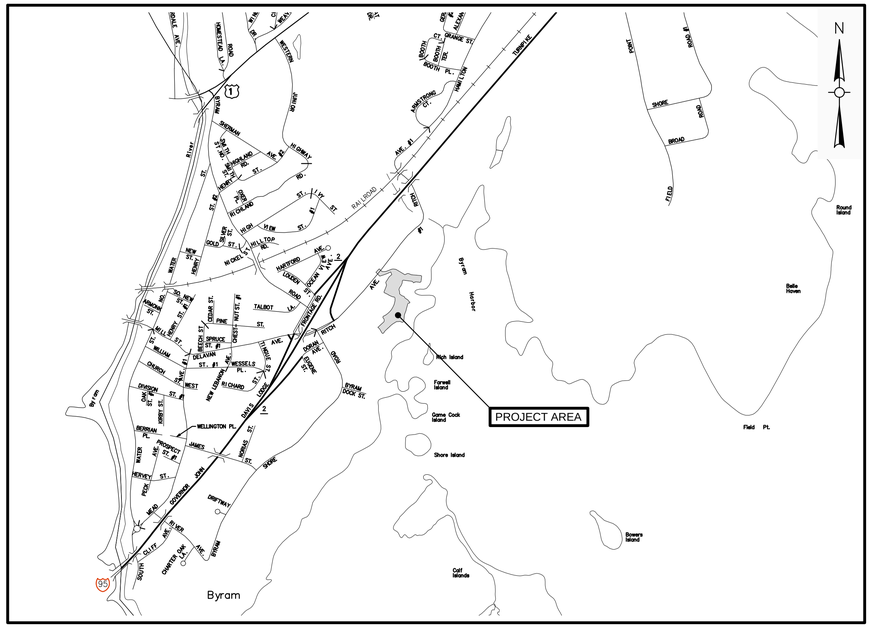

LOCATION MAP
SCALE: 1"=1000'

TOWN OF GREENWICH
DEPARTMENT OF PUBLIC WORKS

BYRAM PARK POOL REPLACEMENT

RITCH AVENUE WEST
GREENWICH, CONNECTICUT

(Revised 03/03/16 per Addendum #1)
(Revised 03/24/16 per Addendum #5)

CONSTRUCTION DOCUMENTS
12/11/15

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SHEET INDEX

1 – CIVIL / LANDSCAPE	
G1.00	ABBREVIATIONS, NOTES, AND LEGEND
G1.01	ADDITIONAL NOTES
C1.00	EXISTING CONDITIONS PLAN
C1.01	DEMOLITION PLAN
C2.00	OVERALL SITE PLAN
C2.01	LOW IMPACT DEVELOPMENT PLAN
C3.00	SITE LAYOUT PLAN–SOUTH
C3.01	SITE LAYOUT PLAN–NORTH
C3.02	PARKING LOT CENTERLINE PROFILE
C3.03	PARKING LOT BASELINE GEOMETRY AND CURB RADIUS SCHEDULE
C4.00	GRADING AND DRAINAGE PLAN–SOUTH
C4.01	GRADING AND DRAINAGE PLAN–NORTH
C5.00	EROSION AND SEDIMENTATION CONTROL PLAN
C6.00	UTILITY PLAN–SOUTH
C6.01	UTILITY PLAN–NORTH
C6.02	UTILITY PROFILE–NORTH
D1.00	EROSION & SEDIMENT CONTROL DETAILS
D1.01	SANITARY DETAILS
D1.02	WATER DETAILS
D1.03	DRAINAGE DETAILS
D1.04	DRAINAGE DETAILS
D1.05	PARKING AREA DETAILS
D1.06	MISCELLANEOUS DETAILS
D1.07	MISCELLANEOUS DETAILS
D1.08	MISCELLANEOUS DETAILS
L2.00	LANDSCAPE/HARDSCAPE PLAN–SOUTH
L2.01	LANDSCAPE/HARDSCAPE PLAN–NORTH
L3.00	HARDSCAPE & AMENITIES PLAN–SOUTH
L4.00	LANDSCAPE & HARDSCAPE DETAILS
L4.01	LANDSCAPE & HARDSCAPE DETAILS 2
L4.02	LANDSCAPE & HARDSCAPE DETAILS 3
L4.03	LANDSCAPE & HARDSCAPE DETAILS 4
2 – STRUCTURAL	
S0.00	GENERAL NOTES
S0.01	TYPICAL DETAILS 1
S0.02	TYPICAL DETAILS 2
S1.00	FOUNDATION PLAN MAIN BUILDING
S1.01	FOUNDATION PLAN AND SECTIONS FILTER BUILDING AND ENTRANCE BUILDING
S1.02	FOUNDATION SECTIONS AND DETAILS
S2.00	SLAB PLAN MAIN BUILDING
S2.01	SLAB PLAN FILTER BUILDING AND ENTRANCE BUILDING
S3.00	ROOF FRAMING PLAN MAIN BUILDING
S3.01	ROOF PLAN FILTER BUILDING AND ENTRANCE BUILDING
S3.02	TRUSS ELEVATIONS AND DETAILS
CS1.00	STRUCTURAL DETAILS
CS1.01	STRUCTURAL DETAILS
CS1.02	STRUCTURAL DETAILS
CS2.00	STRUCTURAL DETAILS

2 – STRUCTURAL CONTINUED	
CS2.01	STRUCTURAL DETAILS
CS2.02	ENTRANCE WALL ELEVATION, SECTION AND PLAN
CS2.03	SLAB PLAN
3 – ELECTRICAL	
E1.00	ELECTRICAL LEGEND
E2.01	ELECTRICAL SITE PLAN
E2.02	ELECTRICAL POOL BONDING PLAN
E3.00	ELECTRICAL MAIN BUILDING LIGHTING PLAN
E3.01	ELECTRICAL MAIN BUILDING POWER PLAN
E3.02	ELECTRICAL KITCHEN POWER PLAN
E3.03	ELECTRICAL FILTER BUILDING PLAN
E4.00	ELECTRICAL ONE LINE DIAGRAM
E5.00	ELECTRICAL SCHEDULES
E6.00	ELECTRICAL DETAILS
4 – MECHANICAL	
M10.1	PROCESS/ MECHANICAL SCHEDULES AND ABBREVIATIONS
M10.2A	PUMPING STATION PLAN AND SECTION
M10.2B	PUMPING STATION PLAN AND PROFILE
M10.3	MECHANICAL DETAILS
M10.4	MECHANICAL DETAILS
M10.5	PUMPIMG STATION ELECTRICAL ONE LINE DIAGRAM
M10.6	PUMPING STATION ELECTRICAL PLAN
M10.7	PUMPING STATION INSTRUMENTATION AND GENERAL CONTROL NOTES
M10.8	PUMPING STATION INSTRUMENTATION PID LAYOUT AND TABLES
5 – HVAC	
H0.00	HVAC LEGEND
H1.01	HVAC FLOOR PLAN
H2.01	HVAC SCHEDULE
H3.01	HVAC DETAILS
6 – PLUMBING	
P0.00	PLUMBING LEGEND AND SCHEDULE
P1.00	PLUMBING UNDERSLAB PLAN
P1.01	PLUMBING FLOOR PLAN
P2.01	PLUMBING DETAILS
P2.02	PLUMBING RISER DIAGRAMS
7 – ARCHITECTURAL – BUILDINGS	
A0.00	ABBREVIATIONS, LEGEND, NOTES & WALL TYPES
A0.01	EXTERIOR & INTERIOR BUILDING SIGNAGE
A0.02	CODE & LIFE SAFETY PLAN
A1.00	OVERALL FLOOR PLAN – MAIN BUILDING
A1.01	OVERALL FLOOR PLANS – ENTRY GATE & FILTER BUILDING
A1.02	OVERALL REFLECTED CEILING PLAN – MAIN BUILDING
A1.03	OVERALL REFLECTED CEILING PLANS – ENTRY GATE & FILTER BUILDING
A1.04	OVERALL ROOF PLAN – MAIN BUILDING
A1.05	OVERALL ROOF PLANS – ENTRY GATE & FILTER BUILDING
A2.00	EXTERIOR ELEVATIONS – MAIN BUILDING
A2.00A	EXTERIOR ELEVATIONS – MAIN BUILDING – ALTERNATE

