Belews Creek Steam Station
3195 Pine Hall Road
Belews Creek, NC 27009
336-445-0610
336-669-2994

Permit No.	Scan Date	DIN
8505-INDUS-	**February 17, 2016**	**25631**

February 16, 2016

RECEIVED
February 17, 2016
Solid Waste Section
Asheville Regional Office

North Carolina Department of Environmental Quality
Division of Waste Management
Solid Waste Section
2090 U.S. Highway 70
Swannanoa, North Carolina 28778

Attn: Mr. Larry Frost

Re: Landfill Leachate Force Main Testing Plan
Permit No.: 8504-INDUS-, Belews Creek Craig Rd Landfill
Permit No.: 8505-INDUS-, Belews Creek FGD Residual Landfill
Belews Creek Steam Station
Stokes County
Belews Creek, North Carolina 27009

Dear Mr. Frost,

The attached plan and drawings are for the Landfill Leachate Force Main Testing of the lines from the Belews Creek Craig Rd Landfill and the FGD Residual Landfill. This plans includes the installation of two gate valves at the consolidated sump to ensure the integrity of the existing leachate lines. The drawings that are included are only for reference to the construction record and do not reflect any modifications. The construction package has been reviewed and at no time during the testing will the pressure exceed 80% of the pipe design pressure.

Duke Energy is submitting this plan to the Division for concurrence of installation of the two new gate valves and an air relief valve. Duke Energy is committed to excellent environmental stewardship and cooperation with the Division regarding the operation, maintenance, safety, and integrity of all of its facilities. We look forward to continuing to work with you regarding environmental concerns.

If there are any questions regarding this request, please contact me at (336) 445-0610.

Respectfully submitted,

Melonie Martin
Environmental Services

cc (via e-mail): Ed Mussler, NCDEQ
Shawn McKee, NCDEQ
Evan Andrews, Duke Energy
Will Harrison, Duke Energy
Kimberlee Hutchinson, Duke Energy
Ed Sullivan, Duke Energy

BELEWS CREEK LANDFIL
LEACHATE FORCE MAIN TESTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnishing and installing the required fittings and accessories to perform hydrostatic testing of the landfill leachate force mains at the Belews Creek Steam Station (BCSS).

B. Performing a hydrostatic test of the BCSS landfill leachate force mains as indicated on the drawings and recording results of the test.

C. Returning the system to operating configuration following a successful test OR performing an investigation to locate and repair any system leaks and re-testing to obtain passing results.

1.02 RELATED SECTIONS

None

1.03 PROJECT RECORD DOCUMENTS

A. Submit product data and material specifications to the Engineer for approval prior to purchase of materials.

B. Provide record of testing including equipment used, testing log and summary of events related to testing.

C. In the event repairs are required, record location and method of conducting repairs prior to retesting the section that failed.

1.04 BASIS OF PAYMENT

A. Payment will be made on a time and materials basis for conducting the work.

PART 2 PRODUCTS

2.01 PIPE

A. Duke records indicate the pipe used in the force main from the Craig Road Landfill to be tested is 4170 HDPE, SDR 17, with a nominal inside diameter of 6 inches. The FGD landfill forcemain is 4170 HDPE, SDR 11 with a nominal inside diameter of 6 inches. <u>At no time shall pressure in these pipes exceed 100 psi at 73 degrees F.</u>

2.02 VALVES AND APPURTENANCES

A. Valve Box: Valve box shall be Carson Plastic model Heavywall 0015-B or approved equal. Box shall extend to straddle forcemain piping, provide unobstructed observation of the forcemain, tapping saddle and air release valve. Box shall be bedding in a minimum 12" #57 stone.

B. Air Release Valve: The air release valve shall be Maxiair 6520 (or approved equal) as manufactured by Flomatic Valves.

C. Couplers/ Flanges: Electrofusion couplers as produced by Intergifuse or approved equal shall be used where required. Couplers shall be compatible with force main piping and have a minimum 150 psi pressure rating at 73 degrees F.

D. Permanent valves and fittings shall be provided with required suitable companion flanges/fittings and stainless steel bolt kits with gaskets where required for installation in the system.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install pipe and pipe fittings in accordance with manufacturer's instructions.

3.02 PREPARATION

A. Obtain all necessary permits, permissions and clearances for performing the work including, but not limited to, LOTO of energized components, site specific safety training, confined space entry, lifting / rigging, scaffolding, elevated work, excavation, underground utility location and traffic control in accordance with Duke Energy Policies and Programs

B. Prior to testing, flush line with fresh water as provided by Owner.

C. Take necessary precautions to contain force main contents during all phases of the testing process. Duke Energy will be notified immediately of leakage or spills beyond approved containment measures.

3.02.1 Craig Road Landfill

A. Prepare inlet end of leachate force main for testing by removing check valve and installing blind flange in valve vault shown on Drawing BC-1037-07-13.

B. Excavate force main on south side of Craig Rd force main high point (approximate station 27+00 per Drawing BC-1037-07-09). Install 1/2" air relief valve with tapping

saddle and vault box at this location. Provide traffic control as needed if working within 4' of the edge of roadway.

C. Excavate force main no more than 5 feet from the edge of the consolidated sump wall to allow for installation of gate valve and fill port on force main.

D. Install gate valve on force main outlet in consolidated sump SMP-42500A as shown on Drawings #BC-6128-07.01, BC-6542.0202 and Site Sketch. Bed installation in a minimum of 6 inches of NCDOT # 57 stone.

E. Install valve boxes over new installation to allow for permanent access, operation and inspection of the new fittings.

3.02.2 FGD Landfill

A. Prepare inlet end of leachate force main for testing by removing 6" ductile iron 'tee' and installing a tap flange in valve vault shown on Drawing BCM 6451.00-0013.001.

B. Excavate force main no more than 5 feet from the edge of the consolidated sump wall to allow for installation of gate valve and fill port on force main.

