

**ANNE ARUNDEL COUNTY  
MARYLAND**

**DEPARTMENT OF PUBLIC WORKS**

**CHAPTER II**

**REFERENCE DRAWINGS**

**for**

**WET WELL/DRY WELL  
PUMPING STATIONS**

**January 2011**

**REFERENCE DRAWINGS FOR  
WET/DRY WELL AND SUBMERSIBLE  
PUMPING STATIONS**

**INDEX OF DRAWINGS**

<b><u>DESCRIPTION</u></b>	<b><u>DRAWING NO.</u></b>
1. Civil – Plan and Details .....	PS-C-1
2. Site Paving Detail .....	PS-C1-1
3. Typical Cantilever Gate and Roller Assembly .....	PS-C1-2
4. Pump Station Access Road Detail .....	PS-C1-3
5. Pipe Bedding Detail .....	PS-C1-4
6. HDPE Pipe Bedding Detail .....	PS-C1-4A
7. Mowing Strip Detail .....	PS-C1-5
8. MJ Adapter Detail DIP to HDPE .....	PS-C1-6
9. Pipe Bollard Detail .....	PS-C1-7
10. Civil – Sediment and Erosion.....	PS-C-2
11. Architectural – Plans and Details .....	PS-A-1
12. Plan – Pump Station Building .....	PS-A1-1
13. Building Elevation 1 .....	PS-A1-2
14. Building Elevation 2 .....	PS-A1-3
15. Building Elevation 3 .....	PS-A1-4
16. Building Elevation 4 .....	PS-A1-5
17. Section 5 .....	PS-A1-6
18. Section 6 .....	PS-A1-7
19. Eave Detail.....	PS-A1-8
20. Rake Detail .....	PS-A1-9
21. Detail – Generator Exhaust Pipe Penetration.....	PS-A1-10
22. Removable Louver Detail.....	PS-A1-11
23. Structural – Plans and Details.....	PS-S-1
24. Exterior Wall Footing Section.....	PS-S1-1
25. Thickened Slab Detail .....	PS-S1-2
26. Typical Section Wet/Dry Well .....	PS-S1-3
27. Anchor Clip Angle Detail.....	PS-S1-3A
28. Typical Section Wet Well .....	PS-S1-4
29. Wet Well Base (less than 10’ dia.) .....	PS-S1-5
30. Wet Well Base (10’ or greater dia.) .....	PS-S1-6
31. Structural Notes .....	PS-S1-7
32. Structural Sections and Details.....	PS-S-2
33. Grating Detail .....	PS-S2-1
34. Ladder and Safety Extension Pole Detail.....	PS-S2-2
35. Removable Bar Screen – Plan View .....	PS-S2-3A
36. Removable Bar Screen – Section .....	PS-S2-3B
37. Bar Screen – Section.....	PS-S2-3C
38. Pipe Penetration Support Detail .....	PS-S2-4
39. Fuel Oil Trench Detail.....	PS-S2-5
40. Equipment Support Pad Detail .....	PS-S2-6
41. Structural – Odor Control Plan and Section.....	PS-S-3
42. Turnbuckle Support Assembly Plan and Section.....	PS-S3-1

43. Turnbuckle Support Assembly Side View and Notes.....	PS-S3-2
44. Soil Odor Filter Blower Pad Detail – Plan View .....	PS-S3-3
45. Soil Odor Filter Pad Detail – Section and Notes.....	PS-S3-4
46. Structural – Odor Control Plans, Sections and Notes .....	PS-S-4
47. Soil Odor Filter Plan View .....	PS-S4-1
48. Bypass Drain Valve and Box Details .....	PS-S4-2
49. Soil Odor Filter Structure Notes.....	PS-S4-3
50. Structural – Soil Odor Filter Sections and Details .....	PS-S5
51. Soil Odor Filter Below Grade Installation Sections.....	PS-S5-1A
52. Soil Odor Filter Above Grade Installation Sections .....	PS-S5-1B
53. Odor Filter Piping, Trench Detail.....	PS-S5-2
54. Mechanical – Wet Well/Dry Well Plan, Sections and Pump Curves .....	PS-M-1A
55. Mechanical – Submersible Plan, Sections and Pump Curves.....	PS-M-1B
56. Pump and System Curve .....	PS-M1-1
57. Pump Station (Top Slab) Plan View Wet/Dry Well .....	PS-M1-2A
58. Pump Station (Top Slab) Plan View Submersible .....	PS-M1-2B
59. Pump Station (Top Slab Removed) Plan View Wet/Dry Well.....	PS-M1-3A
60. Pump Station (Top Slab Removed) Plan View Submersible.....	PS-M1-3B
61. Pump Station (Below Grating) Plan View Submersible.....	PS-M1-3C
62. Service Area Design Flows Chart .....	PS-M1-4
63. Pump Station Section Wet/Dry Well with Valve Vault.....	PS-M1-5A
64. Valve Vault Section Submersible.....	PS-M1-5B
65. Pump Station Section Wet/Dry Well.....	PS-M1-6A
66. Pump Station Section Submersible with Valve Vault .....	PS-M1-6B
67. Bubbler Line Transition into Wet Well.....	PS-M1-7
68. Lifting Eye Detail .....	PS-M1-8
69. Lifting Plate Detail .....	PS-M1-9
70. Mechanical – Plan and Details Wet/Dry Well .....	PS-M-2A
71. Pump Station Building Mechanical Plan .....	PS-M2-1
72. Dry Well – Mechanical Plan Wet/Dry Well .....	PS-M2-2A
73. Wet Well – Mechanical Plan Submersible.....	PS-M2-2B
74. Tie Rod Detail.....	PS-M2-3
75. Horizontal Pipe Pressure Guage Detail.....	PS-M2-4
76. Bubbler System Pneumatic Diagram .....	PS-M2-5
77. Air Compressor Diagram .....	PS-M2-6
78. Pipe Support Details .....	PS-M2-7
79. Mechanical – Plan and Details Submersible .....	PS-M-2B
80. Mechanical – Ferrous Sulfate System.....	PS-M-3
81. Ferrous Sulfate Storage and Feed System – Plan View.....	PS-M3-1
82. Ferrous Sulfate System Section.....	PS-M3-2
83. Ferrous Sulfate System Section.....	PS-M3-3
84. Ferrous Sulfate System Nomenclature.....	PS-M3-4
85. Mechanical – Odor Control Plans and Sections.....	PS-M-4
86. Soil Odor Filter Blower Assembly – Plan View .....	PS-M4-1
87. Soil Odor Filter Blower Assembly – Section B .....	PS-M4-2
88. Irrigation Water Control Schematic .....	PS-M4-3
89. Soil Odor Filter Blower Assembly – Section A.....	PS-M4-4
90. Blower Enclosure Anchor Bolt Detail – Plan View.....	PS-M4-5
91. Irrigation Control Box – Plan View .....	PS-M4-6
92. Heating/Ventilation Schedules .....	PS-M-5
93. Electrical – Plans, Details and Schedules.....	PS-E-1A

94. Electrical Plans, Details and Schedules.....	PS-E-1B
95. Pump Station Building Electrical Plan.....	PS-E1-1
96. Wet Well – Electrical Plan Wet/Dry Well .....	PS-E1-2A
97. Dry Well – Electrical Plan Wet/Dry Well.....	PS-E1-2B
98. Wet Well Electrical Plan Submersible .....	PS-E1-2C
99. Float Mast Assembly Detail .....	PS-E1-3
100. Electrical Legend.....	PS-E1-4
101. Explosion Proof Junction Box Detail.....	PS-E1-5
102. Lighting Schedule .....	PS-E1-6
103. Typical Wet Well Electrical Conduit Entry Detail .....	PS-E1-7
104. Electrical – Control Diagrams .....	PS-E-2A
105. Electrical – Control Diagrams .....	PS-E-2B
106. Bubbler System Control Diagram (Pneumatic Pressure Switches) .....	PS-E2-1A
107. Bubbler System Control Diagram (Elec.Pressure Switches) Wet/Dry Well .	PS-E2-1B
108. Float System Control Diagram, Wet/Dry Well .....	PS-E2-2
109. Pump One Control Diagram, Wet/Dry Well.....	PS-E2-3A
110. Pump Two Control Diagram, Wet/Dry Well .....	PS-E2-3B
111. Electrical – Control Diagrams .....	PS-E-3A
112. Remote Monitor Connections.....	PS-E3-1A
113. Remote Monitor Connections.....	PS-E3-1B
114. Wet Well Supply Fan Control Diagram .....	PS-E3-2
115. Dry Well Ventilation Fans Control Diagram .....	PS-E3-3
116. Control Room Exhaust fan Control Diagram.....	PS-E3-4
117. Electrical – Control Diagrams .....	PS-E-3B
118. Electrical – Diagrams and Schedules .....	PS-E-4A
119. Electrical – Diagrams and Schedules – Submersible .....	PS-E-4B
120. Load Bank Connection One-Line Diagram.....	PS-E4-1
121. Motor Control Center One-Line Diagram.....	PS-E4-1A
122. Motor Control Center Schedule.....	PS-E4-2
123. Schedule of Panel “LP” .....	PS-E4-3A
124. Schedule of Panel “LP” Submersible .....	PS-E4-3B
125. MCC Elevation (sheet 1 of 2).....	PS-E4-4
126. MCC Elevation (sheet 2 of 2).....	PS-E4-4A
127. Electrical P&ID, Details and Specifications .....	PS-E-5
128. Process and Instrumentation Diagram.....	PS-E5-1A
129. P&ID Legend.....	PS-E5-1B
130. Filter Control Diagram and Legend .....	PS-E5-2
131. Electrical Notes for Odor Blower Manual Starter and Filter Controller .....	PS-E5-3
132. Blower Manual Starter.....	PS-E5-4
133. Typical Filter Controller .....	PS-E5-5
134. Pump Motor Power Connection Wet/Dry Well .....	PS-E-100-1
135. Generator .....	PS-E100-2
136. Generator Load Test Connection Box.....	PS-E100-3
137. Supply Fan Wet/Dry Well .....	PS-E100-4
138. Exhaust Fan Drywell .....	PS-E100-5
139. Drywell Air Flow Switch .....	PS-E100-6
140. Gas Detection Monitor Alarm Panel Wet Well.....	PS-E100-7
141. Air Flow Alarm Panel Dry Well .....	PS-E100-8
142. DELETED – Network Diagram .....	PS-E100-9
143. Radio Antenna Installation Detail .....	PS-E100-10
144. Pump Control Panel.....	PS-E100-11

145. Bubbler Control Panel .....	PS-E100-11A
146. Pump Control Panel Primary/Secondary PLC, Analog Input Module .....	PS-E100-12
147. Pump Control Panel Primary PLC Digital Input Module .....	PS-E100-13
148. Pump Control Panel Primary PLC Digital Output Module .....	PS-E100-14
149. Pump Control Panel Secondary PLC Digital Input Module .....	PS-E100-15
150. Pump Control Panel Secondary PLC Digital Output Module .....	PS-E100-16
151. Pump Control Panel Redundant Power .....	PS-E100-17
152. Pump Control Panel 24 VDC Redundant Power .....	PS-E100-18
153. Pump Control Panel Interior Power .....	PS-E100-19
154. VFD Pump Control (Soft Start Only).....	PS-E100-20
155. VFD Pump Control (Flow Matching) .....	PS-E100-21

DESIGN

DRAWINGS

WET/DRY WELL

AND

SUBMERSIBLE

PUMPING STATIONS

TYPICAL  
SITE PLAN  
  
PROJECT SPECIFIC

SITE PAVING  
DETAIL  
  
DWG. C1-1

TYPICAL CANTILEVER GATE  
AND ROLLER ASSEMBLY  
  
DWG. C1-2

ACCESS  
ROAD  
DETAIL  
  
DWG. C1-3

PIPE BEDDING  
DETAIL  
  
DWG. C1-4

MOWING STRIP  
PLAN  
  
DWG. C1-5

WET/DRY WELL

SUBMERSIBLE

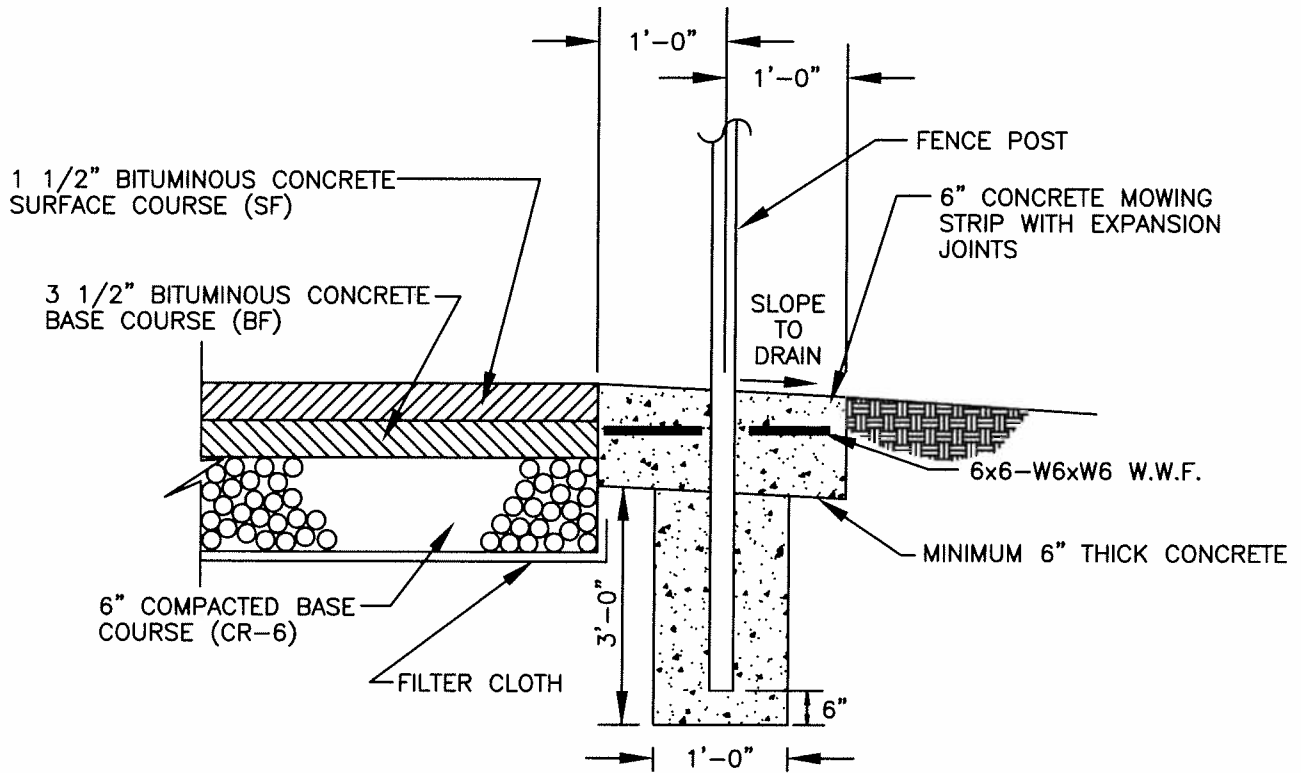
ANNE ARUNDEL  
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DATE: MAY 2011

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*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

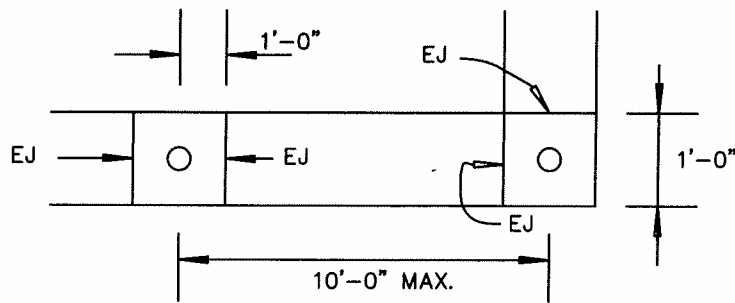
REFERENCE SEWAGE PUMPING STATION DESIGN  
CIVIL  
PLAN AND DETAILS

REVISED

PS  
C-1



PLAN VIEW



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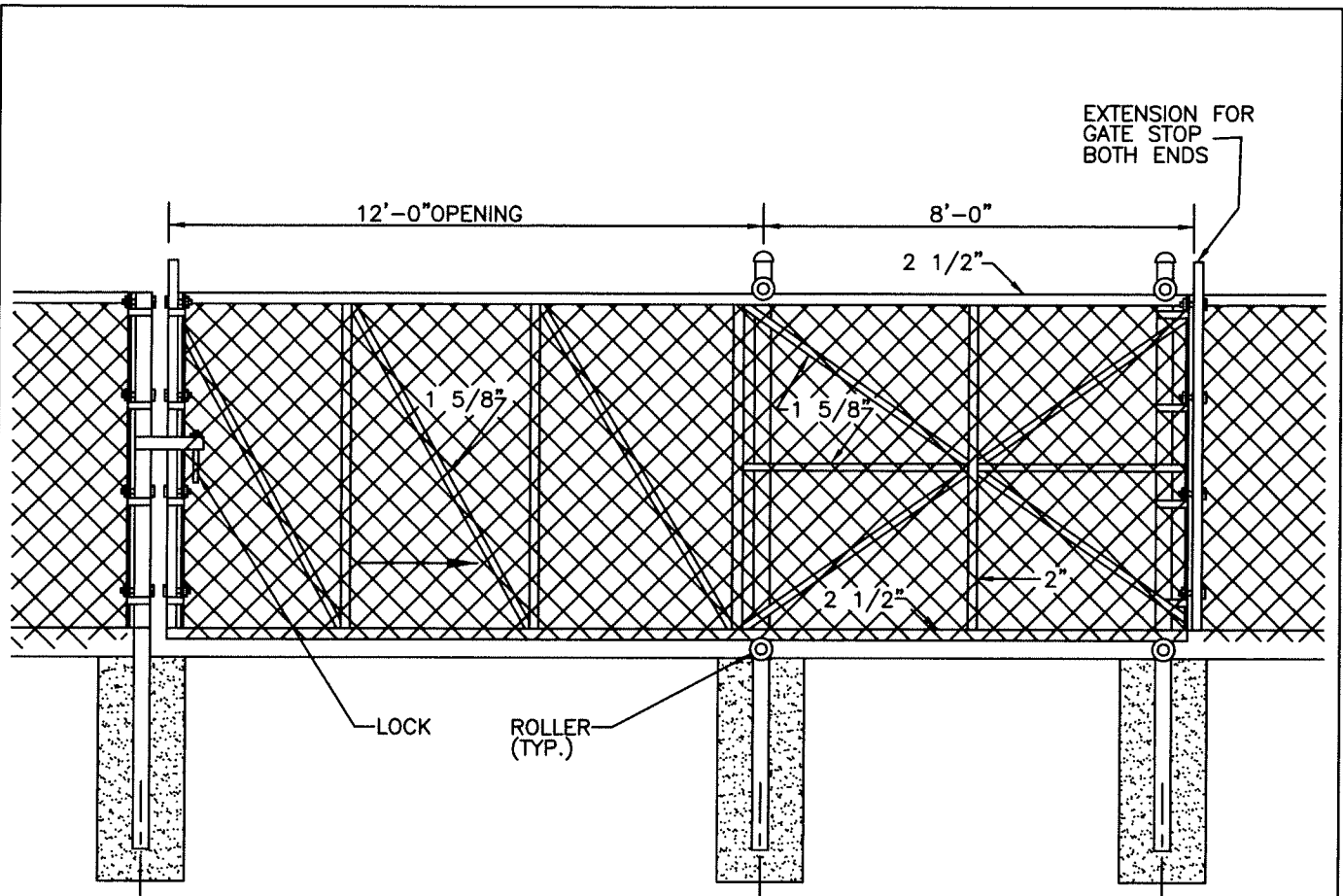
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 DESIGN ENGINEER

REFERENCE SEWAGE  
 PUMPING STATION DESIGN  
 SITE PAVING DETAIL

REVISED

PS  
 C1-1

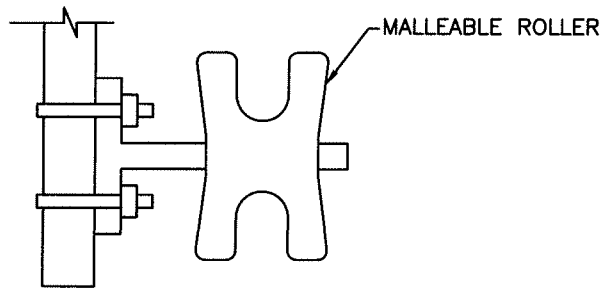




NOTE: MOVABLE GATE FRAMING TO BE ALUMINUM

TYPICAL CANTILEVER SLIDING GATE

NOT TO SCALE



TYPICAL ROLLER ASSEMBLY

NOT TO SCALE

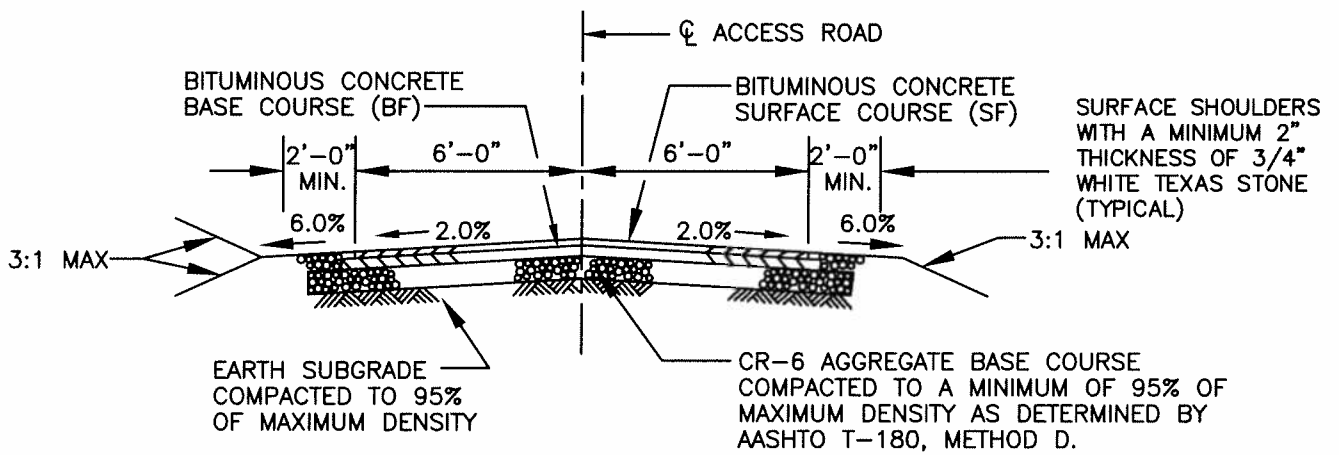
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REFERENCE SEWAGE  
PUMPING STATION DETAIL  
TYPICAL CANTILEVER GATE  
AND ROLLER ASSEMBLY

REVISED

PS  
C1-2



NOTE: ACCESS ROAD SHOULDERS SHALL BE 2' WIDE ON BOTH SIDES AND CONSIST OF 7" MINIMUM DEPTH COMPACTED CR-6 WITH MINIMUM 2" WHITE TEXAS STONE ON TOP.

