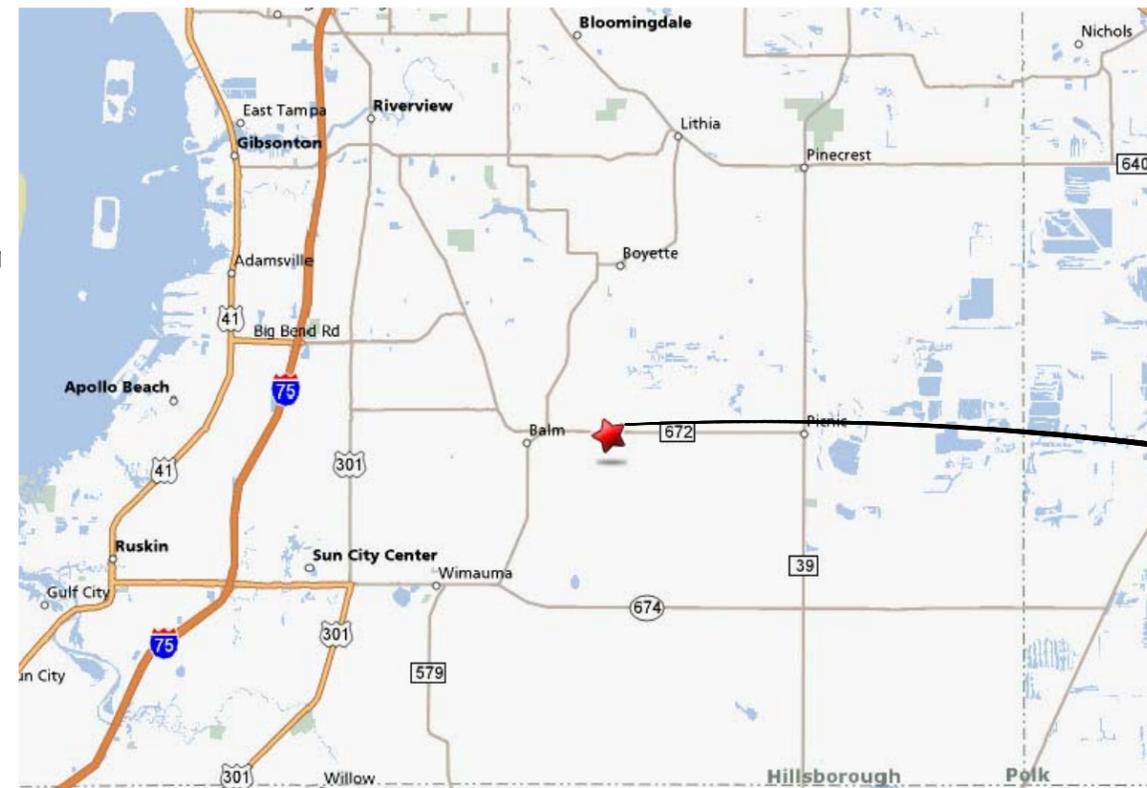


FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY PNRS II AS-BUILT DOCUMENTS

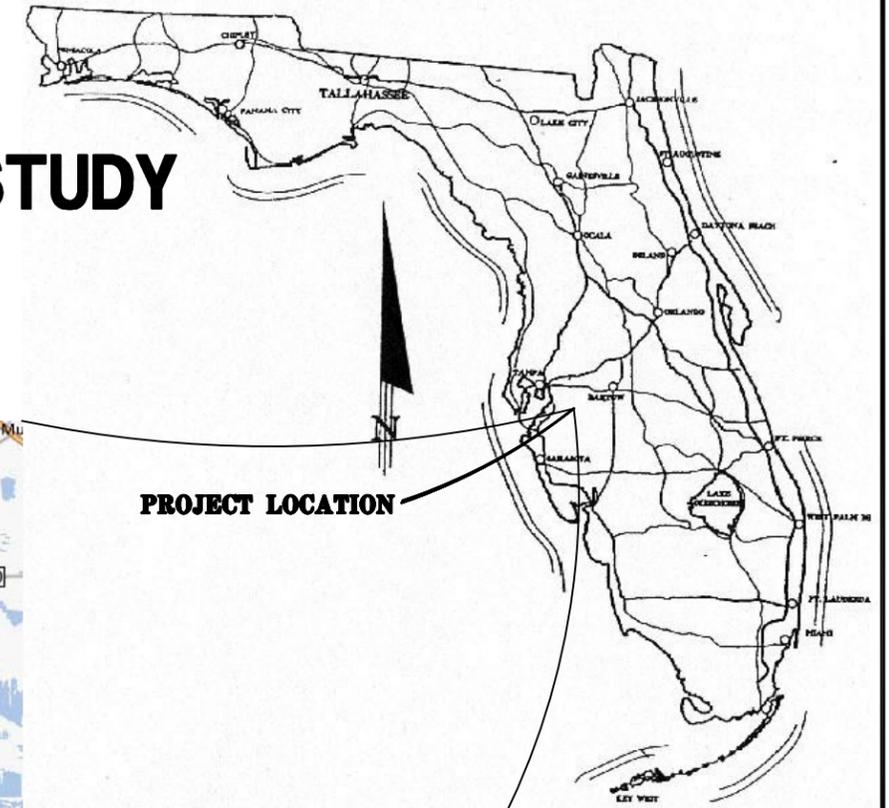
LIST OF DRAWINGS

SHEET COUNT	SHEET NUMBER	SHEET TITLE
GENERAL		
1	G-1	COVER SHEET AND INDEX OF DRAWINGS
2	G-2	LEGENDS AND NOTES
CIVIL		
3	C-1	EXISTING ONSITE WASTEWATER TREATMENT SYSTEM
4	C-2	OVERALL PROPOSED SITE PLAN
5	C-3	PROCESS FLOW DIAGRAM
6	C-4	HYDRAULIC PROFILE PNRS II
7	C-5	PNRS II DETAILS
8	C-6	PNRS II DETAILS
9	C-7	TASK C NITROGEN FATE & TRANSPORT STUDY AND PNRS II IN-SITU SYSTEMS
10	C-8	WASTEWATER SOURCE COMPONENTS DETAILS
11	C-9	MONITORING PLAN
STRUCTURAL		
12	S-1	PNRS II STRUCTURAL SITE PLAN
13	S-2	PNRS II STRUCTURAL SITE PLAN AND DETAILS
14	S-3	PNRS II STRUCTURAL SITE PLAN AND DETAILS
MECHANICAL		
15	M-1	YARD PIPING PLAN
ELECTRICAL		
16	E-1	ELECTRICAL SITE PLAN
17	E-2	ELECTRICAL SITE PLAN AND DETAILS
INSTRUMENTATION		
18	I-1	PANEL POWER
19	I-2	DI MODULE 1
20	I-3	DI MODULE 2
21	I-4	DI MODULE 3
22	I-5	DO MODULE 1
23	I-6	DO MODULE 2
24	I-7	PANEL ELEVATIONS
25	I-8	BILL OF MATERIALS
26	I-9	FUNCTIONAL CONTROL DESCRIPTIONS
27	I-10	FUNCTIONAL CONTROL DESCRIPTIONS



LOCATION MAP

N.T.S.



PROJECT LOCATION

**PROJECT LOCATION
UNIVERSITY OF FLORIDA
GULF COAST RESEARCH AND
EDUCATION CENTER
WIMAUMA, FL.**

HAZEN AND SAWYER
Environmental Engineers & Scientists

10002 Princess Palm Ave., Suite 200
Tampa, Florida 33619
Certificate of Authorization Number: 2771

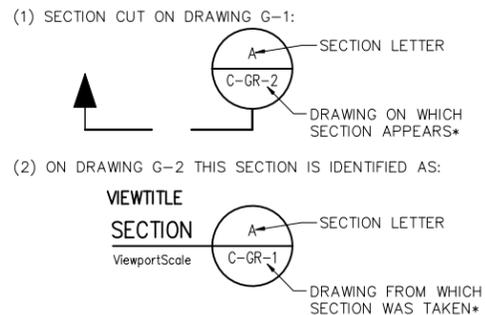


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TALLAHASSEE, FLORIDA 32399-1713
(850)-245-4070

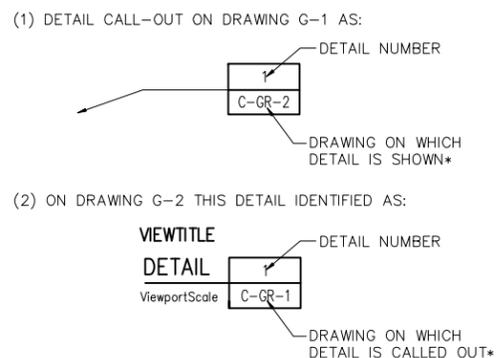
SITE GENERAL NOTES

1. THE TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON A SURVEY AS PREPARED BY PHOTOGRAMMETRIC TECHNOLOGIES, INC. DATED FEBRUARY 2, 2003. THE BOUNDARY SURVEY IS AS PROVIDED BY U.F. I.F.A.S.
2. CONTRACTOR TO REVIEW GEOTECHNICAL REPORT AND BORINGS PRIOR TO BIDDING THE PROJECT AND FOLLOW OUTLINED CONSTRUCTION TECHNIQUES.
3. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING APPLICABLE TESTING WITH THE SERVICES OF AN APPROVED TESTING LABORATORY AND SOILS ENGINEER, AS REQUIRED BY APPLICABLE REGULATORY AGENCIES AND AS MAY BE FOUND IN THE ENGINEERING CONSTRUCTION DRAWINGS. CONTRACTOR TO VERIFY ALL TESTING WITH THE OWNER PRIOR TO COMMENCING CONSTRUCTION. UPON COMPLETION OF THE WORK, THE SOILS ENGINEER MUST SUBMIT TO THE OWNER'S ENGINEER CERTIFICATIONS STATING THAT ALL REQUIREMENTS HAVE BEEN MET.
4. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING FACILITIES, ABOVE OR BELOW GROUND THAT MAY OCCUR AS A RESULT OF THE WORK PERFORMED BY THE CONTRACTOR.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BECOME FAMILIAR WITH THE PERMIT AND INSPECTION REQUIREMENTS OF THE VARIOUS GOVERNMENTAL AGENCIES. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION, AND SCHEDULE INSPECTIONS ACCORDING TO AGENCY INSTRUCTIONS.
6. ALL WORK PERFORMED SHALL COMPLY WITH THE REGULATIONS AND ORDINANCES OF THE VARIOUS GOVERNMENTAL AGENCIES HAVING JURISDICTION OVER THE WORK INCLUDING LANDSCAPING.
7. REPAIR AND REPLACEMENT OF ALL PRIVATE AND PUBLIC PROPERTY AFFECTED BY THIS WORK SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THEN EXISTING CONDITIONS BEFORE COMMENCING CONSTRUCTION WORK UNLESS SPECIFICALLY EXEMPTED BY THE PLANS. ADDITIONAL COSTS ARE INCIDENTAL TO OTHER CONSTRUCTION AND NO EXTRA COMPENSATION WILL BE ALLOWED.
8. RECORD DRAWINGS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING INFORMATION ON A SET OF THE APPROVED PLANS CONCURRENTLY WITH CONSTRUCTION PROGRESS. WITHIN TWO WEEKS FOLLOWING FINAL INSPECTIONS THE CONTRACTOR SHALL SUBMIT ONE SET OF DRAWINGS TO THE ENGINEER OF RECORD. THE FINAL RECORD DRAWINGS SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS:
 - A. DRAWING TO BE LEGIBLY MARKED TO RECORD ACTUAL CONSTRUCTION.
 - B. DRAWINGS SHALL SHOW ACTUAL LOCATION OF ALL UTILITIES AND RELATED ITEMS, BOTH ABOVE AND BELOW GROUND. ALL CHANGES TO PIPING LOCATION INCLUDING HORIZONTAL AND VERTICAL LOCATIONS OF UTILITIES SHALL BE CLEARLY SHOWN AND REFERENCED TO PERMANENT SURFACE IMPROVEMENTS. DRAWINGS SHALL ALSO SHOW ACTUAL INSTALLED PIPE MATERIAL.
 - C. DRAWINGS SHALL CLEARLY SHOW ALL FIELD CHANGES OF DIMENSION AND DETAIL.
 - D. DRAWINGS SHALL CLEARLY SHOW ALL DETAILS NOT ON ORIGINAL CONTRACT DRAWINGS BUT CONSTRUCTED IN THE FIELD. ALL EQUIPMENT AND PIPING RELOCATIONS SHALL BE CLEARLY SHOWN.
 - E. LOCATIONS OF ALL MANHOLES, HYDRANTS, VALVES AND VALVE BOXES SHALL BE SHOWN.
 - F. THE CONTRACTOR SHALL PROVIDE CERTIFIED RECORD DRAWING, SIGNED AND SEALED BY A PROFESSIONAL LAND SURVEYOR. THE RECORD DRAWINGS SHALL SHOW FINAL GRADES AND LOCATIONS ON ALL UTILITIES INCLUDING THE SANITARY SEWER, WATER, PRODUCT PIPING, AND STORM WATER COLLECTION SYSTEM (I.E. PIPES, INLETS, AND PONDS). THE CONTRACTOR SHALL PROVIDE TEN COPIES OF THE CERTIFIED RECORD DRAWINGS TO THE OWNER.
9. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY WITH AND ENFORCE ALL APPLICABLE SAFETY REGULATIONS.
10. ALL DELETERIOUS MATERIAL (I.E. MUCK, PEAT, BURIED DEBRIS) IS TO BE EXCAVATED IN ACCORDANCE WITH THESE PLANS OR AS DIRECTED BY THE OWNER'S ENGINEER OR OWNER'S SOIL TESTING COMPANY. DELETERIOUS MATERIAL IS TO BE STOCKPILED AND REMOVED FROM THE CAMPUS AREA AND PLACED ON-SITE AS DIRECTED BY THE OWNERS REPRESENTATIVE. EXCAVATED AREAS ARE TO BE BACKFILLED WITH APPROVED MATERIALS AND COMPACTED AS SHOWN ON THESE AREAS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXCAVATIONS AGAINST COLLAPSE AND SHALL PROVIDE BRACING, SHEETING OR SHORING AS NECESSARY. TRENCHES SHALL BE KEPT DRY WHILE PIPES ARE BEING PLACED. DEWATERING SHALL BE USED AS REQUIRED, AND PERMITTED THROUGH LOCAL GOVERNMENTAL AGENCIES AND WATER MANAGEMENT DISTRICT PER CURRENT REGULATIONS AT THE SOLE COST OF THE CONTRACTOR.

SECTION IDENTIFICATION



DETAIL IDENTIFICATION



WATER AND WASTEWATER GENERAL NOTES

1. ALL WATER AND WASTEWATER INSTALLATION CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS ON DRAWINGS AND INCLUDED DETAILS.
2. IF THE VERTICAL CLEARANCE AT CROSSING POINTS OF WATER AND SANITARY SEWER LINES IS LESS THAN 18" (IN), THE SANITARY SEWER LINE SHALL THEN BE ENCASED IN A WATER TIGHT CARRIER PIPE FOR 10' (FT) EACH SIDE OF THE CROSSING POINT.
3. CONTRACTOR SHALL SUBMIT FOR REVIEW TO THE OWNER AND OWNER'S ENGINEER SHOP DRAWINGS ON ALL PRECAST AND MANUFACTURED ITEMS TO BE USED ON THIS SITE. FAILURE TO OBTAIN APPROVAL BEFORE INSTALLATION MAY RESULT IN REMOVAL AND REPLACEMENT AT CONTRACTOR'S EXPENSE. ENGINEER'S APPROVAL OF A SHOP DRAWING DOES NOT RELIEVE THE CONTRACTOR'S RESPONSIBILITY FOR THE PERFORMANCE OF THE ITEM.
4. THE CONTRACTOR IS RESPONSIBLE FOR ANY NECESSARY UTILITY FIELD LOCATIONS, RELOCATIONS AS REQUIRED, SHALL BE COORDINATED BY THE CONTRACTOR.
5. THE HORIZONTAL SEPARATION BETWEEN WATER MAINS AND PERMANENT STRUCTURES, TREES AND SANITARY SEWER MAINS SHALL BE 10' (FT) MINIMUM.
6. THE HORIZONTAL SEPARATION BETWEEN SEWER MAINS AND PERMANENT STRUCTURES AND TREES SHALL BE 15' (FT) MINIMUM.
7. WATER MAIN MATERIALS SHALL BE:
 - 4" - 12" MAINS SHALL BE PER AWWA, C900, DR18, CLASS 150.
 - 2" AND SMALLER LINES SHALL BE PVC SCHEDULE 80 WITH PRESSURE RATING OF 200.
8. SANITARY SEWER PIPE MATERIALS SHALL BE:
 - 4" - 8" SEWER SHALL BE PVC, SDR26 MEETING ASTM D3034.
 - 4" AND SMALLER LINES SHALL BE PVC SCHEDULE 80 WITH PRESSURE RATING OF 200.
 - MINIMUM SLOPE FOR LATERALS SHALL BE 1.00%.
9. PROJECT IS LOCATED IN THE HILLSBOROUGH FIRE DISTRICT, STATION NO. 3.