7 – ARCHITECTURAL – BUILDINGS CONTINUED	
A2.01	EXTERIOR ELEVATIONS – MAIN BUILDING
A2.01A	EXTERIOR ELEVATIONS – MAIN BUILDING – ALTERNATE
A2.02	EXTERIOR ELEVATION – ENTRY GATE
A2.03	EXTERIOR ELEVATIONS – FILTER BUILDING
A2.03A	EXTERIOR ELEVATIONS – FILTER BUILDING – ALTERNATE
A3.00	BUILDING SECTION – MAIN BUILDING
A3.01	BUILDING SECTION – ENTRY GATE & FILTER BUILDING
A5.00	MILLWORK DETAILS
A5.01	DETAILS
A6.00	ROOM FINISH & DOOR SCHEDULE AND DOOR DETAILS
A6.01	WINDOW SCHEDULE & DETAILS
A6.02A	MISCELLANEOUS DETAILS – ALTERNATE
A6.03	LOUVER SCHEDULE & DETAILS
A7.00	PLUMBING SCHEDULE AND BATHROOM INTERIOR ELEVATIONS
A7.01	LARGE SCALE BATHROOM FLOOR PLANS
8 – POOL PIPING	
SP1.0	SITE PLAN AND NOTES
SP2.0	ACTIVITY POOL PLAN
SP2.1	ACTIVITY POOL SECTION
SP2.2	ACTIVITY POOL DETAILS
SP2.4	ACTIVITY POOL PIPING SCHEMATIC
SP2.5	ACTIVITY POOL SITE PIPING
SP3.0	WADING POOL PLAN AND SECTION
SP3.1	WADING POOL DETAILS
SP3.2	WADING POOL PIPING SCHEMATIC
SP3.3	WADING POOL SITE PIPING
SP4.0	SPRAY DECK PLAN
SP4.1	SPRAY DECK DETAILS
SP4.2	SPRAY DECK PIPING SCHEMATIC
SP4.3	SPRAY DECK SITE PIPING
SP5.0	FILTER BUILDING
SP5.1	MECHANICAL DETAILS
SP5.2	MECHANICAL DETAILS 2

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12/11/15

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No.	Date	Dr.By	Ck.By	App.By	Description
1	03/03/16	LEC	JSP	CBW	ADDENDUM #1
2	03/24/16	LEC	JSP	CBW	ADDENDUM #5

APPROVED

REGISTERED PROFESSIONAL ENGINEER _____ DATE

TOWN OF GREENWICH – DEPARTMENT OF PUBLIC WORKS
RITCH AVENUE WEST, GREENWICH, CONNECTICUT
BYRAM PARK POOL REPLACEMENT

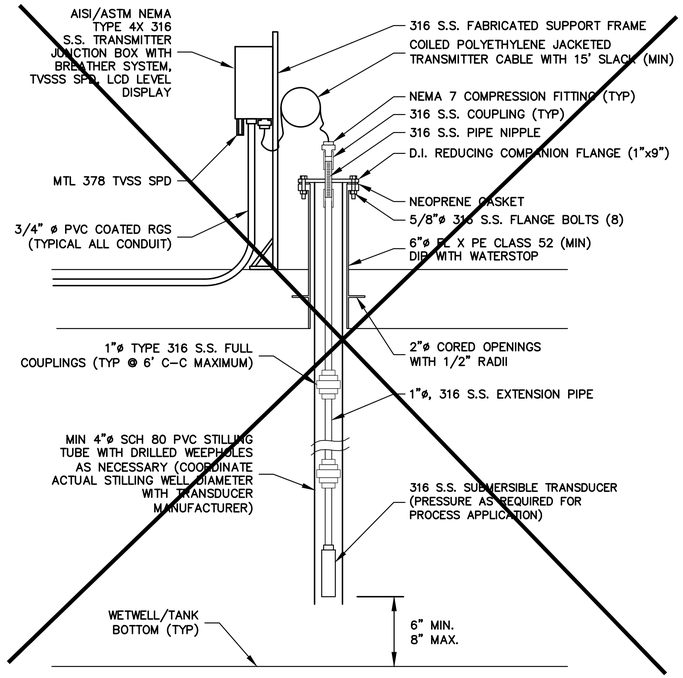
SHEET INDEX

CADD NO.	SCALE:	CONTRACT:	JOB NO.	DR.BY	DSN.BY	CHK.BY	APP.BY
GREENWICH	NONE	–	2130336	L.E.C.	L.E.C.	J.S.P.	C.B.W.

ID1.00

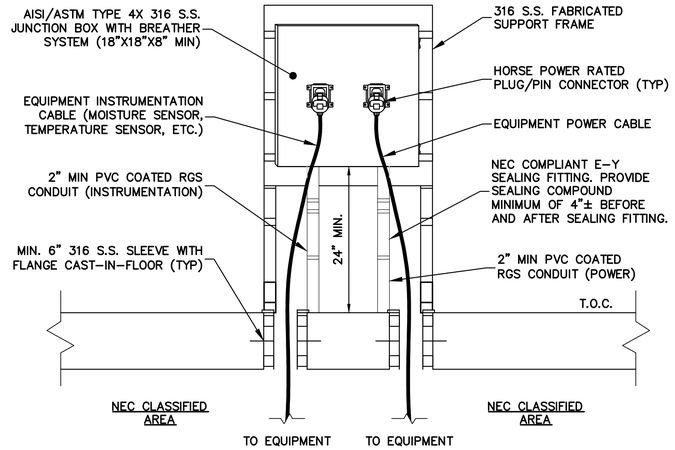
FILE NO.

SHEET – OF –

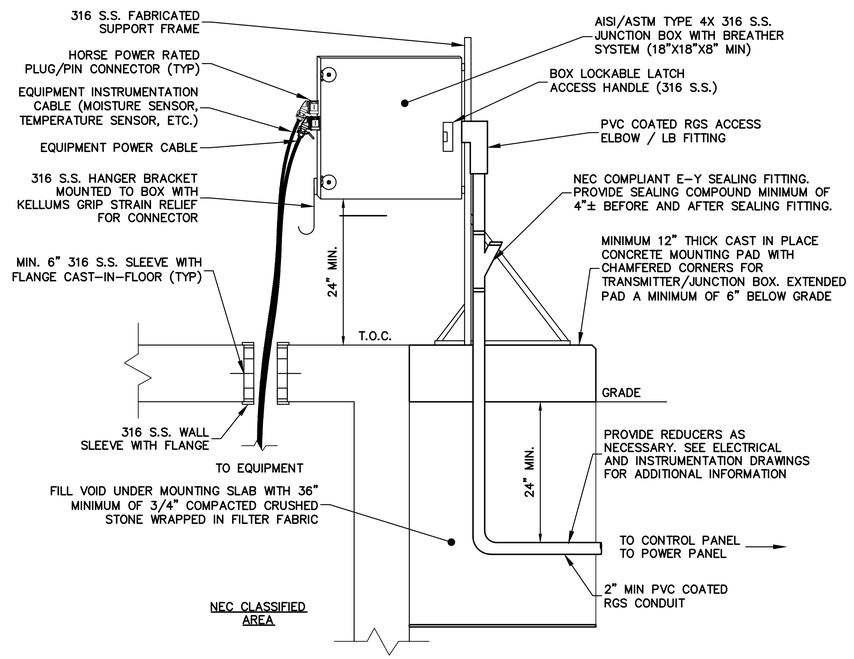


CLOSED-TANK SUBMERSIBLE TRANSMITTER TYPICAL MOUNTING DETAIL

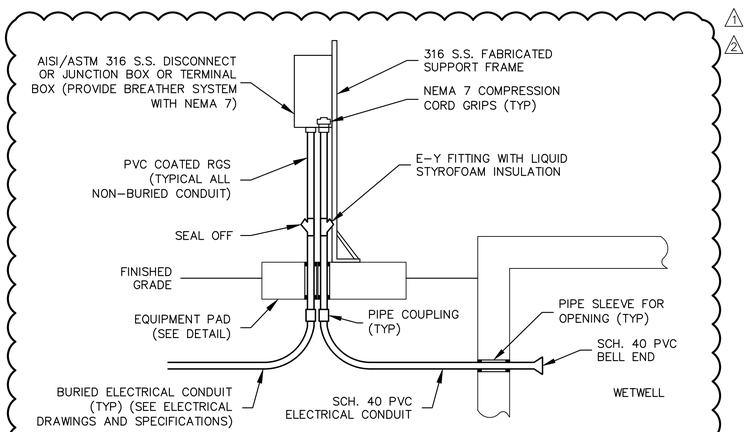
N.T.S.



