THE CITY OF NAPLES WRF AERATION MONITOR & CONTROL INSTRUMENTATION IMPROVEMENTS

10600 CHEVROLET WAY, SUITE 300 ESTERO, FLORIDA 33928

Ph: 239-390-1467 Fax: 239-390-1769



www.tetratech.com

PROJECT LOCATION: 380 RIVERSIDE CIRCLE

NAPLES, FLORIDA 34102

CLIENT INFORMATION:

CITY OF NAPLES
735 EIGHT ST. S
NAPLES, FLORIDA 34102

Tt PROJECT No.: CLIENT PROJECT No.:

200-08516-12001

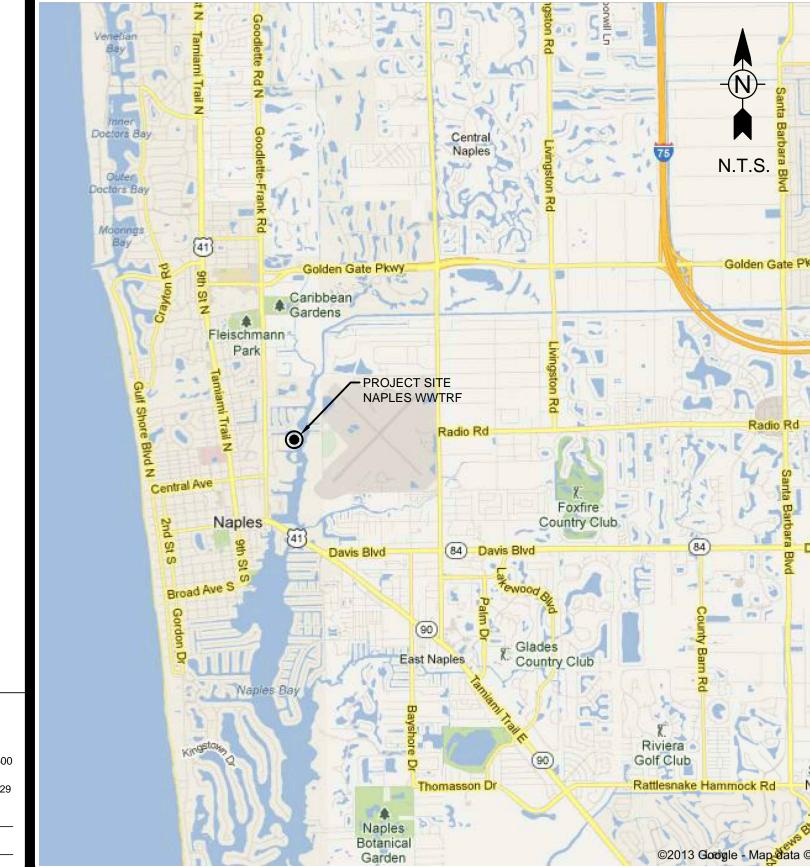
PROJECT DESCRIPTION / NOTES:

Installation of All Monitoring Devices (DO, SS, Sludge Level, & Thermal Mass Flow), PLC, power, communications, junctions, conduits, conductors, integration, and all related and required hardware, materials, and assemblies necessary for complete and operational systems that will allow real time monitoring, tracking, and control for the Blower systems of the aeration basins and improve treatment throughout various stages of the treatment plant.

ISSUED:

10/11/13 - 100% DESIGN REVISED

VICINITY MAP:



ATTACHMENT A - BID 14-016

TOON OF OBER 2013



11 October 2013



PREPARED FOR

THE CITY OF NAPLES

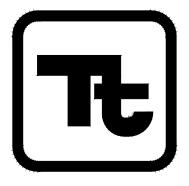
735 EIGHT ST. S NAPLES, FLORIDA 34102

JOHN SOREY III
GARY PRICE
BILL MOSS
BOB MIDDLETON

MAYOR
VICE MAYOR
CITY MANAGER
UTILITIES DIRECTOR

CITY COUNCIL

TERESA HEITMANN
MARGARET "DEE" SULIK
BILL BARNETT
DOUG FINLAY
SAM SAAD III



TETRA TECH, INC.

Infrastructure Offices Throughout Florida
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Florida Registration 56152
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 300
Estero, Florida 33928
Engineering Business No. 2429

DATE

NAPLES WWTRF PROJECT SITE

GENERAL NOTES

- 1. ALL LABOR, MATERIALS, AND METHODS OF CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH THE MINIMUM ENGINEERING AND CONSTRUCTION STANDARDS ADOPTED BY THE CITY OF NAPLES, THE PLANS, AND CONSTRUCTION SPECIFICATIONS. WHERE CONFLICTS OR OMISSIONS EXIST, THE CITY OF NAPLES STANDARDS SHALL DICTATE. SUBSTITUTIONS AND DEVIATION FROM PLANS AND SPECIFICATIONS SHALL BE PERMITTED ONLY WHEN WRITTEN APPROVAL HAS BEEN ISSUED BY THE ENGINEER.
- 2. SHOP DRAWINGS OF ALL MATERIALS BEING USED SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.
- 3. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL REQUIRED PERMITS ARE OBTAINED AND IN HAND BEFORE BEGINNING ANY CONSTRUCTION. NO CONSTRUCTION OR FABRICATION OF ANY ITEM SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED ALL PLANS AND ANY OTHER DOCUMENTATION FROM ALL OF THE PERMITTING AND ANY OTHER REGULATORY AUTHORITIES. ANY PENALTIES, STOP WORK ORDERS ON ADDITIONAL WORK RESULTING FROM THE CONTRACTOR BEING IN VIOLATION OF THE REQUIREMENTS ABOVE SHALL BE FULLY BORNE BY THE CONTRACTOR.
- 4. THE LOCATION OF ALL EXISTING UTILITIES AND STORM DRAINAGE SHOWN ON THE PLANS HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR INACCURACY. PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITIES AND TO MAKE THE NECESSARY ARRANGEMENTS FOR ANY RELOCATION OF THESE UTILITIES WITH THE OWNER OF THE UTILITY. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING UNDERGROUND UTILITY, WHETHER SHOWN ON THE PLAN OR LOCATED BY THE UTILITY COMPANY. ALL UTILITIES WHICH INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FIRST. ANY FEES ASSOCIATED WITH UTILITY RELOCATIONS SHALL BE BORNE IN ACCORDANCE WITH RESPECTIVE UTILITY COMPANY STANDARDS. IT IS REQUESTED UTILITY COMPANIES MOVE THEIR PARTICULAR UTILITIES. ANY DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE RELOCATION OF THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT AND NO EXTRA COMPENSATION WILL BE
- 5. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION AND AT LEAST 48 HOURS BEFORE REQUIRED INSPECTION ON EACH AND EVERY PHASE OF WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS NOTICE PRIOR TO ANY SCHEDULED TESTING. NO PRESSURE TESTING, OR FINAL TESTING WILL BE ACCEPTED UNLESS WITNESSED BY THE ENGINEER'S REPRESENTATIVE.
- 6. ALL CONTRACTORS, CITY REPRESENTATIVES, AND UTILITY COMPANIES ARE RESPONSIBLE FOR THEIR RESPECTIVE SURVEYING AND LAYOUT FROM BENCHMARK PROVIDED ON CONSTRUCTION PLANS. ANY SURVEY MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE REPLACED UPON COMPLETION OF THE WORK BY A REGISTERED LAND SURVEYOR.
- 7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING ANY CONSTRUCTION ACTIVITIES FROM TAKING PLACE OUTSIDE OF THE LIMITS OF CONSTRUCTION SHOWN ON THE PLANS. ANY ON-SITE OR OFFSITE AREAS DISTURBED SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER.
- 8. THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF CONSTRUCTION PLANS AND ALL PERMITS ON THE JOB SITE DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE TWO (2) SETS OF RECORD DRAWINGS TO THE ENGINEER OF RECORD WITHIN TWO (2) WEEKS AFTER CONSTRUCTION HAS BEEN COMPLETED ON EACH PHASE.
- PRIOR TO BID PREPARATION, THE CONTRACTOR MUST BECOME FAMILIAR WITH THE OVERALL SITE CONDITIONS AND PERFORM ADDITIONAL INVESTIGATIONS AS DETERMINED NECESSARY TO UNDERSTAND THE LIMIT AND DEPTH OF EXPECTED ORGANIC SILT PEAT AREAS, ADEQUACY OF EXISTING MATERIALS AS FILL, DE-WATERING REQUIREMENTS, CLEAN FILL REQUIRED FROM OFFSITE, AND MATERIALS TO BE DISPOSED OF OFFSITE, ALL OF WHICH WILL AFFECT HIS PRICING. ANY DELAY, INCONVENIENCE, OR EXPENSE CAUSED TO THE CONTRACTOR DUE TO INADEQUATE INVESTIGATION OF EXISTING CONDITIONS SHALL BE INCIDENTAL TO THE CONTRACT, AND NO EXTRA COMPENSATION WILL BE ALLOWED. THE MATERIALS ANTICIPATED TO BE ENCOUNTERED DURING CONSTRUCTION MAY REQUIRE DRYING PRIOR TO USE AS BACKFILL, AND THE CONTRACTOR MAY HAVE TO IMPORT MATERIALS, AT NO EXTRA COST, FROM OFFSITE TO MEET THE REQUIREMENTS FOR COMPACTION AND PROPER FILL.
- 10. THE CONTRACTOR SHALL SEED AND MULCH ALL AREAS DISTURBED BY CONSTRUCTION UNLESS SODDING, OR OTHER MORE READILY EFFECTIVE STABILIZATION PRACTICES ARE SPECIFIED ON THE PLANS.

| SHEET INDEX | | | | |
|-------------|--------|--|--|--|
| Sheet No. | Dwg ID | Drawing Tittle | | |
| 1 | G-000 | COVER | | |
| 2 | G-001 | LOCATION MAP, GENERAL NOTES, AND DRAWING INDEX | | |
| 3 | E-001 | ELECTRICAL LEGENDS | | |
| 4 | E-002 | PHASE 1 SECTION LEGENDS | | |
| 5 | E-003 | PHASE 2 & PHASE 3 SECTION LEGENDS | | |
| 6 | E-101 | AERATION BASINS AND CLARIFIERS | | |
| 7 | E-102 | EFFLUENT/RAS | | |
| 8 | E-103 | CLARIFIER SLUDGE | | |
| 9 | E-104 | AERATION BASIN AND THERMAL MASS FLOW | | |
| 10 | E-105 | DUCTBANK SECTIONS | | |
| 11 | E-501 | DETAILS | | |
| 12 | E-502 | DETAILS | | |
| 13 | M-001 | PHASE 1 - FLUSH WATER PIPING REQUIREMENTS | | |
| | | | | |
| | | | | |

