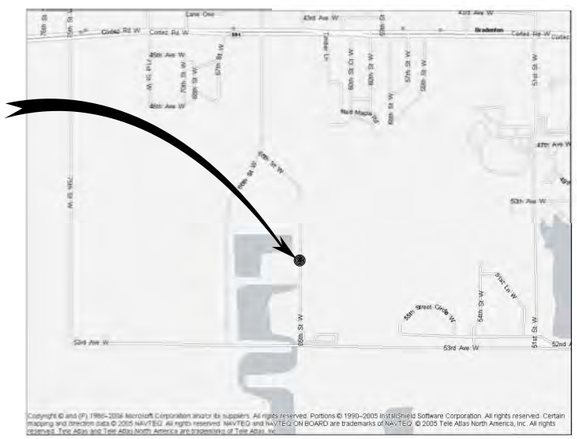
# CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

# SWWRF
# RECHARGE WELL SYSTEM


VICINITY MAP




LOCATION MAP

Manatee County FLORIDA

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PREPARED FOR

MANATEE COUNTY UTILITIES
MANATEE COUNTY, FL

VOLUME 2 OF 2
DRAWINGS


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CH2MHILL

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100% DESIGN DOCUMENTS

# ABBREVIATIONS

| | |
|---|---|
| A | AMMETER, AMPERES, AWNINGS |
| AB | ANCHOR BOLT, ABOVE |
| ABDN | ABANDON |
| AC | ACOUSTICAL, ACOUSTICAL CEILING |
| AC | ALTERNATING CURRENT |
| AC | ASPHALTIC CONCRETE |
| ACFL | ACCESS FLOORING |
| ACI | AMERICAN CONCRETE INSTITUTE |
| ACMU | ACOUSTICAL CONCRETE MASONRY UNIT, ACOUSTICAL CMU |
| ACP | ACOUSTICAL PANELS |
| ACST | ACOUSTICAL |
| ACT | ACOUSTICAL TILE |
| AD | AREA DRAIN |
| ADDL | ADDITIONAL |
| ADJ | ADJACENT |
| ADW | DRY WEATHER AVERAGE |
| AFD | ADJUSTABLE FREQUENCY DRIVE |
| AFF | ABOVE FINISHED FLOOR |
| AFG | ABOVE FINISHED GRADE |
| AG | ACOUSTICAL, ACOUSTICAL GLASS |
| AGGR | AGGREGATE |
| AHR | ANCHOR |
| AISC | AMERICAN INSTITUTE OF STEEL CONSTRUCTION |
| AJ | ADJUSTABLE |
| AL | ALUMINUM |
| ALKY | ALKALINITY |
| ALTN/ALT | ALTERNATE |
| AM | AUTO-MANUAL |
| AMRD | ACOUSTICAL METAL ROOF DECKING |
| ANDZ | ANODIZE |
| APPROX | APPROXIMATE |
| APVD | APPROVED |
| ARCH | ARCHITECTURAL |
| AR | ANALOG RELAY |
| AS | AS SELECTED |
| ATS | AUTOMATIC TRANSFER SWITCH |
| AUTO | AUTOMATIC |
| AUX | AUXILIARY |
| AVG | AVERAGE |
| AWW | WET WEATHER AVERAGE |
| @ | AT |
| | BELL |
| BAL | BALANCE |
| BETW | BETWEEN |
| BF | BLIND FLANGE, BOTTOM FACE |
| BFV | BUTTERFLY VALVE |
| BL | BASELINE |
| BFP | BACKFLOW PREVENTER |
| BLDG | BUILDING |
| BLK | BLOCK |
| BM | BEAM, BENCHMARK |
| BO | BOTTOM OF |
| B.O.B. | BOTTOM OF BEAM |
| BLL | BOTTOM LOWER LAYER |
| BOD | BOTTOM OF DUCT |
| BOP | BOTTOM OF PIPE |
| BOT | BOTTOM |
| BRG | BEARING |
| BRK | BRICK |
| BRKR | BREAKER |
| BSP | BLACK STEEL PIPE |
| BUL | BOTTOM UPPER LAYER |
| BV | BALL VALVE, BLOCK VENT |
| BVC | BEGINNING OF VERTICAL CURVE |
| C | CONDUIT, CASEMENT |
| °C | DEGREE CELSIUS |
| C TO C | CENTER TO CENTER |
| CAB | CABINET |
| CB | CATCH BASIN, CIRCUIT BREAKER |
| CC | CENTER OF CIRCLE |
| CC | CONTROL CABLE |
| CCP | CENTRAL CONTROL PANEL |
| CCS | CENTRAL CONTROL SYSTEM |
| CDF | CONTROLLED DENSITY FILL |
| CE | CONSTRUCTION ENTRANCE |
| CFM | CUBIC FEET PER MINUTE |
| CFS | CUBIC FEET PER SECOND |
| CHEM | CHEMICAL |
| CHKD | CHECKERED |
| CI | CAST IRON |
| CIP | CAST IRON PIPE, CAST IN PLACE |
| CIP | CULVERT INLET PROTECTION |
| CISP | CAST IRON SOIL PIPE |
| CJ | CONSTRUCTION JOINT |
| CKT | CIRCUIT |
| CL | CENTERLINE |
| CLDI | CEMENT LINED DUCTILE IRON |
| CLSF | CONTROLLED LOW STRENGTH FILL |
| CLG | CEILING |
| CLR | CLEAR, CLEARANCE |
| CLSM | CONTROLLED LOW STRENGTH MATERIAL |
| CMP | CENTRAL MONITORING PANEL |
| CMP | CORRUGATED METAL PIPE |
| CMU | CONCRETE MASONRY UNIT |
| CNTR | COUNTER |
| CO | CLEANOUT, CARBON MONOXIDE |
| COL | COLUMN, COLOR |
| CONC | CONCRETE |
| COND | CONDENSATE |
| CONDTN | CONDITIONED |
| CONN | CONNECTION |
| CONSTR | CONSTRUCTION |
| CONT | CONTINUED, CONTINUOUS, CONTINUATION |
| CONTR | CONTRACTOR |
| COORD | COORDINATE |
| COP | COPPER |
| CP | CENTER PIVOT |
| CP-X | CONTROL PANEL NO. X |
| CPLG | COUPLING |
| CPRSR | COMPRESSOR |
| CPT | CONTROL POWER TRANFORMER, CARPET |
| CPVC | CHLORINATED PVC |
| CR | CONTROL RELAY |
| CRS | COLD ROLLED STEEL |
| CRS | CONSTRUCTION ROAD STABILIZATION |
| CT | CERAMIC TILE |
| CT | CURRENT TRANSFORMER |
| CTC | COMPUTER TERMINAL CABINET |
| CTR | CENTER |
| CTRD | CENTERED |
| CTSK | COUNTERSUNK |
| CU | CUBIC |
| CU FT | CUBIC FOOT |
| CU IN | CUBIC INCH |
| CUH | COPPER TUBING, HARD DRAWN |
| CV | CHECK VALVE |
| CWR | CABINET DOOR MOUNTED WASTE RECEPTACLE |
| CY, CU YD | CUBIC YARD |
| CWS | CLEAN WATER SERVICES |
| D | DEEP, DRAIN |
| d | PENNY NAIL SIZE |
| DA | DUAL ACTION |
| DAS | DATA ACQUISTION SYSTEM |
| DBA | DEFORMED BAR ANCHOR |
| DBL | DOUBLE |
| DC | DIRECT CURRENT |
| DEG | DEGREE |
| DET | DETAIL |
| DF | DOUGLAS FIR, DRINKING FOUNTAIN |
| DDI | DROP INLET |
| DH | DOUBLE HUNG |
| DI | DUCTILE IRON |
| DIA | DIAMETER |
| DIAG | DIAGONAL |
| DIP | DUCTILE IRON PIPE |
| DIR | DIRECTION |
| DISCH | DISCHARGE |
| DL | DEAD LOAD |
| DN | DOWN |
| DO | DISSOLVED OXYGEN |
| DOL | DIRECT-ON-LINE |
| DP, DPNL | DISTRIBUTION PANEL |
| DR | DOOR |
| DS | DOWNSPOUT |
| DWG | DRAWING |
| DWL | DOWEL |
| △ | DELTA |
| E | EAST, EMPTY |
| EA | EACH, EXHAUST AIR |
| EB, EBCT | EMPTY BED CONTACT TIME |
| ECC | ECCENTRIC |
| EE | EMERGENCY EYEWASH |
| EDF | EGG-SHAPED DIGESTER FACILITY |
| EF | EACH FACE, EXHAUST FAN |
| EFF | EFFICIENCY, EFFICIENT |
| EFL | EFFLUENT |
| EIFS | EXTERIOR INSULATION AND FINISH SYSTEM |
| EL | ELEVATION |
| ELB | ELBOW |
| ELC | ELECTRICAL LOAD CENTER |
| ELEC | ELECTRIC, ELECTRICAL |
| ENGR | ENGINEER |
| EOP | EDGE OF PAVEMENT |
| ESC | EROSION AND SEDIMENT CONTROL |
| EP | EXPLOSION PROOF, EDGE OF PAVING |
| EQL | EQUAL |
| EQL SP | EQUALLY SPACED |
| EQPT | EQUIPMENT |
| ESC | EROSION AND SEDIMENT CONTROL |
| ETM | ELAPSED TIME METER |
| EVC | END OF VERTICAL CURVE |
| EW | EACH WAY |
| EWC | ELECTRIC WATER COOLER |
| EXH | EXHAUST |
| EXP | EXPANSION, EXPOSED |
| EXP AB | EXPANSION ANCHOR BOLT |
| EXP JT | EXPANSION JOINT |
| EXST, EXIST | EXISTING |
| EXT | EXTERIOR |
| °F | DEGREE FAHRENHEIT |
| FB | FLAT BAR |
| F, FU | FUSE |
| F, FX | FIXED |
| FAP | FIRE ALARM PANEL |
| FC | FLEXIBLE CONDUIT |
| FCA | FLANGED COUPLING ADAPTER |
| FCL2 | FREE CHLORINE RESIDUAL |
| FCO | FLOOR CLEANOUT |
| FCTY | FACTORY |
| FD | FLOOR DRAIN |
| FDN | FOUNDATION |
| FDR | FEEDER |
| FEXT | FIRE EXTINGUISHER |
| FF | FINISHED FLOOR |
| FG | FINISH GRADE, FLOAT GLASS |
| FH | FLAT HEAD |
| FHY | FIRE HYDRANT |
| FIG | FIGURE |
| FL | FLOW LINE |
| FLG | FLANGE |
| FL | FLOOR |
| FLEX | FLEXIBLE |
| FLH | FLAT HEAD |
| FLTR | FILTER |
| FLUOR | FLUORESCENT |
| FNSH | FINISH |
| FOB | FLAT ON BOTTOM |
| FOT | FLAT ON TOP |
| FP | FIELD PANEL |
| FPM | FEET PER MINUTE |
| FR | FORWARD REVERSE |
| FRCF | FIBER REINFORCED CONCRETE FILL |
| FRP | FIBERGLASS REINFORCED PLASTIC |
| FSHS | FOLDING SHOWER SEAT |
| FT | FOOT OR FEET |
| FTG | FOOTING |
| FU | FIXTURE UNIT |
| FVNR | FULL VOLTAGE NON-REVERSING |
| FVR | FULL VOLTAGE REVERSING |
| FWD | FORWARD |
| G, GND | GROUND |
| GA | GAUGE |
| GAL | GALLON |
| GALV | GALVANIZED |
| GB | GYPSUM BOARD |
| GC | GROOVED COUPLING |
| GCMU | GLAZED CONCRETE MASONRY UNITS |
| GFA | GROOVED FLANGE ADAPTER |
| GFI | GROUND FAULT INTERRUPTER |
| GFR | GROUND FAULT RELAY |
| GH | GREENHOUSE |
| GL | GLASS |
| GPD | GALLONS PER DAY |
| GPH | GALLONS PER HOUR |
| GPM | GALLONS PER MINUTE |
| GPS | GLOBAL POSITION SYSTEM |
| GRTG | GRATING |
| GSB | GYPSUM SOFFIT BOARD |
| GSP | GALVANIZED STEEL PIPE |
| GV | GATE VALVE |
| GVL | GRAVEL |
| GWB | GYPSUM WALLBOARD |
| GYP | GYPSUM |
| H | HIGH, HORN OR HOWLER |
| H2S | HYDROGEN SULFIDE |
| H.A.S. | HEADED ANCHOR STUD |
| HC | HOLLOW CORE WOOD |
| HCL | HYDROCHLORIC ACID |
| HDNR | HARDENER |
| HDNS | HARDNESS |
| HDR | HEADER |
| HDW | HARDWARE |
| HGL | HYDRAULIC GRADE LINE |
| HK | HOOK |
| HGT | HEIGHT |
| HH | HANDHOLE |
| HID | HIGH INTENSITY DISCHARGE |
| HK | HOOK |
| HM | HOLLOW METAL |
| HOA | HAND-OFF-AUTO |
| HOR | HAND-OFF-REMOTE |
| HORIZ | HORIZONTAL |
| HP | HORSEPOWER |
| HPT | HIGH POINT |
| HPU | HYDRAULIC POWER UNIT |
| HR | HOSE RACK, HANDRAIL |
| HV | HOSE VALVE |
| HVAC | HEATING, VENTILATING AND AIR CONDITIONING |
| HWL | HIGH WATER LEVEL |
| IC | INTERRUPTING CAPACITY |
| ID | INDUCED DRAFT, INSIDE DIAMETER |
| IE | INVERT ELEVATION |
| I.F. | INSIDE FACE |
| IG | INSULATING, INSULATING GLASS |
| IN | INCH |
| INCAND | INCANDESCENT |
| INFL | INFLUENT |
| INJS | INJECTIONS |
| INST | INSTANTANEOUS |
| INSTM | INSTRUMENT, INSTRUMENTATION |
| INSUL | INSULATION |
| INVT | INVERT |
| IP | INLET PROTECTION, INSTRUMENTATION PANEL |
| IRRIG | IRRIGATION |
| ITG | INSULATED TEMPERED GLASS |
| ITX | ISOLATION TRANSFORMER |
| IU | INTAKE UNIT |
| IW | IRRIGATION WELL JALOUSIE |
| JA | JAL-AWNING |
| JB | JUNCTION BOX |
| JAN | JANITOR |
| JCT | JUNCTION |
| JT | JOINT |
| K | KEY GROUP, KEY INTERLOCK |
| KIP | THOUSAND POUNDS |
| KIT | KITCHEN |
| K-PL | KICKPLATE |
| kPa | KILOPASCAL |
| KSK | KITCHEN SINK |
| KV | KILOVOLTS |
| KVA | KILOVOLT AMPERES |
| KVAR | KILOVOLT AMPERES REACTIVE |
| KW | KILOWATT |
| L | ANGLE, LENGTH |
| LA | LIGHTNING ARRESTER |
| LAB | LABORATORY |
| LAM | LAMINATE |
| LAT | LATITUDE |
| LB | POUND |
| LC | LIGHTING CONTACTOR |
| LD | COMBINATION LOUVER/DAMPER |
| LDG | LOADING DOCK |
| LEL | LOWER EXPLOSIVE LIMIT |
| LF | LINEAR FEET |
| LG | LONG |
| LH | LEFT HAND |
| LL | LIVE LOAD |
| LHR | LEFT HAND REVERSE |
| LLH | LONG LEG HORIZONTAL |
| LLV | LONG LEG VERTICAL |
| LNTL | LINTEL |
| LONG | LONGITUDINAL |
| LOS | LOCK-OUT STOP PUSHBUTTON |
| LP | LIGHT POLE, LIGHTING PANEL, LOCAL PANEL |
| LPT | LOW POINT |
| LR | LATCHING RELAY |
| LR | LOCAL-REMOTE |
| LR | LONG RADIUS |
| LS | LABORATORY SINK |
| LT | LEFT |
| LTG, LTS | LIGHTS OR LIGHTING |
| LTX | LIGHTING TRANSFORMER |
| LWL | LOW WATER LEVEL |
| MA | MANUAL-AUTO |
| MAS | MASONRY |
| MATL | MATERIAL |
| MAX | MAXIMUM |
| MB | MACHINE BOLT |
| MC | MASONRY CLEARANCE |
| MC | MODULATE-CLOSE |
| MCC | MOTOR CONTROL CENTER |
| MCJ | MASONRY CONTROL JOINT |
| MDO | MEDIUM DENSITY OVERLAY |
| MECH | MECHANICAL |
| MFD | MANUFACTURED |
| MFR | MANUFACTURER |
| MGD | MILLION GALLONS PER DAY |
| MH | MANHOLE, MOUNTING HEIGHT |
| MIN | MINIMUM |
| MISC | MISCELLANEOUS |
| MJ | MECHANICAL JOINT |
| MLO | MAIN LUGS ONLY |
| MMDW | DRY WEATHER MAXIMUM MONTH |
| MMP | MECHANICAL MOUNTING PANEL |
| MMWW | WET WEATHER MAXIMUM MONTH |
| MO | MANUAL OPERABLE, MASONRY OPENING |
| MP | METAL PANEL |
| MPa | MEGAPASCAL |
| MPU | MULTIPURPOSE UNIT |
| MS | MANUFACTURER'S STANDARD |
| MSC | MANUFACTURER SUPPLIED CABLE |
| MSH | MOTOR SPACE HEATER |
| MSR | GROUPED MOTOR CONTROL |
| MT | MOUNT |
| MTD | MOUNTED |
| MTG | MOUNTING |
| MTS | MANUAL TRANSFER SWITCH |
| MTS | MILL TYPE STEEL PIPE |
| MU | MULCHING |
| MV | MERCURY VAPOR |
| MWS | MAXIMUM WATER SURFACE |
| N | NORTH, NEUTRAL |
| NA | NOT APPLICABLE |
| NA | NON-AUTOMATIC |
| NC | NORMALLY CLOSED |
| NEUT | NEUTRAL |
| NG | NATURAL GAS |
| NGVD | NATIONAL GEODETIC VERTICAL DATUM |
| NIC | NOT IN CONTRACT |
| N.O. | NORMALLY OPEN |
| NO., # | NUMBER |
| NOM | NOMINAL |
| NP | NON-PROTECTED |
| NPT | NATIONAL PIPE THREADS |
| NS | NON-SHRINK |
| NTS | NOT TO SCALE |
| O2 | OXYGEN |
| O TO O | OUT TO OUT |
| OA | OVERALL, ODOROUS AIR |
| OC | ON CENTER |
| OC | OPEN-CLOSE (O) |
| OCA | OPEN-CLOSE-AUTO |
| OCR | OPEN-CLOSE-REMOTE |
| OD | OUTSIDE DIAMETER, OVERFLOW DRAIN |
| O.F. | OUTSIDE FACE |
| OFCI | OWNER FURNISHED, CONTRACTOR INSTALLED |
| OFOI | OWNER FURNISHED, OWNER INSTALLED |
| OL | OVERLOAD RELAY |
| OO | ON-OFF |
| OOA | ON-OFF-AUTO |
| OOR | ON-OFF-REMOTE |
| OP | OPAQUE PANEL, OUTLET PROTECTION |
| OPER | OPERATOR |
| OPNG | OPENING |
| OPP | OPPOSITE |
| OSA | OUTSIDE AIR |
| OSC | OPEN-STOP-CLOSE |
| OSD | OPEN SITE DRAIN |
| OWSJ | OPEN WEB STEEL JOIST |
| OZ | OUNCE |
| P | PROJECTED |
| P | PILASTER, PIPE |
| PAVT | PAVER TILE |
| PB | PUSHBUTTON SWITCH |
| PC | POINT OF CURVE, PHOTOCELL |
| PC | PRECAST CONCRETE PANEL |
| PCCP | PRECAST CONCRETE CYLINDER PIPE |
| PCV | PRESSURE CONTROL VALVE |
| PE | PLAIN END |
| PED | PEDESTAL, PEDESTRIAN |
| PEP | POLYETHYLENE PIPE |
| PEN. | PENETRATION |
| PFC | POUNDS PER CUBIC FOOT |
| PH | PENTHOUSE |
| pH | HYDROGEN ION CONCENTRATION |
| PH | PHASE |
| PI | POINT OF INTERSECTION |
| PIT | PILOT TUBE TEST STATION |
| PJF | PREMOULDED JOINT FILLER |
| PL | PLATE (STEEL) |
| PL | PROPERTY LINE |
| PLAM | PLASTIC LAMINATE |
| PLAS | PLASTER, PLASTIC |
| PLC | PROGRAMMABLE LOGIC CONTROLLER |
| PLYWD | PLYWOOD |
| PNL | PANEL |
| PP | POWER POLE |
| P-P | PUSH-PULL |
| PPL | POLYPROPYLENE LINED |
| PR | PAIR |
| PRC | POINT OF REVERSE CURVE |
| PRCST | PRECAST |
| PREFAB | PREFABRICATION |
| PRES | PRESSURE |
| PRI | PRIMARY |
| PRM | PERMANENT REFERENCED MARKER |
| PROJ | PROJECTION |
| PROP | PROPERTY |
| PS | PLASTIC SHEET, POLYCARBONATE SHEET |
| PS | PAINT SYSTEM |
| PSF | POUNDS PER SQUARE FOOT |
| PSI | POUNDS PER SQUARE INCH |
| PSIG | POUNDS PER SQUARE INCH, GAUGE |
| PT | POINT OF TANGENCY |
| PT | POTENTIAL TRANSFORMER |
| PT | PRESSURE TREATED |
| PTD | PAPER TOWEL DISPENSER |
| PTN | PARTITION |
| PV | PLUG VALVE |
| PVC | POLYVINYL CHLORIDE |
| PVI | POINT OF VERTICAL INTERSECTION |
| PVMT | PAVEMENT |
| PVT | POINT OF VERTICAL TANGENCY |
| QAA | AVERAGE FLOW |
| QMM | MAXIMUM 30 DAY FLOW |
| QPI | PEAK INSTANTANEOUS FLOW |
| QPP | PEAK PUMPING FLOW |
| QT | QUARRY TILE |
| R | RISER |
| R OR RAD | RADIUS |
| RA | RETURN AIR |
| RC | REINFORCED CONCRETE |
| RCP | REINFORCED CONCRETE PIPE |
| RCPT | RECEPTACLE |
| RD | ROAD, ROOF DRAIN |
| RDCR | REDUCER |
| RDW | REDWOOD |
| RECIR | RECIRCULATION |
| REF | REFER OR REFERENCE |
| REFR | REFRIGERATE, REFRIGERANT |
| REINF | REINFORCED, REINFORCING, REINFORCE |
| REQD | REQUIRED |
| RESIL | RESILIENT |
| RFS | ROLL-UP FIRE SHUTTER |
| RH | RIGHT HAND |
| RH | RODHOLE |
| RHR | RIGHT HAND REVERSE |
| RL | RAIN LEADER |
| RLD | RAIN LOAD |
| RLS | RUBBER LINED STEEL |
| RM | ROOM |
| RO | ROUGH OPENING |
| ROL | RAISE-OFF-LOWER |
| RPM | REVOLUTIONS PER MINUTE |
| RR | RIPRAP |

NOTES:

1. CONTACT ENGINEER FOR ABBREVIATIONS USED BUT NOT SHOWN ON THIS DRAWING.

## GENERAL NOTE:

1. THIS IS A STANDARD LEGEND SHEET. THEREFORE, NOT ALL OF THE INFORMATION SHOWN MAY BE USED ON THIS PROJECT.

REVISION | NO. | DATE | DSGN | DR | CHK | APVD | BY | APVD

T LOOSE | T LOOSE | T LOOSE | T FU

CHECKER



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SOUTHWEST REGIONAL WATER RECLAMATION FACILITY - RECHARGE WELL SYSTEM
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FLORIDA