C. Install gate valve and fill port on force main outlet in consolidated sump SMP-42500A as shown on Drawings #BC-6128-07.01, BC-6542.0202 and Site Sketch.

D. Install valve boxes over new installation to allow for permanent access, operation and inspection of the new fittings.

3.03 HYDROSTATIC TESTS

A. Conduct hydrostatic tests on the leachate force main in the presence of the Engineer.

B. Furnish all labor, materials and equipment required for conducting tests as specified, including pumps, gauges, temporary bulkheads and other miscellaneous items required.

C. Conduct tests in such a manner as to avoid injury to personnel, and damage to equipment, Work, and existing facilities. Follow all Duke Energy safety standards and protocols for completing the work.

D. Conduct a hydrostatic pressure test on the in-place pipe as described below.

1. The pipe shall be tested in place at 125% of the maximum anticipated operating pressure of the system. Test the pipe at 70 psi.

2. Devices that could be damaged by the test pressure shall be isolated or removed from the system during the testing periods. If the device cannot be removed or isolated, then the limiting section test pressure shall be the maximum allowable test pressure for that device.

3. Tests shall be conducted for a minimum of one (1) hour after stabilization at the test pressure. No more than 3 psi loss of pressure shall be permitted for the duration of the test.

4. Carefully examine exposed pipe, joints and fittings during the pressure testing.

5. Replace any leaking or defective piping and fittings disclosed by the testing. Replace or repair defective components of the pipe system in a manner acceptable to the Engineer. The Engineer may reject any repaired component if he feels that the repair is unsatisfactory. Do not complete backfilling until all tests have been conducted, and all defects corrected to meet the requirements of the specified test, and all piping proves to be tight. No caulking of defective piping or joints will be permitted.

3.03 FIELD QUALITY ASSURANCE

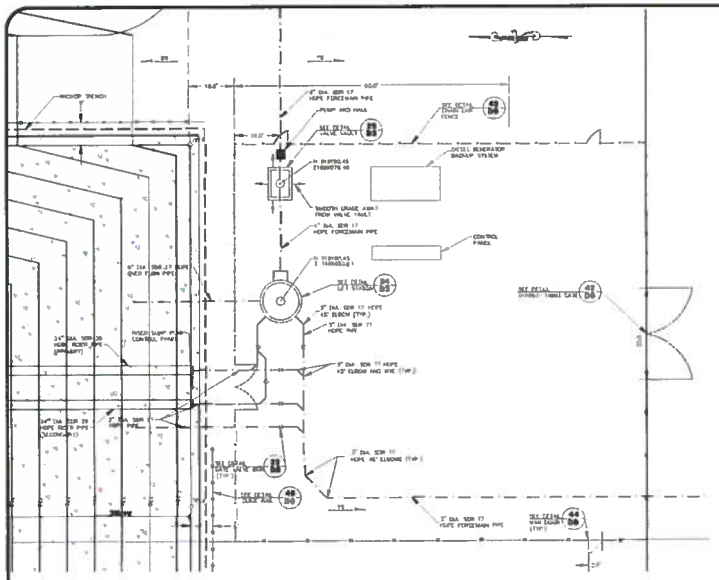
A. Field inspection will be performed by Owner. No work shall be performed without Owner's representative present. Owner's representative must be present to confirm results of all testing.

3.04 PROTECTION

A. Protect unaffected components of the system(s) and return system to full operation following testing. Contractor is responsible for repair or replacement of affected components or collateral damage to the system as a result of negligent, unsafe or other actions not approved by Duke Energy.

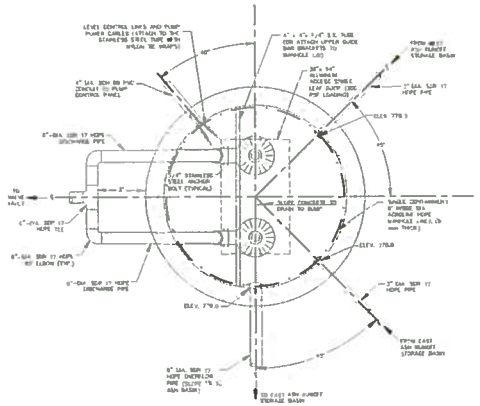
END OF SECTION

ASH RUNOFF FORCEMAIN PIPING PLAN AND PROFILE
CHAIR ROAD ASH LANDFILL
DUKE POWER - BELEWS CREEK STEAM STATION
BELEWS CREEK, NORTH CAROLINA
S&ME
WWW.SMEINC.COM
Duke Power
A Duke Energy Company
PLAN
PROFILE
GRAPHIC SCALE
HORIZONTAL
VERTICAL
ELEVATION (FEET)
LEGEND

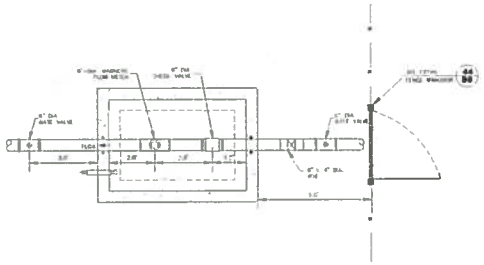


PLAN

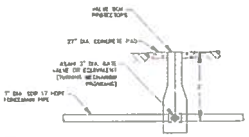
GRAPHIC SCALE



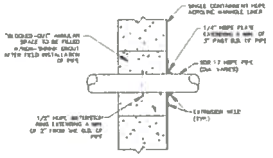
PLAN VIEW



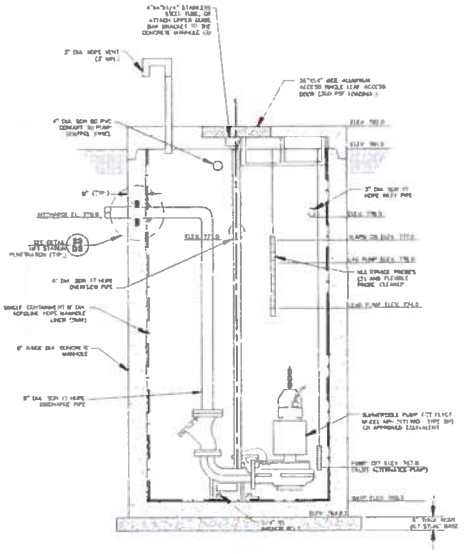
PLAN VIEW



GATE VALVE BOX DETAIL
SCALE: 1"=2'

