

CONTRACT DOCUMENTS
FOR THE CONSTRUCTION OF
SWWRF DIGESTER MODIFICATIONS



PREPARED FOR

MANATEE COUNTY UTILITIES
MANATEE COUNTY, FL

VOLUME 2 OF 2
DRAWINGS

For information regarding this project, contact:

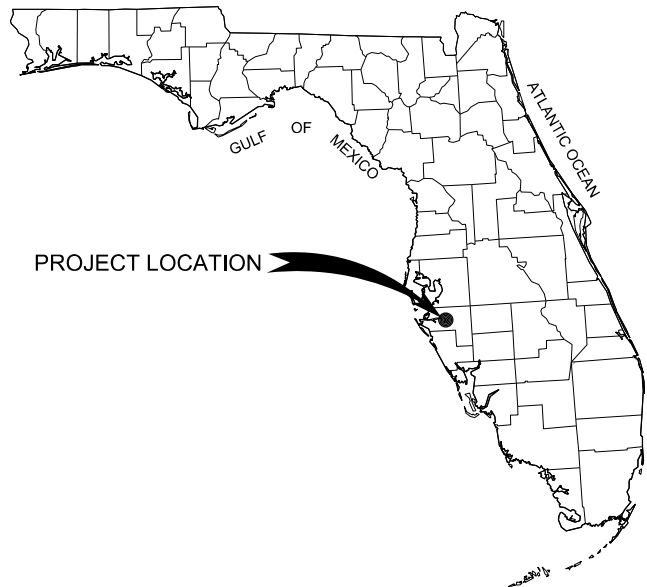
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CH2MHILL

Project No. 457133

JUNE 2013

ISSUED FOR BID



VICINITY MAP



LOCATION MAP

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- 950-N-5001 STANDARD DETAILS
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- 950-N-5003 STANDARD DETAILS

THE DRAWING NUMBERS FOR THIS PROJECT SHALL FOLLOW THE FOLLOWING GUIDELINE:

FACILITY NUMBERS

XXX - N - # # # #

FACILITY NUMBER (3 DIGITS) ↑ ↑ ↑ ↑

DISCIPLINE DESIGNATOR ↑ ↑ ↑ ↑

VARIABLE (2 DIGIT) ↑ ↑ ↑ ↑

SEQUENTIAL NUMBERING (2 DIGITS) ↑ ↑ ↑ ↑

FACILITY NUMBERS	DESIGNATOR	DISCIPLINE	VARIABLES	SEQUENTIAL NUMBERS
000 - GENERAL	G	GENERAL	PLAN TYPES	00
(SEE LIST ON THIS SHEET FOR OTHER FACILITY NUMBERS)	C	CIVIL		01
	Y	YARD PIPING		02
	S	STRUCTURAL		03
	A	ARCHITECTURAL		ETC
	D	PROCESS MECHANICAL		
	M	HVAC		
	P	PLUMBING		
	E	ELECTRICAL		
	N	INSTRUMENTATION AND CONTROL		

001	GENERAL
004	DEMOLITION
005	SITE
007	ELECTRICAL (NON FACILITY SPECIFIC)
008	INSTRUMENTATION AND CONTROLS
200	GENERATOR ROOM
315	SPLITTER BOX
510	ANOXIC BASIN
520	AERATION BASINS
600	MOTOR CONTROL BUILDING
825	SLUDGE HOLDING TANKS
827	BLOWER BUILDING
850	DEWATERING BUILDING
860	EXISTING SW GENERATOR BUILDING
950	STANDARD DETAILS (PACKAGE SPECIFIC)

3011 SW WILLISTON RD
GAINESVILLE, FL 32608
EB0000072 - AAC001992
MATTHEW F. TENNANT - PE 06302

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FL

M. TENNANT
R. BOE
G. GERMAN
DR
CHK
REVISION
BY
APVD
M. TENNANT

CH2MHILL®

GENERAL

INDEX OF DRAWINGS

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE: JUNE 2013

PROJ: 457133

DWG: 001-G-0001

SHEET: of

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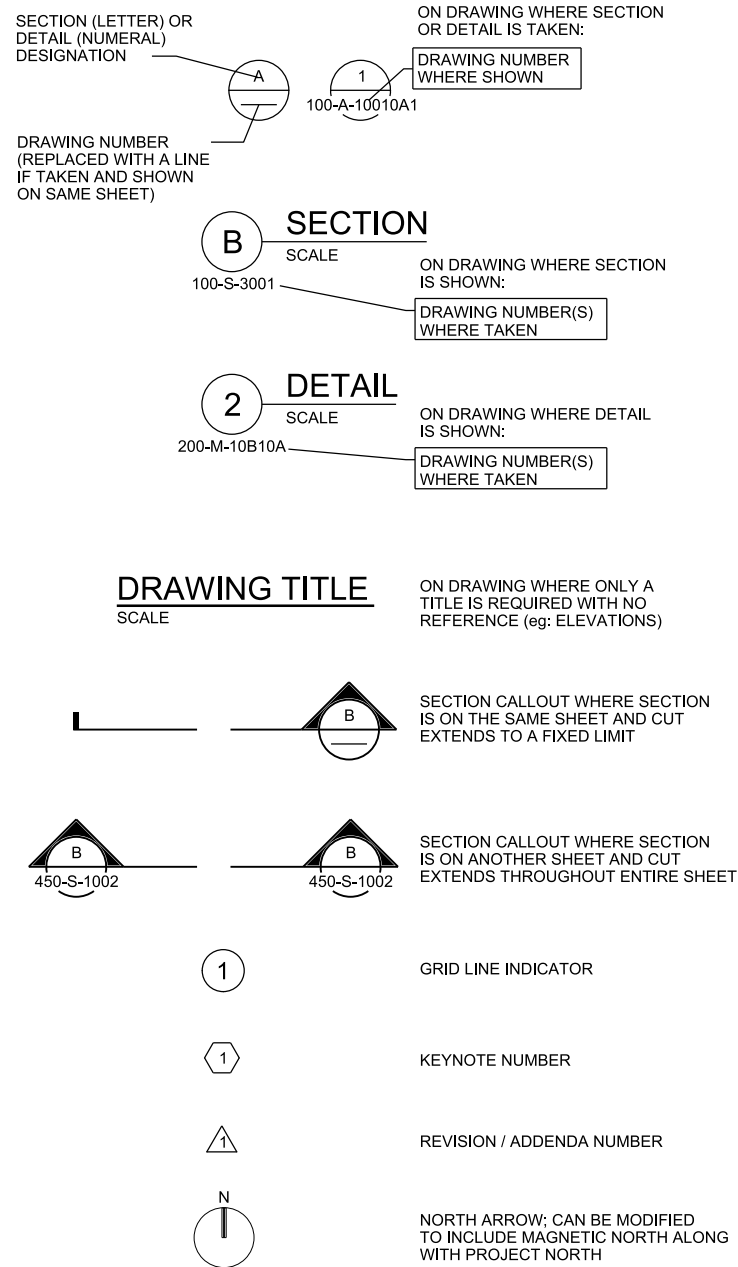
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ABBREVIATIONS