GENERAL
ABBREVIATIONS

100% DESIGN DOCUMENTS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

| | |
|---|---|
| DATE | DECEMBER 2015 |
| PROJ | 659297 |
| DWG | 001-G-101 |
| SHEET | 02 of 51 |

FILENAME: 001-G-1001_659297.dgn PLOT DATE: 12/10/2015 PLOT TIME: 12:41:03 PM

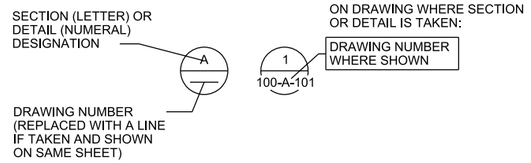
# ABBREVIATIONS

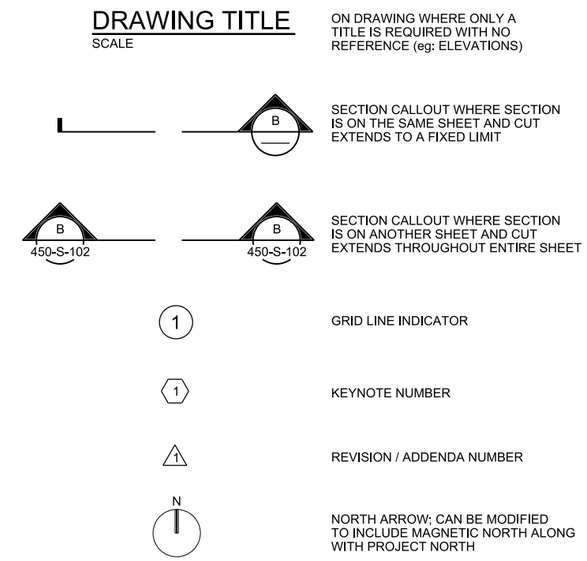
| | |
|---|---|
| RRUB | RADIAL RUBBER |
| RS | RIGID STEEL |
| RST | REINFORCING STEEL |
| RT | RIGHT |
| RTN | RETURN |
| RTO | REGENERATIVE THERMAL OXIDIZER |
| RUB | RUBBER |
| RUBC | RUBBER CUSHIONED FLOORING |
| RUBS | RUBBER ESD CONTROL FLOORING |
| R/W | RIGHT OF WAY |
| S | I-BEAM |
| S | SLOPE, SOUTH, SWITCH |
| SA | SUPPLY AIR |
| SATC | SUSPENDED ACCUSTICAL TILE CEILING |
| SB | SEDIMENT BASIN |
| SC | SHOWER CURTAIN, SOLID CORE WOOD |
| SCADA | SUPERVISORY CONTROL AND DATA ACQUISITION |
| SCC | SOLID CORE |
| SCFM | STANDARD CUBIC FEED PER MINUTE |
| SCHED | SCHEDULE |
| SCU | SPEED CONTROL UNIT |
| SDP | SUB-DISTRIBUTION PANEL |
| SDWK | SIDEWALK |
| SEC | SECONDARY |
| SECT | SECTION |
| SED | SEDIMENTATION |
| SEW | SEWAGE |
| SG | LAMINATED SAFETY GLASS, SAFETY |
| SGWB | SUSPENDED GYPSUM WALL BOARD |
| SH | SHEET |
| SHA | SURFACE HARDENING AGENT |
| SHS | SOLIDS HANDLING SYSTEM |
| SIM | SIMILAR |
| SK | SINK |
| SL | SNOW LOAD |
| SLR | SEALER |
| SMLS | SEAMLESS EPOXY |
| SOI | SPRAY- ON INSULATION |
| SOLN | SOLUTION |
| SP | SPACE OR SPACES, SPANDREL PANEL, STORMPROOF |
| SPEC, SPECS | SPECIFICATIONS |
| SPD | SUMP PUMP DISCHARGE |
| SPG | SPACING |
| SPLY | SUPPLY |
| SQ | SQUARE |
| SQ FT | SQUARE FOOT, FEET |
| SQ IN | SQUARE INCH |
| SR | SHORT RADIUS |
| SS | START-STOP |
| SST | STAINLESS STEEL |
| SSC | SUPERVISORY SET POINT CONTROL |
| ST | STORM DRAIN |
| ST | STRAIGHT |
| STA | STATUS, STATION |
| STD | STANDARD |
| STIF | STIFFENER |
| STIRR | STIRRUP |
| STL | STEEL |
| STRL | STRUCTUAL |
| STRUCT | STRUCTURE |
| SUBFL | SUBFLOOR |
| SUSP | SUSPENDED |
| SV | SOLENOID VALVE |
| SVIN | SHEET VINYL |
| SWBD | SWITCHBOARD |
| SWGR | SWITCHGEAR |
| SYMM | SYMMETRICAL |
| T | THERMOSTAT, TREAD |
| T&B | TOP AND BOTTOM |
| T&G | TONGUE AND GROOVE |
| TA | TRANSFER AIR |
| TAN | TANGENT |
| TB | TERMINAL BOARD |
| TBG | TUBING |
| TC | TIME TO CLOSE |
| TC | TURBIDITY CURTAIN |
| TCAD | TIME CLOSE AFTER DE-ENERGIZATION |
| TCAE | TIME CLOSE AFTER ENERGIZATION |
| TDH | TOTAL DYNAMIC HEAD |
| TDR | TIME DELAY RELAY |
| TECH | TECHNICAL |
| TEL | TELEPHONE |
| TEMP | TEMPORARY, TEMPERATURE |
| TF | TOP FACE |
| TFG | TEMPERED FLOAT GLASS |
| TG | TEMPERED |
| TH | TOP-HINGED |
| THD | THREAD |
| THK | THICKNESS |
| THRU | THROUGH |
| TJB | TERMINAL JUNCTION BOX |
| TL | TEFLON LINED PIPE |
| T.O. | TIME TO OPEN, TOP OF |
| TOAE | TIME OPEN AFTER ENERGIZATION |
| TOC | TOP OF CONCRETE |
| TOC | TOP OF CURB |
| TOD | TIME ON DELAY, TOP OF DUCT<br>TOTAL OXYGEN DEMAND |
| TOF | TOP OF FOOTING |
| TOG | TOP OF GROUT, TOP OF GRATE |
| T.O.P. | TOP OF PARAPET |
| TOS | TOP OF SLAB |
| TOW | TOP OF WALL |
| TP | TURNING POINT |
| TPS | THERMAL PROTECTIVE SYSTEM |
| TR | TRANSOM, TRUSS |
| TRANS | TRANSFORMER, TRANSITION |
| TRANSV | TRANSVERSE |
| TRD | TREAD |
| TS | TEMPORARY SEEDING, TUBE STEEL |
| TSHT | THRESHOLD |
| TSS | TOTAL SUSPENSION SOLIDS |
| TST | TOP OF STEEL |
| TTC | TELEPHONE TERMINAL CABINET |
| TTD | TOILET TISSUE DISPENSER |
| TU-X | TREATMENT UNIT NO. X |
| TURB | TURBIDITY |
| TWP | TRANSLUCENT WALL PANEL |
| TX | TRANSFORMER |
| TYP | TYPICAL |
| UON | UNLESS OTHERWISE NOTED |
| UNO | UNLESS NOTED OTHERWISE |
| UPS | UNINTERRUPTIBLE POWER SUPPLY |
| USB | UNIT SUBSTATION |
| UVR | UNDER VOLTAGE RELAY |
| V | VENT, VALVE |
| V | VOLTMETER, VOLTS |
| VB | VAPOR BARRIER (RETARDER) |
| VC | VERTICAL CURVE |
| VCP | VITRIFIED CLAY PIPE |
| VCT | VINYL COMPOSITION TILE |
| VEL | VELOCITY |
| VERT | VERTICAL |
| VHC | VOLATILE HYDROCARBONS |
| VIB | VIBRATION |
| VIF | VERIFY IN FIELD |
| VIN | VINYL |
| VINT, VT | VINYL TILE |
| VP | VERTICAL PIVOTED |
| VPS | VENEER PLASTER SYSTEM |
| VPC | POINT OF VERTICAL CURVATURE |
| VPI | POINT OF VERTICAL INTERSECTION |
| VPT | POINT OF VERTICAL TANGENT |
| VS | VERTICAL SLIDE |
| VTR | VENT THRU ROOF |
| VWC | VINYL WALL COVERING |
| W | WEST |
| W/ | WITH |
| W/O | WITHOUT |
| WC | WATER COLUMN |
| WEASTRIP | WEATHERSTRIP |
| WG | WIRE, WIRE GLASS |
| WH | WATTHOUR METER |
| WHD | WATTHOUR DEMAND METER |
| WP | WATERPROOF, WEATHERPROOF, WORKPOINT |
| WR | WASTE RECEPTACLE |
| WRB | WATER RESISTANT GWB |
| WS | WATER SURFACE, WATERSTOP, WELDED STEEL |
| WWF | WELDED WIRE FABRIC |
| WWPH | WET WEATHER PEAK HOUR |

NOTES:

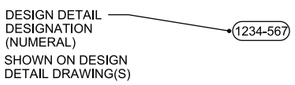
1. CONTACT ENGINEER FOR ABBREVIATIONS USED BUT NOT SHOWN ON THIS DRAWING.

# SECTION / DETAIL DESIGNATIONS




# DESIGN DETAIL DESIGNATION




NOTES:

1. ALL DESIGN DETAILS ARE TYPICAL AND MUST BE USED IF DESIGN DETAIL DESIGNATION IS NOT SHOWN
2. THE TERM STANDARD DETAIL, OR A FORM OF IT, IS SYNOMONOUS WITH DESIGN DETAIL. THE DESIGN DETAILS REPRESENT THE CHARACTER AND NATURE OF THE WORK REQUIRED THROUGHOUT THE PROJECT. ALL ASSOCIATED WORK SHALL BE IN ACCORDANCE WITH THE DESIGN DETAILS SHOWN WHETHER THE DETAILS ARE SPECIFICALLY REFERENCED OR NOT.

# GENERAL NOTE:

1. THIS IS A STANDARD LEGEND SHEET. THEREFORE, NOT ALL OF THE INFORMATION SHOWN MAY BE USED ON THIS PROJECT.

| NO. | DSGN | DATE | DR | CHK | APVD | BY | APVD |
|---|---|---|---|---|---|---|---|
| | | | T LOOSE | CHECKER | | REVISION | T FU |



CH2MHILL®
3011 S.W. WILLISTON ROAD
GAINESVILLE, FLORIDA 32608
EB0000072 · AAC001992
Tao Fu PE 63138

SOUTHWEST REGIONAL WATER RECLAMATION FACILITY - RECHARGE WELL SYSTEM
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FLORIDA

GENERAL
ABBREVIATIONS

100% DESIGN DOCUMENTS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

| | |
|---|---|
| DATE | DECEMBER 2015 |
| PROJ | 659297 |
| DWG | 001-G-102 |
| SHEET | 03 of 51 |

# GENERAL SITE NOTES:

1. SOURCE OF TOPOGRAPHY SHOWN ON THE CIVIL PLANS IS A SURVEY PROVIDED BY ZNS ENGINEERING. ADDITIONAL MAPPING HAS BEEN ADDED FROM RECORD DRAWINGS PREPARED BY URS AND WERE PROVIDED BY MANATEE COUNTY. EXISTING CONDITIONS MAY VARY FROM THOSE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND ADJUST WORK PLAN ACCORDINGLY PRIOR TO BEGINNING CONSTRUCTION.
2. EXISTING TOPOGRAPHY, STRUCTURES, AND SITE FEATURES ARE SHOWN SCREENED AND/OR LIGHT-LINED. NEW FINISH GRADE, STRUCTURES, AND SITE FEATURES ARE SHOWN HEAVY-LINED.
3. HORIZONTAL DATUM: FLORIDA STATE PLANE COORDINATE SYSTEM (WEST ZONE) NAD83/2011
4. VERTICAL DATUM: NAVD88
5. MAINTAIN, RELOCATE, OR REPLACE EXISTING SURVEY MONUMENTS, CONTROL POINTS, AND STAKES WHICH ARE DISTURBED OR DESTROYED. PERFORM THE WORK TO PRODUCE THE SAME LEVEL OF ACCURACY AS THE ORIGINAL MONUMENT(S) IN A TIMELY MANNER, AND AT THE CONTRACTOR'S EXPENSE.
6. COORDINATES AND DIMENSIONS SHOWN FOR ROADWAY IMPROVEMENTS ARE TO FACE OF CURB OR EDGE OF PAVEMENT.
7. STAGING AREA SHALL BE FOR CONTRACTOR'S EMPLOYEE PARKING, CONTRACTOR'S TRAILERS AND ON-SITE STORAGE OF MATERIALS.
8. ELEVATIONS GIVEN ARE TO FINISH GRADE UNLESS OTHERWISE SHOWN.
9. SLOPE UNIFORMLY BETWEEN CONTOURS AND SPOT ELEVATIONS SHOWN.
10. ALL DISTURBED AREAS NOT RECEIVING A HARD SURFACE SHALL BE COVERED WITH GRASS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGNING, PERMITTING, IMPLEMENTING AND MAINTAINING EROSION CONTROL DEVICES DURING CONSTRUCTION. CONTRACTOR SHALL PREPARE A SWPPP AND OBTAIN NECESSARY NPDES PERMIT.
12. CONTRACTOR SHALL TAKE ALL OTHER MEASURES TO POSITIVELY PRECLUDE EROSION MATERIALS FROM LEAVING THE SITE. CONTRACTOR TO SUBMIT EROSION CONTROL PLAN.

# CIVIL LEGEND

- EXISTING GRATE INLET
- EXISTING STORM/SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING UTILITY BOX
- EXISTINGELECTRIC HAND HOLE
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- EXISTING LIGHT POLE
- EXISTING SIGN
- EXISTING BOLLARD
- EXISTING CHAIN LINK FENCE
- +X.XX EXISTING SPOT ELEVATION (HARD SURFACE)
- *X.X EXISTING SPOT ELEVATION (SOFT SURFACE)
- EXISTING ORNAMENTAL TREE (SIZE)
- BENCHMARK
- SOIL BORING
- ⊗ 158.5 SPOT ELEVATION
- 155 CONTOUR LINE
- 3:1 EMBANKMENT AND SLOPE
- DRAINAGEWAY OR DITCH
- CENTER LINE, PIPING, ROAD, DITCH, ETC.
- SILT FENCE
- N 1000.00 / E 1000.00 LOCATION POINT - COORDINATES
- ASPHALT SURFACING
- CONCRETE

## GENERAL NOTE:

1. THIS IS A STANDARD LEGEND SHEET. THEREFORE, NOT ALL OF THE INFORMATION SHOWN MAY BE USED ON THIS PROJECT.

| NO. | DATE | DR | REVISION | CHK | APVD | BY | APVD |
|---|---|---|---|---|---|---|---|
| DSGN | R MORRISON | C CHILDRESS | | A MALONE | | R MORRISON | |



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SOUTHWEST REGIONAL WATER RECLAMATION FACILITY - RECHARGE WELL SYSTEM
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FLORIDA

GENERAL
CIVIL LEGEND AND GENERAL NOTES



100% DESIGN DOCUMENTS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

| | |
|---|---|
| DATE | DECEMBER 2015 |
| PROJ | 659297 |
| DWG | 001-G-103 |
| SHEET | 04 of 51 |

FILENAME: 001-G-1003_659197.dgn PLOT DATE: 12/10/2015 PLOT TIME: 12:40:43 PM

# DESIGN CRITERIA

1. APPLICABLE CODE: FLORIDA BUILDING CODE FIFTH EDITION (2014), AS AMENDED BY APPLICABLE LOCAL AGENCIES.
2. REFER TO THE DRAWINGS FOR ADDITIONAL AND SPECIFIC STRUCTURE LOADINGS AND REQUIREMENTS.
3. ALL LOADS SHOWN ARE SERVICE LEVEL (UNFACTORED) UNLESS SPECIFICALLY NOTED OTHERWISE.
4. DEAD LOADS: SELF WEIGHT
5. LIVE LOADS:

| | |
|---|---|
| CONCRETE EQUIPMENT PADS | = 300 PSF |
| GRATING | = 100 PSF |
| VEHICULAR TRAFFIC | AASHTO HS 20-44 |

DEFLECTION CRITERIA FOR CONTRACTOR DESIGNED FLOOR SYSTEM:

| | |
|---|---|
| TOTAL LOAD | L/240 |
| LIVE LOAD | L/360 |

WHERE L IS THE MEMBER SPAN LENGTH

6. WIND LOADS:

| | |
|---|---|
| ULTIMATE DESIGN WIND SPEED ($V_{ULT}$) | = 148 MPH (3 SECOND GUST) |
| NOMINAL DESIGN WIND SPEED ($V_{ASD}$) | = 115 MPH |
| RISK CATEGORY | = III |
| WIND EXPOSURE CATEGORY | = C |

7. SNOW LOAD: GROUND SNOW LOAD = 0 PSF
8. SEISMIC LOADS:

| | |
|---|---|
| MAPPED SPECTRAL RESPONSE ACCELERATIONS | |
| $S_S$ | = 0.053g |
| $S_1$ | = 0.028g |
| DESIGN SPECTRAL RESPONSE ACCELERATIONS | |
| $S_{DS}$ | = 0.056g |
| $S_{D1}$ | = 0.045g |
| SITE CLASS (ASSUMED) | = D |
| SEISMIC DESIGN CATEGORY | = A |
| IMPORTANCE FACTOR, Ie | = 1.25 |

9. SOIL DESIGN PARAMETERS:

| | |
|---|---|
| NET ALLOWABLE SOIL BEARING PRESSURES: | = 1500 PSF |
| LATERAL EARTH PRESSURE COEFFICIENTS | |
| ACTIVE ($K_a$): | = 0.33 |
| AT REST ($K_o$): | = 0.50 |
| VERTICAL SURCHARGE: | = 2 FT OF SOIL WEIGHT |
| MODULUS OF SUBGRADE REACTION: | = 100 PCI |
| NATIVE SOIL UNIT WEIGHT: | = 115 PCF |
| GROUND WATER (GW) ELEVATION: | |
| DESIGN HIGH GW | = AT GRADE |
| FACTOR OF SAFETY FOR UPLIFT RESISTANCE: | |
| NORMAL HIGH GW ELEVATION: | FOS = 1.25 EXCEPT IF OVERTOPPING USE 1.10 (SOIL FRICTION AND WEDGE FAILURE NOT CONSIDERED) |

# GENERAL INFORMATION

1. FOR ABBREVIATIONS NOT LISTED, SEE ASME Y14.38 "ABBREVIATIONS AND ACRONYMS: PUBLICATION AS DISTRIBUTED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
2. DESIGN DETAILS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS OCCURRING THROUGHOUT THE PROJECT, WHETHER OR NOT THEY ARE INDIVIDUALLY CALLED OUT.
3. VERIFY FINAL OPENING DIMENSIONS IN WALLS AND SLABS WITH OTHER DISCIPLINE DRAWINGS PRIOR TO CONSTRUCTION OF THESE ELEMENTS.
4. FOR NUMBER, TYPE, SIZE, ARRANGEMENT, AND/OR LOCATION OF EQUIPMENT PADS, SEE OTHER DISCIPLINE DRAWINGS. COORDINATE WITH EQUIPMENT SUPPLIER PRIOR TO PLACING SLABS, WALLS AND FOUNDATIONS. COORDINATE PIPING OPENINGS WITH OTHER DISCIPLINE DRAWINGS.
5. DO NOT CUT OR MODIFY STRUCTURAL MEMBERS FOR PIPES, DUCTS, ETC, UNLESS SPECIFICALLY DETAILED OR APPROVED IN WRITING BY THE ENGINEER.
6. VISITS TO THE JOB SITE BY THE ENGINEER TO OBSERVE THE CONSTRUCTION DO NOT IN ANY WAY MEAN THAT ENGINEER IS GUARANTOR OF CONSTRUCTOR'S WORK, NOR RESPONSIBLE FOR THE COMPREHENSIVE OR SPECIAL INSPECTIONS, COORDINATION, SUPERVISION, OR SAFETY AT THE JOB SITE.
7. INFORMATION (DETAILING, DIMENSIONS, CONFIGURATIONS, AND ELEVATIONS, ETC.) OF EXISTING CONSTRUCTION SHOWN REFLECTS AVAILABLE EXISTING DESIGN DOCUMENTS, AND DOES NOT NECESSARILY REPRESENT THE AS-CONSTRUCTED CONDITIONS. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS, ELEVATIONS AND DETAILING OF THE EXISTING STRUCTURES PRIOR TO UNDERTAKING ANY WORK THAT IS AFFECTED BY THE EXISTING STRUCTURE. NOTIFY ENGINEER IF CONDITIONS VARY FROM THAT SHOWN PRIOR TO STARTING WORK.

# INSPECTION AND TESTING

1. THE CONTRACTOR SHALL SCHEDULE INSPECTIONS.
2. SPECIFIED CONCRETE AND OTHER MATERIAL TESTING RELATED TO INSPECTION DURING CONSTRUCTION WILL BE OWNER FURNISHED.
3. SPECIFIED LABORATORY TEST MIXES AND SIMILAR TEST RESULTS TO VERIFY MATERIAL QUALITY AND CONFORMANCE TO SPECIFICATIONS, AND SUBMITTED FOR REVIEW PRIOR TO ACCEPTANCE FOR USE ON THE PROJECT, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
4. INSPECTION AND TESTING (OWNER FURNISHED) WILL BE IN ACCORDANCE WITH FBC SECTION 110. INSPECTION AND TESTING WILL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF FBC.

# GEOTECHNICAL OBSERVATION

1. INSPECTION (OWNER FURNISHED) WILL BE IN ACCORDANCE WITH FBC SECTION 110 ON THE FOLLOWING PORTIONS OF THE WORK:
   A. SOILS

# FOUNDATIONS

1. EXCAVATIONS SHALL BE SHORED TO PREVENT SUBSIDENCE OR DAMAGE TO ADJACENT EXISTING STRUCTURES, ROADS, UTILITIES, ETC.
2. FOUNDATION SLABS, SLABS-ON-GRADE AND WALL SPECIFICALLY NOTED TO BE ON FILL SHALL BEAR ON 6" COMPACTED GRANULAR FILL, UNLESS OTHERWISE NOTED.
3. FOUNDATION BEARING SURFACES WILL BE OBSERVED BY THE GEOTECHNICAL ENGINEER OR QUALIFIED DESIGNEE PRIOR TO PLACEMENT OF FORMWORK OR REINFORCING STEEL. THE OBSERVATION WILL VERIFY IF THE ACTUAL EXPOSED SUBGRADE IS AS ANTICIPATED BY THE SITE SPECIFIC BORINGS AND DATA REPORTS.
4. NO BACKFILL SHALL BE PLACED BEHIND CANTILEVERED, FREE TOP WALLS UNTIL THE CONCRETE HAS ATTAINED 100 PERCENT OF ITS SPECIFIED 28 DAY COMPRESSIVE STRENGTH.

# FORMWORK, SHORING, AND BRACING

1. STRUCTURES SHOWN ON THE DRAWINGS HAVE BEEN DESIGNED FOR STABILITY UNDER FINAL CONDITIONS ONLY. DESIGN SHOWN DOES NOT INCLUDE NECESSARY COMPONENTS OR EQUIPMENT FOR STABILITY OF THE STRUCTURES DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR WORK RELATING TO CONSTRUCTION ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS REQUIRED TO SAFELY PERFORM THE WORK SHOWN.
2. TEMPORARY SHORING SHALL REMAIN IN PLACE UNTIL ELEVATED CONCRETE FLOOR OR SLABS HAVE REACHED 80 PERCENT OF THE 28 DAY COMPRESSIVE STRENGTH AS DETERMINED BY FIELD CYLINDER BREAKS.
3. "BURY"BARS OR "CARRIER"BARS ARE NOT ALLOWED FOR THE BOTTOM MATS OF REINFORCING IN ALL ELEVATED SLABS AND ARE NOT ALLOWED FOR THE TOP MATS OF REINFORCING IN ELEVATED SLABS LESS THAN 12 INCHES THICK.

# CONCRETE REINFORCING

1. REINFORCING STEEL:
   TYPICAL: ASTM A615, GRADE 60
2. FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CRSI MSP-1 "MANUAL OF STANDARD PRACTICE"AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE".
3. MINIMUM REINFORCING FOR CONCRETE WALLS AND SLABS SHALL BE AS FOLLOWS:

| THICKNESS | REINF EACH WAY | LOCATION |
|---|---|---|
| 6" | #4@12" | CENTERED |
| 8" | #5@12" | CENTERED |
| 10" | #4@12" | EACH FACE |
| 12" | #5@12" | EACH FACE |

PROVIDE LARGER SIZES AND MORE REINFORCING IN SECTIONS OF CONCRETE WHERE REQUIRED BY THE DETAILS ON THE DRAWINGS OR BY THE SPECIFICATIONS.

4. CONCRETE COVER FOR REINFORCING, UNLESS SHOWN OTHERWISE, SHALL BE:

| | |
|---|---|
| WHEN PLACED ON GROUND: | 3" |
| OTHER CONCRETE SURFACES | 2" |

5. REFER TO WALL CORNER AND WALL INTERSECTION REINFORCING DETAIL 0330-003. WALL CORNER REINFORCING SIZES AND SPACINGS SHALL BE AS SHOWN ON THE DRAWINGS AND REFERENCED TO THIS DETAIL. TYPICAL HORIZONTAL WALL REINFORCING SHALL LAP WITH THE CORNER HORIZONTAL REINFORCING.
6. 90 DEGREE BENDS, UNLESS OTHERWISE SHOWN, SHALL BE ACI 318 STANDARD HOOKS.
7. WALL CORNER AND WALL INTERSECTION REINFORCEMENT BARS SHALL BE CONTINUOUS AROUND CORNERS AND THROUGH COLUMNS OR PILASTERS. REINFORCEMENT SHALL BE EXTENDED INTO CONNECTING WALLS AND LAPPED ON THE OPPOSITE FACE OF THE CONNECTING WALLS, AS INDICATED IN DETAIL 0330-003.
8. WALL FOOTING CORNER AND INTERSECTION REINFORCEMENT BARS SHALL BE EXTENDED INTO CONNECTING FOOTINGS AND LAPPED ON THE OPPOSITE FACE OF THE CONNECTING FOOTING. OUTSIDE FACE WALL FOOTING REINFORCEMENT SHALL BE LAPPED WITH CORNER BARS.
9. REINFORCING STEEL FOR FOOTINGS AND SLABS ON GRADE SHALL BE ADEQUATELY SUPPORTED ON BAR SUPPORTS WITH SPACERS TO KEEP REINFORCING ABOVE THE PREPARED GRADE. LIFTING REINFORCING OFF GRADE DURING CONCRETE PLACEMENT IS NOT PERMITTED.
10. PROVIDE ADDITIONAL STEEL REINFORCEMENT AROUND OPENINGS IN ACCORDANCE WITH DETAILS 0330-001.
11. LOCATE TOP MAT OF STEEL REINFORCEMENT IN HORIZONTAL CONSTRUCTION JOINTS CONTAINING PLASTIC OR RUBBER WATERSTOPS IN ACCORDANCE WITH DETAIL 0315-154.
12. REINFORCEMENT BENDS AND LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE FOLLOWING MINIMUM REQUIREMENTS:

| CONCRETE DESIGN STRENGTH = 4,000 PSI MIN AT 28 DAYS | | GRADE 60 REINFORCING STEEL | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| BAR SIZE | | #3 | #4 | #5 | #6 | #7 | #8 | #9 | #10 | #11 |
| LAP SPLICE LENGTH | | | | | | | | | | |
| SPACING = 3" | TOP BAR* | 1'-4" | 1'-8" | 2'-1" | 3'-0" | 5'-2" | 6'-8" | 8'-6" | 10'-10" | 13'-4" |
| | OTHER BAR | 1'-4" | 1'-4" | 1'-8" | 2'-4" | 4'-0" | 5'-2" | 6'-7" | 8'-4" | 10"-3" |
| SPACING = 4" | TOP BAR* | 1'-4" | 1'-8" | 2'-0" | 2'-5" | 3'-10" | 5'-0" | 6'-5" | 8'-1" | 10'-0" |
| | OTHER BAR | 1'-4" | 1'-4" | 1'-7" | 1'-10" | 3'-0" | 3'-11" | 4'-11" | 6'-3" | 7'-8" |
| SPACING ≥ 6" | TOP BAR* | 1'-4" | 1'-8" | 2'-0" | 2'-5" | 3'-6" | 4'-0" | 5'-0" | 6'-2" | 7'-5" |
| | OTHER BAR | 1'-4" | 1'-4" | 1'-7" | 1'-10" | 2'-9" | 3'-1" | 3'-10" | 4'-9" | 5'-8" |
| EMBEDMENT LENGTH | | | | | | | | | | |
| SPACING = 3" | TOP BAR* | 1'-0" | 1'-3" | 1'-8" | 2'-4" | 4'-0" | 5'-2" | 6'-7" | 8'-4" | 10'-3" |
| | OTHER BAR | 1'-0" | 1'-0" | 1'-3" | 1'-10" | 3'-1" | 4'-0" | 5'-1" | 6'-5" | 7'-11" |
| SPACING = 4" | TOP BAR* | 1'-0" | 1'-3" | 1'-7" | 1'-10" | 3'-0" | 3'-11" | 4'-11" | 6'-3" | 7'-8" |
| | OTHER BAR | 1'-0" | 1'-0" | 1'-3" | 1'-5" | 2'-4" | 3'-0" | 3'-10" | 4'-10" | 5'-11" |
| SPACING ≥ 6" | TOP BAR* | 1'-0" | 1'-3" | 1'-7" | 1'-10" | 2'-9" | 3'-1" | 3'-10" | 4'-9" | 5'-8" |
| | OTHER BAR | 1'-0" | 1'-0" | 1'-3" | 1'-5" | 2'-1" | 2'-5" | 3'-0" | 3'-8" | 4'-5" |

1. LAP LENGTHS ARE BASED ON MINIMUM CONCRETE COVER OF 2". LONGER LENGTHS ARE REQUIRED FOR CONCRETE COVER LESS THAN 2".
2. TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12 INCHES OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.
3. WHERE 3000 PSI CONCRETE IS USED, INCREASE ABOVE LENGTHS BY 16 PERCENT. WHERE 3500 PSI CONCRETE IS USED, INCREASE ABOVE LENGTHS BY 7 PERCENT.