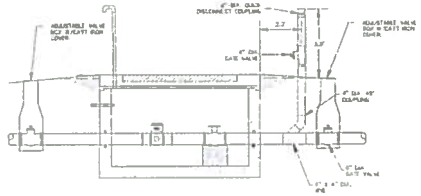


TYPICAL LIFT STATION PENETRATION DETAIL



ELEVATION

LIFT STATION DETAIL



SECTION A – A'

VALVE VAULT DETAIL

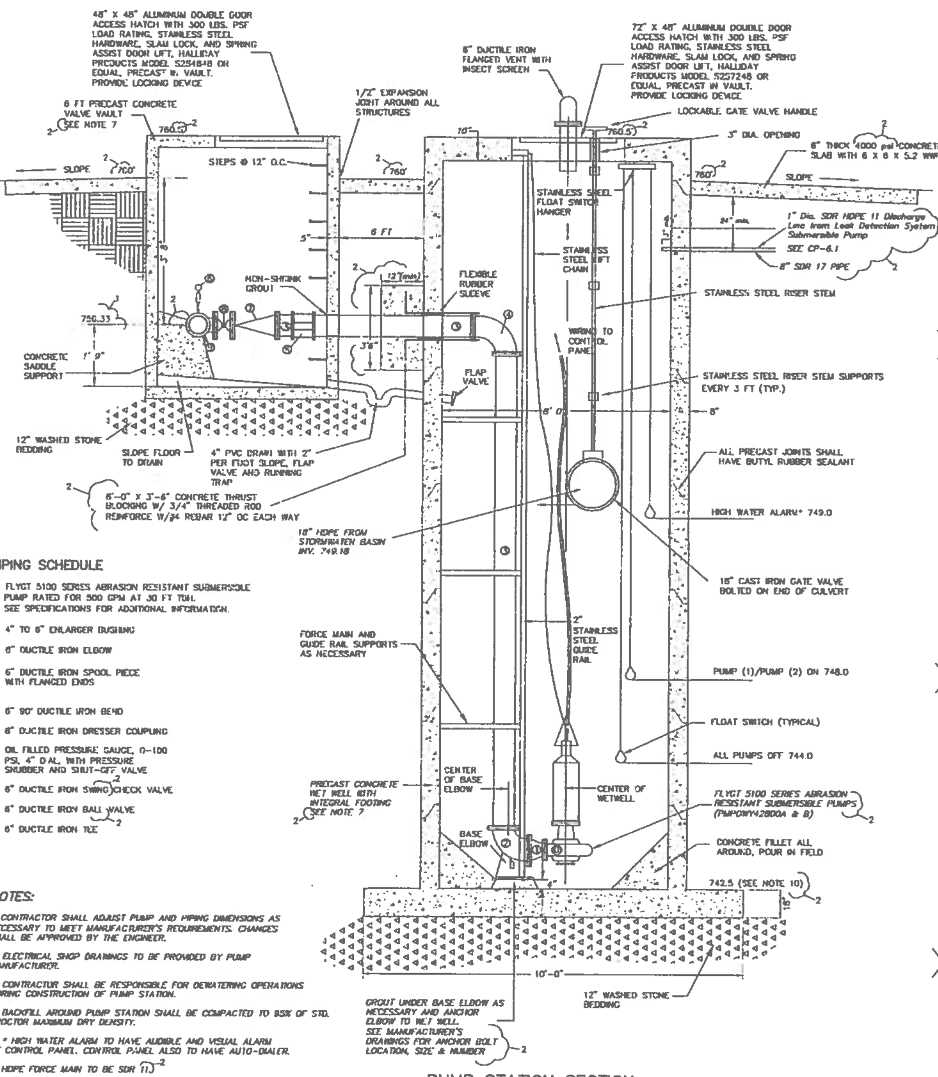
LIFT STATION AND VALVE VAULT DETAILS
CRAIG ROAD ASH LANDFILL

DUKE POWER - BELEWS CREEK STEAM STATION
BELEWS CREEK, NORTH CAROLINA

Duke Power
A Duke Energy Company

S&ME
WWW.SMEINC.COM

DESIGNED BY: CY	DRAWN BY:
CHECKED BY:	APPROVED BY:
PROJECT NUMBER: 1356-01-544A	
SCALE: AS SHOWN	DATE: 12-16-05
SHEET NO: D3	OF: 24
DWG NO: BC-1537-07-13	



PIPING SCHEDULE

⓪ FLYGT 5100 SERIES ABRASION RESISTANT SUBMERSIBLE PUMP RATED FOR 500 GPM AT 30 FT TDH. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

① 4" TO 6" ENLARGER BUSHING

② 6" DUCTILE IRON ELBOW

③ 6" DUCTILE IRON SPOOL PIECE WITH FLANGED ENDS

④ 6" 90° DUCTILE IRON BEND

⑤ 6" DUCTILE IRON DRESSER COUPLING

⑥ OIL FILLED PRESSURE GAUGE, 0-100 PSI, 4" DIAL, WITH PRESSURE SNUBBER AND SHUT-OFF VALVE

⑦ 6" DUCTILE IRON SWING CHECK VALVE

⑧ 6" DUCTILE IRON BALL VALVE

⑨ 6" DUCTILE IRON TEE

NOTES:

1. CONTRACTOR SHALL ADJUST PUMP AND PIPING DIMENSIONS AS NECESSARY TO MEET MANUFACTURER'S REQUIREMENTS. CHANGES SHALL BE APPROVED BY THE ENGINEER.