RRUB	RADIAL RUBBER	TG	TEMPERED
RS	RIGID STEEL	TH	TOP-HINGED
RST	REINFORCING STEEL	THD	THREAD
RT	RIGHT	THK	THICKNESS
RTN	RETURN	THRU	THROUGH
RTO	REGENERATIVE THERMAL OXIDIZER	TJB	TERMINAL JUNCTION BOX
RUB	RUBBER	TL	TEFLON LINED PIPE
RUBC	RUBBER CUSHIONED FLOORING	T.O.	TIME TO OPEN, TOP OF
RUBS	RUBBER ESD CONTROL FLOORING	TOAE	TIME OPEN AFTER ENERGIZATION
R/W	RIGHT OF WAY	TOC	TOP OF CONCRETE
		TOC	TOP OF CURB
		TOD	TIME ON DELAY, TOP OF DUCT
S	I-BEAM		TOTAL OXYGEN DEMAND
S	SLOPE, SOUTH, SWITCH	TOF	TOP OF FOOTING
SA	SUPPLY AIR	TOG	TOP OF GROUT, TOP OF GRATE
SATC	SUSPENDED ACCUSTICAL TILE CEILING	T.O.P.	TOP OF PARAPET
SB	SEDIMENT BASIN	TOS	TOP OF SLAB
SC	SHOWER CURTAIN, SOLID CORE WOOD	TOW	TOP OF WALL
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION	TP	TURNING POINT
SCC	SOLID CORE	TR	TRANSOM, TRUSS
SCFM	STANDARD CUBIC FEED PER MINUTE	TRANS	TRANSFORMER, TRANSITION
SCHED	SCHEDULE	TRANSV	TRANSVERSE
SCU	SPEED CONTROL UNIT	TRD	TREAD
SDP	SUB-DISTRIBUTION PANEL	TS	TEMPORARY SEEDING, TUBE STEEL
SDWK	SIDEWALK	TSHT	THRESHOLD
SEC	SECONDARY	TSS	TOTAL SUSPENSION SOLIDS
SECT	SECTION	TST	TOP OF STEEL
SED	SEDIMENTATION	TTC	TELEPHONE TERMINAL CABINET
SEW	SEWAGE	TTD	TOILET TISSUE DISPENSER
SG	LAMINATED SAFETY GLASS, SAFETY	TU-X	TREATMENT UNIT NO. X
SGWB	SUSPENDED GYPSUM WALL BOARD	TURB	TURBIDITY
SH	SHEET	TWP	TRANSLUCENT WALL PANEL
SHA	SURFACE HARDENING AGENT	TX	TRANSFORMER
SHS	SOLIDS HANDLING SYSTEM	TYP	TYPICAL
SIM	SIMILAR		
SK	SINK	UON	UNLESS OTHERWISE NOTED
SLR	SEALER	UNO	UNLESS NOTED OTHERWISE
SMLS	SEAMLESS EPOXY	UPS	UNINTERRUPTIBLE POWER SUPPLY
SOI	SPRAY- ON INSULATION	USB	UNIT SUBSTATION
SOLN	SOLUTION	UVR	UNDER VOLTAGE RELAY
SP	SPACE OR SPACES,	V	VENT, VALVE
	SPANDREL PANEL, STORMPROOF	V	VOLTMETER, VOLTS
SPEC, SPECS	SPECIFICATIONS	VB	VAPOR BARRIER (RETARDER)
SPD	SUMP PUMP DISCHARGE	VC	VERTICAL CURVE
SPG	SPACING	VCP	VITRIFIED CLAY PIPE
SPLY	SUPPLY	VCT	VINYL COMPOSITION TILE
SQ	SQUARE	VEL	VELOCITY
SQ FT	SQUARE FOOT, FEET	VERT	VERTICAL
SQ IN	SQUARE INCH	VHC	VOLATILE HYDROCARBONS
SR	SHORT RADIUS	VIB	VIBRATION
SS	START-STOP	VIF	VERIFY IN FIELD
SST	STAINLESS STEEL	VIN	VINYL
SSC	SUPERVISORY SET POINT CONTROL	VINT, VT	VINYL TILE
ST	STORM DRAIN	VP	VERTICAL PIVOTED
ST	STRAIGHT	VPS	VENEER PLASTER SYSTEM
STA	STATUS, STATION	VPC	POINT OF VERTICAL CURVATURE
STD	STANDARD	VPI	POINT OF VERTICAL INTERSECTION
STIF	STIFFENER	VPT	POINT OF VERTICAL TANGENT
STIRR	STIRRUP	VS	VERTICAL SLIDE
STL	STEEL	VTR	VENT THRU ROOF
STRL	STRUCTURAL	VWC	VINYL WALL COVERING
STRUCT	STRUCTURE		
SUBFL	SUBFLOOR	W	WEST
SUSP	SUSPENDED	W/	WITH
SV	SOLENOID VALVE	WC	WATER COLUMN
SVIN	SHEET VINYL	WEASTRIP	WEATHERSTRIP
SWBD	SWITCHBOARD	WG	WIRE, WIRE GLASS
SWGR	SWITCHGEAR	WH	WATTHOUR METER
SYMM	SYMMETRICAL	WHD	WATTHOUR DEMAND METER
		WP	WATERPROOF, WEATHERPROOF, WORKPOINT
T	THERMOSTAT, TREAD	WR	WASTE RECEPTACLE
T&B	TOP AND BOTTOM	WRB	WATER RESISTANT GWB
T&G	TONGUE AND GROOVE	WS	WATER SURFACE, WATERSTOP, WELDED STEEL
TA	TRANSFER AIR	WWF	WELDED WIRE FABRIC
TAN	TANGENT	WWPH	WET WEATHER PEAK HOUR
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		

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

SECTION / DETAIL DESIGNATIONS



DESIGN DETAIL DESIGNATION

DESIGN DETAIL DESIGNATION (NUMERAL) SHOWN ON DESIGN DETAIL DRAWING(S) (1234-567)

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 SYNONOMOUS 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.

3011 SW WILLISTON RD
GAINESVILLE, FL 32608
EB0000072 - AAC001992
MATHEW F. TENNANT - PE 68302
SWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY UTILITIES
MANATEE COUNTY, FL

DATE: JUNE 2013
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NEW CONSTRUCTION ARCHITECTURAL LEGEND

SYMBOL	LEGEND	SYMBOL	LEGEND
	VENEER		GRATING, SPAN DIRECTION INDICATED
	METAL STUD WALL (PLAN)		CHECKERED PLATE
	WOOD STUD WALL (PLAN)		GROUT
	RIGID INSULATION		GRANULAR FILL
	BATT INSULATION		EARTH OR FINISH GRADE
	STEEL		CONCRETE
	ALUMINUM		CMU WALL (PLAN)
	PLYWOOD		CMU WALL (SECTION)
	GYPSUM WALLBOARD		
	ACOUSTICAL TILE		
	WOOD, ROUGH CONTINUOUS		CONTROL JOINT
	WOOD, ROUGH NON-CONTINUOUS		EXPANSION JOINT "X" = DIMENSION
	WOOD, FINISHED FINISH AS SCHEDULED		RAILINGS
	GRID / COLUMN INDICATOR		
	ROOM IDENTIFIER		
	DOOR DESIGNATION		INDICATES PAIR OF DOORS (DOOR # ON ACTIVE)
	WINDOW IDENTIFIER		FIRE EXTINGUISHER "X" = NUMBER IN SPECIFICATIONS
	RELIGHT IDENTIFIER		
	LOUVER IDENTIFIER		
	PARTITION TYPE INDICATOR		PRECAST PANEL IDENTIFIER
	SIGNAGE IDENTIFIER		SLAB INDICATOR
	INTERIOR ELEVATION INDICATOR		BEAM INDICATOR
	SPOT ELEVATION INDICATOR (IN FEET)		
	ELEVATION DATUM (IN FEET)		
	DIRECTION OF SLOPE DOWN		
	HATCH SWING INDICATOR		

APPLICABLE CODES

- 2010 FLORIDA EXISTING BUILDING CODE
- 2010 FLORIDA BUILDING CODE
- 2010 FLORIDA FIRE PREVENTION CODE
- 2011 NATIONAL ELECTRIC CODE
- 2010 FLORIDA PLUMBING CODE
- 2010 FLORIDA MECHANICAL CODE
- 2010 FLORIDA FIRE PREVENTION CODE

PROJECT SPECIFIC BUILDING CODE INFORMATION

THIS PROJECT SCOPE INVOLVES UPGRADES AND REPLACEMENT EQUIPMENT IN SUPPORT OF WATER TREATMENT AT THE SOUTHWEST WASTEWATER RECLAMATION FACILITY.

