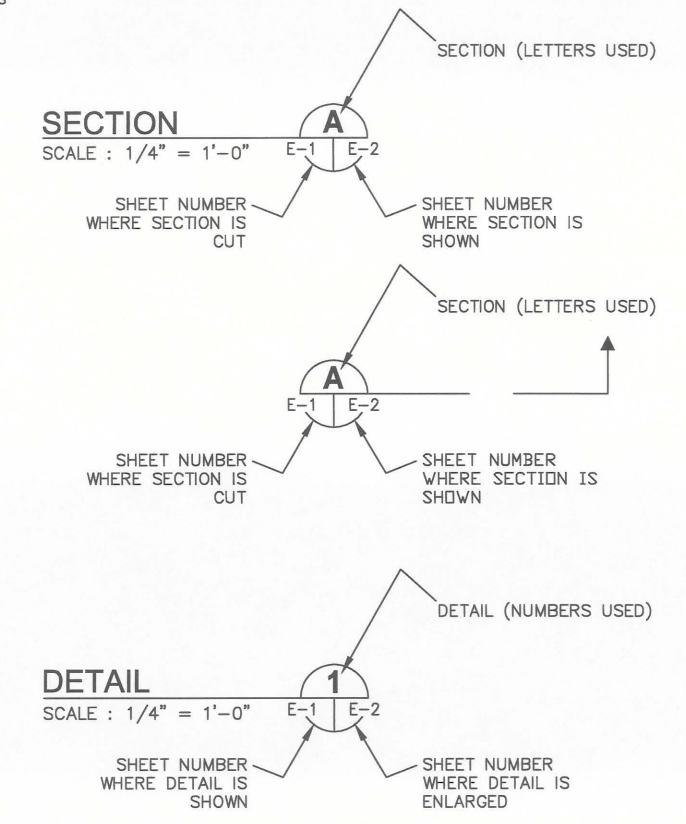
- HOME RUN TO PANELBOARD. CIRCUIT(S) AS INDICATED.
- JUNCTION BOX.

- WIRES INDICATED AS FOLLOWS :
- TWO WIRES:
 - THREE WIRES:
 - FOUR WIRES ETC:
 - NEUTRAL WIRE
 - ISOLATED GROUND WIRE

OVIDE 2-#12 THWN CU IN 1/2" C. UNLESS OTHERWISE NOTED, AND GROUND WIRE (NOT INDICATED) IN ALL POWER AND LIGHTING RACEWAYS.

- INDICATING PILOT LIGHT LETTER INDICATES COLOR OF LENS
- DISCONNECT OR TOGGLE SWITCH
- NORMALLY OPEN MOMENTARY CIRCUIT CLOSING PUSH-BUTTON SWITCH SPRING OPEN. NUMBER OF ELECTRICAL CONTACTS ON SWITCH SHOWN ON CONTROL SCHEMATIC
- NORMALLY CLOSED MOMENTARY CIRCUIT OPENING PUSH-BUTTON SWITCH SPRING CLOSE. NUMBER OF ELECTRICAL CONTACTS ON SWITCH SHOWN ON CONTROL SCHEMATIC
- LIMIT SWITCH NORMALLY CLOSED CONTACT CONTACT OPENS WHEN ACTUATED
- TORQUE SWITCH NORMALLY CLOSED CONTACT CONTACT OPENS WHEN ACTUATED
- PUMP THERMAL SENSOR

EXAMPLE OF SECTION CUT AND DETAIL

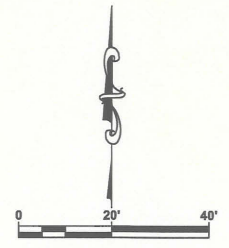


XXX	XXX DEVICE	DESCRIPTION
HLS	HLS	HIGH LEVEL SWITCH
HOA	HOA	HAND-OFF-AUTO
LD	LD	LEAK DETECTION
LLS	LLS	LOW LEVEL SWITCH
LOR	LOR	LOCAL-OFF-REMOTE
PB	PB	PUSH BUTTON
RTU	RTU	REMOTE TERMINAL UNIT
SS	SS	SOFT STARTER
SS/B	SS/B	SOFT START OR BYPASS
TS	TS	TEMPERATURE SWITCH
TVSS	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
ZS	ZS	POSITION SENSOR (LIMIT SWITCH)

- FUSE
- MOTOR
- THERMAL OVERLOAD



<p>SEWRF DEDICATED REJECT LINE</p>				<p>MANATEE COUNTY DEPARTMENT OF PUBLIC WORKS UTILITIES DEPARTMENT 4410 66th Street West Bradenton, Florida 34210 (941) 792-8811</p>	<p>Cardno TBE 380 Park Place Blvd., Suite 300, Clearwater, Florida, 33759 www.cardnotbe.com - 727.531.3605 Certificate of Authorization No. 3843</p>	<p>TIMOTHY THOMAS, PE LIC. NO.: 47079</p>	DESIGNED	TDT	<p>ELECTRICAL LEGEND AND ABBREVIATIONS</p>	PROJECT NO:	00193-009-01
							DRAWN	EAK		DATE:	NOVEMBER 2013
NO.	DESCRIPTION	BY	DATE					APPROVED		SHEET NO:	E-1



- KEYED NOTES:**
- ① EXISTING MAIN ELECTRICAL BUILDING. REFER TO PLAN ON SHEET E-3.
 - ② CONTRACTOR TO PROVIDE AND INSTALL NEW NEMA 4X SS JUNCTION BOX ON EXTERIOR OF MAIN ELECTRICAL BUILDING. REFER TO SHEET E-3 FOR DETAILS.
 - ③ PROVIDE AND INSTALL 3/4"C. WITH 3-#12 + 1-#12 GND AND 3/4"C. WITH 12-#14 + 1- #14 GND FOR MOV 101.
 - ④ PROVIDE AND INSTALL 3/4"C. WITH 3-#12 + 1-#12 GND AND 3/4"C. WITH 12-#14 + 1- #14 GND FOR MOV 102.
 - ⑤ PROVIDE AND INSTALL FOUR (4) 3/4" SPARE CONDUITS FOR FUTURE MOV'S.
 - ⑥ PROVIDE AND INSTALL 30A, 480V, 3-POLE, NON-FUSED DISCONNECTS IN NEMA 4X STAINLESS STEEL ENCLOSURES FOR MOV 101 AND MOV 102 DISCONNECTING MEANS. INSTALL DISCONNECTS ON 4" SQUARE CONCRETE POSTS. COORDINATE EXACT MOV LOCATIONS WITH CIVIL DRAWINGS.
 - ⑦ CAP SPARE CONDUITS BELOW GROUND AND PROVIDE MARKER POST TO IDENTIFY LOCATION.
 - ⑧ PROVIDE AND INSTALL PULL BOX. REFER TO SHEET E-5 FOR DETAILS.