LEGEND	
EXISTING	EXISTING ELEVATION CONTOUR
	EXISTING SPOT ELEVATION
	EXISTING FENCE
	EXISTING SANITARY SEWER LINE & MANHOLE
	EXISTING WATER LINE & VALVE
	EXISTING STORM LINE & STRUCTURE
	EXISTING ELECTRIC LINE
	EXISTING OVERHEAD POWER LINE
	EXISTING GAS LINE
	EXISTING LIGHT
	EXISTING UTILITY POLE
	EXISTING WOOD POWER POLE
	EXISTING TELEPHONE PEDESTAL
	EXISTING GUY ANCHOR
	EXISTING WELL
	EXISTING WATER METER
	EXISTING FIRE HYDRANT
	EXISTING UNDERGROUND TELEPHONE LINE
	EXISTING TREE (SIZE & TYPE)
	EXISTING STRUCTURE
	PROJECT BENCHMARK
	NEW BUILDING
	NEW SHELL GRAVEL
	NEW GRAVITY LINE
	NEW PRESSURE LINE
	NEW FLOW METER
	NEW CHECK VALVE
	NEW BALL VALVE NORMALLY CLOSED
	NEW BALL VALVE NORMALLY OPEN
	NEW PINCH VALVE (PNEUMATIC) NORMALLY CLOSED
	NEW PINCH VALVE (PNEUMATIC) NORMALLY OPEN
	NEW RECIRCULATION VALVE
	NEW WATER MAIN WITH GATE VALVE & BOX
	NEW SILT FENCE LINE
	NEW ELEVATION CONTOUR
	NEW STORM STRUCTURE IDENTIFICATION
	NEW SPOT ELEVATION
	DIRECTION OF SURFACE DRAINAGE FLOW
	EQUIPMENT CONNECTION OUTLET - VERIFY LOCATION
	JUNCTION BOX
	TRANSFORMER
	DISTRIBUTION SWITCHBOARD OR PANELBOARD
	BRANCH CIRCUIT PANELBOARD
	CONDUIT
	HOMERUN TO PANELBOARD. "L1" INDICATES THE PANELBOARD NUMBER. "1,3" INDICATES THE BRANCH CIRCUIT NUMBERS. HATCH MARKS DENOTE NUMBER OF CONDUCTORS EXCLUDING GROUND CONDUCTOR. NO HATCH MARKS DENOTES TWO #12 CONDUCTORS AND ONE #12 GROUNDING CONDUCTOR
	UNDERGROUND CONDUIT
	CONDUIT STUB-UP
	PANELBOARD NUMBER

ELECTRICAL LEGEND

ELECTRICAL ABBREVIATIONS

- A AMPS
- AFF ABOVE FINISHED FLOOR
- AICS AMPS INTERRUPTING CAPACITY SYMMETRICAL
- BKR BREAKER
- C CONDUIT
- CLG CEILING
- CKT CIRCUIT
- CU COPPER
- EF EXHAUST FAN
- EMT ELECTRICAL METALLIC TUBING
- FU FUSE
- FLR FLOOR
- GFI GROUND FAULT INTERRUPTER
- GRD GROUND
- HOA HAND-OFF-AUTOMATIC
- HP HORSEPOWER
- IMC INTERMEDIATE METAL CONDUIT
- K KILO
- LTG LIGHTING
- MTD MOUNTED
- NEC NATIONAL ELECTRICAL CODE
- OHP OVERHEAD PRIMARY
- P POLE
- PWR POWER
- UGE UNDERGROUND ELECTRIC
- UL UNDERWRITERS LABORATORIES
- UNO UNLESS NOTED OTHERWISE
- V VOLTS
- VA VOLT-AMPERES
- W WATTS
- WP WEATHERPROOF
- ∅ PHASE

SUMMARY OF TANKAGE

TANK	TANK DESCRIPTION	SIZE	MATERIAL
TANK 1	NEW STE TWO COMPARTMENT DOSING TANK	1050 GAL	CONCRETE
TANK 2	EXISTING STAGE 2 SEPTIC TANK	1250 GAL	CONCRETE
TANK 3	NEW DENITE FEED TANK	30 GAL	PLASTIC
TANK 4	NEW STE DRIP STORAGE TANK	300 GAL	CONCRETE
TANK 5	NEW NO3 DRIP STORAGE TANK	300 GAL	CONCRETE

SUMMARY OF PUMPS

PUMP	PUMP LOCATION	TYPE	MANUFACTURER/MAKE	MODEL
P1	TANK 2	SUBMERSIBLE	GOULDS BLASTER	33EB05
P2	TANK 1	SUBMERSIBLE	LITTLE GIANT	5-MSP
P3	TANK 1	SUBMERSIBLE	LITTLE GIANT	5-MSP
P4	TANK 1	SUBMERSIBLE	LITTLE GIANT	5-MSP
P5	DOSES INSITU STAGE 1 BIOFILTERS	PERISTALTIC	MASTERFLEX	R-07523-80
P6	RECIRCULATION DOSE TANK 1	SUBMERSIBLE	LITTLE GIANT	5-MSP
P7	RECIRCULATION DOSE TANK 2	SUBMERSIBLE	LITTLE GIANT	5-MSP
P8	RECIRCULATION DOSE TANK 3	SUBMERSIBLE	LITTLE GIANT	5-MSP
P9	RECIRCULATION DOSE TANK 4	SUBMERSIBLE	LITTLE GIANT	5-MSP
P10	NOT USED			
P11	DOSES STAGE 2 BIOFILTERS	PERISTALTIC	MASTERFLEX	R-07523-90
P12	TANK 4	SUBMERSIBLE	GOULDS BLASTER	20EB05
P13	TANK 5	SUBMERSIBLE	GOULDS BLASTER	20EB05
P14	TANK 1	SUBMERSIBLE	LITTLE GIANT	5-MSP
P15	TANK 4	SUBMERSIBLE	LITTLE GIANT	5-MSP

FLORIDA DEPARTMENT OF HEALTH
FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY

LEGENDS AND NOTES

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE MAY 2010 H & S JOB NUMBER 44237-001 CONTRACT NUMBER DRAWING NUMBER G-2
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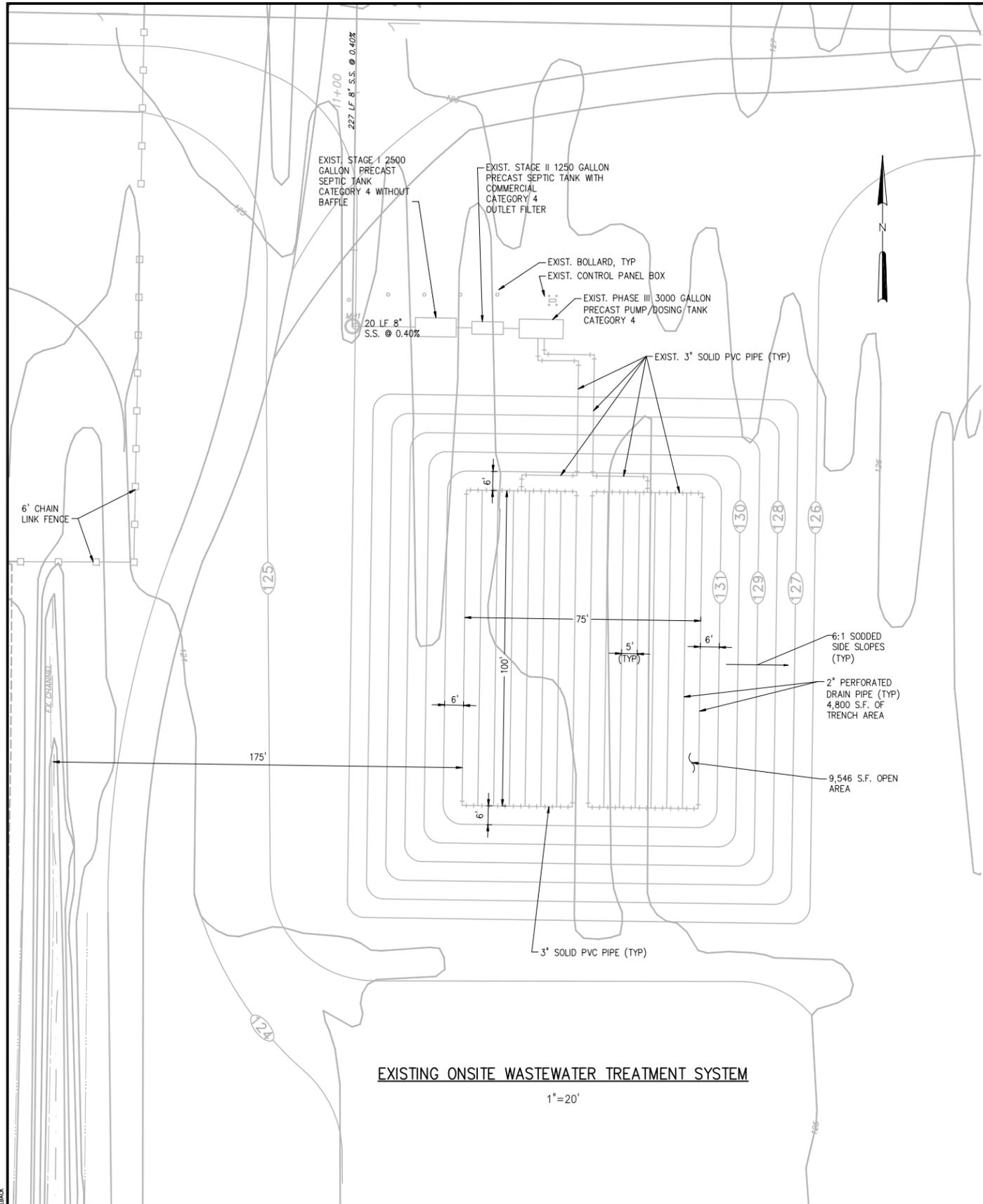
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Certificate of Authorization Number: 2771



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4052 BALD CYPRESS WAY, BIN A08
TALLAHASSEE, FL 32399-1713
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DESIGNED	JME
DRAWN	CMS
CHECKED	DBS
PROJ. ENGR.	JME
DLA	
APPROVED	

JOSEFIN M. EDEBACK
Name: _____ Date: _____
Florida Professional Engineer's Registration Number: 69835



NOTE:

THIS SHEET IS BASED ON ORIGINAL DESIGN DRAWINGS FOR THE GREC FACILITY WHICH WERE NOT PREPARED BY HAZEN AND SAWYER, P.C. IT IS UNKNOWN IF THESE DRAWINGS REPRESENT AS-BUILT CONDITIONS OR ARE ONLY DESIGN DRAWINGS AND CALCULATIONS.

EXISTING DRAIN FIELD CALCULATION

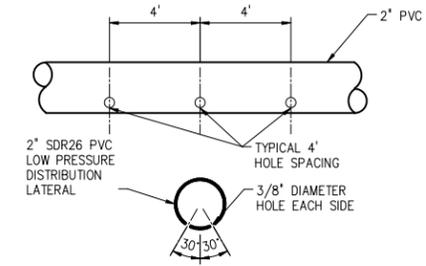
BASED ON UNSUITABLE SUBSURFACE CONDITIONS

LOAD RATE = 0.65
 TRENCH AREA = 2828 GPD/0.65 = 4351 SF
 OPEN AREA = 2 x 4351 SF = 8702 SF

EXISTING SYSTEM FLOW CALCULATION

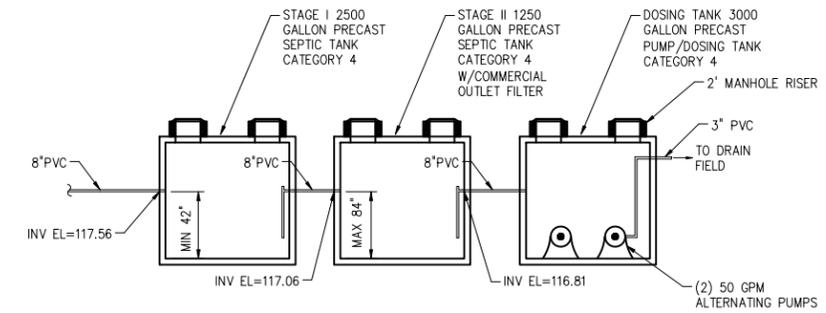
DESIGN FLOW (PER 64E-6.008(1b) TABLE 1)

ADMIN/STAFF (100x15) = 1500 GPD
 SCHOOL [STUDENT BOARDING TYPE] (16 x 75 GPD) = 1200 GPD
 ADD FOR SHOWERS (16 x 4) = 64 GPD
 ADD FOR CAFETERIA (16 x 4) = 64 GPD
 TOTAL = 2828 GPD



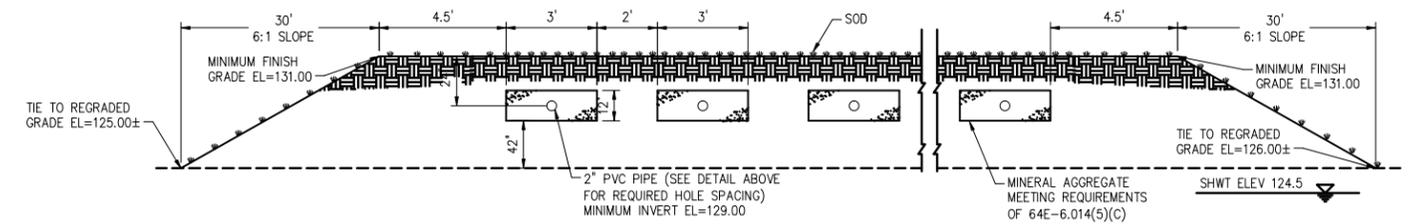
EXISTING HOLE SPACING DETAIL

N.T.S.



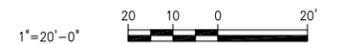
EXISTING SEPTIC TANK CROSS-SECTION

N.T.S.



TYPICAL SECTION THRU EXISTING DRAIN FIELD

N.T.S.



PLOT DATE: 5/28/2010 4:28 PM BY: EDEBACK

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DRAWN			
CHECKED			
PROJ. ENGR.			
APPROVED			

NO.	ISSUED FOR	DATE	BY
5	AS-BUILTS PNRS II	05/10	
4	FINAL SUBMITTAL	01/10	
3	100% SUBMITTAL	12/09	
2	75% SUBMITTAL	12/09	
1	50% SUBMITTAL	08/09	

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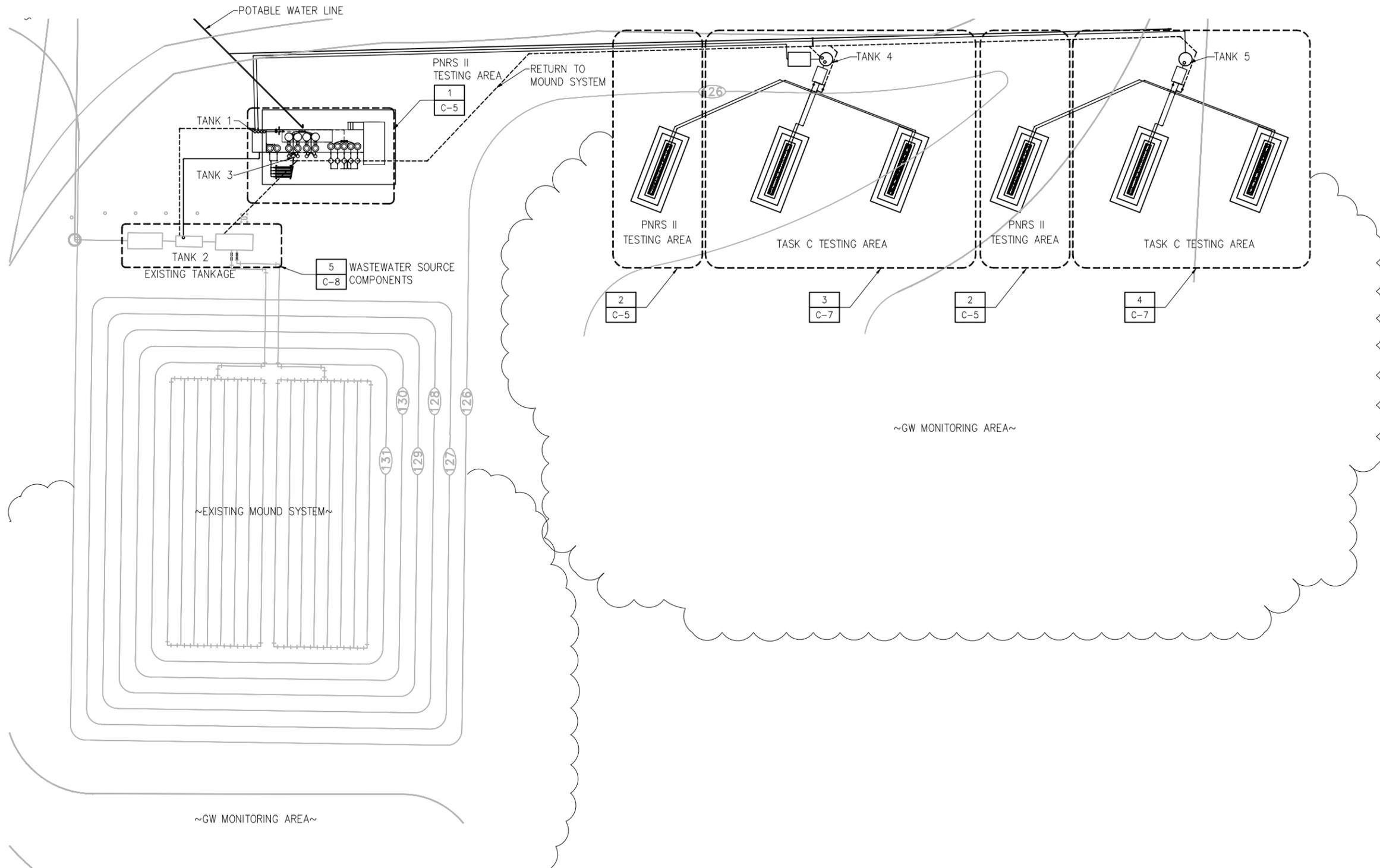
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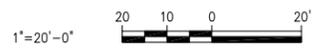
EXISTING ONSITE WASTEWATER TREATMENT SYSTEM

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE MAY 2010
	H & S JOB NUMBER 44237-001
	CONTRACT NUMBER
	DRAWING NUMBER C-1

PLOT DATE: 5/28/2010 4:28 PM BY: EDEBACK



PROPOSED SITE PLAN
1"=20'



PROJ DATE: 5/26/2010 4:28 PM BY: EDEBACK

NO.	ISSUED FOR	DATE	BY	APPROVED
5	AS-BUILTS PNRS II	05/10	-	-
4	FINAL SUBMITTAL	01/10	-	-
3	100% SUBMITTAL	12/09	-	-
2	75% SUBMITTAL	12/09	-	-
1	50% SUBMITTAL	08/09	-	-

DESIGNED	JME
DRAWN	CMS
CHECKED	DBS
PROJ. ENGR.	JME
	DLA
	APPROVED

JOSEFIN M. EDEBACK
 Name: _____ Date: _____
 Florida Professional Engineer's Registration Number: 69835