PER THE 2010 FLORIDA EXISTING BUILDING CODE, ALL FACILITY BUILDINGS AFFECTED BY PROCESS CHANGES ARE ONLY CLASSIFIED UNDER THE CODE BY ALTERATION OF EQUIPMENT PADS AND RENOVATION OF ELECTRICAL BUILDING POWER SYSTEMS. THE SCOPE OF WORK WITHIN ALL FOUR OF THE BUILDINGS DO NOT QUALIFY AS ADDITIONS, CHANGE OF OCCUPANCY, OR ALTERATIONS LEVEL 2 OR 3.

THE FOLLOWING IS A LIST OF THE AFFECTED FACILITIES, THE CLASSIFICATION OF WORK PER CODE AND SPECIFIC DRAWING NUMBERS FOR REFERENCE:

- 600 EXISTING SOUTH ELECTRICAL BUILDING -WORK CLASSIFICATION LEVEL I ALTERATION
SEE DRAWING 600-A-0001
- 827 EXISTING BLOWER BUILDING-WORK CLASSIFICATION LEVEL I ALTERATION
SEE DRAWING 827-A-0001.
- 850 EXISTING DEWATERING BUILDING-WORK CLASSIFICATION LEVEL I ALTERATION
SEE DRAWING 850-E-2001.
- 860 EXISTING SOUTHWEST GENERATOR BUILDING-WORK CLASSIFICATION LEVEL I ALTERATION
SEE DRAWING 860-A-0001.

ARCHITECTURAL GENERAL NOTES

LINE OF EXISTING GRADES, AS SHOWN ON THE BUILDING ELEVATIONS AND SECTIONS ARE APPROXIMATE. THEY ARE AT THE BUILDING FACE, OR AT THE SECTION END EXCEPT AS NOTED.

VERIFY ALL ROUGH-IN DIMENSIONS FOR EQUIPMENT PROVIDED IN THIS CONTRACT, OR BY OTHERS.

NIC MEANS "NOT IN CONTRACT".

VERIFY ALL ROUGH-IN DIMENSIONS FOR EQUIPMENT PROVIDED IN THIS CONTRACT, OR BY OTHERS.

CONTRACTOR IS RESPONSIBLE FOR FULL ENCLOSURE OF ALL AIR CONDITIONED SPACES, AND SEPARATION FROM NON-AIR-CONDITIONED SPACES, BY CARRYING WALLS TO UNDERSIDE OF DECKING AND SEALING TO PREVENT AIR EXCHANGE. SEALING AROUND STRUCTURAL MEMBERS MAY REQUIRE CONTRACTOR TO OBTAIN ADDITIONAL ENGINEERING JUDGEMENTS FOR THE SEALANT MANUFACTURER, WHICH CONTRACTOR SHALL DO AT NO ADDITION COST TO OWNER.

CH2MHILL® GENERAL ARCHITECTURAL LEGEND AND CODE DATA		3011 SW WILLISTON RD GAINESVILLE, FL 32608 EB0000072 AAC001992 BETH TRAUTWEIN - AR 91588	SWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS MANATEE COUNTY UTILITIES MANATEE COUNTY, FL
		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.	DR K RIMMER REVISION CHK APVD APVD
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SYMBOL	DESCRIPTION
ONE LINE DIAGRAMS	
	DRAWOUT AIR CIRCUIT BREAKER, LOW VOLTAGE
	CIRCUIT BREAKER, THERMAL MAGNETIC TRIP SHOWN, 3 POLE, UNO
	CIRCUIT BREAKER, STATIC TRIP UNIT, SENSOR AMP TRIP AND FRAME RATINGS SHOWN, 3 POLE, UNO
	CIRCUIT BREAKER, MAGNETIC TRIP ONLY, TRIP RATING SHOWN, 3 POLE, UNO
	SWITCH, CURRENT RATING INDICATED, 3 POLE, UNO
	FUSE, CURRENT RATING AND QUANTITY INDICATED
	MAGNETIC STARTER WITH OVERLOAD, NEMA SIZE INDICATED, FVNR UNO
	ELECTRONIC STARTER/SPEED CONTROL AFD = AC ADJUSTABLE FREQUENCY DRIVE DC = DC ADJUSTABLE SPEED DRIVE RVAT = REDUCED VOLTAGE AUTO TRANSFORMER TYPE RVRT = REDUCED VOLTAGE REACTOR TYPE
	DRAWOUT CIRCUIT BREAKER, MEDIUM VOLTAGE
	MOTOR CONTACTOR, MEDIUM VOLTAGE
	RVSS = REDUCED VOLTAGE SOFT STARTER
	CABLE OR BUS CONNECTION POINT
	KEY INTERLOCK
	SURGE ARRESTER (GAP TYPE)
	CAPACITOR - KVAR INDICATED, 3 PHASE
	AC MOTOR, SQUIRREL CAGE INDUCTION - HORSEPOWER INDICATED
	GENERATOR, KW/KVA RATING SHOWN
	UTILITY REVENUE METER
	GROUND
	TRANSFORMER, SIZE, VOLTAGE RATINGS, AND PHASE INDICATED
	SHIELDED ISOLATION TRANSFORMER
	POTENTIAL TRANSFORMER, VOLTAGE RATING AND QUANTITY INDICATED
	CURRENT TRANSFORMER, RATIO(100:5) AND QUANTITY INDICATED (3)
	CONNECTION POINT TO EQUIPMENT SPECIFIED IN OTHER DIVISIONS, RACEWAY, CONDUCTOR AND CONNECTION IN THIS DIVISION
	SURGE PROTECTIVE DEVICE
	DIGITAL POWER METER WITH MODBUS COMMUNICATIONS LINK TO DEVICE SHOWN