- GENERAL NOTES :**
- 1. CONTRACTOR SHALL CUT, PATCH AND REPAIR ALL ROAD AND SIDEWALK CROSSINGS AS REQUIRED TO INSTALL NEW ELECTRICAL DUCTBANK. REFER TO SPECIFICATIONS FOR REPAIR REQUIREMENTS.
 - 2. DUCTBANKS SHALL BE A MINIMUM OF 36" FROM NEWLY INSTALLED REJECT PIPING.
 - 3. REFER TO CIVIL DRAWINGS TO IDENTIFY KNOWN UNDERGROUND UTILITIES.
 - 4. CONTRACTOR SHALL HAND DIG TRENCHES IN AREAS OF KNOWN CONFLICTS.

TRICON
CONSULTING ENGINEERS
777 S. Harbour Island Blvd., STE 870, TAMPA, FL 33602
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Certificate of Authorization No. 00000363

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**SOUTHEAST WRF
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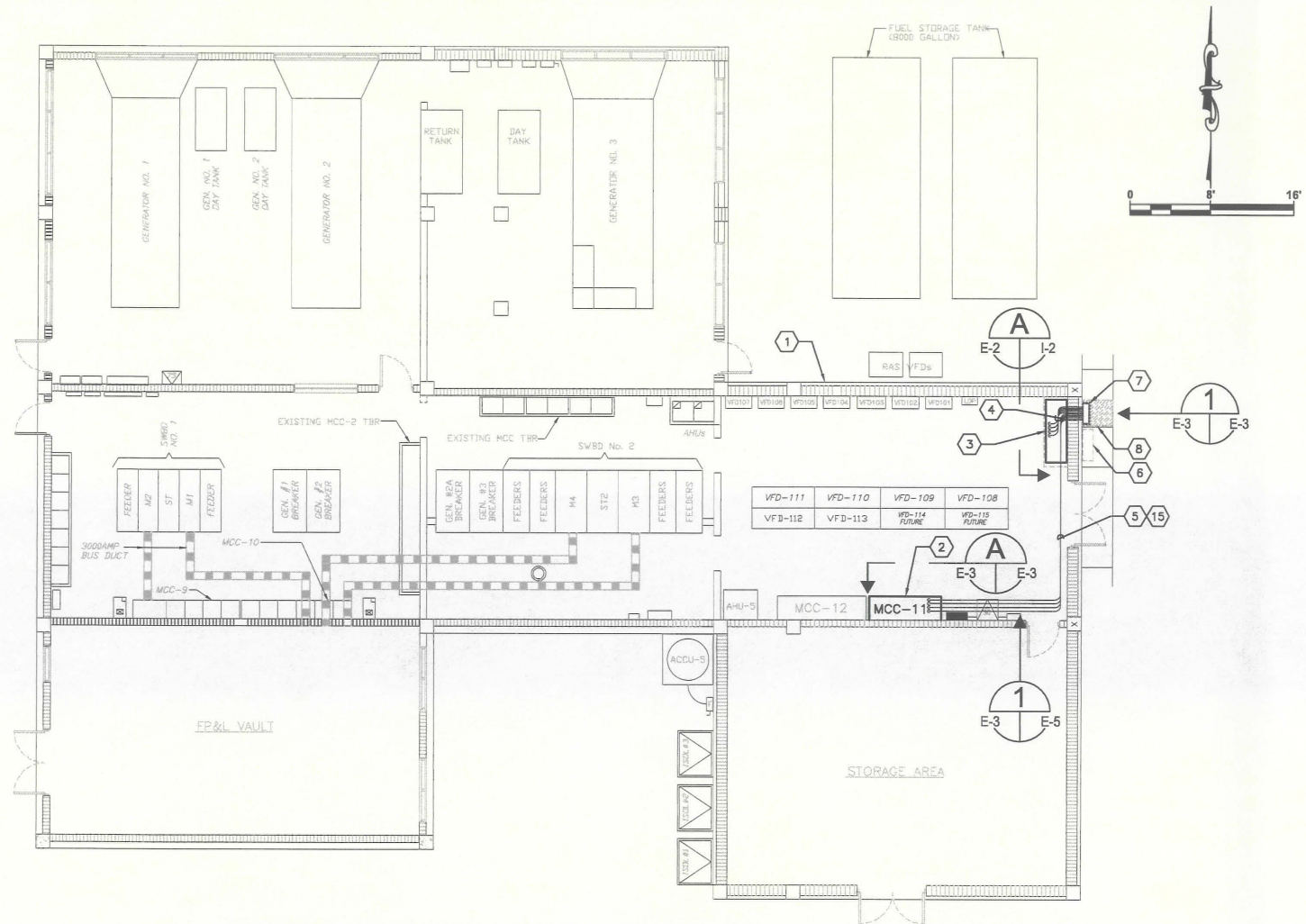
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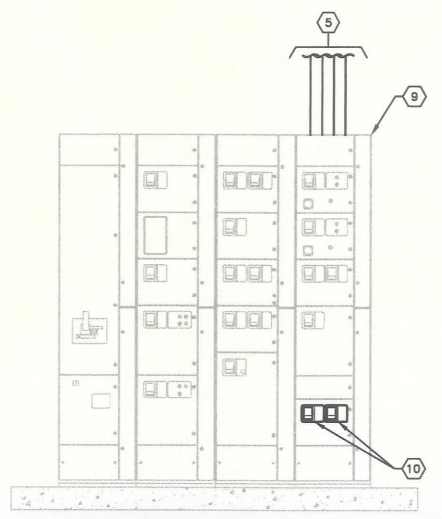
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Q.C.
APPROVED
TIMOTHY THOMAS, PE DATE
LIC. NO.: 47079