TYPICAL FRONT ANGLE



TYPICAL SIDE ANGLE



TYPICAL DISCONNECT OR JUNCTION BOX DETAIL

N.T.S.

NOTES:

1. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO PLUG/PIN CONNECTORS PER MOTOR ASSEMBLY. ONE DEDICATED PLUG/PIN CONNECTOR SHALL BE PROVIDED FOR THE EQUIPMENT POWER AND ONE FOR THE INSTRUMENTATION CABLES. POWER PLUG/PINS SHALL BE NEMA 4X AND HORSEPOWER RATED. ADDITIONAL HORSEPOWER RATED PLUG/PINS SHALL BE PROVIDED AT NO ADDITIONAL COST BASED ON THE ACTUAL MOTOR LOADS AND HORSEPOWER RATING REQUIREMENTS. THE CONTRACTOR SHALL COORDINATE THESE REQUIREMENTS WITH THE EQUIPMENT MANUFACTURER. PLUG/PIN CONNECTORS SHALL BE AS MANUFACTURED BY CROUSE-HINDS OR MELTRIC CORPORATION.
2. PLUG/PIN CONNECTORS ARE SHOWN MOUNTED TO THE FRONT OF THE JUNCTION BOX/TRANSMITTER ENCLOSURE FOR CLARITY OF THE DETAIL. THE PLUG/PIN CONNECTORS SHALL BE INSTALLED ON THE BOTTOM OF THE JUNCTION BOX/TRANSMITTER ENCLOSURE SUCH THAT THE ENCLOSURE PROVIDES A DRIP EDGE/ MEANS OF WEATHER PROTECTION FOR THE PLUG/PIN CONNECTORS.
3. ALL COMPONENTS OF THE PLUG/PIN CONNECTORS SHALL BE NON-FUSED.
4. ALL EQUIPMENT UTILIZING PLUG/PIN CONNECTIONS SHALL BE PROVIDED WITH LOCKOUT/TAGOUT PROVISIONS ON THE SYSTEM CONTROL PANEL/STARTER REGARDLESS OF WHETHER OR NOT THE LOCKOUT/TAGOUT PROVISIONS ARE SPECIFIED.
5. THE CONTRACTOR SHALL COORDINATE THE EQUIPMENT CABLE AND CABLE PIN QUANTITY REQUIREMENTS WITH THE APPROVED EQUIPMENT. THE CONTRACTOR SHALL PROVIDE PLUGS/PINS WITH ADDITIONAL PINS AS NECESSARY AND AT NO ADDITIONAL COST TO THE OWNER BASED ON THE QUANTITY OF PINS REQUIRED BY THE EQUIPMENT MANUFACTURER.
6. FOR SUBMERSIBLE PUMPING APPLICATIONS THE CONTRACTOR SHALL PROVIDE ONE JUNCTION BOX/TRANSMITTER WITH ALL OF THE PLUG/PIN RECEPTACLES PROVIDED ON THE BOX. THE CONTRACTOR SHALL UPSIZE THE MINIMUM JUNCTION BOX/TRANSMITTER SIZE AS REQUIRED AND AT NO ADDITIONAL COST.

PLUG/PIN STYLE CONNECTOR TRANSMITTER AND JUNCTION BOX MOUNTING DETAIL

N.T.S.

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No.	Date	Dr.By	Ck.By	App.By	Description
1	03/07/16	IMJ	CBW	CBW	ADDENDUM #1
2	03/24/16	KJM	IMJ	CBW	ADDENDUM #5

APPROVED 03-07-16 DATE

REGISTERED PROFESSIONAL ENGINEER

TOWN OF GREENWICH - DEPARTMENT OF PUBLIC WORKS
RITCH AVENUE WEST, GREENWICH, CONNECTICUT
BYRAM PARK POOL REPLACEMENT

MECHANICAL DETAILS

CADD NO. GREENWICH | SCALE: NONE | CONTRACT: - | JOB NO. 21303336 | DR.BY L.E.C. | DSN.BY L.E.C. | CHK.BY J.S.P. | APP.BY C.B.W.

M10.4

FILE NO.

SHEET — OF —

POWER PANELBOARD

DESIGNATION:	PP–1	MAIN CIRCUIT BREAKER:	100AF/100AT
VOLTS:	277Y/480V	MAIN BUS:	100A
PHASE:	3	SHORT CIRCUIT RATING:	22KAIC
WIRES:	4	MOUNTING:	SURFACE
NEUTRAL:	SOLID	ENCLOSURE:	NEMA 12
PANEL POLES:	12	GROUND BUS:	YES

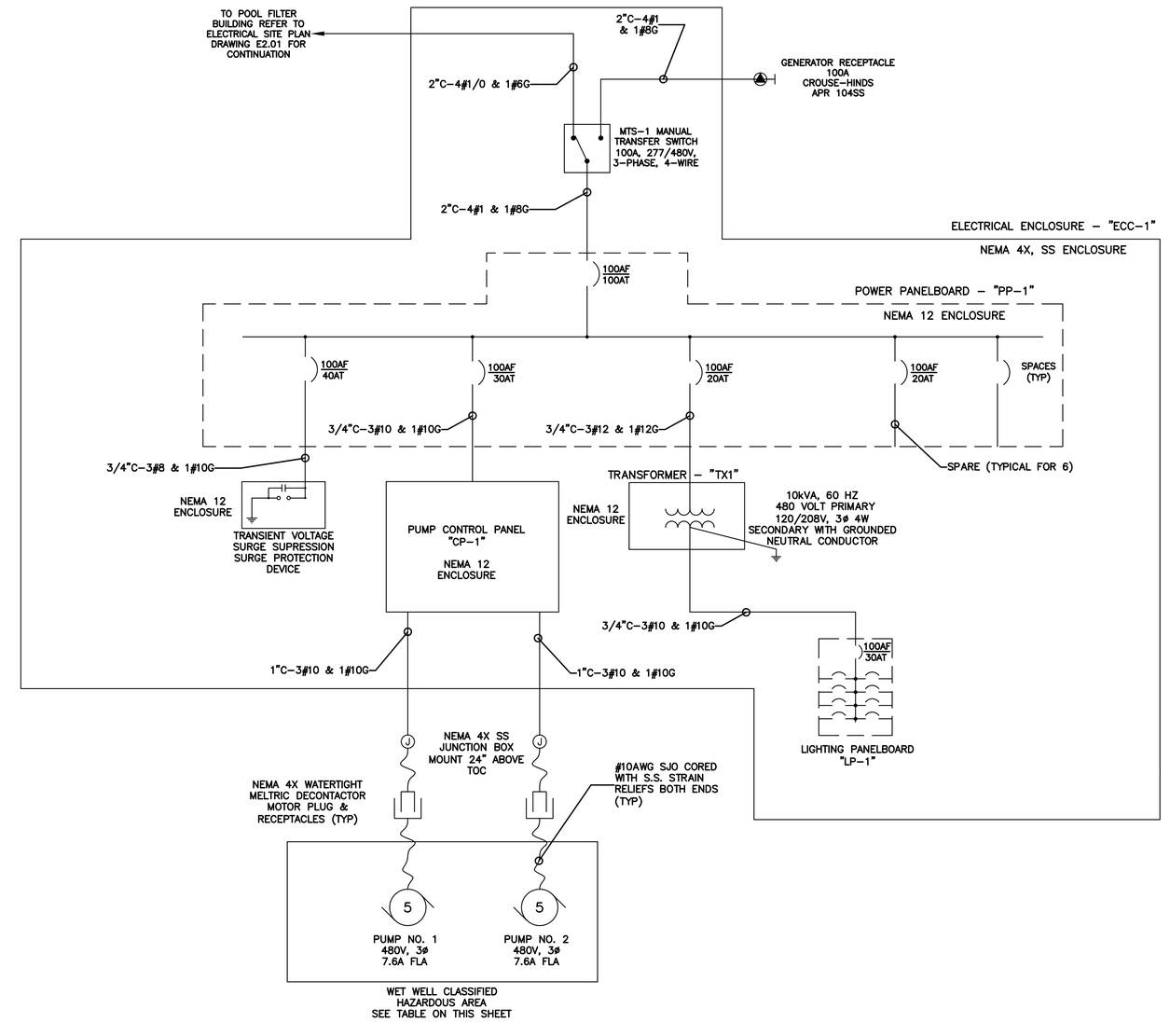
NO.	CIRCUIT DESCRIPTION	FRM.	TRIP	POLE	kVA	NOTES
1	MAIN CIRCUIT BREAKER	100	100	3		
2	TVSS PANEL	100	40	3		TVSS SPD
3	PUMP CONTROL PANEL CP–1	100	30	3		
4	SPARE	100	20	3		
5	TRANSFORMER TX–1	100	25	3	XX	
6	SPARE	100	20	3		
7	SPARE	100	20	3		
8	SPARE	100	20	3		
9	SPACE					
10	SPACE					
11	SPACE					
12	SPACE					