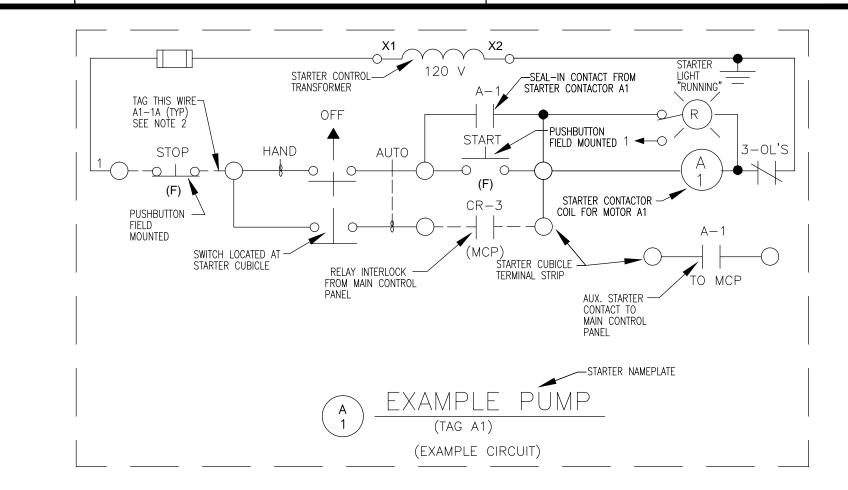
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Project No.: 200-08516-1200 Designed By Drawn By:

Checked By:

| | BACKGROUND PLAN AND (| ONE LINE | SYMBOLS |
|------------|--|----------------|--|
| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
| • | CONTROL SWITCH (SEL. OR P.B.) SEE CIRCUITS FOR SPECIFIC TYPE | 0 | LOW VOLTAGE DISCONNECT SWITCH |
| F FL | SEE CIRCUITS FOR SPECIFIC TYPE FLOAT SWITCH - FLOW SWITCH | | LOW VOLTAGE FUSE (BELOW 600V) |
| T M | TEMPERATURE - HUMIDISTAT SWITCH (SUBSCRIPT = NO. OF STAGES) | 1 | ALL STARTERS SHALL BE FULL |
| L P V | LIMIT - PRESSURE - VACUUM SWITCH | RV 2 FVR | VOLTAGE NON-REVERSING UNLESS OTHERWISE INDICATED (FVR) FULL VOLTAGE REVERSING |
| ALT | ELECTRICAL OR MECHANICAL ALTERNATOR (SEE WIRING) | 2S,2W | (RV) REDUCED VOLTAGE (2S,2W) TWO SPEED, TWO WINDING |
| OS | OVERLOAD SWITCH OR DEVICE | 0 0 | 600V, 3 POLE MOLDED CASE CIRCUIT BREAKER, FRAME & RATING AS SHOWN |
| TB | TERMINAL BOX | 1/2 A-3 | SINGLE PHASE, FRACTIONAL HP MOTOR TO LOCATION INDICATED (SEE GEN. NOTE 4) |
| \otimes | SOLENOID VALVE | A 1 | THREE PHASE LOAD WITH IDENTIFICATION |
| PC | PHOTOCELL LINE VOLTAGE | | HIGH VOLTAGE FUSE (ABOVE 600 V) |
| 304 | ITEM NO. INTERCOM EQUIPMENT | | TAG NO. (BALLOON) FOR DEVICE INDICATED |
| A WS LB | INTERCOMMUNICATION SYSTEM AMPLIFIER - WALL STATION - LINE BALANCE | A-3 | FOR POWER (SEE GEN. NOTE 4) 3/4"C(2/C#18 SHLD.)CONDUIT AND WIRE RUN FROM DEVICE INDICATED TO |
| DS | INTERCOMMUNICATION DESK SET | FT MCP OR CP-1 | RUN FROM DEVICE INDICATED TO LOCATION INDICATED |
| | FLOAT SWITCH | 床 | CAPACITOR, 3 PHASE, SIZE AS INDICATED |
| \bigcirc | INTERCOM. SPEAKER (CEILING LAY-IN) | f f c | DISCONNECT SWITCH (F) = FUSED (C) = CIRCUIT BREAKER |
| ▼ | TELEPHONE OUTLET OR JUNCTION BOX | \boxtimes | MAGNETIC STARTER (BACKGROUND DRAWINGS ONLY) |
| | WELDING RECEPTACLE - NEMA L9-50R 600V, 2P, 3W, SIMPLEX | SIZE 2 | COMBINATION MAGNETIC STARTER FUSED UNLESS NOTED (CIRCUIT BREAKER) |
| HS | INTERCOM HANDSET - SURFACE MOUNTED WITH REMOTE SPEAKER AMPLIFIER | LC | COMBINATION LIGHTING CONTACTOR WITH HAND-OFF-AUTO SWITCH |
| VC | INTERCOM VOLUME CONTROL | | MANUAL STARTER (R) = REVERSING |
| \square | INTERCOM SPEAKER - SURFACE MOUNTED | СР | CONTROL PANEL |
| HS | INTERCOM HANDSET - FLUSH MOUNTED WITH REMOTE SPEAKER AMPLIFIER | TCP | TEMPERATURE CONTROL PANEL |
| | AS NOTED (LIGHTING PANEL, CONTROL PANEL, DISTRIBUTION PANEL ETC.) WALL MOUNTED | 1/8 UH-19 | UNIT HEATER, 1/8 HORSEPOWER |
| JB | JUNCTION BOX | BUS DUCT (| 600 VOLT FEEDER BUS DUCT (AMPERAGE AS INDICATED) |
| r | HEATER | <u></u> | LIGHTNING ARRESTOR |
| 38 | TRANSFORMER | A-3 | LOW VOLTAGE HOME RUNS 120/208 V 120/240 V (SEE GEN. NOTE 4) |
| | CONDUIT WITH CONDUIT SEAL FITTING | NEMA 4 | WATERTIGHT |
| | CONDUIT EXPOSED | NEMA 4X | WATERTIGHT AND CORROSION PROOF |
| | CONDUIT CONCEALED | NEMA 7 | EXPLOSION PROOF - CLASS I, DIVISION I, GROUP D |
| E | DIRECT BURIED CONDUIT | NEMA 9 | EXPLOSION PROOF - CLASS II, DIVISION 1 |
| UG | DIRECT BURIED CABLE | (K) | KEYLOCK |
| —— ОН —— | OVERHEAD LINE | SD | SMOKE DETECTOR |
| —— DB —— | UNDERGROUND DUCT BANK | E | EXIT LIGHT |
| 023 | CONCRETE ENCASED DUCT BANK, WITH CABLE LOCATIONS AND SPARE DUCTS AS | | FLUORESCENT LUMINAIRE |
| 456 | INDICATED ON DRAWINGS | | INCANDESCENT LUMINAIRE |
| | CABLE REEL | | HIGH INTENSITY DISCHARGE LIGHT |
| FOPP | 16-PORT FIBER OPTIC PATCH PANEL (ST CONNECTORS) | EM | EMERGENCY BATTERY PACK |

| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION | |
|------------|--|------------------|--|--|
| 0 | PRESS. ACTUATED SWITCH | H | SELECTOR SWITCH OPERATO | |
| 70 | FLOAT ACTUATED SWITCH | <u> </u> | WITH SHOTION SHOWIN | |
| | FLOW ACTUATED SWITCH | 0 0 | MOMENTARY PUSHBUTTON OPERATOR-NORMALLY OPEN | |
| | TEMP. ACTUATED SWITCH | 0 1 0 | MOMENTARY PUSHBUTTON OPERATOR-NORMALLY CLOS | |
| √ ° | LIMIT SWITCH- NORMALLY OPEN | οΤο | PUSHBUTTON OPERATOR WITH MUSHROOM HEAD | |
| 0~70 | LIMIT SWITCH- NORMALLY CLOSED | <u>O O</u> (F) | FIELD LOCATED STOP BUTTO | |
| 00 | LIMIT SWITCH-NORMALLY CLOSED-HELD OPEN | -0 0 | MAINTAINED PUSH-PULL OPERATOR | |
| 070 | LIMIT SWITCH-NORMALLY OPEN-HELD CLOSED | 0 0 | MAINTAINED STOP-START PUSHBUTTON OPERATOR | |
| 9 | LATCHING CABLE SWITCH | 7/ | | |
| | TIME-DELAY FUSE | -0-1/-0- | SOLENOID OR CLUTCH | |
| _CR_ | CONTROL RELAY COIL | 1 4 0 | PUSH-TO-TEST INDICATING LIGHT | |
| | CONTROL RELAY CONTACT-NORMALLY OPEN | | MAINTAINED STOP- MOMENTARY START | |
| N | CONTROL RELAY CONTACT-NORMALLY CLOSED | 0 1 0 | PUSHBUTTON (JOG) | |
| -CR L | TWO COIL LATCHING RELAY | | ZERO SPEED OR ANTI- PLUGGING SWITCH | |
| -CR | TWO GOIL LATOLING RELAT | | LOCAL TERMINALS WITH EXTERNAL WIRING | |
| | TIMING RELAY COIL | —(ETI)— | ELAPSED TIME INDICATOR | |
| | TIMED CLOSED CONTACT ON ENERGIZATION | INST. | TIMING RELAY | |
| 70 | TIMED OPEN CONTACT ON ENERGIZATION | INST. | INSTANTANEOUS CONTACT | |
| 0 | TIMED OPEN CONTACT ON DE-ENERGIZATION | | | |
| | TIMED CLOSED CONTACT ON DE-ENERGIZATION | | | |
| ×1 ×2 | 120 VAC TRANSFORMER | | | |



GENERAL NOTES:

- 1. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN LIGHT LINE WEIGHTS ON THE DRAWINGS ARE EXISTING ITEMS TO REMAIN. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN HEAVY LINE WEIGHTS ARE NEW THIS CONTRACT.
- 2. ITEMS SHOWN CROSSHATCHED ON THE DRAWINGS ARE EXISTING ITEMS TO BE
- 3. FOR ITEMS INDICATED AS "FIELD LOCATE" CHECK DRAWINGS OF OTHER TRADES (IN PARTICULAR PIPING AND STRUCTURAL) FOR INTERFERENCE AND FOR LOCATIONS OF MOUNTING FLANGES, CONNECTION POINTS, ETC.
- 4. INSTALL A SINGLE CONDUCTOR INSULATED (RHW, THHN, OR XHHW) COPPER GROUND WIRE IN EACH CONDUIT, SIZE AS SHOWN ON DRAWINGS OR AS A MINIMUM PER THE NATIONAL ELECTRICAL CODE. THIS GROUND WIRE SHALL BE CONNECTED AT EACH END TO THE EQUIPMENT GROUND. CONDUIT SHALL BE 3/4" MIN.
- 5. ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. INSTALLATION SHALL BE PLUMB AND LEVEL.
- 6. ELECTRICAL EQUIPMENT REMOVED FROM SITE SHALL BE RETURNED TO OWNER INCLUDING, BUT NOT LIMITED TO, MCC, MCC BUCKETS AND COMPONENTS, AND
- 7. ELECTRICAL WIRES SHOWN SHALL BE RATED FOR 90-DEGREES CELSIUS, MINIMUM.