# CAST IN PLACE CONCRETE

1. 28-DAY COMPRESSIVE STRENGTHS:

| | |
|---|---|
| EQUIPMENT PADS: | 4000 PSI (4500 PSI @ 56-DAYS) |
| CURBS AND SIDEWALKS: | 3000 PSI |
| DUCT BANKS AND PIPE ENCASEMENTS NOT INTEGRAL WITH FOUNDATIONS: | 3000 PSI |

3. DESIGN STRENGTHS ARE SAME AS 28-DAY COMPRESSIVE STRENGTHS.
4. CONTINUOUS WATERSTOP AS SPECIFIED SHALL BE INSTALLED IN CONSTRUCTION JOINTS OF LIQUID CONTAINMENT BASINS, CHANNELS, AND BELOW GRADE STRUCTURES, EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE.
5. CONSTRUCTION JOINTS INDICATED ARE SUGGESTED LOCATIONS. CONTRACTOR MAY REVISE LOCATION OF JOINTS, SUBJECT TO SPECIFIED REQUIREMENTS. LAYOUT SHOWING ALL CONSTRUCTION JOINT LOCATIONS SHALL BE SUBMITTED FOR REVIEW BY ENGINEER.
6. ROUGHEN AND CLEAN CONSTRUCTION JOINTS IN WALLS AND SLABS AS SPECIFIED PRIOR TO PLACING ADJACENT CONCRETE.
7. COORDINATE PLACEMENT OF OPENINGS, CURBS, DOWELS, SLEEVES, CONDUITS, BOLTS AND INSERTS PRIOR TO PLACEMENT OF CONCRETE.
8. NO ALUMINUM CONDUIT OR PRODUCTS CONTAINING ALUMINUM OR ANY OTHER MATERIAL INJURIOUS TO THE CONCRETE SHALL BE EMBEDDED IN THE CONCRETE.
9. DO NOT PLACE CONDUIT PARALLEL TO BEAM OR COLUMN REINFORCEMENT UNLESS SPECIFICALLY INDICATED IN DRAWINGS.
10. PATCH FORM TIE HOLES IN ACCORDANCE WITH DETAILS 0310-051.

# WELDING

1. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS):
   D1.1, STRUCTURAL WELDING CODE STEEL
   D1.2, STRUCTURAL WELDING CODE ALUMINUM
   D1.6, STRUCTURAL WELDING CODE STAINLESS STEEL
2. REPAIR WELDS FOUND DEFECTIVE IN ACCORDANCE WITH AWS D1.1 SECTION 5.26.
3. BUTT JOINT WELDS SHALL BE COMPLETE JOINT PENETRATION (CJP) UNLESS INDICATED OTHERWISE.

# STRUCTURAL STEEL AND METAL FABRICATIONS

1. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:
   STAINLESS STEEL SHAPES A276
2. ALUMINUM SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:

| | |
|---|---|
| STRUCTURAL SHAPES | B308 |
| PLATES | B209 |

3. STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION, CURRENT EDITION, AND CURRENT OSHA STANDARDS.
4. FASTENERS SHALL BE HIGH STRENGTH BOLTS CONFORMING TO THE FOLLOWING ASTM STANDARDS EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE:
   ANCHOR BOLTS (AB) AND MACHINE BOLTS (MB)
   STAINLESS STEEL F593, AISI TYPE 316, CONDITION CW
5. ITEMS TO BE EMBEDDED IN CONCRETE SHALL BE CLEAN AND FREE OF OIL, DIRT AND PAINT.
6. NO HOLES OTHER THAN THOSE SPECIFICALLY DETAILED SHALL BE ALLOWED THROUGH STRUCTURAL STEEL MEMBERS. NO CUTTING OR BURNING OF STRUCTURAL STEEL IS PERMITTED WITHOUT THE APPROVAL OF THE ENGINEER.

# DEFERRED SUBMITTALS

1. DEFERRED SUBMITTALS ARE THOSE PORTIONS OF THE DESIGN WHICH ARE NOT SUBMITTED AT THE TIME OF PERMIT APPLICATION AND WHICH ARE TO BE SUBMITTED TO THE PERMITTING AGENCY FOR ACCEPTANCE PRIOR TO INSTALLATION OF THAT PORTION OF THE WORK OR ARE REQUIRED TO BE SUBMITTED FOR REVIEW ONLY BY THE ENGINEER.
2. THE FOLLOWING IS A LIST OF DEFERRED SUBMITTALS PER FBC SECTION 107.3.4.1 THAT ARE EXPECTED TO CONTAIN STRUCTURAL CALCULATIONS OR SAFETY RELATED SYSTEM INFORMATION FOR REVIEW TO MEET BUILDING PERMITTING REQUIREMENTS FOR DESIGNED SYSTEMS. PRIOR TO INSTALLATION OF THE INDICATED STRUCTURAL ELEMENT, EQUIPMENT, DISTRIBUTION SYSTEM, OR COMPONENT OR ITS ANCHORAGE, THE CONTRACTOR SHALL SUBMIT THE REQUIRED CALCULATIONS AND SUPPORTING DATA AND DRAWINGS FOR REVIEW AND ACCEPTANCE BY THE ENGINEER. ADDITIONALLY, ACCEPTANCE INDICATED ON THE ENGINEER'S COMMENT FORM, ALONG WITH THE COMPLETED, FINAL SUBMITTAL SHALL THEN BE SUBMITTED BY THE CONTRACTOR TO THE PERMITTING AGENCY AND APPROVED PRIOR TO INSTALLATION OF THESE ITEMS.

| SPECIFICATION SECTION | CODE REQUIRED DEFERRED SUBMITTALS FOR REVIEW BY PERMITTING AGENCY |
|---|---|
| 01 88 15 | ANCHORAGE AND BRACING |
| 03 40 00 | PRECAST CONCRETE |
| 06 82 00 | GLASS-FIBER-REINFORCED PLASTIC |
| 40 05 15 | PIPING SUPPORT SYSTEMS |
| OTHER | ANY EQUIPMENT OR COMPONENT IN WHICH A TECHNICAL SPECIFICATION REQUIRES SUBMITTAL OF EQUIPMENT OR ANCHORAGE SYSTEM CALCULATIONS |

| NO. | DATE | DSGN | DR | CHK | CHECKER | BY | APVD | REVISION |
|---|---|---|---|---|---|---|---|---|
| | | R KOEKEMOER | P RAYMONT | | APVD | R KOEKEMOER | | |



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SOUTHWEST REGIONAL WATER RECLAMATION FACILITY - RECHARGE WELL SYSTEM
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FLORIDA

GENERAL
STRUCTURAL NOTES



100% DESIGN DOCUMENTS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

| | |
|---|---|
| DATE | DECEMBER 2015 |
| PROJ | 659297 |
| DWG | 001-G-104 |
| SHEET | 05 of 51 |

FILENAME: 001-G-1004_659297.dgn PLOT DATE: 12/17/2015 PLOT TIME: 5:57:59 AM

# PIPE AND FITTING SYMBOLS

| DOUBLE LINE | SINGLE LINE | |
|---|---|---|
| | | EXISTING PIPE |
| | | NEW PIPE |
| | | EXISTING PIPE TO BE ABANDONED |
| | | EXISTING PIPE TO BE REMOVED |
| | | WELDED JOINT |
| | | GROOVED END JOINT |
| | | FLANGED JOINT |
| | | MECHANICAL JOINT & PROPRIETARY RESTRAINED JOINT |
| | | BELL & SPIGOT JOINT (LEADED) |
| | | HUB & SPIGOT JOINT (RUBBER GASKET) |
| | | BALL JOINT |
| | | ADAPTER SIDE GROOVED END ADAPTER FLANGE |
| | | FLANGED COUPLING ADAPTER |
| | | FLEXIBLE COUPLING |
| | | METAL BELLOWS EXP JOINT |
| | | ELASTOMER BELLOWS EXP JOINT |
| | | ELBOW UP |
| | | ELBOW DOWN |
| | | TEE UP |
| | | TEE DOWN |
| | | LATERAL UP |
| | | LATERAL DOWN |
| | | CONCENTRIC REDUCER |
| | | ECCENTRIC REDUCER |

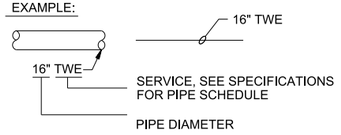
| DOUBLE LINE | SINGLE LINE | |
|---|---|---|
| | | REDUCING BUSHING |
| | | UNION |
| | | CAP |
| | | ANCHOR |
| | | ELBOW, 90 DEGREE |
| | | CROSS |
| | | TEE |
| | | ELBOW, 45 DEGREE |
| | | LATERAL |

NOTES:

1. ONLY FLANGED END CONNECTIONS ARE SHOWN HERE FOR DOUBLE LINE FITTINGS. FITTINGS WITH OTHER END PATTERNS ARE SHOWN SIMILARLY ON THE CONSTRUCTION DRAWINGS. ALSO SEE PIPING SPECIFICATIONS.
2. SYMBOLS SHOWN HERE FOR SINGLE LINE FITTINGS ARE GENERIC ONLY. REFER TO PIPING SPECIFICATIONS FOR SPECIFIC END CONNECTIONS FOR SINGLE LINE PIPE AND FITTINGS.
3. EXISTING PIPE AND EQUIPMENT IS SHOWN LIGHT-LINED AND/OR SCREENED AND IS NOTED AS EXISTING. NEW PIPING AND EQUIPMENT IS SHOWN HEAVY-LINED.

## PIPING DESIGNATION

EXAMPLE:



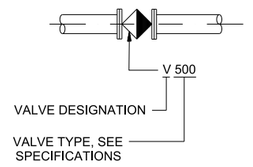

# VALVE SYMBOLS

| SINGLE LINE | DOUBLE LINE | |
|---|---|---|
| | | GATE |
| K | | KNIFE GATE |
| | | BUTTERFLY |
| | | GLOBE |
| | | BALL |
| | | SEATING PORT |
| | | ECCENTRIC PLUG |
| | | PLUG OR COCK |
| | | NEEDLE |
| | | DIAPHRAGM |
| | | PINCH |
| | | SWING CHECK |
| | | BALL CHECK |
| | | HOSE VALVE (HV- X) OR (V-X) X = NO. IN SPECS |
| S | | SAMPLE |
| | | MUD |
| | | PRESSURE RELIEF |
| | | AIR AND/OR VACUUM RELEASE |
| | | REGULATED SIDE PRESSURE CONTROL (INTERNAL PILOT) |
| | | REGULATED SIDE PRESSURE CONTROL (EXTERNAL PILOT) |
| | | MULTI-PORT VALVE, ARROWS INDICATE FLOW PATTERN. SEATING PORTS ARE IMPLIED BY INDICATED FLOW PATTERN. |
| | | TELESCOPING SCUM VALVE |

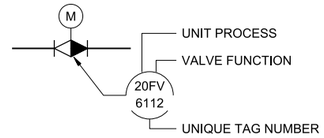
OR

# VALVE DESIGNATIONS

## MANUAL VALVES AND CHECK VALVES

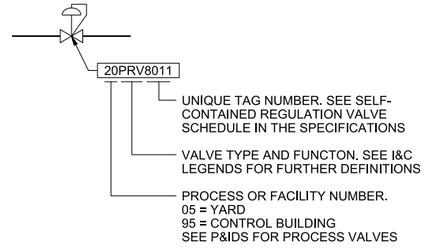



## CONTROL VALVES




NOTE:
SEE I&C LEGENDS FOR FURTHER DEFINITIONS AND ACTUATOR TYPES.

## SELF-CONTAINED REGULATING VALVES




# ACTUATOR SYMBOLS

| | |
|---|---|
| | PNEUMATIC DIAPHRAGM |
| | PNEUMATIC CYLINDER |
| M | ELECTRIC MOTOR |
| H | HYDRAULIC |
| | MANUAL |
| S | SOLENOID |
| E/H | ELECTRO HYDRAULIC |

# MECHANICAL LEGEND AND NOTES

## GENERIC PIPING NOTES

1. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
2. SIZE OF FITTINGS SHOWN ON DRAWINGS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
3. LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS SHOWN IS ONLY APPROXIMATE. CONTRACTOR SHALL DESIGN SUPPORTS AS SPECIFIED.
4. ALL JOINTS SHALL BE WATERTIGHT. WALL PIPES SHALL BE USED WHEREVER PIPING PASSES FROM A STRUCTURE TO BACKFILL.
5. ALL FLEXIBLE CONNECTORS AND COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.
6. SYMBOLS, LEGENDS, AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE DRAWINGS, WHEREVER APPLICABLE. NOT ALL OF THE VARIOUS PIPING COMPONENTS ARE NECESSARILY USED IN THE PROJECT.
7. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT FLANGED, WELDED, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED.
8. NUMBER AND LOCATION OF UNIONS SHOWN ON DRAWINGS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
9. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER.

| NO. | DSGN | DATE | REVISION | BY | APVD |
|---|---|---|---|---|---|
| | DR | T FU | A BARTON | CHK | APVD |
| | | | | CHECKER | T FU |



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SOUTHWEST REGIONAL WATER RECLAMATION FACILITY - RECHARGE WELL SYSTEM
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FLORIDA

GENERAL
PROCESS MECHANICAL
PROCESS MECHANICAL LEGEND

REUSE OF DOCUMENTS: THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE IS THE PROPERTY OF CH2M HILL AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CH2M HILL.

100% DESIGN DOCUMENTS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

| | |
|---|---|
| DATE | DECEMBER 2015 |
| PROJ | 659297 |
| DWG | 001-G-105 |
| SHEET | 06 of 51 |

## GENERAL NOTES

1. CONDUIT, WIRE AND EQUIPMENT SIZES AND LOCATIONS SHOWN ARE FOR BID BASIS ONLY AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL WORK WITH APPROVED SHOP DRAWINGS, WITH THE REQUIREMENTS OF EQUIPMENT PROVIDED, WITH EQUIPMENT FURNISHED BY OWNER FOR INSTALLATION BY CONTRACTOR AND WITH REQUIREMENTS OF OTHER DIVISIONS OF THE CONTRACT AS NECESSARY TO PROVIDE COMPLETE AND WORKING SYSTEMS COMPLYING WITH THE CONTRACT DOCUMENTS. ALL PROPOSED DEVIATIONS FROM CONTRACT DOCUMENTS SHALL BE SUBMITTED AND APPROVED BY ENGINEER BEFORE EXECUTION OF THE AFFECTED WORK.

2. THE TERMS RACEWAY AND CONDUIT ARE USED IN THESE DOCUMENTS TO DENOTE NOT ONLY THE RACEWAY OR CONDUIT ITSELF BUT ALSO ALL JUNCTION BOXES, PULL BOXES, CONDULETS, FITTINGS, CLAMPS, SUPPORTS AND ALL OTHER ITEMS NECESSARY FOR A COMPLETE AND WORKING SYSTEM COMPLYING WITH THE CONTRACT DOCUMENTS.

3. NOTES INDICATED AS "REF", "REFERENCE" OR "REFER TO" ARE PROVIDED TO ASSIST IN LOCATING RELATED CONTRACTUAL REQUIREMENTS BUT ARE NOT CONTRACTUAL INSTRUCTIONS THEMSELVES. MISSING, INCORRECT OR INCOMPLETE REFERENCES SHALL HAVE NO EFFECT ON THE REQUIREMENTS OF THE CONTRACT.

4. AT ITEMS MARKED MSC (MANUFACTURER SUPPLIED OR SPECIFIED CABLE) CONTRACTOR SHALL DETERMINE REQUIREMENTS FOR, AND PROVIDE, CONDUIT AND CABLE AS REQUIRED BY MANUFACTURER AND IN COMPLIANCE WITH CONTRACT DOCUMENTS.

5. EXCEPT AS NOTED BELOW, ALL WIRE AND CABLE, INCLUDING GROUNDED CONDUCTORS ABOVE GRADE AND FIBER OPTIC CABLE, SHALL BE INSTALLED IN RACEWAY AND ENCLOSURES. EXCEPTIONS ARE EQUIPMENT CABLES PROVIDED BY EQUIPMENT MANUFACTURERS AND UL LISTED FOR INSTALLATION OUTSIDE OF CONDUIT, INCLUDING FLOAT SWITCH AND SUBMERSIBLE PUMP CABLES.

6. SPARE RUNS OF CONDUCTORS SHALL BE INSULATED OR TERMINATED AND LABELED AT BOTH ENDS. SPARE RUNS OF FIBER OPTIC STRANDS SHALL BE LABELED AND TERMINATED AT BOTH ENDS. ALL CONDUCTORS AND FIBERS SHALL BE TESTED AFTER INSTALLATION AND TEST REPORTS SHALL BE SUBMITTED. REPLACE ALL DEFECTIVE MATERIAL; DO NOT SUBMIT TEST REPORTS SHOWING DEFECTS.

7. LOCATIONS AND ELEVATIONS OF ELECTRICAL CONNECTIONS, MOTORS, PANEL BOARDS, SWITCH GEAR, TRANSFORMERS, CONTROL CABINETS AND OTHER ITEMS SHOWN ON DOCUMENTS ARE APPROXIMATE ONLY UNLESS DIMENSIONED. COORDINATE EXACT LOCATIONS AND ELEVATIONS WITH REQUIREMENTS OF OTHER DIVISIONS OF THESE DOCUMENTS. IN AREAS WHERE SPACE AVAILABLE IS LIMITED, INCLUDING ALL ELECTRICAL ROOMS AND OTHER SPACES CONTAINING PANELBOARDS, MOTOR CONTROL CENTERS, SWITCHBOARDS OR SWITCHGEAR, PREPARE DIMENSIONED DRAWINGS SHOWING EXACT PROPOSED LOCATIONS OF EQUIPMENT AND VERIFYING THAT EQUIPMENT PROPOSED FOR USE CAN BE INSTALLED AS SHOWN ON PLANS IN COMPLIANCE WITH NEC AND MANUFACTURER'S REQUIREMENTS. SUBMIT THESE DRAWINGS AND RECEIVE APPROVAL BEFORE EXECUTING THE WORK. DO NOT SUBMIT SHOP DRAWINGS FOR EQUIPMENT WHICH IS NOT ACCOMPANIED BY DRAWINGS VERIFYING COMPLIANCE WITH CONTRACT REQUIREMENTS.

8. CONTROL (LADDER LOGIC) DIAGRAMS DEPICT FUNCTIONS REQUIRED, MAJOR COMPONENTS AND THEIR INTERCONNECTIONS, BUT ARE NOT INTENDED TO BE COMPLETE WIRING DIAGRAMS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURERS OF EQUIPMENT PROVIDED TO ENSURE THAT ALL MATERIALS AND LABOR ARE PROVIDED WHICH ARE NECESSARY TO SECURE COMPLETE AND WORKING SYSTEMS WITH ALL FUNCTIONS AND COMPONENTS SHOWN ON THE CONTRACT DOCUMENTS, INCLUDING DIVISION 16 AND INSTRUMENTATION AND CONTROL DOCUMENTS.

9. PROVIDE DISCONNECT SWITCHES WHERE SHOWN, WITH THE SAME NUMBER OF POLES AS THEIR SOURCE CIRCUIT BREAKERS, AND WITH VOLTAGE AND CURRENT RATINGS EQUAL TO OR GREATER THAN THAT OF THE SOURCE CIRCUIT BREAKER'S.

10. PROVIDE FUSED DISCONNECT SWITCHES WHERE SHOWN OR WHERE REQUIRED BY THE UL LISTING OR MANUFACTURER'S REQUIREMENTS FOR THE POWERED EQUIPMENT.

11. THE REQUIREMENTS FOR DISCONNECT SWITCHES SHOWN MAY BE MET BY DISCONNECT SWITCHES PROVIDED BY EQUIPMENT MANUFACTURERS, WHERE ALL REQUIREMENTS OF THE NEC AND THESE DOCUMENTS ARE MET BY THOSE SWITCHES.

12. INSTALL GROUND RINGS AROUND ALL OBJECTS PROVIDED AT OR ABOVE FINISHED GRADE BY THIS PROJECT OR INDICATED ON THE DRAWINGS. GROUND RING SHALL BE #4/0 OR LARGER TINNED BARE COPPER CONDUCTOR. INSTALL GROUND RING AND GROUND CONDUCTORS 30 INCHES BELOW FINISHED GRADE WITH 2 INCH, RED, DETECTABLE, ELECTRICAL WARNING TAPE DIRECTLY ABOVE CONDUCTOR AND 12 INCHES BELOW FINISHED GRADE. MAINTAIN SIX FEET MINIMUM CLEARANCE TO ALL OBJECTS AT OR ABOVE FINISHED GRADE. CAD WELD GROUND RING AND RADIAL GROUND CONDUCTORS TO ALL BURIED GROUND RODS EXCEPT PROVIDE CLAMPS WHERE SHOWN. CAD WELD RADIAL GROUND CABLES TO STEEL REINFORCEMENT MEMBERS IN CONCRETE AT ALL CORNERS AND AT INTERVALS ON STRAIGHT SECTIONS NOT EXCEEDING TWENTY FEET. CONNECT TO LIGHTNING PROTECTION SYSTEMS WHERE REQUIRED ELSEWHERE IN DOCUMENTS. PROVIDE GROUND ROD AT ALL POLE MOUNTED LIGHTING FIXTURES. HAND HOLE GROUNDING REQUIREMENTS ARE DESCRIBED ELSEWHERE IN DOCUMENTS. THE TERM CAD WELD IS USED TO DENOTE EXOTHERMIC WELDS.

13. WHERE RAILINGS, LADDERS, STEPS, GRATINGS, FRAMING, PROCESS EQUIPMENT OR OTHER CONDUCTIVE ITEMS WHICH ARE NORMALLY NOT ENERGIZED ARE INSTALLED OUTDOORS, BOND TO GROUND RING WITH #4/0 MINIMUM TINNED BARE COPPER CONDUCTOR, UL LISTED CLAMPS ABOVE GRADE AND CAD WELDS BELOW GRADE. ITEMS SUCH AS RAILINGS WHICH ARE INSTALLED AS MULTIPLE SECTIONS SHALL BE BONDED TOGETHER WITH #4/0 COPPER CONDUCTOR OR EQUIVALENT TINNED COPPER STRAP TO AVOID ISOLATION FROM A GROUND RING OF ANY ITEM WHICH IS REQUIRED TO BE GROUNDED.

14. CONDUCTIVE ENCLOSURES AND OTHER EXTERIOR METAL COMPONENTS OF INSTRUMENTS AND CONTROLS WHICH ARE NOT NORMALLY ENERGIZED SHALL BE CONNECTED TO GROUND RING WITH #6 MINIMUM TINNED COPPER CONDUCTOR.

15. PROVIDE SURGE SUPPRESSORS ON BOTH ENDS OF ALL LOW VOLTAGE (600 VOLTS OR LESS) BRANCH CIRCUITS, FEEDERS, INSTRUMENTATION AND CONTROL CIRCUITS WHICH ARE NOT ENTIRELY WITHIN A BUILDING PROTECTED BY A LIGHTNING PROTECTION SYSTEM OR ENTIRELY UNDER ITS SLAB.

16. PROVIDE #10 WIRE INSTEAD OF #12 WIRE FOR ALL 20 AMPERE 120 VOLT OR 208 VOLT CIRCUITS EXCEEDING 150 FEET CONDUIT LENGTH.

17. WHERE THE NUMBER OR SIZE OF CONDUCTORS SHOWN TO BE CONNECTED ARE IN EXCESS OF THE CAPACITY OF THE STANDARD TERMINALS OF THE CONNECTED EQUIPMENT, PROVIDE ADDITIONAL TERMINALS, ENCLOSURES, JUNCTION BOXES, PULL SECTIONS, WIRES, CONDUITS AND ALL OTHER MATERIALS AND LABOR AS NECESSARY TO MAKE THE CONNECTIONS SHOWN IN COMPLIANCE WITH THE CONTRACT DOCUMENTS.

18. ALL MATERIALS AND EQUIPMENT PROPOSED FOR USE SHALL BE FULLY RATED AS SPECIFIED AND SCHEDULED IN THE CONTRACT DOCUMENTS AT THE PROJECT ALTITUDE AND MAXIMUM AMBIENT TEMPERATURE.

19. PROVIDE ARC FLASH WARNING AND OTHER SIGNS ON ALL PANELBOARDS, MOTOR CONTROL CENTERS, MOTOR CONTROLLERS, CONTROL PANELS, SWITCHBOARDS AND OTHER EQUIPMENT PROVIDED OR MODIFIED UNDER THIS CONTRACT AND REQUIRED TO BE LABLED BY NEC INCLUDING BUT NOT LIMTED TO PARAGRAPH 110.16 FLASH PROTECTION.

20. COORDINATE SIZE AND INSTALLATION OF ALL EQUIPMENT WITH EXISTING CONDITIONS AND WORK IN OTHER DIVISIONS OF CONTRACT TO ENSURE COMPLIANCE WITH THE NEC, INCLUDING BUT NOT LIMITED TO PARAGRAPH 110.26 SPACES ABOUT ELECTRICAL EQUIPMENT.

21. STANDARD DETAILS INCLUDED IN THESE DOCUMENTS SHALL BE USED WHERE APPLICABLE WHETHER SPECIFICALLY CALLED OUT ON THE PLANS OR NOT. PRACTICES CUSTOMARY TO THE TRADE MAY BE USED ONLY WHERE NO APPLICABLE STANDARD DETAIL CAN BE FOUND IN THESE DOCUMENTS AND WHERE THE CUSTOMARY PRACTICE WILL RESULT IN A COMPLETE AND WORKING SYSTEM IN COMPLIANCE WITH THESE DOCUMENTS.