2. ELECTRICAL SHOP DRAWINGS TO BE PROVIDED BY PUMP MANUFACTURER.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING OPERATIONS DURING CONSTRUCTION OF PUMP STATION.

4. BACKFILL AROUND PUMP STATION SHALL BE COMPACTED TO 95% OF STD. PROCTOR MAXIMUM DRY DENSITY.

5. * HIGH WATER ALARM TO HAVE AUDIBLE AND VISUAL ALARM AT CONTROL PANEL. CONTROL PANEL ALSO TO HAVE AUTO-DIALER.

6. HDPE FORCE MAIN TO BE SDR 11.

7. WET WELL AND VALVE VAULT SHALL BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO ASTM C-478. CONCRETE SHALL BE 3000 PSI (MIN.). JOINTS SHALL BE MADE TO RECEIVE RUBBER GASKET, BUTYL MASTIC ROPE SEALER, OR A NON-SHRINK TYPE GROUT ESPECIALLY MADE FOR THIS PURPOSE. WETWELL BOTTOM SHALL BE INTEGRALLY CAST WITH EXTENDED BASE AND WALLS SHALL CONFORM TO C-478 OR TO MINIMUM DIMENSIONS SHOWN ON THE DRAWINGS.

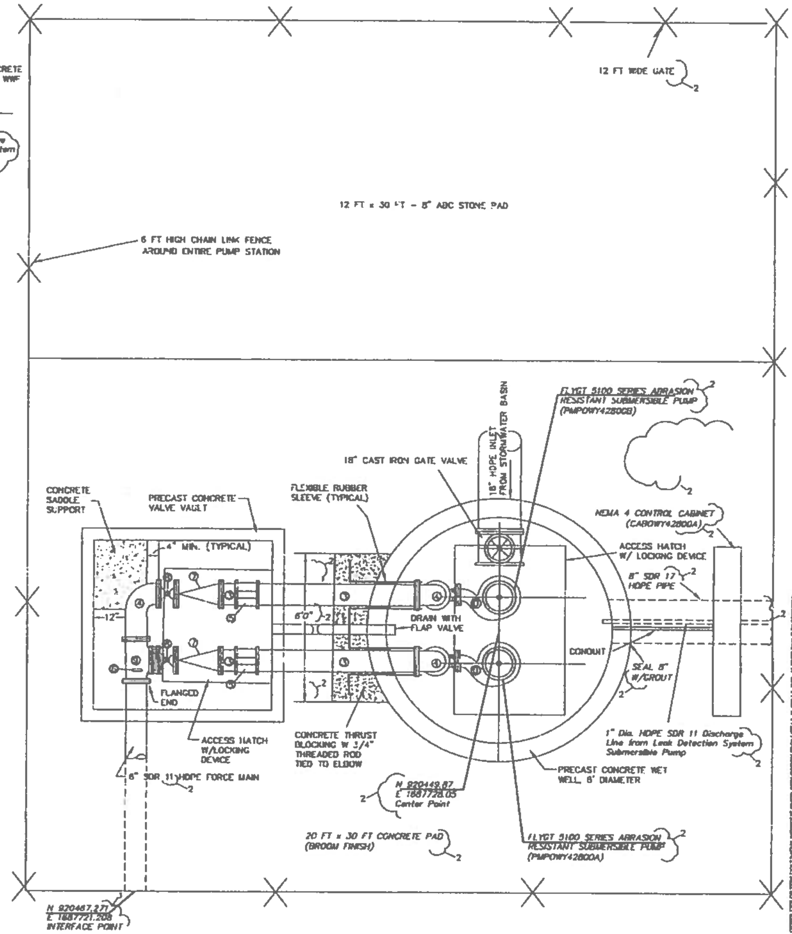
8. ELECTRICAL POWER FOR PUMPS BY OTHERS.

9. REFER TO CONSTRUCTION PLAN APPLICATION, TECHNICAL SPECIFICATIONS (BCM6451.00-0000.001) FOR MATERIALS, CONSTRUCTION, AND TESTING REQUIREMENTS NOT ADDRESSED ON THIS SHEET.

10. BOTTOM ELEVATION OF PUMP STATION IN EXCESS OF 4' ABOVE ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION.

ERN: FHS009AH

PUMP STATION SECTION
NTS



PUMP STATION PLAN VIEW
NTS

CHAS. H. SELLS, INC.
128 Overhill Drive
Suite 105
Mooresville, NC 28117
Tel: 704-662-0100
Fax: 704-662-0101
www.chashsells.com

DAN E. BREWER
11/14/06

BELEWS CREEK STEAM STATION
FGD RESIDUE LANDFILL
STOKES COUNTY, NORTH CAROLINA

REVISIONS

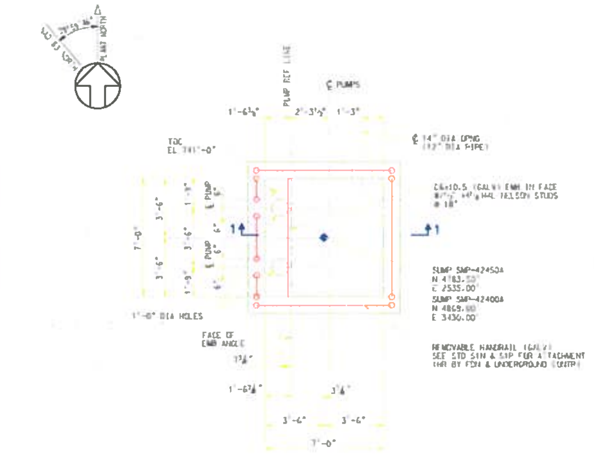
3	11/10/06	Revised Pipe Elev. to 750.33, Revised Pipe Interface Coordinates
2	7/10/06	Issued For Construction, Added Coordinates, Revised Notes
1	4/18/06	Issued for Revised CPA
0	9/30/05	Issued for CPA