NOTES:

- 1. THE FOLLOWING COMPONENT IDENTIFICATION SHALL BE USED AS APPROPRIATE:
 - (F) FIELD MOUNTED NOT AT STARTER OR OTHER CONTROL PANELS.
 (S) STARTER PANEL MOUNTED.
 (TCP) AT TEMPERATURE CONTROL PANEL.
 (MCP) AT MAIN CONTROL PANEL.
 (1) AT CONTROL PANEL NO. 1.

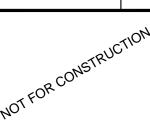
(2) AT CONTROL PANEL NO. 2.

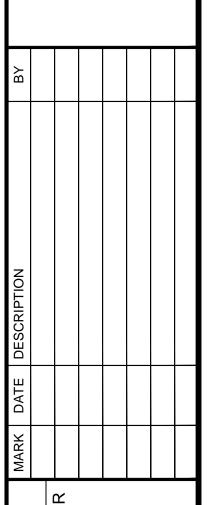
- 2. WIRE NUMBERS (1,3 & 5) ETC. SHALL BE PREFIXED WITH STARTER TAG NUMBERS. THE WIRE NUMBER AFTER THE PREFIX, MAY BE THE MANUFACTURERS WIRE NUMBERING SYSTEM. WIRE MARKERS MAY BE USED AT EACH WIRE TERMINATION POINT.
- 3. CONTRACTOR SHALL PROVIDE A LIST OF EQUIPMENT AND MATERIALS NECESSARY FOR CONSTRUCTION, PER COUNTY STANDARDS, TO COUNTY PRIOR TO BID. CONTRACTOR'S LIST SHALL BE APPROVED BY COUNTY PRIOR TO SUBMITTING BID, ANY ADDITIONAL COST ASSOCIATED WITH ADHERING TO COUNTY STANDARDS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

| | FLO | DW DIAGRAM SYMBOL LEGEND | | | | I.S.A. STANDARD LE | ETTER FUNCTIONS |
|--|---|--|-----------|---------------------------------------|--------|----------------------------|-------------------------|
| SYMBOL DESCRIPTION | SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION | SYMBOL | | SUCEEDING LETTERS |
| FIFT D OD LOCALLY MOUNTED DEVICE | | CHECK VALVE | % | GAIN OR PROPORTIONAL CONTROL | A | ANALYSIS , ANALOG | ALARM |
| field or locally mounted device | S S _D | SOLENOID VALVE OPERATOR, SOLENOID VALVE OPERATOR-DETENTED | | INTEGRAL OR RESET CONTROL | В | BURNER , FLAME | BATCH |
| | | BUTTERFLY VALVE, DAMPER OR LOUVER | D | DERIVATIVE OR RATE CONTROL | С | CONDUCTIVITY, COMMAND | CONTROL (FEEDBACK TYPE) |
| BOARD OR PANEL MOUNTED DEVICE -(DASHED LINR THRU | | GATE VALVE OR KNIFE GATE | V | VELOCITY ALGORITHM | D | DENSITY, SPECIFIC GRAVITY | |
| CIRCLE INDICATES DEVICE MOUNTED INSIDE OF PANEL) | | PLUG VALVE | 1-0 | ON-OFF CONTROL | E | VOLTAGE | PRIMARY ELEMENT |
| ——— ELECTRICAL SIGNAL | | GLOBE VALVE | √ | SQUARE ROOT EXTRACTOR | F | FLOW RATE | RATIO |
| AIR LINE | | FLOW ORIFICE | € | ADD OR TOTALIZE | G | GAGING | GLASS |
| — ⊢ HYDRAULIC SIGNAL | | VENTURI OR INSERT FLOW TUBE | Δ | SUBTRACT OR DIFFERENCE | Н | HAND , MANUAL | HIGH |
| ELECTROMAGNETIC OR SONIC SIGNAL | | IN-LINE FLOW ELEMENT (MAGNETIC TYPE) | <u> </u> | HIGHEST MEASURED VARIABLE | | CURRENT | INDICATE |
| CONNECTION TO PROCESS, OR MECHANIICAL LINK | 8 | IN-LINE FLOW ELEMENT (PROPELLER TYPE) | | LOWEST MEASURED VARIABLE | J | POWER | SCAN |
| PROGRAMMED FUNCTION NOT NORMALLY | | IN-LINE FLOW ELEMENT (ULTRA SONIC) | E/I , I/P | CONVERT ONE TO ANOTHER | K | TIME , TIME SCHEDULE | CONTROL (NO FEEDBACK) |
| ACCESSIBLE TO OPERATOR | 7^ A | PNEUMATIC DIAPHRAGM OR POSITIONER (OPEN-SHUT & THROTTLING) | X , ÷ | MULTIPLY, DIVIDE | L | LEVEL , LIGHT | LOW |
| | | STROKE OR POSITION ACTUATOR CYLINDER (OPEN-SHUT & THROTTLING) | € | BIAS OR REVERSING | M | MOISTURE , HUMIDITY | MIDDLE , MODULATE |
| PROGRAMMED FUNCTION ACCESSIBLE THROUGH | M M | MOTOR OPERATED (OPEN-SHUT & THROTTLING) | f(x) | CHARACTERIZE - (EQUATION / /D/%/ETC.) | N | | |
| OPERATOR'S INTERFACE DEVICE | | ROTAMETER | | | 0 | OVERLOAD | ORIFICE |
| PROGRAMMABLE CONTROLLER | Image: control of the | TURBIDIMETER | | | P | PRESSURE , VACUUM | POINT |
| INPUT/OUTPUT POINT | | BALL VALVE | | | Q | QUANTITY | TOTALIZE , INTEGRATE |
| | | SLUICE GATE | | | R | RADIOACTIVITY | RECORD, PRINT, RECEIVE |
| R RESET F.O. FAIL OPEN | | SLIDE-STOP GATE | | | S | SPEED, FREQUENCY, SOLENOID | SWITCH |
| T TRIP F.C. FAIL CLOSE | | | | | T | TEMPERATURE , TURBIDITY | TRANSMIT , TRANSFORM |
| AS AIR SUPPLY | | | | | U | MULTIVARIABLE | MULTIFUNCTION |
| DO DISSOLVED OXYGEN | | | | | V | VIBRATION , VISCOSITY | VALVE , DAMPER , LOUVER |
| GS GAS SUPPLY | | | | | W | WEIGHT, FORCE | |
| HS HYDRAULIC SUPPLY | | INTERLOCKING AND S MOTOR STARTER P PURGE A ALTERNATOR OR EXCLUSIVE OR | | | X | | |
| NS NITROGEN SUPPLY | | , v | | | Y | | RELAY, COMPUTE |
| ORP OXYGEN REDUCTION POTENTIAL | | PARSHALL FLUME | | | Z | POSITION | DRIVE , ACTUATE |
| SS STEAM SUPPLY | A | COMPUTOR LOGIC SYSTEM, INPUT OR OUTPUT | | | | | |
| SP SET POINT | | | | | | | |
| WS WATER SUPPLY | <u>~~₹~</u> | AIR SET ASSEMBLY | | | | | |
| PV PROCESS VARIABLE | | TERMINAL OR TRANSITION POINT | | | | | |
| | | MOTOR | | | | | |

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CITY OF NAPLES WRF AERATION MOI
& CONTROL INSTRUMENTATION
IMPROVEMENTS

ELECTRICAL LEGEN

Project No.: 200-08516-12001

Designed By: JAS

Drawn By: JAS

Checked By: FWY

E-00

JBOX#22A->PWR

4B-SSP/4C-DOP

NO SCALE

NO SCALE

CABLES[DO&SS])

CONTRACT)

CONTRACT)

ANALOG INPUTS INTO THE PLC.