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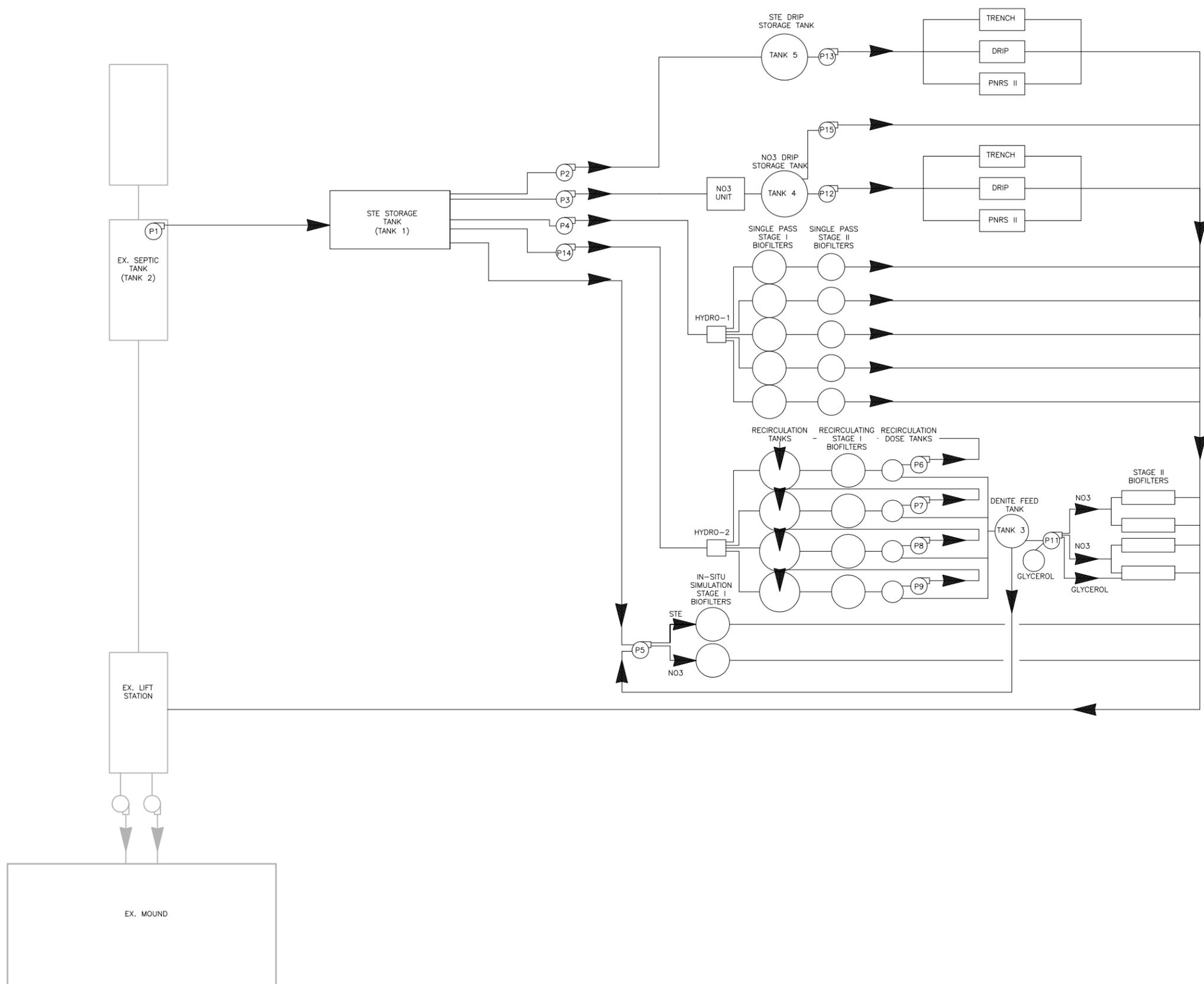
FLORIDA DEPARTMENT OF HEALTH
 FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY

OVERALL PROPOSED SITE PLAN

THE SCALE BAR
 SHOWN BELOW
 MEASURES ONE
 INCH LONG ON
 THE ORIGINAL
 DRAWING.

DATE	MAY 2010
H & S JOB NUMBER	44237-001
CONTRACT NUMBER	
DRAWING NUMBER	C-2

File: C:\14237-001-PRJ\14237-001\Drawings\06_SitePlan\06_SitePlan.dwg - 5/26/2010 1:15 PM



NO.	ISSUED FOR	DATE	BY
5	AS-BUILTS PNRS II	05/10	-
4	FINAL SUBMITTAL	01/10	-
3	100% SUBMITTAL	12/09	-
2	75% SUBMITTAL	12/09	-
1	50% SUBMITTAL	08/09	-

DESIGNED	JME
DRAWN	CMS
CHECKED	DBS
PROJ. ENGR.	JME
APPROVED	DLA

JOSEFIN M. EDEBACK
 Name: _____ Date: _____
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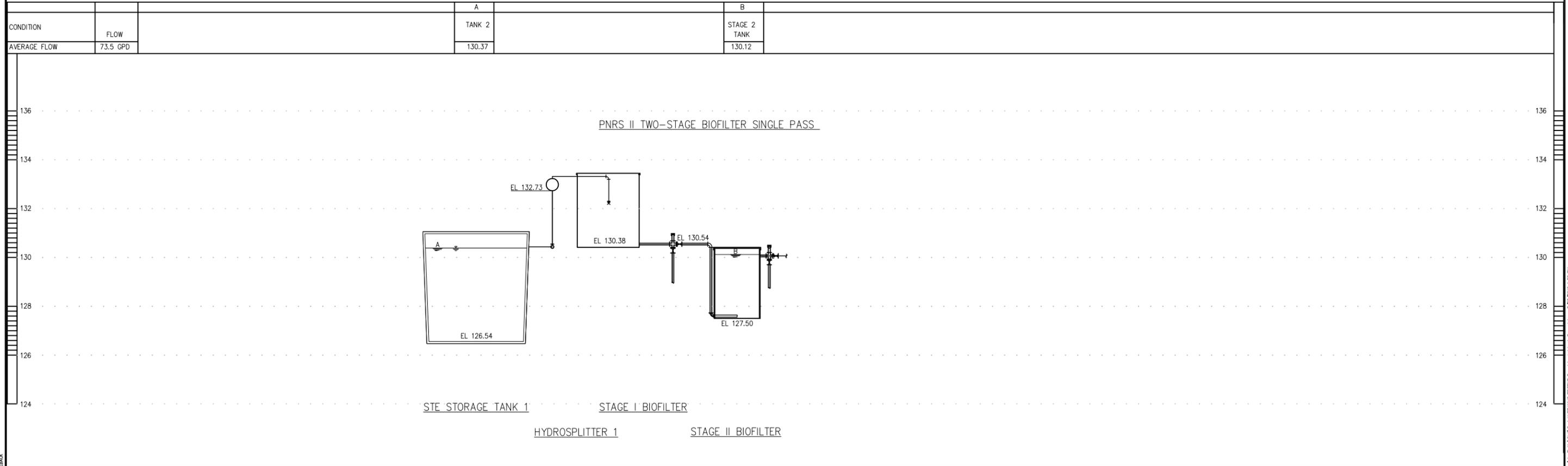
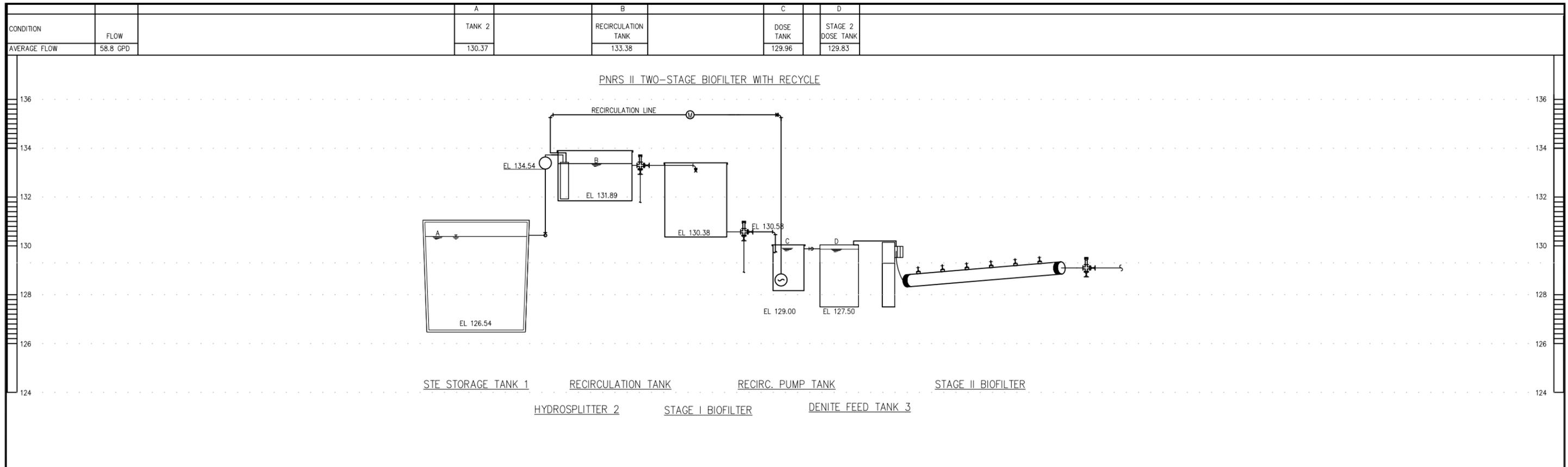
FLORIDA DEPARTMENT OF HEALTH
 FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY
 PROCESS FLOW DIAGRAM

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE: MAY 2010
 H & S JOB NUMBER: 44237-001
 CONTRACT NUMBER:
 DRAWING NUMBER: C-3

PLOT DATE: 5/28/2010 4:26 PM BY: EDEBACK

File: C:\14237-001\14237-001\Process Flow Diagram.dwg by jmetz 5/28/2010 3:38 AM



PLOT DATE: 5/28/2010 4:28 PM BY: EDEBACK

NO.	ISSUED FOR	DATE	BY	APPROVED
5	AS-BUILTS PNRs II	05/10		JME
4	FINAL SUBMITTAL	01/10		CMS
3	100% SUBMITTAL	12/09		DBS
2	75% SUBMITTAL	12/09		JME
1	50% SUBMITTAL	08/09		DLA

DESIGNED: JME
 DRAWN: CMS
 CHECKED: DBS
 PROJ. ENGR.: JME
 APPROVED: DLA

JOSEFIN M. EDEBACK
 Name: _____ Date: _____
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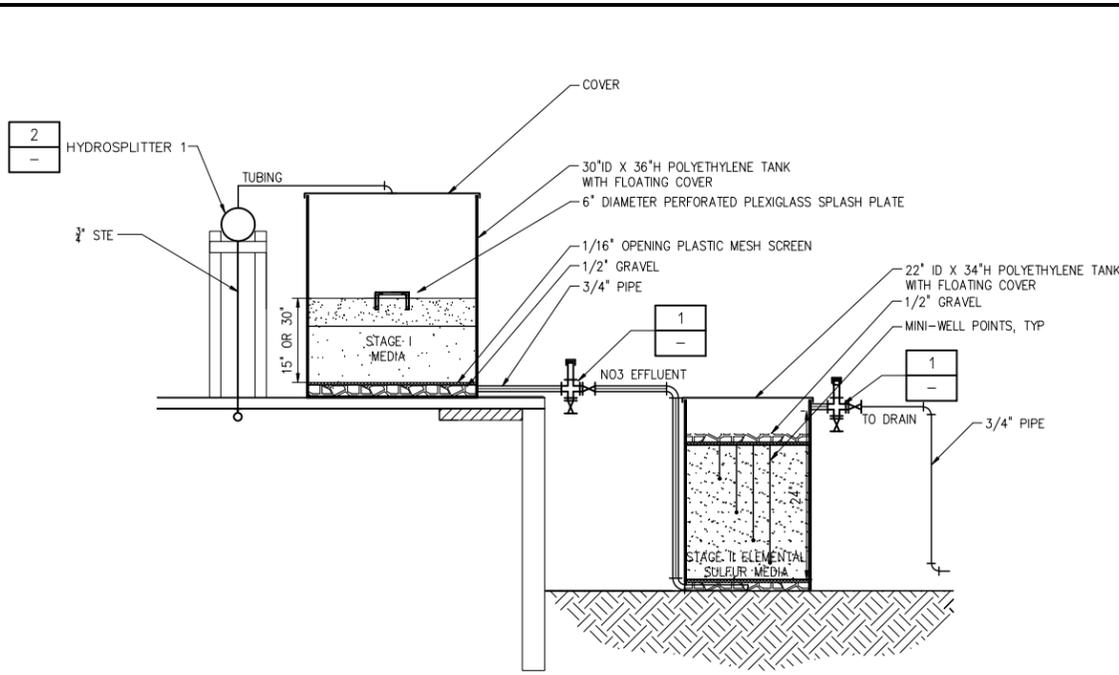
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FLORIDA DEPARTMENT OF HEALTH
 FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY

HYDRAULIC PROFILE PNRs II

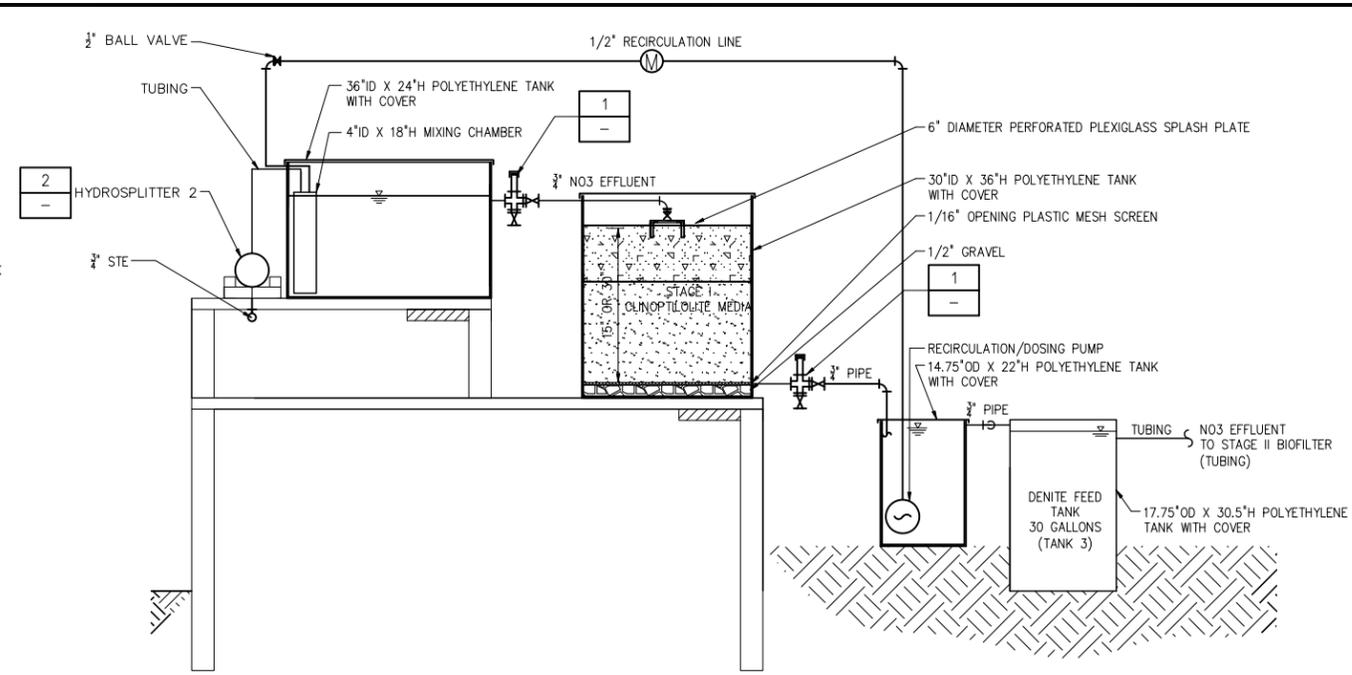
THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE	MAY 2010	H & S JOB NUMBER	44237-001
			CONTRACT NUMBER	
			DRAWING NUMBER	C-4

PLOT DATE: 5/28/2010 4:28 PM BY: EDEBACK



PNRS II TWO-STAGE BIOFILTER SINGLE PASS (TYPICAL)

SECTION A
NTS C-5

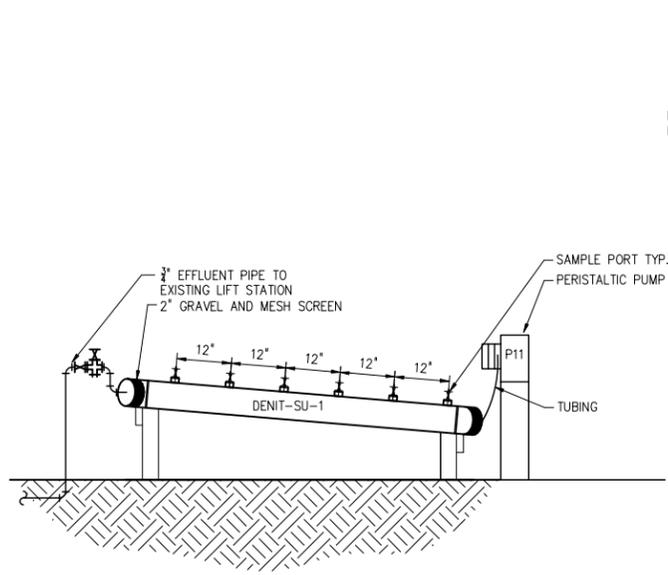
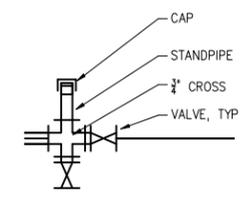


PNRS II TWO-STAGE BIOFILTER WITH RECYCLE (TYPICAL)