LIGHTING PANELBOARD

DESIGNATION:	LP–1	MAIN CIRCUIT BREAKER:	MLO
VOLTS:	120Y/208V	MAIN BUS:	100A
PHASE:	3	SHORT CIRCUIT RATING:	22KAIC
WIRES:	4	MOUNTING:	SURFACE
NEUTRAL:	SOLID	ENCLOSURE:	NEMA 12
PANEL POLES:	24	GROUND BUS:	YES

NO.	CIRCUIT DESCRIPTION	FRM.	TRIP	POLE	kVA	NOTES
1	ENCLOSURE LIGHTS	100	20	1		
2	ENCLOSURE HEATERS	100	20	1		
3	ENCLOSURE FANS	100	20	1		
4	ENCLOSURE RECEPTACLE	100	20	1		GFCI BREAKER
5	ENCLOSURE RECEPTACLE	100	20	1		GFCI BREAKER
6	SPARE	100	20	1		
7	SPARE	100	20	1		
8	SPARE	100	20	1		
9	SPARE	100	20	1		
10	SPARE	100	20	1		
11	SPARE	100	20	1		
12	SPARE	100	20	1		
13	SPARE	100	20	1		
14–24	SPACES					

NOTES:
1. SEE SHEET E1.00 FOR GENERAL NOTES, LEGENDS AND SYMBOLS.
2. ALL NEMA 12 ENCLOSURES TO BE GASKETED AND CUSTOM PAINTED CARBON STEEL.



ONE LINE DIAGRAM
N.T.S.

AREA CLASSIFICATIONS TABLE

AREA	DESIGNATION	NEMA RATINGS	NEC CLASSIFICATION	U.L. LISTING
WETWELL INTERIOR AND EXTERIOR WITHIN 3 FEET OF HATCH OR VENT	WET, CORROSIVE, HAZARDOUS	4X, 7	CLASS 1, DIV. 1 GROUP C & D	WATERTIGHT
WETWELL EXTERIOR WITHIN 5 FEET OF HATCH OR VENT	WET, CORROSIVE, HAZARDOUS	4X, 7	CLASS 1, DIV. 2 GROUP C & D	WATERTIGHT
VALVE VAULT (PUMP CHAMBER) INTERIOR	WET, CORROSIVE	4X, 7		WATERTIGHT
EXTERIOR	WET, CORROSIVE	4X		WATERTIGHT

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No.	Date	Dr.By	Ck.By	App.By	Description
1	03/07/16	IMJ	CBW	CBW	ADDENDUM #5

APPROVED 03–07–16 DATE
REGISTERED PROFESSIONAL ENGINEER

TOWN OF GREENWICH – DEPARTMENT OF PUBLIC WORKS
RITCH AVENUE WEST, GREENWICH, CONNECTICUT

BYRAM PARK POOL REPLACEMENT

PUMPING STATION
ELECTRICAL ONE LINE DIAGRAM

CADD NO.	SCALE:	CONTRACT:	JOB NO.	DR.BY	DSN.BY	CHK.BY	APP.BY
GREENWICH	NONE	–	21303336	L.E.C.	L.E.C.	J.S.P.	C.B.W.

FILE NO.

M10.5

SHEET – OF –

NOTES:

1. CONTRACTOR SHALL DEVELOP AND SUBMIT DETAILED SCALED DRAWINGS WITH DIMENSIONS SHOWING ALL PROPOSED EQUIPMENT LOCATED AS PROPOSED IN THE ELECTRICAL/INSTRUMENTATION CABINET.
2. MOTOR BRANCH WIRING IS SHOWN ON SINGLE LINE DIAGRAM, RUN ALL OTHER POWER AND LIGHTING CIRCUITS WITH SEPARATE NEUTRALS IN SEPARATE CONDUIT FROM MOTOR POWER CIRCUITS.
3. PROVIDE A WARNING NAMEPLATE ON THE MAIN CIRCUIT BREAKER ENCLOSURE MARKED "CAUTION – TO COMPLETELY DISCONNECT SYSTEM, TURN OFF GENERATOR AND OPEN THIS BREAKER".

FREE–STANDING EXTERIOR ELECTRICAL ENCLOSURES

A. FREESTANDING EXTERIOR ELECTRICAL OUTER ENCLOSURES SHALL BE FURNISHED AND INSTALLED WHERE INDICATED ON THE DRAWINGS.

B. ENCLOSURE SHALL BE FREE STANDING WITH NEMA 3R RATING, SINGLE OR DOUBLE DOOR OR QUAD–DOOR AS INDICATED, FOR THE HOUSING OF THE ELECTRICAL SERVICE EQUIPMENT, TRANSFER SWITCH, PUMPING STATION CONTROL PANEL, ENCLOSURE ACCESSORIES, AND OTHER ANCILLARY EQUIPMENT, ETC., AS SHOWN ON THE DRAWINGS.

C. ENCLOSURES SHALL BE FABRICATED OF 1/8" THICK (MINIMUM) 5052 SERIES PAINTED ALUMINUM WITH CONTINUOUSLY WELDED SEAMS. ENCLOSURES SHALL HAVE A SLANTED ROOF AND COMBINATION OVERHANG/DRIP–EDGE OVER THE DOOR(S).

D. ENCLOSURE DOOR(S) SHALL HAVE A HEAVY–GAUGE CONTINUOUS HINGE WITH 1/4" DIAMETER (MINIMUM) STAINLESS STEEL HINGE PIN. ENCLOSURE DOOR SHALL BE EQUIPPED WITH HEAVY–DUTY THREE–POINT ROLLER–TYPE LATCHING HARDWARE WITH 3/4" DIAMETER STAINLESS STEEL DOOR HANDLE WITH PROVISIONS FOR PADLOCKING. SCREW CLAMPS SHALL NOT BE ALLOWED.

E. ENCLOSURES SHALL BE PRIMED AND PAINTED WITH A MINIMUM OF TWO COATS OF HUNTER GREEN (HENNESSY PRODUCTS T–10) POLYESTER POWDER COATING.