NOTES:

2"C(2-5/16" FLUSH TUBING[DO&SS] & 2 - PROBE

1. THIS PHASE OF THE PROJECT (DO & SS MONITORING) SHALL REQUIRE 26

ANALOG INPUTS INTO THE PLC. (TO BE PERFORMED UNDER SEPARATE

3. PHASE 3 OPTION (THERMAL MASS FLOW MONITORING) SHALL REQUIRE 20 ANALOG INPUTS INTO THE PLC. (TO BE PERFORMED UNDER SEPARATE

2. PHASE 2 OPTION (SLUDGE BLANKET MONITORING) SHALL REQUIRE 6

1"C(3#12BLK, 2#12WT, 1#12G)

1. JBOX#10 BELOW 2B-BB2 CONTROLLER TO JBOX#9 @

2B-SSP/2C-DOP

2"C(2EA-4/C#18SH) + (3EA-4/C#18SH FROM G) 2. JBOX#22B->CTP (HOME RUNS) NO SCALE 1"C(3#12BLK, 2#12WT, 1#12G) JB0X#19A->22A 2. JBOX#19B->22B->CTP (HOME RUNS) $2^{\circ}C(2EA-4/C\#18SH) + (3EA-4/C\#18SH FROM G)$ NO SCALE 2"C(2-5/16" FLUSH TUBING[DO&SS] & 2 - PROBE JBOX#20 BELOW 3A-BB2 CONTROLLER TO JBOX#21 @ 3A-SSP/3B-DOP CABLES[DO&SS]) NO SCALE 1"C(3#12BLK, 2#12WT, 1#12G) JB0X#11A->18A 2. JBOX#18B->19B->22B->CTP (CONTINUOUS RUNS) 1.25"C(3EA-4/C#18SH) NO SCALE 1. JBOX#16 BELOW 3B-BB2 CONTROLLER TO JBOX#17 @ 2"C(2-5/16" FLUSH TUBING[DO&SS] & 2 - PROBE CABLES[DO&SS]) 3B-SSP/3C-DOP NO SCALE 1"C(3#12BLK, 2#12WT, 1#12G) JBOX#29A->PWR $2^{\circ}C(2EA-4/C\#18SH) + (3EA-4/C\#18SH FROM E)$ 2. JBOX#29B->CTP (HOME RUNS) NO SCALE 1"C(3#12BLK, 2#12WT, 1#12G) JB0X#26A->29A 2. JBOX#26B->29B->CTP (HOME RUNS) $2^{\circ}C(2EA-4/C\#18SH) + (3EA-4/C\#18SH FROM E)$ NO SCALE 2"C(2-5/16" FLUSH TUBING[DO&SS] & 2 - PROBE JBOX#27 BELOW 4A-BB2 CONTROLLER TO JBOX#28 @ CABLES[DO&SS]) 4A-SSP/4B-DOP SECTION \E-101/ NO SCALE JB0X#25A->26A 1"C(3#12BLK, 2#12WT, 1#12G) 2. JBOX#25B->26B->29B->CTP (CONTINUOUS RUNS) 2. 1.25"C(3EA-4/C#18SH)

1. JBOX#24 BELOW 4B-BB2 CONTROLLER TO JBOX#23 @

NO SCALE

NO SCALE

NO SCALE

CABLES[DO])

CABLES[DO])

NO SCALE

2. 1¼"C(3#4,1#8G)

14"C(4-STRAND FIBER)

1"C(2#12BLK, 1#12WT, 1#12G)

2"C(1-5/16" FLUSH TUBING[DO&SS] & 1 - PROBE

2"C(1-5/16" FLUSH TUBING[DO&SS] & 1 - PROBE

1.25"C(2EA-4/C#18SH)

THE NEW PLC SHALL BE INSTALLED IN AN ALUMINUM PANEL (HINGED DOOR, NEMA 3R, STAINLESS STEEL SNAP LATCHES, DRIP EDGE, AND BACK PLATE) OF SUFFICIENT SIZE TO MOUNT A RACK SYSTEM FOR THE CPU AND OF THE ANALOG MODULES FOR THE DEVICES SHOWN IN THE PROJECT WITH PROPER SPACING FOR REQUIRED WIRING DUCTS. PROVIDE ENCLOSURE SIZED TO ACCOMMODATE THE FULL BUILD OUT OF THREE PHASES. THE PROGRAMMABLE LOGIC CONTROLLER SHALL BE ALLEN BRADLEY CONTROLLOGIX SERIES, WITH A L6 PROCESSOR. PROVIDE PLC RACK SIZED TO ACCOMMODATE THE I/O SHOWN FOR THREE PHASES PLUS 10% SPARE PER I/O TYPE. PROVIDE I/O MODULES AS REQUIRED FOR PHASE I I/O ONLY. PROVIDE UPS SIZED TO MAINTAIN POWER TO PLC AND NETWORK EQUIPMENT ONLY FOR 45 MINUTES MINIMUM. PANEL SHALL NOT REQUIRE A LOCAL INTERFACE. PROVIDE ROOM IN ENCLOSURE TO INSTALL THE REQUIRED FIBER CONVERTERS.

JBOX#30A->PWR

JBOX#30B->CTP (HOME RUNS)

JBOX#33 BELOW 5-BB2 CONTROLLER TO JBOX#32 @ 5A-DOP

JBOX#33 BELOW 5-BB2 CONTROLLER TO JBOX#31 @

FIBER CONVERTER AT NEW PLC TO FIBER CONVERTER

AT EXISTING PLC IN GNERATOR BUILDING GENERATOR BUILDING FROM MCC #8 TO NEW 40

CIRCUIT PANEL.

5A-DOP (USE LB'S TO TRANSITION WALL)

THE NEW COMM TERMINAL PANEL WILL BE INSTALLED IN AN ALUMINUM PANEL (HINGED DOOR, 3R OR 12, SS SNAP LATCHES, DRIP EDGE, AND BACK PLATE) OF SUFFICIENT SIZE TO MOUNT THE PROTECTIVE TERMINAL STRIPS THAT YOU NORMAL SPECIFY FOR THESE PROJECTS. THE FOLLOWING DIN RAIL MOUNTED DEVICES SHALL BE INSTALLED IN LINE FOR EACH LOOP: INVENSYS EUROTHERM ULTRA SLIMPAKII #WV408 DC VOLTAGE CURRENT INPUT SIGNAL CONDITIONER.

THE NEW 40 CIRCUIT POWER PANEL SHALL BE A STANDARD, SURFACE MOUNT, WITH MAIN AND COVER AND SHALL BE INSTALLED IN AN ALUMINUM PANEL (HINGED DOOR, 3R OR 12, SS SNAP LATCHES, DRIP EDGE, AND BACK PLATE) OF SUFFICIENT SIZE TO MOUNT THE CIRCUIT BREAKER PANEL AND HAVE SUFFICIENT SPACE FOR REQUIRED WIRING.

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 \overline{S} PHA

Project No.: 200-08516-1200° Designed By Drawn By:

Checked By:

E-002

NO SCALE

CABLES[DO&SS])

2"C(2-5/16" FLUSH TUBING[DO&SS] & 2 - PROBE

| T SECTION E-103 NO SCALE 1. 1"C(2#12BLK, 1#12WT, 1: 2. 1.25"C(2EA-4/C#18SH) | | JBOX#37A->PWR JBOX#37B->CTP (HOME RUNS) |
|--|------------------------|---|
| SECTION NO SCALE 1. 1"C(2#12BLK, 1#12WT, 1 2. 1.25"C(2EA-4/C#18SH) | # 12G) 1. 2. | JBOX#36A UNDER #6 BB1 ->37A JBOX#36B UNDER #6 BB1 ->37B->CTP (HOME RUNS) |
| R SECTION NO SCALE 1. 1"C(2#12BLK, 1#12WT, 1 2. 1"C(1EA-4/C#18SH) | #12G) 1. 2. | JBOX#35A UNDER #5 BB1 ->36A JBOX#35B UNDER #5 BB1 ->36B->CTP (HOME RUN) |
| W SECTION E-103 NO SCALE 1. 1"C(2#12BLK, 1#12WT, 1; 2. 1.25"C(2EA-4/C#18SH) SECTION | #12G) 1. 2. | " |
| NO SCALE 1. 1"C(2#12BLK, 1#12WT, 1 2. 1.25"C(2EA-4/C#18SH) SECTION | #12G) 1. 2. | JBOX#39A UNDER #4 BB1 ->40A JBOX#39B UNDER #4 BB1 ->40B->CTP (HOME RUNS) |
| E-103 NO SCALE 1. 1"C(2#12BLK, 1#12WT, 1 2. 1"C(1EA-4/C#18SH) AA SECTION | #12G) 1. 2. | JBOX#38A UNDER #3 BB1 ->39A JBOX#38B UNDER #3 BB1 ->39B->CTP (HOME RUN) |
| E-103 NO SCALE 1. 1"C(2#12BLK, 1#12WT, 1; 2. 1.25"C(2EA-4/C#18SH) | # 12G) 1. 2. | " |
| E-103 NO SCALE 1. 1"C(2#12BLK, 1#12WT, 1 2. 1.25"C(2EA-4/C#18SH) | # 12G) 1. | " |

1. JBOX#42A UNDER #2 BB1->43A 2. JBOX#42B UNDER #2 BB1->43B->44B->CTP(HOME RUN)

1. JBOX#41A UNDER #1 BB1->43A 2. JBOX#41B UNDER #1 BB1->43B->44B->CTP(HOME RUN)

<u>Y</u> E-103

1"C(2#12BLK, 1#12WT, 1#12G) 1"C(1EA-4/C#18SH)

1"C(2#12BLK, 1#12WT, 1#12G)

NO SCALE

1"C(1ËA-4/C#18SH)