22. ALL TERMINATIONS OF RIGID METAL CONDUIT IN WALLS OF ENCLOSURES WITHOUT CAST-IN-PLACE THREADED CONDUIT BOSSES, AND WHICH ARE LOCATED OUTDOORS OR IN WET OR DAMP LOCATIONS, SHALL BE MADE USING ALUMINUM MYERS HUBS.

23. REFER TO DOCUMENTS OF OTHER DIVISIONS OF CONTRACT, INCLUDING BUT NOT LIMITED TO PROCESS MECHANICAL AND HVAC, FOR LOCATIONS OF PROCESS, INSTRUMENTATION, CONTROL, HVAC AND OTHER EQUIPMENT REQUIRING ELECTRICAL, FIBER OPTIC OR RACEWAY-ONLY CONNECTIONS TO BE PROVIDED UNDER THIS DIVISION OF CONTRACT. ALL EQUIPMENT LOCATIONS SHOWN ON DRAWINGS IN THIS DIVISION ARE APPROXIMATE ONLY UNLESS DIMENSIONED.

24. PROVIDE ADDITIONAL RACEWAY, WIRING AND CONNECTIONS AS NECESSARY FOR MOTOR HEATERS, TEMPERATURE PROTECTIVE DEVICES AND OTHER MOTOR AUXILIARIES WHERE RECOMMENDED BY EQUIPMENT MANUFACTURERS, SHOWN IN CONTROL DIAGRAMS OR ON PLANS OR REQUIRED IN SPECIFICATIONS.

25. ALL SHEET METAL JUNCTION BOXES, TERMINAL JUNCTION BOXES, CONTROL PANELS AND OTHER SHEET METAL ELECTRICAL ENCLOSURES SHALL BE NEMA 4-X STAINLESS STEEL WITH FAST OPERATING CLAMP ASSEMBLIES. PROVIDE HOFFMAN SUFFIX TYPE SSLP WITH AFC412SS CLAMPS OR APPROVED EQUALS. PROVIDE TERMINAL JUNCTION BOXES AND CONTROL PANELS WITH REMOVABLE INTERIOR STEEL PANELS FACTORY PAINTED WHITE.

26. ALL FABRICATED ASSEMBLIES SUPPORTING ELECTRICAL EQUIPMENT PROVIDED UNDER THIS DIVISION OF CONTRACT SHALL BE UL LISTED INDIVIDUALLY, UL LISTED AS PART OF AN ASSEMBLY OR SHALL BE FABRICATED TO A DESIGN PREPARED BY A STRUCTURAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF FLORIDA OR OTHERWISE PERMITTED TO PRACTICE ENGINEERING IN THE STATE OF FLORIDA. WHERE DETAILS IN THE CONTRACT DOCUMENTS CONTAIN SPECIFIC DIMENSIONS, SIZES, WELD INSTRUCTIONS OR SIMILAR INFORMATION, THESE SHALL BE INTERPRETED AS MINIMUM CONTRACT REQUIREMENTS AND MAY BE SUPERSEDED BY UL OR DESIGN REQUIREMENTS ABOVE.

27. AT ALL LOCATIONS WHERE CONTRACTOR IS DIRECTED TO CUT OFF CONDUITS THROUGH CONCRETE SLAB AND GROUT CLOSED, CONTRACTOR SHALL FIRST DRILL 1-1/2 INCHES DEEP INTO CONCRETE AND USE NON-SHRINK GROUT TO BACKFILL HOLE FLUSH AND SMOOTH WITH EXISTING CONCRETE SURFACE.

28. COORDINATE EARTH WORK AND INSTALLATION OF ELECTRICAL ITEMS WITH INTERFERENCES SHOWN ON DOCUMENTS OF ALL DIVISIONS OF CONTRACT, INCLUDING CIVIL AND YARD PIPING. REPORT ALL DAMAGE AT ONCE TO OWNER AND ENGINEER AND REPAIR AS DIRECTED AT NO CHANGE IN CONTRACT.

29. ALL CONDUCTORS IN DUCT BANK, HAND HOLES, BURIED OR OUTDOOR CONDUIT, AND DIRECT BURIED SHALL BE PROVIDED IN TRAY RATED CABLE TYPE TC UL LISTED FOR CONTINUOUS SUBMERSION.

30. PROVIDE FOUR INCH HIGH CONCRETE HOUSEKEEPING PAD TYPE "E" PER STANDARD DETAIL 0330-056 UNDER ALL FLOOR MOUNTED EQUIPMENT PROVIDED OR INSTALLED UNDER THIS CONTRACT WHICH IS NOT EQUIPPED WITH MINIMUM 4 INCH HIGH LEGS.

31. PROVIDE RACKS AND SUPPORT ARMS ON WALLS OF ALL HANDHOLES. ROUTE CABLES ON, AND SECURED TO, THESE SUPPORTS. CABLES SHALL NOT BE ROUTED DIRECTLY FROM ONE DUCT TO ANOTHER.

32. REQUIREMENT FOR INSTALLATION OF ANALOG CABLES IN FERROUS CONDUIT ELSEWHERE IN DOCUMENTS, AND OTHER CONDUIT APPLICATION REQUIREMENTS CONTRARY TO REQUIREMENTS BELOW, ARE REMOVED. AT THE SPECIFIC REQUEST OF PLANT STAFF, PVC SCHEDULE 80 CONDUIT SHALL BE USED FOR ALL UNDERGROUND STRAIGHT RUNS AND RIGID ALUMINUM CONDUIT SHALL BE USED FOR ALL ABOVE GRADE RUNS. PVC COATED ALUMINUM RMC SHALL BE USED FOR BELOW GRADE ELLS AND RISERS AND ABOVE GRADE RUNS IN AREAS CORROSIVE TO ALUMINUM.

    CONTRACTOR IS ADVISED THAT REMOVAL OF FERROUS CONDUIT REQUIREMENT FOR ANALOG SIGNALS DOES NOT IN ANY WAY ALTER THE REQUIREMENT THAT ALL SYSTEMS PROVIDED UNDER THIS CONTRACT SHALL BE COMPLETE AND WORKING AND IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS. IF CONTRACTOR BELIEVES FOR ANY REASON, INCLUDING REMOVAL OF FERROUS CONDUIT REQUIREMENT, THAT THIS REQUIREMENT CANNOT BE MET, CONTRACTOR SHALL TAKE SPECIFIC EXCEPTION IN BID.

| NO. | DATE | DSGN | DR | CHK | BY | APVD |
|---|---|---|---|---|---|---|
| REVISION | | D NICHOLSON | M REICHERT | M WAYNE | D NICHOLSON | |



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SOUTHWEST REGIONAL WATER RECLAMATION FACILITY - RECHARGE WELL SYSTEM
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FLORIDA

GENERAL

ELECTRIAL GENERAL NOTES

NTS
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

| | |
|---|---|
| DATE | DECEMBER 2015 |
| PROJ | 659297 |
| DWG | 001-G-106 |
| SHEET | 07 of 51 |

100% DESIGN DOCUMENTS

FILENAME: 001-G-1006_659297.dgn PLOT DATE: 12/16/2015 PLOT TIME: 9:20:50 AM

## ONE LINE DIAGRAMS

| SYMBOL | DESCRIPTION |
|---|---|
| | DRAWOUT AIR CIRCUIT BREAKER, LOW VOLTAGE |
| 400 | CIRCUIT BREAKER, THERMAL MAGNETIC TRIP SHOWN, 3 POLE, UNO |
| AS/AF or AT/AF | CIRCUIT BREAKER, STATIC TRIP UNIT, SENSOR AMP TRIP AND FRAME RATINGS SHOWN, 3 POLE, UNO |
| 100/M | CIRCUIT BREAKER, MAGNETIC TRIP ONLY, TRIP RATING SHOWN, 3 POLE, UNO |
| 100 | SWITCH, CURRENT RATING INDICATED, 3 POLE, UNO |
| 60 (3) | FUSE, CURRENT RATING AND QUANTITY INDICATED |
| 1 | MAGNETIC STARTER WITH OVERLOAD, NEMA SIZE INDICATED, FVNR UNO |
| AFD | ELECTRONIC STARTER/SPEED CONTROL<br>AFD = AC ADJUSTABLE FREQUENCY DRIVE<br>DC = DC ADJUSTABLE SPEED DRIVE<br>RVAT = REDUCED VOLTAGE AUTO TRANSFORMER TYPE<br>RVRT = REDUCED VOLTAGE REACTOR TYPE |
| | DRAWOUT CIRCUIT BREAKER, MEDIUM VOLTAGE |
| | MOTOR CONTACTOR, MEDIUM VOLTAGE |
| | RVSS = REDUCED VOLTAGE SOFT STARTER |
| | CABLE OR BUS CONNECTION POINT |
| K | KEY INTERLOCK |
| | SURGE ARRESTER (GAP TYPE) |
| 10 | CAPACITOR - KVAR INDICATED, 3 PHASE |
| 3 | AC MOTOR, SQUIRREL CAGE INDUCTION - HORSEPOWER INDICATED |
| G<br>500/625 | GENERATOR, KW/KVA RATING SHOWN |
| | UTILITY REVENUE METER |
| | GROUND |
| 15 KVA<br>480-120/240V<br>1 PH | TRANSFORMER, SIZE, VOLTAGE RATINGS, AND PHASE INDICATED |
| | SHIELDED ISOLATION TRANSFORMER |
| 480-120V<br>(3) | POTENTIAL TRANSFORMER, VOLTAGE RATING AND QUANTITY INDICATED |
| 100:5<br>(3) | CURRENT TRANSFORMER, RATIO(100:5) AND QUANTITY INDICATED (3) |
| | CONNECTION POINT TO EQUIPMENT SPECIFIED IN OTHER DIVISIONS. RACEWAY, CONDUCTOR AND CONNECTION IN THIS DIVISION |
| SDP | SURGE PROTECTIVE DEVICE |
| DPM | DIGITAL POWER METER WITH MODBUS CONNUMICATIONS LINK TO DEVICE SHOWN |

## CONTROL DIAGRAMS

| SYMBOL | DESCRIPTION |
|---|---|
| | PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY OPEN |
| | PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY CLOSED |
| HAND OFF REMOTE | SELECTOR SWITCH - MAINTAINED CONTACT - CHART IDENTIFIES OPERATION WHEN NEEDED FOR CLARITY: |

| | POSITION | | |
|---|---|---|---|
| CKT | HAND | OFF | REMOTE |
| 1 | X | O | O |
| 2 | O | O | X |

X - CLOSED CONTACT
O - OPEN CONTACT

| | |
|---|---|
| | TOGGLE SWITCH, ON-OFF TYPE |
| ON OFF | SELECTOR SWITCH, ON-OFF TYPE |
| A | INDICATING LIGHT, PUSH-TO-TEST, LETTER INDICATES COLOR |
| A | INDICATING LIGHT - LETTER INDICATES COLOR<br>A - AMBER G - GREEN S - STROBE<br>B - BLUE R - RED<br>C - CLEAR W - WHITE |
| ETM | ELAPSED TIME METER |
| M | MOTOR STARTER CONTACTOR COIL |
| CRX | CONTROL RELAY, X INDICATES NUMERICAL ORDER IN CIRCUIT |
| TDR X | TIME DELAY RELAY, X INDICATES NUMERICAL ORDER IN CIRCUIT |
| SV X | SOLENOID VALVE, X INDICATES NUMERICAL ORDER IN CIRCUIT |
| | CONTACT - NORMALLY OPEN |
| | CONTACT - NORMALLY CLOSED |
| | REMOTE DEVICE |
| | TIME DELAY RELAY CONTACT, NORMALLY OPEN, CLOSES WHEN ENERGIZED AND TIMED OUT |
| | TIME DELAY RELAY CONTACT, NORMALLY CLOSED, OPENS WHEN ENERGIZED AND TIMED OUT |
| | TIME DELAY RELAY CONTACT, CLOSES WHEN ENERGIZED, OPENS WHEN DE-ENERGIZED AND TIMED OUT |
| | TIME DELAY RELAY CONTACT, OPENS WHEN ENERGIZED, CLOSES WHEN DE-ENERGIZED AND TIMED OUT |
| | TERMINAL BLOCK, REMOTE |
| | TERMINAL BLOCK, INTERNAL |
| | FUSE, RATING INDICATED |
| CPT<br>120V | TRANSFORMER, CONTROL POWER |

NOTES:

1. THESE ARE STANDARD LEGEND SHEETS. SOME SYMBOLS AND ABBREVIATIONS MAY APPEAR ON THE LEGEND AND NOT ON THE DRAWINGS.
2. FOR ADDITIONAL ABBREVIATIONS OF OTHER DIVISIONS (HVAC, MECHANICAL, AND STRUCTURAL/ARCHITECTURAL) SEE OTHER LEGENDS.

## GROUND SYSTEM PLAN

| SYMBOL | DESCRIPTION |
|---|---|
| | GROUND ROD (2605-235) |
| | GROUND ROD IN TEST WELL WITH CLAMP (NOT CAD WELD) (2605-202) |
| G | CAD WELD CABLE CONNECTION |
| R | CAD WELD CABLE TO REBAR WITH MINIMUM 2-INCH CONCRETE COVER |
| C | CLAMP ON BOLTED CONNECTION TO EQUIPMENT OR STRUCTURAL ELEMENT |

## ABBREVIATIONS

| | |
|---|---|
| A | AMMETER, AMPERES |
| AIC | AVAILABLE INTERRUPTING CURRENT |
| BC | BY-PASS CONTACTOR |
| C | CONDUIT |
| CB | CIRCUIT BREAKER |
| CE | CONCRETE ENCASED |
| CPT | CONTROL POWER TRANSFORMER |
| CR | CONTROL RELAY |
| CU | COPPER |
| DOE | DELAY ON ENERGIZATION |
| DPM | DIGITAL POWER METER |
| DWG | DRAWING |
| EXST | EXSTING |
| FO | FIBER OPTIC |
| FOC | FIBER OPTIC CABLE |
| G, GND | GROUND |
| HH | HANDHOLE |
| HZ | HERTZ |
| IC | ISOLATION CONTACTOR |
| KVA | KILOVOLT AMPERES |
| KV | KILOVOLT |
| LS1 | LONG TIME, SHORT TIME, INSTANTANEOUS |
| LV | LOW VOLTAGE |
| MCC | MOTOR CONTROL CENTER |
| MIN | MINUTE, MINIMUM |
| MTD | MOUNTED |
| MTS | MANUAL TRANSFER SWITCH |
| MV | MEDIUM VOLTAGE |
| NEC | NATIONAL ELECTRICAL CODE |
| NFPA | NATIONAL FIRE PROTECTION ASSOCIATION |
| OL | OVERLOAD |
| PH | PHASE |
| RMS | ROOT MEAN SQUARE |
| RVSS | REDUCES VOLTAGE SOLID STATE STARTER |
| SEC | SECONDS |
| SPD | SURGE PROTECTIVE DEVICE |
| SW | SOUTH WEST |
| TDR | TIME DELAY RELAY |
| TYP | TYPICAL |
| V | VOLTS, VOLTAGE, VOLT METER |
| W | WITH |
| XFMR | TRANSFORMER |
| Z | IMPEDANCE |

## LIGHTING FIXTURE SCHEDULE

| SYMBOL | MARK | VOLTS | LAMP TYPE | LAMP WATTS | LAMP QTY | MOUNT | DESCRIPTION | MAKE/MODEL |
|---|---|---|---|---|---|---|---|---|
| | A | 120 | LED | 1.73 | 63 | CONCRETE POLE, 10 FT AFG | CUT-OFF SHOE BOX LIGHTING FIXTURE, ALL ALUMINUM, WITH DIE CAST BODY AND DOOR, TEMPERED GLASS LENS, MOUNTED ON NINE INCH ARM, SEALED AGAINST ENTRY OF INSECTS, ALUMINUM REFLECTOR, SR3 TYPE II DISTRIBUTION WITH HINGED DOOR ACCESS. PROVIDE MANUAL ON-OFF SWITCH 48 INCHES AFG ON POLE. UL LISTED FOR OUTDOOR LOCATIONS. CONTRACTOR SHALL HAVE STRUCTURAL CALCULATIONS PERFORMED TO DETERMINE REQUIRED POLE AND HARDWARE STRENGTH AND DEPTH OF BURIAL. CALCULATIONS SHALL BE BASED ON CHARACTERISTICS OF LIGHT FIXTURE AND DESIGN CRITERIA ON STRUCTURAL NOTES SHEET OF THESE DOCUMENTS AND SHALL BE PERFORMED BY AN ENGINEER QUALIFIED UNDER FLORIDA STATUTES 471.003 EITHER BY LICENSURE OR FULL TIME EMPLOYMENT BY POLE MANUFACTURER. | LITHONIA KAD LED SERIES<br>COOPER/LUMARK RIDGEWAY SERIES<br>HUBBELL/ SPAULDING CIMARRON SERIES |

| NO. | DATE | REVISION | DR | CHK | BY | APVD |
|---|---|---|---|---|---|---|
| DSGN | D NICHOLSON | | M REICHERT | M WAYNE | D NICHOLSON | |



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FACILITY - RECHARGE WELL SYSTEM
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FLORIDA

CH2MHILL®

GENERAL
ELECTRIAL LEGEND 1
AND LIGHTING FIXTURE SCHEDULE

NTS
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

| | |
|---|---|
| DATE | DECEMBER 2015 |
| PROJ | 659297 |
| DWG | 001-G-107 |
| SHEET | 08 of 51 |

100% DESIGN DOCUMENTS

FILENAME: 001-G-1007_659297.dgn PLOT DATE: 12/16/2015 PLOT TIME: 9:20:51 AM

| SYMBOL | DESCRIPTION |
|---|---|

## POWER SYSTEM PLAN

| | |
|---|---|
| | CONNECTION POINT TO EQUIPMENT SPECIFIED. RACEWAY, CONDUCTOR,TERMINATION AND CONNECTION IN THIS DIVISION. |
| MCC-A | MAJOR ELECTRICAL COMPONENT OR DEVICE - NAME OR IDENTIFYING SYMBOL AS SHOWN. |
| LPXXA | PANELBOARD - SURFACE MOUNTED |
| L = PANELBOARD LETTER OR NUMBER<br>XX = FACILITY NUMBER<br>A = LP - LOW VOLTAGE PANEL<br>DP - DISTRIBUTION PANEL | |
| | PANELBOARD - FLUSH MOUNTED |
| | TERMINAL JUNCTION BOX |
| M | MOTOR, SQUIRREL CAGE INDUCTION |
| G | GENERATOR, VOLTAGE AND SIZE AS INDICATED. |
| LPXXA | HOME RUN - DESTINATION SHOWN |
| or G | EXPOSED CONDUIT AND CONDUCTORS* |
| or G | CONCEALED CONDUIT AND CONDUCTORS* |

NOTE:
ALL UNMARKED CONDUIT RUNS CONSIST OF TWO NO. 12, ONE NO. 12 GROUND CONDUCTORS IN 3/4" CONDUIT. RUNS MARKED WITH CROSSHATCHES INDICATE NUMBER OF NO. 12 CONDUCTORS. CROSSHATCH WITH SUBSCRIPT "G" INDICATES GREEN GROUND WIRE.

| | |
|---|---|
| G | CROSSHATCHES WITH BAR INDICATE NO.10 CONDUCTOR. SIZE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODE. |
| [A1] | CONDUIT AND CONDUCTOR CALLOUT, SEE LEGEND. |
| | CONDUIT DOWN |
| | CONDUIT UP |
| | CONDUIT, STUBBED AND CAPPED |
| | CONDUIT TERMINATION AT CABLE TRAY |
| EX | EXISTING CONDUIT/ DUCT BANK |
| BD | BUS DUCT - SEE SPECIFICATIONS |
| FO | FIBER OPTIC CONDUIT |
| DB | DIRECT BURIED CONDUIT |
| | CONCRETE ENCASED CONDUIT |
| XXXX | CONCRETE ENCASED DUCT BANK WHERE XXXX IS THE DUCT BANK ID. SEE DUCT BANK SCHEDULE |
| T | TRANSFORMER |
| J or HH | GENERAL CONTROL OR WIRING DEVICE. LETTER SYMBOLS OR ABBREVIATIONS INDICATE TYPE OF DEVICE |
| CS | CONTROL STATION, SEE CONTROL DIAGRAMS FOR CONTROL DEVICE(S) REQUIRED. |
| 30 | NONFUSED DISCONNECT SWITCH, CURRENT RATING INDICATED, 3 POLE |
| 60/40 | FUSED DISCONNECT SWITCH, CURRENT RATING INDICATED (60/40, 60=SWITCH RATING / 40=FUSE RATING) 3 POLE |
| 2 | COMBINATION CIRCUIT BREAKER AND MAGNETIC STARTER, NEMA SIZE INDICATED |

| SYMBOL | DESCRIPTION |
|---|---|

## POWER SYSTEM PLAN

| | |
|---|---|
| 100/40 | BREAKER, SEPARATELY MOUNTED, CURRENT RATING INDICATED (100/40, 100 = FRAME SIZE; 40 = TRIP RATING) 3 POLE |
| L 30 | LIGHTING CONTACTOR, CURRENT RATING INDICATED |
| 2 | STARTER, MAGNETIC NEMA SIZE INDICATED |
| XX 2 | CONVENIENCE RECEPTACLE - DUPLEX UNLESS NOTED OTHERWISE<br>WP - WEATHERPROOF C - CLOCK HANGER<br>TL - TWIST LOCK CRE - CORROSION RESISTANT<br>GFCI - GROUND FAULT CIRCUIT INTERRUPTER<br>SUBSCRIPT NUMBER AT RECEPTACLE INDICATES CIRCUIT |
| | 240V RECEPTACLE |
| | CONVENIENCE RECEPTACLE - QUADRUPLEX |
| | DUPLEX CONVENIENCE RECEPTACLE - FLUSH IN FLOOR |
| | CONVENIENCE RECEPTACLE, PEDESTAL, DUPLEX SINGLE FACE UNLESS INDICATED OTHERWISE |
| L20R 20 | RECEPTACLE, SPECIAL PURPOSE-NEMA CONFIGURATION AND AMPERAGE INDICATED |
| T | THERMOSTAT |
| | UTILITY POLE |

## LIGHTING SYSTEM PLAN

| | |
|---|---|
| 1 or 1 | LUMINAIRE, SEE SCHEDULE |
| 1 | LUMINAIRE, SEE SCHEDULE |
| 1 or | LUMINAIRE WITH INTERNAL BATTERY BACKUP, SEE SCHEDULE |
| 1 | STRIP LUMINAIRE, SEE SCHEDULE |
| 4 or 4 | LUMINAIRE AND POLE, SEE SCHEDULE |
| 5 or 5 | WALL MOUNTED LUMINAIRE, SEE SCHEDULE |
| 1 | FLOOD LIGHTS - AIM IN THE DIRECTION SHOWN |
| | STANDBY LIGHTING UNIT, SURFACE MOUNTED, SEE SCHEDULE |
| XX or | EXIT LIGHTS - FILLED SECTION INDICATES LIGHTED FACE, ARROW INDICATES EGRESS DIRECTIONAL INDICATORS, XX = FIXTURE NUMBER, SEE SCHEDULE |
| $a or 2a | SMALL LETTER SUBSCRIPT AT SWITCH AND LUMINAIRE INDICATES SWITCHING. SUBSCRIPT NUMBER AT LUMINAIRE INDICATES CIRCUIT |
| $3 | WALL SWITCH:<br>2- DOUBLE POLE P- PILOT LIGHT<br>3- THREE WAY K- KEY OPERATED<br>4- FOUR WAY D- DIMMER<br>WP- WEATHERPROOF CRE- CORROSION RESISTANT<br>EX- EXPLOSIONPROOF L- MOMENTARY 3-WAY<br>M- MOTOR RATED MS- MANUAL STARTER WITH OVERLOADS |
| LC | LIGHTING CONTACTOR |
| PC | PHOTOCELL |
| | TELEPHONE/DATA OUTLET |