ELECTRICAL SITE PLAN

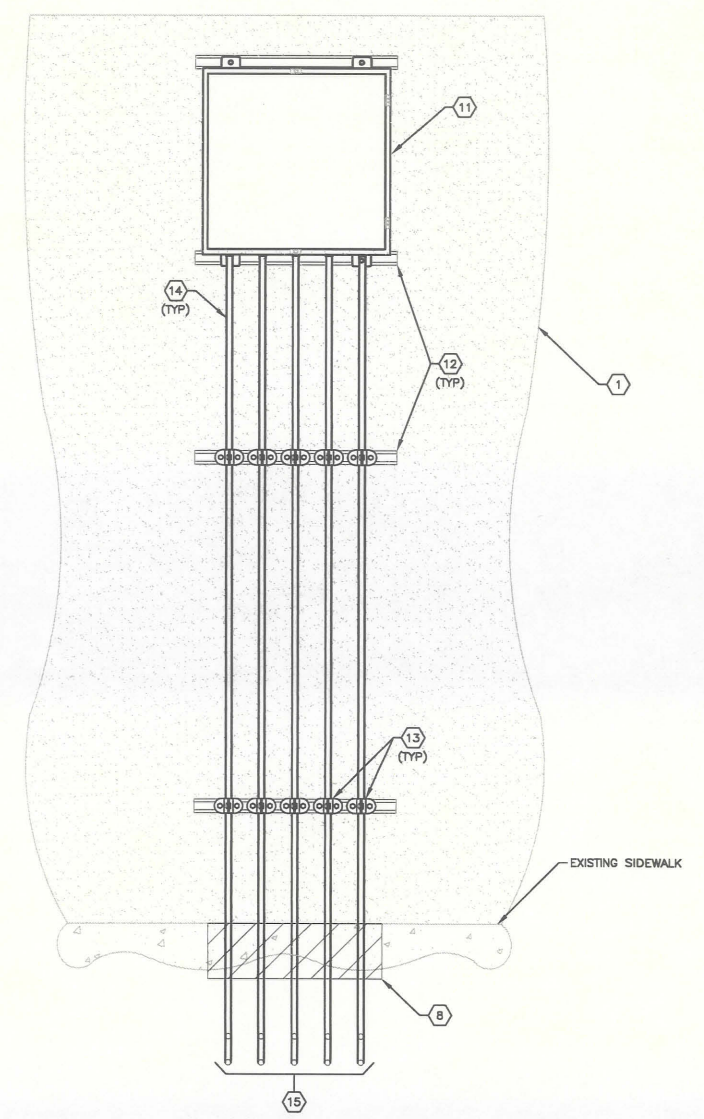
PROJECT NO:
00193-009-01
DATE:
NOVEMBER 2013
SHEET NO:
E-2



MAIN ELECTRICAL BUILDING PLAN 1
SCALE : 1/8" = 1'-0"
E-2 E-3



MCC-11 ELEVATION A
SCALE : N.T.S.
E-3 E-3



JUNCTION BOX DETAIL 1
SCALE : N.T.S.
E-3 E-3

- KEYED NOTES :**
- 1 EXISTING MAIN ELECTRICAL BUILDING.
 - 2 EXISTING MOTOR CONTROL CENTER : MCC-11. REFER TO ELEVATION ON THIS SHEET.
 - 3 EXISTING SCADA PANEL No. 1. REFER TO ELEVATION ON SHEET I-2.
 - 4 CONTRACTOR SHALL PROVIDE AND INSTALL TWO (2) 3/4" CONDUITS, EACH CONTAINING 12-#14 THWN CU + 1-#14 THWN CU GND FOR MOV 101 AND MOV 102 1/0 CIRCUITS. CONTRACTOR SHALL ALSO PROVIDE AND INSTALL TWO (2) SPARE 3/4" CONDUITS FOR FUTURE USE.
 - 5 CONTRACTOR SHALL PROVIDE AND INSTALL TWO (2) 3/4" CONDUITS, EACH CONTAINING 3-#12 THWN CU + 1-#12 THWN CU GND FOR MOV 101 AND MOV 102 480V, 3Ø POWER. CONTRACTOR SHALL ALSO PROVIDE AND INSTALL TWO (2) SPARE 3/4" CONDUITS FOR FUTURE USE.
 - 6 EXISTING EXTERIOR JUNCTION BOX. NO WORK REQUIRED.
 - 7 CONTRACTOR SHALL PROVIDE AND INSTALL NEW 24"W X 24"H X 12"D NEMA 4X, STAINLESS STEEL JUNCTION BOX, HOFFMAN CAT # A24H240BSS6LP. CONTRACTOR SHALL ATTACH JUNCTION BOX (AND ASSOCIATED CONDUIT) TO EXTERIOR WALL WITH 1-5/8" X 1-5/8" STAINLESS STEEL UNISTRUT.
 - 8 CONTRACTOR TO CUT CONCRETE SIDEWALK. REPLACE IN KIND AFTER CONDUIT INSTALLATION.
 - 9 EXISTING MCC-11. 800A, 480V, 3Ø, 3-WIRE. CUTLER HAMMER FREEDOM SERIES 2100.
 - 10 EXISTING 12" SPACE TO BE REPLACED WITH FREEDOM 2100 DUAL TAP FEEDER UNIT. EACH UNIT SHALL BE PROVIDED WITH A 3-POLE, 15 AMPERE CIRCUIT BREAKER EATON HFD3015. CIRCUIT BREAKERS TO BE DESIGNATED TO SERVE MOV 101 AND MOV 102. CONTRACTOR SHALL PROVIDE NEW DOOR, BUCKET, HANDLES, OR ANY OTHER ACCESSORIES AS REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM.
 - 11 NEW 24"W X 24"H X 12"D NEMA 4X, STAINLESS STEEL JUNCTION BOX. INSTALL JUNCTION BOX AT APPROXIMATELY THE SAME HEIGHT AS THE ADJACENT, EXISTING JUNCTION BOX TO ACCOMMODATE THE NEW CONDUITS EXITING THE BUILDING.
 - 12 PROVIDE AND INSTALL 1-5/8" X 1-5/8" STAINLESS STEEL UNISTRUT.
 - 13 PROVIDE AND INSTALL STAINLESS STEEL CONDUIT CLAMPS.
 - 14 NEW CONDUITS TO NEW MOTOR ACTUATED VALVES. REFER TO SHEET E-2 FOR CONTINUATION.
 - 15 NEW CONDUITS TO BE TRAPEZE HUNG FROM CEILING UTILIZING 1-5/8" X 1-5/8" STAINLESS STEEL UNISTRUT WITH STAINLESS STEEL HARDWARE. TYPICAL FOR ALL CONDUITS AT CEILING. REFER TO DETAIL ON SHEET E-5.