SYMBOL	DESCRIPTION																
CONTROL DIAGRAMS																	
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY OPEN																
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY CLOSED																
	SELECTOR SWITCH - MAINTAINED CONTACT - CHART IDENTIFIES OPERATION WHEN NEEDED FOR CLARITY:																
	<table border="1"> <thead> <tr> <th colspan="4">POSITION</th> </tr> <tr> <th>CKT</th> <th>HAND</th> <th>OFF</th> <th>REMOTE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>X</td> <td>O</td> <td>O</td> </tr> <tr> <td>2</td> <td>O</td> <td>O</td> <td>X</td> </tr> </tbody> </table> X - CLOSED CONTACT O - OPEN CONTACT	POSITION				CKT	HAND	OFF	REMOTE	1	X	O	O	2	O	O	X
POSITION																	
CKT	HAND	OFF	REMOTE														
1	X	O	O														
2	O	O	X														
	TOGGLE SWITCH, ON-OFF TYPE																
	SELECTOR SWITCH, ON-OFF TYPE																
	INDICATING LIGHT, PUSH-TO-TEST, LETTER INDICATES COLOR																
	INDICATING LIGHT - LETTER INDICATES COLOR A - AMBER G - GREEN S - STROBE B - BLUE R - RED C - CLEAR W - WHITE																
	ELAPSED TIME METER																
	MOTOR STARTER CONTACTOR COIL																
	CONTROL RELAY, X INDICATES NUMERICAL ORDER IN CIRCUIT																
	TIME DELAY RELAY, X INDICATES NUMERICAL ORDER IN CIRCUIT																
	SOLENOID VALVE, X INDICATES NUMERICAL ORDER IN CIRCUIT																
	CONTACT - NORMALLY OPEN																
	CONTACT - NORMALLY CLOSED																
	REMOTE DEVICE																
	TIME DELAY RELAY CONTACT, NORMALLY OPEN, CLOSURES WHEN ENERGIZED AND TIMED OUT																
	TIME DELAY RELAY CONTACT, NORMALLY CLOSED, OPENS WHEN ENERGIZED AND TIMED OUT																
	TIME DELAY RELAY CONTACT, CLOSURES WHEN ENERGIZED, OPENS WHEN DE-ENERGIZED AND TIMED OUT																
	TIME DELAY RELAY CONTACT, OPENS WHEN ENERGIZED, CLOSURES WHEN DE-ENERGIZED AND TIMED OUT																
	TERMINAL BLOCK, REMOTE																
	TERMINAL BLOCK, INTERNAL																
	FUSE, RATING INDICATED																
	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.																	

SYMBOL	DESCRIPTION
GROUND SYSTEM PLAN	
	GROUND ROD
	GROUND ROD IN TEST WELL
	GROUNDING CONDUCTOR, SIZE AS INDICATED
	PIGTAIL FOR CONNECTION TO EQUIPMENT CABINET OR FRAME
	EQUIPMENT GROUND BUS
	EQUIPMENT NEUTRAL BUS

SYMBOL	DESCRIPTION
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

CH2MHILL®		GENERAL		ELECTRICAL LEGEND SHEET 1	
3011 SW WILLISTON RD GAINESVILLE, FL 32608 EB0000072 AAC001992 DAVID C NICHOLSON - PE 00201		SWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS MANATEE COUNTY UTILITIES MANATEE COUNTY, FL		REVISION CHK M WAYNE APVD D NICHOLSON	
DATE		JUNE 2013		BY	
PROJ		457133		APVD	
DWG		001-G-0301		D NICHOLSON	
SHEET		of		DR	
VERIFY SCALE		BAR IS ONE INCH ON ORIGINAL DRAWING.		NO. DATE	
DATE		JUNE 2013		DSGN	
PROJ		457133		K KRINER	
DWG		001-G-0301		DR	
SHEET		of		M WAYNE	
				APVD	
				D NICHOLSON	

INSTRUMENT IDENTIFICATION

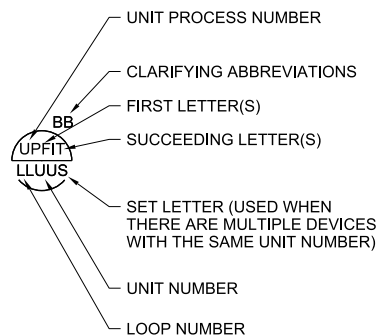
INSTRUMENT IDENTIFICATION LETTERS TABLE

LETTER	FIRST-LETTER		SUCCEEDING-LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	READOUT OR PASSIVE FUNCTION	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			
T	TEMPERATURE			SWITCH	
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.

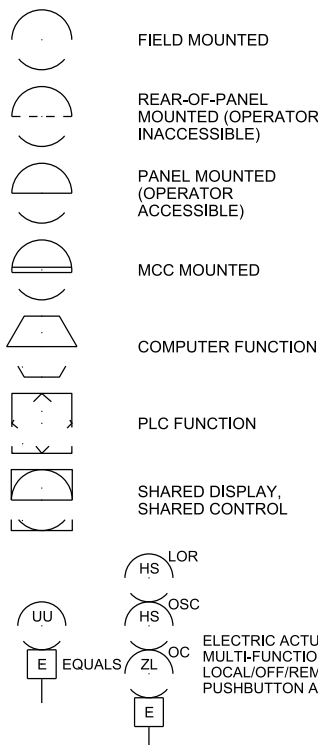
EXAMPLE SYMBOLS



DIGITAL SYSTEM INTERFACES

- ▲ ANALOG INPUT
- ▼ ANALOG OUTPUT
- △_x DISCRETE INPUT
- ▽_x DISCRETE OUTPUT

GENERAL INSTRUMENT OR FUNCTIONAL SYMBOLS



TRANSDUCERS

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



ACCESSORY DEVICES

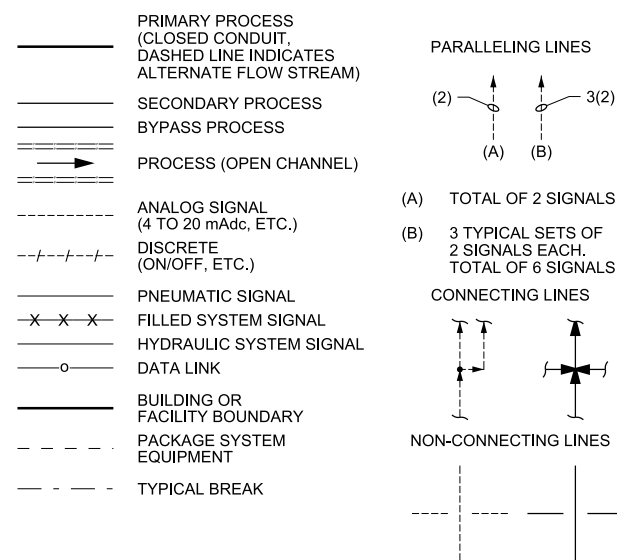
- A ALARM
- C CONTROLLER
- I INDICATOR
- R RECORDER
- S SWITCH
- T TRANSMITTER
- X UNCLASSIFIED



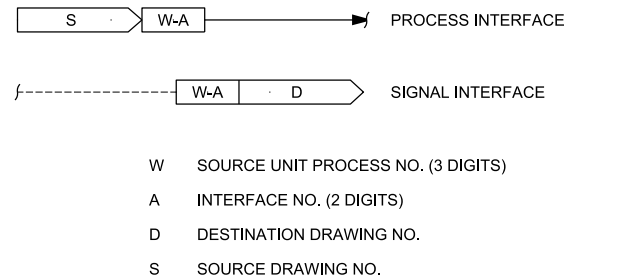
SPECIAL CASES

- YL OO ON AND OFF EVENT LIGHTS
- OO ON-OFF HAND SWITCH, MAINTAINED CONTACT SWITCH (CONTROLLED DEVICE WILL RESTART ON RETURN OF POWER AFTER POWER FAILURE).
- HS SS STOP-START HAND SWITCH MOMENTARY CONTACT SWITCHES (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE).