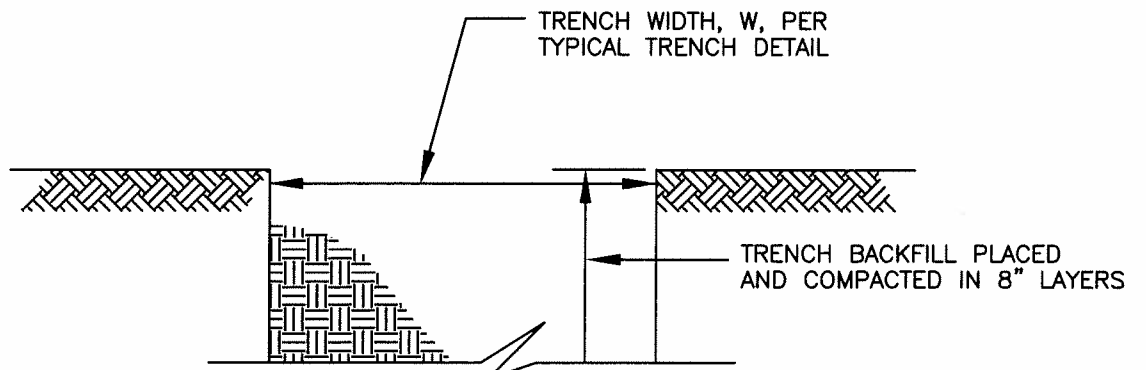
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REFERENCE SEWAGE PUMPING STATION DETAIL  
 PUMP STATION ACCESS ROAD DETAIL

REVISED

PS  
 C1-3



SHAPE COMPACTED PIPE BEDDING TO CONFORM TO PIPE, MINIMUM WIDTH 6/10 PIPE O.D.

2'-0" MIN.

GRAVITY SEWER OR D.I.P. FORCE MAIN

CAREFULLY COMPACTED TRENCH BACKFILL PLACED IN 6" LAYERS. MIN. 2'-0" OVER PIPE.

COMPACTED STONE BEDDING WHERE ORDERED BY THE ENGINEER

WHERE STONE BEDDING IS USED, MINIMUM OF 6" BELOW BARREL AND 4" BELOW BELL

EXCAVATION AND COMPACTED STONE REFILL FOR TRENCH SUBGRADE STABILIZATION, WHERE DEEMED NECESSARY BY THE ENGINEER. 18 INCHES DEPTH TYPICAL, OR AS ORDERED BY THE ENGINEER.

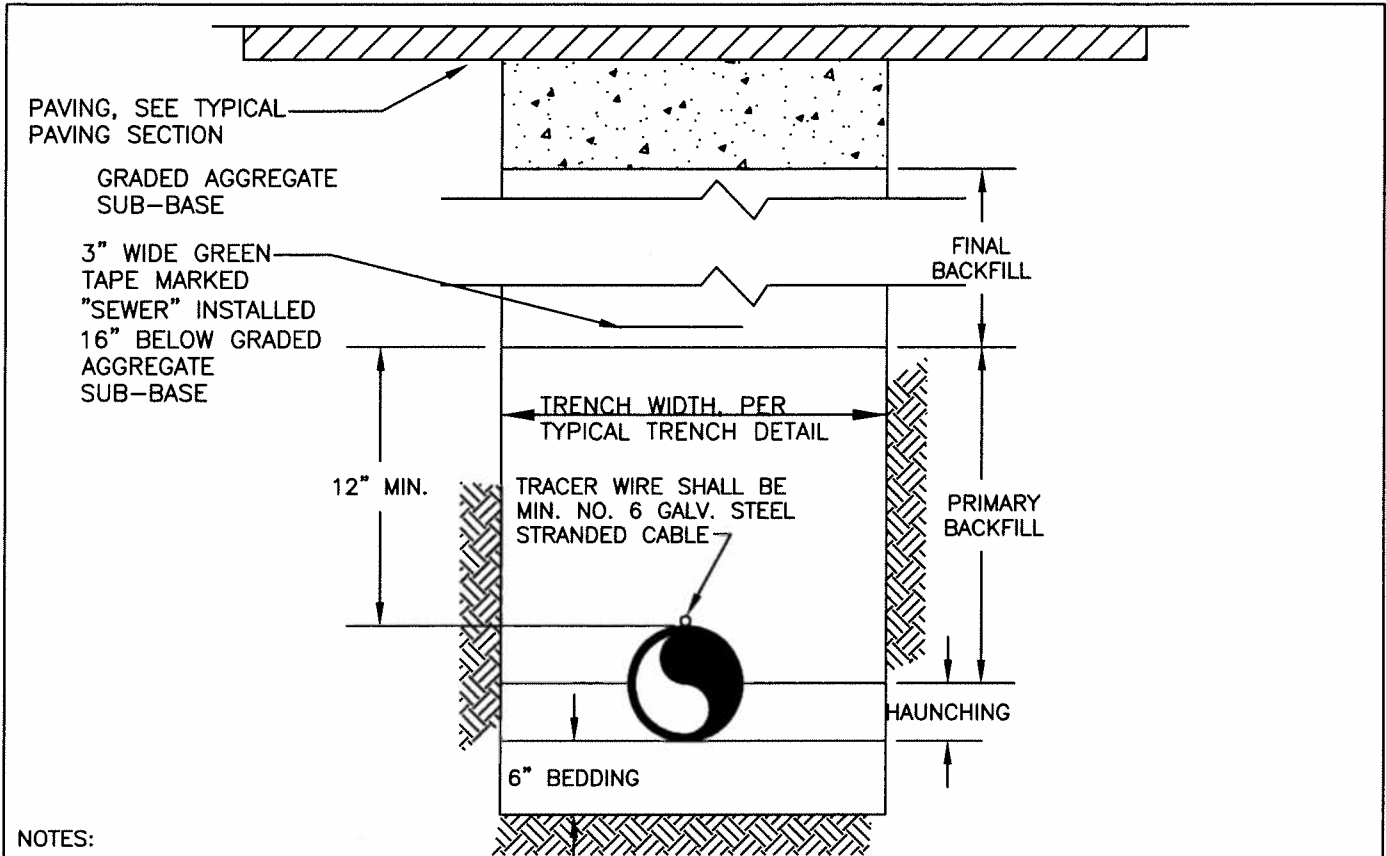
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 CHIEF ENGINEER  
*[Signature]* 5/10/11  
 DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DETAIL PIPE BEDDING DETAIL



REVISED

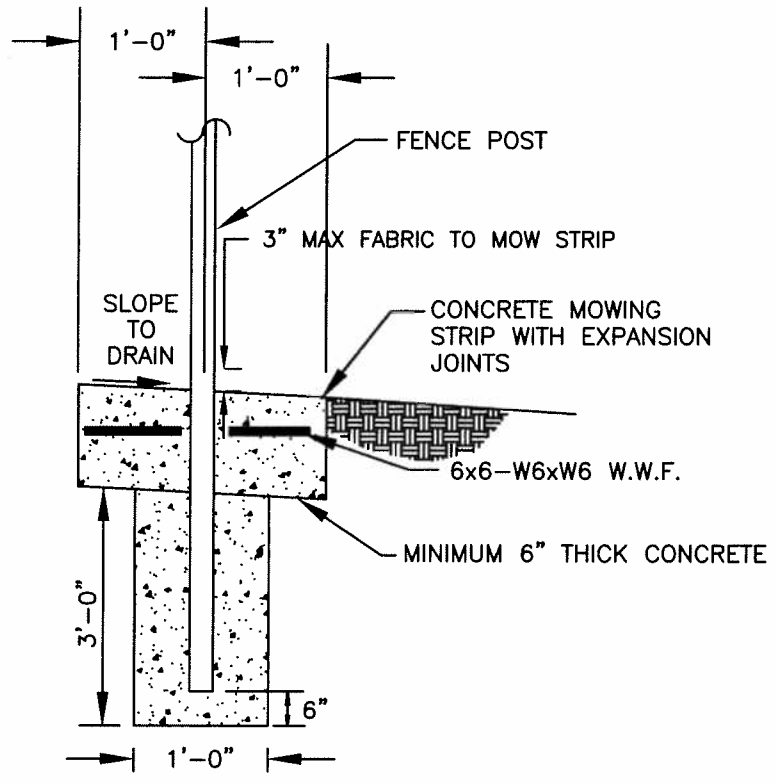
PS  
 C1-4



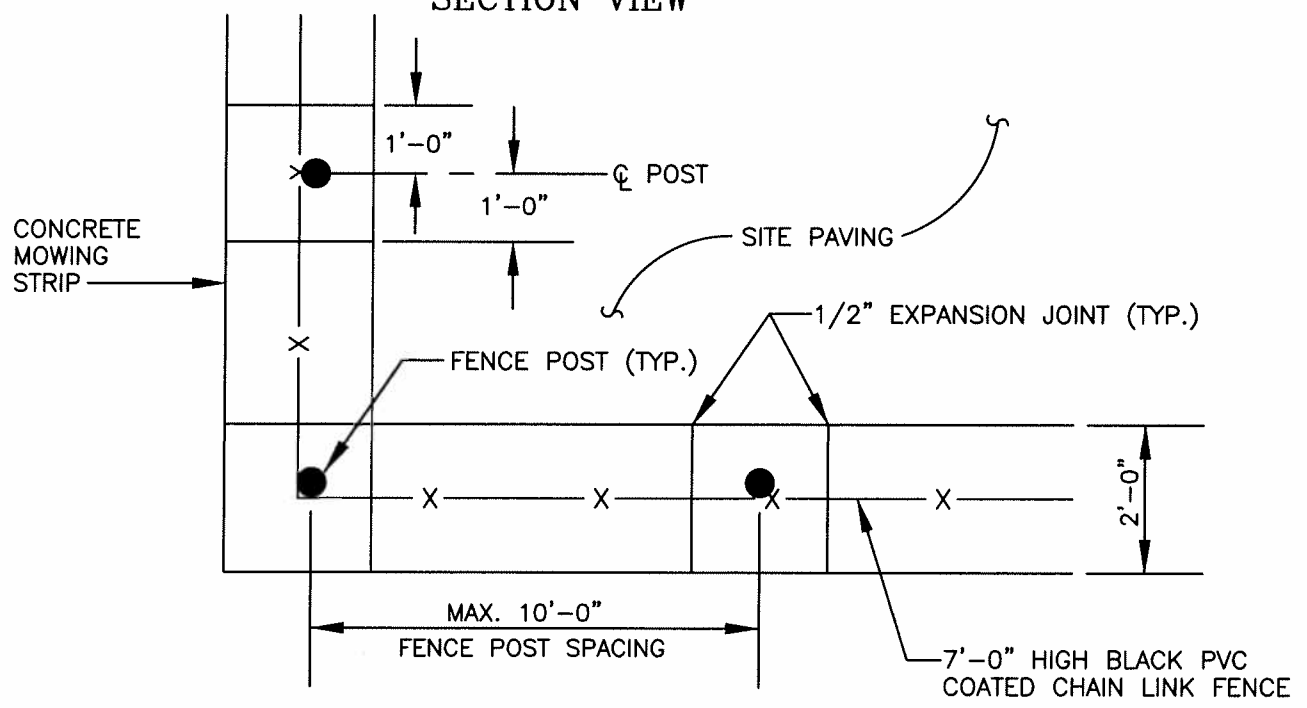
NOTES:

1. SHORE OR BRACE TRENCH WALLS AS REQUIRED BY LAW AND WHERE SAFE SLOPES WOULD INTERFERE WITH EXISTING UTILITIES, STRUCTURES AND IMPROVEMENTS, OR EXTEND BEYOND THE EASEMENT OR R-O-W LIMITS PER SPEC. SECTION 02400.
2. TRENCH SUPPORT MATERIAL TO BE REMOVED IN SUCH A MANNER THAT THE BACKFILL MATERIAL FROM THE TRENCH SUBGRADE TO TWO FEET ABOVE PIPE WILL BE COMPACTED AGAINST UNDISTURBED EARTH.
3. THE TRENCH BOTTOM SHOULD BE SMOOTH, DRY, AND STABILIZED AS NECESSARY.
4. BEDDING AND PRIMARY BACKFILL SHALL MEET THE REQUIREMENTS OF MARYLAND DESIGNATION BRG BASE OR BRG S/B, ASTM 2940 DESIGNATION GA BASE OR GA/SB OR AASHTO M43, SIZE NO.57. THE MATERIAL SHOULD BE LEVELED AND COMPACTED TO A MINIMUM OF 92% STANDARD PROCTOR DENSITY.
5. PLACE BACKFILL MATERIAL UNDER THE PIPE HAUNCHES.
6. TAMPING IS REQUIRED AROUND THE HAUNCHES USING SUITABLE TOOLS.
7. PRIMARY BACKFILL SHOULD BE PLACED EVENLY IN LAYERS NOT EXCEEDING 12 INCHES, AND EACH LAYER SHOULD BE COMPACTED TO A MINIMUM OF 92% STANDARD PROCTOR DENSITY.
8. THE PRIMARY BACKFILL SHALL BE 12 INCHES ABOVE THE CROWN OF THE PIPE.
9. THE FINAL BACKFILL SHALL BE FREE OF LARGE STONES OR OTHER FOREIGN MATTER.
10. FINAL BACKFILL SHALL CONSIST OF SUITABLE NATIVE MATERIAL, INSTALLED PER A.A. COUNTY STANDARD SPECIFICATIONS. SURFACE RESTORATION TO BE "AS IS OR BETTER CONDITION". BEDDING AND PRIMARY BACKFILL FOR ALL OPEN CUT PIPE INSTALLATION SHALL BE PER THE DETAIL, AND SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR THE PIPE. CONTINGENT BORROW BACKFILL WITHIN THE "FINAL BACKFILL" ZONE WILL ONLY BE USED AND PAID FOR "AS DIRECTED BY THE ENGINEER".
11. ADEQUATE COMPACTION SHALL BE OBTAINED BEFORE ANY EQUIPMENT IS DRIVEN OVER THE PIPE.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL H.D.P.E. PIPE BEDDING N.T.S.	REVISED	PS C1-4A
	 DESIGN ENGINEER			



SECTION VIEW



PLAN VIEW

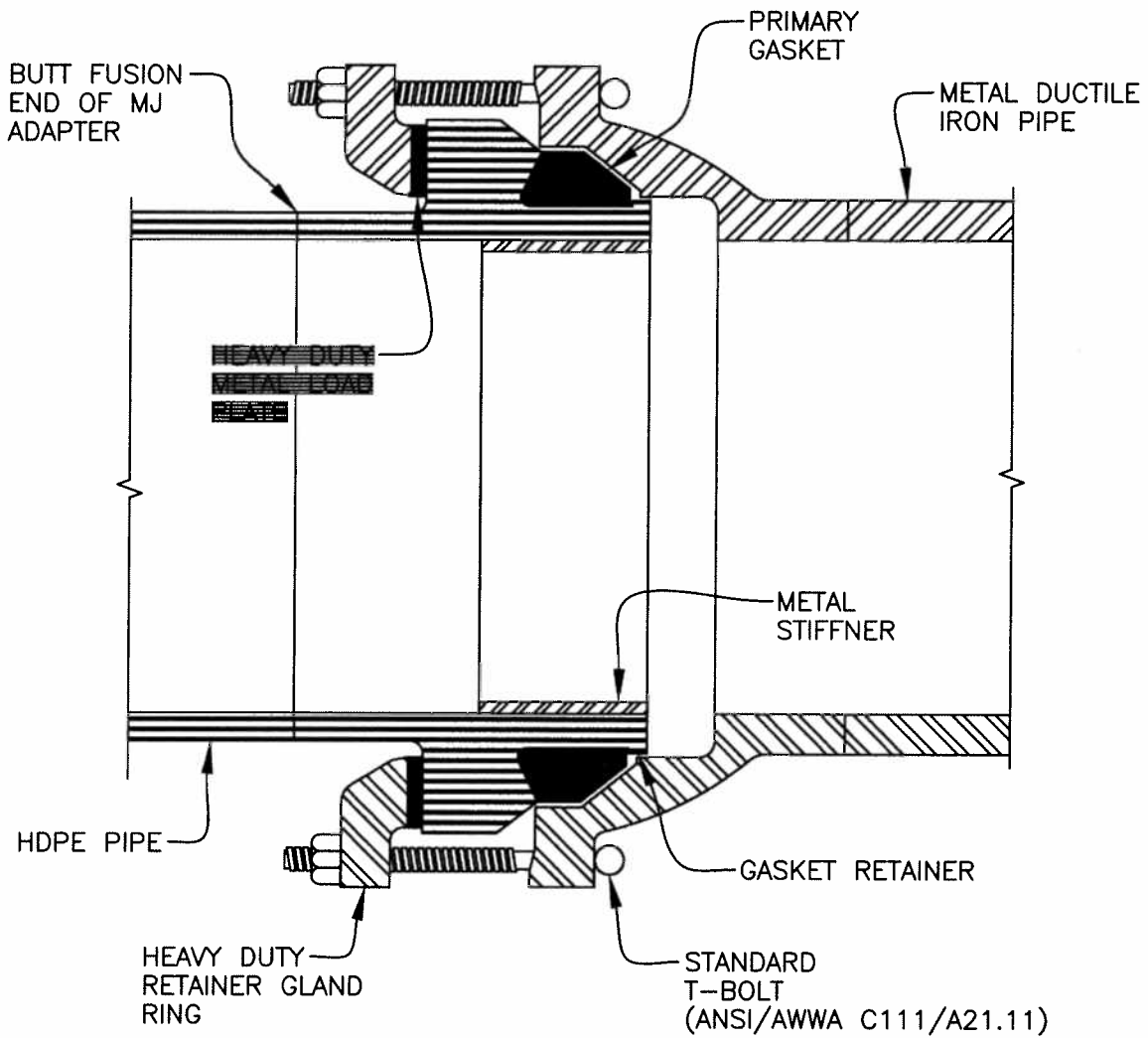
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 CHIEF ENGINEER  
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 DESIGN ENGINEER

REFERENCE SEWAGE  
 PUMPING STATION DESIGN  
 MOWING STRIP DETAIL

REVISED

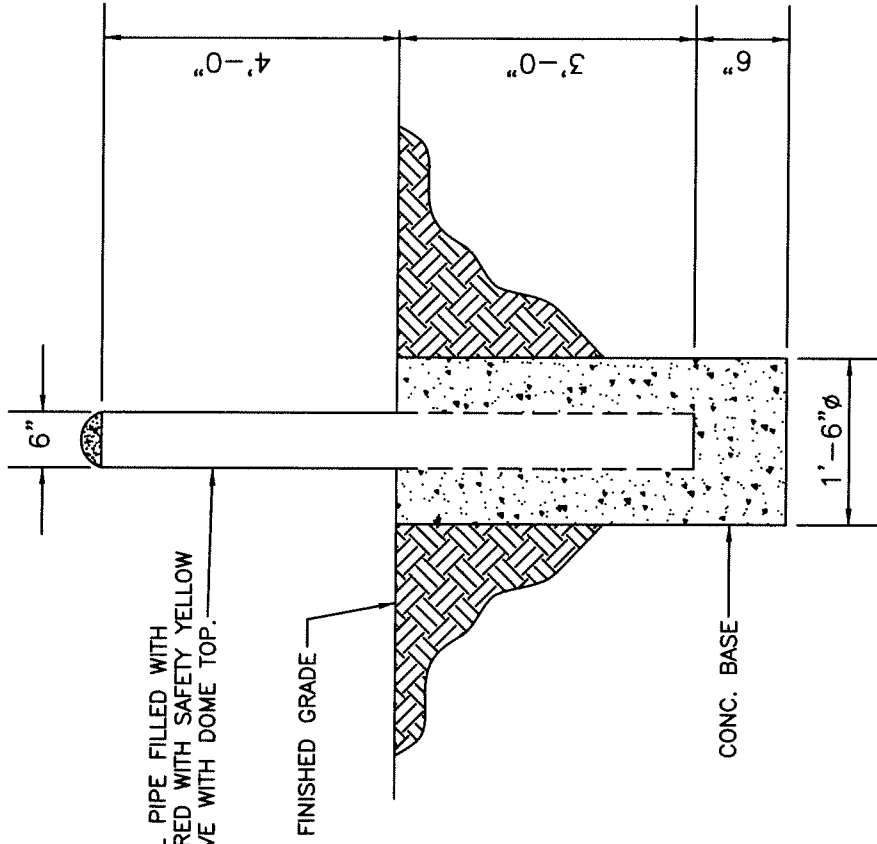
PS  
 C1-5



**MJ ADAPTER DETAIL  
DUCTILE IRON PIPE TRANSITION  
TO H.D.P.E. PIPE**

SCALE: N.T.S.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  MJ ADAPTER DETAIL D.I.P. TRANSITION TO H.D.P.E.	REVISED	PS C1-6



6" DIA. SCH.40 STEEL PIPE FILLED WITH CONCRETE AND COVERED WITH SAFETY YELLOW COLORED VINYL SLEEVE WITH DOME TOP.