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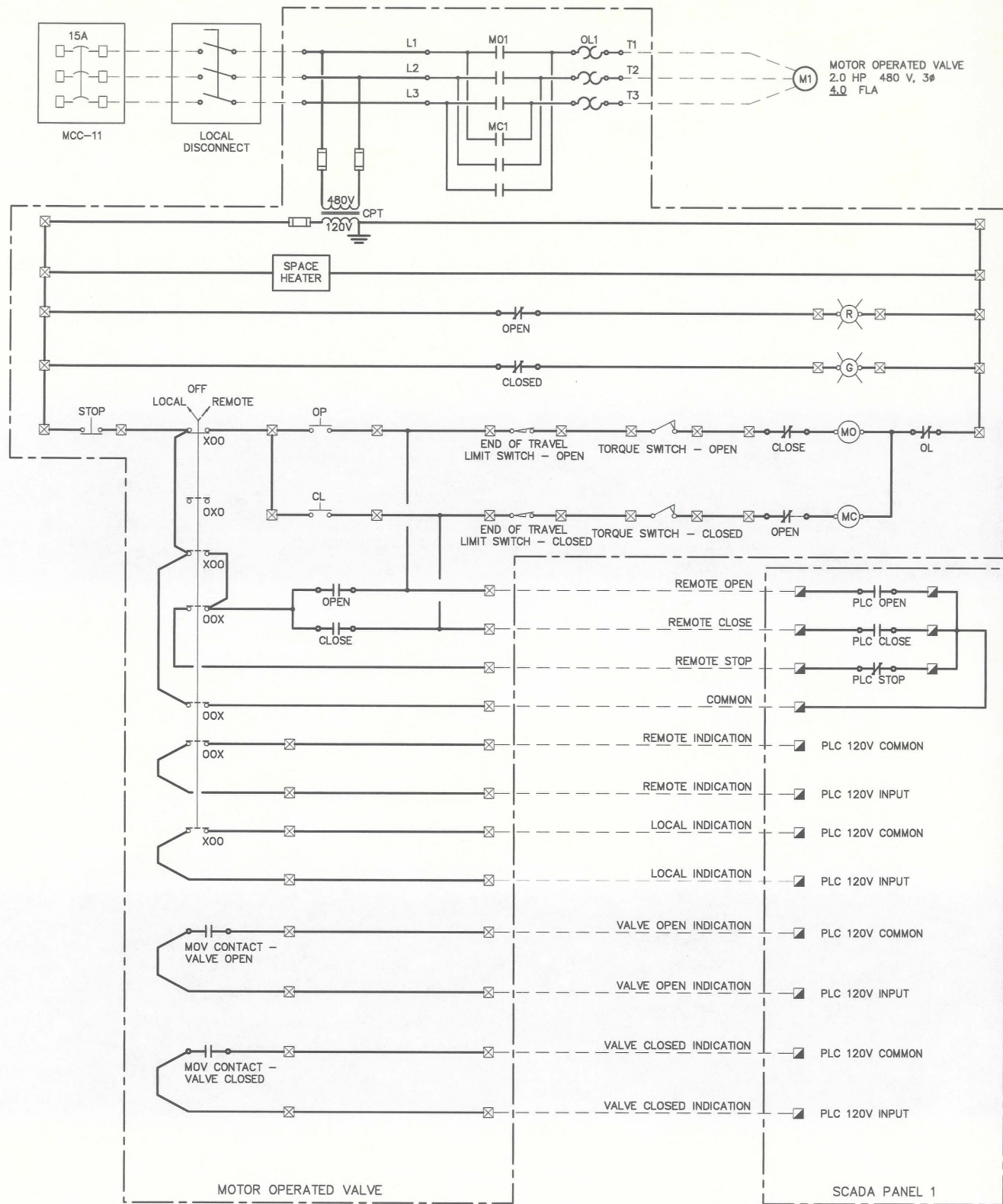

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 Certificate of Authorization No. 3843

TIMOTHY THOMAS, PE
 LIC. NO. : 47079

DESIGNED TDT
 DRAWN EAK
 G.C.
 APPROVED _____

**MAIN ELECTRICAL BUILDING
FLOOR PLAN AND DETAILS**

PROJECT NO:
00193-009-01
 DATE:
NOVEMBER 2013
 SHEET NO:
E-3



LEGEND :

- ☒ TERMINAL POINT IN NEW MOTOR OPERATED VALVE
- ▣ TERMINAL POINT IN EXISTING SCADA PANEL 1 (SP-1)
- FIELD WIRING
- |—|— NORMALLY OPEN (N.O.) CONTACT
- |/—|— NORMALLY CLOSED (N.C.) CONTACT
- |—|— FUSE
- |—|— GROUND CONNECTION
- ⊗ INDICATING PILOT LIGHT LETTER INDICATES COLOR OF LENS
- ⊗ DISCONNECT OR TOGGLE SWITCH
- |—|— NORMALLY OPEN MOMENTARY CIRCUIT CLOSING PUSH-BUTTON SWITCH SPRING OPEN. NUMBER OF ELECTRICAL CONTACTS ON SWITCH SHOWN ON CONTROL SCHEMATIC
- |—|— NORMALLY CLOSED MOMENTARY CIRCUIT OPENING PUSH-BUTTON SWITCH SPRING CLOSE. NUMBER OF ELECTRICAL CONTACTS ON SWITCH SHOWN ON CONTROL SCHEMATIC
- |—|— LIMIT SWITCH NORMALLY CLOSED CONTACT CONTACT OPENS WHEN ACTUATED
- |—|— TORQUE SWITCH NORMALLY CLOSED CONTACT CONTACT OPENS WHEN ACTUATED
- INDIVIDUAL DEVICE TERMINAL

GENERAL NOTES:

1. THE MOTOR OPERATED VALVE WIRING SCHEMATIC PRESENTED IS BASED ON THE TYPICAL CONFIGURATION OF A SPECIFIC MANUFACTURER. THE SCHEMATIC FOR THE MOTOR OPERATED VALVE SELECTED AND PURCHASED BY THE CONTRACTOR MAY VARY FROM WHAT IS SHOWN. THE WIRING SCHEMATIC SHOWN IS INTENDED SOLELY TO PROVIDE THE REQUIRED INPUTS AND OUTPUTS (I/O) AND BASIC CONTROL METHODOLOGY TO BE UTILIZED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED WIRING WITH THE MOV MANUFACTURER.

TYPICAL MOTOR OPERATED VALVE WIRING SCHEMATIC



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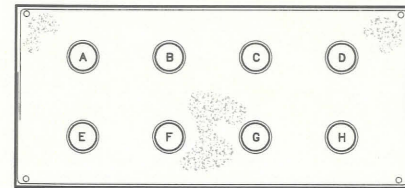
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TIMOTHY THOMAS, PE
 LIC. NO.: 47079

DESIGNED TDT
 DRAWN EAK
 Q.C.
 APPROVED

**MOTOR OPERATED VALVE
ELECTRICAL DETAILS**

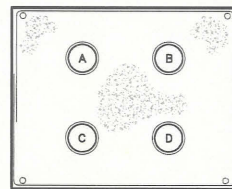
PROJECT NO:
00193-009-01
 DATE:
NOVEMBER 2013
 SHEET NO:
E-4



DUCTBANK SECTION 'A'
SCALE : N.T.S.