PROJECT #: 046119 DATE: 9/30/05
DRAWN BY: DB CHECKED BY: DB

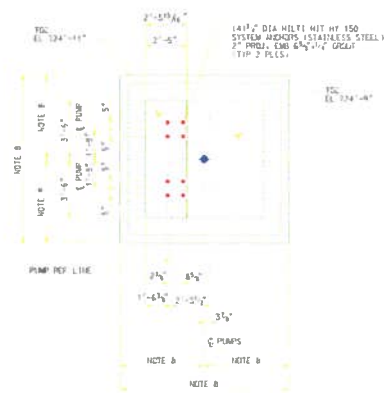
TITLE
PUMP STATION DETAILS

SHEET CP-7

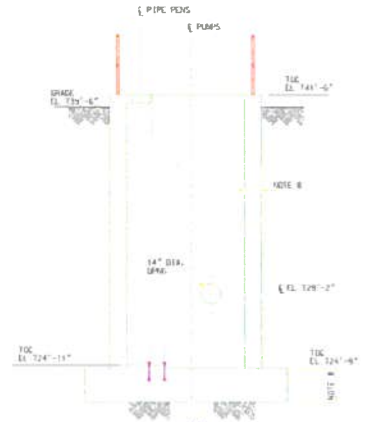
DOCUMENT NO.
BCM 6451.00-0013.001



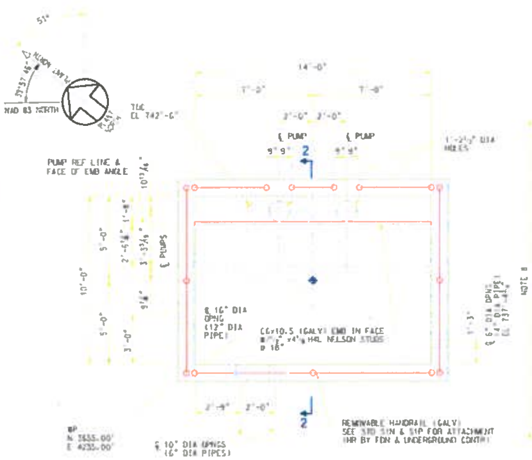
PLAN - WFGD PROCESS AREA RUNOFF SUMPS #1 & #2
SUMP #1 (SMP-42450A, AS SHOWN)
SUMP #2 (SMP-42400A, OPP HAND)
SCALE: ½" = 1'-0"



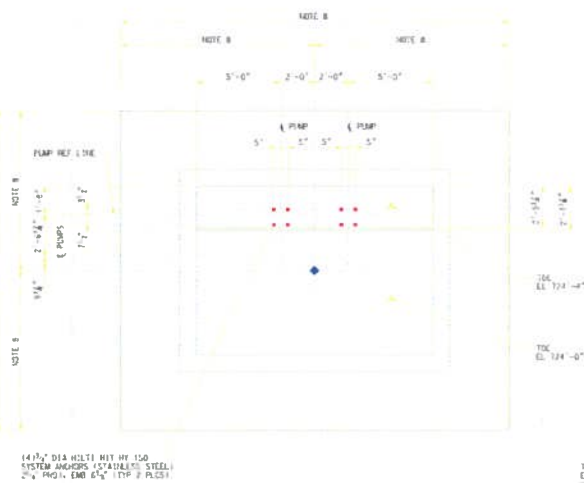
PLAN - SUMP BOTTOM
SCALE: ½" = 1'-0"



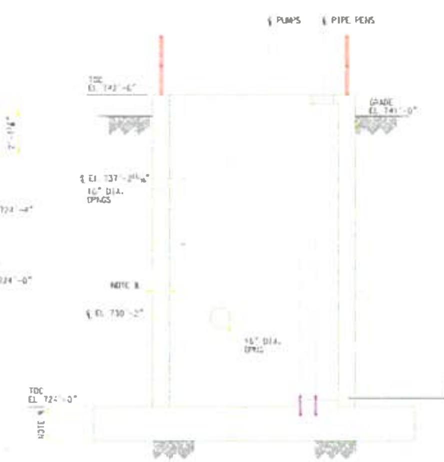
1-1
SCALE: ½" = 1'-0"



PLAN - SUMP TOP
LIMESTONE & GYPSUM STACKOUT PILE RUNOFF SUMP #3 (SMP-42500A)
SCALE: ½" = 1'-0"



PLAN - SUMP BOTTOM
SCALE: ½" = 1'-0"



2-2
SCALE: ½" = 1'-0"

NOTES:

1. SUMPS TO BE PRECAST IN ACCORDANCE WITH SPECIFICATION NO. BCS-6173.00-00-0001.
2. OUTSIDE SURFACES OF ABSORBER, REAGENT, AND DEWATERING SUMPS SHALL BE COATED WITH AN ELASTOMERIC WATERPROOF MEMBRANE.
3. ABSORBER, REAGENT, AND DEWATERING SUMPS SHALL BE DESIGNED FOR 2.5 KSF SURCHARGE LOADING.
4. SUMPS SHALL CONFORM TO THE REQUIREMENTS OF LOCAL, STATE, AND NATIONAL CODES, AS WELL AS ACI 318, BUILDING CODE FOR STRUCTURAL CONCRETE, AND ACI 350R, ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES.
5. SUMPS TO BE DESIGNED FOR ADJACENT AASHTO HS-25 LOADING.
6. SUMPS TO BE DESIGNED TO WITHSTAND BUOYANCY UPLIFT FORCES TO A FACTOR OF SAFETY OF 1.5.
7. FOUNDATION TO BE FOUNDED ON UNDISTURBED SOIL OR STRUCTURAL FILL MOISTURE CONDITIONED TO WITHIN 3% OF OPTIMUM AND COMPACTED TO 95% (ASTM D1557).
8. SUMP MANUFACTURER TO DETERMINE.
9. SUMP MANUFACTURER TO PURCHASE AND SHIP WITH SUMPS PIPE SEALS TO MATCH PIPES AND HOLES SHOWN ON DESIGN DRAWING. SEAL MANUFACTURER TO BE LINKSEAL OR APPROVED EQUAL. FINISH ON SUMP WALLS TO BE AS RECOMMENDED BY SEAL MANUFACTURER.
   16" DIA HOLE — 12" DIA PIPE — ITEM NO LS-400-C
   10" DIA HOLE — 6" DIA PIPE — ITEM NO LS-410-D
   6" DIA HOLE — 4" DIA PIPE — ITEM NO LS-300-D