FINISHED GRADE

CONC. BASE

**PIPE BOLLARD DETAIL**

SCALE: N.T.S.

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DATE: MAY 2011

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*[Signature]* 5/27/11  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
PIPE BOLLARD DETAIL

REVISED

PS  
C1-7

SEDIMENT  
AND  
EROSION

PROJECT SPECIFIC

WET/DRY WELL  SUBMERSIBLE

APPROVED  
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ENGINEER

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DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
CIVIL  
SEDIMENT AND EROSION

REVISED


PS  
C-2

ANNE ARUNDEL  
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DATE: MAY 2011



PUMPING STATION  
BUILDING  
PLAN  
REF. DWG. A1-1

LOUVER  
DETAIL  
REF. DWG. A1-11

EAVE  
DETAIL  
REF. DWG. A1-8

RAKE  
DETAIL  
REF. DWG. A1-9

DETAIL  
GENERATOR  
EXHAUST PIPE  
PENETRATION  
REF. DWG. A1-10

PUMP STATION  
BUILDING  
ELEVATION 1  
REF. DWG. A1-2

PUMP STATION  
BUILDING  
ELEVATION 2  
REF. DWG. A1-3

PUMP STATION  
BUILDING  
ELEVATION 3  
REF. DWG. A1-4

PUMP STATION  
BUILDING  
ELEVATION 4  
REF. DWG. A1-5

PUMP  
STATION  
BUILDING  
WALL  
SECTION  
REF. DWG. A1-6

PUMP  
STATION  
BUILDING  
WALL  
SECTION  
REF. DWG. A1-7

WET/DRY WELL  SUBMERSIBLE

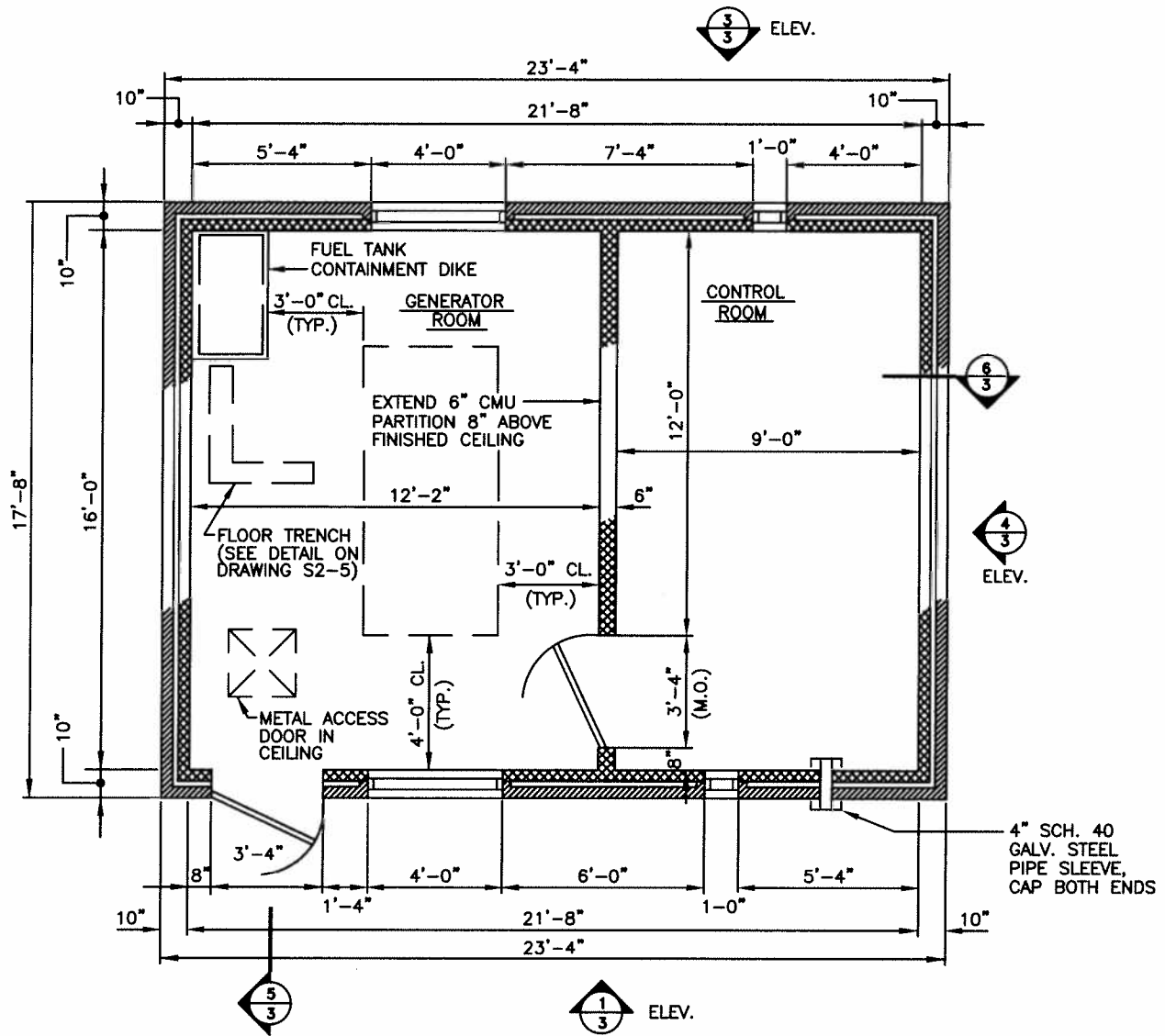
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CHIEF ENGINEER  
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*[Signature]* 3/17/14  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
ARCHITECTURAL  
PLANS AND DETAILS

REVISED

PS  
A-1



**PLAN-PUMP STATION BUILDING**

NOTE:  
 THE BUILDING DIMENSIONS ARE FOR A 100 KW GENERATOR AND 275 GALLON FUEL TANK. BUILDING DIMENSIONS FOR OTHER SIZE GENERATORS AND FUEL TANKS SHALL BE MODIFIED ACCORDINGLY.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/12/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  PLAN PUMP STATION BUILDING	REVISED	PS A1-1
	<i>[Signature]</i> DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	

PRE-FINISHED ALUMINUM  
CONTINUOUS RIDGE VENT

COMPOSITION SHINGLES

PRE-FINISHED ALUM.  
GUTTER & DOWNSPOUT  
(DRAINAGE MUST FLOW IN  
SUCH A MANNER AS NOT TO  
CAUSE A SLIP HAZARD DURING  
COLD WEATHER)

TOP OF MASONRY  
AT BEARING

FRP DOOR W/  
ALUM. FRAME  
& PIANO  
HINGE WITH  
COVER

PRE-FINISHED ALUM.  
INTAKE LOUVER

PRE-FINISHED ALUM.  
INTAKE LOUVER  
(REMOVABLE)

FACE  
BRICK

4" SCH. 40  
GALV. STEEL  
PIPE SLEEVE  
CAPPED

FLOOR SLAB

PRE-CAST CONC.  
SPLASHBLOCK  
(TYPICAL)

ELEVATION

1  
3

NOTE: COLORS TO BE SELECTED BY THE OWNER.  
MISC. ALUM. PRODUCTS TO BE DARK BRONZE.

ANNE ARUNDEL  
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DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

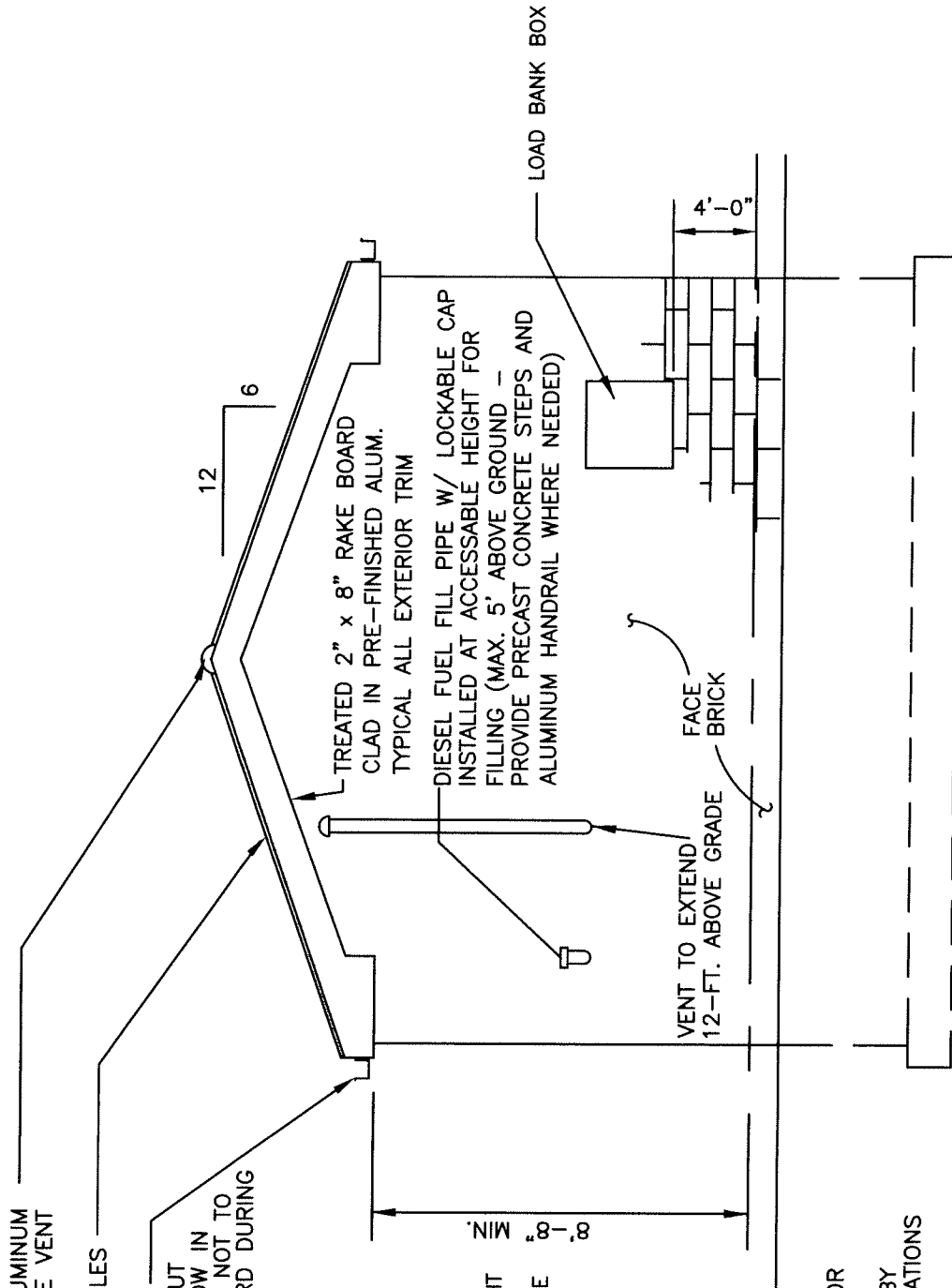
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CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
BUILDING ELEVATION 1

REVISED

PS  
A1-2



NOTE: PROVIDE BUILDING HEIGHT FOR ADEQUATE CLEARANCE OF GENERATOR EXHAUST PIPE ABOVE LINTEL OVER LOUVER.

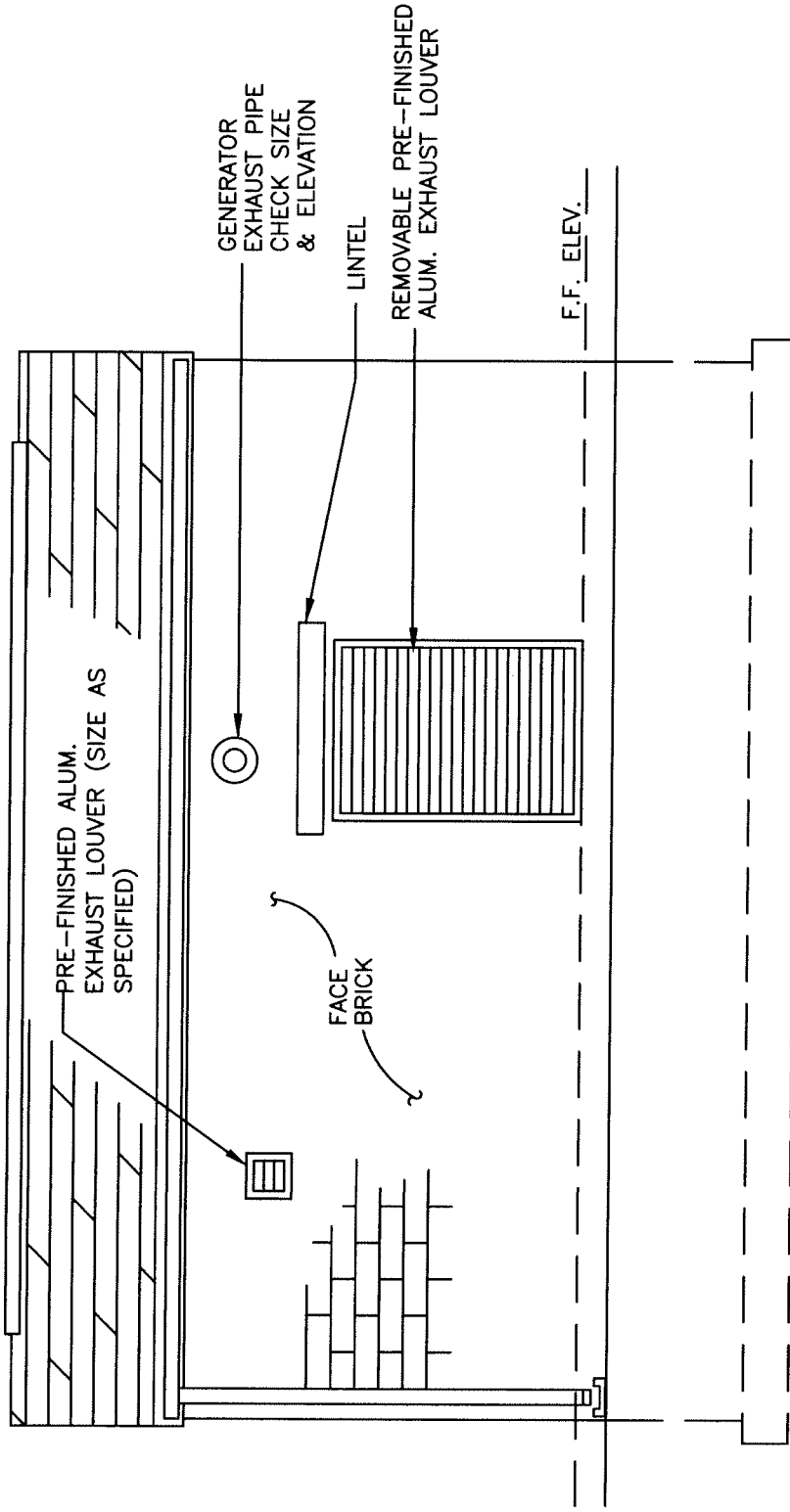
NOTE:  
 1. SEE SITE GRADING PLAN FOR DOWN SPOUT LOCATIONS.  
 2. COLORS TO BE SELECTED BY THE OWNER (COUNTY OPERATIONS BUREAU PERSONNEL)

ELEVATION 2  
3

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER  DESIGN ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN BUILDING ELEVATION 2	REVISED 6-08 PS A1-3
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NOTE: COLORS TO BE SELECTED BY THE OWNER  
(COUNTY OPERATIONS BUREAU PERSONNEL)

NOTE: PROVIDE BUILDING HEIGHT FOR  
ADEQUATE CLEARANCE OF GENERATOR  
EXHAUST PIPE ABOVE LINTEL OVER LOUVER.



ELEVATION 3

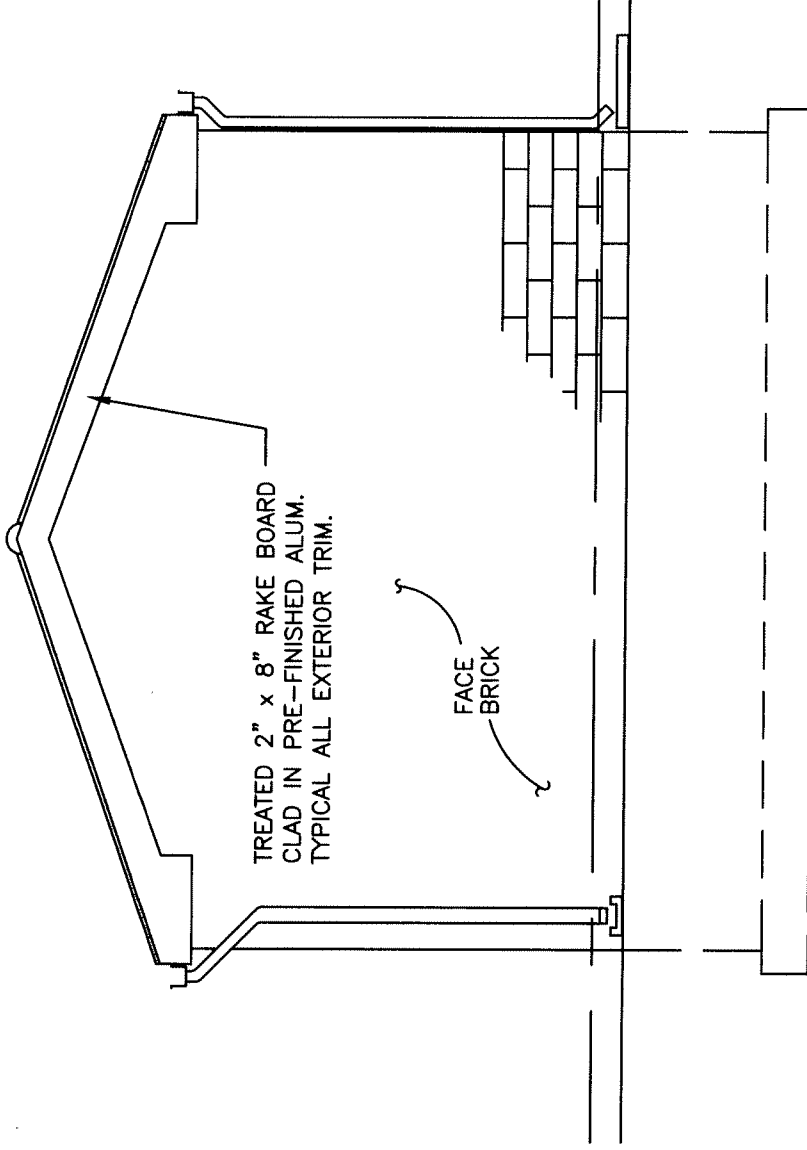
ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
BUILDING ELEVATION 3

REVISED

PS  
A1-4



ELEVATION

4  
3

NOTE: COLORS TO BE SELECTED BY THE OWNER  
(COUNTY OPERATIONS BUREAU PERSONNEL)