LINE LEGEND



INTERFACE SYMBOLS



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, BLR BLOWER, CMP COMPRESSOR, E EJECTOR, GTE GATE, M MECHANICAL EQUIPMENT, MIX MIXER, NMH MONORAIL, PMP PUMP, PRV PRESSURE RELIEF VALVE, T TANK, SCR SCREEN
 - X LOOP NUMBER
 - Y UNIT NUMBER

ABBREVIATIONS & LETTER SYMBOLS

- AC ALTERNATING CURRENT
- AFD ADJUSTABLE FREQUENCY DRIVE
- AM AUTO-MANUAL
- CAM COMPUTER-AUTO-MANUAL
- CCS CENTRAL CONTROL SYSTEM
- CL₂ 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
- FAP FIRE ALARM PANEL
- FCL₂ 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=PAGE NUMBER)
- FR FORWARD-REVERSE
- HOA HAND-OFF-AUTO
- HOR HAND-OFF-REMOTE
- ISR INTRINSICALLY SAFE RELAY
- LCP LOCAL CONTROL PANEL
- LEL LOWER EXPLOSIVE LIMIT
- LOS LOCKOUT STOP
- LR LOCAL-REMOTE
- MA MANUAL-AUTO
- MC MODULATE-CLOSE
- MCC-X MOTOR CONTROL CENTER NO. X
- MCP MASTER CONTROL PANEL
- 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
- OIU OPERATOR INTERFACE UNIT
- 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
- TCL₂ TOTAL CHLORINE RESIDUAL
- TOC TOTAL ORGANIC CARBON
- TOD TOTAL OXYGEN DEMAND
- TURB TURBIDITY
- VFD VARIABLE FREQUENCY DRIVE
- VHC VOLATILE HYDROCARBONS
- VIB VIBRATION
- Δ DIFFERENCE
- Σ SUM
- x MULTIPLY
- ÷ DIVIDE
- F(X) CHARACTERIZED
- Xⁿ RAISED TO THE Nth POWER
- √ SQUARE ROOT
- AVG AVERAGE
- 1:1 REPEAT OR BOOST
- > SELECT HIGHEST SIGNAL
- < SELECT LOWEST SIGNAL
- } BIAS
- % GAIN OR ATTENUATE

GENERAL NOTES

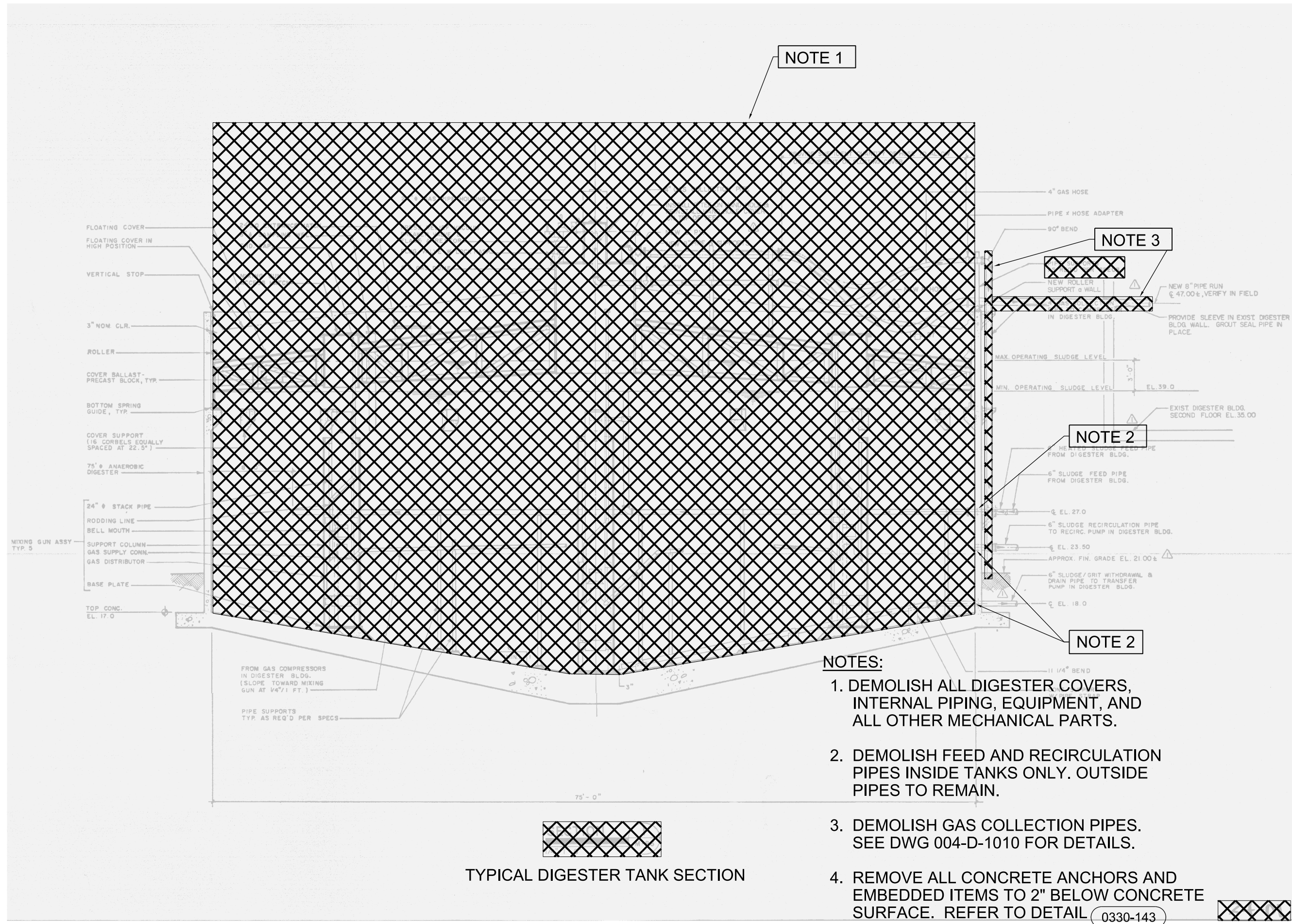
- COMPONENTS AND PANELS SHOWN WITH A SINGLE ASTERISK (*) ARE TO BE PROVIDED AS PART OF A PACKAGE SYSTEM.
- COMPONENTS AND PANELS SHOWN WITH A DOUBLE ASTERISK (***) ARE TO BE PROVIDED UNDER DIVISION 26, ELECTRICAL.
- COMPONENTS SHOWN WITH A DIAMOND (◆) ARE PART OF PROCESS INSTRUMENTATION AND CONTROLS.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

CH2MHILL®

GENERAL INSTRUMENTATION AND CONTROLS LEGEND SHEET 1

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	JUNE 2013
PROJ	457133
DWG	001-G-0401
SHEET	of