F. ENCLOSURE SHALL BE MOUNTED AS INDICATED ON DRAWINGS. ENCLOSURES SHALL BE FASTENED TO THE FOUNDATION WITH 1/2 INCH MINIMUM DIAMETER HOOK–TYPE STAINLESS STEEL ANCHOR BOLTS.

G. ENCLOSURE LIGHTING KITS SHALL BE HOFFMAN MODEL A–LFDA2 REMOTE DOOR ACTIVATED LIGHTING PACKAGES, OR EQUIVALENT WITH 24" LONG, 20–WATT FLUORESCENT BULBS AND NON–YELLOWING THERMOPLASTIC LENS. ONE FIXTURE SHALL BE PROVIDED OVER EACH DOOR OPENING AND A MINIMUM OF TWO SPARE BULBS SHALL BE PROVIDED FOR EACH FIXTURE.

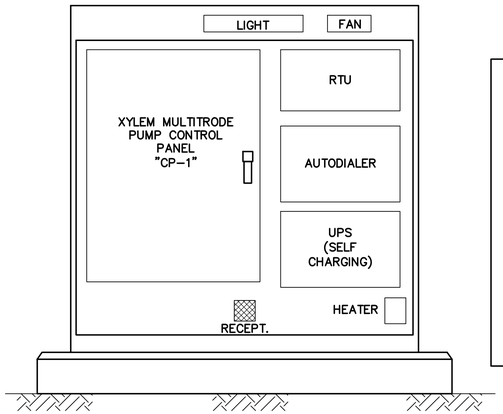
H. ENCLOSURES SHALL BE PROVIDED WITH A MINIMUM OF FOUR CORROSION INHIBITORS, HOFFMAN MODEL A–HC1–10E INDUSTRIAL CORROSION INHIBITORS, OR EQUIVALENT.

I. ENCLOSURE SHALL BE PROVIDED WITH AUTOMATICALLY ENGAGING DOOR RESTRAINT BARS.

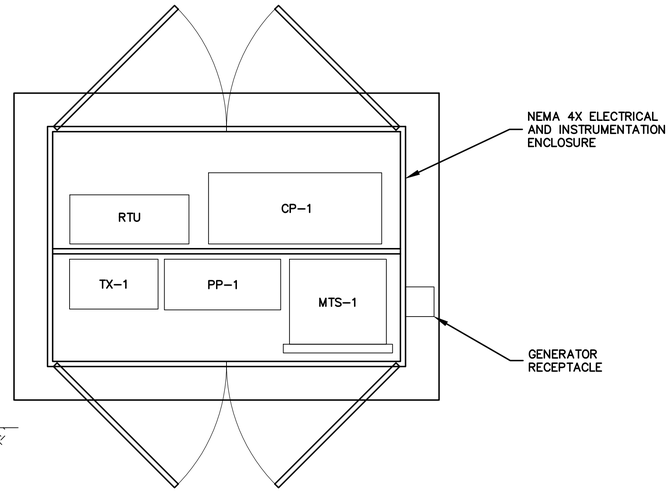
J. ENCLOSURE SHALL HAVE A THERMOSTATICALLY CONTROLLED FAN DRIVEN ELECTRICAL RESISTANCE SPACE HEATERS. SPACE HEATERS FOR ENCLOSURES SHALL BE HOFFMAN CATALOG# A–DAH4001FT 400W–120V OR EQUIVALENT. A MINIMUM OF ONE HEATER SHALL BE FURNISHED AND INSTALLED FOR EACH DOOR ON THE ENCLOSURE, E.G., A QUAD–DOOR ENCLOSURE SHALL HAVE A MINIMUM OF FOUR HEATERS. STRIP HEATERS SHALL NOT BE ACCEPTABLE.

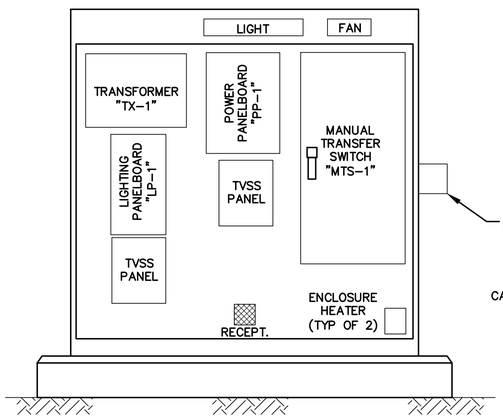
K. ENCLOSURE SHALL HAVE INTAKE LOUVERS WITH REMOVABLE AIR FILTER AND THERMOSTATICALLY CONTROLLED 100 CFM EXHAUST FAN WITH SCREENED AIR EXHAUST. ONE EXHAUST FAN SHALL BE PROVIDED FOR EVERY TWO ENCLOSURE DOORS, E.G., A QUAD–DOOR ENCLOSURE SHALL HAVE A MINIMUM OF TWO FANS.

L. ENCLOSURES SHALL BE MANUFACTURED BY APX TECHNOLOGIES, INC., MERCERSBURG, PA, EQUIVALENT BY ERPEL DESIGN CORPORATION, TELFORD, PA, OR EQUIVALENT. ENCLOSURES SHALL BE SPECIALLY DESIGNED, UL LISTED, OUTDOOR ENCLOSURES. INTERIOR TYPE ENCLOSURES MODIFIED FOR EXTERIOR USE SHALL NOT BE ACCEPTABLE.

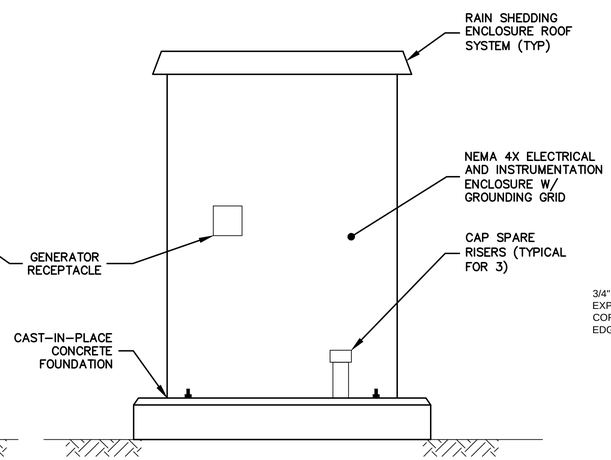


INSTRUMENTATION / CONTROL SIDE



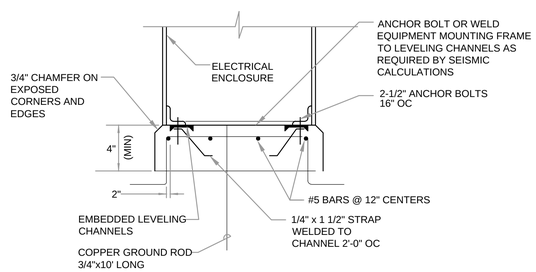


POWER SIDE

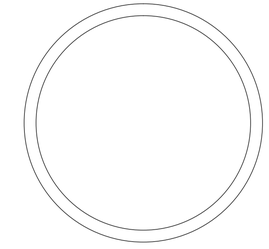


METER SIDE ELEVATION

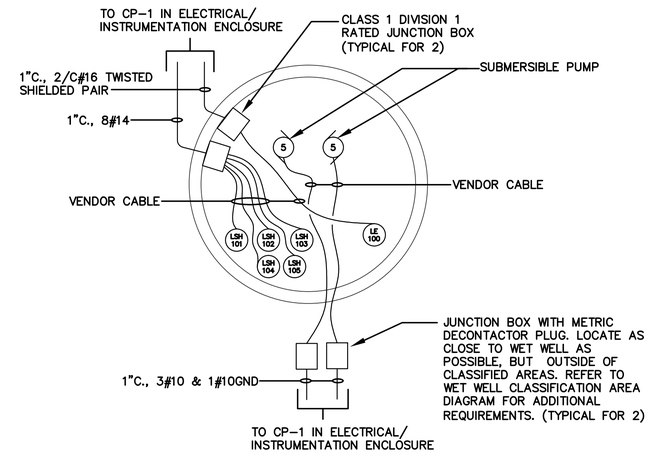
ELECTRICAL & INSTRUMENTATION ENCLOSURE (ECC–1)
PLAN, SECTION & ELEVATION
NOT TO SCALE