MATERIALS:

104 LF HANDRAIL
30 LB EMBEDDED ITEMS

REFERENCE DRAWINGS:

BC-6102-00.01	OVERALL SITE FOUNDATION LOCATION PLAN
BC-6128-07.02	SUMPS 4 & 5 PLANS & SECTIONS
BC-6128-07.03	SUMPS 6 & 7 PLANS & SECTIONS
BC-6129-01.02	RELOCATED FUEL OIL TANK SECTIONS & DETAILS - SHT 2
BC-6408-01.33	MISC. YARD STRUCTURES COMPOSITE PLAN YARD AREA 33
BC-6408-01.43	MISC. YARD STRUCTURES COMPOSITE PLAN YARD AREA 43
BC-6408-01.59	MISC. YARD STRUCTURES COMPOSITE PLAN YARD AREA 59
BCSA-6737-01.59	UNDERGROUND ELECTRICAL LIMESTONE & GYPSUM STACKOUT PILE RUNOFF

PUMP DRAWINGS
CP/3201 FLYGT
CP/3300 FLYGT

NO.	REVISIONS	DRN	CHKD	APPR	DATE
3	ISSUED AS FINAL - INCORPORATED AS-BUILT REVISIONS	SWF	DWG		[illegible]
2	REVISED ELEVATIONS AND CALLOUTS	SWF	DWS		[illegible]
1	REVISED AS NOTED	SPT	SGR		[illegible]
0	ISSUED FOR CONSTRUCTION	SPT	SSR		[illegible]

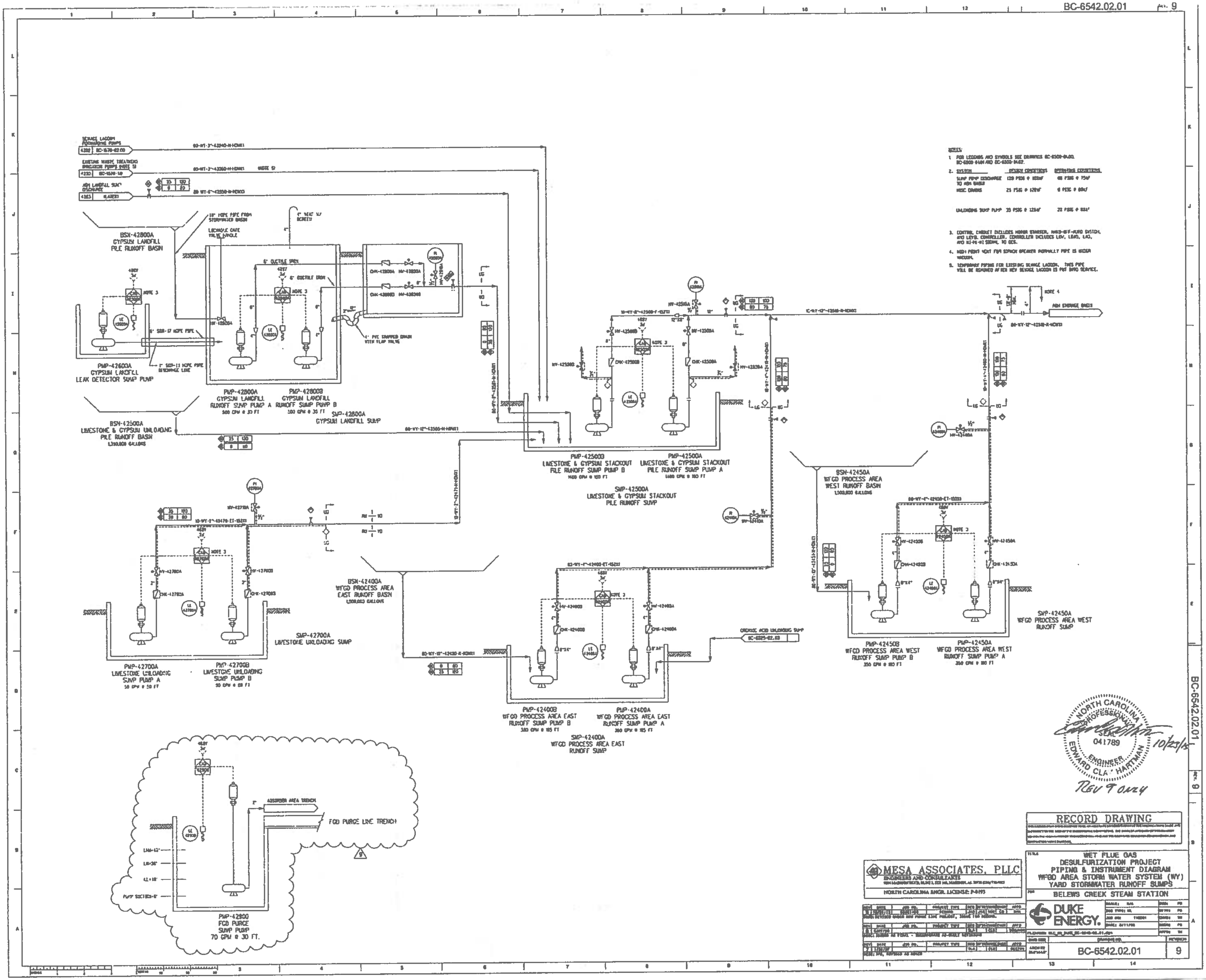
ALSTOM
Shaw Stone & Webster, Inc.