A
B
C
D



NOTE 1

NOTE 3

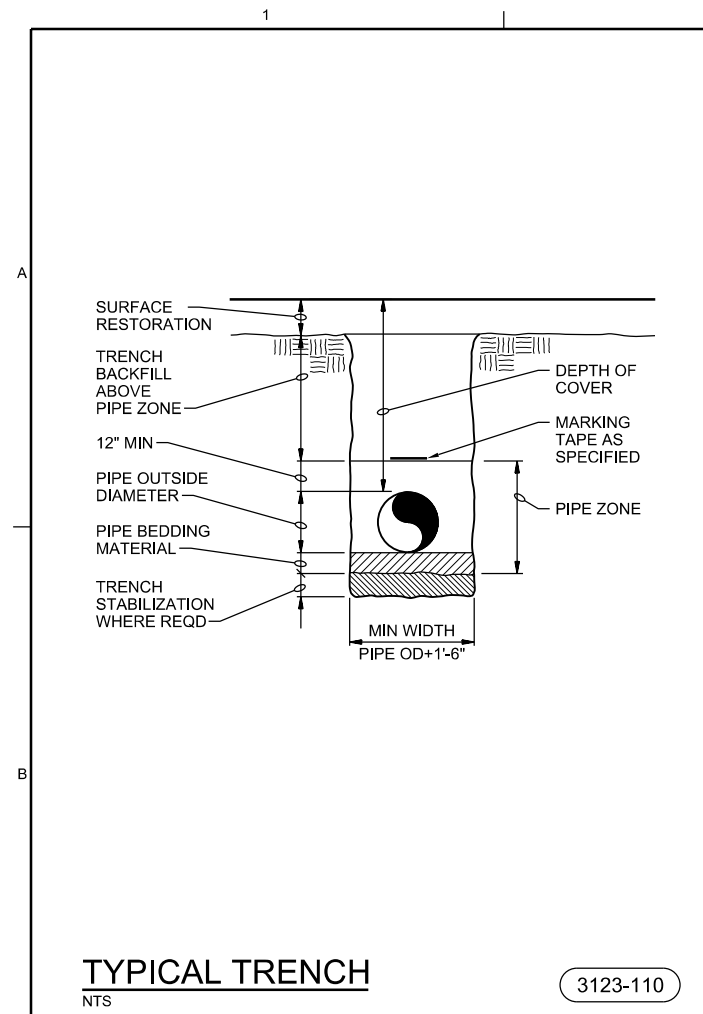
NOTE 2

NOTE 2

- NOTES:**
1. DEMOLISH ALL DIGESTER COVERS, INTERNAL PIPING, EQUIPMENT, AND ALL OTHER MECHANICAL PARTS.
 2. DEMOLISH FEED AND RECIRCULATION PIPES INSIDE TANKS ONLY. OUTSIDE PIPES TO REMAIN.
 3. DEMOLISH GAS COLLECTION PIPES. SEE DWG 004-D-1010 FOR DETAILS.
 4. REMOVE ALL CONCRETE ANCHORS AND EMBEDDED ITEMS TO 2" BELOW CONCRETE SURFACE. REFER TO DETAIL 0330-143

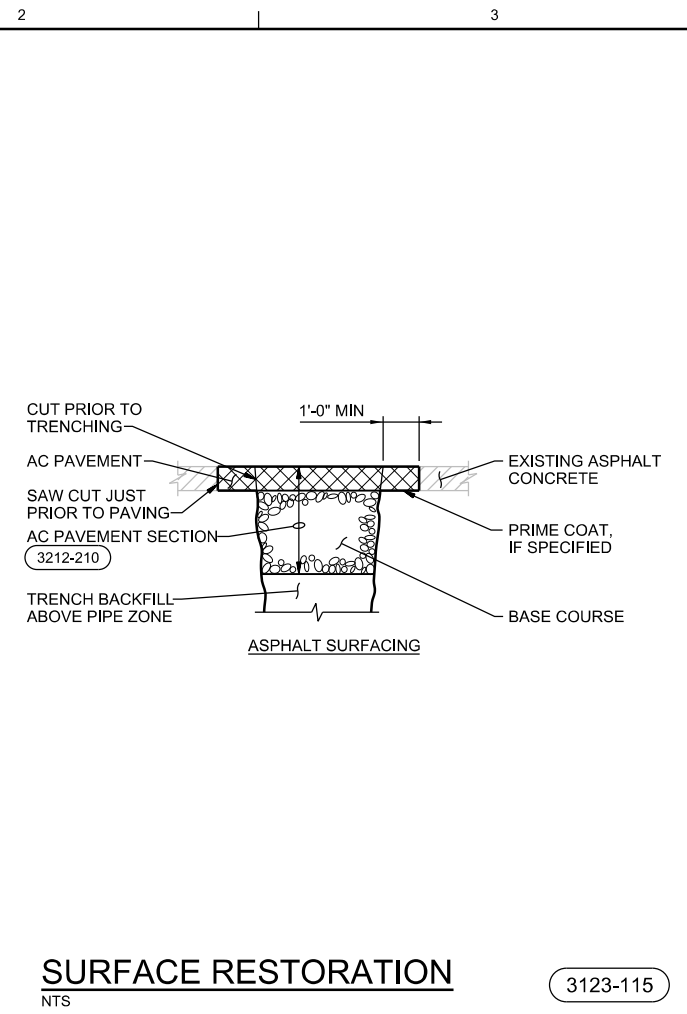
TYPICAL DIGESTER TANK SECTION

<p>CH2MHILL</p> <p>DEMOLITION</p> <p>ANAEROBIC DIGESTER FACILITIES</p> <p>PRIMARY DIGESTER SECTION</p>		<p>3011 SW WILLISTON RD GAINESVILLE, FL 32608 EB0000072 AAC001992 TAO FU - PE 83138</p>		<p>SWMRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS MANATEE COUNTY UTILITIES MANATEE COUNTY, FL</p>	
		<p>NO. DATE</p>	<p>DR</p>	<p>REVISION</p>	<p>BY</p>
<p>VERIFY SCALE</p> <p>BAR IS ONE INCH ON ORIGINAL DRAWING.</p>		<p>DATE</p>	<p>PROJ</p>	<p>DWG</p>	<p>SHEET</p>
<p>DATE</p>		<p>PROJ</p>	<p>DWG</p>	<p>SHEET</p>	<p>ISSUED FOR BID</p>