ELECTRICAL & INSTRUMENTATION ENCLOSURE BASE DETAIL
NOT TO SCALE

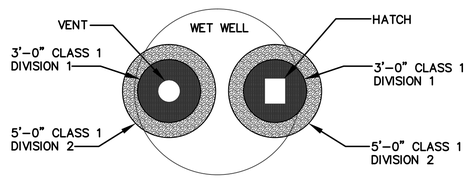


DRY WELL



WET WELL

PUMP STATION ELECTRICAL PLAN
NOT TO SCALE



WET WELL CLASSIFICATION AREA DIAGRAM
NOT TO SCALE

CONSTRUCTION DOCUMENTS 12/11/15

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No.	Date	Dr.By	Ck.By	App.By	Description
1	03/07/16	IMJ	CBW	CBW	ADDENDUM #5

APPROVED
REGISTERED PROFESSIONAL ENGINEER
DATE 03-07-16

TOWN OF GREENWICH – DEPARTMENT OF PUBLIC WORKS
RITCH AVENUE WEST, GREENWICH, CONNECTICUT
BYRAM PARK POOL REPLACEMENT
PUMPING STATION ELECTRICAL PLAN

CADD NO.	SCALE:	CONTRACT:	JOB NO.	DR.BY	DSN.BY	CHK.BY	APP.BY
GREENWICH	AS NOTED	–	2130336	L.E.C.	L.E.C.	J.S.P.	C.B.W.

FILE NO. M10.6

SHEET – OF –

INSTRUMENT SYMBOLS

- LOCALLY MOUNTED
- REAR OF PANEL OR RACK MOUNTED
- FRONT OF PANEL MOUNTING (PRIMARY LOCATION)
- FRONT OF PANEL MOUNTING (AUXILIARY LOCATION)
- INSTRUMENTS SHARING COMMON HOUSING
- PROCESS INTERLOCK
- SHARED DISPLAY FUNCTION (BLIND)
- SHARED DISPLAY FUNCTION (OPERATOR ACCESS PRIMARY LOCATION)
- SHARED DISPLAY FUNCTION (OPERATOR ACCESS AUXILIARY LOCATION)
- COMPUTER FUNCTION (BLIND)
- COMPUTER FUNCTION (OPERATOR ACCESS PRIMARY LOCATION)
- COMPUTER FUNCTION (OPERATOR ACCESS AUXILIARY LOCATION)
- PLC LOGIC FUNCTION (BLIND)
- PLC LOGIC FUNCTION (OPERATOR ACCESS PRIMARY LOCATION)
- PLC LOGIC FUNCTION (OPERATOR ACCESS AUXILIARY LOCATION)
- PERSONAL SAFETY ALARM PUSH BUTTON (AIL) OR EMERGENCY STOP PUSH BUTTON (RIL)
  - AIL – AMBER INDICATING LIGHT
  - BIL – BLUE INDICATING LIGHT
  - GIL – GREEN INDICATING LIGHT
  - RIL – RED INDICATING LIGHT
  - WIL – WHITE INDICATING LIGHT
- ALARM ACTIVATED HORN
- RFBH — RED FLASHING BEACON HORN
- DO — DIGITAL OUTPUT
- DI — DIGITAL INPUT
- AO — ANALOG OUTPUT
- AI — ANALOG INPUT

HAND SWITCHES

HS 101 — SPECIFIC SWITCH FUNCTION, (TYP); LOOP NUMBER

- AO–AUTO/OFF
- AM–AUTO/MANUAL
- CM–COMPUTER/MANUAL
- CL–COMPUTOR/LOCAL
- ES–EMERGENCY STOP
- FOR–FORWARD/OFF/REVERSE
- FS–FAST/SLOW
- FOS–FAST/OFF/SLOW
- HOA–HAND/OFF/AUTO
- LLS–LEAD/LAG/STANDBY
- LOR–LOCAL/OFF/REMOTE
- LOS–LOCKOUT/STOP
- LR–LOCAL/REMOTE
- OC–OPEN/CLOSE
- OCA–OPEN/CLOSE/AUTO
- OO–ON/OFF
- OSC–OPEN/STOP/CLOSE
- SS–START/STOP
- SOR–START/OFF/RESET

PRIMARY ELEMENTS

- AV — AUTOMATIC CONTROL VALVE
- FE / M — MAGNETIC FLOW METER
- FE — TURBINE FLOW METER
- FE — ULTRASONIC FLOW METER
- FE — ORIFICE FLOW METER
- FS — FLOW SWITCH
- LE — LEVEL CAPACITANCE
- LE — ULTRASONIC LEVEL SENSOR
- LS — PROBE LEVEL SENSOR
- PI — PRESSURE GAUGE
- PDI — DIFFERENTIAL PRESSURE GAUGE
- PS — PRESSURE SWITCH
- PT — PRESSURE TRANSMITTER
- TI — TEMPERATURE GAUGE
- TT — TEMPERATURE TRANSMITTER
- VENTURI FLOW METER

INSTRUMENT LINE SYMBOLS

- CONNECTION TO PROCESS OR INSTRUMENT IMPULSE LINE
- INSTRUMENT PNEUMATIC SIGNAL LINE (3–15 PSIG UNLESS NOTED OTHERWISE)
- INSTRUMENT ELECTRONIC SIGNAL LINE (CURRENT OR VOLTAGE AS NOTED ON SPEC SHEETS)
- FIELD TUBING OR CAPILLARY FOR THERMAL ELEMENTS AND PRESSURE SEALS
- INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)
- UNGUIDED ELECTROMAGNETIC OR SONIC SIGNAL
- HEAT TRACED LINE
- RS232/RS485 SERIAL
- POWER
- INSTRUMENTATION
- ENET — ETHERNET
- FO — FIBER OPTIC MEDIA

INSTRUMENTATION DESIGNATIONS

A/B	SELECTOR SWITCH
A/M	AUTO/MANUAL
CLR	CHLORINE RESIDUAL
ES	EMERGENCY STOP
ESD	EMERGENCY SHUT DOWN
F/R	FORWARD/REVERSE
H/O/A	HAND/OFF/AUTO
O/C	OPEN CLOSE
OL	MOTOR OVERLOAD TRIP
O/O	ON OR OFF
pH	HYDROGEN ION CONCENTRATION
S/S	START STOP
S	START
TU	TURBIDITY
ESE	INDUSTRIAL ETHERNET SWITCH/HUB
FOC	FIBER OPTIC CONVERTER
PSA	PERSONAL SAFETY ALARM ILLUMINATED PUSHBUTTON
ESC	EMERGENCY STOP ILLUMINATED PUSHBUTTON
	RED INDICATING LIGHT
HLS	HIGH LOW ANALOG SELECT
PSA	PERSONAL SAFETY ALARM
DO	DISSOLVED OXYGEN
NOX	NITRATE
TSS	TOTAL SUSPENDED SOLIDS
OIT	OPERATOR INTERFACE TERMINAL (LOCAL PANLE MOUNT HMI)
HMI	HUMAN MACHINE INTERFACE
PC	PERSONAL COMPUTER
LCP	LOCAL CONTROL PANEL
CP	CONTROL PANEL
PLC	PROGRAMMABLE LOGIC CONTROLLER
FO	FIBER OPTIC MEDIA

NOTES:

1. THIS IS A GENERAL LEGEND AND NOTES SHEET AND SOME SYMBOLS OR NOTATIONS MAY NOT APPLY TO THIS PROJECT.
2. TAG ID NUMBERS AND EQUIPMENT TAG ID NUMBERS SHALL BE PROVIDED ON ACTUAL INSTRUMENTS AND EQUIPMENT. RENUMBER COMPLETE FACILITY EQUIPMENT AND INSTRUMENTATION WITH TAG IDS, ENGRAVED LAMICOID WHITE ON NAVY.
3. ANALOG SIGNALS ARE 4–20 MA DC UNLESS OTHERWISE NOTED.
4. ALL PROCESS AND PROGRAMMABLE LOGIC CONTROL FUNCTIONS ARE DETAILED IN THE SPECIFICATION SECTION 13421 AND 13450. THE FOLLOWING SHEETS SCHEMATICALLY REPRESENT INSTRUMENTATION AND CONTROL.
5. ALL PROCESS CONTROL FUNCTIONS AND DISPLAYS TO BE PROVIDED AT THE COMPUTER CONTROL SYSTEM SHALL BE PROVIDED BY THE INSTRUMENTATION AND CONTROL SYSTEM PROVIDER AS SPECIFIED.
6. SEE ELECTRICAL DRAWINGS FOR INSTRUMENTATION BLOCK DIAGRAMS FOR INTERCONNECTIONS BETWEEN CONTROL DEVICES, WIRING, AND SCADA NETWORK.
7. PROVIDE COMPLETE SYSTEM INTEGRATION FOR EXISTING INSTRUMENTATION AND NEW INSTRUMENTATION SYSTEMS.
8. DEVICES MAY BE SUFFIXED "H" OR "L" TO DESIGNATE HIGH OR LOW ACTIVATION, AND "HH" OR "LL" TO DESIGNATE HIGH–HIGH OR LOW–LOW ACTIVATION.
9. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INSTRUMENTATION EQUIPMENT IDENTIFICATION, LINE SYMBOLS, ADDITIONAL ABBREVIATIONS AND INSTRUMENT TAGGING CONVENTIONS.
10. PROVIDE ISOLATION VALVES ON ALL SAMPLE LINES, 2 VALVE MANIFOLDS FOR ALL ABSOLUTE AND PRESSURE GAUGE DEVICES, AND 5 VALVE MANIFOLDS FOR ALL DIFFERENTIAL PRESSURE DEVICES.
11. REFERENCE CONTROL PANEL DRAWINGS INSTRUMENTATION CONFIGURATIONS AND PROCESS INSTRUMENTATION DRAWINGS FOR DETAILS.
12. SEE MECHANICAL SHEETS FOR INSTRUMENT AND EQUIPMENT LOCATIONS AND ADDITIONAL INSTALLATION DETAILS.
13. NOT ALL REQUIRED CONDUITS AND WIRING ARE INDICATED ON THE DRAWINGS. THE CONTRACTOR SHALL INCLUDE A MINIMUM 10% CONTINGENCY FOR ADDITIONAL CONDUITS AND WIRING THAT ARE REQUIRED OR USED BUT MAY NOT BE SHOWN.
14. ALL REQUIRED CONDUIT, WIRING, TERMINATIONS, RECEPTACLES, CONNECTORS, PATCH PANELS, AND OTHER COMPONENTS NOT PROVIDED BY THE UTILITY OR EQUIPMENT VENDOR SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.
15. ALL LOW VOLTAGE, SIGNAL, CONTROL, DATA AND ETHERNET CABLES SHALL BE TESTED WHILE ENERGY/POWER IS APPLIED TO POWER CONDUCTORS TO TEST FOR RFI/EMI "NOISE" AND CORRECTIVE ACTIONS SHALL BE TAKEN AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.
16. ALL LOW VOLTAGE, SIGNAL, CONTROL, DATA AND ETHERNET CABLES SHALL BE SHIELDED TYPE. GALVANIZED METAL OR PVC COATED GALVANIZED METAL (DEPENDING ON AREA CLASSIFICATION) SHALL BE PROVIDED FOR ALL LOW VOLTAGE, SIGNAL, CONTROL, DATA AND ETHERNET CABLES.

INSTRUMENTATION IDENTIFICATION LETTERS

	FIRST–LETTER		SUCCEEDING–LETTERS		
SYMBOL	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS	–	ALARM	–	–
B	BURNER, COMBUSTION	–	–	–	–
C	–	–	–	CONTROL	–
D	–	DIFFERENTIAL	–	–	–
E	VOLTAGE	–	SENSOR (PRIMARY ELEMENT)	–	–
F	FLOW RATE	RATIO (FRACTION)	–	–	–
G	–	–	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	–	LOW
M	–	MOMENTARY	–	–	MIDDLE, INTERMEDIATE
N	–	–	–	–	–
O	–	–	ORIFICE, RESTRICTION	–	–
P	PRESSURE, VACUUM	–	POINT (TEST) CONNECTION	–	–
Q	QUANTITY	INTEGRATE, TOTALIZE	–	–	–
R	RADIATION	–	RECORD	–	
S	SPEED, FREQUENCY	SAFETY	–	SWITCH	–
T	TEMPERATURE	–	–	TRANSMIT	–
U	MULTIVARIABLE	–	MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS	–	–	VALVE, DAMPER, LOUVER	–
W	WEIGHT, FORCE	–	WELL	–	–
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS	–	RELAY, COMPUTE, CONVERT	–
Z	POSITION, DIMENSION	Z AXIS	–	DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	–

CONSTRUCTION DOCUMENTS
12/11/15

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No.	Date	Dr.By	Ck.By	App.By	Description
1	03/07/16	IMJ	CBW	CBW	ADDENDUM #5
				APPROVED	

03-07-16
DATE

REGISTERED PROFESSIONAL ENGINEER

TOWN OF GREENWICH – DEPARTMENT OF PUBLIC WORKS
RITCH AVENUE WEST, GREENWICH, CONNECTICUT

BYRAM PARK POOL REPLACEMENT

PUMPING STATION

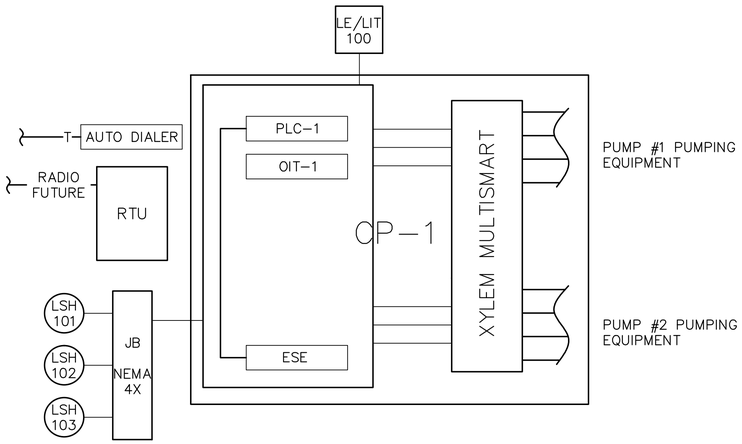
INSTRUMENTATION AND GENERAL CONTROL NOTES

CADD NO.	SCALE:	CONTRACT:	JOB NO.	DR.BY	DSN.BY	CHK.BY	APP.BY
GREENWICH	NONE	–	2130336	L.E.C.	L.E.C.	J.S.P.	C.B.W.

M10.7

FILE NO.

SHEET – OF –



CONTROL/INSTRUMENTATION PID DIAGRAM

N.T.S

NOTES

1. SEE WIRING TABLE FOR MINIMUM CONDUIT AND WIRE SIZE AND QUANTITY.
2. COORDINATE INSTRUMENTATION WIRING TO RUN WITH ELECTRICAL CONDUITS WHEREVER POSSIBLE. INSTRUMENTATION CONDUITS SHALL BE PVC COATED RIGID GALVANIZED OR PVC W/ 36" SPACING TO PREVENT INTERFERENCE.
3. INSTRUMENTATION WIRE SHALL BE AS SPECIFIED IN DIVISION 16.
4. PRIOR TO INSTALLATION, COORDINATE THE ELECTRICAL, MECHANICAL AND INSTRUMENTATION DRAWINGS. REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY.
5. PROVIDE SPARE 20 AMP SINGLE POLE BREAKER INSIDE THE CONTROL PANEL, MINIMUM OF 2.