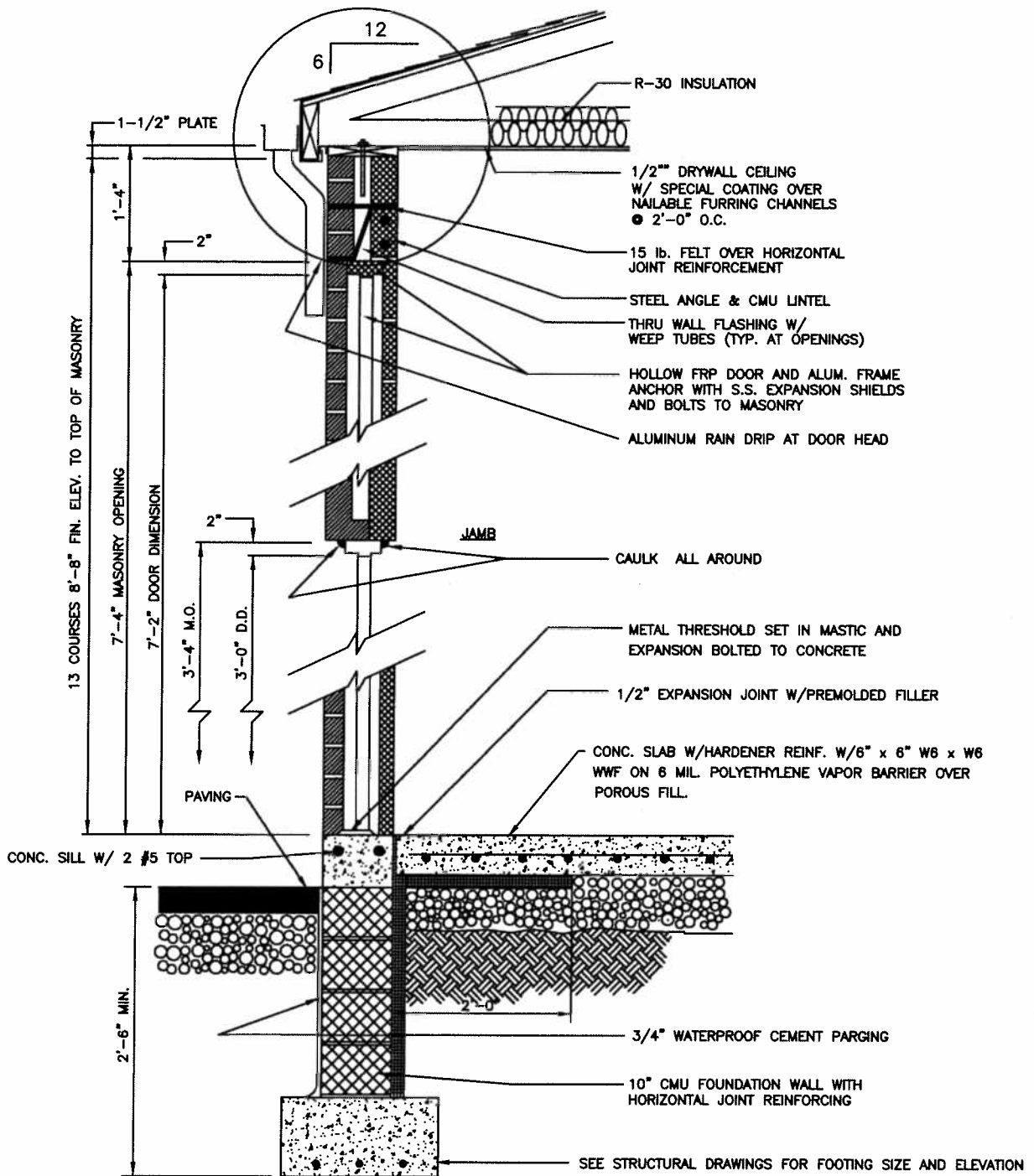
ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
BUILDING ELEVATION 4

REVISED

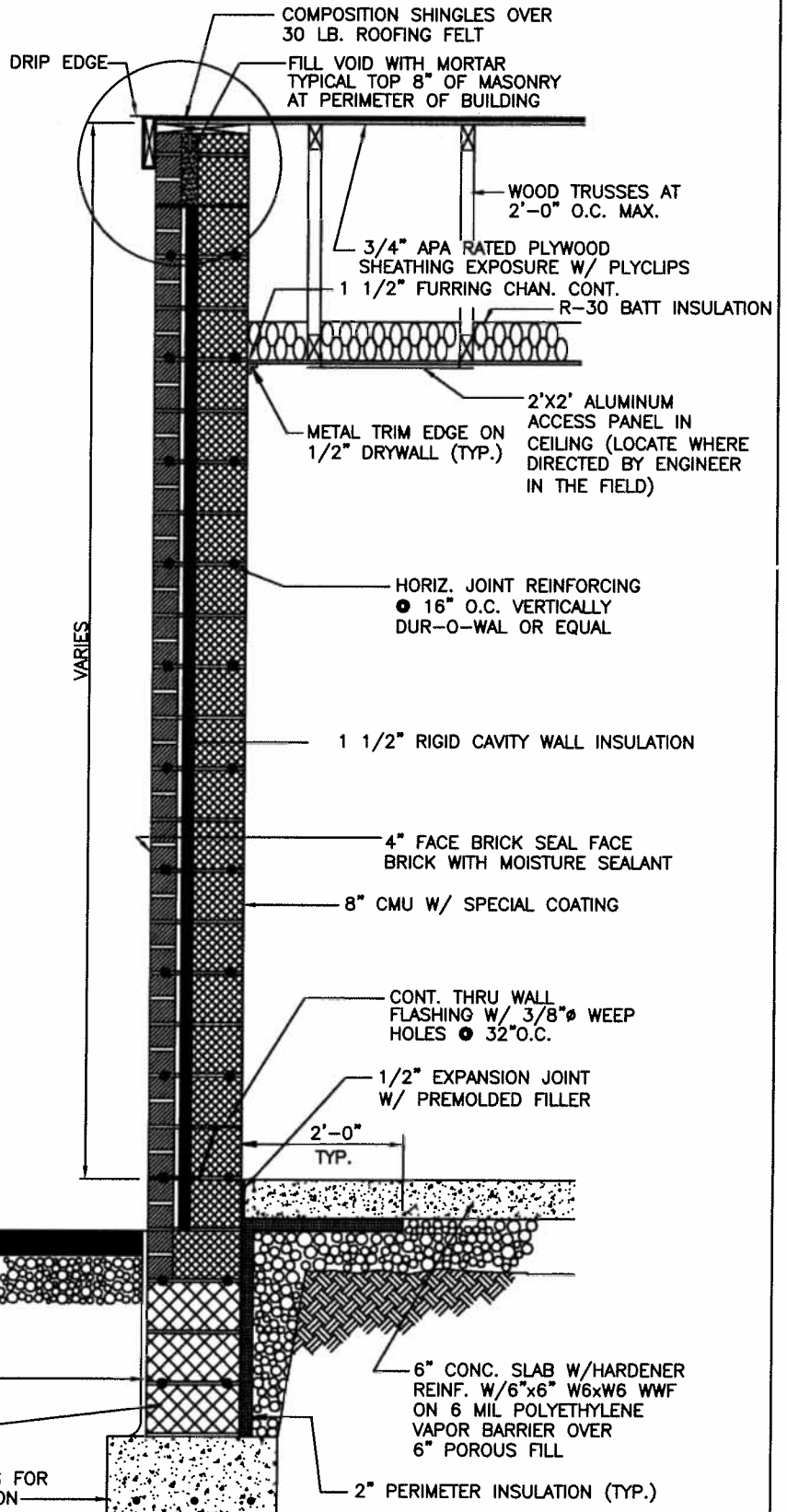
PS  
A1-5



SECTION 5  
3

NOTE: COLORS TO BE SELECTED BY THE OWNER  
(COUNTY OPERATIONS BUREAU PERSONNEL)

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  SECTION 5	REVISED	PS A1-6
	 DESIGN ENGINEER			



NOTE: COLOR OF BRICK TO BE SELECTED BY THE OWNER.

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

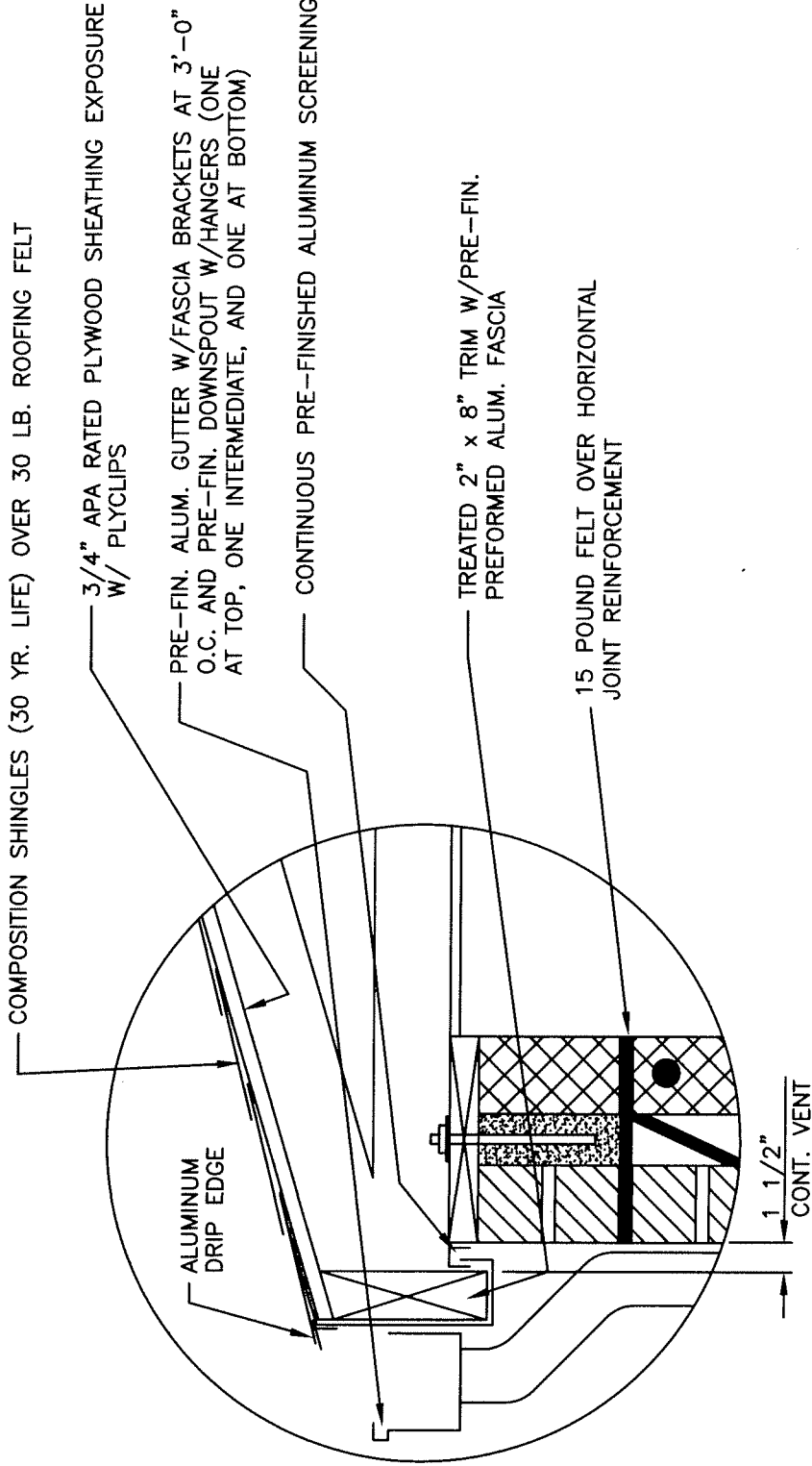
APPROVED  
*[Signature]* 5/12/11  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE  
PUMPING STATION DESIGN  
SECTION 6

REVISED

PS  
A1-7





ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS  
 DATE: MAY 2011

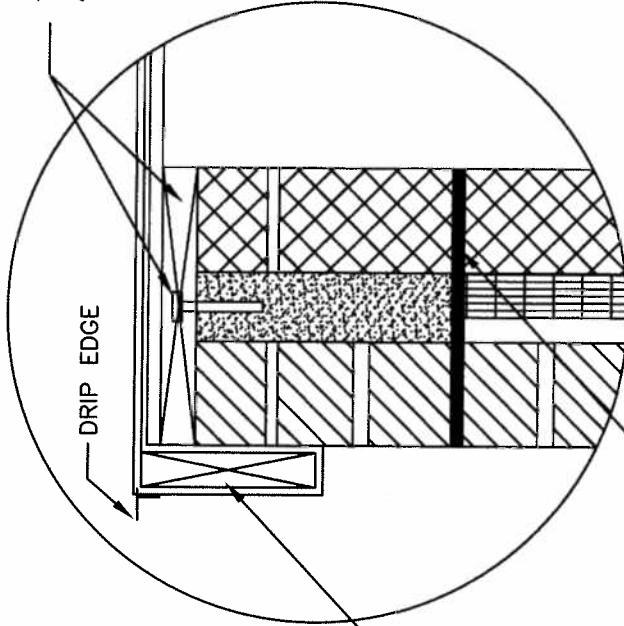
APPROVED  
*[Signature]*  
 CHEF ENGINEER  
*[Signature]*  
 DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION  
 EAVE DETAIL

REVISED

PS  
 A1-8

TREATED 2" x 10" WIDE PLATE W/ 1/2"Ø ANCHOR BOLTS @ 4'-0" O.C. (TYP.)



DRIP EDGE

TREATED 2" x 8" TRIM W/PRE-FIN. PREFORMED ALUM. FASCIA

15 POUND FELT OVER HORIZONTAL JOINT REINFORCEMENT

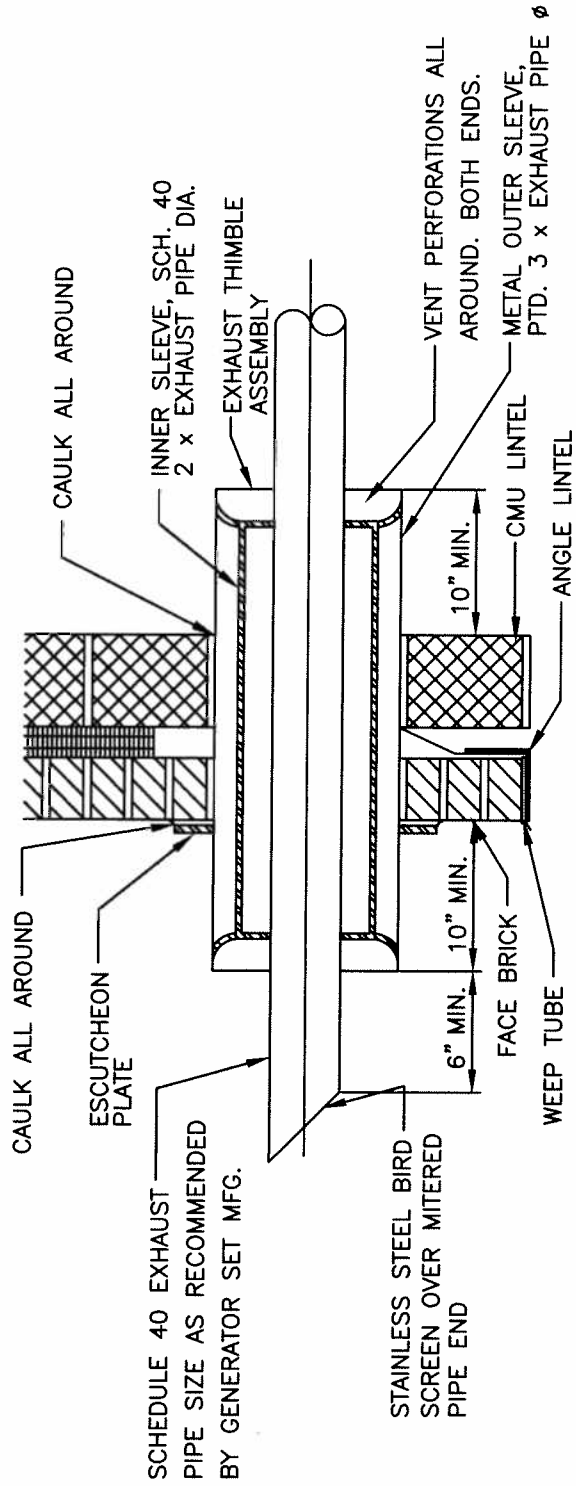
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS  
DATE: MAY 2011

APPROVED *[Signature]* 5/17/11  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION  
RAKE DETAIL

REVISED

PS  
A1-9



TYPICAL DETAIL OF WALL PENETRATION  
FOR GENERATOR EXHAUST PIPE

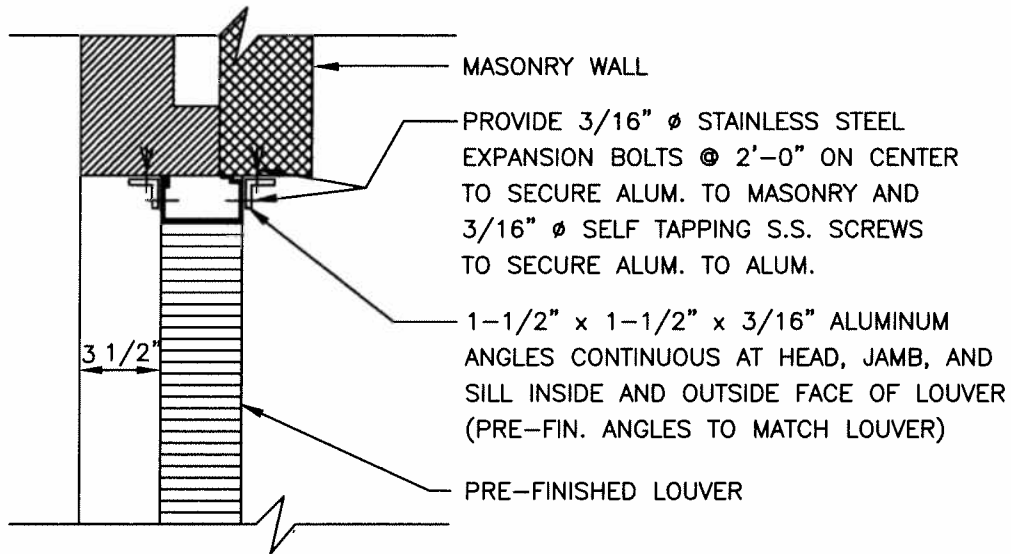
ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER



REFERENCE SEWAGE PUMPING STATION  
DETAIL - GENERATOR  
EXHAUST PIPE PENETRATION

REVISED

PS  
A1-10



TYPICAL DETAIL OF REMOVABLE LOUVER AT GENERATOR ROOM

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN REMOVABLE LOUVER DETAIL	REVISED	<u>PS</u> A1-11
	 DESIGN ENGINEER			

FOUNDATION PLAN  
PROJECT SPECIFIC

ROOF FRAMING  
PLAN  
PROJECT SPECIFIC

STRUCTURAL  
NOTES  
DWG. S1-7

TYPICAL  
WET/DRY WELL  
DWG. S1-3  
OR  
TYPICAL SECTION  
WET WELL  
DWG. S1-4

TYPICAL  
EXTERIOR  
WALL  
FOOTING  
DWG. S1-1

TYPICAL  
THICKENED  
SLAB  
DETAIL  
DWG. S1-2

TYPICAL  
WET WELL  
BASE  
CONNECTION  
DWG.  
S1-5 OR S1-6

EMERGENCY CONNECTION  
VAULT COVER  
PROJECT SPECIFIC

WET/DRY WELL

SUBMERSIBLE

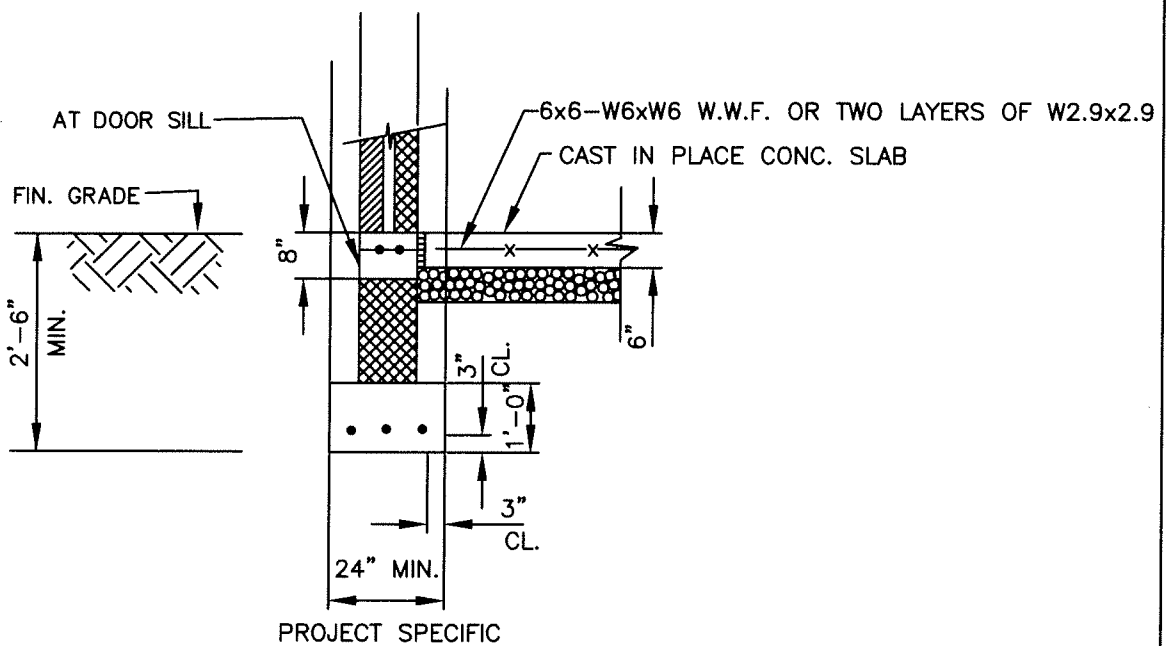
ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
STRUCTURAL  
PLAN AND DETAILS