| CIRCUIT AND RACEWAY |
|---|

## GENERAL CIRCUIT CONDUCTOR AND CONDUIT IDENTIFICATION

**POWER CIRCUIT CALLOUT SCHEDULE**

| EQUIPMENT GROUNDS NEC 250 Table 122 | | 100% GROUNDS NEC 250-122(A) | | SERVICE GROUNDS NEC 250 Table 66 | |
|---|---|---|---|---|---|
| **2 Wire + Ground** | | | | | |
| [20E2] | 3/4"C-2#12,#12G | [20M2] | 3/4"C-2#12,#12G | NA | NA |
| [30E2] | 3/4"C-2#10,#10G | [30M2] | 3/4"C-2#10,#10G | NA | NA |
| [40E2] | 3/4"C-2#8,#10G | [40M2] | 3/4"C-2#8,#8G | [40S2] | 3/4"C-2#8,#8N |
| [50E2] | 3/4"C-2#8,#10G | [50M2] | 3/4"C-2#8,#8G | [50S2] | 3/4"C-2#8,#8G |
| [60E2] | 1"C-2#6,#10G | [60M2] | 1"C-2#6,#6G | [60S2] | 3/4"C-2#6,#8G |
| [70E2] | 1"C-2#4,#8G | [70M2] | 1"C-2#4,#4G | [70S2] | 3/4"C-2#4,#8G |
| [80E2] | 1"C-2#4,#8G | [80M2] | 1"C-2#4,#4G | [80S2] | 3/4"C-2#4,#8G |
| [90E2] | 1"C-2#3,#8G | [90M2] | 1"C-2#3,#3G | [90S2] | 1"C-2#3,#8G |
| [100E2] | 1"C-2#3,#8G | [100M2] | 1"C-2#3,#3G | [100S2] | 1"C-2#3,#8G |
| [110E2] | 1"C-2#2,#6G | [110M2] | 1"C-2#2,#2G | [110S2] | 1"C-2#2,#8G |
| [125E2] | 1-1/4"C-2#1,#6G | [125M2] | 1-1/4"C-2#1,#1G | [125S2] | 1-1/4"C-2#1,#6G |
| [150E2] | 1-1/4"C-2#1/0,#6G | [150M2] | 1-1/4"C-2#1/0,#1/0G | [150S2] | 1-1/4"C-2#1/0,#6G |
| [200E2] | 1-1/2"C-2#3/0,#6G | [200M2] | 1-1/2"C-2#3/0,#3/0G | [200S2] | 1-1/4"C-2#3/0,#4G |
| [225E2] | 2"C-2#4/0,#4G | [225M2] | 2"C-2#4/0,#4/0G | [225S2] | 1-1/2"-2#4/0,#2G |
| [400E2] | 3"C-2#500,#3G | [400M2] | 3"C-2#500,#500G | [400S2] | 3"-2#500,#1/0G |
| **3 Wire + Ground** | | | | | |
| [20E3] | 3/4"C-3#12,#12G | [20M3] | 3/4"C-3#12,#12G | NA | NA |
| [30E3] | 3/4"C-3#10,#10G | [30M3] | 3/4"C-3#10,#10G | NA | NA |
| [40E3] | 3/4"C-3#8,#10G | [40M3] | 3/4"C-3#8,#8G | [40S3] | 3/4"C-3#8,#8G |
| [50E3] | 3/4"C-3#8,#10G | [50M3] | 3/4"C-3#8,#8G | [50S3] | 3/4"C-3#8,#8G |
| [60E3] | 3/4"C-3#6,#10G | [60M3] | 3/4"C-3#6,#6G | [60S3] | 3/4"C-3#6,#8G |
| [70E3] | 1"C-3#4,#8G | [70M3] | 1"C-3#4,#4G | [70S3] | 1"C-3#4,#8G |
| [80E3] | 1"C-3#4,#8G | [80M3] | 1"C-3#4,#4G | [80S3] | 1"C-3#4,#8G |
| [90E3] | 1-1/4"C-3#3,#8G | [90M3] | 1-1/4"C-3#3,#3G | [90S3] | 1"C-3#3,#8G |
| [100E3] | 1-1/4"C-3#3,#8G | [100M3] | 1-1/4"C-3#3,#3G | [100S3] | 1"C-3#3,#8G |
| [110E3] | 1-1/2"C-3#2,#6G | [110M3] | 1-1/2"C-3#2,#2G | [110S3] | 1"C-3#2,#8G |
| [125E3] | 1-1/2"C-3#1,#6G | [125M3] | 1-1/2"C-3#1,#1G | [125S3] | 1-1/2"C-3#1,#6G |
| [150E3] | 1-1/2"C-3#1/0,#6G | [150M3] | 1-1/2"C-3#1/0,#1/0G | [150S3] | 1-1/4"C-3#1/0,#6G |
| [200E3] | 2"C-3#3/0,#6G | [200M3] | 2"C-3#3/0,#3/0G | [200S3] | 1-1/2"C-3#3/0,#4G |
| [225E3] | 2"C-3#4/0,#4G | [225M3] | 2"C-3#4/0,#4/0G | [225S3] | 2"C-3#4/0,#2G |
| [250E3] | 2-1/2"C-3#300,#4G | [250M3] | 2-1/2"C-3#300,#300G | [250S3] | 2-1/2"C-3#300,#2G |
| [300E3] | 3"C-3#350,#4G | [300M3] | 3"C-3#350,#350G | [300S3] | 2-1/2"C-3#350,#2G |
| [350E3] | 3"C-3#500,#3G | [350M3] | 3"C-3#500,#500G | [350S3] | 3"C-3#500,#1/0G |
| [400E3] | 4"C-3#500,#3G | [400M3] | 3"C-3#500,#500G | [400S3] | 3"C-3#500,#1/0G |
| [500E3] | (2)2-1/2"C-3#250,#2G | [500M3] | (2)2-1/2"C-3#250,#250G | [500S3] | (2)2-1/2"C-3#250,#1/0G |
| [600E3] | (2)3"C-3#350,#1G | [600M3] | (2)3"C-3#350,#350G | [600S3] | (2)4"C-3#350,#2/0G |
| [700E3] | (2)3"C-3#500,#1/0G | [700M3] | (2)3"C-3#500,#500G | [700S3] | (2)3"C-3#500,#2/0G |
| [800E3] | (2)3"C-3#500,#1/0G | [800M3] | (2)3"C-3#500,#500G | [800S3] | (2)3"C-3#500,#2/0G |
| [1000E3] | (3)3"C-3#350,#2/0G | [1000M3] | (3)3"C-3#500,#500G | [1000S3] | (3)3"C-3#500,#3/0G |
| [1200E3] | (3)3-1/2"C-3#600,#3/0G | [1200M3] | (3)3-1/2"C-3#600,#600G | [1200S3] | (3)3-1/2"C-3#600,#3/0G |
| [1600E3] | (4)4"C-3#600,#4/0G | [1600M3] | (4)4"C-3#600,#600G | [1600S3] | (4)4"C-3#600,#3/0G |
| [2000E3] | (5)3-1/2"C-3#600,#250G | [2000M3] | (5)3-1/2"C-3#600,#600G | [2000S3] | (5)3-1/2"C-3#600,#3/0G |
| [2500E3] | (6)3-1/2"C-3#600,#350G | [2500M3] | (6)3-1/2"C-3#600,#600G | [2500S3] | (6)3-1/2"C-3#600,#3/0G |
| [3000E3] | (8)3-1/2"C-3#600,#400G | [3000M3] | (8)3-1/2"C-3#600,#600G | [3000S3] | (8)3-1/2"C-3#600,#3/0G |
| [4000E3] | (10)3-1/2"C-3#600,#500G | [4000M3] | (10)3-1/2"C-3#600,#600G | [4000S3] | (10)3-1/2"C-3#600,#3/0G |
| **4 Wire + Ground** | | | | **MULTI-WIRE 20 AMP** | |
| [20E4] | 3/4"C-4#12,#12G | [20M4] | 3/4"C-4#12,#12G | [20E5] | 3/4"C-5#12,1#12G |
| [30E4] | 3/4"C-4#10,#10G | [30M4] | 3/4"C-4#10,#10G | [20E6] | 3/4"C-6#12,1#12G |
| [40E4] | 3/4"C-4#8,#10G | [40M4] | 3/4"C-4#8,#8G | [20E7] | 3/4"C-7#12,1#12G |
| [50E4] | 3/4"C-4#8,#10G | [50M4] | 3/4"C-4#8,#8G | [20E8] | 3/4"C-8#12,1#12G |
| [60E4] | 1"C-4#6,#8G | [60M4] | 1"C-4#6,#6G | [20E9] | 3/4"C-9#12,1#12G |
| [70E4] | 1-1/4"C-4#4,#8G | [70M4] | 1-1/4"C-4#4,#4G | [20E10] | 1"C-10#10,1#10G |
| [80E4] | 1-1/4"C-4#4,#8G | [80M4] | 1-1/4"C-4#4,#4G | [20E11] | 1"C-11#10,1#10G |
| [90E4] | 1-1/4"C-4#3,#8G | [90M4] | 1-1/4"C-4#3,#3G | [20E12] | 1"C-12#10,1#10G |
| [100E4] | 1-1/4"C-4#3,#8G | [100M4] | 1-1/4"C-4#3,#3G | [20E13] | 1"C-13#10,1#10G |
| [110S4] | 1-1/2"C-4#2,#6G | [110M3] | 1-1/2"C-4#2,#2G | [20E14] | 1"C-14#10,1#10G |
| [125E4] | 1-1/2"C-4#1,#6G | [125M4] | 1-1/2"C-4#1,#1G | [20E15] | 1"C-15#10,1#10G |
| [150E4] | 2"C-4#1/0,#6G | [150M4] | 2"C-4#1/0,#1/0G | [20E16] | 1-1/4"C-16#10,1#10G |
| [200E4] | 2"C-4#3/0,#6G | [200M4] | 2"C-4#3/0,#3/0G | [20E17] | 1-1/4"C-17#10,1#10G |
| [225E4] | 2-1/2"C-4#4/0,#4G | [225M4] | 2-1/2"C-4#4/0,#4/0G | [20E18] | 1-1/4"C-18#10,1#10G |
| [250E4] | 3"C-4#300,#4G | [250M4] | 3"C-4#300,#300G | [20E19] | 1-1/4"C-19#10,1#10G |
| [300E4] | 3"C-4#350,#2G | [300M4] | 3"C-4#350,#350G | [20E20] | 1-1/4"C-20#10,1#10G |
| [350E4] | 3-1/2"C-4#500,#3G | [350M4] | 3-1/2"C-4#500,#500G | | |
| [400E4] | 3-1/2"C-4#500,#3G | [400M4] | 3-1/2"C-4#500,#500G | | |
| [500E4] | (2)3-1/2"C-4#250,#2G | [500M4] | (2)3-1/2"C-4#250,#250G | | |
| [600E4] | (2)3"C-4#350,#1G | [600M4] | (2)3"C-4#350,#350G | | |
| [700E4] | (2)3-1/2"C-4#500,#1/0G | [700M4] | (2)3-1/2"C-4#500,#500G | | |
| [800E4] | (2)3-1/2"C-4#500,#1/0G | [800M4] | (2)3-1/2"C-4#500,#500G | | |
| [1000E4] | (3)3"C-4#350,#2/0G | [1000M4] | (3)3"C-4#350,#350G | | |
| [1200E4] | (3)4"C-4#600,#3/0G | [1200M4] | (3)4"C-4#600,#600G | | |
| [1600E4] | (4)4"C-4#600,#4/0G | [1600M4] | (4)4"C-4#600,#600G | | |
| [2000E4] | (5)4"C-4#600,#250G | [2000M4] | 4"C-4#600,#600G | | |
| [2500E4] | (6)4"C-4#600,#350G | [2500M4] | 4"C-4#600,#600G | | |
| [3000E4] | (8)4"C-4#600,#400G | [3000M4] | 4"C-4#600,#600G | | |
| [4000E4] | (10)4"C-4#600,#500G | [4000M4] | 4"C-4#600,#600G | | |

**THE CONFIGURATIONS SHOWN IN THIS SECTION TITLED "MULTI-WIRE 20 AMP" SHALL NOT BE USED FOR RECEPTACLE CIRCUITS OR OTHER CORD-AND-PLUG-CONNECTED PORTABLE LOADS. NEC-240.4(B)**

**ANALOG and DISCRETE CABLE CALLOUTS**

| ANALOG | | ANALOG | | DISCRETE | |
|---|---|---|---|---|---|
| [A1] | 3/4"C, 1 TYPE 3 | [B1] | 3/4"C, 1 TYPE4 | [C1] | 1"C, MBC |
| [A2] | 3/4"C, 2 TYPE 3 | [B2] | 1"C, 2 TYPE 4 | [C2] | 3/4"C, 2#14, 1#14G |
| [A3] | 1"C, 3 TYPE 3 | [B3] | 1"C, 3 TYPE 4 | [C4] | 3/4"C, 4#14, 1#14G |
| [A4] | 1"C, 4 TYPE 3 | [B4] | 1-1/4"C, 4 TYPE 4 | [C6] | 3/4"C, 6#14, 1#14G |
| [A5] | 1"C, 5 TYPE 3 | [B5] | 1-1/4"C, 5 TYPE 4 | [C8] | 3/4"C, 8#14, 1#14G |
| [A6] | 1-1/4"C, 6 TYPE 3 | [B6] | 1-1/2"C, 6 TYPE 4 | [C10] | 3/4"C, 10#14, 1#14G |
| [A7] | 1-1/4"C, 7 TYPE 3 | [B7] | 1-1/2"C, 7 TYPE 4 | [C12] | 3/4"C, 12#14, 1#14G |
| [A8] | 1-1/2"C, 8 TYPE 3 | [B8] | 1-1/2"C, 8 TYPE 4 | [C14] | 3/4"C, 14#14, 1#14G |
| [A9] | 1-1/2"C, 9 TYPE 3 | | | [C16] | 3/4"C, 16#14, 1#14G |
| [A10] | 1-1/2"C, 10 TYPE 3 | | | [C18] | 3/4"C, 18#14, 1#14G |
| [A11] | 1-1/2"C, 11 TYPE 3 | | | [C20] | 1"C, 20#14, 1#14G |
| [A12] | 2"C, 12 TYPE 3 | | | [C22] | 1"C, 22#14, 1#14G |
| [A13] | 2"C, 13 TYPE 3 | | | [C24] | 1"C, 24#14, 1#14G |
| [A14] | 2"C, 14 TYPE 3 | | | [C26] | 1"C, 26#14, 1#14G |
| [A15] | 2"C, 15 TYPE 3 | | | [C28] | 1"C, 28#14, 1#14G |
| [A16] | 2"C, 16 TYPE 3 | | | [C30] | 1"C, 30#14, 1#14G |
| [A17] | 2"C, 17 TYPE 3 | | | [C36] | 1-1/2"C, 36#14, 1#14G |
| [A18] | 2"C, 18 TYPE 3 | | | [C40] | 1-1/2"C, 40#14, 1#14G |
| [A19] | 2"C, 19 TYPE 3 | | | [C46] | 1-1/2"C, 46#14, 1#14G |
| [A20] | 2"C, 20 TYPE 3 | | | [C50] | 1-1/2"C, 50#14, 1#14G |
| [A21] | 2-1/2"C, 21 TYPE 3 | | | [C58] | 1-1/2"C, 58#14, 1#14G |
| [A22] | 2-1/2"C, 22 TYPE 3 | | | [C72] | 1-1/2"C, 72#14, 1#14G |
| | | | | [C100] | 2-1/2"C, 100#14, 1#14G |
| | | | | [CAT] | 3/4"C, CAT 6 |
| | | | | [MODBUS] | 3/4"C, MODBUS RTU CABLE, TYPE 31 |

NOTES:
1. FOR CABLE TYPES, SEE SPECIFICATIONS.
2. CONDUIT SIZES SHOWN ARE MINIMUM. PROVIDE LARGER DUCT AND CONDUIT SIZES WHERE REQUIRED ELSEWHERE IN DOCUMENTS.
3. REFER ELSEWHERE IN DOCUMENTS, INCLUDING BUT NOT LIMITED TO GENERAL NOTE 29 AND SPECIFICATION 260505 CONDUCTORS, FOR ADDITIONAL REQUIREMENTS.
4. WHERE CIRCUITS ARE UNDERGROUND, DIRECT BURIED OR CONCRETE ENCASED, MINIMUM DUCT AND CONDUIT SIZE SHALL BE 1".
5. INCREASE DUCT AND CONDUIT SIZES AS NECESSARY FOR TYPE TC OR OTHER CABLES.

| NO. | DATE | REVISION | BY | APVD |
|---|---|---|---|---|
| DSGN | D NICHOLSON | DR M REICHERT CHK M WAYNE | D NICHOLSON | APVD |



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David C. Nicholson PE 60201

SOUTHWEST REGIONAL WATER RECLAMATION FACILITY - RECHARGE WELL SYSTEM
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FLORIDA



CH2MHILL®

GENERAL

ELECTRIAL LEGEND 2

NTS

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

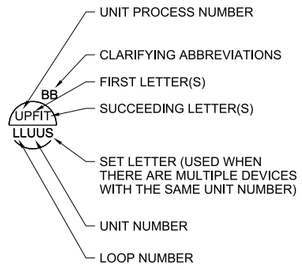
| | |
|---|---|
| DATE | DECEMBER 2015 |
| PROJ | 659297 |
| DWG | 001-G-108 |
| SHEET | 09 of 51 |

100% DESIGN DOCUMENTS

FILENAME: 001-G-1008_659297.dgn PLOT DATE: 12/16/2015 PLOT TIME: 9:20:46 AM

# INSTRUMENT IDENTIFICATION

## EXAMPLE SYMBOLS




## DIGITAL SYSTEM INTERFACES

- ▲ ANALOG INPUT
- ▼ ANALOG OUTPUT
- $\triangle_X$ DISCRETE INPUT
- $\nabla_X$ DISCRETE OUTPUT

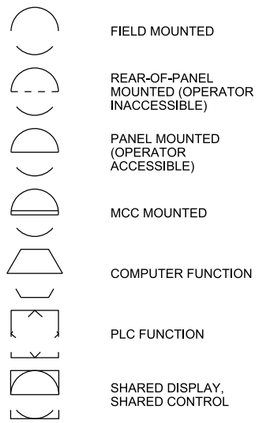
## INSTRUMENT IDENTIFICATION LETTERS TABLE

| LETTER | FIRST-LETTER: PROCESS OR INITIATING VARIABLE | FIRST-LETTER: MODIFIER | SUCCEEDING-LETTERS: READOUT OR PASSIVE FUNCTION | SUCCEEDING-LETTERS: READOUT OR PASSIVE FUNCTION | SUCCEEDING-LETTERS: READOUT OR PASSIVE FUNCTION |
|---|---|---|---|---|---|
| A | ANALYSIS (+) | | ALARM | | |
| B | BURNER, COMBUSTION | | USER'S CHOICE (*) | USER'S CHOICE (*) | USER'S CHOICE (*) |
| C | USER'S CHOICE (*) | | | CONTROL | |
| D | DENSITY (S.G.) | DIFFERENTIAL | | | |
| E | VOLTAGE | | PRIMARY ELEMENT, SENSOR | | |
| F | FLOW RATE | RATIO (FRACTION) | | | |
| G | USER'S CHOICE (*) | | GLASS, GAUGE VIEWING DEVICE | GATE | |
| H | HAND (MANUAL) | | | | HIGH |
| I | CURRENT (ELECTRICAL) | | INDICATE | | |
| J | POWER | SCAN | | | |
| K | TIME, TIME SCHEDULE | TIME RATE OF CHANGE | | CONTROL STATION | |
| L | LEVEL | | LIGHT (PILOT) | | LOW |
| M | MOTION | MOMENTARY | | | MIDDLE, INTERMEDIATE |
| N | TORQUE | | USER'S CHOICE (*) | USER'S CHOICE (*) | USER'S CHOICE (*) |
| O | USER'S CHOICE (*) | | ORIFICE, RESTRICTION | | |
| P | PRESSURE, VACUUM | | POINT (TEST) CONNECTION | | |
| Q | QUANTITY | INTEGRATE, TOTALIZE | | | |
| R | RADIATION | | RECORD OR PRINT | | |
| S | SPEED, FREQUENCY | SAFETY | | SWITCH | |
| T | TEMPERATURE | | | TRANSMIT | |
| U | MULTI VARIABLE | | MULTI FUNCTION | MULTI FUNCTION | MULTI FUNCTION |
| 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 | Z AXIS | | DRIVE, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT | |

TABLE BASED ON THE INTERNATIONAL SOCIETY OF AUTOMATION (ISA) STANDARD.

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.
(*) WHEN USED, DEFINE THE MEANING HERE FOR THE PROJECT.

## GENERAL INSTRUMENT OR FUNCTIONAL SYMBOLS




## TRANSDUCERS

| | | | |
|---|---|---|---|
| A | ANALOG | I | CURRENT |
| D | DIGITAL | P | PNEUMATIC |
| E | VOLTAGE | PF | PULSE FREQUENCY |
| F | FREQUENCY | PD | PULSE DURATION |
| H | HYDRAULIC | R | RESISTANCE |

EXAMPLE


CURRENT TO PNEUMATIC TRANSDUCER (BACK OF PANEL, IN A FLOW LOOP)

## ACCESSORY DEVICES

| | |
|---|---|
| A | ALARM |
| C | CONTROLLER |
| I | INDICATOR |
| R | RECORDER |
| S | SWITCH |
| T | TRANSMITTER |
| X | UNCLASSIFIED |

EXAMPLE


TRANSMITTER AS AN ACCESSORY TO A FLOW ELEMENT

## SPECIAL CASES


ON AND OFF EVENT LIGHTS

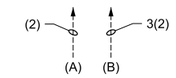

ON-OFF HAND SWITCH, MAINTAINED CONTACT SWITCH (CONTROLLED DEVICE WILL RESTART ON RETURN OF POWER AFTER POWER FAILURE).


STOP-START HAND SWITCH MOMENTARY CONTACT SWITCHES (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE).

# LINE LEGEND

- PRIMARY PROCESS (CLOSED CONDUIT, DASHED LINE INDICATES ALTERNATE FLOW STREAM)
- SECONDARY PROCESS
- VENT/DRAIN LINE
- PROCESS (OPEN CHANNEL)
- ANALOG SIGNAL
- DISCRETE SIGNAL
- DATA LINK
- PNEUMATIC SIGNAL
- FILLED SYSTEM SIGNAL
- HYDRAULIC SYSTEM SIGNAL
- BUILDING OR FACILITY BOUNDARY
- PACKAGE SYSTEM EQUIPMENT
- TYPICAL BREAK
- MSC MANFACTURER SUPPLIED CABLE
- P POWER

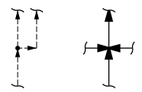
PARALLELING LINES




(A) TOTAL OF 2 SIGNALS

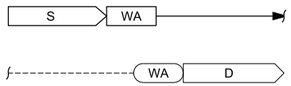
(B) 3 TYPICAL SETS OF 2 SIGNALS EACH. TOTAL OF 6 SIGNALS.

CONNECTING LINES



NON-CONNECTING LINES

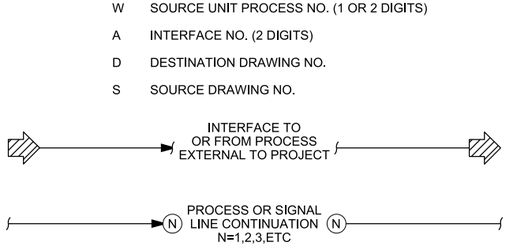
# INTERFACE SYMBOLS




PROCESS INTERFACE

SIGNAL INTERFACE

- W SOURCE UNIT PROCESS NO. (1 OR 2 DIGITS)
- A INTERFACE NO. (2 DIGITS)
- D DESTINATION DRAWING NO.
- S SOURCE DRAWING NO.




# SELF CONTAINED VALVE & EQUIPMENT TAG NUMBERS

W-D-X-Y

- W UNIT PROCESS NUMBER
- D
  - ARV AIR RELEASE VALVE
  - AVRV AIR AND VACUUM RELEASE VALVE
  - E EJECTOR
  - G GATE
  - M MECHANICAL EQUIPMENT
  - P PUMP
  - T TANK
- X LOOP NUMBER
- Y UNIT NUMBER

# ABBREVIATIONS & LETTER SYMBOLS

| | |
|---|---|
| AC | ALTERNATING CURRENT |
| AM | AUTO-MANUAL |
| CAM | COMPUTER-AUTO-MANUAL |
| CCS | CENTRAL CONTROL SYSTEM |
| $CL_2$ etc. | CHLORINE (TYPICAL: USE STANDARD CHEMICAL ELEMENT ABBREVIATIONS) |
| CM | COMPUTER-MANUAL |
| COD | CHEMICAL OXYGEN DEMAND |
| CP-X | CONTROL PANEL NO. X |
| DC | DIRECT CURRENT |
| DCS | DISTRIBUTED CONTROL SYSTEM |
| DCU | DISTRIBUTED CONTROL UNIT |
| DO | DISSOLVED OXYGEN |
| $FCL_2$ | FREE CHLORINE RESIDUAL |
| FOS | FAST-OFF-SLOW |
| FOSA | FAST-OFF-SLOW-AUTO |
| FOSR | FAST-OFF-SLOW-REMOTE |
| FP-W-X | FIELD PANEL NO. WX (W=UNIT PROCESS NUMBER X=PANEL NUMBER) |
| FR | FORWARD-REVERSE |
| HOA | HAND-OFF-AUTO |
| HOR | HAND-OFF-REMOTE |
| ISR | INTRINSICALLY SAFE RELAY |
| LEL | LOWER EXPLOSIVE LIMIT |
| LOS | LOCKOUT STOP |
| LR | LOCAL-REMOTE |
| MA | MANUAL-AUTO |
| MC | MODULATE-CLOSE |
| MCC-X | MOTOR CONTROL CENTER NO. X |
| MSC | MANUFACTURER SUPPLIED CABLE |
| OC | OPEN-CLOSE(D) |
| OCA | OPEN-CLOSE-AUTO |
| OCR | OPEN-CLOSE-REMOTE |
| OO | ON-OFF |
| OOA | ON-OFF-AUTO |
| OOR | ON-OFF-REMOTE |
| ORP | OXIDATION REDUCTION POTENTIAL |
| OSC | OPEN-STOP-CLOSE |
| pH | HYDROGEN ION CONCENTRATION |
| PLC | PROGRAMMABLE LOGIC CONTROLLER |
| RIO | REMOTE I/O UNIT |
| RM-X | REMOTE MULTIPLEXING MODULE NO. X |
| RTU-X | REMOTE TELEMETRY UNIT NO. X |
| SF | SLOWER-FASTER |
| SS | START-STOP |
| SSC | SUPERVISORY SET POINT CONTROL |
| $TCL_2$ | TOTAL CHLORINE RESIDUAL |
| TOC | TOTAL ORGANIC CARBON |
| TOD | TOTAL OXYGEN DEMAND |
| TURB | TURBIDITY |
| VHC | VOLATILE HYDROCARBONS |
| VIB | VIBRATION |
| $\Delta$ | DIFFERENCE |
| $\Sigma$ | SUM |
| × | MULTIPLY |
| ÷ | DIVIDE |
| F(X) | CHARACTERIZED |
| $X^n$ | RAISED TO THE Nth POWER |
| $\sqrt{\ }$ | SQUARE ROOT |
| AVG | AVERAGE |
| 1:1 | REPEAT OR BOOST |
| > | SELECT HIGHEST SIGNAL |
| < | SELECT LOWEST SIGNAL |
| } | BIAS |
| % | GAIN OR ATTENUATE |

# GENERAL NOTES

1. COMPONENTS AND PANELS SHOWN WITH A SINGLE ASTERISK ( ∗ ) ARE TO BE PROVIDED AS PART OF A PACKAGE SYSTEM.
2. COMPONENTS AND PANELS SHOWN WITH A DOUBLE ASTERISK ( ∗∗ ) ARE TO BE PROVIDED UNDER DIVISION 26, ELECTRICAL.
3. COMPONENTS AND PANELS SHOWN WITH A DIAMOND (◆) ARE TO BE PROVIDED UNDER SECTION PROCESS INSTRUMENTATION AND CONTROLS.
4. THIS IS A STANDARD LEGEND. THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THE PROJECT.

| NO. | DATE | REVISION | BY | APVD |
|---|---|---|---|---|
| DSGN | D.CORY | DR AL PASTRANA | CHK T.RIDGIK | APVD T.RIDGIK |



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EB0000072 · AAC001992
Thomas Andrew Ridgik PE 35105

SOUTHWEST REGIONAL WATER RECLAMATION FACILITY - RECHARGE WELL SYSTEM
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FLORIDA

GENERAL
INSTRUMENTATION AND CONTROL LEGEND SHEET 1

100% DESIGN DOCUMENTS

| | |
|---|---|
| NTS | |
| VERIFY SCALE | |
| BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1" | |
| DATE | DECEMBER 2015 |
| PROJ | 659297 |
| DWG | 001-G-109 |
| SHEET | 10 of 51 |