PANEL SCHEDULE

ID	NAME	LOCATION	SPEC.	ENCLOSURE
CP-1	SCADA CONTROL PANEL (CP-1, PLC-1)	ELEC ENCL INTERIOR	13421	NEMA 12

NOTES:

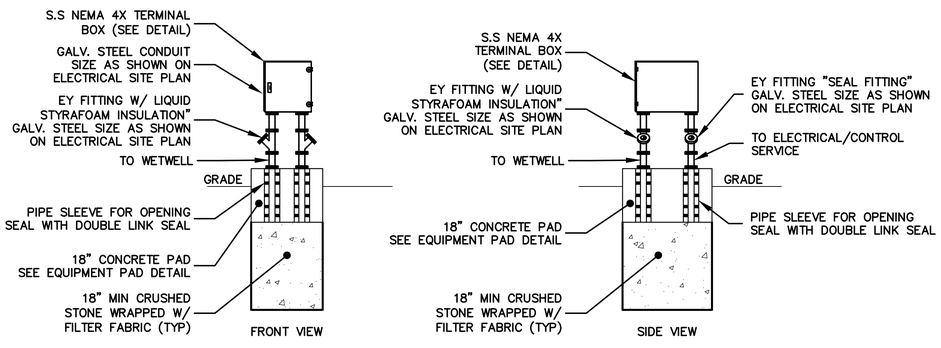
1. ALL PANELS SHALL HAVE ENGRAVED PLASTIC NAME PLATES (WHITE ON BLACK) MINIMUM 3" LETTER HEIGHT INDICATING THE PANEL NAME.
2. PROVIDE DETAILED INTERIOR AND EXTERIOR PANEL LAYOUT DRAWINGS DURING SHOP DRAWING REVIEW.
3. PROVIDE ETHERNET PORT FOR PORTABLE LAPTOP CONNECTION TO THE INTERNET AT EACH PLC PANEL (EXCLUDING EQUIPMENT PLC CONTROL PANELS).
4. ALL PANELS SHALL BE EQUIPPED WITH STAINLESS STEEL LOCKING ENCLOSURES, HANDLE LATCH, KEYED ALIKE.
5. ALL PANELS SHALL INCLUDE:
   - RELAYS
   - TERMINAL STRIP, FIELD WIRING
   - WIRE MANAGEMENT DUCTS
   - CIRCUIT BREAKERS
   - 24 VOLT POWER SUPPLY AS NEEDED WITH CBS
   - SURGE SUPPRESSOR

WIRING TABLE

INSTRUMENT TAG	TO PANEL TAG	CONDUIT SIZE	WIRE SIZE	GROUND WIRE SIZE
FIT 100	CP-1	1-1/2"	2/C #16 TSP	
LIT 100	CP-1	1-1/2"	2/C #16 TSP	
PUMP #1	CP-1	1"	10 #14	
PUMP #2	CP-1	1"	10 #14	
LSH 101-103	JB	1"	8 #14	
TELEPHONE	CP-1	2"		

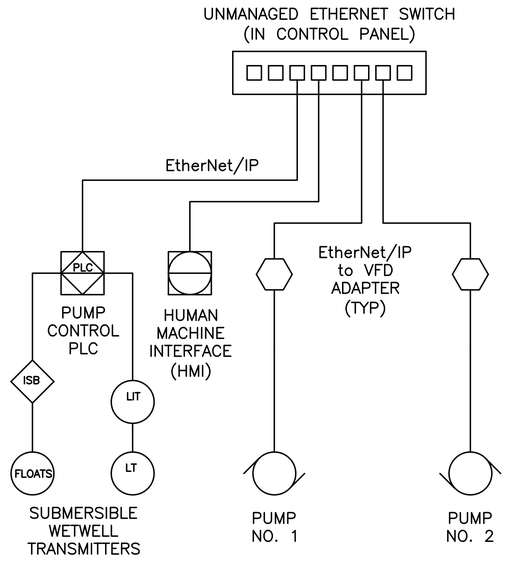
NOTES:

1. COORDINATE WITH EQUIPMENT VENDER / PACKAGED SYSTEMS PROVIDER FOR WIRING REQUIREMENTS.
2. INSTRUMENT CABLES SHALL BE PROVIDED WITH THE INSTRUMENTS BY THE INSTRUMENT MANUFACTURER. SUFFICIENT LENGTH OF CABLE SHALL BE REQUESTED DURING PURCHASE.
3. WHEREVER POSSIBLE COORDINATE THE LOCATION OF THE ELECTRICAL AND INSTRUMENTATION CONDUITS TO RUN IN THE SAME TRENCH.



TYPICAL TERMINAL BOX CONNECTION DETAIL

SCALE: NTS



WASTEWATER PUMPING STATION INSTRUMENTATION AND CONTROL NETWORK DIAGRAM

SCALE: NTS

INSTRUMENTATION SYSTEM GENERAL NOTES:

1. DETAILED I&C SYSTEM ENGINEERING AND COORDINATION SHALL BE DEVELOPED BY THE SYSTEM SUPPLIER. THE SYSTEM SUPPLIER SHALL DEVELOP PLC I/O TABULATIONS, INSTRUMENT LOOP DIAGRAMS (ILDs), ELEMENTARY WIRING DIAGRAMS (EWDs), CUSTOM INSTRUMENT MOUNTING DETAILS (IMDs), DETAILED POINT-TO-POINT INTERCONNECTION DIAGRAMS, ETC. AS PART OF THE DETAILED ENGINEERING AND COORDINATION SUBMITTAL.
2. THE SYSTEM SUPPLIER'S DETAILED ENGINEERING AND COORDINATION RESPONSIBILITIES EXTEND TO, AND INCLUDE, ALL PROCESS, ELECTRICAL, AND INSTRUMENTATION EQUIPMENT, ETC. ON THE PROJECT.
3. INSTRUMENTATION AND CONTROL CONDUIT AND CONDUCTORS SHALL BE INSTALLED BY THE ELECTRICAL TRADE. INSTALLATION SUPERVISION, INSPECTION, TESTING, AND ALL TERMINATIONS SHALL BE PERFORMED BY THE SYSTEM SUPPLIER.
4. THE SYSTEM SUPPLIER SHALL BE RESPONSIBLE FOR FURNISHING ALL EQUIPMENT AND INCIDENTALS NECESSARY FOR A COMPLETE AND FUNCTIONAL SYSTEM AS SHOWN HEREIN AND SPECIFIED.
5. ALL EQUIPMENT PROVIDED BY THE SYSTEM SUPPLIER SHALL BE INSTALLED BY THE GENERAL CONTRACTOR.

PUMPING STATION CONTROL PANEL

LOCATION: BYRAM PARK PUMPING STATION

PROVIDED BY: SYSTEM SUPPLIER

LOCATED: ON-SITE ELECTRICAL/INSTRUMENTATION ENCLOSURE

- POWER SUPPLY CONDITIONING

EQUIPMENT MONITORED/CONTROLLED:
- PUMP NUMBER 1
- PUMP NUMBER 2
- WETWELL LEVEL INDICATION

ALARMS:
- WASTEWATER PUMP ALARMS - SEE EQUIPMENT SPECIFICATION
- WASTEWATER PUMP - MANUAL MODE

CONSTRUCTION DOCUMENTS
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TOWN OF GREENWICH - DEPARTMENT OF PUBLIC WORKS
RITCH AVENUE WEST, GREENWICH, CONNECTICUT
BYRAM PARK POOL REPLACEMENT

PUMPING STATION
INSTRUMENTATION PID LAYOUT AND TABLES

CADD NO.	SCALE:	CONTRACT:	JOB NO.	DR.BY	DSN.BY	CHK.BY	APP.BY
GREENWICH	NONE	-	21303336	L.E.C.	L.E.C.	J.S.P.	C.B.W.

M10.8

FILE NO.

SHEET - OF -