DUCTBANK 'A' SCHEDULE:

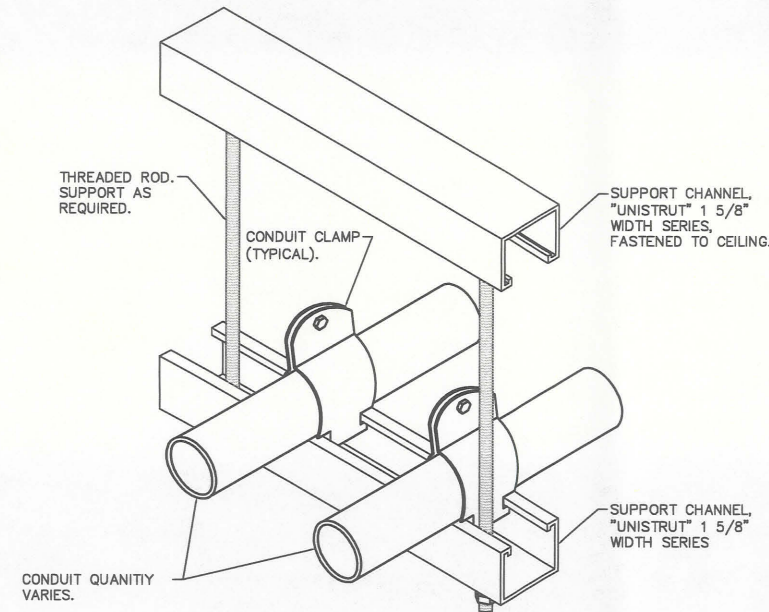
- A. 3/4"C. WITH 3-#12 + 1-#12 GND : MOV 101 480V POWER.
- B. 3/4"C. WITH 12-#14 + 1-#14 GND : MOV 101 CONTROLS.
- C. 3/4"C. SPARE CONDUIT FOR FUTURE MOV.
- D. 3/4"C. SPARE CONDUIT FOR FUTURE MOV.
- E. 3/4"C. WITH 3-#12 + 1-#12 GND : MOV 102 480V POWER.
- F. 3/4"C. WITH 12-#14 + 1-#14 GND : MOV 102 CONTROLS.
- G. 3/4"C. SPARE CONDUIT FOR FUTURE MOV.
- H. 3/4"C. SPARE CONDUIT FOR FUTURE MOV.



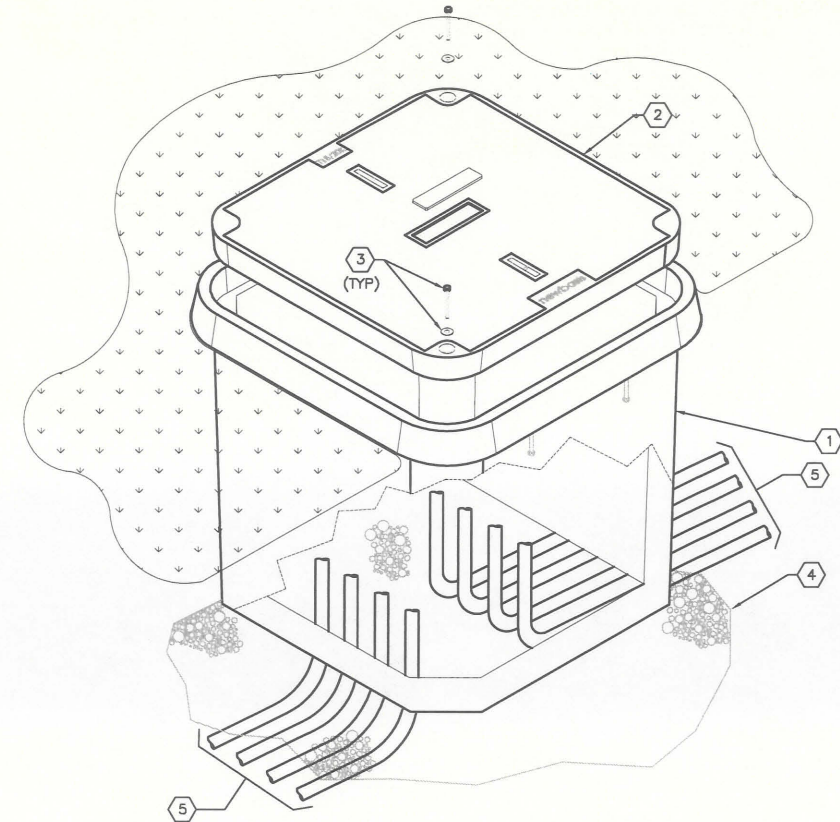
DUCTBANK SECTION 'B'
SCALE : N.T.S.

DUCTBANK 'B' SCHEDULE:

- A. 3/4"C. SPARE CONDUIT FOR FUTURE MOV.
- B. 3/4"C. SPARE CONDUIT FOR FUTURE MOV.
- C. 3/4"C. SPARE CONDUIT FOR FUTURE MOV.
- D. 3/4"C. SPARE CONDUIT FOR FUTURE MOV.



CONDUIT TRAPEZE SUPPORT DETAIL
SCALE : NONE



PULL BOX DETAIL
SCALE : N.T.S.

KEYED NOTES:

- 1 36" x 36" x 36" FIBER-REINFORCED POLYMER CONCRETE VAULT.
- 2 "HH" TRAFFIC-RATED LID. PROVIDE RECESSED IDENTIFICATION MARKING OF "ELECTRIC" PERMANENTLY INDENTED IN THE COVER. LID SHALL BE PROVIDED WITH NON-SKID SURFACE.
- 3 STAINLESS STEEL BOLTS AND ASSOCIATED HARDWARE. BOLTS SHALL BE A MINIMUM OF 5/8".
- 4 PROVIDE A BED OF PEA ROCK GRAVEL (6" MINIMUM DEPTH, 3" MINIMUM EXTERIOR OF PULL BOX) INSIDE THE BOTTOM OF THE PULL BOX.
- 5 3/4" CONDUITS AS REQUIRED. CONDUIT QUANTITY VARIES PER PULL BOX. REFER TO SHEET E-2 FOR CONDUITS REQUIRED.