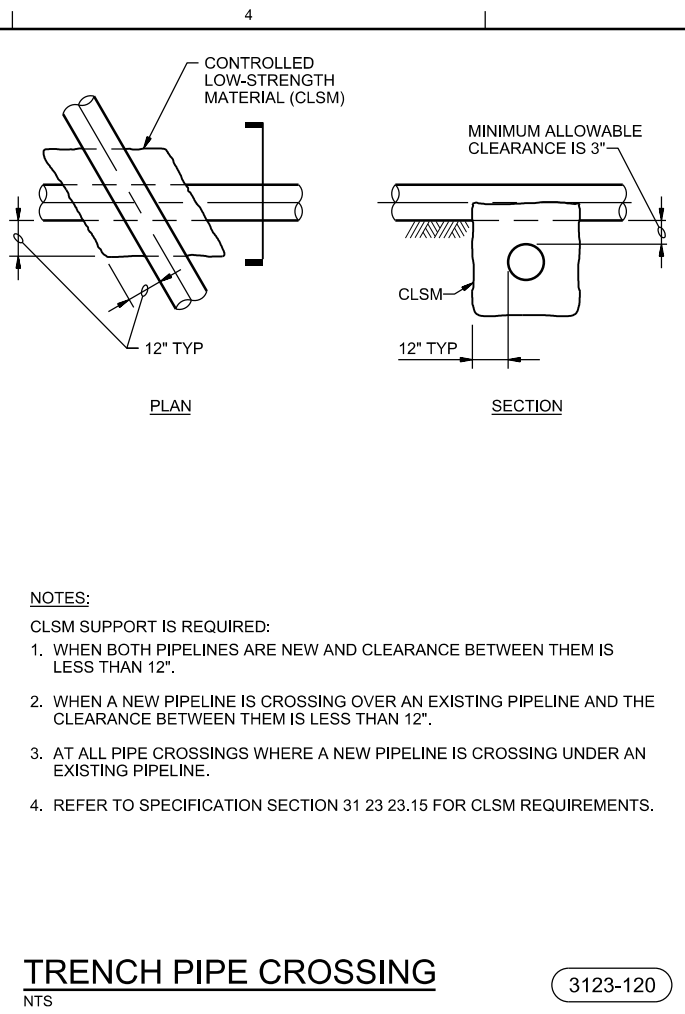
TYPICAL TRENCH
NTS

3123-110



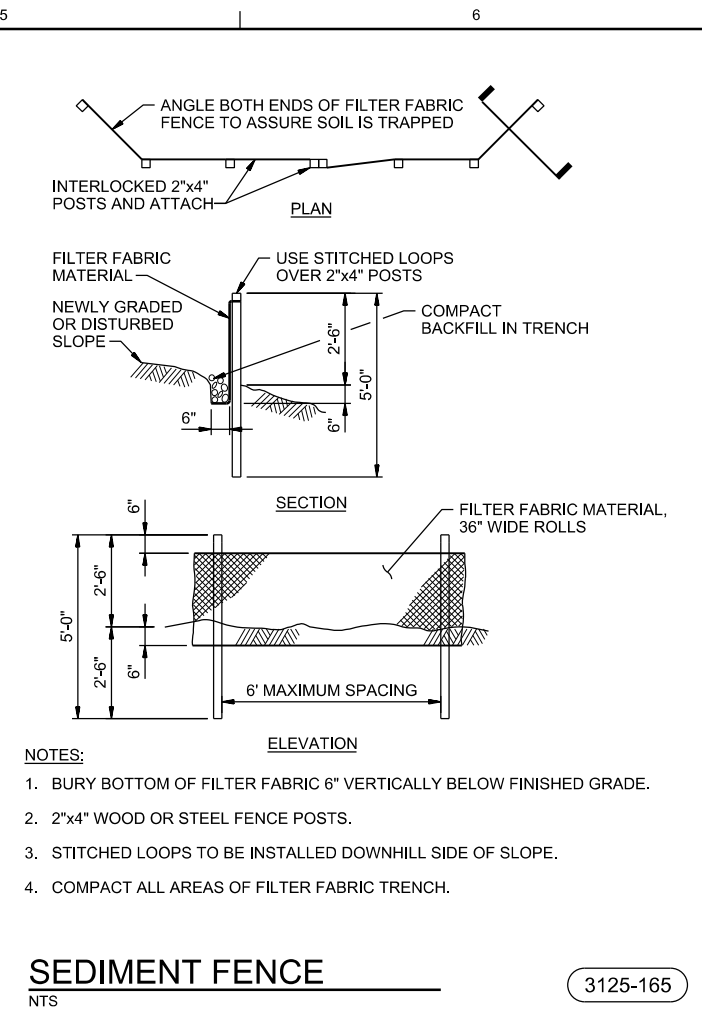
SURFACE RESTORATION
NTS

3123-115



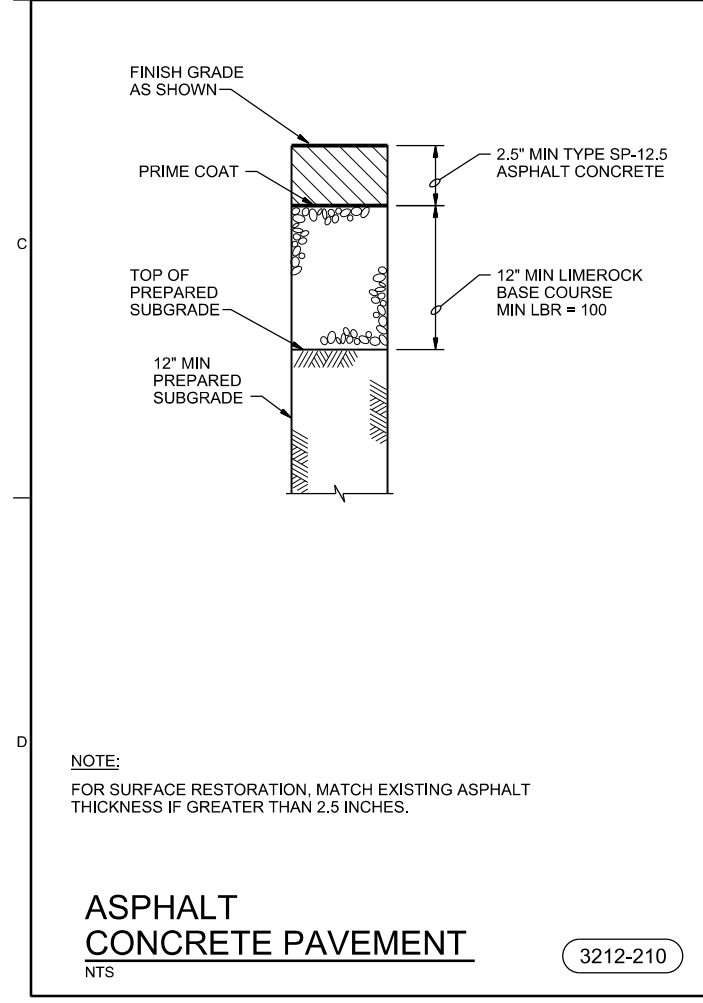
TRENCH PIPE CROSSING
NTS

3123-120



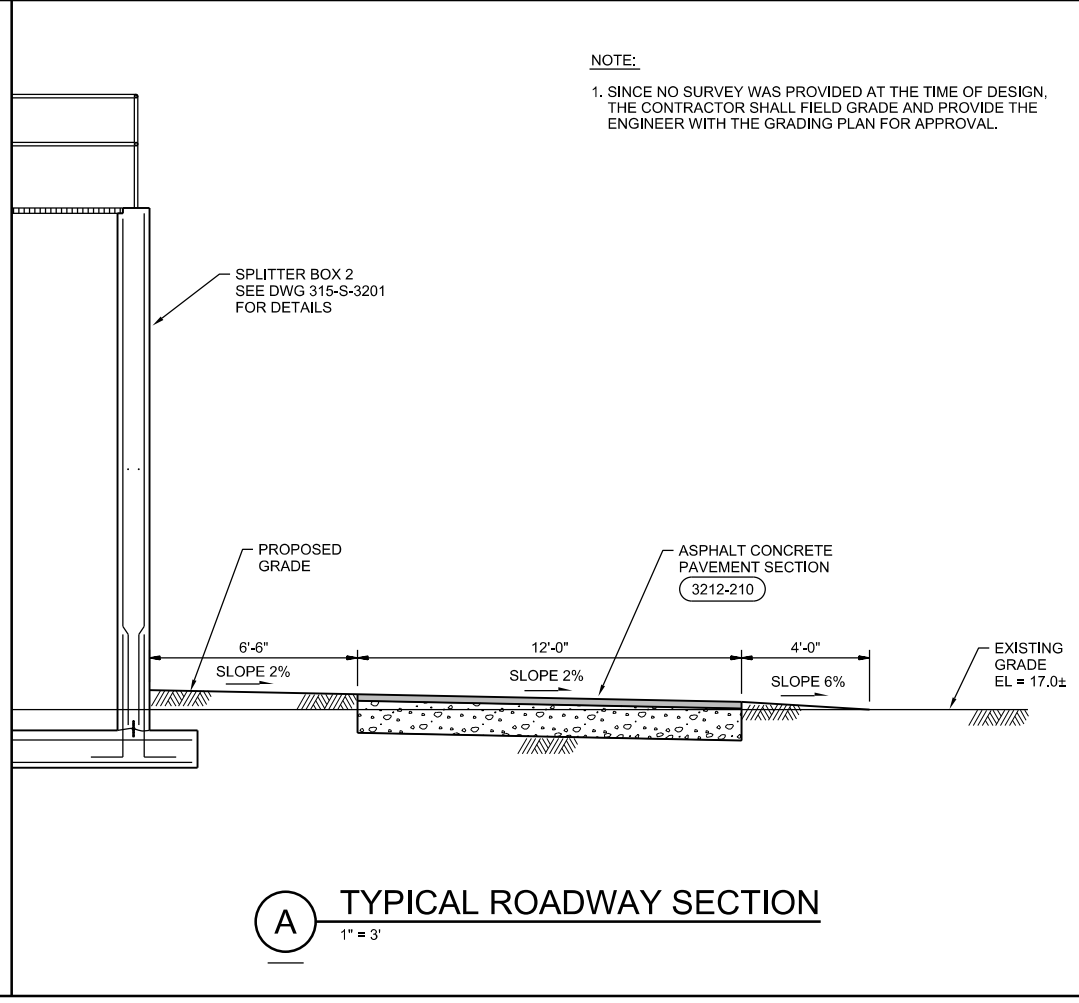
SEDIMENT FENCE
NTS

3125-165



ASPHALT CONCRETE PAVEMENT
NTS

3212-210



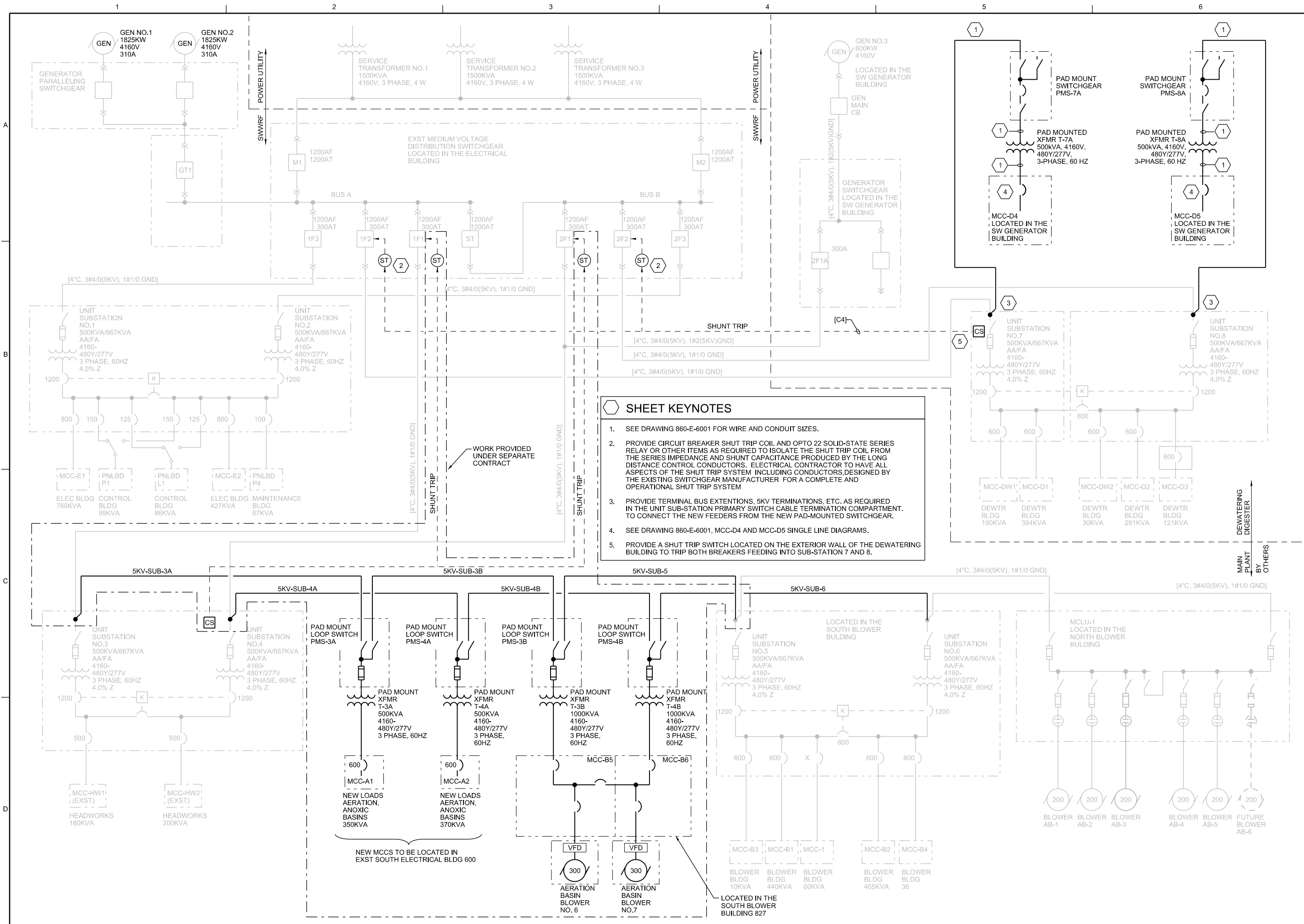
TYPICAL ROADWAY SECTION
1" = 3'

NOTE:
1. SINCE NO SURVEY WAS PROVIDED AT THE TIME OF DESIGN, THE CONTRACTOR SHALL FIELD GRADE AND PROVIDE THE ENGINEER WITH THE GRADING PLAN FOR APPROVAL.

3011 SW WILLISTON RD GAINESVILLE, FL 32608 EB0000072 AAC001992 RICHARD THOMAS MORRISON - PE 67713		SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS MANATEE COUNTY UTILITIES MANATEE COUNTY, FL	
CH2MHILL CIVIL DETAILS		R. MORRISON A. MALONE C. CHILDRESS	
DATE	JUNE 2013	DR	R. MORRISON
PROJ	457133	CHK	A. MALONE
DWG	005-C-5001	REVISION	
SHEET	of	APVD	R. MORRISON
VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"		BY APVD	

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ISSUED FOR BID



- ### SHEET KEYNOTES
- SEE DRAWING 860-E-6001 FOR WIRE AND CONDUIT SIZES.