SECTION B
NTS C-5

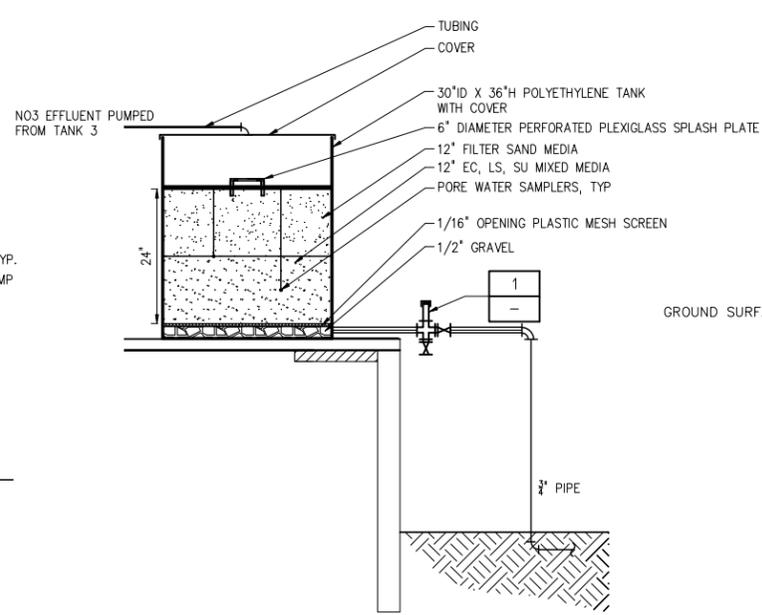
TYPICAL SAMPLE PORT

DETAIL 1
NTS -



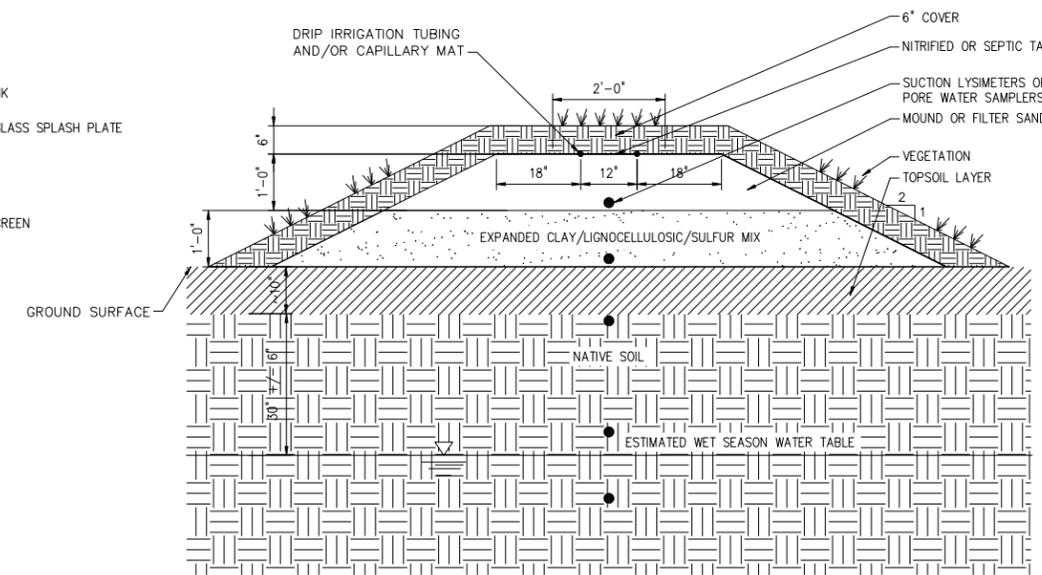
PNRS II STAGE II BIOFILTER FED FROM TANK 3

SECTION C
NTS C-5



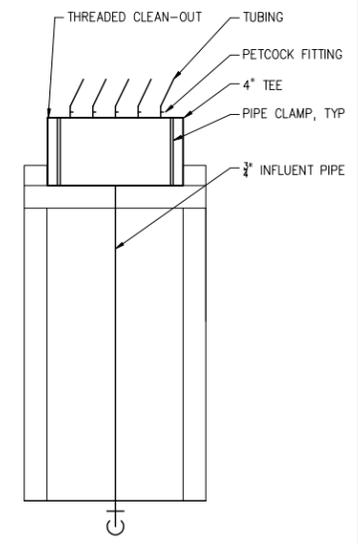
PNRS II STAGE I IN-SITU BIOFILTER SIMULATOR

SECTION D
NTS C-5



PNRS II INSITU SYTEM

SECTION E
NTS C-5



HYDROSPPLITER

DETAIL 2
NTS -

PLOT DATE: 5/26/2010 4:27 PM BY: EDEBACK

NO.	ISSUED FOR	DATE	BY	APPROVED
5	AS-BUILTS PNRS II	05/10	-	
4	FINAL SUBMITTAL	01/10	-	
3	100% SUBMITTAL	12/09	-	
2	75% SUBMITTAL	12/09	-	
1	50% SUBMITTAL	08/09	-	

DESIGNED	JME
DRAWN	CMS
CHECKED	DBS
PROJ. ENGR.	JME
	DLA
APPROVED	

JOSEFIN M. EDEBACK
Name: _____ Date: _____
Florida Professional Engineer's Registration Number: 69835

HAZEN AND SAWYER
Environmental Engineers & Scientists
10002 Princess Palm Avenue
Registry One Building, Suite 200
Tampa, Florida 33619
Certificate of Authorization Number: 2771



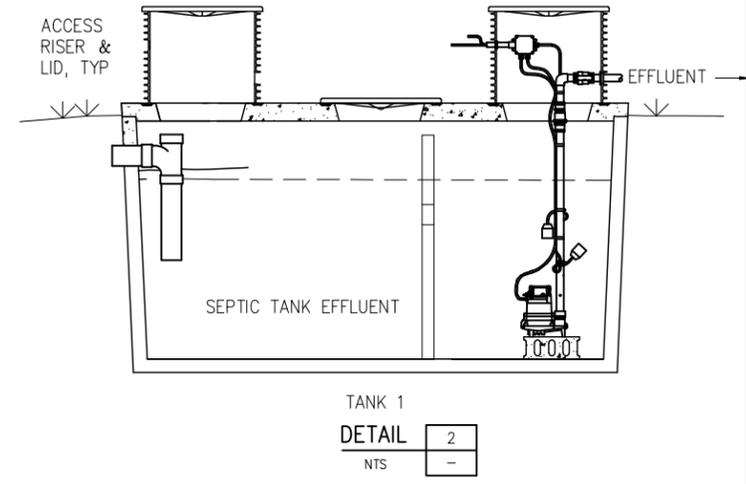
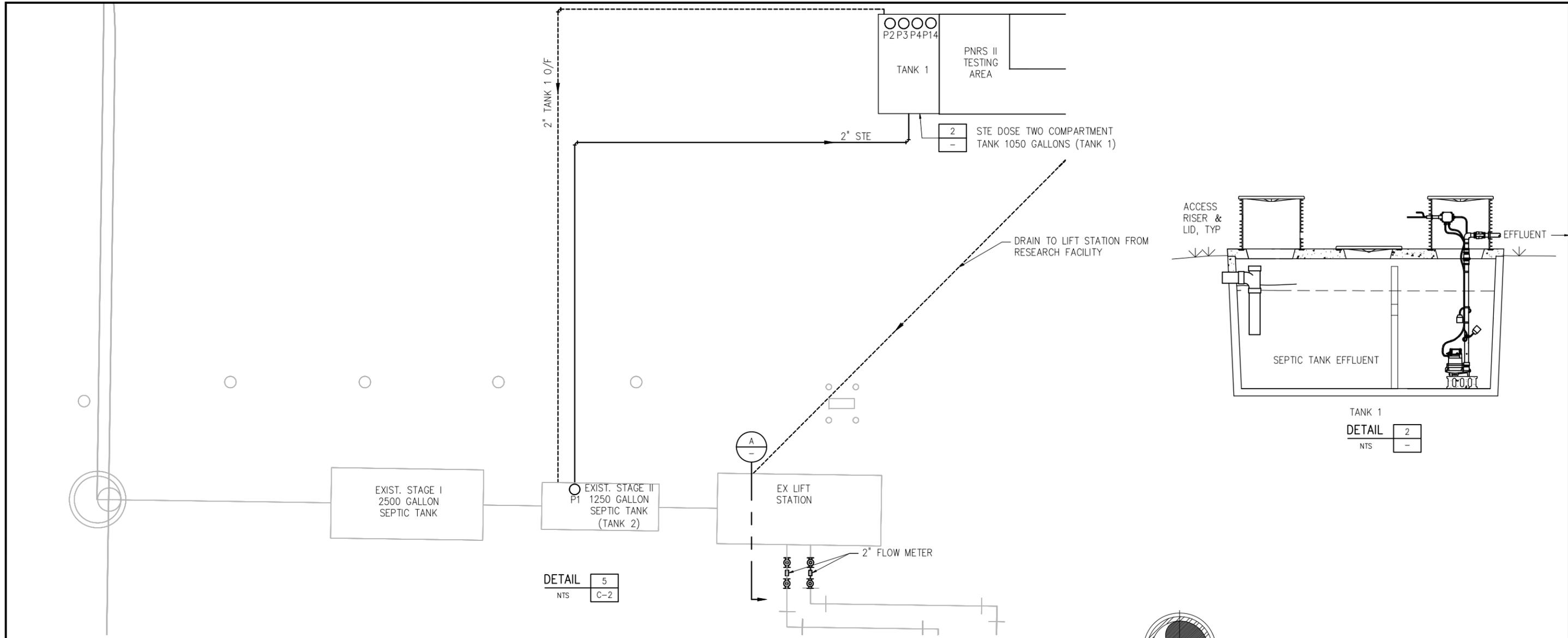
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TALLAHASSEE, FL 32399-1713
(850)-245-4070

FLORIDA DEPARTMENT OF HEALTH
FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY

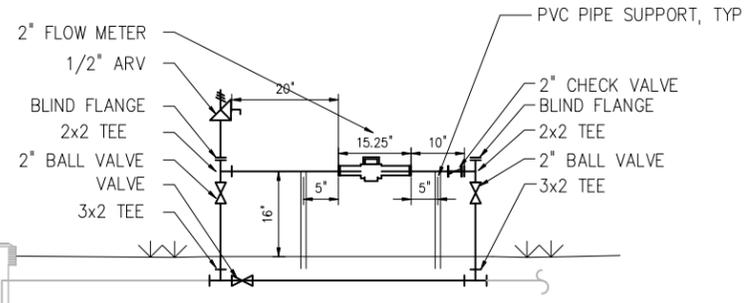
PNRS II DETAILS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE MAY 2010
	H & S JOB NUMBER 44237-001
	CONTRACT NUMBER
	DRAWING NUMBER C-6

PLOT DATE: 5/26/2010 4:27 PM BY: EDEBACK

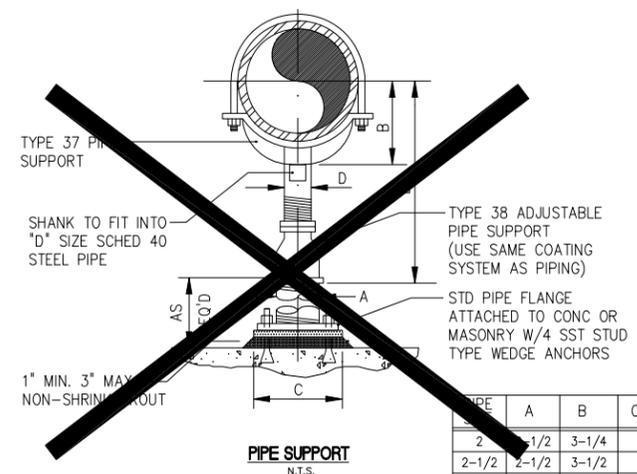


DETAIL 5
NTS C-2



SECTION A
NTS

- NOTES:
1. PROVIDE HALF ROUND RIGID INSULATION & INSULATION PROTECTION SHIELD, SIMILAR TO ANVIL FIG.167 OR COOPER B-LINE B3151 WHEN PIPING IS INSULATED.
 2. PROVIDE NEOPRENE WAFFLE ISOLATION PAD SIMILAR TO MASON TYPE "W" OR KORFUND KORPAD 40, UNDER SUPPORT FOOT WHEN PIPING IS TO BE ISOLATED OR FIRST SUPPORT ADJACENT TO MECHANICAL EQUIPMENT.
 3. FOR BASE, HEIGHT, & FLANGE DIMENSIONS, SEE TABLE TO RIGHT.
 4. SST=TYPE 316



PIPE SUPPORT
N.T.S.

DETAIL 3
NTS STD

PIPE	A	B	C	D	E	
					MIN.	MAX.
2	1-1/2	3-1/4	9	1-1/2	7 -3/4	12-3/4
2-1/2	2-1/2	3-1/2	9	1-1/2	8	13
3	2-1/2	3-3/4	9	1-1/2	8-1/4	13-1/4
3-1/2	2-1/2	4	9	1-1/2	8-1/2	13-1/2
4	3	4-1/4	9	2-1/2	9-1/4	14

NO.	ISSUED FOR	DATE	BY	APPROVED
5	AS-BUILTS PNRS II	05/10	-	
4	FINAL SUBMITTAL	01/10	-	
3	100% SUBMITTAL	12/09	-	
2	75% SUBMITTAL	12/09	-	
1	50% SUBMITTAL	08/09	-	

DESIGNED	JME
DRAWN	CMS
CHECKED	DBS
PROJ. ENGR.	JME
	DLA
APPROVED	

JOSEFIN M. EDEBACK
Name: _____ Date: _____
Florida Professional Engineer's Registration Number: 69835

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Certificate of Authorization Number: 2771



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TALLAHASSEE, FL 32399-1713
(850)-245-4070

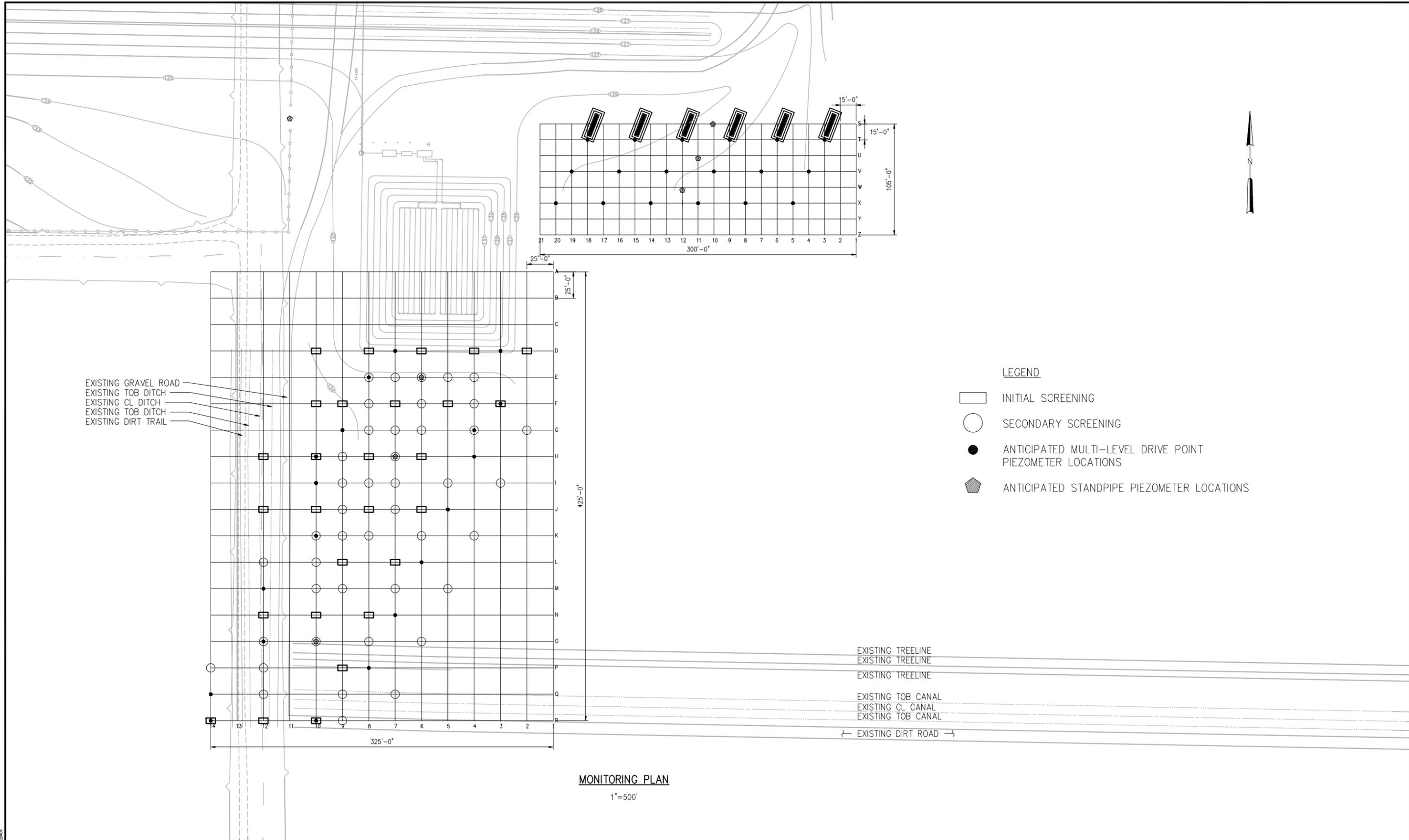
FLORIDA DEPARTMENT OF HEALTH
FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY

WASTEWATER SOURCE COMPONENTS DETAILS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE MAY 2010
	H & S JOB NUMBER 44237-001
	CONTRACT NUMBER
	DRAWING NUMBER C-8

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PLOT DATE: 5/28/2010 4:28 PM BY: EDEBACK

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4	FINAL SUBMITTAL	01/10	-	-
3	100% SUBMITTAL	12/09	-	-
2	75% SUBMITTAL	12/09	-	-
1	50% SUBMITTAL	08/09	-	-

DESIGNED	JME
DRAWN	CMS
CHECKED	DBS
PROJ. ENGR.	JME
	DLA

JOSEFIN M. EDEBACK
 Name: _____ Date: _____
 Florida Professional Engineer's Registration Number: 69835