REVISED

PS  
S-1

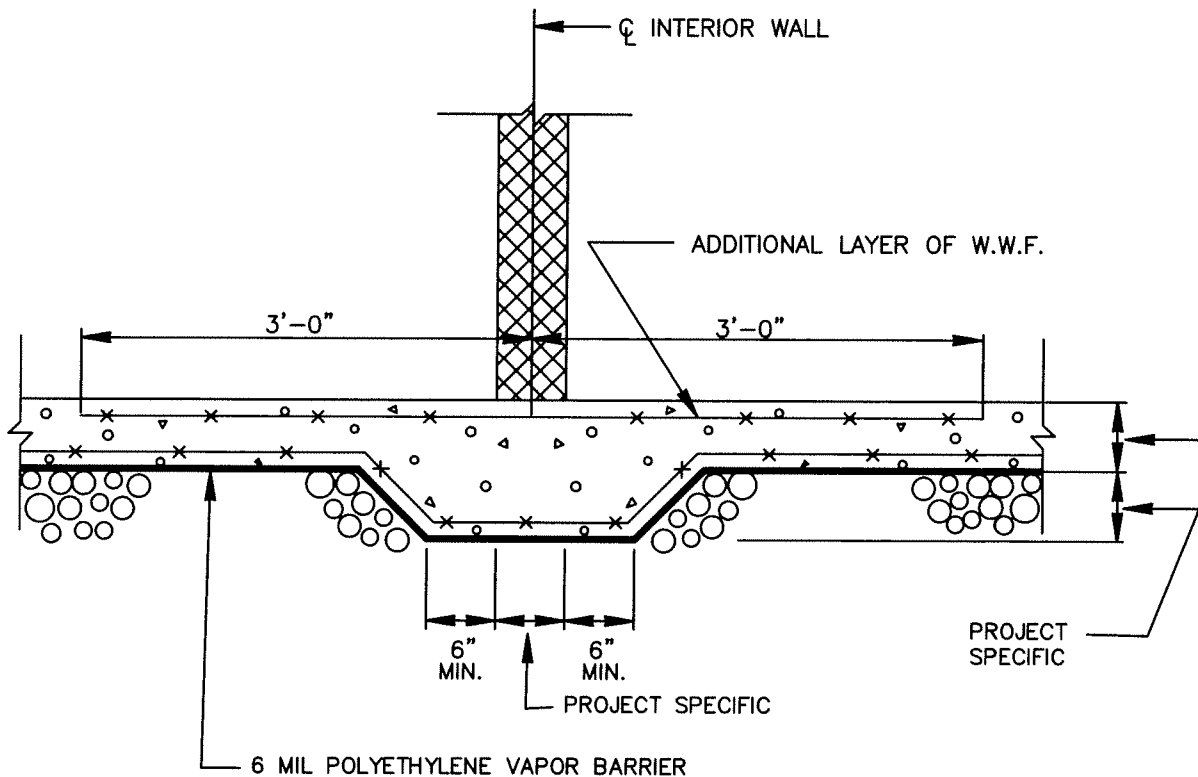


SECTION 1  
4

**NOTES:**

1. FOOTER SIZE AND REINFORCING SHALL BE DESIGNED BY ENGINEERS
2. WATER PROOFING, VAPOR BARRIER AND INSULATION REQUIREMENTS SHOWN ON ARCHITECTURAL SHEETS

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED CHIEF ENGINEER DESIGN ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  EXTERIOR WALL FOOTING SECTION	REVISED    	PS  S1-1
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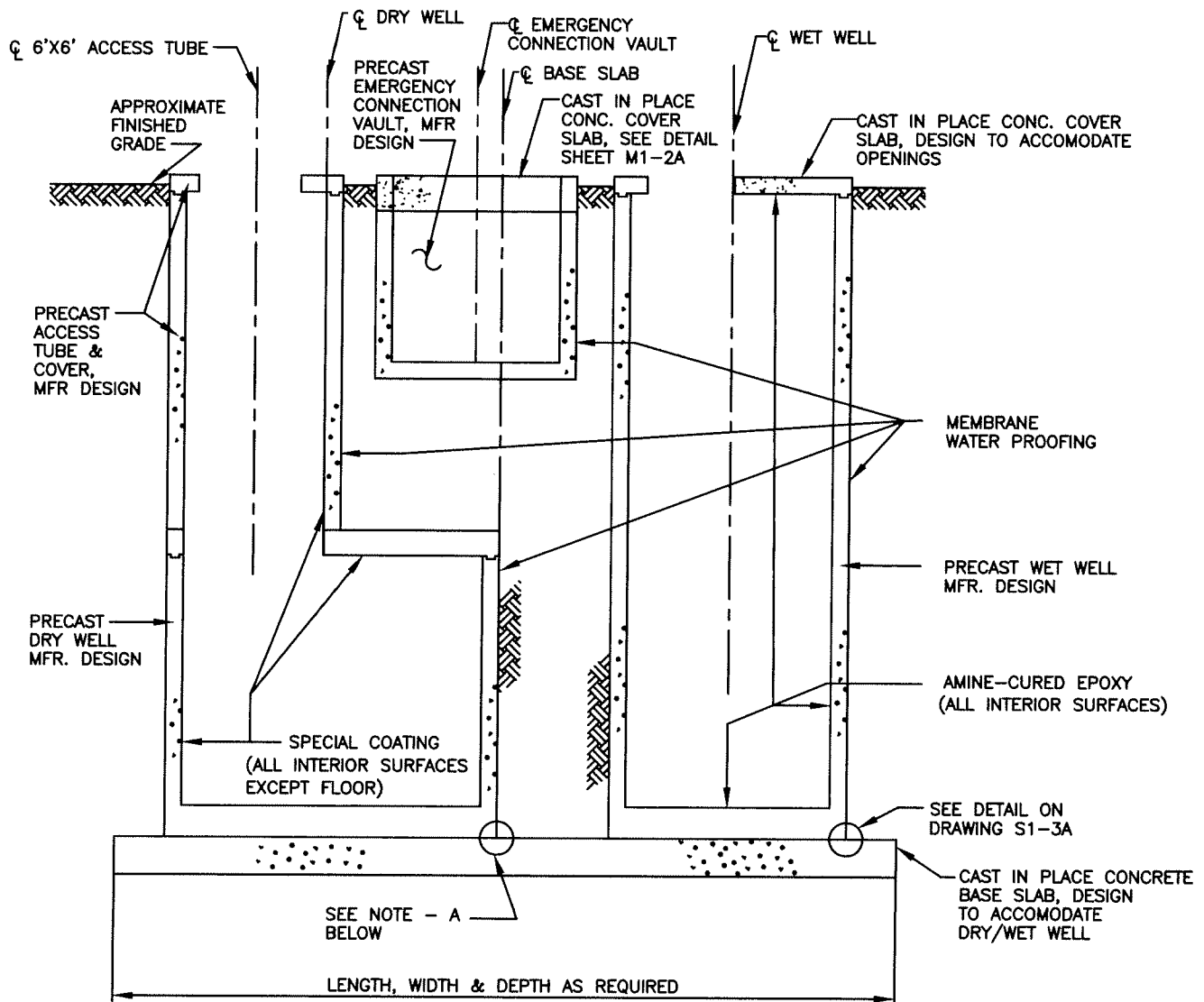
**THICKENED SLAB DETAIL**

SCALE: 3/4" = 1'-0"

**NOTE-A**

SHOW VAPOR BARRIER UNDER SLAB

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/14/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  THICKENED SLAB DETAIL	REVISED	PS S1-2
	<i>[Signature]</i> DESIGN ENGINEER		 	

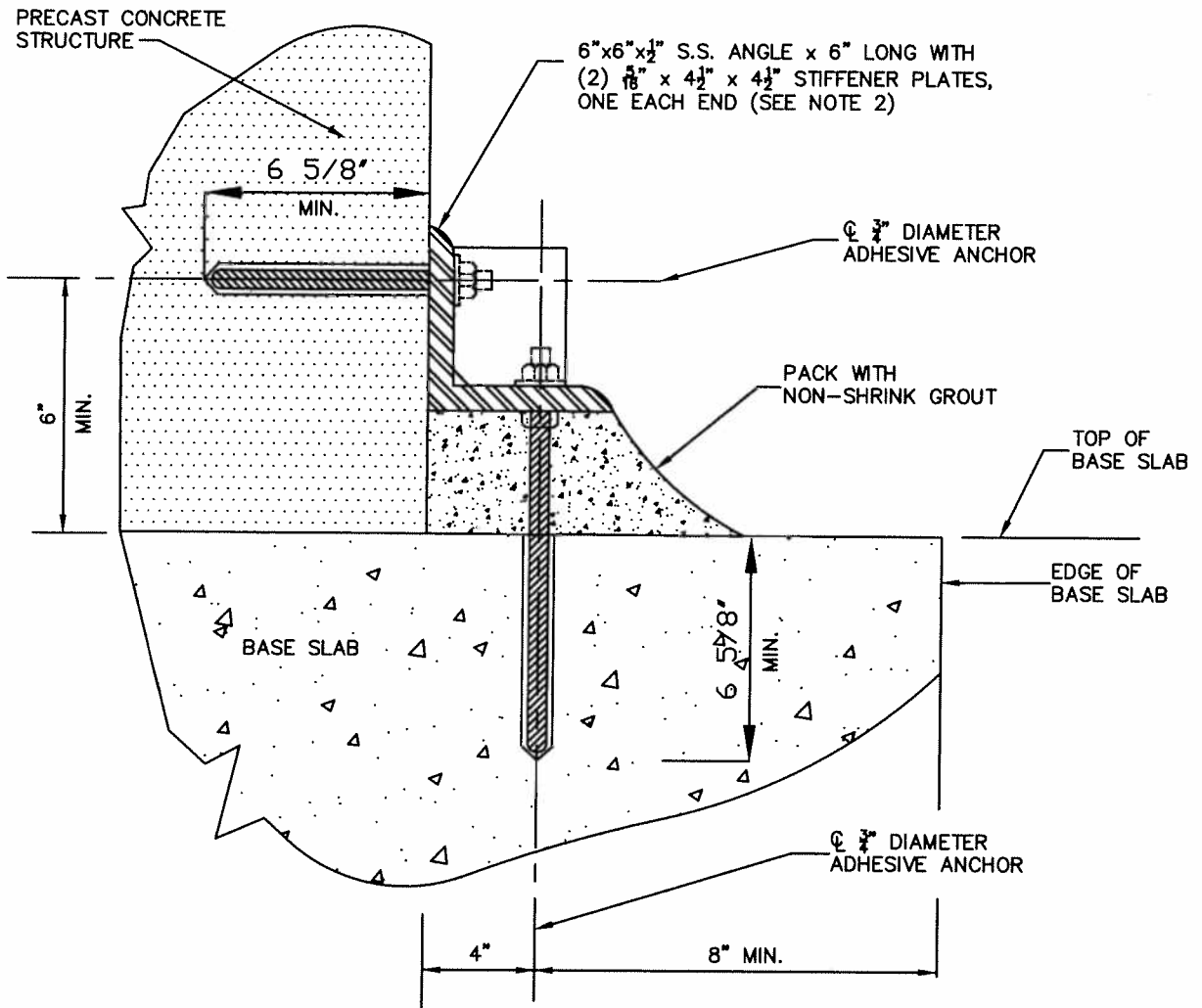


**NOTE-A**  
 PROVIDE STAINLESS STEEL CONNECTION  
 DETAIL PER MANUFACTURER'S  
 RECOMMENDATIONS

**NOTE-B**  
 SET TOP OF STRUCTURE  
 A MINIMUM OF 9" ABOVE FINISH GRADE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/12/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  TYPICAL SECTION WET/DRY WELL	REVISED	PS S1-3
	<i>[Signature]</i> DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	

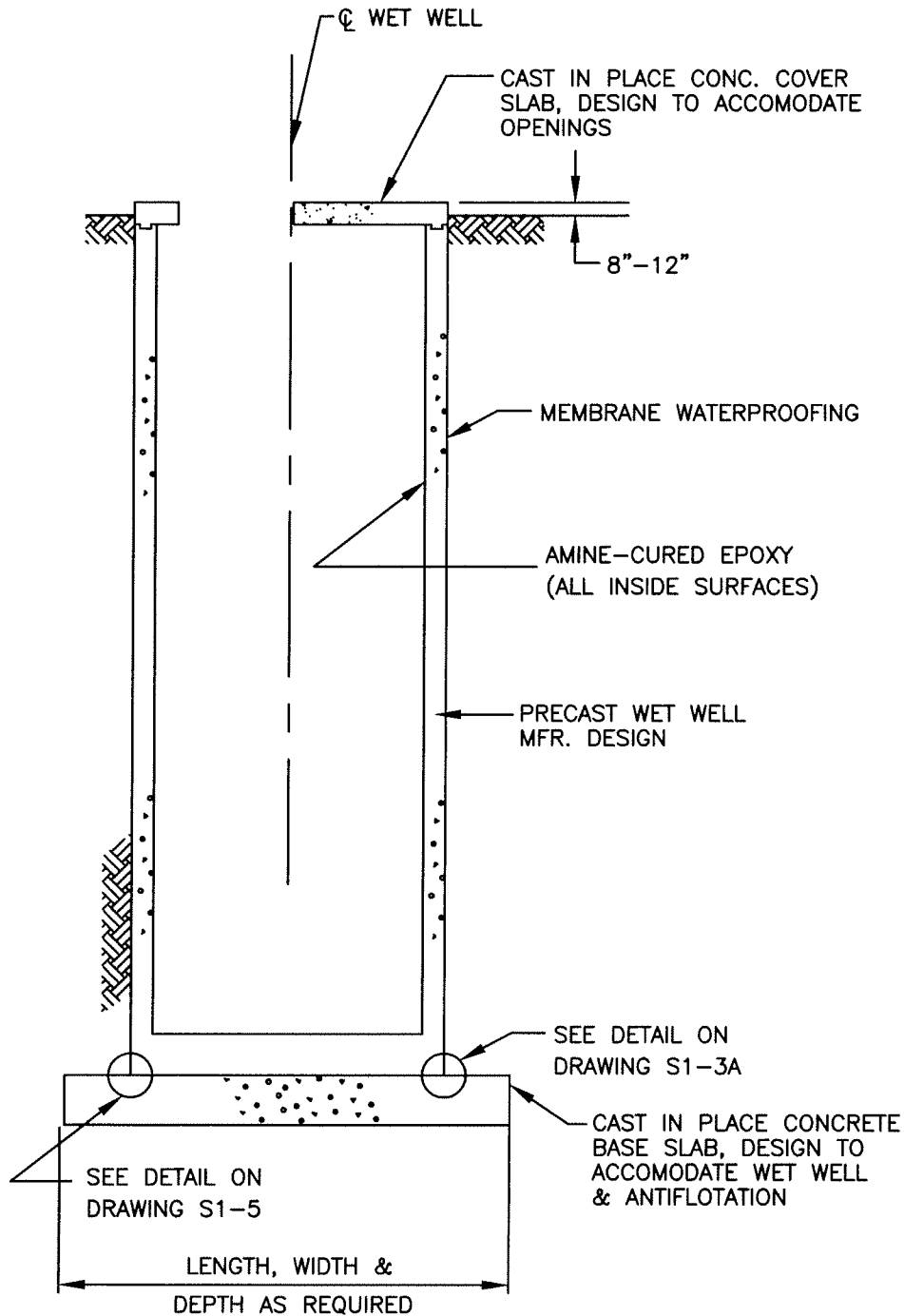




NOTES:

1. ADHESIVE ANCHORS TO BE  $\frac{3}{4}$ " DIAMETER HAS STAINLESS STEEL RODS (AISI 304/316SS) WITH  $6 \frac{5}{8}$ " MINIMUM EMBEDMENT USING HVA ADHESIVE CAPSULES, BY HILTI, INC. OR APPROVED EQUAL.
2. DESIGNER TO DETERMINE NUMBER OF ANCHORS REQUIRED TO RESIST FLOTATION.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>Charles P. Higgins</i> 3/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN ANCHOR CLIP ANGLE DETAIL	REVISED	PS S1-3A
	<i>BEW</i> DESIGN ENGINEER			

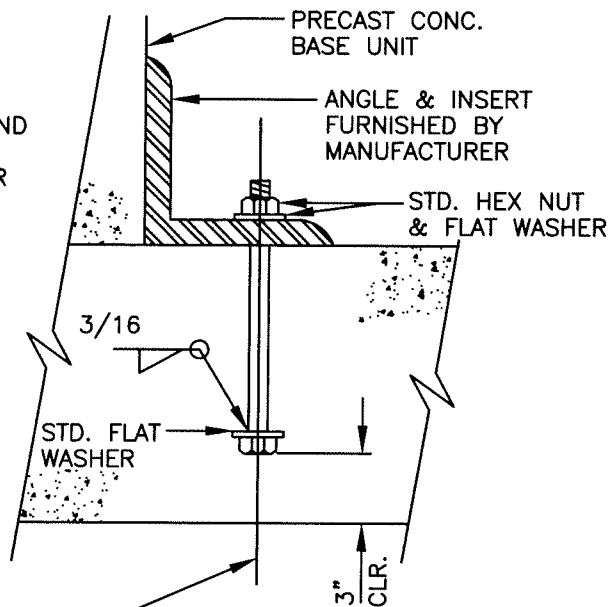


NOTES:

1. ALL INSIDE SURFACES OF WET WELL SHALL BE PAINTED WITH TWO (2) COATS OF AMINE CURED HIGH SOLIDS EPOXY.
2. WATERPROOF EXTERIOR OF WET WELL AND HOLD DOWN ANGLES WITH BITUTHENE MEMBRANE PER MANUFACTURER'S RECOMMENDATIONS.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN TYPICAL SECTION WET WELL	REVISED	PS S1-4
	<i>[Signature]</i> DESIGN ENGINEER			



WATERPROOF WET WELL AND  
HOLD DOWN ANGLES WITH  
BITUTHENE MEMBRANE PER  
MANUFACTURER'S  
RECOMMENDATIONS

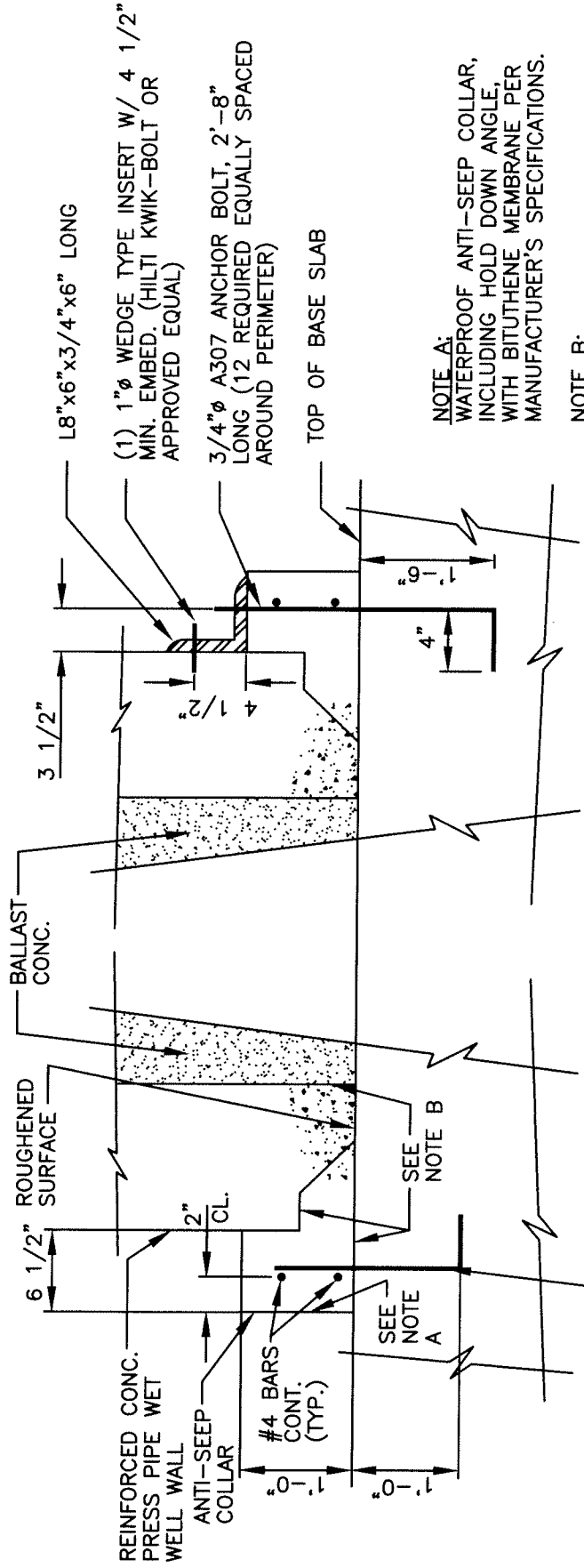


Ø 3/4" A307 ANCHOR BOLT  
LENGTH AS REQUIRED  
(MINIMUM OF 12 REQUIRED -  
EQUALLY SPACED AROUND  
PERIMETER)

DETAIL - A

(FOR LESS THAN 10'-0" Ø WET WELLS)

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  WET WELL BASE	REVISED	PS S1-5
	 DESIGN ENGINEER			



**NOTE A:**  
 WATERPROOF ANTI-SEEP COLLAR,  
 INCLUDING HOLD DOWN ANGLE,  
 WITH BITUTHENE MEMBRANE PER  
 MANUFACTURER'S SPECIFICATIONS.