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**DUCTBANK SECTIONS AND
ELECTRICAL DETAILS**

PROJECT NO:
00193-009-01
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SHEET NO:
E-5

FUNCTION SYMBOL SCHEDULE

IDENTIFICATION LETTERS				
	FIRST LETTER		SUCCEEDING LETTERS	
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION
A	ANALYSIS		ALARM	
B	BURNER, COMBUSTION		PROGRAMMER	
C	CONDUCTIVITY			CLOSED
D	DENSITY	DIFFERENTIAL		
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)	
F	FLOW RATE	RATIO (FRACTION)		
G	GAGING		GLASS VIEWING DEVICE	
H	HAND			HIGH
I	CURRENT (ELECTRICAL)		INDICATE	
J	POWER	SCAN		
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION
L	LEVEL		LIGHT (PILOT)	LOW
M	MOTOR	MOMENTARY		MIDDLE, INTERMEDIATE
N	VIBRATION		IGNITOR	ISOLATOR
O	OPERATION	OFFSET	ORIFICE, RESTRICTION	OPEN
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION	
Q	QUANTITY, EVENT	INTEGRATE, TOTALIZE	INTEGRATE	
R	RADIATION		RECORD, PRINT	
S	SPEED, FREQUENCY	SAFETY		SWITCH
T	TEMPERATURE			TRANSMIT
U	MULTIVARIABLE	TREND	MULTIFUNCTION	MULTIFUNCTION
V	VISCOSITY	VACUUM		VALVE, DAMPER, LOUVER, GATE
W	WEIGHT, FORCE, TORQUE		WELL	
X	UNCLASSIFIED		UNCLASSIFIED	UNCLASSIFIED
Y			RELAY, COMPUTE, CONVERT	
Z	POSITION		FINAL CONTROL ELEMENT	UNCLASSIFIED

LINE DESIGNATIONS

INSTRUMENTATION SIGNAL ———
 ELECTRICAL POWER ———
 DATA LINK — D — D —
 RADIO LINK — R — R —
 FIBER OPTIC DATA — F — F —

MISCELLANEOUS NOTATIONS

S/D = SHUTDOWN
 O/R = OVERRIDE
 MCS = MASTER CONTROL STATION
 VFD = VARIABLE FREQUENCY DRIVE
 PCC = PROCESS CONTROL CABINET
 LCP = LOCAL CONTROL PANEL
 ES = ELECTRICAL SUPPLY (120VAC)

CONTROLLER NOTATION

PV= PROCESS VARIABLE INPUT
 SP= SET POINT INPUT
 C= CONTROL OUTPUT

EQUIPMENT NOTATION

B = BLOWER OR FAN
 E = ENGINE
 G = GENERATOR
 F = FILTER
 GS = GRINDER/SCREEN
 K = COMPRESSOR
 H = HOIST
 ME = MECHANICAL EQUIPMENT
 MX = MIXER
 P = PUMP
 T = TANK OR SUMP

INPUT/OUTPUT NOTATIONS

AI = ANALOG INPUT
 AO = ANALOG OUTPUT
 DI = DISCRETE INPUT
 DO = DISCRETE OUTPUT

HAND SWITCH NOTATION


HOA = HAND-OFF-AUTO
 S/S = START/STOP
 SEL = SELECTOR
 O/C = OPEN/CLOSE
 O/O = ON/OFF
 LOS = LOCKOUT-START
 LOR = LOCAL-OFF-REMOTE
 OAC = OPEN-AUTO CLOSE
 CAO = CLOSED-AUTO OPEN

VALVE DESIGNATIONS

MOV = MOTOR OPERATED VALVE

GENERAL ABBREVIATIONS

SCADA - SUPERVISORY CONTROL AND DATA ACQUISITION.
 PLC - PROGRAMMABLE LOGIC CONTROL
 SA - SURGE SUPPRESSOR DEVICE

















 INTERLOCK

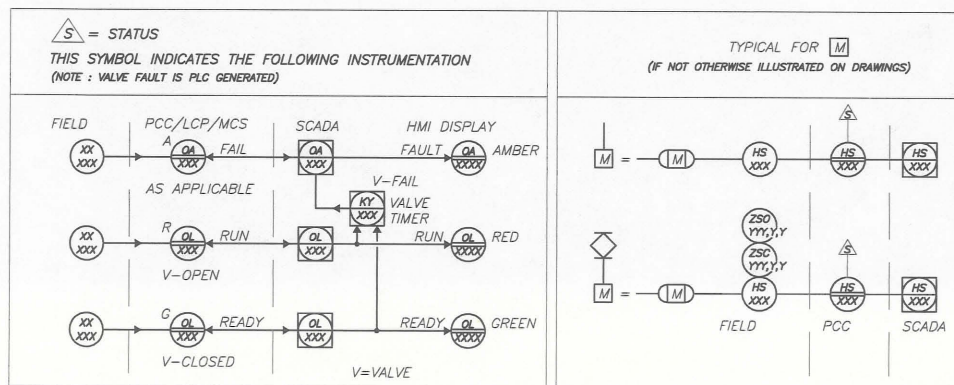
 CONTINUATION OF SIGNAL OR DATA TO/FROM SHEET NUMBER INDICATED

BASIC SYMBOLS

SINGLE FUNCTION

MULTIPLE FUNCTION

-  OR  FIELD MOUNTED INSTRUMENT OR DEVICE
-  OR  FRONT OF PANEL MOUNTED INSTRUMENT ON LCP, PCC, MCS, OR VFD
-  OR  REAR OF PANEL MOUNTED INSTRUMENT ON LCP, PCC, MCS, OR VFD
-  OR  FRONT OF PANEL MOUNTED INSTRUMENT ON MAIN PANEL
-  OR  REAR OF PANEL MOUNTED INSTRUMENT ON MAIN PANEL
-  OR  PLC AND/OR COMPUTER SOFTWARE COMPONENT (OPERATOR ACCESSIBLE UNDER NORMAL CONDITIONS) OR
-  OR  PLC AND/OR COMPUTER GENERATED COMPONENT (NOT OPERATOR ACCESSIBLE UNDER NORMAL CONDITIONS)
-  OR  DATA FLOW SYSTEMS RTU INPUT/OUTPUT