 - PROVIDE CIRCUIT BREAKER SHUT TRIP COIL AND OPTO 22 SOLID-STATE SERIES RELAY OR OTHER ITEMS AS REQUIRED TO ISOLATE THE SHUT TRIP COIL FROM THE SERIES IMPEDANCE AND SHUNT CAPACITANCE PRODUCED BY THE LONG DISTANCE CONTROL CONDUCTORS. ELECTRICAL CONTRACTOR TO HAVE ALL ASPECTS OF THE SHUT TRIP SYSTEM INCLUDING CONDUCTORS, DESIGNED BY THE EXISTING SWITCHGEAR MANUFACTURER FOR A COMPLETE AND OPERATIONAL SHUT TRIP SYSTEM
 - PROVIDE TERMINAL BUS EXTENSIONS, 5KV TERMINATIONS, ETC. AS REQUIRED IN THE UNIT SUB-STATION PRIMARY SWITCH CABLE TERMINATION COMPARTMENT TO CONNECT THE NEW FEEDERS FROM THE NEW PAD-MOUNTED SWITCHGEAR.
 - SEE DRAWING 860-E-6001, MCC-D4 AND MCC-D5 SINGLE LINE DIAGRAMS.
 - PROVIDE A SHUT TRIP SWITCH LOCATED ON THE EXTERIOR WALL OF THE DEWATERING BUILDING TO TRIP BOTH BREAKERS FEEDING INTO SUB-STATION 7 AND 8.

3011 SW WILLISTON RD GAINESVILLE, FL 32608 EB0000072 AAC001992 DAVID C NICHOLSON - PE 60201		SWWRf NITROGEN REMOVAL AND DIGESTER MODIFICATIONS MANATEE COUNTY UTILITIES MANATEE COUNTY, FL	
ELECTRICAL CH2MHILL®		DIGESTER AREA ONE LINE DIAGRAM	
VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1" 1"			
DATE	JUNE 2013	PROJ	457133
DWG	007-E-6002	SHEET	of
N ADAMS DR		M WAYNE APVD	
N ADAMS DSGN		D NICHOLSON BY	
NO. DATE		REVISION	
NO. DATE		BY APVD	