**NOTE B:**  
 COAT SLAB AND PRECAST PIPE  
 W/ EPOXY BONDING COMPOUND  
 BEFORE PLACING CONCRETE.

**NOTE C:**  
 USE S.S. BOLTS, NUTS AND WASHERS

**DETAIL - B**  
 (FOR 10" AND LARGER WET WELLS)

ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS  
 DATE: MAY 2011

APPROVED  
*[Signature]*  
 CHIEF ENGINEER  
*[Signature]*  
 DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
 WET WELL BASE

REVISED

PS  
 S1-6

## STRUCTURAL NOTES

### SPECIFICATIONS

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE ANNE ARUNDEL COUNTY DEPT. OF PUBLIC WORKS "STANDARD DETAILS AND SPECIFICATIONS FOR CONSTRUCTION DATED SEPTEMBER 1988 INCLUDING ALL REVISIONS AND ADDENDA, AND ALL APPLICABLE OSHA STANDARDS.

CONCRETE DESIGN: SERVICE LOAD DESIGN METHOD, FC=1350 PSI  
 REINFORCED STEEL DESIGN: FS=24,000 PSI  
 STRUCTURAL STEEL DESIGN: ELASTIC DESIGN METHOD

### FOUNDATIONS

ALL FOUNDATION DESIGNS ARE BASED ON AN ASSUMED MINIMUM SAFE SOIL BEARING PRESSURE OF 2,000 PSF. THE CONTRACTOR SHALL VERIFY THE SOIL BEARING PRESSURE BEFORE CONSTRUCTION COMMENCES AND SHALL IMMEDIATELY CONTACT THE ENGINEER IF THE ACTUAL SOIL BEARING PRESSURE DOES NOT MEET THE ASSUMED MINIMUM DESIGN VALUE.

### FOOTINGS

THE BOTTOMS OF ALL FOOTINGS SHALL BE AT LEAST 2'-6" BELOW FINISHED GRADE. ALL FOOTINGS SHALL BEAR UPON UNDISTURBED SOIL OR THOROUGHLY COMPACTED FILL. ALL DISTURBED SOIL UNDER FOOTINGS SHALL BE REPLACED BY S.H.A. MIX NO. 1 CONCRETE.

### CONCRETE

ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH ACI 318-95. ALL STRUCTURAL CONCRETE SHALL BE S.H.A. MIX NO. 2 WITH A MINIMUM 28 DAY STRENGTH OF 3,000 PSI. CONCRETE NOTED AS S.H.A. MIX NO. 1 SHALL HAVE A MINIMUM 28 DAY STRENGTH OF 2,500 PSI. ALL EXPOSED CORNERS SHALL BE CHAMFERED, 3/4"x3/4".

### REINFORCED STEEL

REINFORCING STEEL BARS SHALL CONFORM TO A.S.T.M. A-615 GRADE 60. WELDED WIRE MESH SHALL BE IN CONFORMANCE WITH A.S.T.M. A-185. UNLESS OTHERWISE NOTED, ALL SPLICES SHALL BE IN ACCORDANCE WITH ACI 318-95. UNLESS OTHERWISE INDICATED, THE MINIMUM COVER SHALL BE 2".

### STRUCTURAL STEEL

ALL STRUCTURAL STEEL SHALL BE A.S.T.M. A-36. SEE SPECIAL PROVISIONS.

### ALUMINUM


SEE SPECIAL PROVISIONS.

### LINTELS

CMU LINTELS ARE PRECAST CONCRETE, SEE SPECS. FOR BRICK VENEER SUPPORT ACROSS OPENINGS, PROVIDE LOOSE ANGLE LINTELS WITH 3 1/2" LEG HORIZONTAL AS FOLLOWS:

OPENINGS TO 3'-6"                      3"x3 1/2"x1/4" ANGLE  
 OPENINGS 3'-7" TO 5'-0"              4"x3 1/2"x5/16" ANGLE  
 OPENINGS 5'-1" TO 7'-11"            5"x3 1/2"x3/8" ANGLE

ALL ANGLES SHALL HAVE A 6" MINIMUM BEARING.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  STRUCTURAL NOTES	REVISED	PS <hr/> S1-7

GRATING  
DETAIL  
  
DWG. S2-1

LADDER ELEVATION  
DETAIL AND SECTION  
  
DWG. S2-2

PIPE  
PENETRATION  
SUPPORT DETAIL  
  
DWG. S2-4

FUEL OIL TRENCH  
DETAIL  
  
DWG. S2-5

EQUIPMENT SUPPORT  
PAD DETAIL  
  
DWG. S2-6

BAR SCREEN  
PLAN  
AND SECTIONS  
  
DWG. S2-3A,B AND C

WET/DRY WELL

SUBMERSIBLE

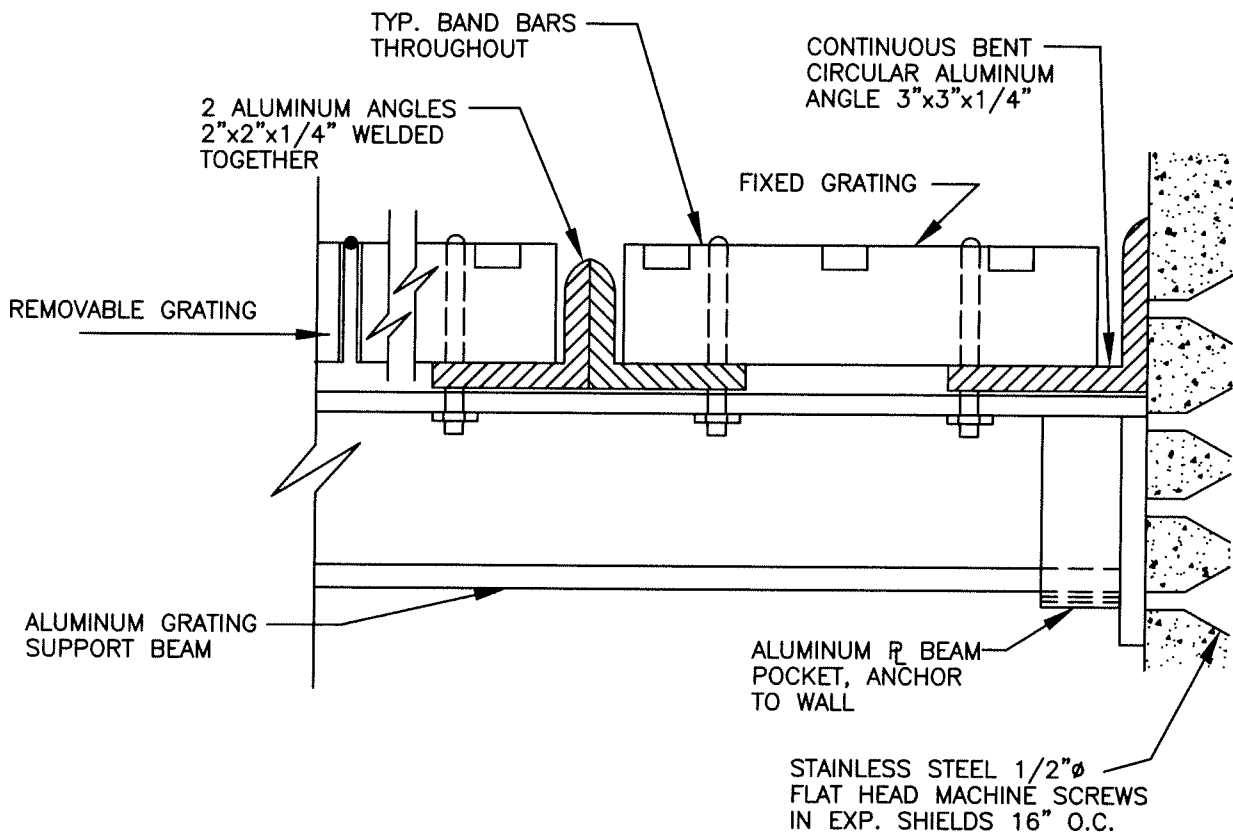
APPROVER  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

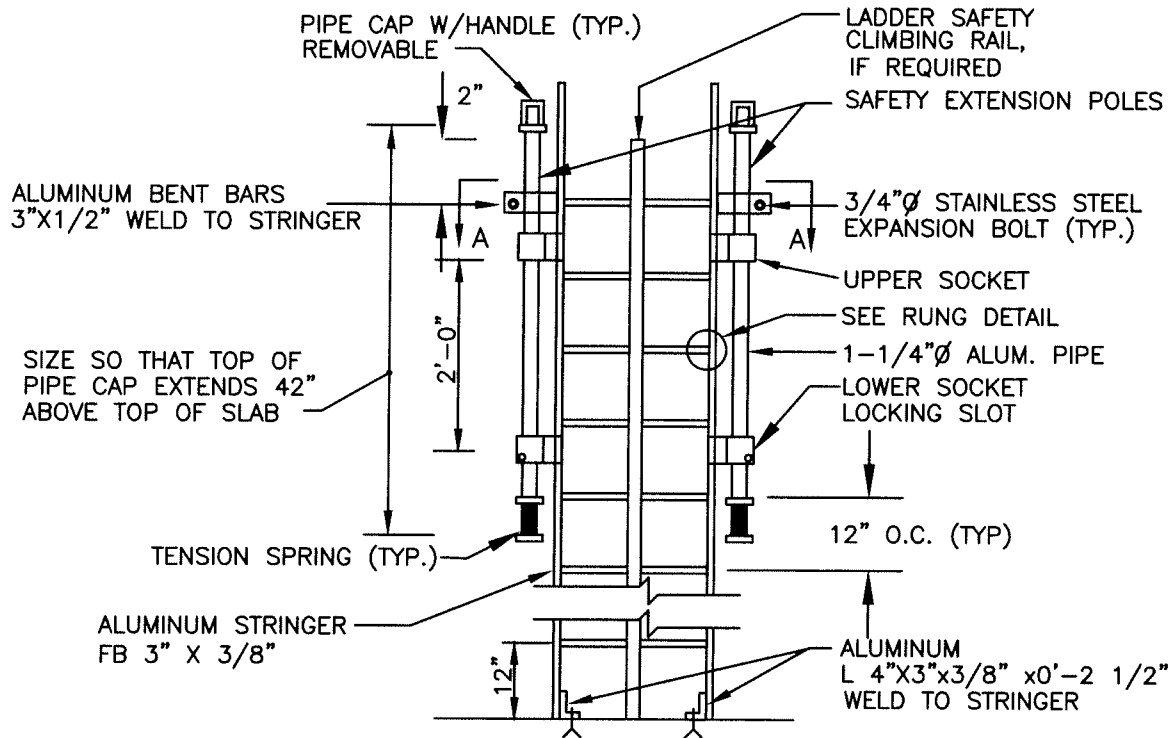
REFERENCE SEWAGE PUMPING STATION DESIGN  
STRUCTURAL  
SECTIONS AND DETAILS

REVISED

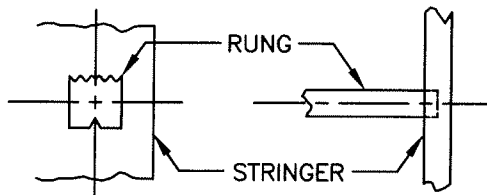
PS  
S-2



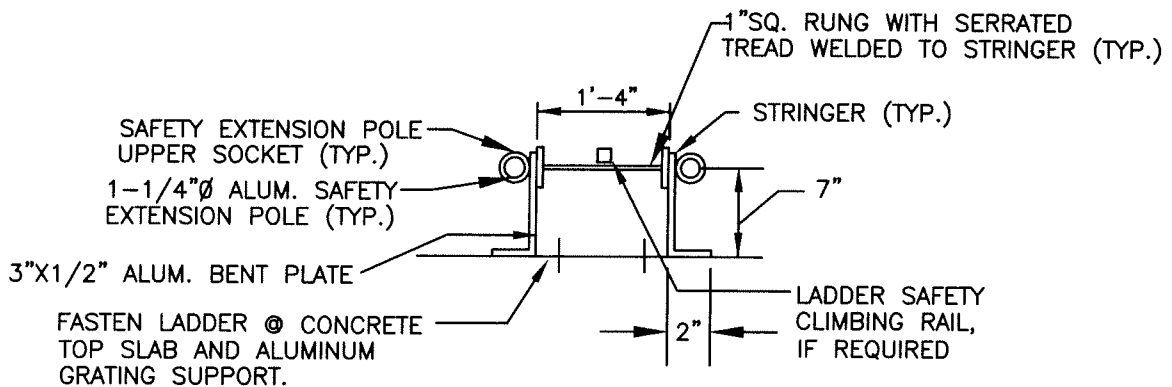
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  GRATING DETAIL	REVISED	PS S2-1
	<i>[Signature]</i> DESIGN ENGINEER		 	



**ELEVATION**



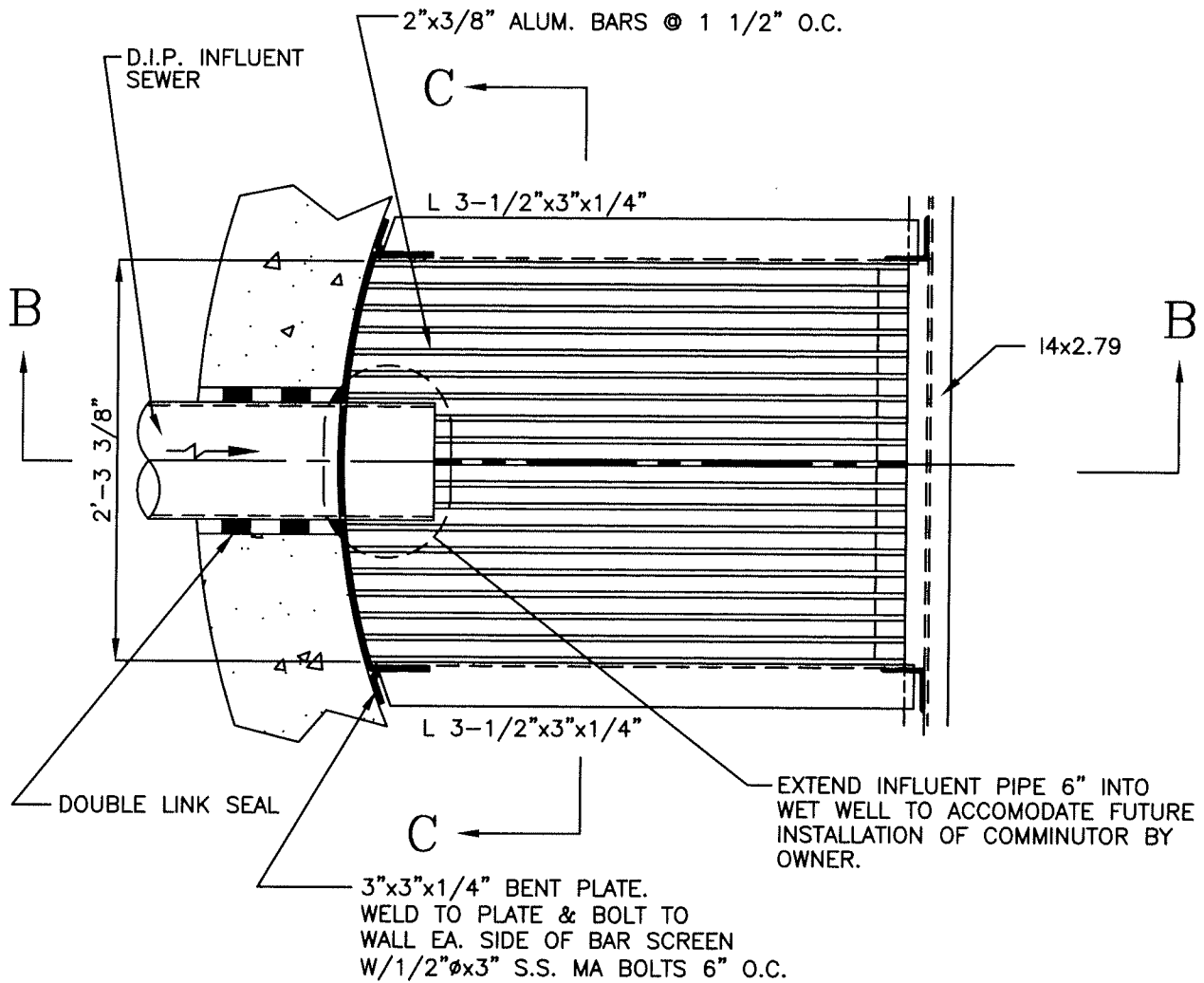
**RUNG DETAIL**



**SECTION A-A**

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 3/12/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  LADDER AND SAFETY EXTENSION POLE DETAIL	REVISED	PS S2-2
	<i>[Signature]</i> 2/10/14 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	
	_____		_____	

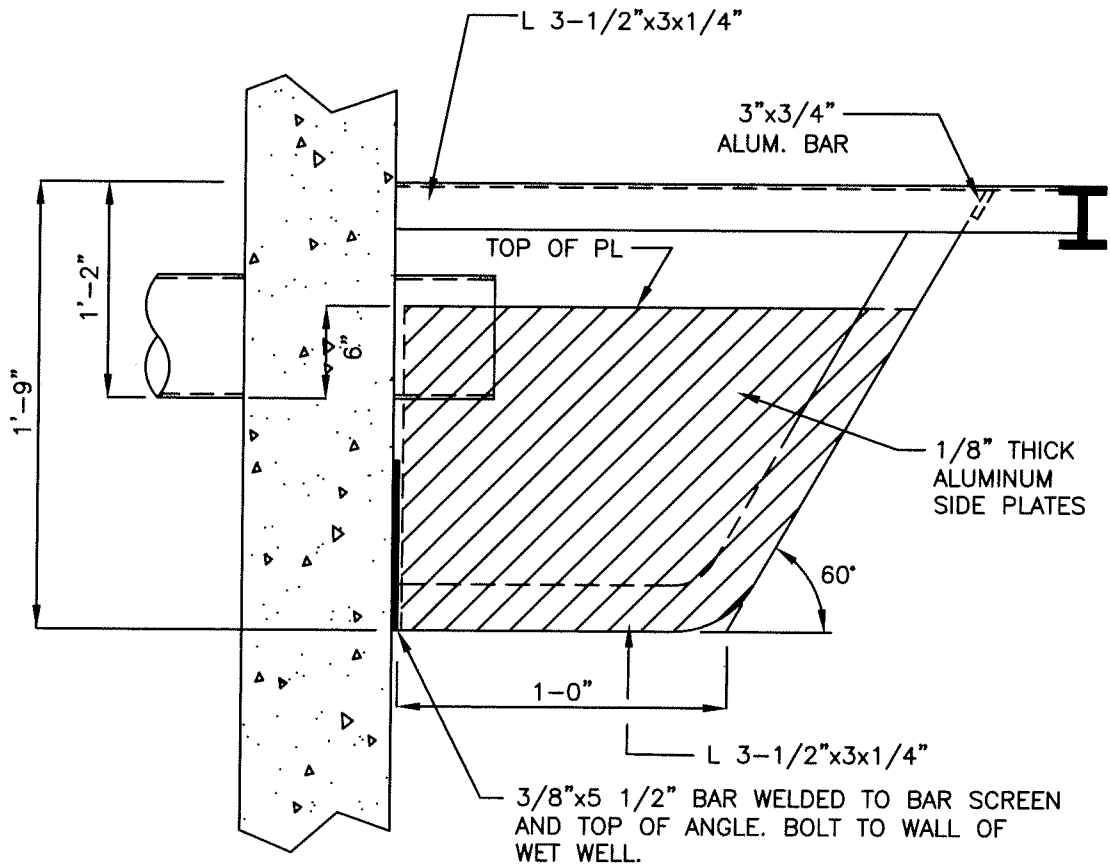




NOTES:

1. ALL ALUMINUM SURFACES TO BE IN CONTACT WITH CONCRETE SHALL BE COATED WITH APPROVED BARRIER MATERIAL.
2. BAR SCREEN SHALL BE BOLTED INTO PLACE AND BE EASILY REMOVABLE.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL REMOVABLE BAR SCREEN PLAN VIEW	REVISED	PS S2- 3A
	<i>[Signature]</i> 8/10/11 DESIGN ENGINEER			