DUKE ENERGY
CHARLOTTE, N.C.

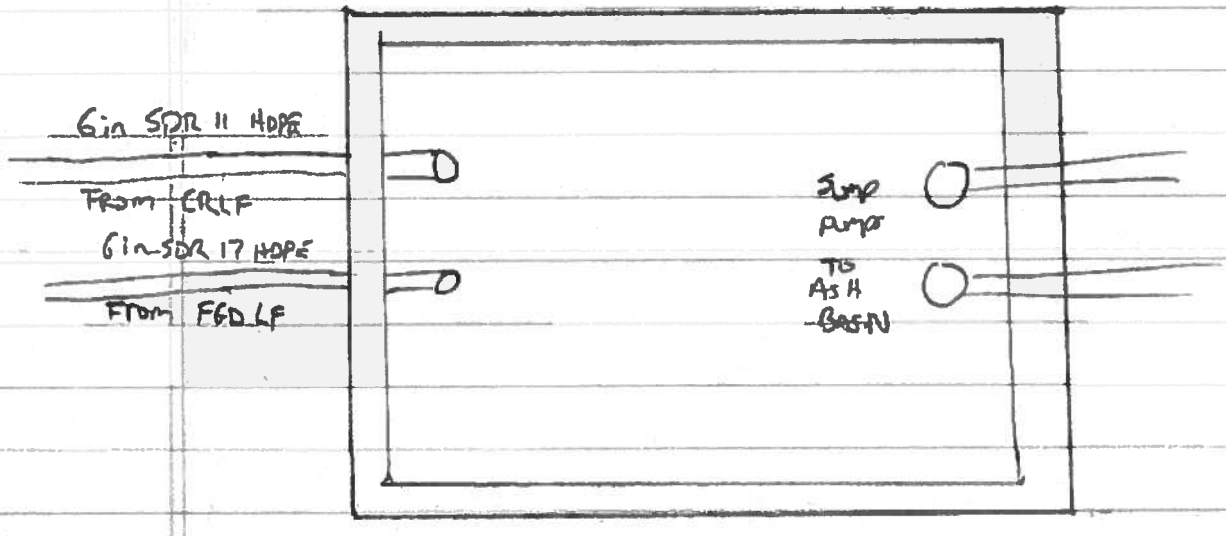
WET FLUE GAS DESULFURIZATION PROJECT
SUMPS #1, #2 AND #3
PLANS AND SECTIONS

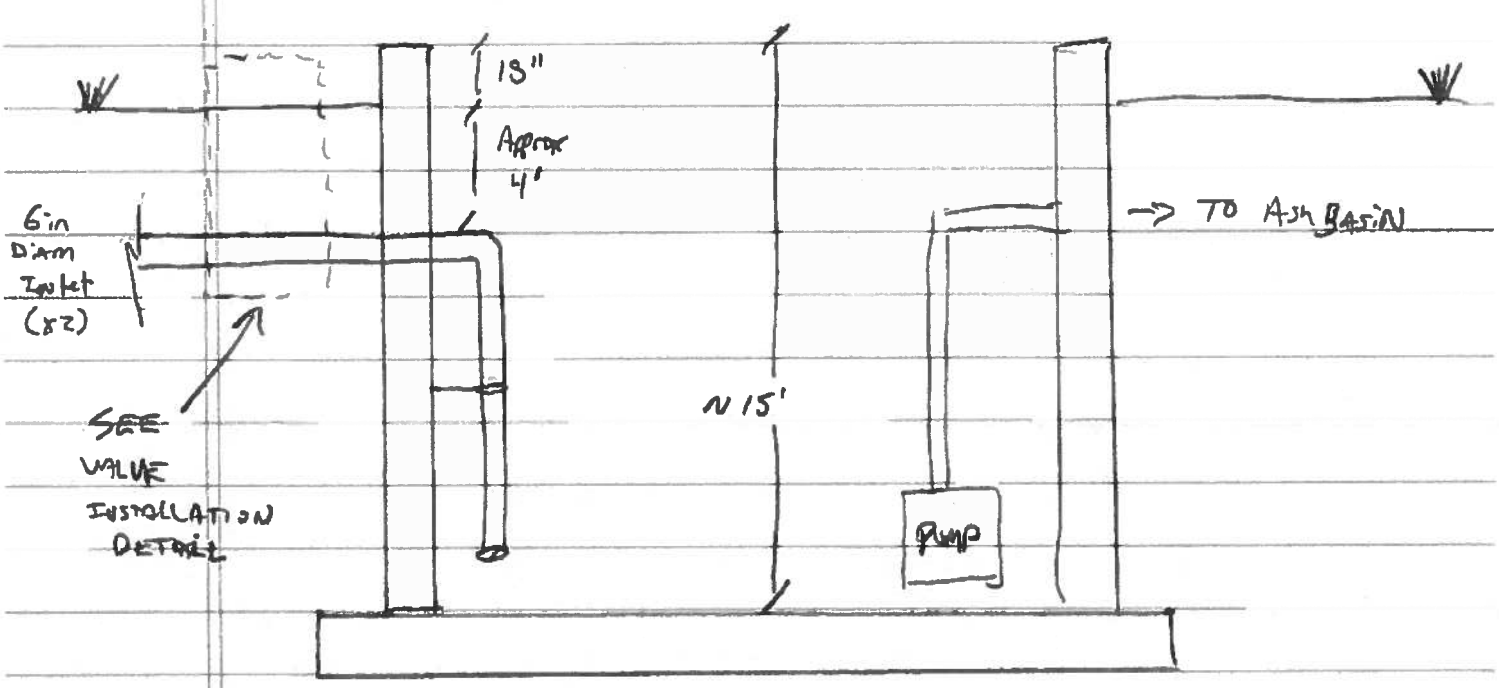
STATION
BELEWS CREEK

DWG. NO. BC-6128-07.01 REV 3


BC-6542.02.01
REV. 9
BSN-42800A
GYPSUM LANDFILL
PILE RUNOFF BASIN
PMP-42600A
GYPSUM LANDFILL
LEAK DETECTOR SUMP PUMP
PMP-42800A
GYPSUM LANDFILL
RUNOFF SUMP PUMP A
PMP-42800B
GYPSUM LANDFILL
RUNOFF SUMP PUMP B
SMP-42800A
GYPSUM LANDFILL SUMP
BSN-42500A
LIMESTONE & GYPSUM UNLOADING
PILE RUNOFF BASIN
PMP-42500B
LIMESTONE & GYPSUM STACKOUT
PILE RUNOFF SUMP PUMP B
PMP-42500A
LIMESTONE & GYPSUM STACKOUT
PILE RUNOFF SUMP PUMP A
SMP-42500A
LIMESTONE & GYPSUM STACKOUT
PILE RUNOFF SUMP
ASH STORAGE BASIN
NOTE 4
BSN-42450A
WFGD PROCESS AREA
WEST RUNOFF BASIN
PMP-42450B
WFGD PROCESS AREA WEST
RUNOFF SUMP PUMP B
PMP-42450A
WFGD PROCESS AREA WEST
RUNOFF SUMP PUMP A
SMP-42450A
WFGD PROCESS AREA WEST