## VALVE SYMBOLS

- GATE
- KNIFE GATE
- BUTTERFLY
- GLOBE
- BALL
- VEE-BALL
- PLUG
- SEAT PORT ECCENTRIC PLUG
- DIAPHRAGM
- PINCH
- NEEDLE
- SWING CHECK
- BALL CHECK
- BACKFLOW PREVENTER
- ROTARY
- TELESCOPE
- SAMPLE
- MUD
- PRESSURE RELIEF
- AIR AND/OR VACUUM RELEASE
- REGULATED SIDE PRESSURE CONTROL
- PRESSURE REGULATION (CLAY-TYPE)
- MULTI-PORT VALVE (GATE VALVE SHOWN. FOR OTHER VALVE TYPES, APPROPRIATE VALVE SYMBOL SHOWN.) SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.
- ANGLE GATE

## GATE SYMBOLS

- SLUICE
- BUTTERFLY
- FABRICATED SLIDE
- FLAP
- STOP LOG

## ACTUATOR SYMBOLS

- PNEUMATIC DIAPHRAGM SPRING-OPPOSED, SINGLE OR DOUBLE ACTING
- PNEUMATIC CYLINDER SINGLE OR DOUBLE ACTING ACTUATED BY ONE INPUT
- ELECTRIC MOTOR
- SOLENOID
- VALVE POSITIONER
- HYDRAULIC
- DIAPHRAGM, DIFFERENTIAL PRESSURE
- ELECTROHYDRAULIC
- MANUAL

NOTE:
ON LOSS OF PRIMARY POWER (PNEUMATIC, ELECTRICAL, OR HYDRAULIC)

XX: FO FAIL OPEN
FC FAIL CLOSED
FLP FAIL TO LAST POSITION

## PRIMARY ELEMENT SYMBOLS

- PARSHALL FLUME
- WEIR
- ORFICE PLATE
- FLOW TUBE
- PITOT-STATIC
- VORTEX METER
- ULTRASONIC FLOWMETER
- ELECTROMAGNETIC FLOWMETER
- PROPELLER OR TURBINE METER
- THERMAL FLOWMETER
- LEVEL (BUBBLER TUBE)
- LEVEL (FLOAT)
- ROTAMETER
- DENSITY METER
- GENERIC
- LEVEL

## MISCELLANEOUS SYMBOLS

- VENT TO ATMOSPHERE
- AIR GAP
- DRIP TRAP
- PIG INSERT POINT
- PIG CATCH POINT
- SELF CONTAINED AIR SUPPLY
- AIR PURGE SET
- FLUSHING CONNECTION
- SEAL WATER SET
- WATER PURGE SET
- FLEXIBLE CONNECTION
- AERATOR
- DIAPHRAGM SEAL
- ANNULAR DIAPHRAGM SEAL
- COMPOSITE SAMPLER
- FLAME TRAP
- CALIBRATION COLUMN
- INLINE SILENCER
- BLIND FLANGE
- PIPE CAP
- STRAINER
- BASKET STRAINER
- FILTER
- PULSATION DAMPENER
- EXPANSION CHAMBER
- FFLCPLLLX — PANEL CONTINUED ON SAME OR OTHER DRAWING; PANEL OUTLINE; PANEL NAME
- 120V — 120 VOLT, 60 HZ POWER
- 480V — 480 VOLT, 60 HZ POWER
- XX — AIR SET XX = SUPPLY PRESSURE IN PSIG.
- PLUG
- RECEPTACLE
- RUPTURE DISK (VACUUM)
- RUPTURE DISK (PRESSURE)
- TV MONITOR
- TV CAMERA
- LOGIC ELEMENT: IF A AND NOT B THEN C
- LOGIC ELEMENT: IF A OR B THEN C
- RADIO ANTENNA
- OR — INTERLOCK, SEE CONTROL DIAGRAMS
- HORN
- SKIMMING MECHANISM
- SCREW
- SCREW CONVEYOR
- MIXER
- ELECTRIC MOTOR
- MOTOR STARTER

## PUMP AND COMPRESSOR SYMBOLS

- CENTRIFUGAL PUMP (DRY PIT)
- CENTRIFUGAL WET PIT PUMP OR TURBINE PUMP
- RECIPROCATING OR METERING PUMP (POSITIVE DISPLACEMENT)
- DIAPHRAGM PUMP
- GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)
- PROGESSING CAVITY PUMP
- COMPRESSOR (CENTRIFUGAL)
- COMPRESSOR (PISTON)
- BLOWER OR FAN (CENTRIFUGAL)
- EJECTOR
- PISTON PUMP
- SUBMERSIBLE SUMP PUMP
- ROTARY PUMP
- VACUUM PUMP
- SCREW PUMP

XX: AS ADJUSTABLE SPEED
CS-1 CONSTANT SPEED (SINGLE SPEED)
CS-2 CONSTANT SPEED (TWO SPEED)

## FLOW STREAM IDENTIFICATION

| | |
|---|---|
| DR | DRAIN |
| LAS | LIQUID AMMONIUM SULFATE |
| OF | OVERFLOW |
| RW | REUSE WATER |
| SA | SAMPLE |
| SE | SECONDARY EFFLUENT |
| SHC | SODIUM HYPOCHLORITE |
| V | VENT |

| NO. | DATE | DSGN |
|---|---|---|
| | | DR |
| | | AL PASTRANA |
| | | CHK |
| | | D CORY |
| | | APVD |
| | | T RIDGIK |
| | | BY |
| | | APVD |
| | | T RIDGIK |

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NTS
VERIFY SCALE
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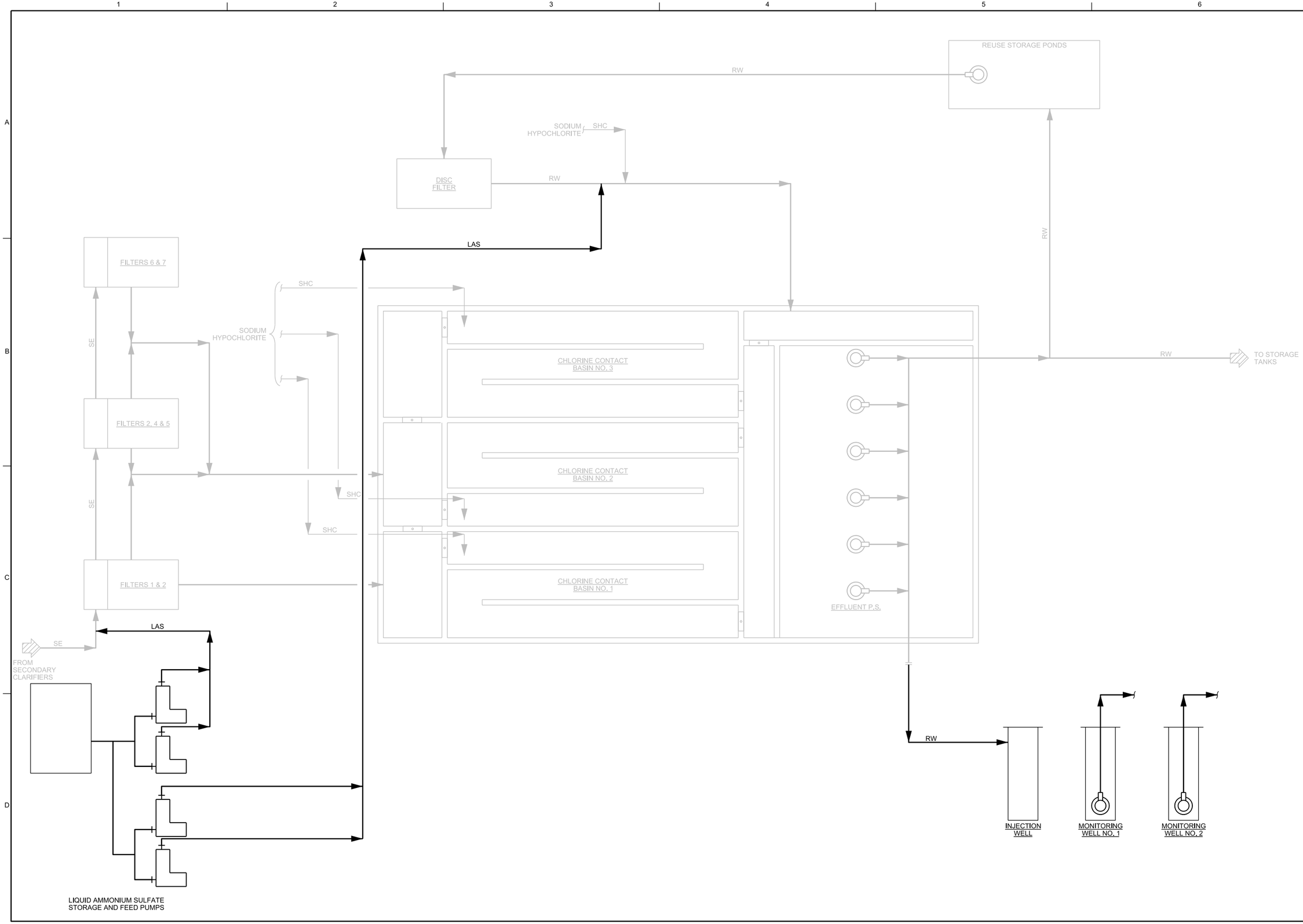




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GENERAL

PROCESS FLOW DIAGRAM

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CIVIL
OVERALL SITE PLAN

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| SHEET | 13 of 51 |

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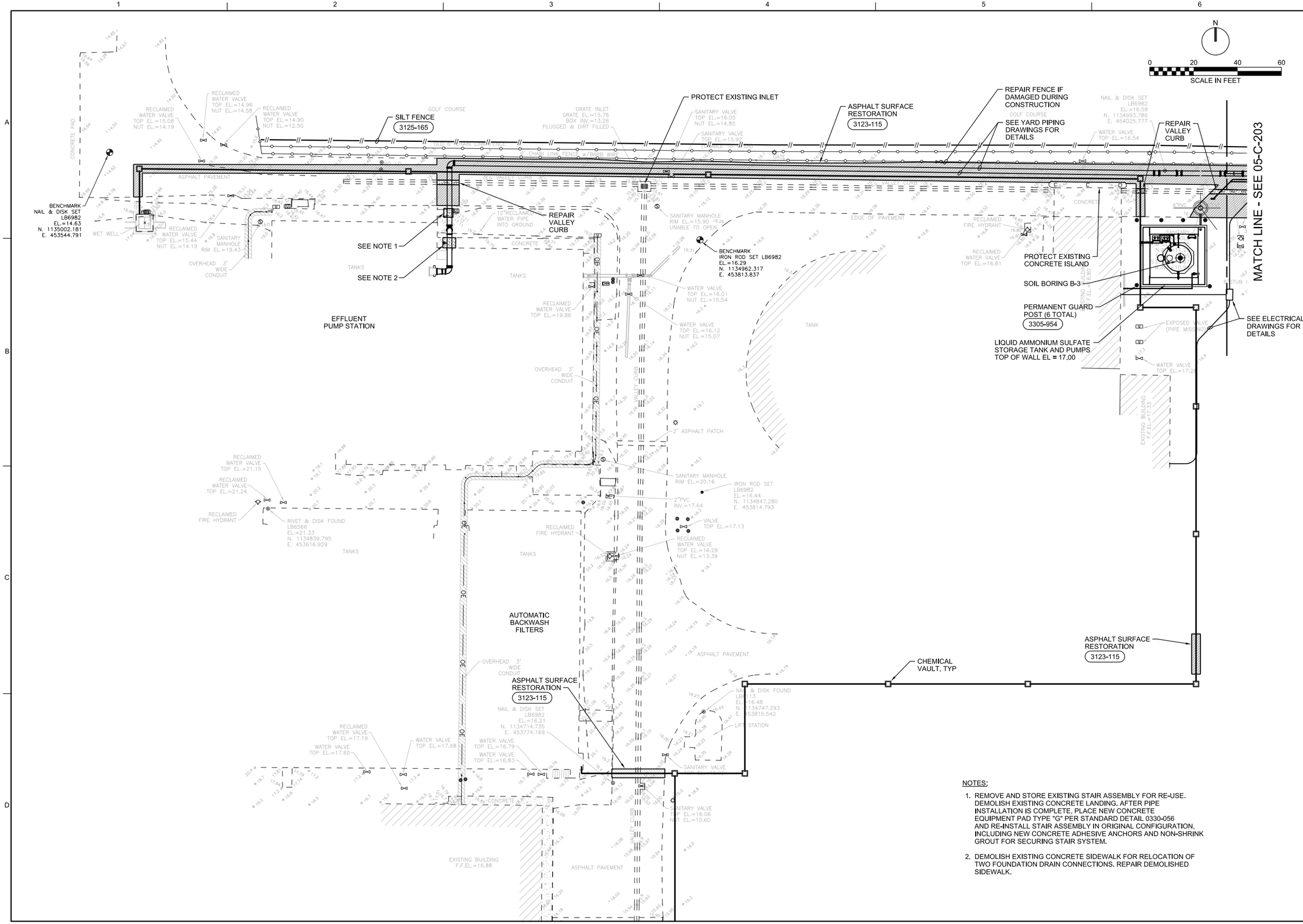


NOTES:

1. REMOVE AND STORE EXISTING STAIR ASSEMBLY FOR RE-USE. DEMOLISH EXISTING CONCRETE LANDING. AFTER PIPE INSTALLATION IS COMPLETE, PLACE NEW CONCRETE EQUIPMENT PAD TYPE "G" PER STANDARD DETAIL 0330-056 AND RE-INSTALL STAIR ASSEMBLY IN ORIGINAL CONFIGURATION, INCLUDING NEW CONCRETE ADHESIVE ANCHORS AND NON-SHRINK GROUT FOR SECURING STAIR SYSTEM.
2. DEMOLISH EXISTING CONCRETE SIDEWALK FOR RELOCATION OF TWO FOUNDATION DRAIN CONNECTIONS. REPAIR DEMOLISHED SIDEWALK.

| NO. | DATE | DSGN |
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| | | |
| | | |
| DR | C CHILDRESS | A MALONE |
| REVISION | CHK | APVD |
| BY | APVD | |
| R MORRISON | | |



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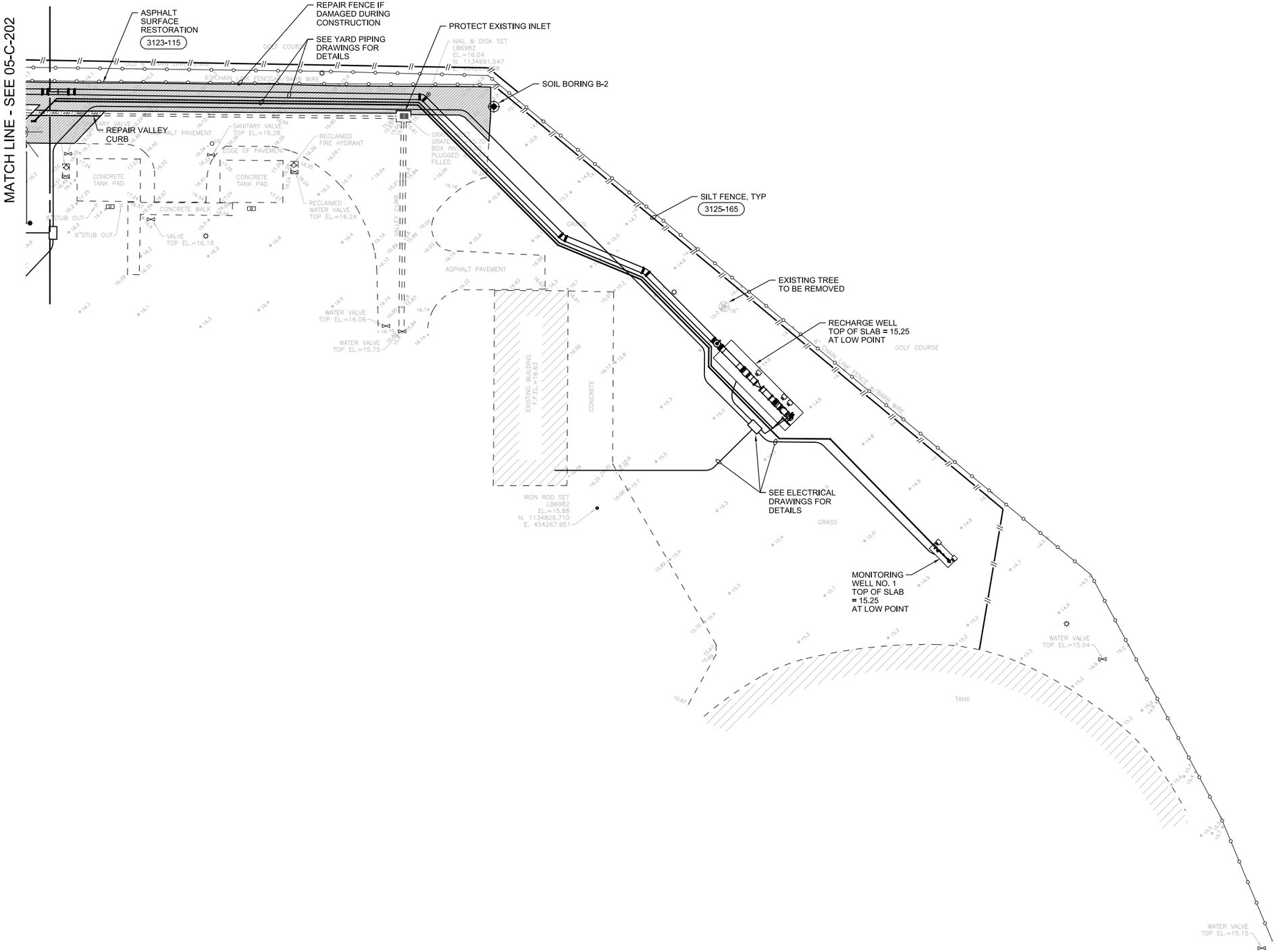


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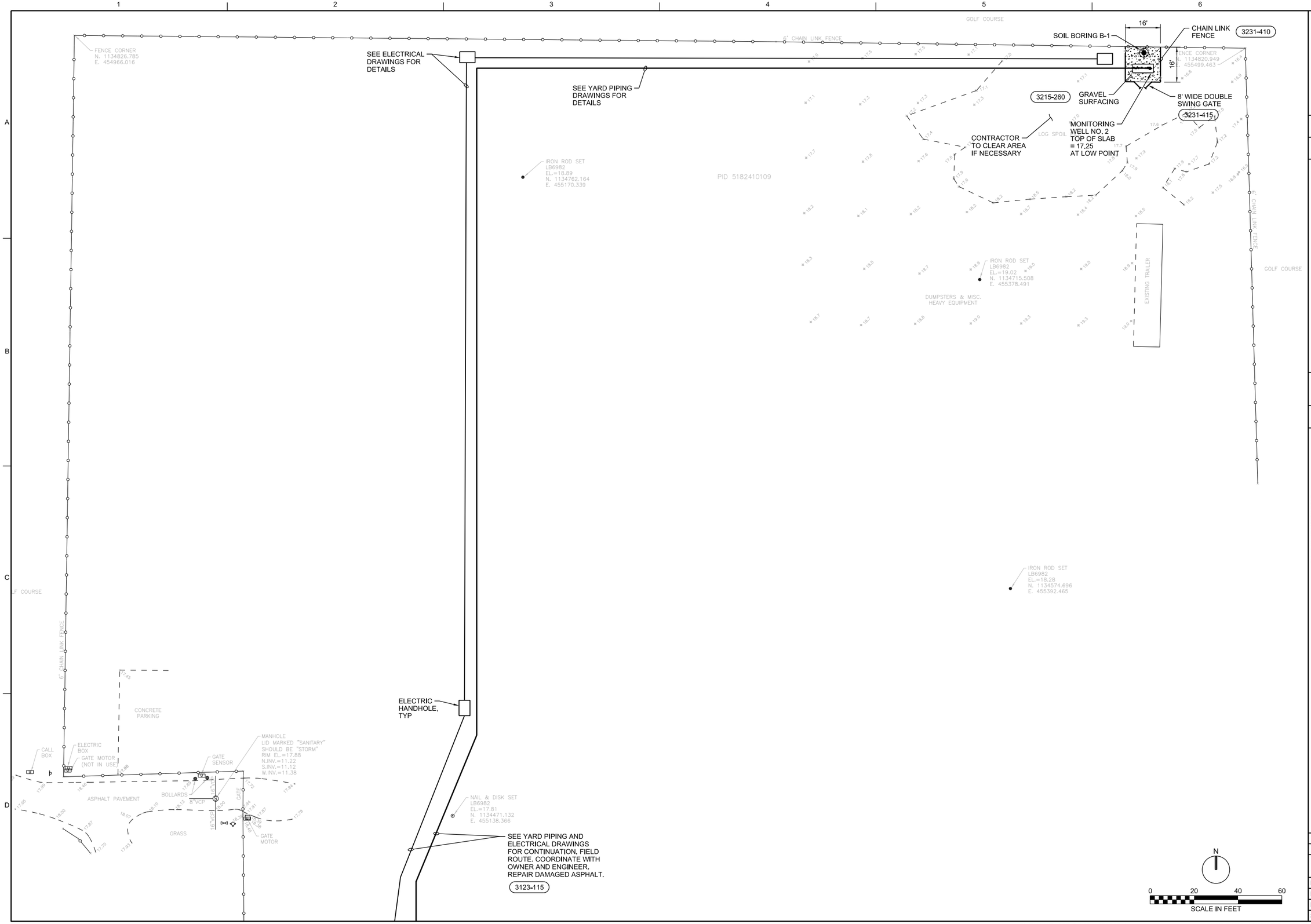


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| | | | | | BY |
| | | | | | APVD |

R MORRISON



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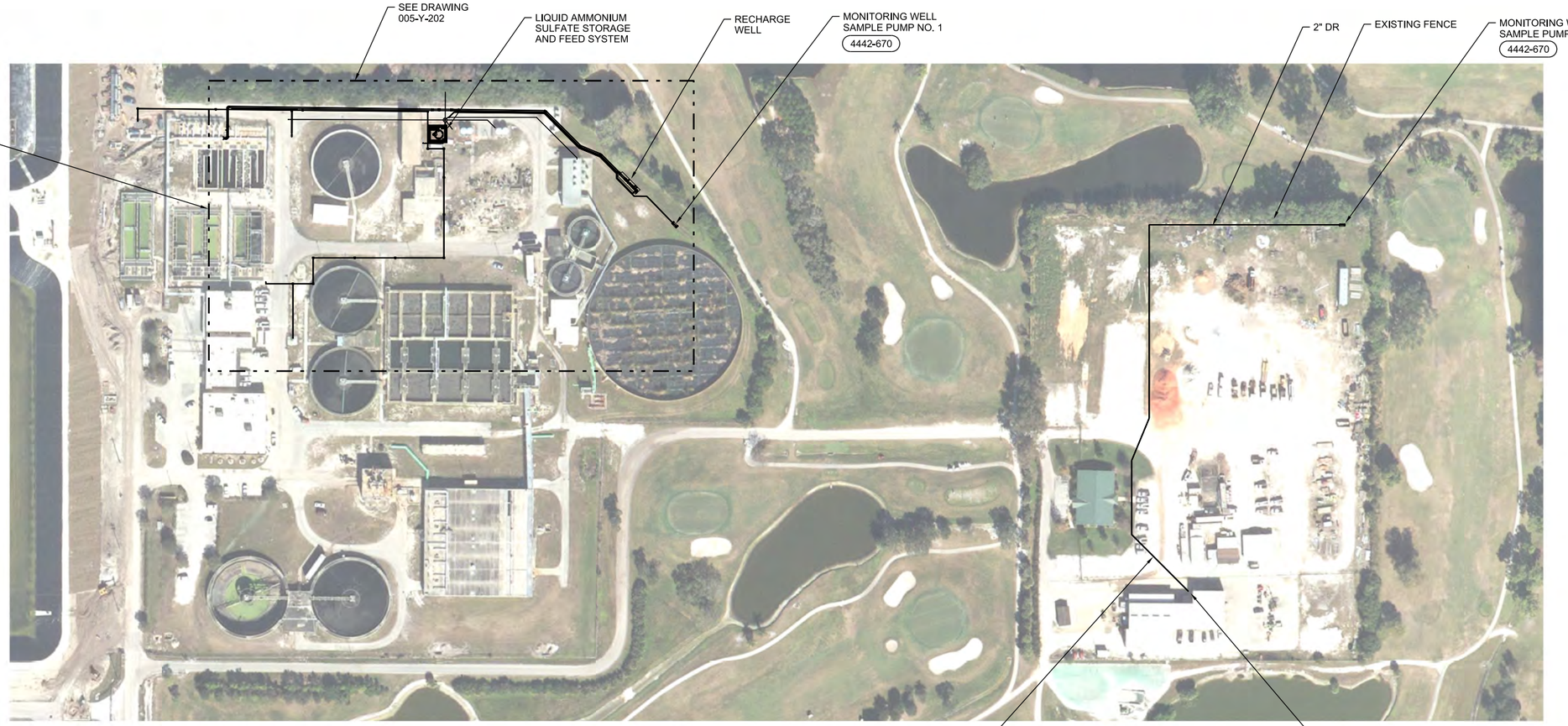


N

0 1 2 3

1"=100'

## SITE PLAN

1"=100'