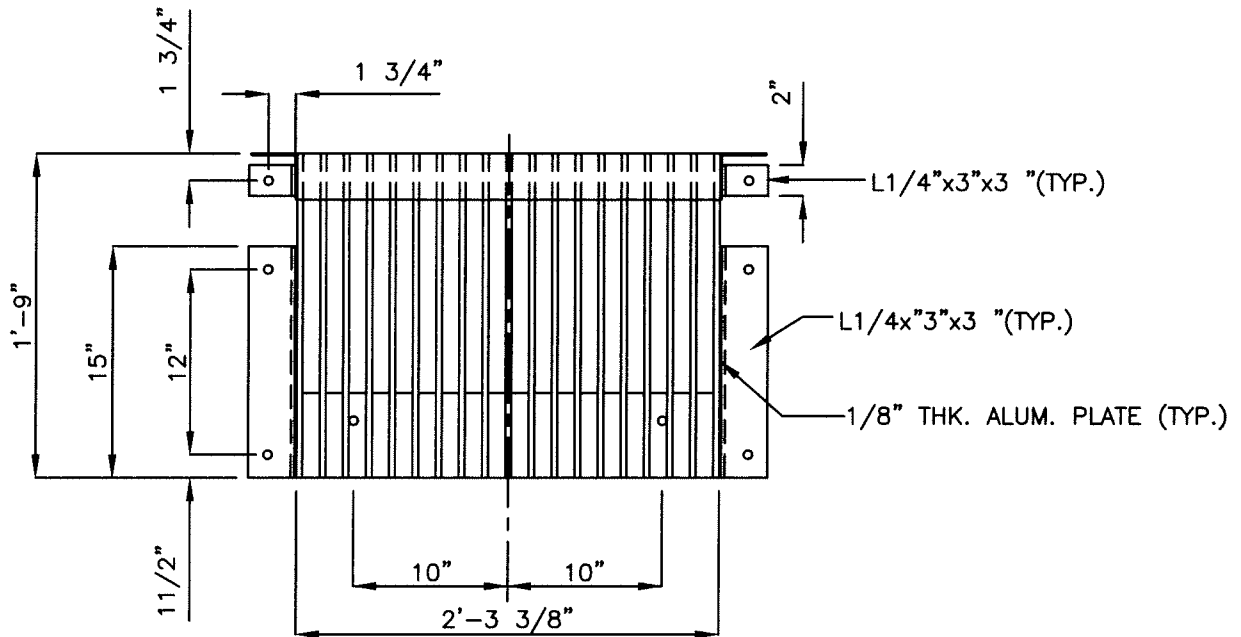


**SECTION B-B**

NOTES:

1. ALL ALUMINUM SURFACES TO BE IN CONTACT WITH CONCRETE SHALL BE COATED WITH APPROVED BARRIER MATERIAL.
2. BAR SCREEN SHALL BE BOLTED INTO PLACE AND BE EASILY REMOVED.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  REMOVABLE BAR SCREEN SECTION	REVISED	PS S2- 3B
	<i>[Signature]</i> DESIGN ENGINEER			

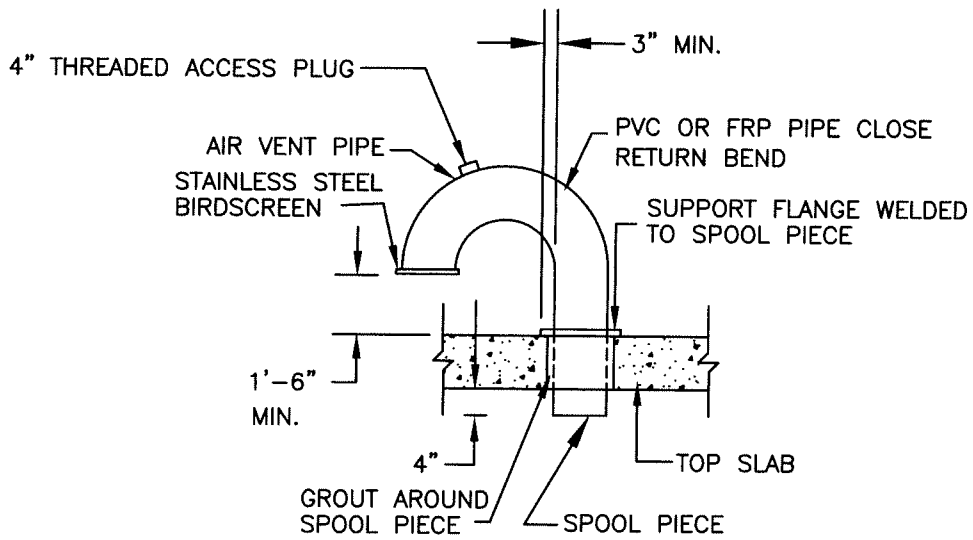


NOTES

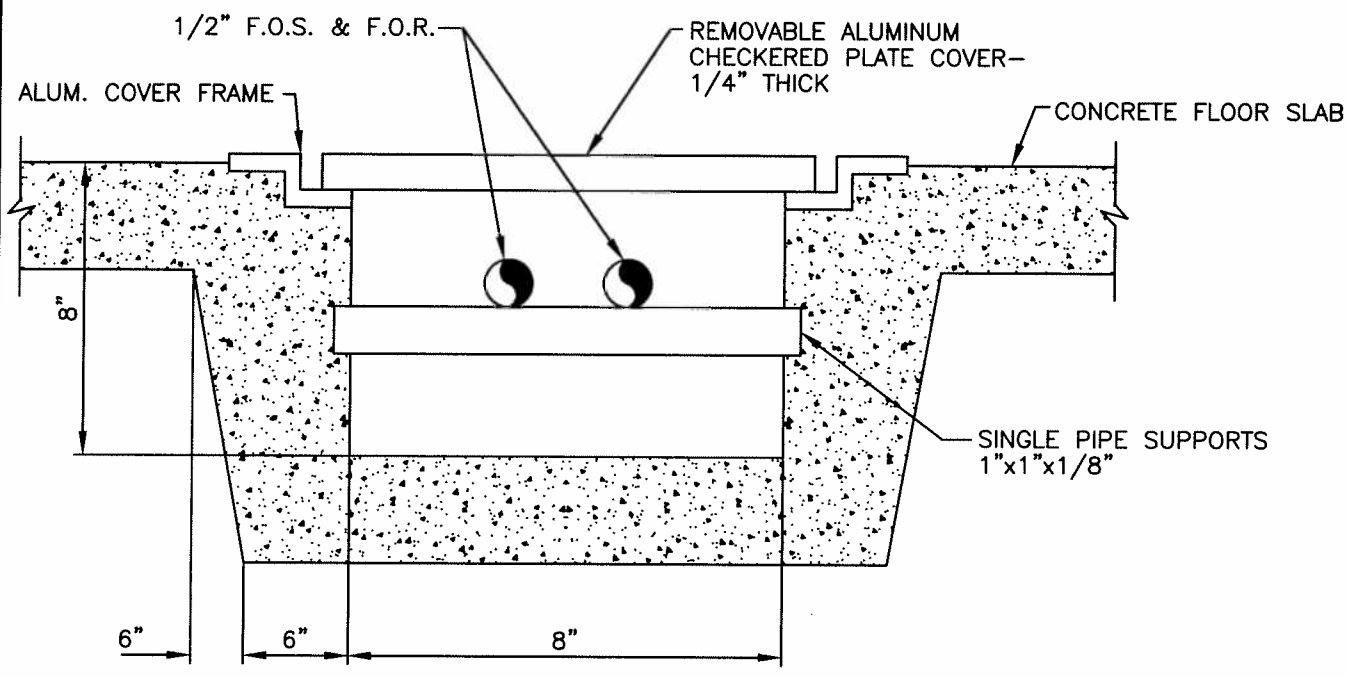
SECTION C-C

1. ALL ALUMINUM SURFACES TO BE IN CONTACT WITH CONCRETE SHALL BE COATED WITH APPROVED BARRIER MATERIAL.

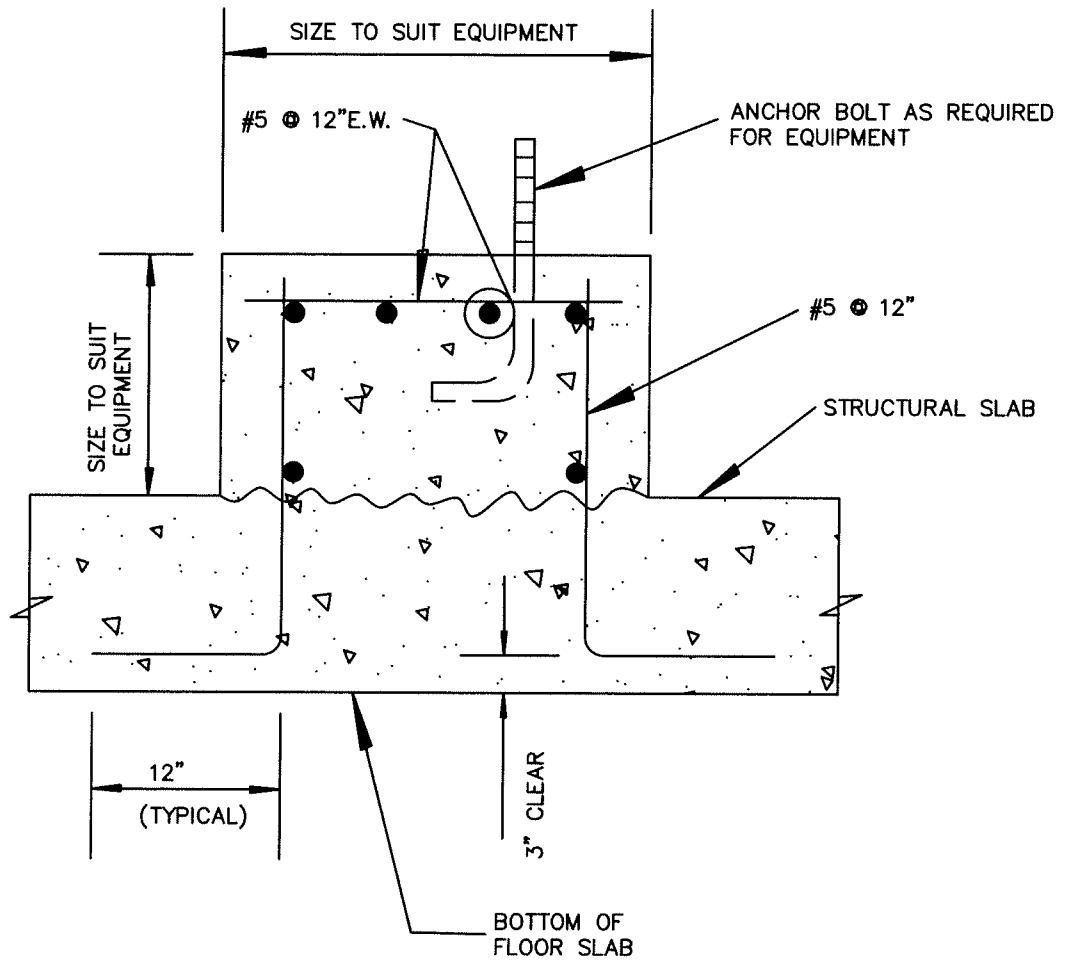
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/12/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  BAR SCREEN SECTION	REVISED	PS S2- 3C
	<i>[Signature]</i> 8/10/11 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	
	_____		_____	



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 2/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  PIPE PENETRATION SUPPORT DETAIL	REVISED	PS S2-4
	<i>[Signature]</i> DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	
	_____		_____	



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN FUEL OIL TRENCH DETAIL	REVISED	PS S2-5
	<i>[Signature]</i> DESIGN ENGINEER			



ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS  
 DATE: MAY 2011

APPROVED  
*[Signature]* 3/17/11  
 CHIEF ENGINEER  
*[Signature]*  
 DESIGN ENGINEER

REFERENCE SEWAGE  
 PUMPING STATION DESIGN  
 EQUIPMENT SUPPORT PAD  
 DETAIL

REVISED


PS  
 S2-6

TURNBUCKLE  
SUPPORT ASSEMBLY  
PLAN AND SECTION  
  
DWG. S3-1

TURNBUCKLE SUPPORT  
ASSEMBLY - SIDE  
VIEW AND NOTES  
  
DWG. S3-2

SOIL ODOR FILTER  
BLOWER PAD DETAIL  
PLAN VIEW  
  
DWG. S3-3

PROJECT SPECIFIC

SOIL ODOR FILTER  
BLOWER PAD DETAIL  
SECTION AND NOTES  
  
DWG. S3-4

WET/DRY WELL

SUBMERSIBLE

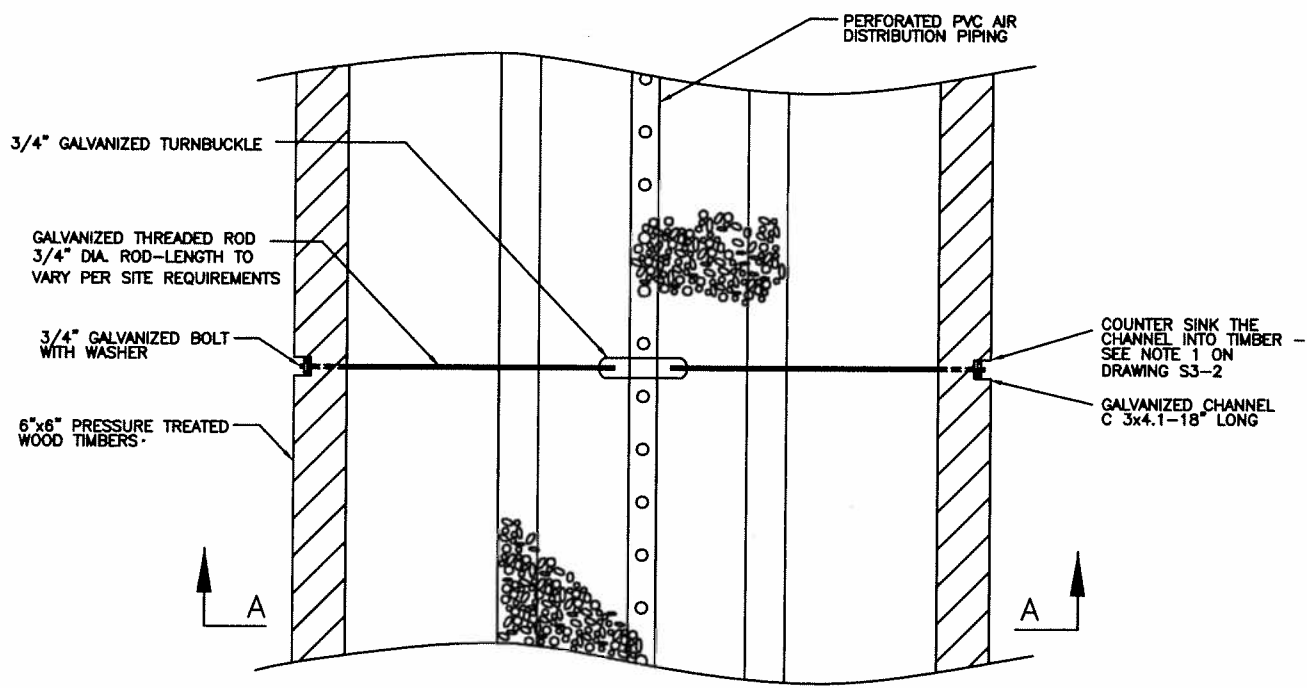
APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

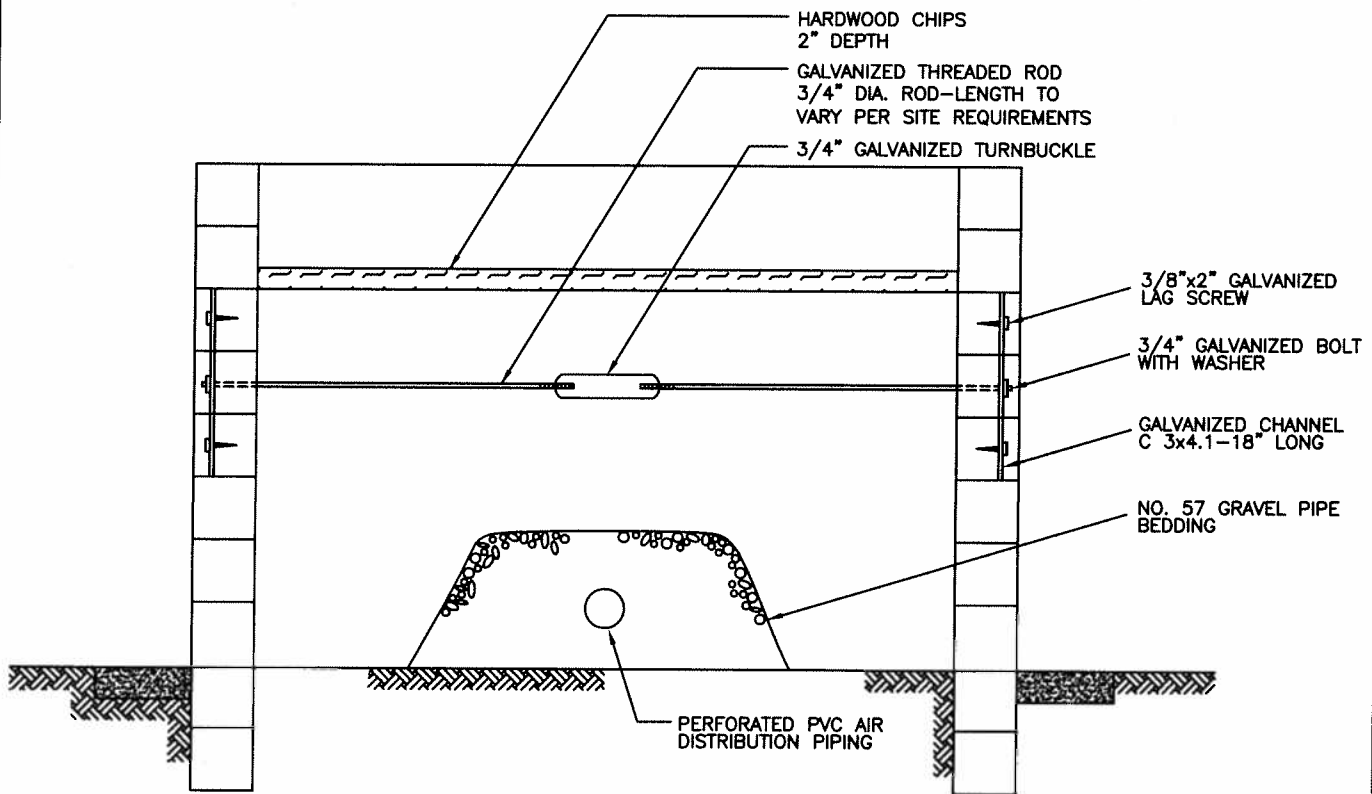
REFERENCE SEWAGE PUMPING STATION DESIGN  
STRUCTURAL  
ODOR CONTROL  
PLANS AND SECTIONS

REVISED

PS  
S-3



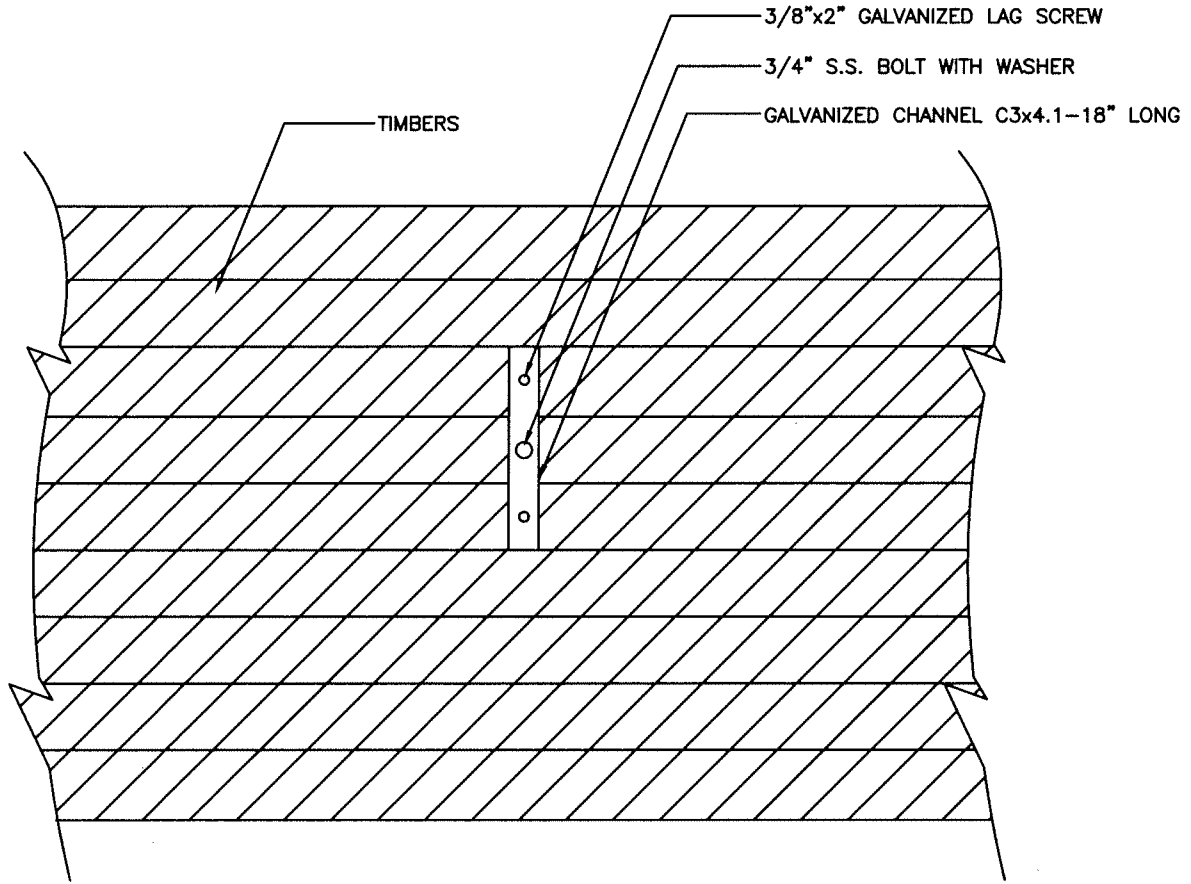
PLAN



SECTION A-A

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 5/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN TURNBUCKLE SUPPORT ASSEMBLY PLAN & SECTION	REVISED	PS S3-1
	<i>[Signature]</i> DESIGN ENGINEER			