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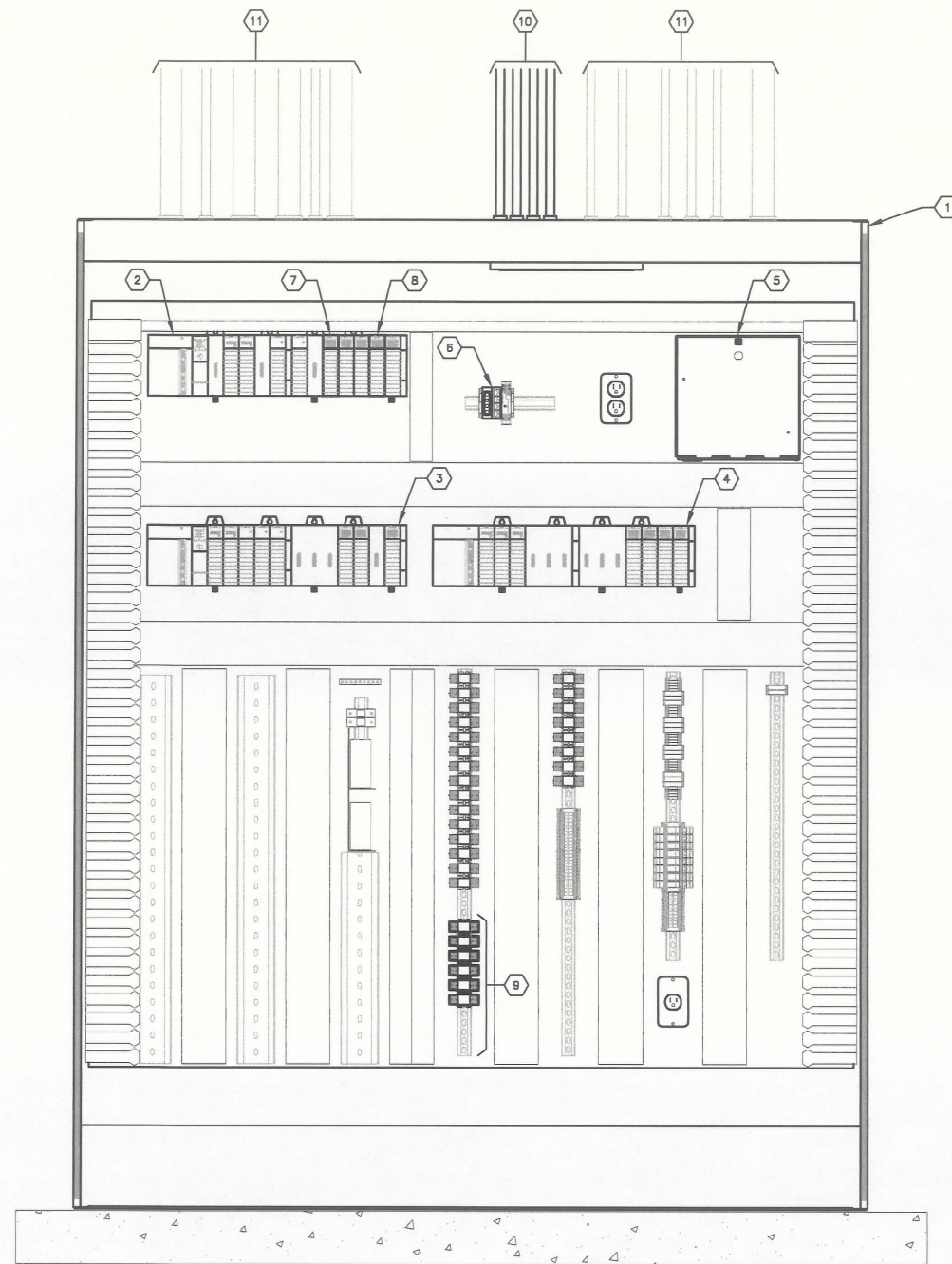
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TIMOTHY THOMAS, PE DATE
 L.I.C. NO.: 47079

**INSTRUMENTATION AND CONTROLS
 LEGEND**

PROJECT NO:
 00193-009-01
 DATE:
 NOVEMBER 2013
 SHEET NO:
 I-1





SCADA PANEL 1 ELEVATION
SCALE : N.T.S.

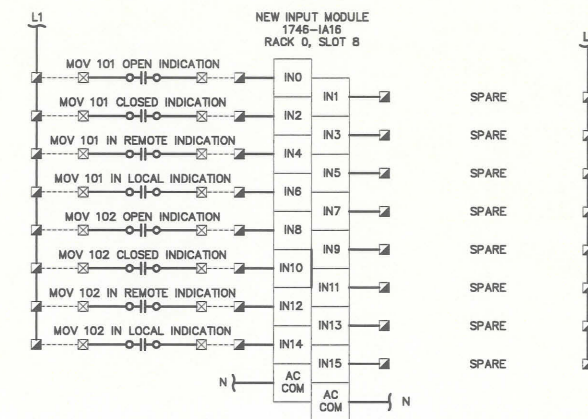


KEYED NOTES :

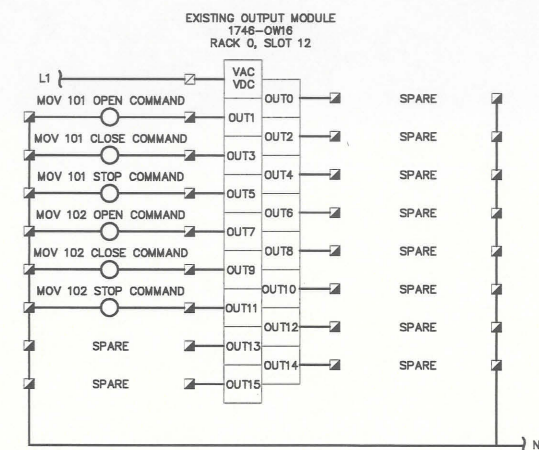
- 1 EXISTING SCADA PANEL 1 (SHOWN WITH DOORS OPEN).
- 2 EXISTING ALLEN-BRADLEY PLC (PLC-1, RACK 0). SLC 5/05 PROCESSOR; TWO (2) ANALOG INPUT MODULES: 1746-NIB; TWO (2) ANALOG OUTPUT MODULES: 1746-NO4; TWO (2) A/C INPUT MODULES: 1746-IA16; ONE (1) DIGITAL CONTACT OUTPUT MODULE: 1746-OW16; POWER SUPPLY: 1746-P4; 13-SLOT RACK: 1746-A13. FOUR (5) SPARE I/O MODULE SPACES AVAILABLE.
- 3 EXISTING ALLEN-BRADLEY PLC (PLC-2, RACK 1). SLC 5/05 PROCESSOR; TWO (2) ANALOG INPUT MODULES: 1746-NIB; THREE (3) ANALOG OUTPUT MODULES: 1746-NO4; TWO (2) A/C INPUT MODULES: 1746-IA16; ONE (1) DIGITAL CONTACT OUTPUT MODULE: 1746-OW16; POWER SUPPLY: 1746-P4; 13-SLOT RACK: 1746-A13. FOUR (4) SPARE I/O MODULE SPACES AVAILABLE.
- 4 EXISTING ALLEN-BRADLEY REMOTE I/O RACK (RACK 2). THREE (3) ANALOG INPUT MODULES: 1746-NIB; FOUR (4) A/C INPUT MODULES: 1746-IA16; POWER SUPPLY: 1746-P4; 13-SLOT RACK: 1746-A13. CHASSIS INTERCONNECT CABLE: 1746-C7; SIX (6) SPARE I/O MODULE SPACES AVAILABLE.
- 5 EXISTING FIBER OPTIC PATCH PANEL.
- 6 EXISTING PHOENIX CONTACT ETHERNET SWITCH WITH FOUR (4) FIBER OPTIC PORTS AND FOUR (4) UTP COPPER PORTS.
- 7 PROVIDE AND INSTALL NEW 120V A/C INPUT MODULE (RACK 0, SLOT 8) IN EXISTING EMPTY (SPARE) SLOT. ALLEN-BRADLEY 1746-IA16. MODULE TO BE UTILIZED FOR NEW MOTOR ACTUATED VALVE(S) I/O. REFER WIRING SCHEMATIC ON THIS SHEET.
- 8 PROVIDE AND INSTALL NEW 120V A/C RELAY OUTPUT MODULE (RACK 0, SLOT 11) IN EXISTING EMPTY (SPARE) SLOT. ALLEN-BRADLEY 1746-OW16. MODULE TO BE UTILIZED FOR NEW VFD OUTPUTS. REFER WIRING SCHEMATIC ON THIS SHEET.
- 9 PROVIDE AND INSTALL NEW DPST RELAYS WITH 120V COILS AND RELAY BASES. NEW RELAYS TO MATCH EXISTING.
- 10 CONTRACTOR SHALL PROVIDE AND INSTALL TWO (2) 3/4" CONDUITS, EACH CONTAINING 12-#14 THWN CU + 1-#14 THWN CU GND FOR MOV 101 AND MOV 102 I/O CIRCUITS. CONTRACTOR SHALL ALSO PROVIDE AND INSTALL TWO (2) SPARE 3/4" CONDUITS FOR FUTURE USE. REFER TO SHEET E-3 FOR CONTINUATION.
- 11 EXISTING CONDUIT/CONDUCTORS. NO WORK REQUIRED.