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 Environmental Engineers & Scientists
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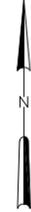
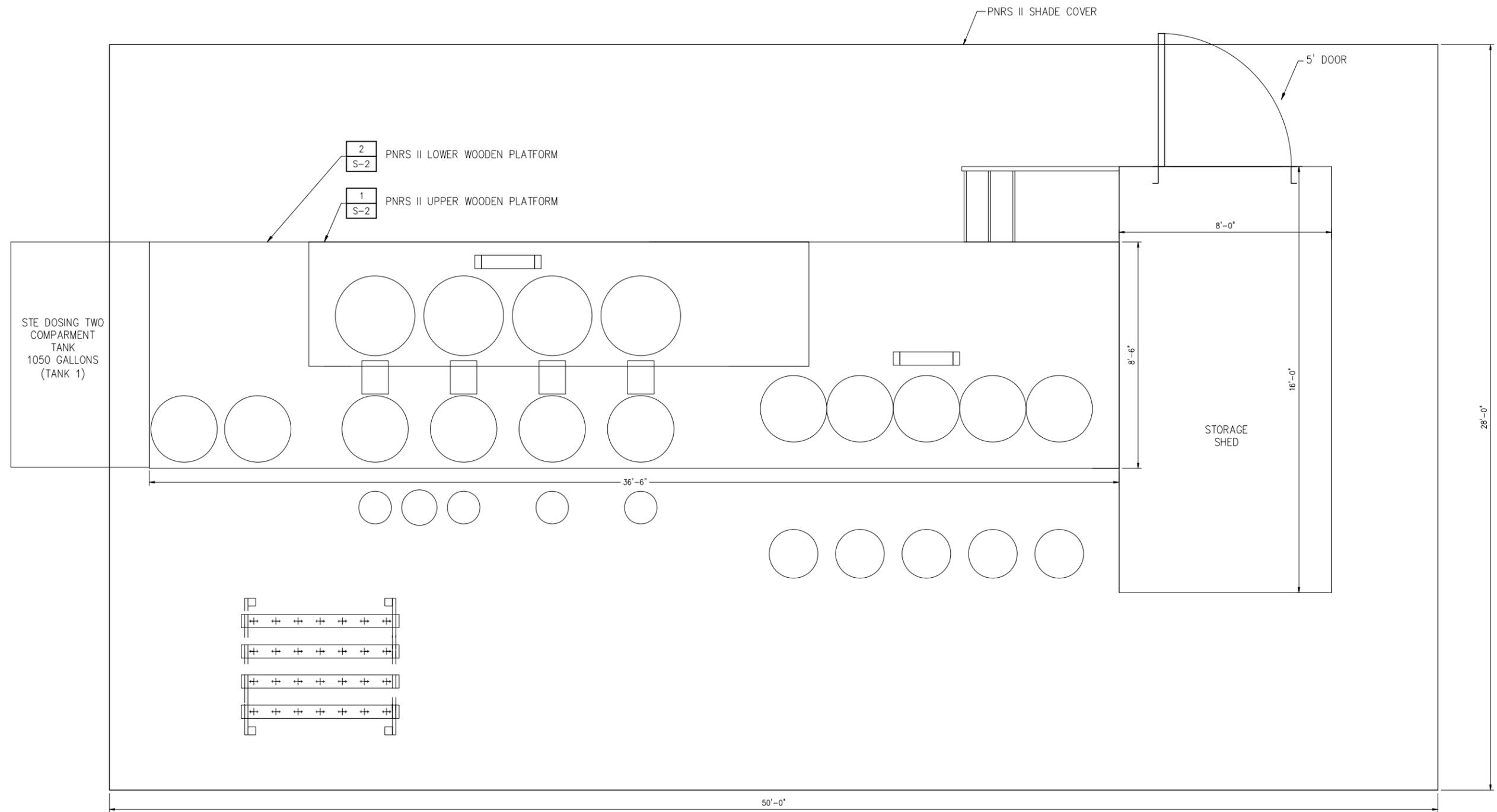
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MONITORING PLAN

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE	MAY 2010
	H & S JOB NUMBER	44237-001
	CONTRACT NUMBER	
	DRAWING NUMBER	C-9

File: C:\44237-001\Drawings\08\Bald\CA-C-9 MONITORING PLAN.dwg Printed by jmedbak on 5/28/2010 4:28 PM



PROPOSED SITE PLAN

1/2"=1'-0"

PLOT DATE: 5/28/2010 4:28 PM BY: EDEBACK

NO.	ISSUED FOR	DATE	BY
5	AS-BUILTS PNRS II	05/10	-
4	FINAL SUBMITTAL	01/10	-
3	100% SUBMITTAL	12/09	-
2	75% SUBMITTAL	12/09	-
1	50% SUBMITTAL	08/09	-

DESIGNED	AVF
DRAWN	GPB
CHECKED	AFH
PROJ. ENGR.	SJ
	DLA
APPROVED	

Name: SHAJAN JOYKUTTY
 Date: _____
 Florida Professional Engineer's Registration Number: 43323

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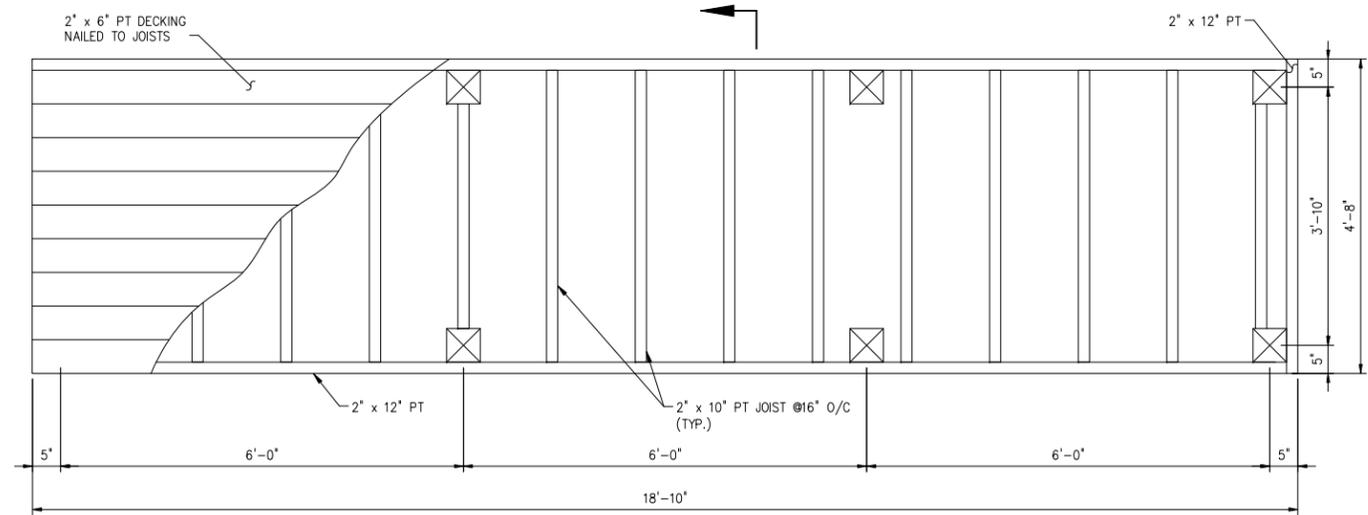
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 (850)-245-4070

FLORIDA DEPARTMENT OF HEALTH FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY	
PNRS II STRUCTURAL SITE PLAN	

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE	MAY 2010
H & S JOB NUMBER	44237-001
CONTRACT NUMBER	
DRAWING NUMBER	S-1

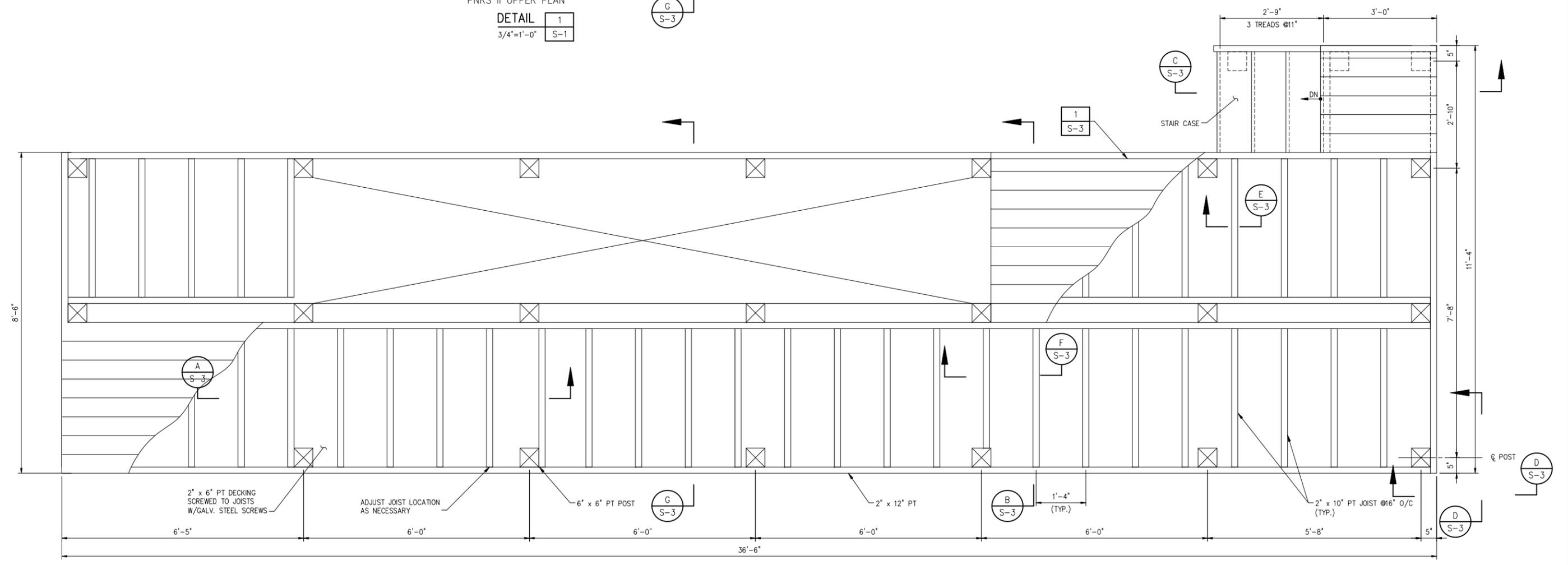
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PNRS II UPPER PLAN

DETAIL	1
	3/4"=1'-0"
	S-1

G
S-3



PNRS II PLAN

DETAIL	2
	3/4"=1'-0"
	S-1

3/4"=1'-0"

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NO.	ISSUED FOR	DATE	BY
5	AS-BUILTS PNRS II	05/10	-
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2	75% SUBMITTAL	12/09	-
1	50% SUBMITTAL	08/09	-

DESIGNED	AVF
DRAWN	GPB
CHECKED	AFH
PROJ. ENGR.	SJ
DLA	-
APPROVED	-

Name: SHAJAN JOYKUTTY, PE Date: _____
Florida Professional Engineer's Registration Number: 43323

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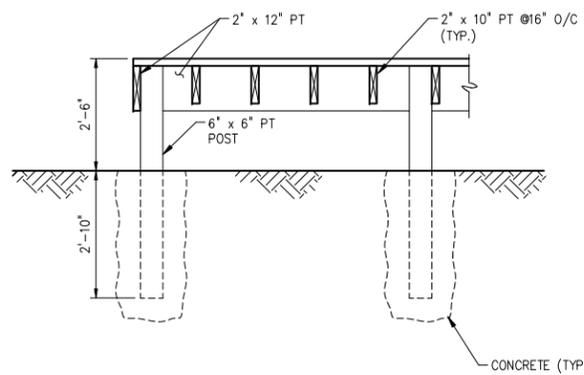
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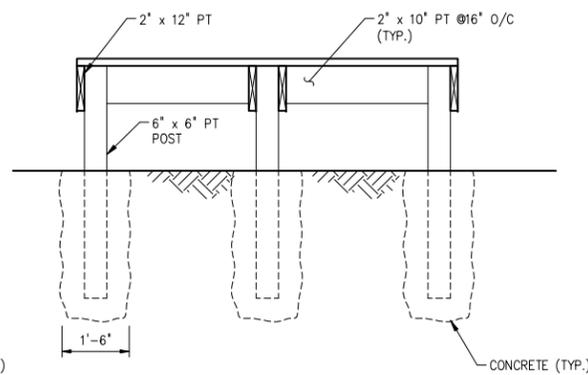
PNRS II STRUCTURAL SITE PLAN AND DETAILS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE MAY 2010
	H & S JOB NUMBER 44237-001
	CONTRACT NUMBER
	DRAWING NUMBER S-2

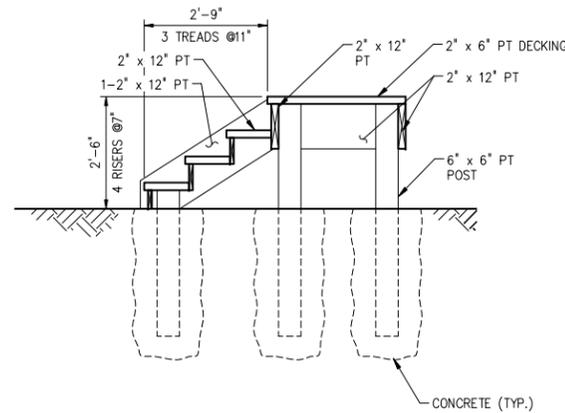
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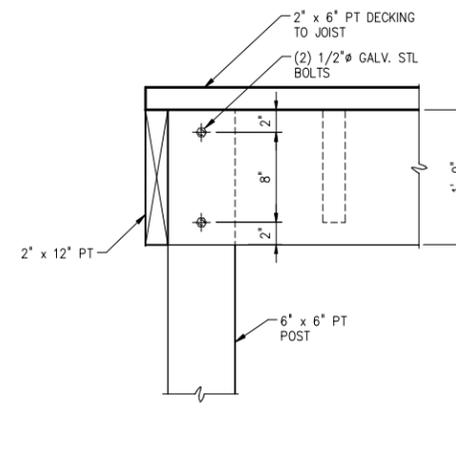
SECTION A
1/2"=1'-0"



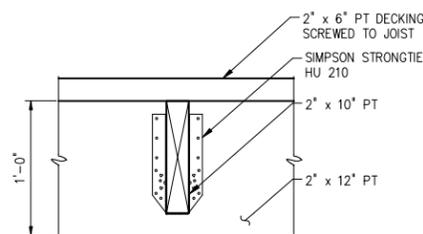
SECTION B
1/2"=1'-0"



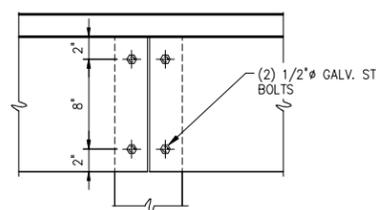
SECTION C
1/2"=1'-0"



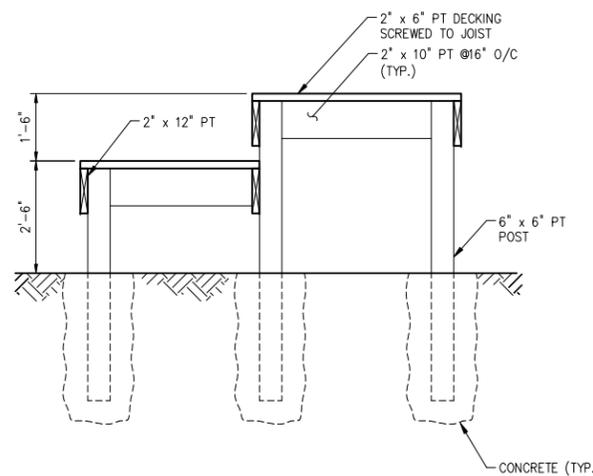
SECTION D
1-1/2"=1'-0"



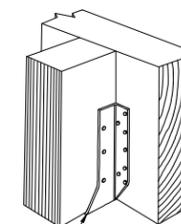
SECTION E
1-1/2"=1'-0"



SECTION F
1-1/2"=1'-0"



SECTION G
1/2"=1'-0"



HU 210 JOIST HANGER BY—
SIMPSON STRONG TIE, FASTEN WITH
(8) 1/2" x 1 3/8" LONG AND (6) 10d
x 1 3/8" LONG NAILS FOR JOIST
(N.O.A. #03-0123.05)

DETAIL 1
N.T.S.



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NO.	ISSUED FOR	DATE	BY	APPROVED
5	AS-BUILTS PNRS II	05/10		
4	FINAL SUBMITTAL	01/10		
3	100% SUBMITTAL	12/09		
2	75% SUBMITTAL	12/09		
1	50% SUBMITTAL	08/09		

DESIGNED	AVF
DRAWN	GPB
CHECKED	AFH
PROJ. ENGR.	SJ

Name: SHAJAN JOYKUTTY, PE Date: _____
Florida Professional Engineer's Registration Number: 43323

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Tampa, Florida 33619
Certificate of Authorization Number: 2771



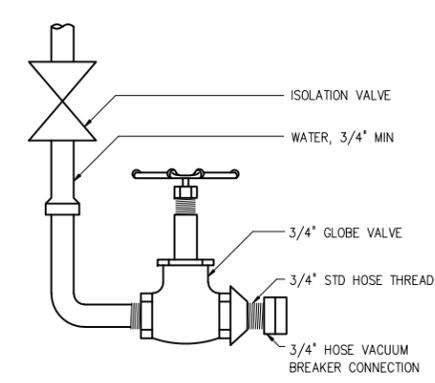
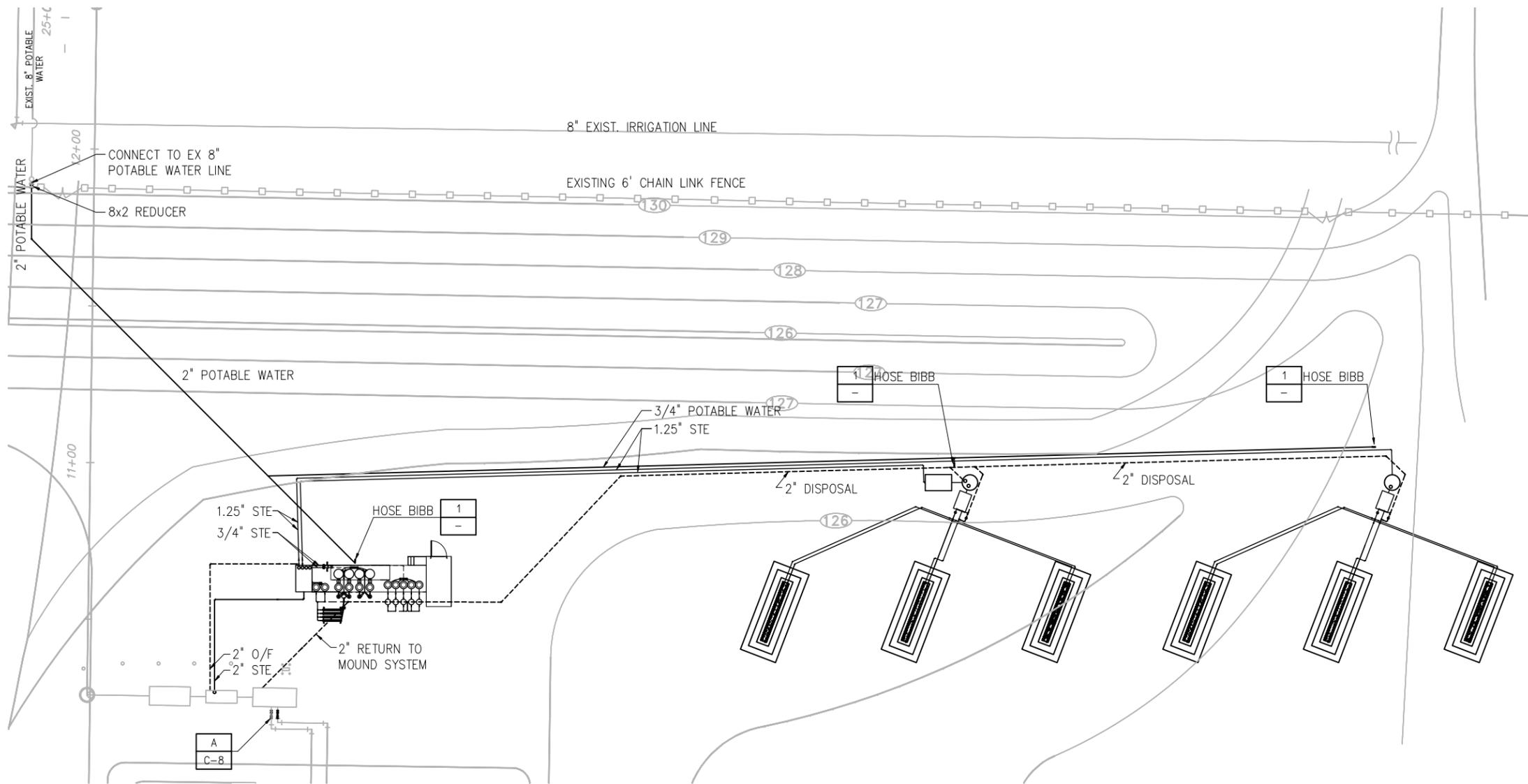
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FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY

PNRS II STRUCTURAL SITE PLAN AND DETAILS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE MAY 2010
	H & S JOB NUMBER 44237-001
	CONTRACT NUMBER
	DRAWING NUMBER S-3

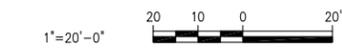
PLOT DATE: 5/28/2010 4:28 PM BY: EDEBACK



HOSE BIBB
 DETAIL 1
 NTS -

YARD PIPING PLAN
 1"=20'

- NOTES
- ALL YARD PIPING, UNLESS OTHERWISE SHOWN SHALL BE SOLVENT WELDED PVC LAID AT EXISTING SITE GRADE AND COVERED WITH FILL MATERIAL.
 PVC PIPING SHALL BE LAID WHERE POSSIBLE IN COMMON TRENCHES AND MARKED WITH PIPE NUMBERS IN PERMANENT MARKINGS AT 10' INTERVALS.
 - MAINTAIN SLOPE AND GRADE OF GRAVITY LINES AS INDICATED ON THE DRAWINGS.



PLOT DATE: 5/28/2010 4:29 PM BY: EDEBACK

NO.	ISSUED FOR	DATE	BY
5	AS-BUILTS PNRS II	05/10	-
4	FINAL SUBMITTAL	01/10	-
3	100% SUBMITTAL	12/09	-
2	75% SUBMITTAL	12/09	-
1	50% SUBMITTAL	08/09	-

DESIGNED	JME
DRAWN	CMS
CHECKED	DBS
PROJ. ENGR.	JME
	DLA
APPROVED	

JOSEFIN M. EDEBACK
 Name: _____ Date: _____
 Florida Professional Engineer's Registration Number: 69835

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YARD PIPING PLAN

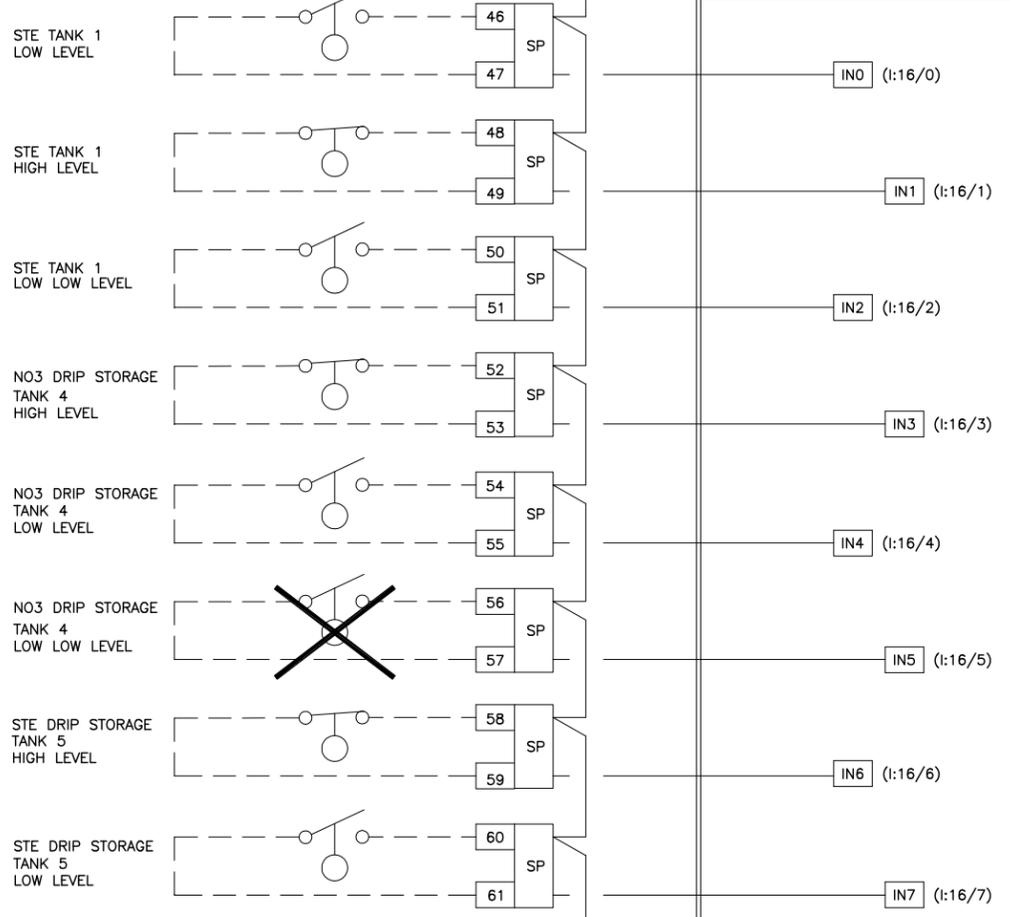
THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE	MAY 2010
	H & S JOB NUMBER	44237-001
	CONTRACT NUMBER	
	DRAWING NUMBER	M-1

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290
300
310
320
330

24V+ (FU-10)
24V+ (TO LINE 340)

CHASSIS: 1
SLOT: 2
DC DISCRETE IN
MODEL: 1746-IB16

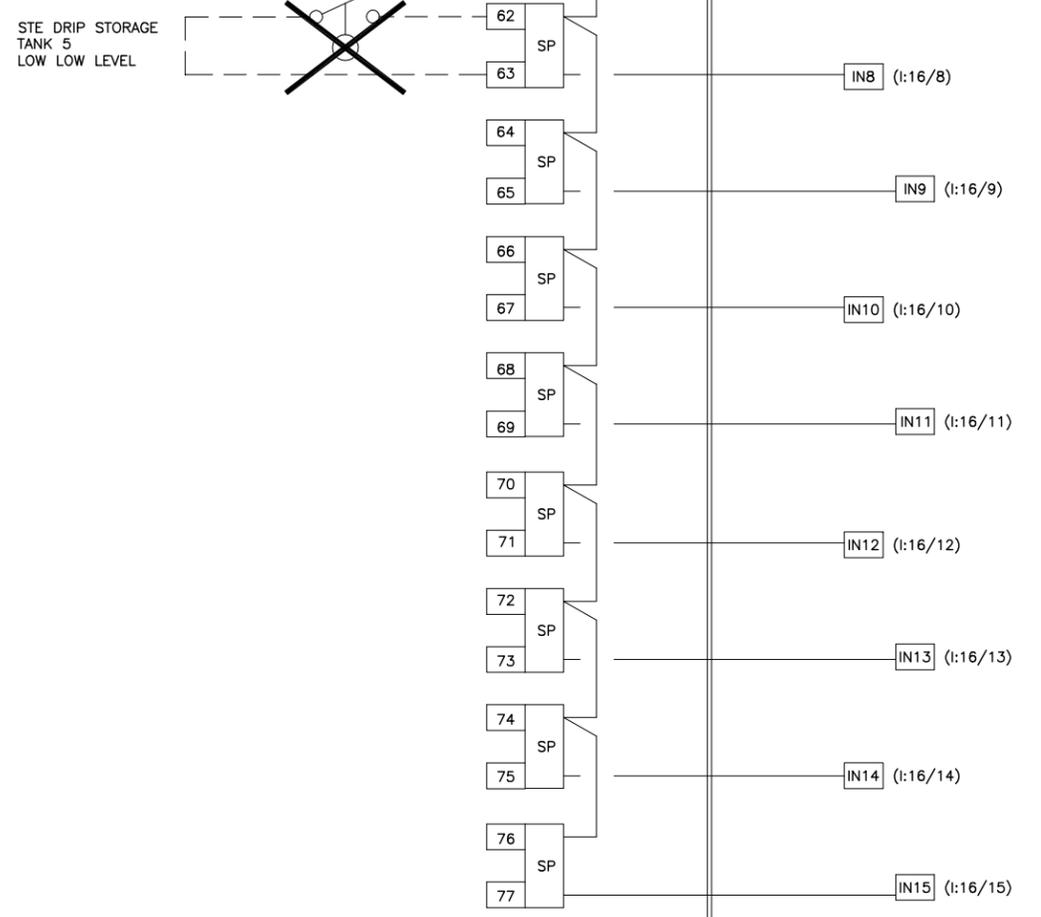


(CONT'D ABOVE RIGHT)

340
350
360
370
380

24V+ (FROM LINE 330)

DC COM



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NO.	ISSUED FOR	DATE	BY	APPROVED
5	AS-BUILTS PNRS II	05/10	-	
4	FINAL SUBMITTAL	01/10	-	
3	100% SUBMITTAL	12/09	-	
2	75% SUBMITTAL	12/09	-	
1	50% SUBMITTAL	08/09	-	

DESIGNED	DBS
DRAWN	CMS
CHECKED	JB
PROJ. ENGR.	DBS
	DLA
APPROVED	

DANIEL B. SCHMIDT
Name: _____ Date: _____
Florida Professional Engineer's Registration Number: 40233

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DI MODULE 2

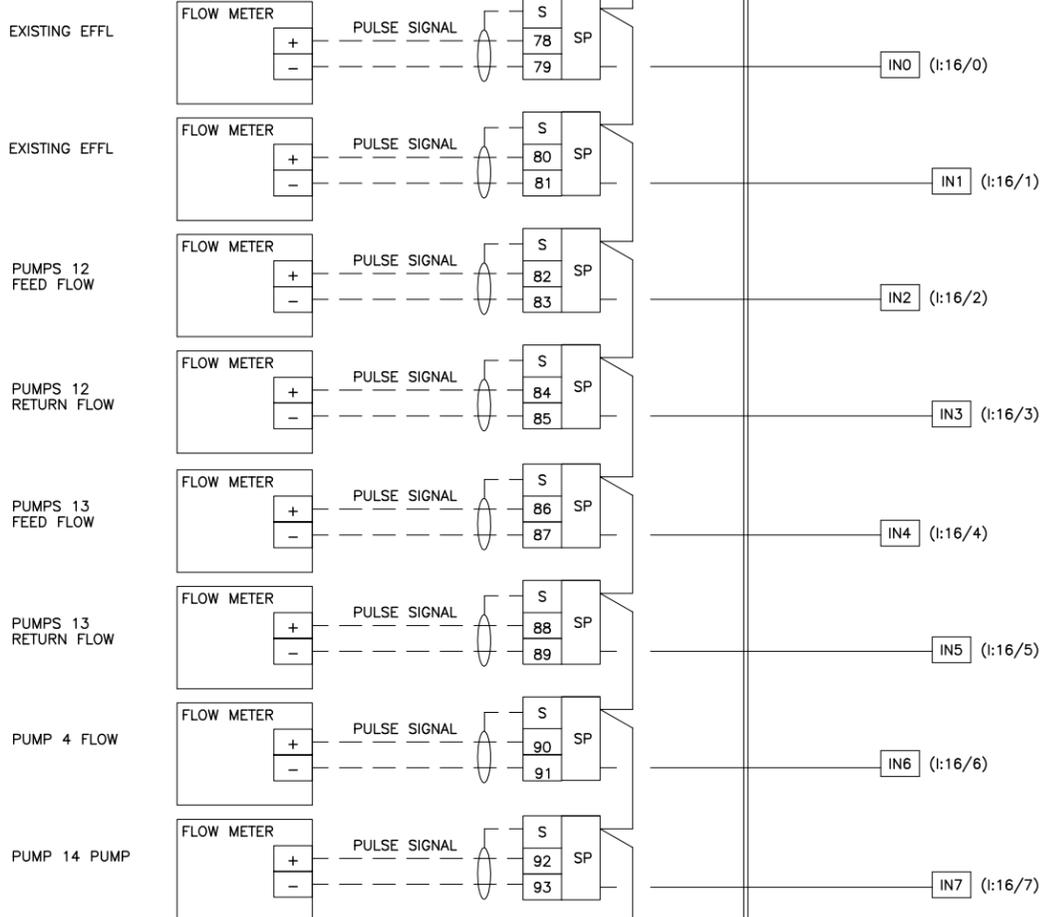
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	H & S JOB NUMBER	44237-001
	CONTRACT NUMBER	
	DRAWING NUMBER	1-3

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390
400
410
420
430

24V+ (FU-11)
24V+ (TO LINE 440)

CHASSIS: 1
SLOT: 4
DC DISCRETE IN
MODEL: 1746-IB16

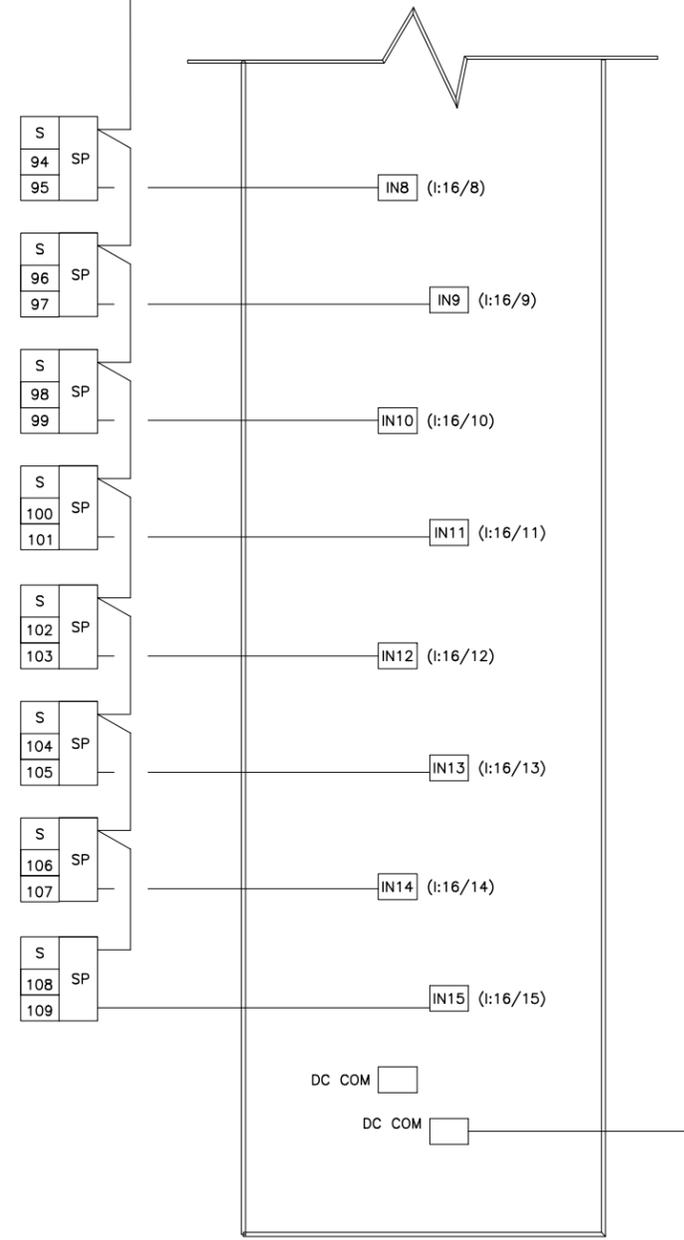


(CONT'D ABOVE RIGHT)

440
450
460
470
480

24V+ (FROM LINE 430)

DC COM



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4	FINAL SUBMITTAL	01/10	-	
3	100% SUBMITTAL	12/09	-	
2	75% SUBMITTAL	12/09	-	
1	50% SUBMITTAL	08/09	-	

DESIGNED	DBS
DRAWN	CMS
CHECKED	JB
PROJ. ENGR.	DBS
	DLA

DANIEL B. SCHMIDT
Name: _____ Date: _____
Florida Professional Engineer's Registration Number: 40233

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DI MODULE 3

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE	MAY 2010
	H & S JOB NUMBER	44237-001
	CONTRACT NUMBER	
DRAWING NUMBER		I-4