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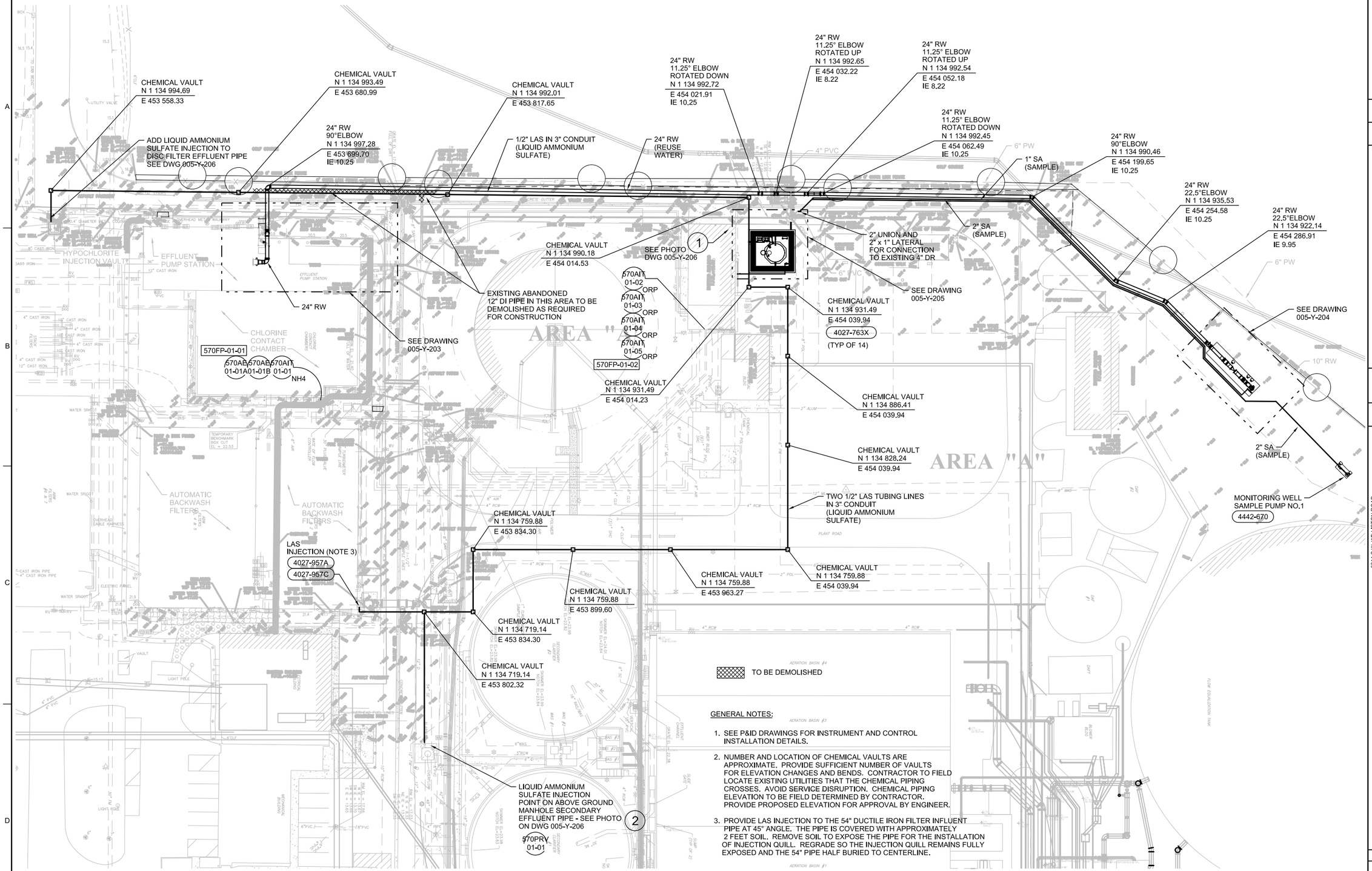




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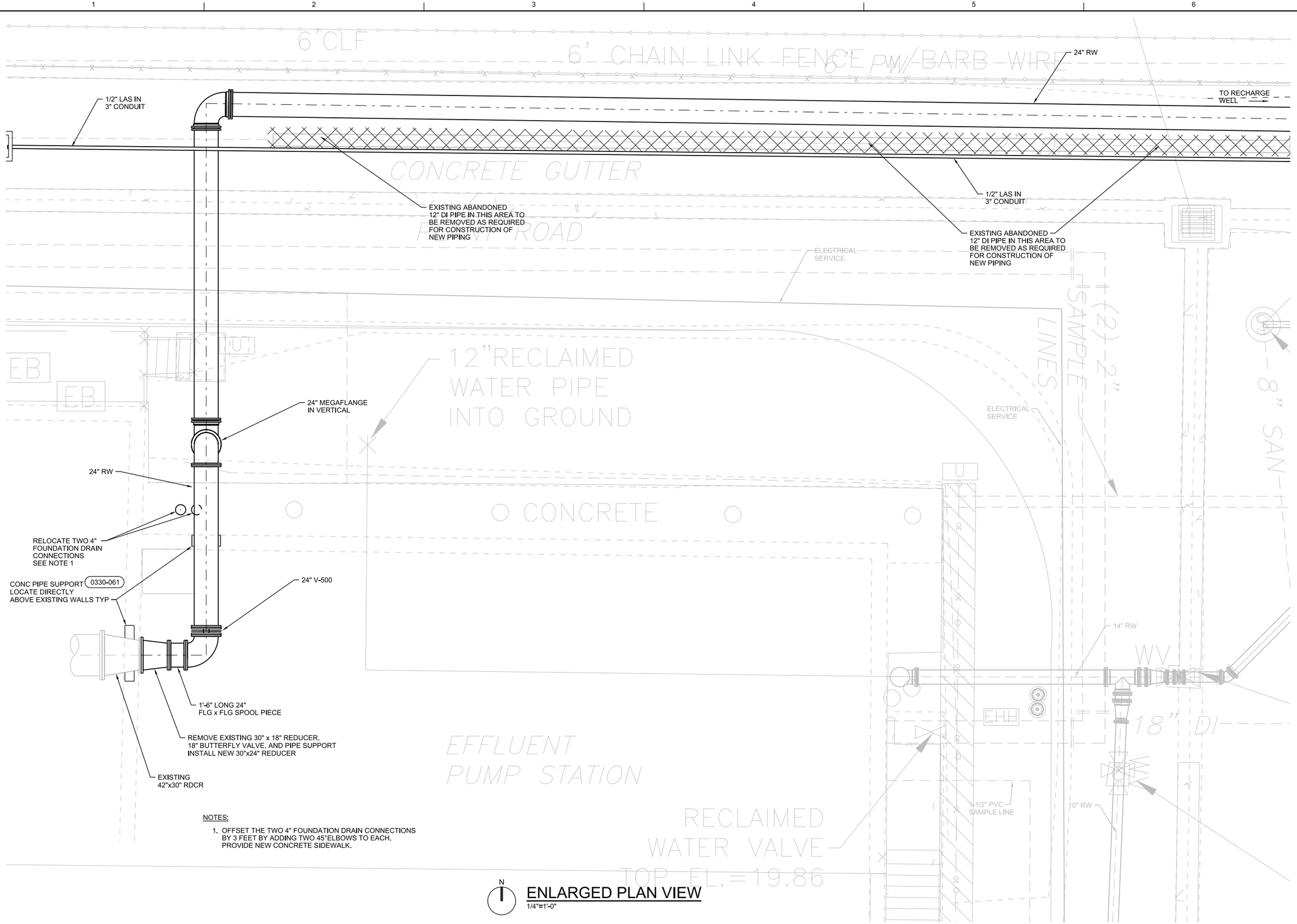


NOTES:

1. OFFSET THE TWO 4" FOUNDATION DRAIN CONNECTIONS BY 3 FEET BY ADDING TWO 45°ELBOWS TO EACH. PROVIDE NEW CONCRETE SIDEWALK.

N

## ENLARGED PLAN VIEW

1/4"=1'-0"

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# PIPING AT EXISTING EFFLUENT PUMP STATION ENLARGED PLAN

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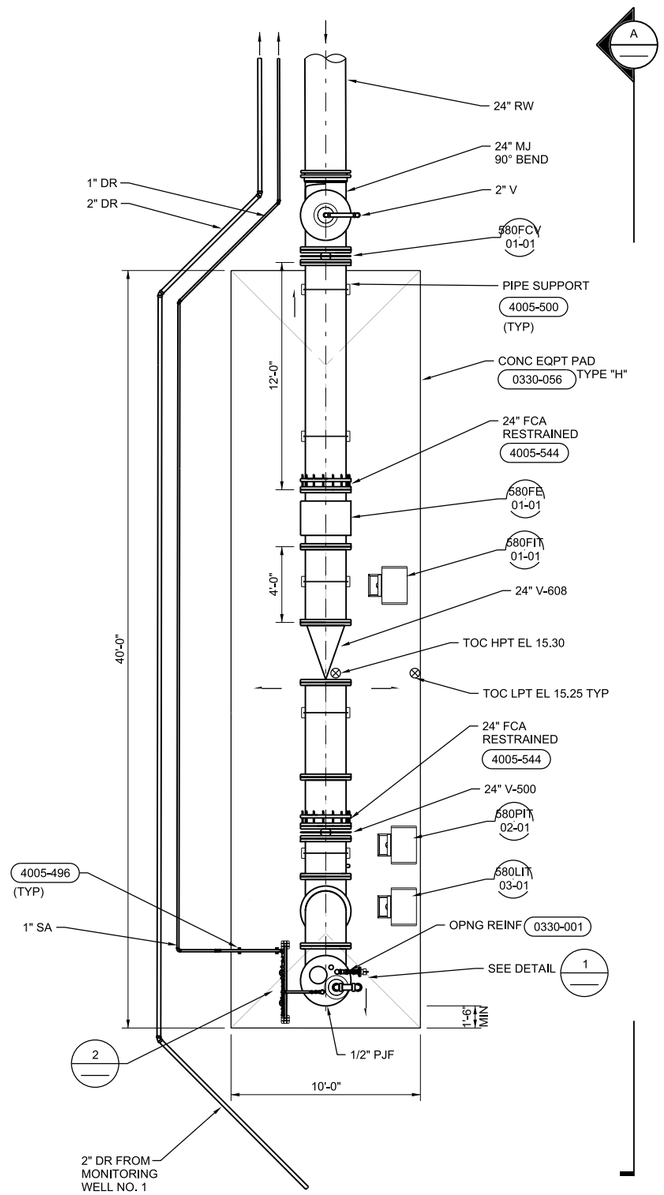
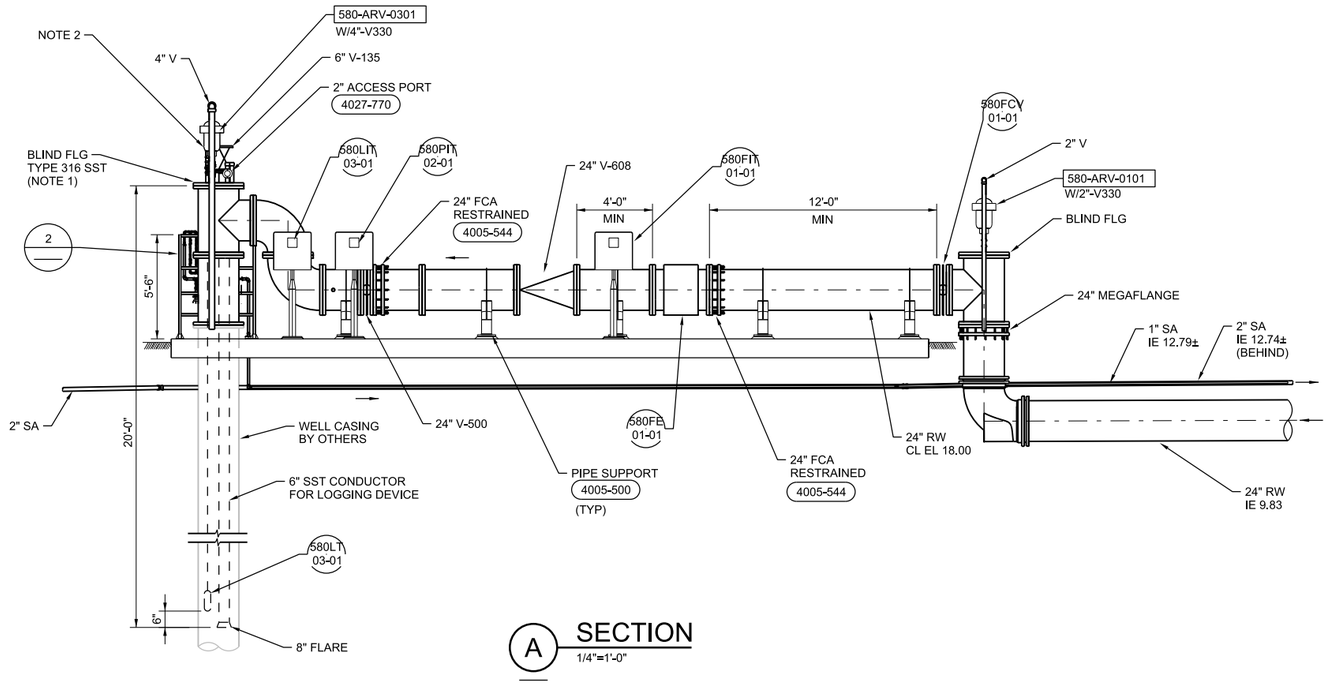



A

## ENLARGED PLAN VIEW

1/4"=1'-0"




A SECTION

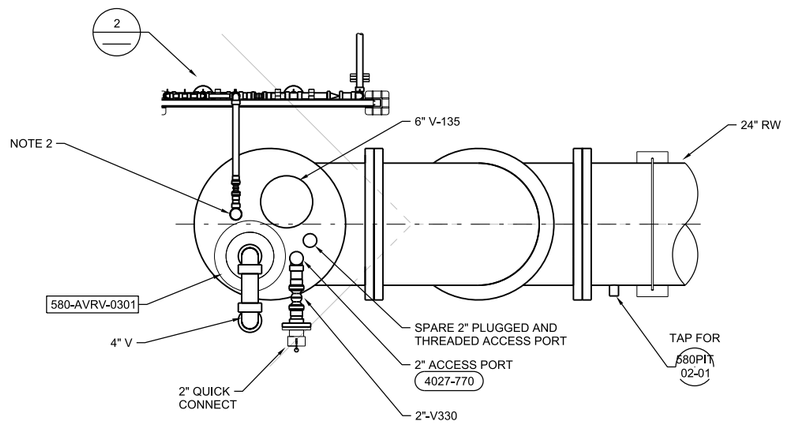
1/4"=1'-0"

NOTES:

1. WELL HEAD BLIND FLANGE SHALL BE TYPE 316 SST. WELD 6" SCHEDULE 10 TYPE 316 SST PIPE TO BLIND FLANGE FOR LOGGING. WELD 4" SCHEDULE 10 TYPE 316 SST PIPE FOR VENT CONNECTION.
2. FOR WELL HEAD CONNECTION OF LEVEL TRANSMITTER.

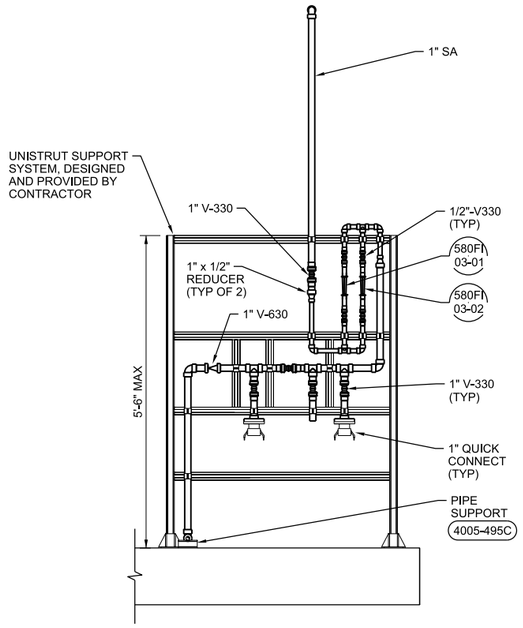
GENERAL NOTES:

1. SEE P&ID DRAWINGS FOR INSTRUMENT AND CONTROL INSTALLATION DETAILS.




1 DETAIL

3/4"=1'-0"




2 DETAIL

3/4"=1'-0"

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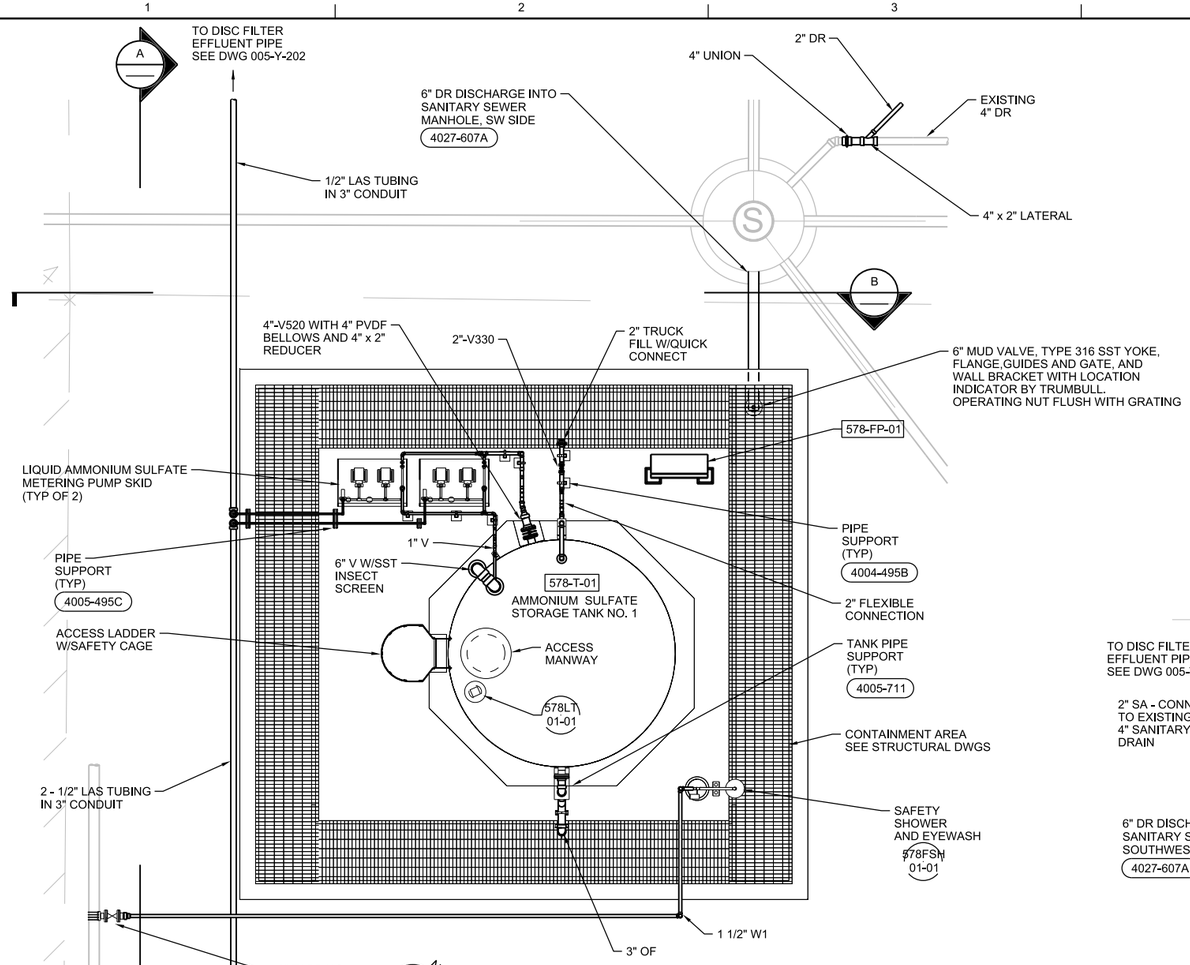
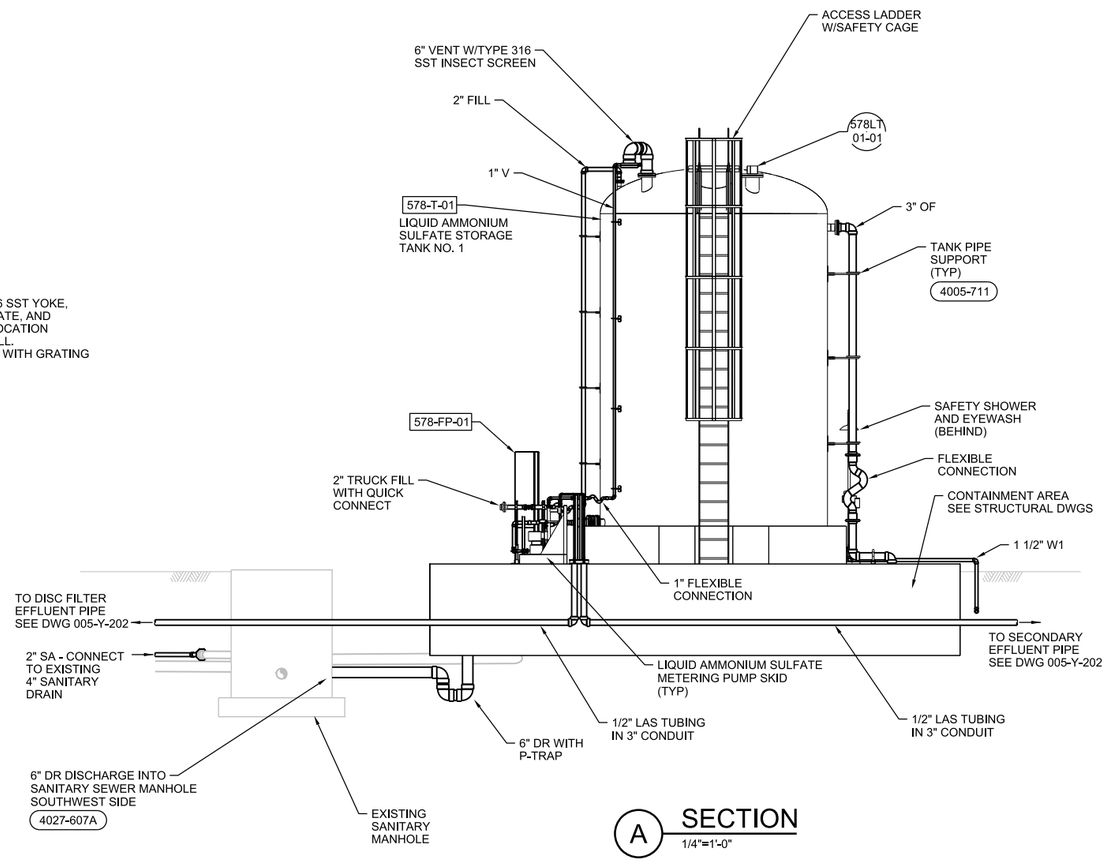



## ENLARGED PLAN VIEW

1/4"=1'-0"

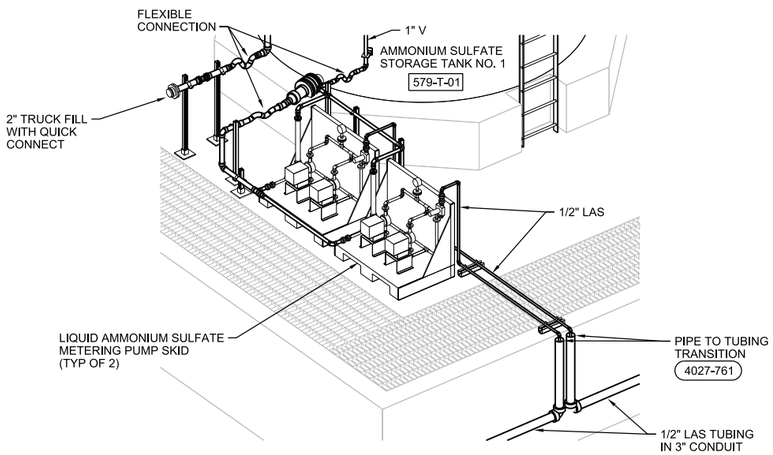



## A SECTION

1/4"=1'-0"

GENERAL NOTES:

1. SEE P&ID DRAWINGS FOR INSTRUMENT AND CONTROL INSTALLATION DETAILS.
2. METERING PUMP SKIDS SHALL BE IN ENCLOSURES AS SPECIFIED. ENCLOSURES NOT SHOWN FOR CLARITY ONLY.