RUNOFF SUMP
BSN-42400A
WFGD PROCESS AREA
EAST RUNOFF BASIN
PMP-42400B
WFGD PROCESS AREA EAST
RUNOFF SUMP PUMP B
PMP-42400A
WFGD PROCESS AREA EAST
RUNOFF SUMP PUMP A
SMP-42400A
WFGD PROCESS AREA EAST
RUNOFF SUMP
SMP-42700A
LIMESTONE UNLOADING SUMP
PMP-42700A
LIMESTONE UNLOADING
SUMP PUMP A
PMP-42700B
LIMESTONE UNLOADING
SUMP PUMP B
PMP-42900
FGD PURGE
SUMP PUMP
70 GPM @ 30 FT.
FGD PURGE LINE TRENCH
NOTES:
RECORD DRAWING
MESA ASSOCIATES, PLLC
NORTH CAROLINA ENGR. LICENSE: P-0193
WET FLUE GAS
DESULFURIZATION PROJECT
PIPING & INSTRUMENT DIAGRAM
WFGD AREA STORM WATER SYSTEM (WY)
YARD STORMWATER RUNOFF SUMPS
BELEWS CREEK STEAM STATION
DUKE ENERGY.
BC-6542.02.01
9
NORTH CAROLINA
PROFESSIONAL
ENGINEER
041789
EDWARD CLA HARTMAN
10/23/15
REV 9 ONLY

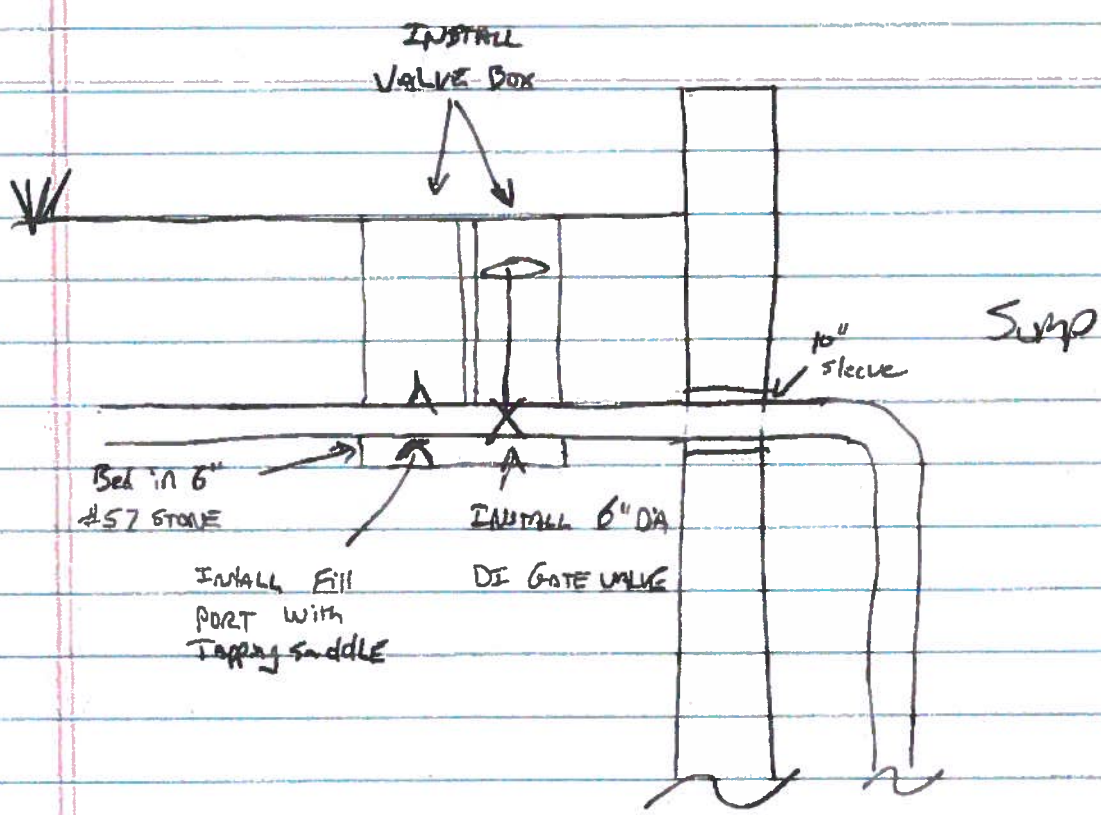
BCSS Consolidated Sump
SMP-42500A
(NTS)





SITE SKETCH
(1/2)

EA
2/16/16



VALVE INSTALLATION DETAIL

SITE SKETCH
(2/2)

EA
2/16/16