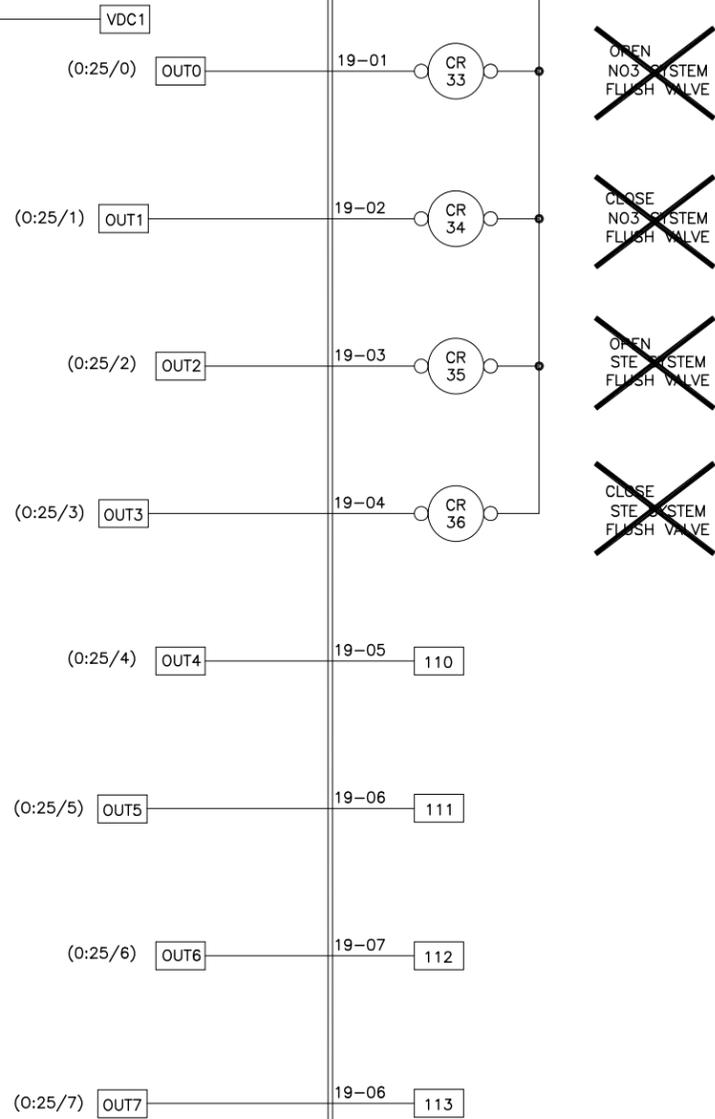
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590
600
610
620
630

CHASSIS: 1
SLOT: 6
RELAY OUTPUT
MODEL: 1746-OW16

24V+
(FU-13)

24V-
(COM)



~~OPEN
NO3 SYSTEM
FLUSH VALVE~~

~~CLOSE
NO3 SYSTEM
FLUSH VALVE~~

~~OPEN
STE SYSTEM
FLUSH VALVE~~

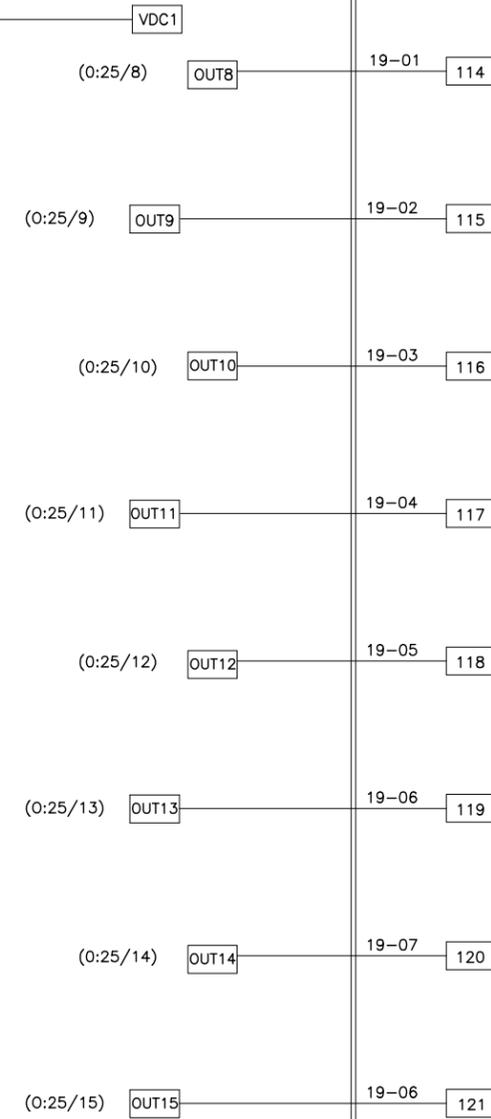
~~CLOSE
STE SYSTEM
FLUSH VALVE~~

24V+
(TO LINE 640)

(CONT'D ABOVE RIGHT)

640
650
660
670
680

(24V+)
(FROM LINE 630)



PLOT DATE: 5/28/2010 4:30 PM BY: EDEBACK

NO.	ISSUED FOR	DATE	BY
5	AS-BUILTS PNRS II	05/10	-
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3	100% SUBMITTAL	12/09	-
2	75% SUBMITTAL	12/09	-
1	50% SUBMITTAL	08/09	-

DESIGNED	DBS
DRAWN	CMS
CHECKED	JB
PROJ. ENGR.	DBS
APPROVED	DLA

DANIEL B. SCHMIDT
Name: _____ Date: _____
Florida Professional Engineer's Registration Number: 40233

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(850)-245-4070

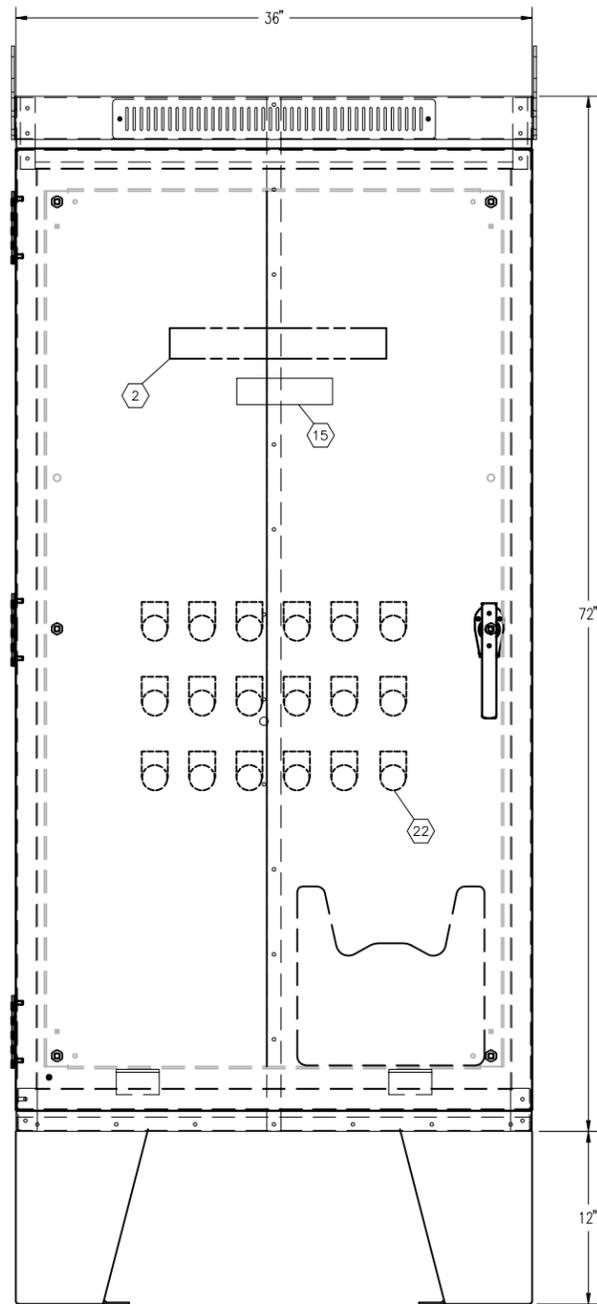
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DO MODULE 2

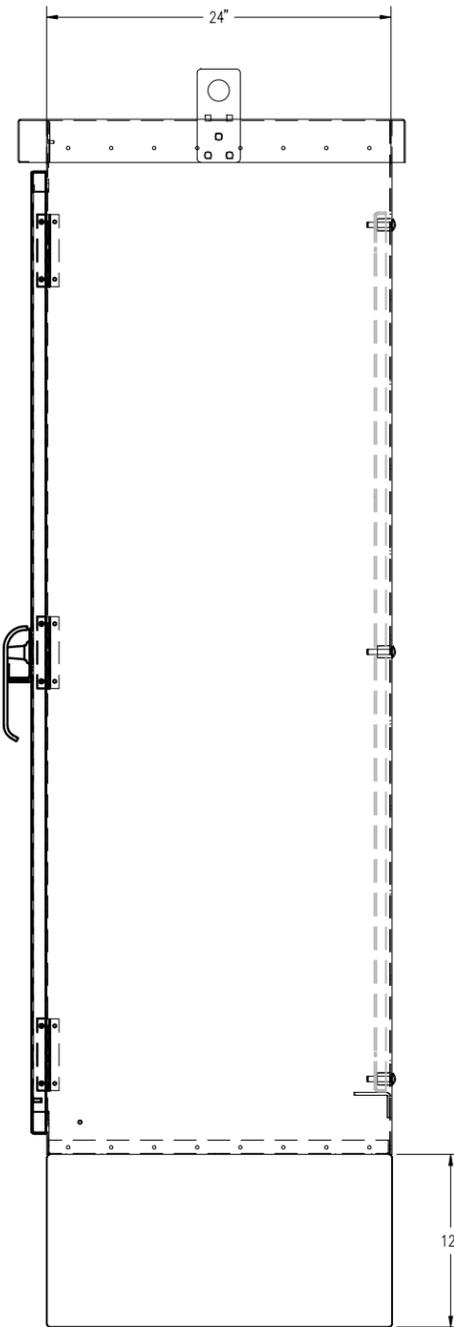
THE SCALE BAR
SHOWN BELOW
MEASURES ONE
INCH LONG ON
THE ORIGINAL
DRAWING.

DATE	MAY 2010
H & S JOB NUMBER	44237-001
CONTRACT NUMBER	
DRAWING NUMBER	I-6

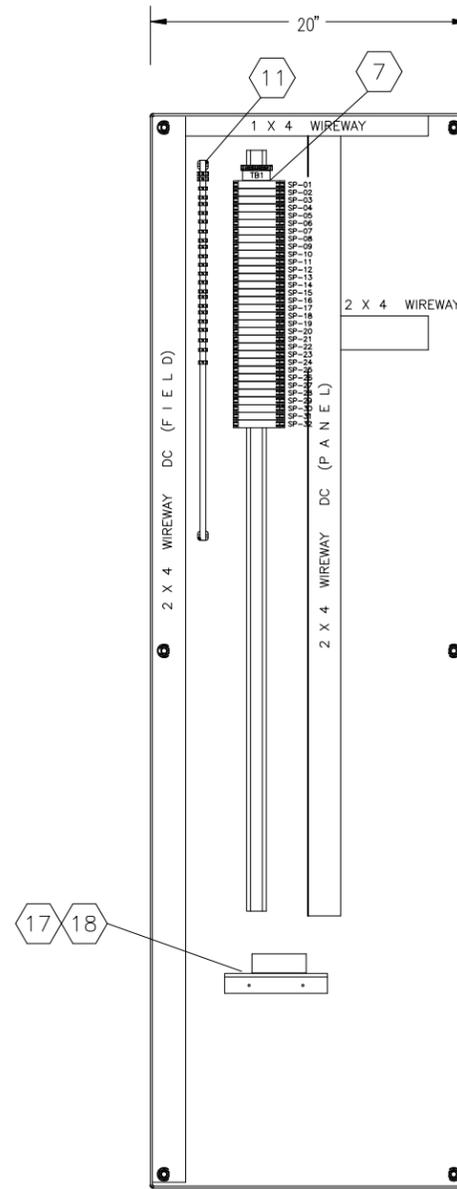
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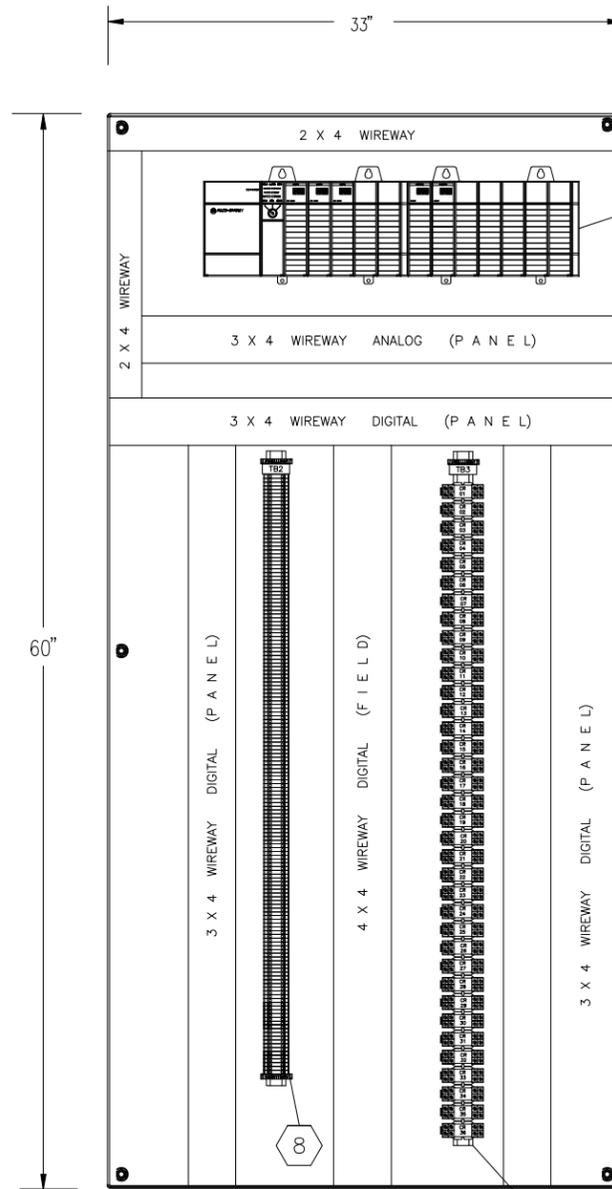
FRONT VIEW



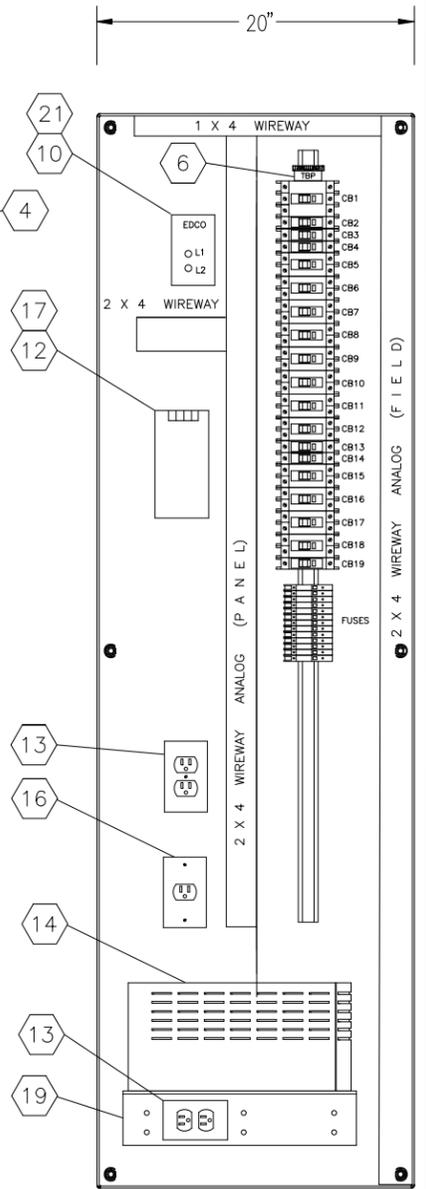
RIGHT SIDE VIEW



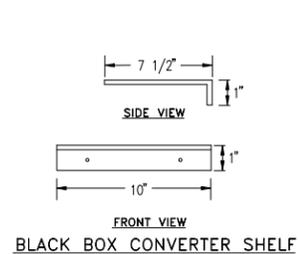
LEFT SUBPANEL



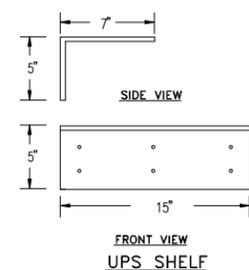
BACK SUBPANEL



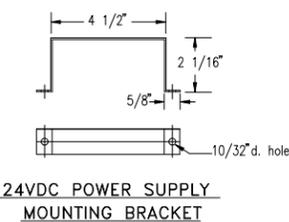
RIGHT SUBPANEL



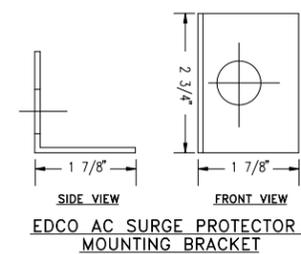
BLACK BOX CONVERTER SHELF



UPS SHELF



24VDC POWER SUPPLY MOUNTING BRACKET



EDCO AC SURGE PROTECTOR MOUNTING BRACKET

PLOT DATE: 5/28/2010 4:30 PM BY: EDEBACK

NO.	ISSUED FOR	DATE	BY	APPROVED
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4	FINAL SUBMITTAL	01/10	-	
3	100% SUBMITTAL	12/09	-	
2	75% SUBMITTAL	12/09	-	
1	50% SUBMITTAL	08/09	-	

DESIGNED	DBS
DRAWN	CMS
CHECKED	JB
PROJ. ENGR.	DBS
	DLA

DANIEL B. SCHMIDT
 Name: _____ Date: _____
 Florida Professional Engineer's Registration Number: 40233

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FLORIDA DEPARTMENT OF HEALTH
 FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY

PANEL ELEVATIONS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE MAY 2010
	H & S JOB NUMBER 44237-001
	CONTRACT NUMBER
	DRAWING NUMBER 1-7

File: 0-14237-000-001-001-001.dwg (Pump) by: Bahai (nsuramun@flh.com) 7 Panel Elevations Sheet by: Jdeback. Save date = 1/28/2010 4:38 PM

FUNCTIONAL CONTROL DESCRIPTIONS

1.01 THE REQUIREMENT

- A. Furnish, test, install and place in satisfactory operation all PLC control strategies, operator interface programming, and related programming as noted herein.
- B. The PLC programming and operator interface is to be fully tested at the manufacturer's shop prior to shipping. Once delivered, the programming is to be checked out prior to operation of the system and is to be demonstrated to the Engineer that the programs perform all functions as intended.
- C. All control functions are to be performed by the PLC. The operator interface is to be used for manual override of equipment, adjustment of setpoints, and to download stored data from the PLC.

1.02 OPERATOR INTERFACE

- A. The PLC shall communicate with a laptop computer which shall function as the operator interface. The operator interface software shall be supplied with the PLC control panel and be set up to provide full access to the PLC for operator manual override of all equipment, ability to make adjustments to setpoints, download stored data from the PLC, and make modifications to the PLC program itself as needed.
- B. The PLC shall include a data storage module capable of storing up to a month of data as described herein. The operator interface laptop will be used to download the data on a periodic basis. Data shall be transferable in MS Excel spreadsheet format.
- C. The following displays shall be created and stored on the laptop for operator interface:

Menu Bar – menu bar across the top of each display to provide quick access to any display.