## PUMP SKID ISOMETRIC

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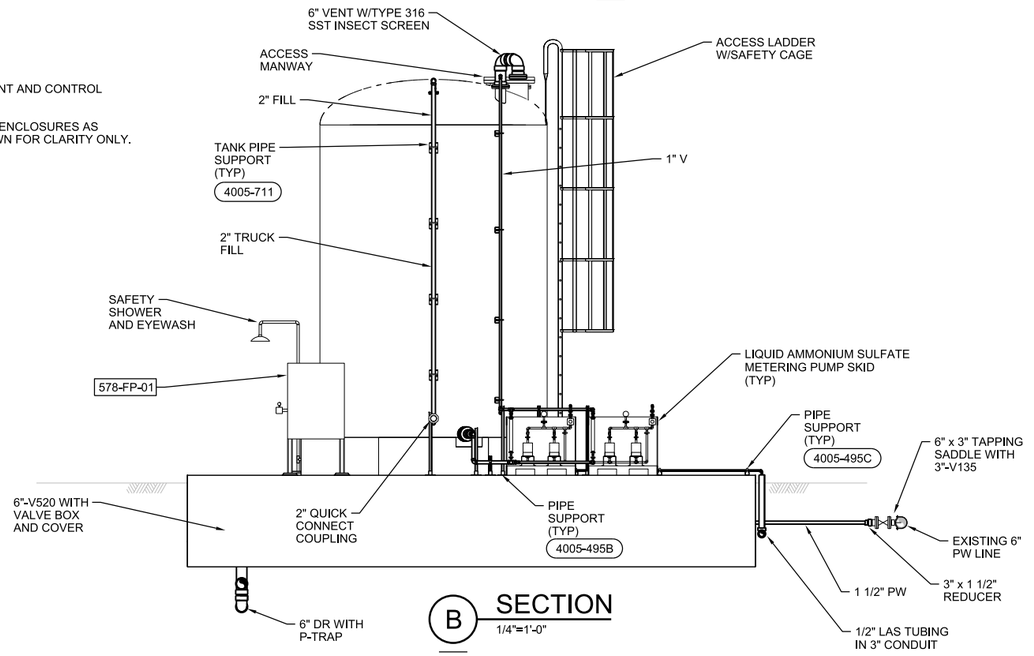


## B SECTION

1/4"=1'-0"

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YARD PIPING

# LIQUID AMMONIUM STORAGE TANKS PLAN AND SECTIONS

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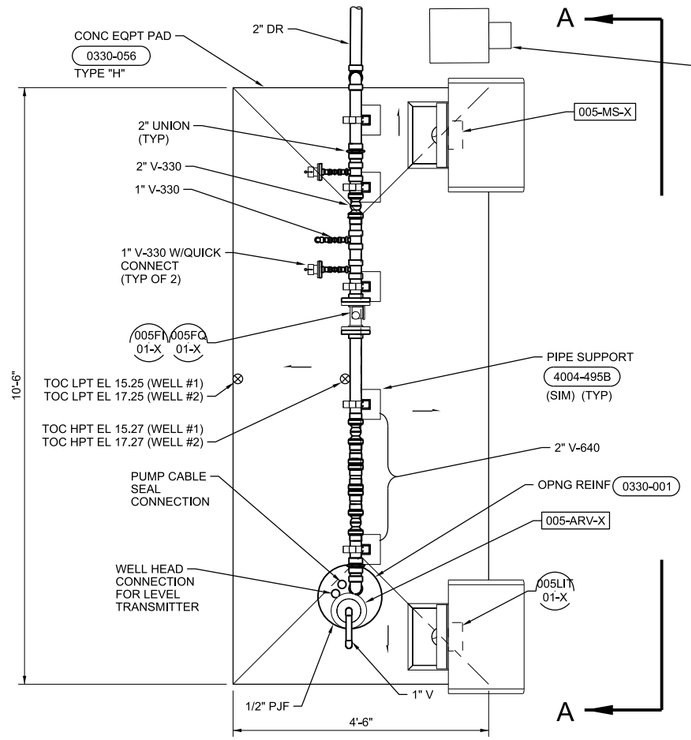
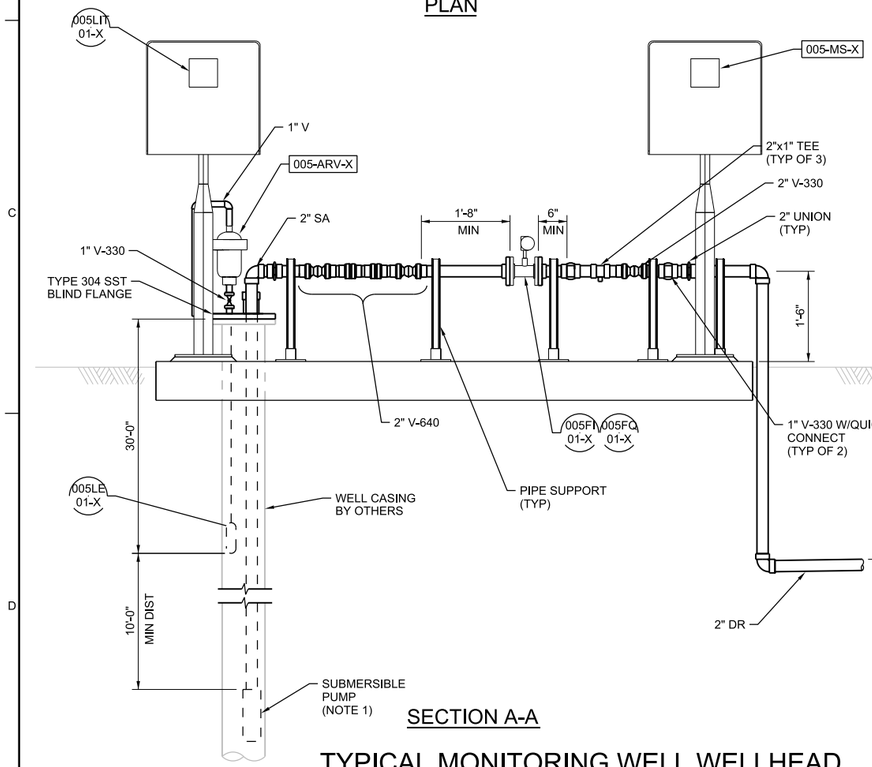



PLAN




SECTION A-A

## TYPICAL MONITORING WELL WELLHEAD

3/4"=1'-0"

LOCATION OF NEW 24" RECLAIMED WATER LINE

NOTE: CONTRACTOR TO PROTECT STRUCTURAL INTEGRITY OF EXISTING CANOPY SUPPORT COLUMNS DURING CONSTRUCTION AND INSTALLATION OF NEW PIPING USING A TRENCH BOX IF REQUIRED.

## 1 EXISTING CHLORINE GAS FACILITY CANOPY

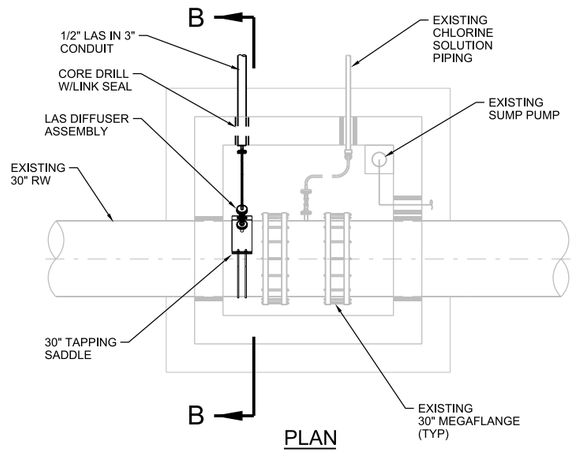
NTS

005-Y-202

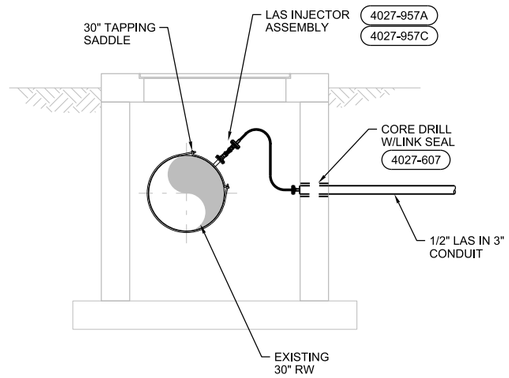

NOTE: CONTRACTOR TO INSTALL NEW AMMONIUM SULFATE INJECTION LINE OPPOSITE TO EXISTING HYPOCHLORITE INJECTION SYSTEM AND SIMILAR IN CONSTRUCTION.

## 2 EXISTING CHEMICAL INJECTION POINT ON SECONDARY EFFLUENT ABOVE GROUND MANHOLE

005-Y-202




PLAN




SECTION B-B

## EXISTING DISC FILTER EFFLUENT INJECTION POINT

1/4"=1'-0"

NOTES:

1. SUBMERSIBLE PUMP SHALL BE GOULDS 40GS 15, 304 SST CONSTRUCTION, W/SINGLE PHASE, 120V, 1.5 HP MOTOR, RATED 60 GPM @ 50 FT. MOTOR SHALL MEET DIV 26 SPECIFICATION REQUIREMENTS.

GENERAL NOTES:

1. SEE P&ID DRAWINGS FOR INSTRUMENT AND CONTROL INSTALLATION DETAILS.
2. IN TAG NUMBERS, X = 01 AND 02.

| NO. | DSGN | DATE | REVISION | DR | CHK | APVD | BY | APVD |
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MANATEE COUNTY, FLORIDA



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YARD PIPING

TYPICAL MONITORING WELL AND DETAILS

100% DESIGN DOCUMENTS

VERIFY SCALE

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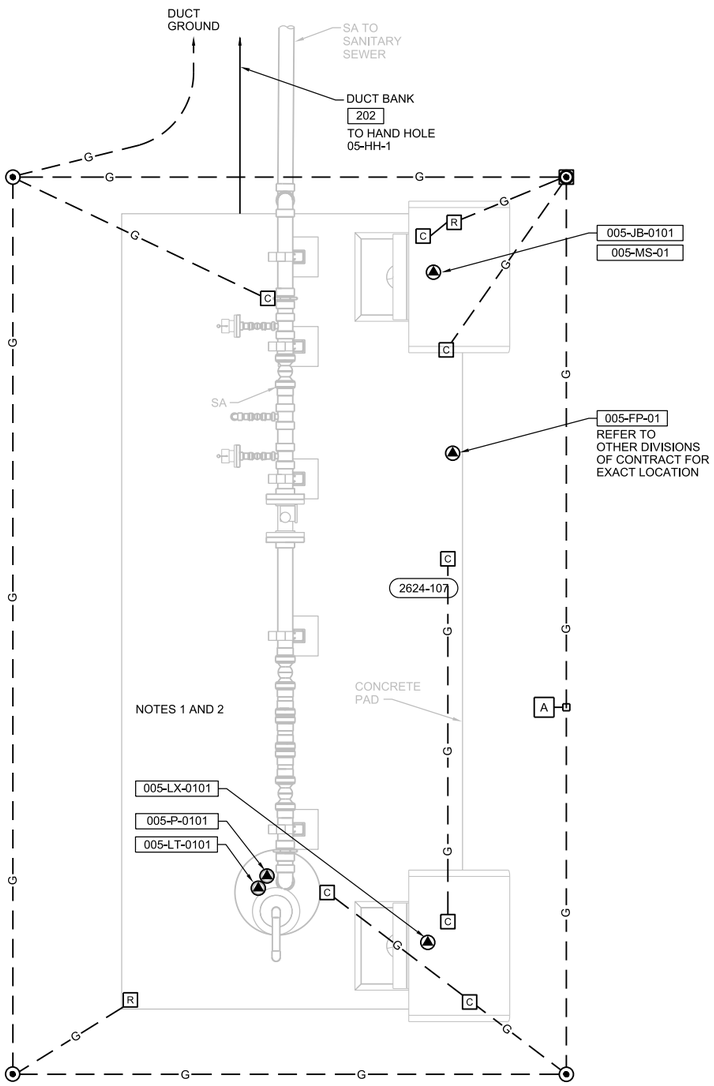


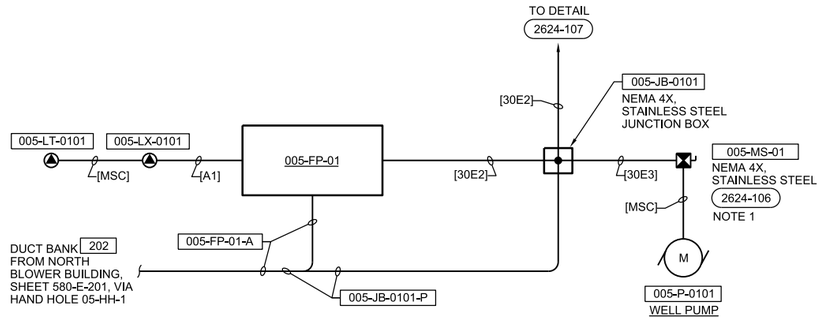

PLAN

NOTES:

1. COMPLY WITH NOTE 3 ON DRAWING 575-E-201 FOR CONDUIT STUB UP LOCATIONS.
2. PROVIDE LIGHTNING PROTECTION SYSTEM.

## MONITORING WELL NO. 1

NTS




NOTE:

1. ALL CABLES ENTERING WELL SHALL BE ROUTED IN OPEN AIR AND SHALL BE UL RATED FOR OUTDOOR EXPOSURE. CABLES SHALL BE CONNECTED TO WELL HEAD AND ENCLOSURE AT OTHER END WITH CABLE GLANDS. THERE SHALL BE NO CONDUIT OR SIMILAR CONNECTION BETWEEN INTERIOR OF WELL AND ENCLOSURE WHICH WILL TRANSMIT WATER OR GAS. THIS NOTE APPLIES AT ALL LOCATIONS IN PROJECT.

## MONITORING WELL NO. 1 ONE LINE DIAGRAM

NTS

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|---|---|---|---|---|
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ELECTRICAL

MONITORING WELL NO. 1 PLAN AND ONE LINE DIAGRAM

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VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

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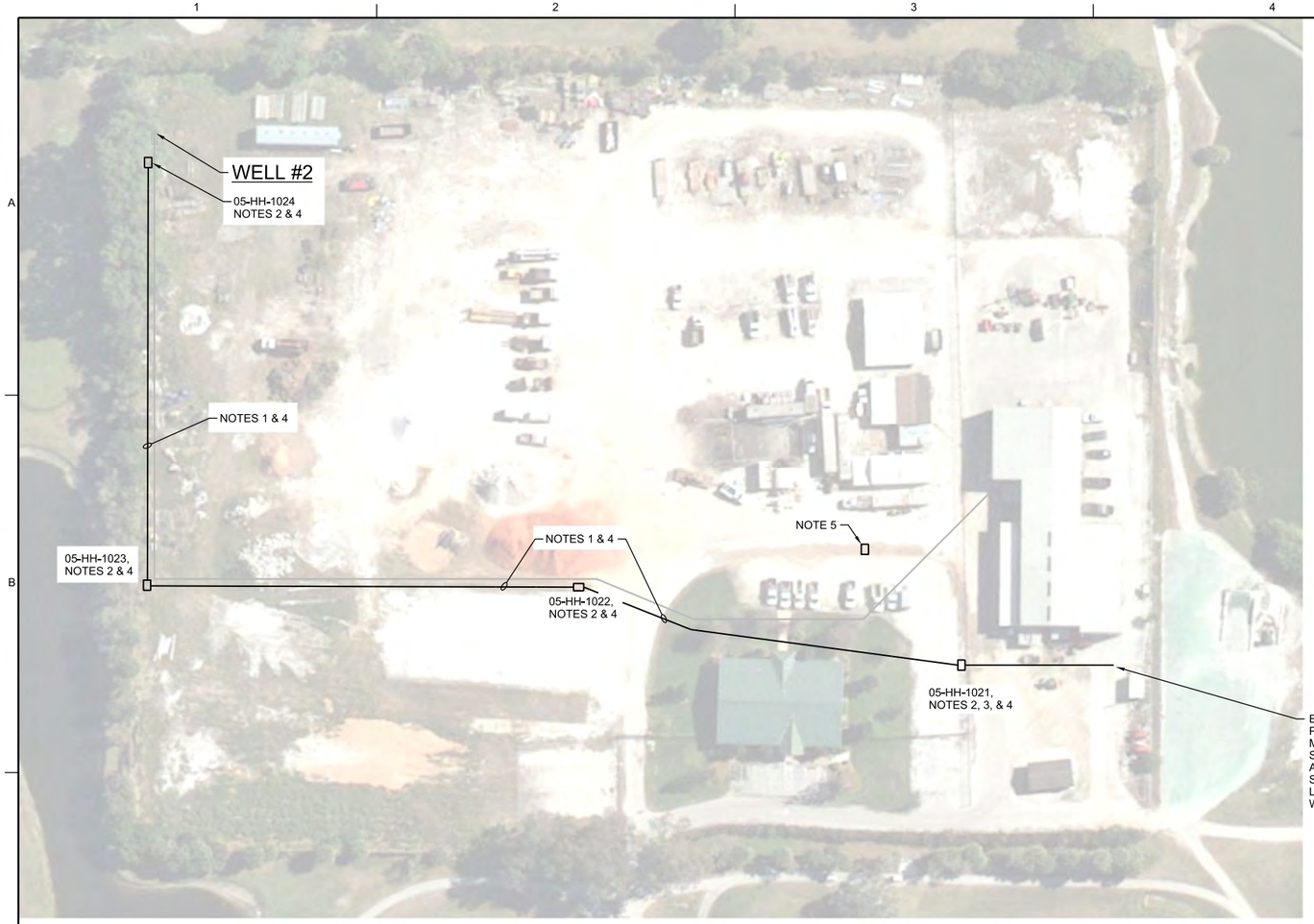
|---|---|
| DATE | DECEMBER 2015 |
| PROJ | 659297 |
| DWG | 005-E-210 |
| SHEET | 23 of 51 |



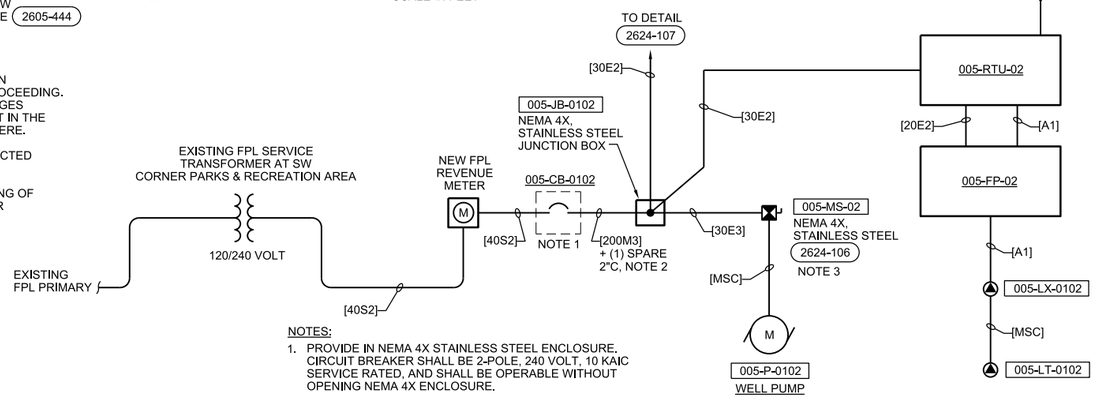

PLAN NOTES:

1. ROUTE ELECTRICAL CONDUITS IN SAME TRENCH AS PIPING PROVIDED UNDER OTHER DIVISIONS OF CONTRACT. DEPTH OF BURIAL OF CONDUITS SHALL NOT BE LESS THAN NEC REQUIREMENTS.
2. COORDINATE EXACT LOCATIONS OF HANDHOLES WITH NEW PIPING AND EXISTING UNDERGROUND FEATURES. PROVIDE (2605-444)
3. PROVIDE TRENCH FOR CONDUIT ONLY IN THIS LOCATION. EXTEND TO 005-CB-0102.
4. EXERCISE EXTREME CAUTION WHEN EXCAVATING. OBTAIN LOCATIONS OF ALL UNDERGROUND UTILITIES BEFORE PROCEEDING. UNDERGROUND ELECTRICAL LINES OPERATING AT VOLTAGES WHICH ARE LETHAL UPON CONTACT ARE KNOWN TO EXIST IN THE SOUTH WEST AREA OF THIS SITE AND MAY EXIST ELSEWHERE. CONTRACTOR SHALL REPORT ALL DAMAGE TO EXISTING UNDERGROUND FEATURES AT ONCE AND REPAIR AS DIRECTED WITHOUT CHANGE IN CONTRACT.
5. APPROXIMATE LOCATION OF EXISTING HANDHOLE. ROUTING OF CONNECTING PIPES AND DUCTS NOT KNOWN. SHOWN FOR CONTRACTOR INFORMATION ONLY; NO WORK REQUIRED.

N

## PLAN

0 50 100 150
SCALE IN FEET

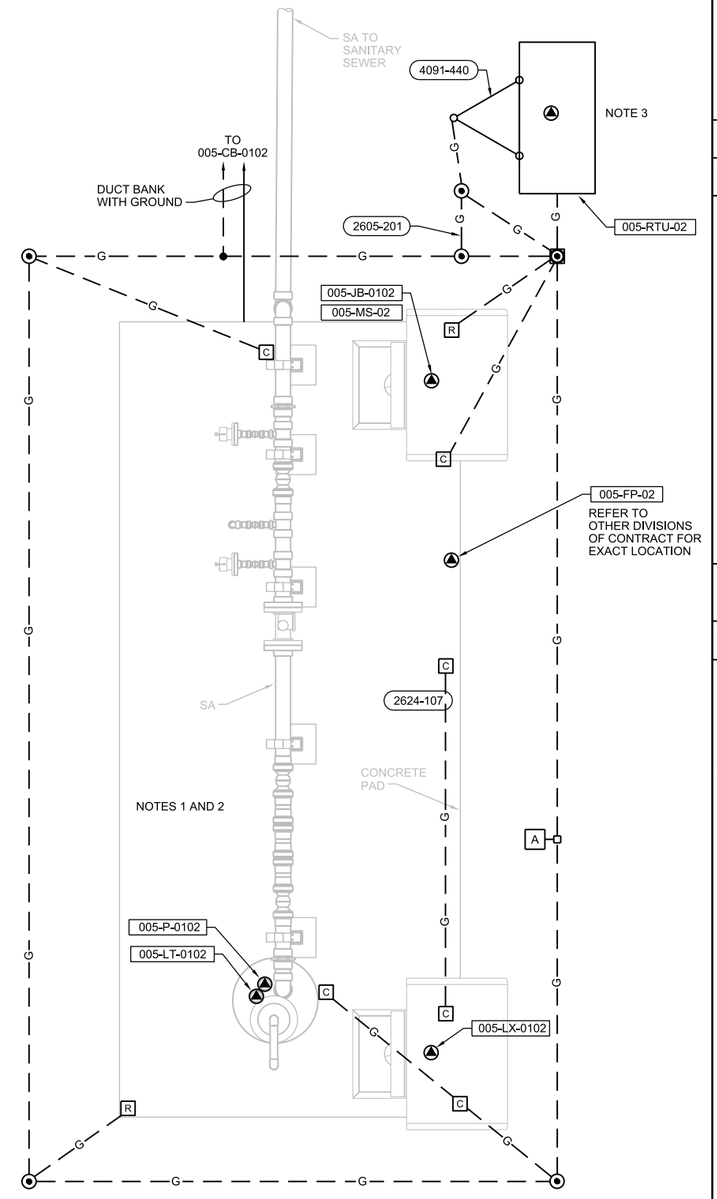



NOTES:

1. PROVIDE IN NEMA 4X STAINLESS STEEL ENCLOSURE, CIRCUIT BREAKER SHALL BE 2-POLE, 240 VOLT, 10 KAIC SERVICE RATED, AND SHALL BE OPERABLE WITHOUT OPENING NEMA 4X ENCLOSURE.
2. PROVIDE TERMINAL BLOCKS AT BOTH ENDS OF [200M3] IN NEMA 4X STAINLESS STEEL ENCLOSURES TO ADAPT WIRE TO SMALLER SIZES SHOWN.
3. SEE NOTE 1 ON DRAWING 005-E-210.

## MONITORING WELL NO. 2 ONE LINE DIAGRAM

NTS




## PLAN

NOTES:

1. COMPLY WITH NOTE 3 ON DRAWING 575-E-201 FOR CONDUIT STUB UP LOCATIONS.
2. PROVIDE LIGHTNING PROTECTION SYSTEM.
3. PROVIDE GROUND CONNECTIONS AS REQUIRED BY NEC, TOWER, ANTENNA, AND RTU MANUFACTURERS.

N

## MONITORING WELL NO. 2

NTS

| NO. | DATE | REVISION | BY | APVD |
|---|---|---|---|---|
| DSGN | D NICHOLSON | DR M REICHERT | CHK M WAYNE | APVD D NICHOLSON |



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EB0000072 · AAC001992
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SOUTHWEST REGIONAL WATER RECLAMATION FACILITY - RECHARGE WELL SYSTEM
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FLORIDA

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PARTIAL SITE PLAN, MONITORING WELL NO. 2 PLAN AND ONE LINE DIAGRAM

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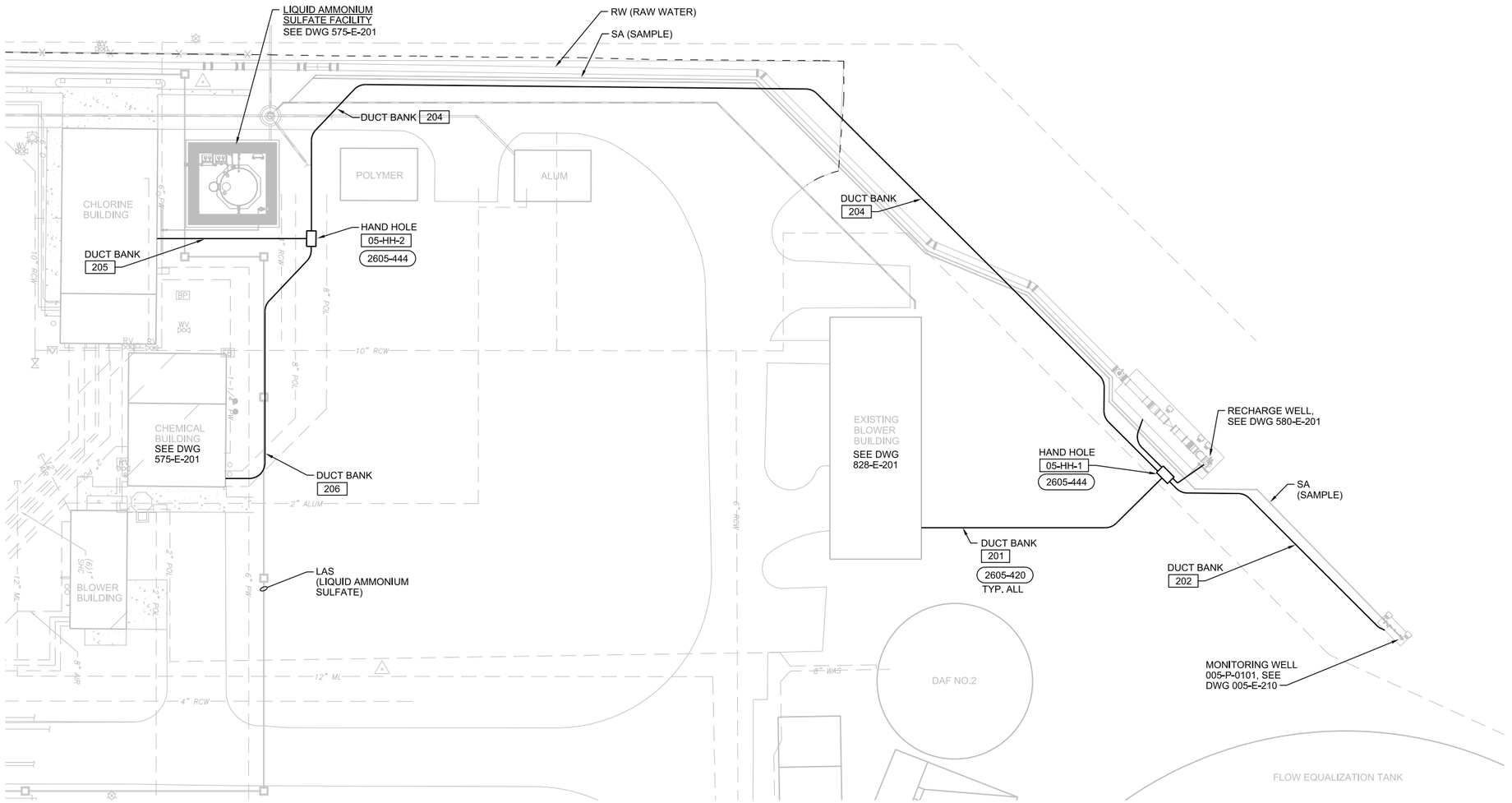
FILENAME: 005-E-2200_659297.dgn PLOT DATE: 12/16/2015 PLOT TIME: 9:14:39 AM

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PLAN

0 20 40 60

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|---|---|---|---|---|---|---|---|
| | D NICHOLSON | D NICHOLSON | M REICHERT | M WAYNE | APVD | D NICHOLSON | |



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ELECTRICAL
PARTIAL YARD ELECTRICAL PLAN

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