| (A1) SECTION NO SCALE | | |
|--|-------------|---|
| 1. 3/4"C(2#12BLK, 1#12WT, 1#12G 2. 3/4"C(1EA-4/C#18SH) | 1. 2. | FROM SSLAC JBOX#50@ 1E TMFT ->JBOX#51A FROM SSLAC JBOX#50@ 1E TMFT->JBOX#51B->HOME |
| (A2) SECTION | | RUN THRU->53B->CTP |
| SECTION E-104 NO SCALE | | |
| 1. 3/4"C(2#12BLK, 1#12WT, 1#12G 2. 1"C(2EA-4/C#18SH) | 5) 1. 2. | |
| (A3) SECTION | | |
| E-104 NO SCALE | 4 | IDOVIETA/@ADOA A THETY > OTD |
| 1. 1"C(3#12BLK, 2#12WT, 1#12G) 2. 1\frac{1}{4}"C(3EA-4/C#18SH) | 1. 2. | " \ |
| SECTION SECTION | | |
| E-104/ NO SCALE 1. 3/4"C(2#12BLK, 1#12WT, 1#12G 2. 3/4"C(1EA-4/C#18SH) | 5) 1. 2. | |
| 2. 3/4 C(1EA-4/C#163H) | 2. | RUN THRU->58B->CTP |
| (B2) SECTION E-104) NO SCALE | | |
| 1. 3/4"C(2#12BLK, 1#12WT, 1#12G 2. 1"C(2EA-4/C#18SH) | 5) 1. 2. | JBOX#57B (@2D&2C TMFT) ->JBOX#58B(@2B&2A TMFT) |
| B3 SECTION | | HOME RUNS TO CTP |
| E-104 NO SCALE | | |
| 1. 1"C(3#12BLK, 2#12WT, 1#12G) 2. 1‡"C(3EA-4/C#18SH) | 1. 2. | JBOX#58A(@2B&2A TMFT) -> CTP JBOX#58B(@2B&2A TMFT) -> CTP |
| C1 SECTION | | |
| E-104 NO SCALE 1. 3/4"C(2#12BLK, 1#12WT, 1#12G | | FROM SSLAC JBOX#60@ 3E TMFT ->JBOX#61A |
| 2. 3/4"C(1EA-4/C#18SH) | ۷. | FROM SSLAC JBOX#60@ 3E TMFT->JBOX#61B->HOME RUN THRU->63B->CTP |
| (C2) SECTION E-104) NO SCALE | | |
| 1. 3/4"C(2#12BLK, 1#12WT, 1#12G 2. 1"C(2EA-4/C#18SH) | 1. 2. | JBOX#61B (@3D&3C TMFT) ->JBOX#63B(@3B&3A TMFT) |
| C3 SECTION | | HOME RUNS TO CTP |
| E-104 NO SCALE | | |
| 1. 1"C(3#12BLK, 2#12WT, 1#12G) 2. 1¼"C(3EA−4/C#18SH) | 1. 2. | JBOX#63A(@3B&3A TMFT) -> CTP JBOX#63B(@3B&3A TMFT) -> CTP |
| D1 SECTION | | |
| E-104 NO SCALE 1. 3/4"C(2#12BLK, 1#12WT, 1#12G | | |
| 2. 3/4"C(1EA-4/C#18SH) | 2. | FROM SSLAC JBOX#65@ 4E TMFT->JBOX#66B->HOME RUN THRU->JBOX#68B->CTP |
| SECTION E-104) NO SCALE | | |
| 1. 3/4"C(2#12BLK, 1#12WT, 1#12G 2. 1"C(2EA-4/C#18SH) | 1. 2. | JBOX#66B (@4D&4C TMFT) ->JBOX#68B(@4B&4A TMFT) |
| (D2) SECTION | | HOME RUNS TO CTP |
| E-104 SECTION NO SCALE | | |
| · · · · · · · · · · · · · · · · · · · | | |

1"C(3#12BLK, 2#12WT, 1#12G)

REQUIRED 6" THERMAL MASS FLOW TRANSMITTERS 1A, 1D, 2A, 2D, 3A, 3D, 4A, & 4D = 8 TOTAL

REQUIRED 8" THERMAL MASS FLOW TRANSMITTERS

REQUIRED 10" THERMAL MASS FLOW TRANSMITTERS

REQUIRED 16" THERMAL MASS FLOW TRANSMITTERS

MAGNETROL TA2 THERMAL MASS FLOW TRANSMITTERS (ONLY)

2. 1¼"C(3EA-4/C#18SH)

 $\frac{1}{1}$ B, 2B, 3B, & 4B = 4 TOTAL

1C, 2C, 3C, & 4C = 4 TOTAL

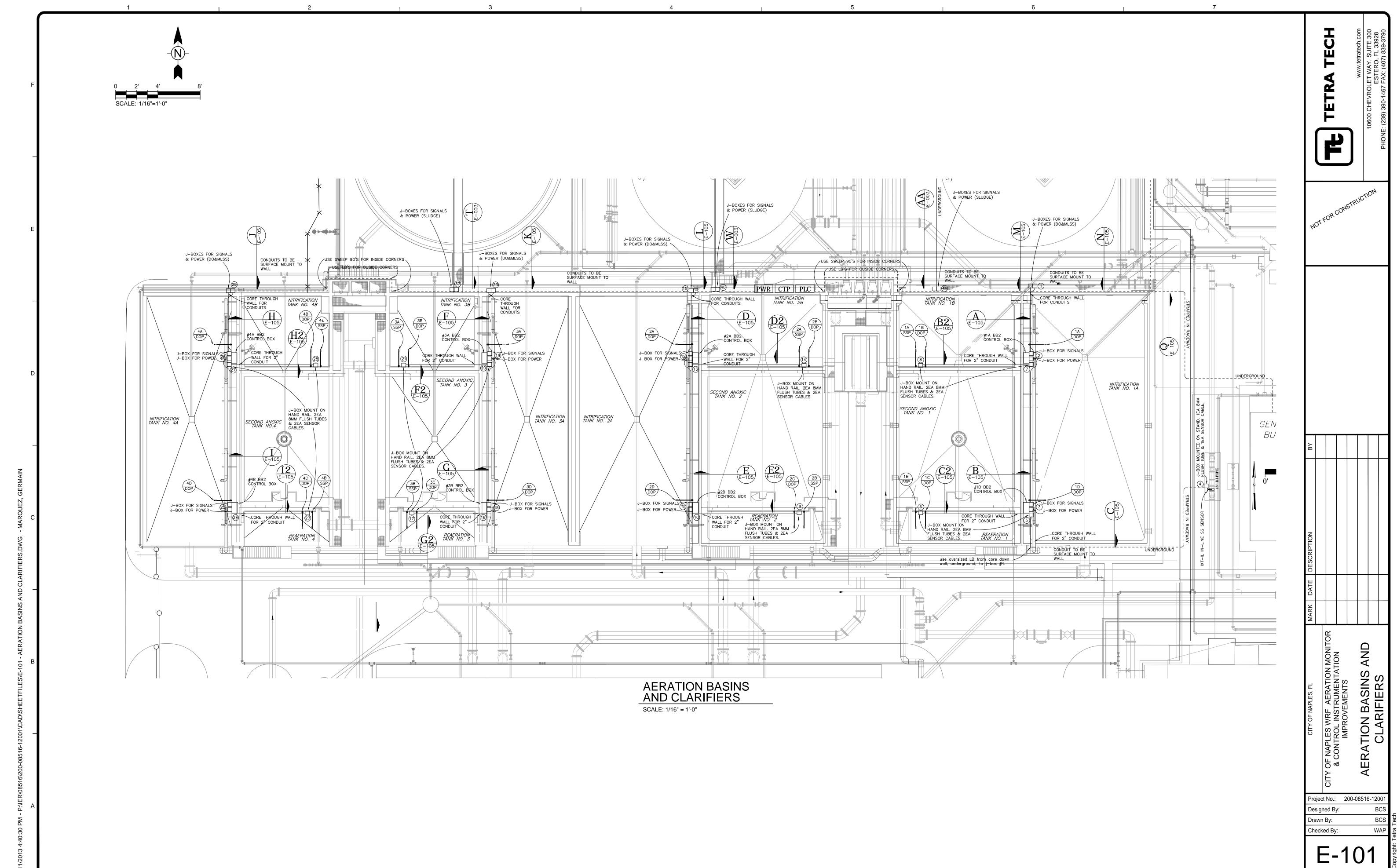
1E, 2E, 3E, & 4E = 4 TOTAL

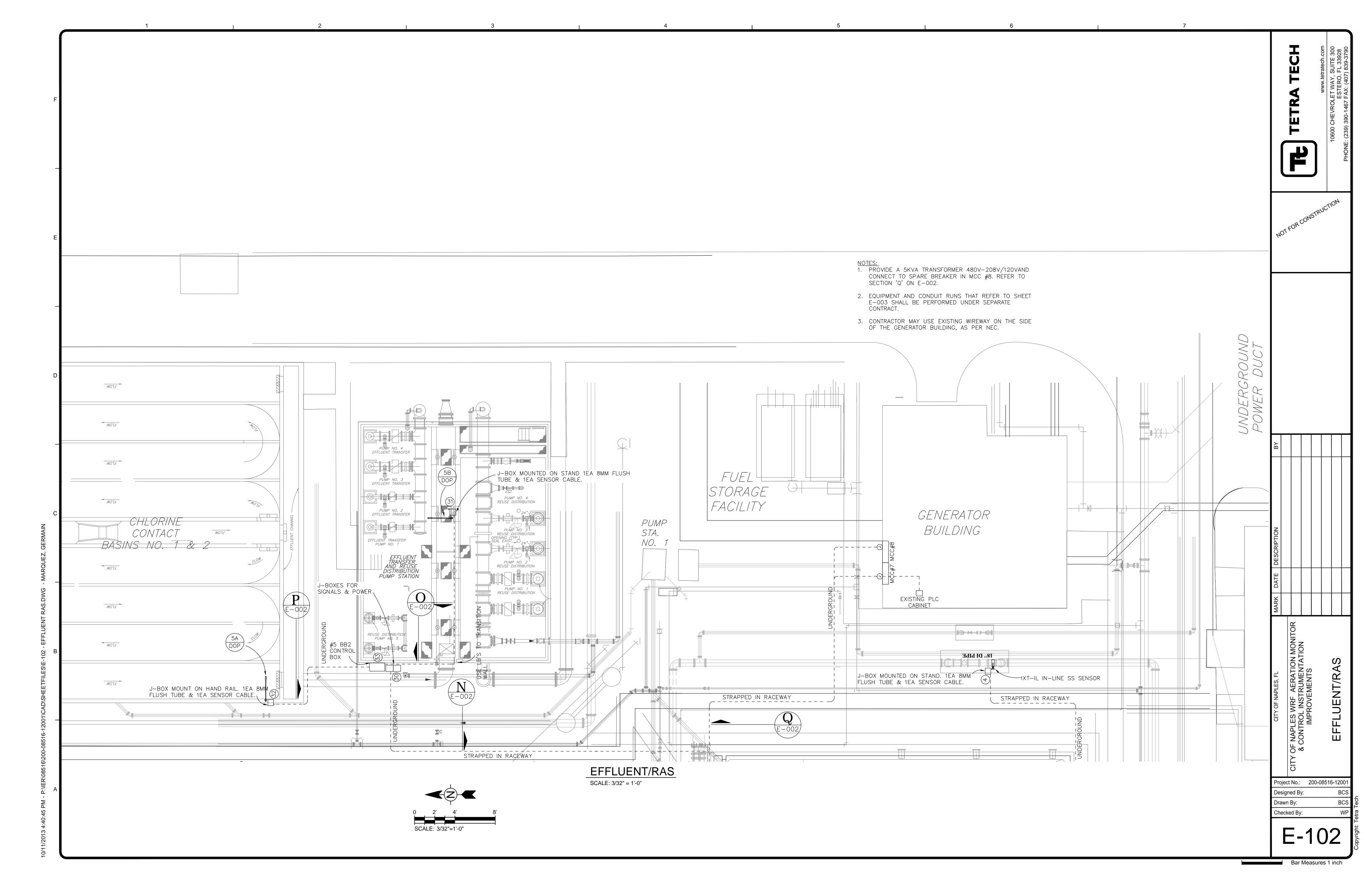
1. JBOX#68A(@4B&4A TMFT) -> CTP 2. JBOX#68B(@4B&4A TMFT) -> CTP