KEYED NOTES :

1. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION. CONTRACTOR SHALL NOTIFY ENGINEER OF DISCREPANCIES.
2. CONSTRUCTION SEQUENCE SHALL BE COORDINATED TO AVOID ANY TREATMENT PROCESS INTERRUPTION.
3. CONTRACTOR TO PROVIDE AND INSTALL ANY NEW MATERIALS (TERMINAL BLOCKS, SURGE ARRESTERS, INTERPOSING RELAYS, ETC.) AS REQUIRED TO ACCOMMODATE NEW SCADA PANEL 1 I/O. ALL NEW MATERIALS TO MATCH EXISTING.



120V INPUT MODULE WIRING SCHEMATIC



RELAY OUTPUT MODULE WIRING SCHEMATIC

LEGEND :

- ☒ TERMINAL POINT IN NEW MOTOR OPERATED VALVE
- ☑ TERMINAL POINT IN EXISTING SCADA PANEL 1 (SP-1)
- FIELD WIRING



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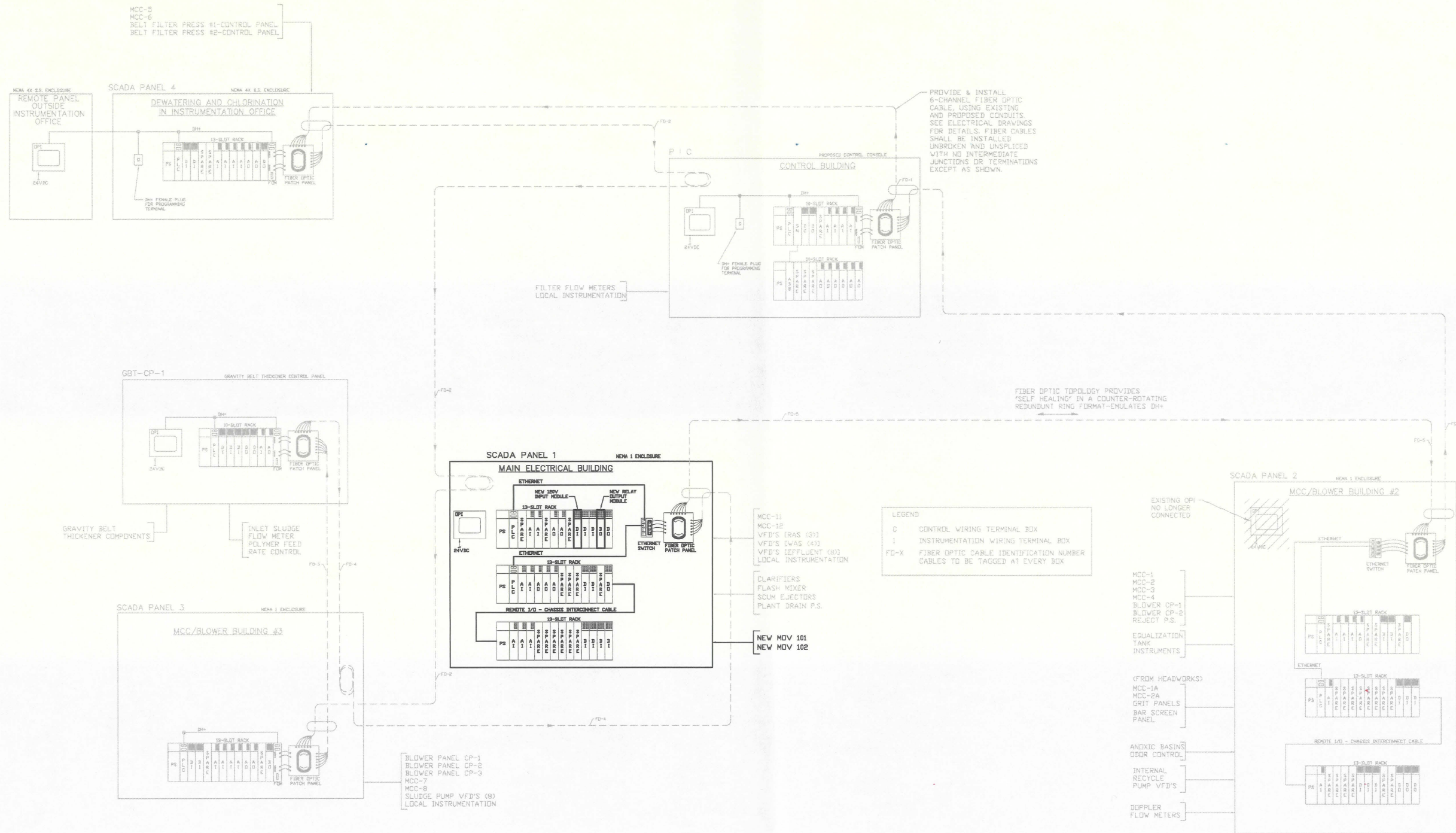
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DRAWN EAK
Q.C.
APPROVED

**SCADA PANEL 1 ELEVATION
AND WIRING SCHEMATICS**

PROJECT NO:
00193-009-01
DATE:
NOVEMBER 2013
SHEET NO:
1-2



TRICON
CONSULTING ENGINEERS

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**EXISTING FIBER OPTIC TOPOLOGY
AND PLC CONFIGURATIONS**

PROJECT NO:
00193-009-01
DATE:
NOVEMBER 2013
SHEET NO:
I-3