Control Display – Tabular display of all pumps, blower, and valves. For each device, provide an ON / OFF / AUTO button (OPEN / CLOSE / AUTO for valves) for point and click control of the equipment. For each device, provide a RED run indicator (open indicator for valves) that is grey when not running (or valve closed). For each pump and blower, provide the totalized runtime value calculated by the PLC (in hours and tenths of hours up to 999,999.9). For each pump with an associated flow meter, provide the totalized flow value calculated by the PLC. For each pump, blower, or valve on timer control, provide indication of time remaining until (or time HH:MM of) next start or, if running, time remaining until the equipment stops (or closes). For each pump whose normal sequence can be interrupted, provide indication of the override (low level shutoff or Pump "X" running interrupt).

Setpoint Display – Tabular display(s) for all control setpoints as described herein with simple point and click access to each setpoint that allows value changes by typing in a numeric value and pressing the ENTER key.

Timer Setpoint Display – For all timer setpoints, provide a 24-hour, bar graph format display to show the relative on and off times of each pump and blower.

1.03 PUMP 1 – EXISTING SEPTIC TANK 2 TO STE STORAGE TANK 1

- A. Control Description: Pump shall start on LOW level in STE STORAGE TANK 1 and stop on HIGH level in STE STORAGE TANK 1. If PUMP 13 is running as part of its normal timed sequence, delay start of PUMP 1 until that sequence is complete.
- B. Data Storage: Record totalized runtime, daily pump runtime, and number of starts per day.

1.04 PUMP 2 – STE STORAGE TANK 1 TO STE DRIP STORAGE TANK 5

- A. Control Description: Pump shall start on LOW level in STE DRIP STORAGE TANK 5 and stop on HIGH level in STE DRIP STORAGE TANK 5. Pump shall stop on LOW LOW level in STE STORAGE TANK 1 and remain off until LOW level in STE STORAGE TANK 1 is reached. If PUMP 14 is running as part of its normal timed sequence, delay start of PUMP 2 until that sequence is complete.
- B. Data Storage: Record totalized runtime, daily pump runtime, and number of starts per day.

1.05 PUMP 3 – STE STORAGE TANK 1 TO NITRIFICATION UNIT

- A. Control Description: Pump shall start up to 8 times a day and run for a set amount of time. Provide 8 individual start times based on a 24-hour clock format (HH:MM). Provide 1 global cycle duration timer for all 8 start times. The 8 start times and the 1 cycle duration time setpoint shall be adjustable from the operator interface. Pump shall stop on LOW LOW level in STE STORAGE TANK 1 and remain off until LOW level in STE STORAGE TANK 1 is reached.
- B. Data Storage: Record totalized runtime and daily pump runtime.

1.06 PUMP 4 – STE STORAGE TANK 1 TO HYDROSPLITTER SYSTEM 1

- A. Control Description: Pump shall start a set number of times a day (up to 24 times) and run for a set amount of time. The number of start times a day and the cycle duration time setpoint shall be adjustable from the operator interface. The PLC shall divide the number of start times a day entered into 1,440 minutes (24 hours) to determine the start times of the pump starting from midnight. For example, if 18 times a day were selected, the pumps would start every 80 minutes (00:00, 01:20, 02:40 21:20, 22:40). For uneven values, the PLC shall round to the nearest minute. Pump shall stop on LOW LOW level in STE STORAGE TANK 1 and remain off until LOW level in STE STORAGE TANK 1 is reached.
- B. Data Storage: Record totalized runtime and daily pump runtime. Receive pulse input from flow meter and record totalized daily volume pumped. One pulse equals one gallon.

1.07 PUMP 5 – STE STORAGE TANK 1 TO IN-SITU SYSTEM

- A. Control Description: Pump shall start up to 6 times a day and run for a set amount of time. Provide 6 individual start times based on a 24-hour clock format (HH:MM). Provide 1 global cycle duration timer for all 6 start times. The 6 start times and the 1 cycle duration time setpoint shall be adjustable from the operator interface.
- B. Data Storage: Record totalized runtime and daily pump runtime. Calculate totalized daily volumes pumped based on pump flow rate entered by operator (calculated from pump maximum capacity, frequency, and stroke length set at pump).

1.08 PUMPS 6 THROUGH 9 – HYDROSPLITTER SYSTEM 2 RECIRCULATION PUMPS

- A. Control Description: Pumps shall start when PUMP 14 starts and each pump shall run for a set amount of time. Provide 1 global cycle duration timer for each individual pump. The cycle duration time setpoint shall be adjustable from the operator interface.
- B. Data Storage: Record totalized runtime and daily pump runtimes.

1.09 PUMPS 10 AND 11 – DENITE FEED FROM TANK 3

- A. Control Description: Each pump shall start a set number of times a day (up to 24 times) and run for a set amount of time. The number of start times a day and the cycle duration time setpoint shall be adjustable from the operator interface and each pump shall run off individual setpoints. The PLC shall divide the number of start times a day entered into 1,440 minutes (24 hours) to determine the start times of the pump starting from 15 minutes after midnight. For example, if 13 times a day were selected, the pumps would start every 110.77 minutes (00:15, 02:06, 03:57 20:33, 22:24). For uneven values, the PLC shall round to the nearest minute as indicated in example.
- B. Data Storage: Record totalized runtime and daily pump runtimes. Calculate totalized daily volumes pumped based on pump flow rate entered by operator (calculated from pump maximum capacity, frequency, and stroke length set at pump).

1.10 PUMP 12 – NO3 DRIP STORAGE TANK 4 TO NO3 DRIP SYSTEM

- A. Control Description: Pump shall start up to 6 times a day and run for a set amount of time. Provide 6 individual start times based on a 24-hour clock format (HH:MM). Provide 1 global cycle duration timer for all 6 start times. The 6 start times and the 1 cycle duration time setpoint shall be adjustable from the operator interface. Pump shall stop on LOW LOW level in NO3 DRIP STORAGE TANK 4 and remain off until LOW level in NO3 DRIP STORAGE TANK 4 is reached. Pump shall also start with flush cycle (see VALVE 1 controls).
- B. Data Storage: Record totalized runtime. Record separate daily runtimes for the timed sequence described above and for the flush sequence. Receive pulse inputs from the supply and return flow meters and record totalized daily volume pumped as supply only (subtract return flow from supply flow). One pulse equals one gallon.

1.11 PUMP 13 – STE DRIP STORAGE TANK 5 TO STE DRIP System

- A. Control Description: Pump shall start up to 6 times a day and run for a set amount of time. Provide 6 individual start times based on a 24-hour clock format (HH:MM). Provide 1 global cycle duration timer for all 6 start times. The 6 start times and the 1 cycle duration time setpoint shall be adjustable from the operator interface. Pump shall stop on LOW LOW level in STE DRIP STORAGE TANK 5 and remain off until LOW level in STE DRIP STORAGE TANK 5 is reached. Pump shall also start with flush cycle (see VALVE 2 controls).
- B. Data Storage: Record totalized runtime. Record separate daily runtimes for the timed sequence described above and for the flush sequence. Receive pulse inputs from the supply and return flow meters and record totalized daily volume pumped as supply only (subtract return flow from supply flow). One pulse equals one gallon.

1.12 PUMP 14 – STE STORAGE TANK 1 TO HYDROSPLITTER SYSTEM 2

- A. Control Description: Pump shall start a set number of times a day (up to 24 times) and run for a set amount of time. The number of start times a day and the cycle duration time setpoint shall be adjustable from the operator interface. The PLC shall divide the number of start times a day entered into 1,440 minutes (24 hours) to determine the start times of the pump starting from 30 minutes after midnight. For example, if 16 times a day were selected, the pumps would start every 90 minutes (00:30, 02:00, 03:30 21:30, 23:00). For uneven values, the PLC shall round to the nearest minute. Pump shall stop on LOW LOW level in STE STORAGE TANK 1 and remain off until LOW level in STE STORAGE TANK 1 is reached.
- B. Data Storage: Record totalized runtime and daily pump runtime. Receive pulse input from flow meter and record totalized daily volume pumped. One pulse equals one gallon.

1.13 PUMP 15 – NO3 DRIP STORAGE TANK 4 TO GRAVITY SUMP

- A. Control Description: Pump shall start on HIGH level in NO3 DRIP STORAGE TANK 4 and stop on LOW level in NO3 DRIP STORAGE TANK 4. If PUMPS 3 or 13 are running as part of their normal timed sequences, delay start of PUMP 15 until those sequences are complete.
- B. Data Storage: Record totalized runtime, daily pump runtime, and number of starts per day.

1.14 BLOWER – NO3 SYSTEM

- A. Control Description: Blower shall start based on a repeat cycle ON / OFF timer. Separate ON and OFF times, in minutes, shall be provided that are adjustable from the operator interface. If 0 minutes are entered for ON time, the blower shall never run. If 0 minutes are entered for OFF time, the blower shall run continuously.
- B. Data Storage: Record totalized runtime.

1.15 VALVE 1 – NO3 DRIP SYSTEM FLUSH

- A. Control Description: Once per day, as determined by a flush time setting (HH:MM), the valve shall open. Once the valve is confirmed open, Pump 12 shall start and run for a set amount of time. Once timed out, the pump shall stop first, then the valve shall be closed. If Pump 12 is already running as part of its normal timed sequence, start of the flush cycle shall be delayed until that sequence is complete and the pump has shut off. The flush start time and cycle duration setpoint shall be adjustable from the operator interface.

1.16 VALVE 2 – STE DRIP SYSTEM FLUSH

- A. Control Description: Once per day, as determined by a flush time setting (HH:MM), the valve shall open. Once the valve is confirmed open, Pump 13 shall start and run for a set amount of time. Once timed out, the pump shall stop first, then the valve shall be closed. If Pump 13 is already running as part of its normal timed sequence, start of the flush cycle shall be delayed until that sequence is complete and the pump has shut off. The flush start time and cycle duration setpoint shall be adjustable from the operator interface.

1.17 POWER DISTRIBUTION CALCULATION

- A. Control Description: Odd numbered pumps 1–15 and Valve 1 are powered from one pole of the main power feed to the panel. Even numbered pumps, the blower, and Valve 2 are powered from the other pole. Pumps 1, 12, and 13 draw 5.5 amps. Pumps 2, 3, 4, 6, 7, 8, 9, 14, and 15 draw 2.5 amps. Pumps 5, 10, and 11, the blower, and the two valves draw less than 1 amp. Logic described above for permissives and selected time settings should minimize the number of pumps running at one time. However, the PLC shall calculate the estimated amp draw (sum of the values listed above) for each pole for the equipment running at any time. If the estimated value exceeds 30 amps, the PLC shall delay start of any additional equipment until the amp draw decreases below 30 amps.
- B. Data Storage: Record highest estimated daily amp draw.

1.18 TIME OF DAY RESET

- A. Control Description: Provide means for operator to enter the hour and minute of the day and then reset the PLC clock to match this time. Display of actual PLC time is to be shown on the Control Display.

PLOT DATE: 5/28/2010 4:30 PM BY: EDEBACK

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5	AS-BUILTS PNRS II	05/10	-
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DESIGNED	DBS
DRAWN	CMS
CHECKED	JB
PROJ. ENGR.	DBS
	DLA
APPROVED	

DANIEL B. SCHMIDT	
Name:	Date:
Florida Professional Engineer's Registration Number: 40233	



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FLORIDA DEPARTMENT OF HEALTH
FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY

FUNCTIONAL CONTROL DESCRIPTIONS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE	MAY 2010
H & S JOB NUMBER	44237-001
CONTRACT NUMBER	
DRAWING NUMBER	1-9

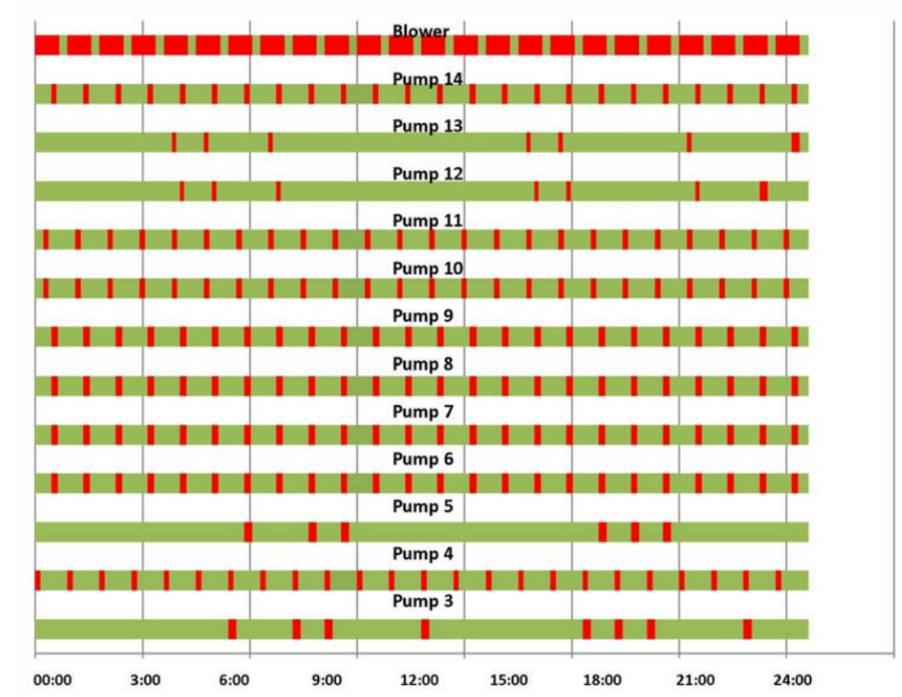
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CONTROL DISPLAY

Device Control	Status	Total Runtime	Totalized Flow (gal)	Time to Next Start	Cycle Interruption
PUMP 1 Septic Tank 2 to STE Storage Tank 1	ON OFF AUTO RUNNING	005,480.0			No
PUMP 2 STE Storage Tank 1 to STE Drip Storage Tank 5	ON OFF AUTO STOPPED	005,480.0			No
PUMP 3 STE Storage Tank 1 to NO3 Drip Storage Tank 4	ON OFF AUTO STOPPED	000,340.0		06:00	No
PUMP 4 STE Storage Tank 1 to Hydrosplitter System 1	ON OFF AUTO STOPPED	000,080.7	524,453	02:40	No
PUMP 5 STE Storage Tank 1 to In-Situ System	ON OFF AUTO STOPPED	000,111.3	103,024	08:15	
PUMP 6 Hydrosplitter System 2 Recirculation	ON OFF AUTO RUNNING	000,148.5		10.3 min	
PUMP 7 Hydrosplitter System 2 Recirculation	ON OFF AUTO RUNNING	000,148.5		10.3 min	
PUMP 8 Hydrosplitter System 2 Recirculation	ON OFF AUTO RUNNING	000,148.5		10.3 min	
PUMP 9 Hydrosplitter System 2 Recirculation	ON OFF AUTO RUNNING	000,148.5		10.3 min	
PUMP 10 Feed from Denite Feed Tank 3	ON OFF AUTO RUNNING	000,030.0	010,231	03:57	
PUMP 11 Feed from Denite Feed Tank 3	ON OFF AUTO RUNNING	000,030.0	010,231	03:57	
PUMP 12 NO3 Drip Storage Tank 4 to NO3 Drip System	ON OFF AUTO STOPPED	005,480.0	705,480	09:45	Low Level
PUMP 13 STE Drip Storage Tank 5 to STE Drip System	ON OFF AUTO STOPPED	000,340.0	685,301	09:45	No
PUMP 14 STE Storage Tank 1 to STE Hydrosplitter System 2	ON OFF AUTO RUNNING	000,080.7	705,480	10.3 min	No
PUMP 15 NO3 Drip Storage Tank 4 to Gravity Sump	ON OFF AUTO STOPPED	000,111.3			No
BLOWER NO3 System Air Supply Blower	ON OFF AUTO RUNNING	102,533.6		24.3 min	
VALVE 1 NO3 Drip Storage Tank 4 Flush Valve	OPEN CLOSE AUTO CLOSED			22:30	
VALVE 2 STE Drip Storage Tank 5 Flush Valve	OPEN CLOSE AUTO CLOSED			23:00	

11:43 PLC TIME Existing System Flows: Meter 1 685,301 Meter 2 685,301

TIMECHART



SETPOINT DISPLAY

Device	Start Times (HH:MM)	Cycle Time (min)	Number of Starts / Day	Cycle Time (min)
PUMP 3 STE Storage Tank 1 to NO3 Drip Storage Tank 4	06 : 00 08 : 00 09 : 00 12 : 00 17 : 00 18 : 00 19 : 00 22 : 00	15	24	10
PUMP 4 STE Storage Tank 1 to Hydrosplitter System 1			24	10
PUMP 5 STE Storage Tank 1 to In-Situ System	06 : 30 08 : 30 09 : 30 17 : 30 18 : 30 19 : 30	15	On Time 45	Off Time 15
PUMP 10 Feed from Denite Feed Tank 3			24	10
PUMP 11 Feed from Denite Feed Tank 3			24	10
PUMP 12 NO3 Drip Storage Tank 4 to NO3 Drip System	04 : 30 05 : 30 07 : 30 15 : 30 16 : 30 20 : 30	8		
PUMP 14 STE Storage Tank 1 to Hydrosplitter System 2			24	10
PUMP 6 Hydrosplitter System 2 Recirculation				12
PUMP 7 Hydrosplitter System 2 Recirculation				12
PUMP 8 Hydrosplitter System 2 Recirculation				12
PUMP 9 Hydrosplitter System 2 Recirculation				12
PUMP 13 STE Drip Storage Tank 5 to STE Drip System	04 : 15 05 : 15 07 : 15 15 : 15 16 : 15 20 : 15	8		
VALVE 2 STE Drip Storage Tank 5 Flush Valve			23 : 30	15
VALVE 1 NO3 Drip Storage Tank 4 Flush Valve	22 : 30	15		
Pump 10 Feed Rate:			03	gph
Pump 11 Feed Rate:			03	gph

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File: G:\44237-001\Drawings\44237-001\Functional Control Descriptions.dwg Scale: 1/8"=1'-0" Plot Date: 5/28/2010 4:30 PM