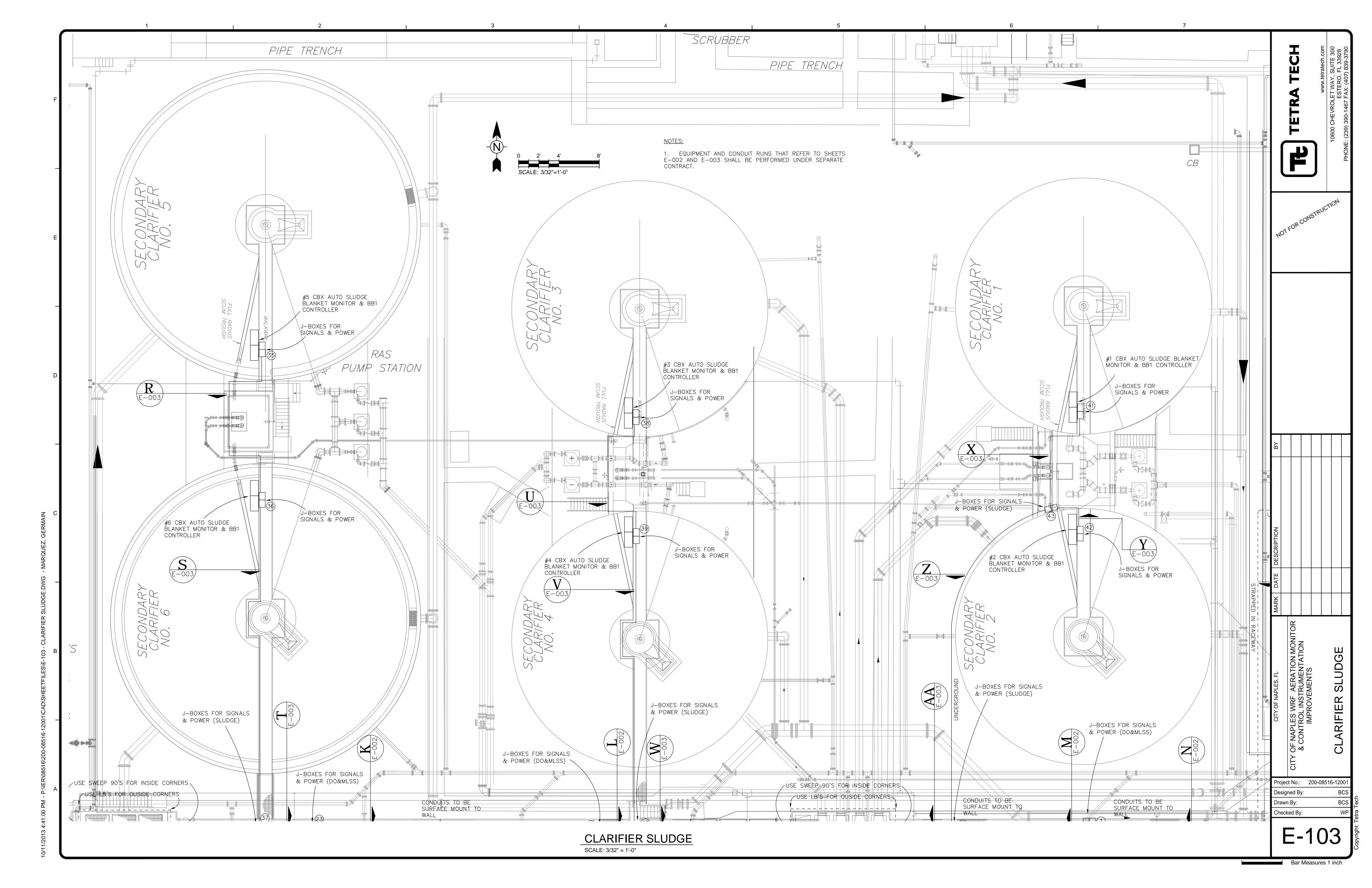
Project No.: 200-08516-12001

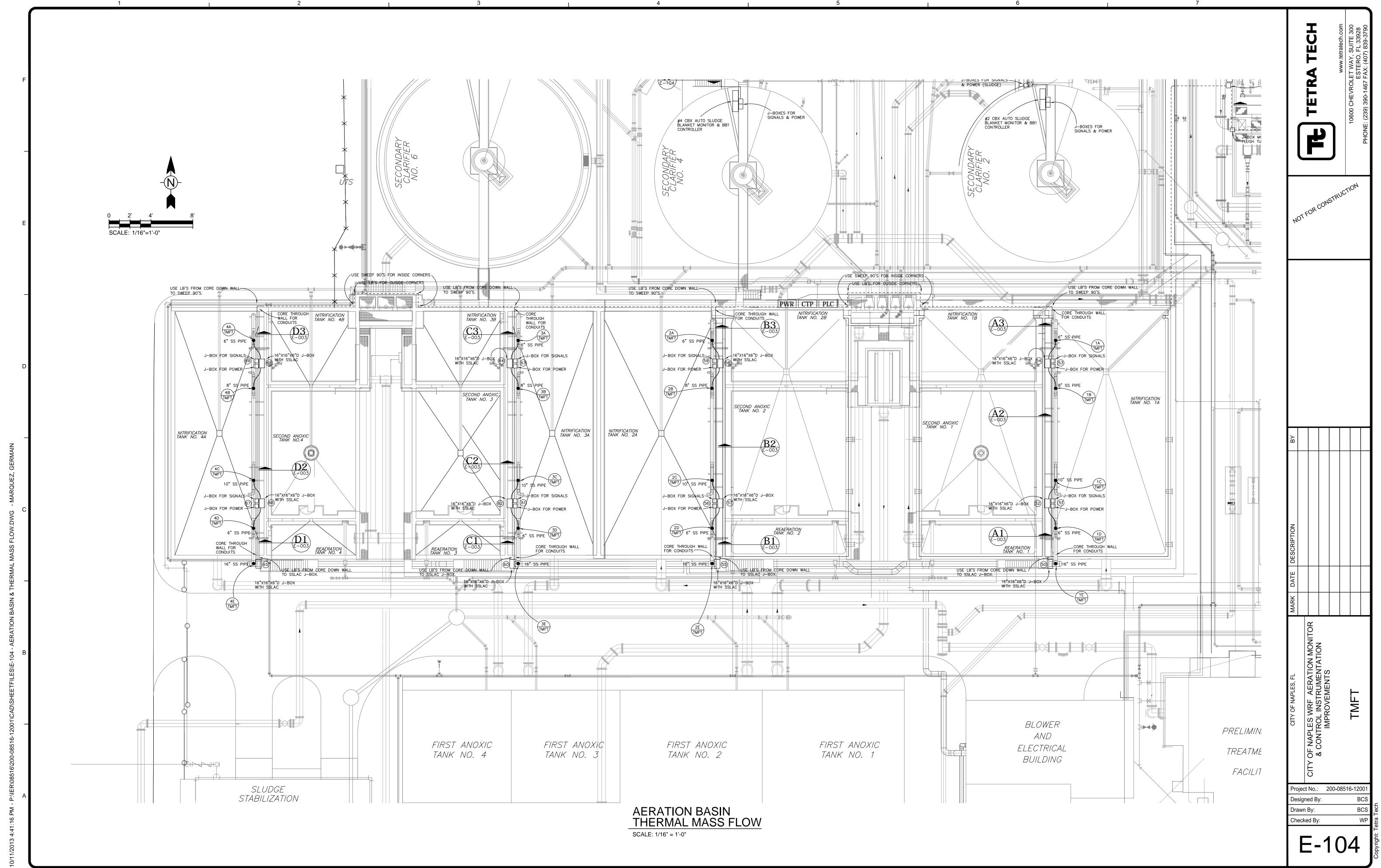
E-003

Drawn By: Checked By:



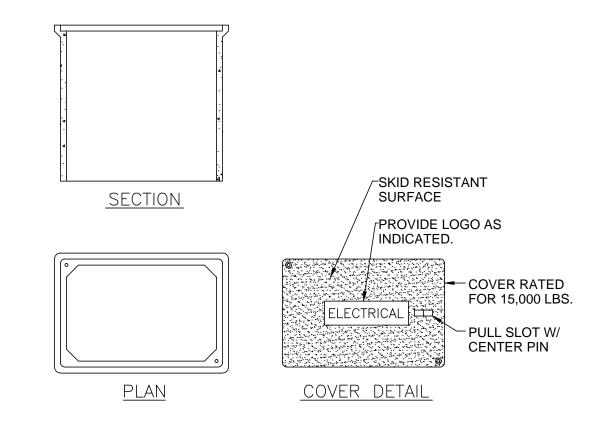






TYPICAL JBOX INSTALLATION ON HAND RAILS (LAYOUTS MAY VARY) NO SCALE

MIN. 1.5"D S.S. STRUT



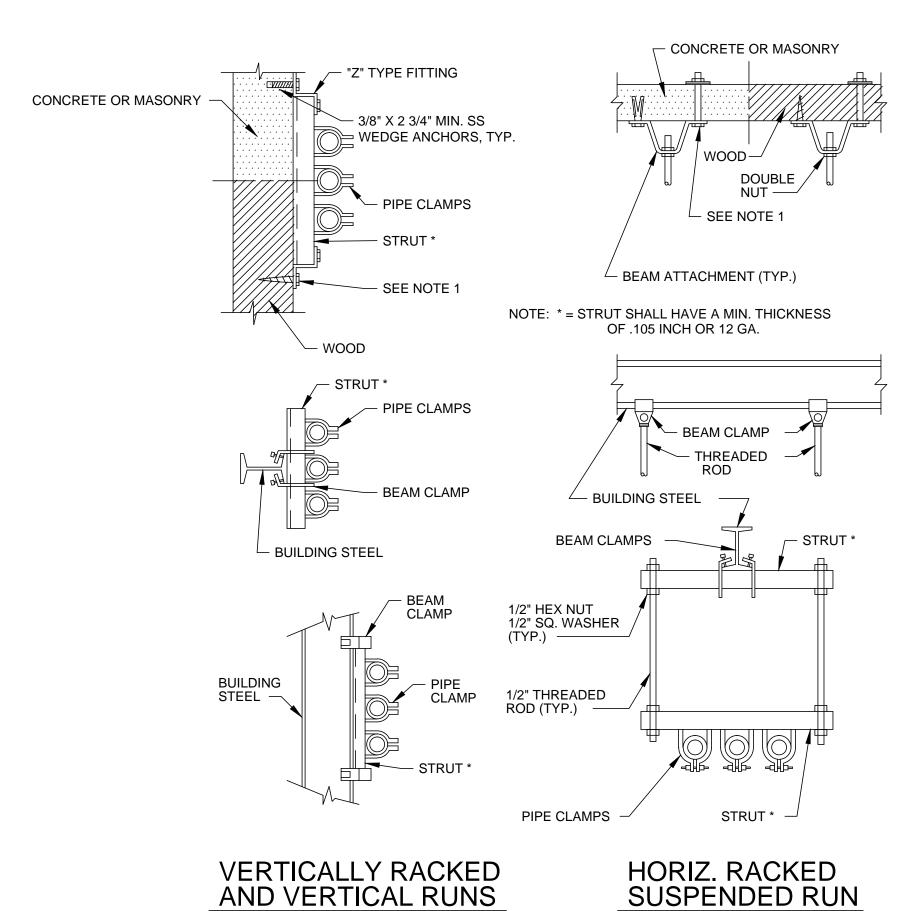
NOTES:

- 1. HANDHOLES FOR LOW VOLTAGE CABLES INSTALLED IN PARKING LOTS, SIDEWALKS, AND TURFED AREAS SHALL BE FABRICATED FROM AN AGGREGATE CONSISTING OF SAND AND WITH CONTINUOUS WOVEN GLASS STRANDS HAVING AN OVERALL COMPRESSIVE STRENGTH OF AT LEAST 10,000 PSI AND A FLEXURAL STRENGTH OF AT LEAST 5,000 PSI. PULLBOX AND HANDHOLE COVERS IN SIDEWALKS, AND TURFED AREAS SHALL BE OF THE SAME MATERIAL AS THE BOX. CONCRETE PULLBOXES SHALL CONSIST OF PRECAST REINFORCED CONCRETE BOXES, EXTENSIONS, BASES, AND COVERS.
- 2. IN PAVED AREAS, FRAMES AND COVERS FOR HANDHOLE ENTRANCES IN VEHICULAR TRAFFIC AREAS SHALL BE FLUSH WITH THE FINISHED SURFACE OF THE PAVING. IN UNPAVED AREAS, THE TOP OF MANHOLE COVERS SHALL BE APPROXIMATELY 1/2" ABOVE THE FINISHED GRADE.

QUAZITE COMPOSOLITE OR EQUAL

HANDHOLE DETAIL

NO SCALE



MASS FLOW SENSOR WITH INTEGRAL INDICATOR 3/4" N.P.T. CONDUIT CONNECTION (BOTH ENDS) 3/4"C FLEXIBLE CONDUIT PIPE TAP SIZED PER SENSOR MFR RECOMMENDATIONS. _PROCESS PIPE

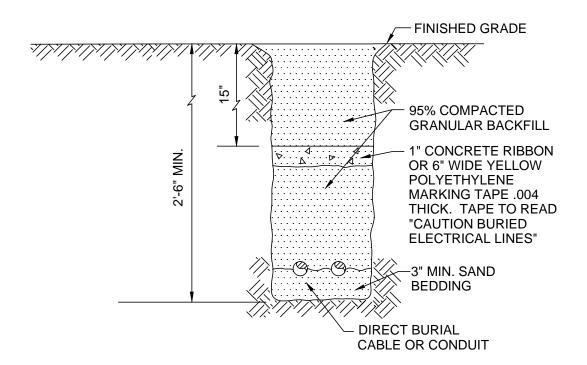
> MASS FLOW SENSOR DETAIL NO SCALE

NOTE:

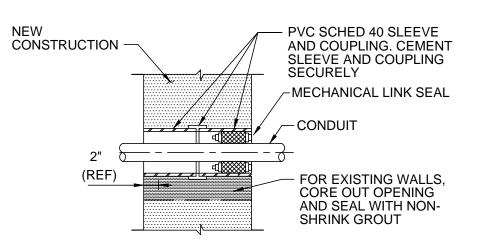
1. ALL MOUNTING HARDWARE SHALL BE 304 STAINLESS STEEL (I.E.: ANCHORS, BOLTS, WASHERS, NUTS, THREADED ROD, CLAMPS, STRUTS, ETC.)

SUSPENDED RUN

NO SCALE



TRENCHING DETAIL NO SCALE

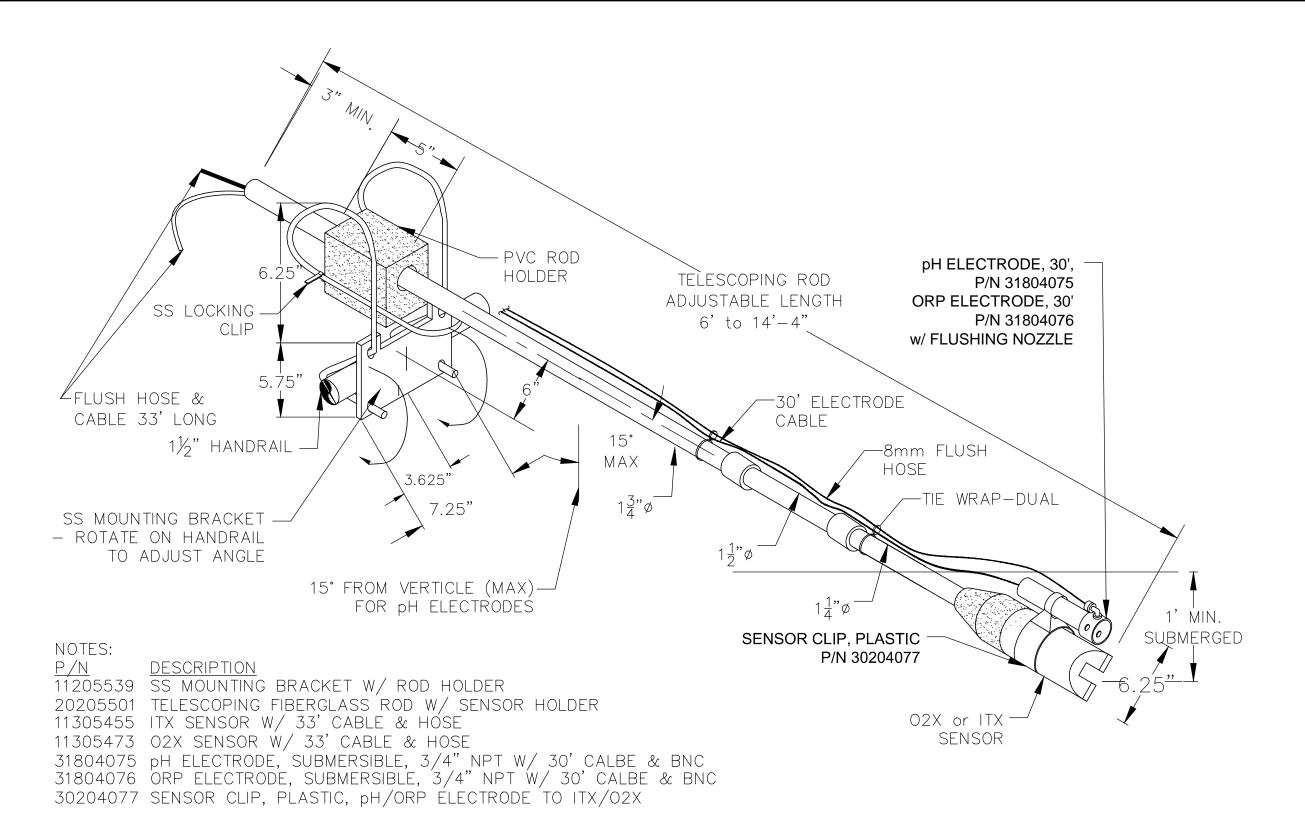


EXTERIOR WALL CONDUIT SLEEVE DETAIL NO SCALE DO NOT USE BELOW GRADE

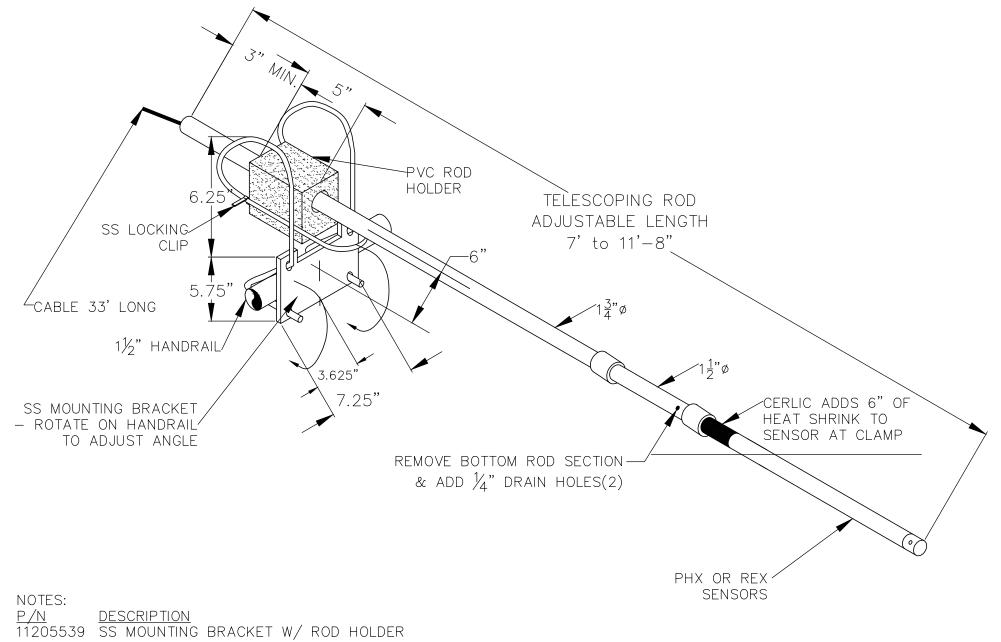
TECH

Project No.: 200-08516-1200 Designed By: Drawn By:

Checked By:



TELESCOPING ROD ASSEMBLY FOR O2X/ITX SENSOR W/ pH/ORP ELECTRODE NO SCALE



20205501 TELESCOPING FIBERGLASS ROD 11305552 PHX SENSOR W/ 33' CABLE

11305598 REX SENSOR W/ 33' CABLE

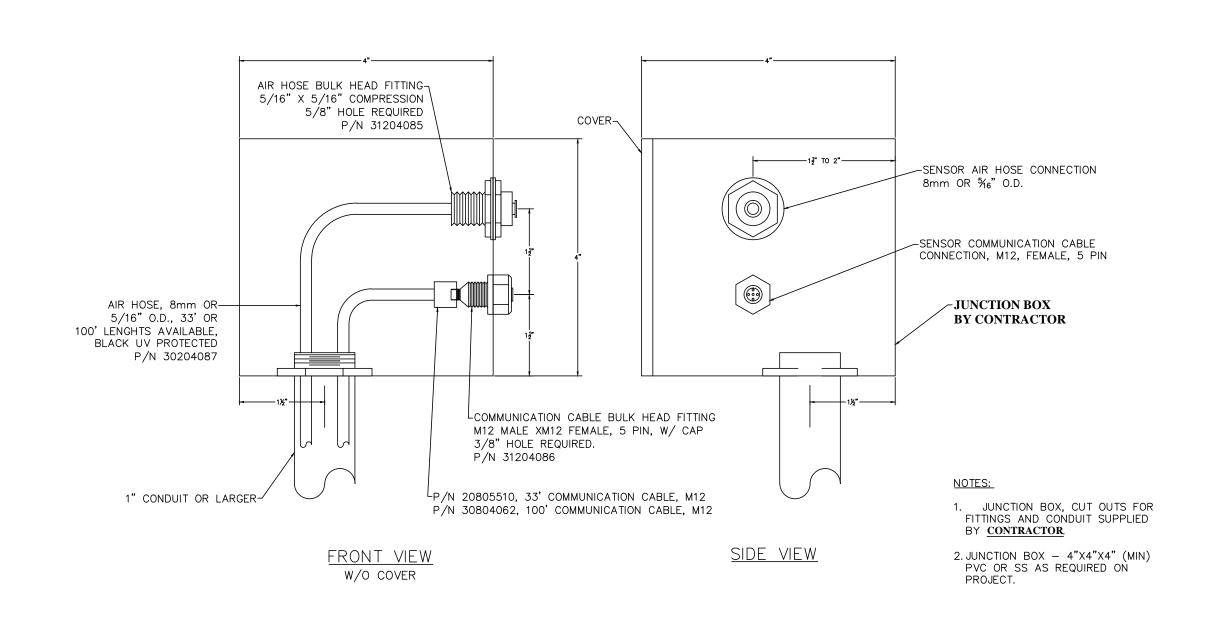
PHX & REX ROD DRAWING W/ SS BRACKET & ROD FOR 1 1/2" HANDRAIL

PHX & REX ROD DETAIL WITH SS BRACKET & ROD FOR 1-1/2" HANDRAIL NO SCALE

HOLDER TELESCOPING ROD ADJUSTABLE LENGTH SS LOCKING-CLIP 6' to 14'-4" LFLUSH HOSE & CABLE 33' LONG 1¹" HANDRAIL_ 3.625" SS MOUNTING BRACKET - ROTATE ON HANDRAIL-TO ADJUST ANGLE SUBMERGED NOTES: 02X or ITX P/N DESCRIPTION
11205539 SS MOUNTING BRACKET W/ ROD HOLDER SENSOR 20205501 TELESCOPING FIBERGLASS ROD W/ SENSOR HOLDER 11305455 ITX SENSOR W/ 33' CABLE & HOSE

SS HANDRAIL MOUNTING BRACKET & RODTO 1-1/2" HANDRAIL NO SCALE

11305473 O2X SENSOR W/ 33' CABLE & HOSE

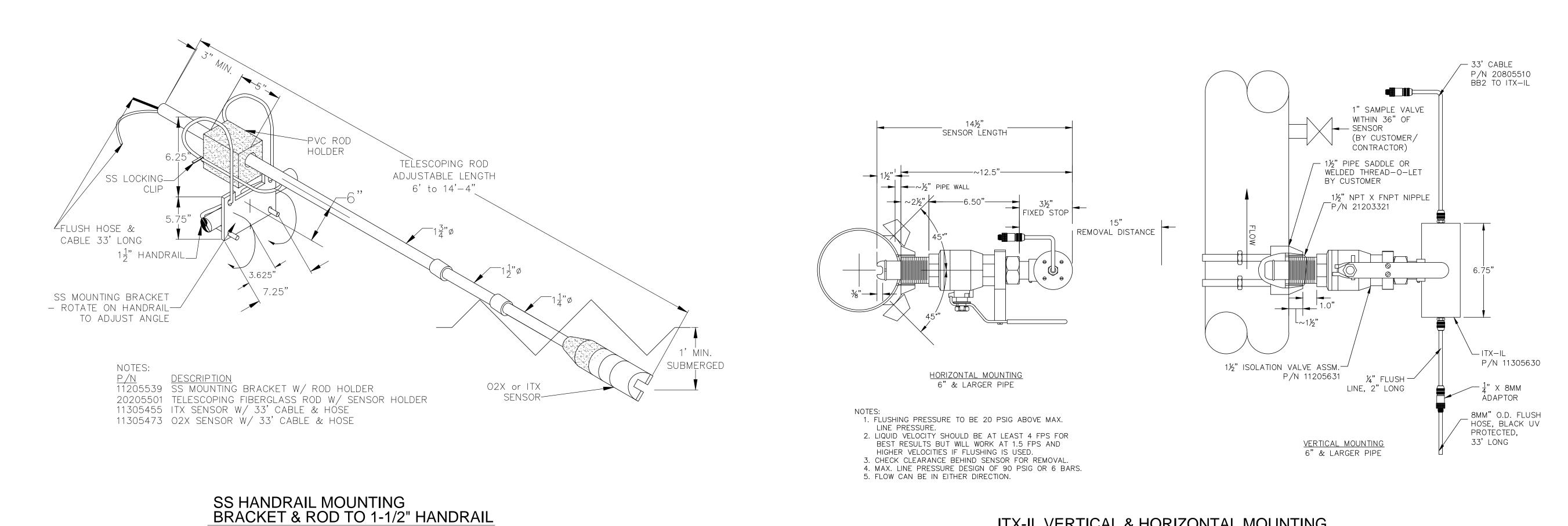


JUNCTION BOX FOR M12 CABLE & 5/16" HOSE MINIMUM SIZE 4"x4"x4" NO SCALE

TECH

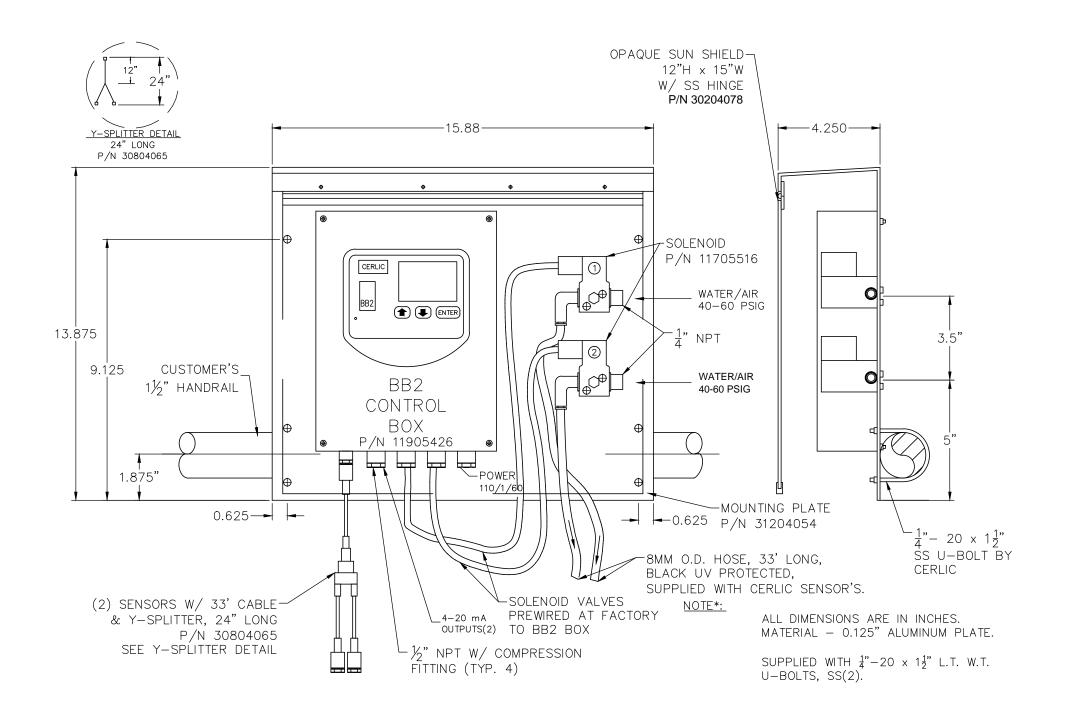
Project No.: 200-08516-1200 Designed By: Drawn By:

Checked By:



ITX-IL VERTICAL & HORIZONTAL MOUNTING DETAILS FOR 6" OR LARGER PIPE

NO SCALE



BB2 CONTROL BOX W/ 2 SOLENOID VALVES, MOUNTING PLATE & SUN SHIELD

10/11/2013 4:42:00 PM - P:\IER\08516\200-08516-12001\CAD\SHEETFILES\E-502 DETAILS.DWG - MARQUEZ, G

NO SCALE

E-501

Bar Measures 1 inch

Project No.: 200-08516-1200⁻

Designed By:

Drawn By:

TECH