SIDE VIEW

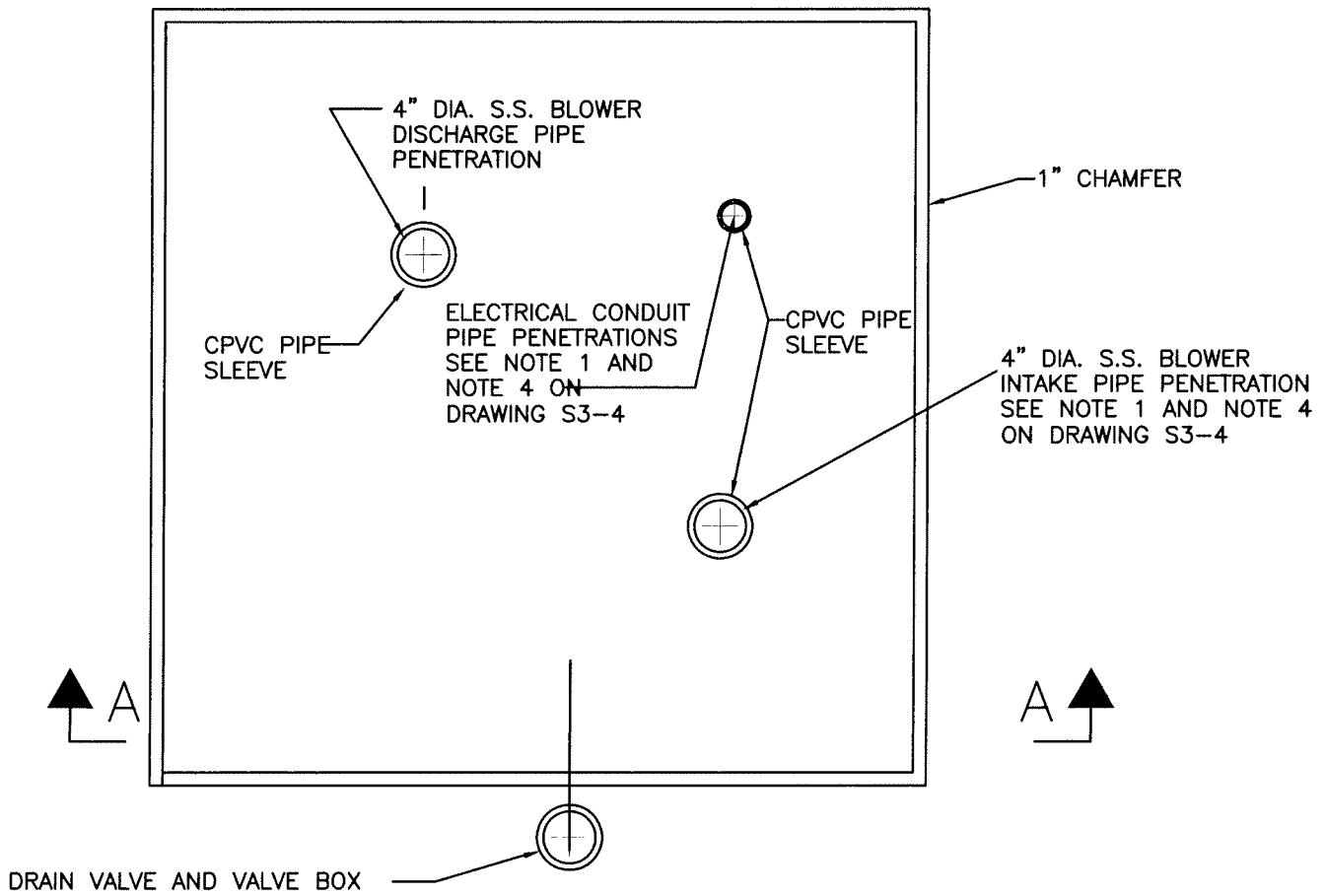
NOTE



The Contractor shall countersink the galvanized C-channel into the pressure treated timbers as shown on the plans. The width and depth of the countersunk groove shall be made within 1/2-inch of the C-channel's width and depth. Grooves constructed exceeding this tolerance will not be approved and the timbers will be removed from the project.

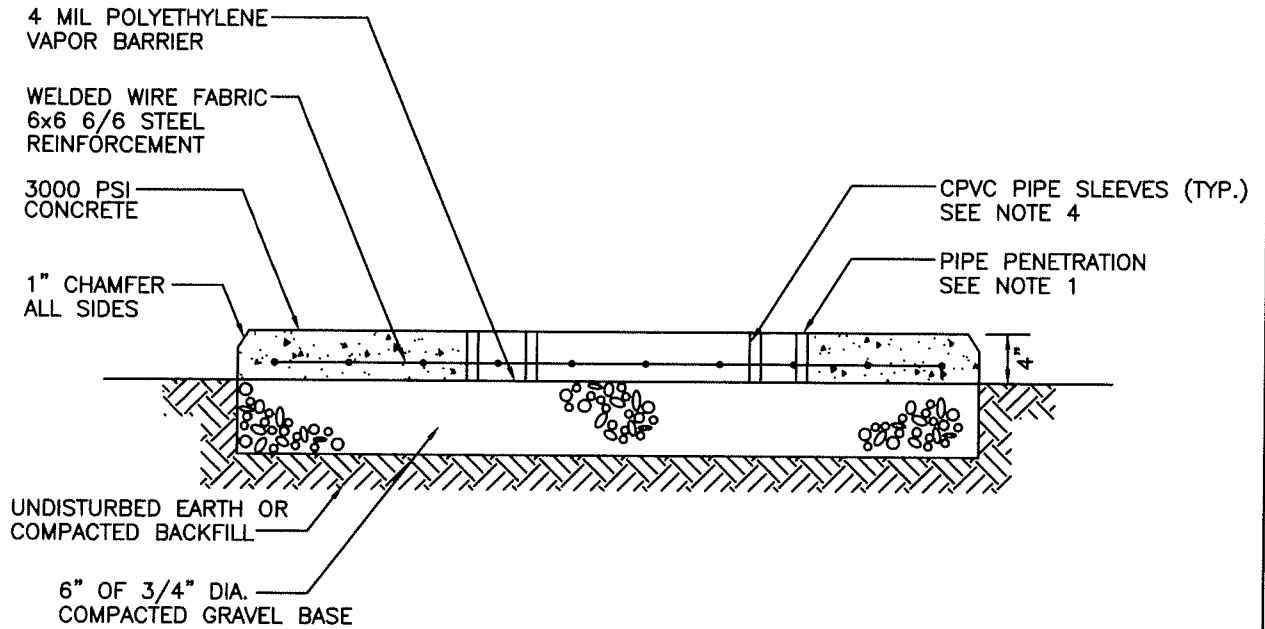
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN BIO-FILTER TURNBUCKLE SUPPORT ASSEMBLY SIDE VIEW AND NOTES	REVISED	PS S3-2
	<i>[Signature]</i> 8/10/11 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	

NOTE:

- SIZE OF PAD AND LOCATION OF PENETRATIONS TO SUIT BLOWER AND ENCLOSURE



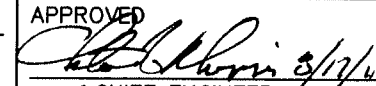

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  SOIL ODOR FILTER BLOWER PAD DETAIL - PLAN VIEW	REVISED	PS S3-3
	 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	



## SECTION A-A

### NOTES

- 1) PIPE PENETRATIONS AND ELECTRICAL CONDUIT ENTRANCE LOCATIONS SHOWN ARE APPROXIMATE AND HAVE BEEN LOCATED TO AVOID ANY PIPE PENETRATION OF THE FIBERGLASS ENCLOSURE. THE CONTRACTOR IS RESPONSIBLE FOR FIELD LOCATING ALL SLAB PENETRATIONS AND ENTRANCES TO ACCOMMODATE THE INSTALLED EQUIPMENT.
- 2) BLOWER ENCLOSURE INTERIOR TO INCLUDE SOUND PROOFING.
- 3) PIPE PENETRATIONS THROUGH THE FIBERGLASS ENCLOSURE WILL NOT BE PERMITTED.
- 4) ALL PIPE PENETRATIONS THROUGH THE CONCRETE SOIL ODOR FILTER PAD TO PASS THROUGH CPVC PIPE SLEEVE 1" DIAMETER LARGER THAN THE PIPE PENETRATION REQUIRED. SPACE BETWEEN SLEEVE AND PENETRATING PIPE TO REMAIN OPEN.
- 5) ALL BLOWER INTER-CONNECTING PIPING WITHIN THE BLOWER ENCLOSURE SHALL BE SCH 40 S.S.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN SOIL ODOR FILTER BLOWER PAD DETAIL - SECTION AND NOTES	REVISED	PS S3-4
	 DESIGN ENGINEER			

SOIL ODOR FILTER PLAN

DWG. S4-1

BYPASS DRAIN VALVE  
AND VALVE BOX DETAIL  
PLAN AND SECTION

DWG. S4-2

SOIL ODOR FILTER STRUCTURE

NOTES

DWG. S4-3

WET/DRY WELL  SUBMERSIBLE

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED

*[Signature]*  
CHIEF ENGINEER

*[Signature]*  
DESIGN ENGINEER

REVISED

PS  
S-4

REFERENCE SEWAGE PUMPING STATION DESIGN  
STRUCTURAL  
ODOR CONTROL  
PLANS, SECTIONS AND NOTES

B/S5-1B

PIPE SUPPORT - TWO REQUIRED ON EACH SPRINKLER RISER

3/8" X 8" STAINLESS STEEL LAG SCREW TWO REQUIRED FOR EACH SUPPORT.  
STAINLESS STEEL SPIKES FOR TOP COURSE ONLY. ALL OTHER COURSES TO USE 3/8" X 8" STAINLESS STEEL LAG SCREWS

NO. 57 GRAVEL PIPE BED.

4" X 4" TEE WITH RISER AND THREADED CAP.  
SOLVENT WELL CAP.

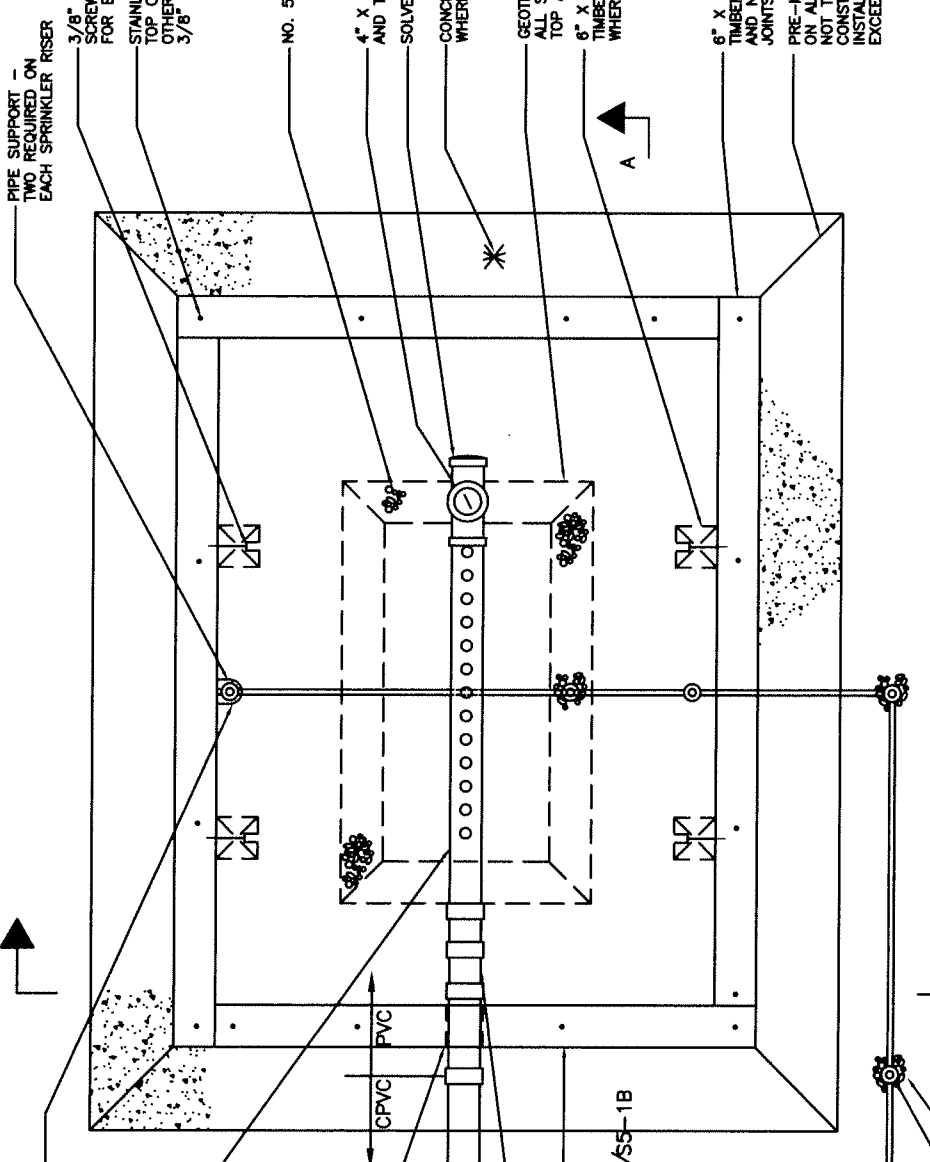
CONCRETE MOWING STRIP WHERE REQUIRED.

GEOTEXTILE COVER OVER ALL STONE SURFACES - TOP AND SIDES.

6" X 6" PRESSURE TREATED TIMBER VERTICAL SUPPORTS WHERE REQUIRED.

6" X 6" PRESSURE TREATED TIMBERS. MINIMUM LENGTHS AND NUMBER OF PERMISSIBLE JOINTS PROVIDED ON SHEET NO.

PRE-MOLDED EXPANSION JOINT ON ALL CORNERS AND AT INTERVALS NOT TO EXCEED 12 FEET. CONSTRUCTION JOINTS TO BE INSTALLED AT INTERVALS NOT TO EXCEED 4 FEET.



POP UP SPRINKLERS

4" DIA. PERFORATED PVC AIR PIPE PERFORATIONS AT 3, 6, 9, AND 12 O'CLOCK. PERFORATIONS TO BE ON 6" CENTERS IN GRAVEL BED ONLY.

ANY PIPE PENETRATION OF TIMBER STRUCTURE TO INCLUDE MECHANICAL LINK SEAL

FROM ODOR FILTER BLOWER

PVC AIR DISTRIBUTION PIPING.

EXPANSION JOINT BETWEEN ALL CONCRETE AND TIMBER FACES.

CURB VALVE WITH DRAIN RISER AND CAP.

AUTOMATIC DRAIN VALVE (TYP.)

NO. 57 GRAVEL DRAIN BED. STONE TO BE INSTALLED 2 FEET ON ALL SIDES OF VALVE. (TYP.)

NOTE: SEE DRAWING S4-3 FOR ADDITIONAL NOTES

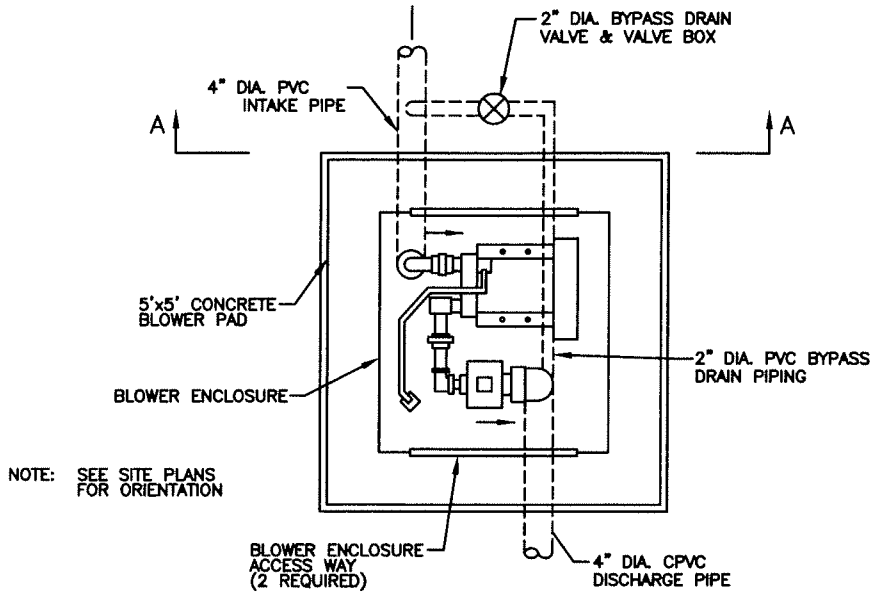
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011

APPROVED: [Signature] 8/17/11 CHIEF ENGINEER [Signature] DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN SOIL ODOR FILTER PLAN VIEW

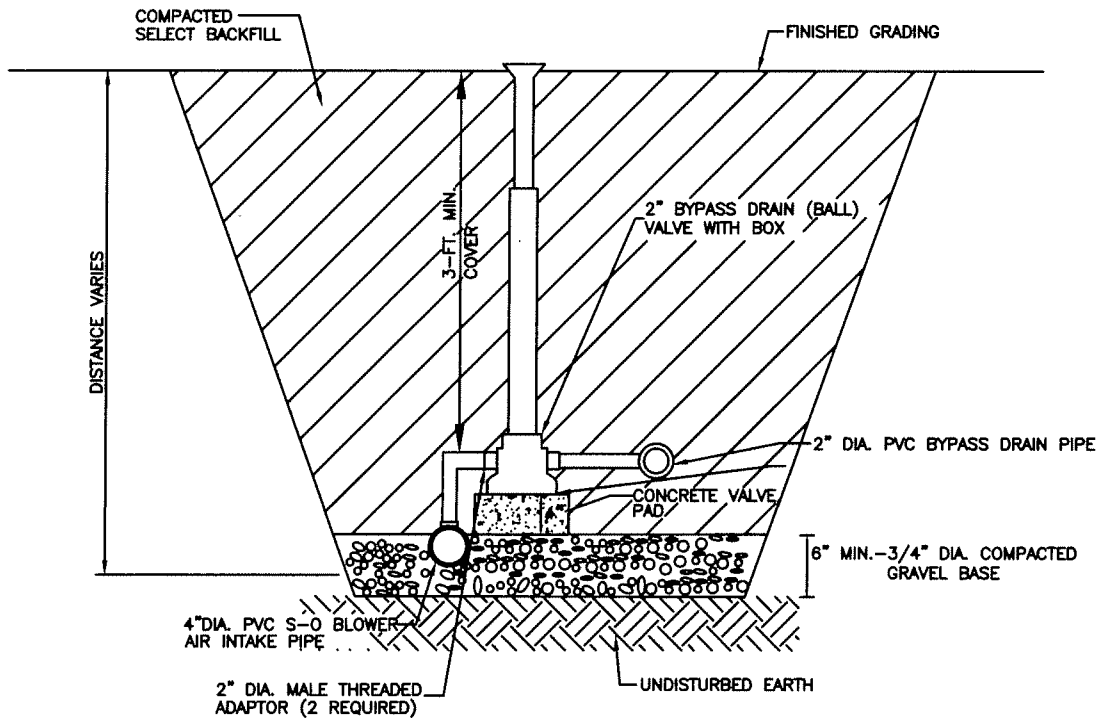
REVISED

PS S4-1





**PLAN - BYPASS DRAIN VALVE  
AND VALVE BOX DETAIL**

SCALE: N.T.S.




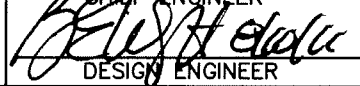
**SECTION A-A  
BYPASS DRAIN VALVE**

SCALE: N.T.S.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN BYPASS DRAIN VALVE AND BOX DETAILS	REVISED	PS S4-2
	 DESIGN ENGINEER			

SOIL ODOR FILTER STRUCTURE

1. THE PRESSURE TREATED TIMBERS SHALL BE MARINE GRADE AND BE TREATED WITH 100 % PURE OXIDE FORM OF CHROMATE COPPER ARSENATE (CCA) AT A RATE OF 2.5 LBS. CCA PER CUBIC FOOT OF WOOD. COMMON GRADE, GROUND CONTACT, PRESSURE TREATED TIMBERS WILL NOT BE APPROVED FOR USE IN CONSTRUCTING THE FILTER STRUCTURE.
2. DURING CONSTRUCTION OF THE TIMBER FILTER STRUCTURE, INDIVIDUAL TIMBERS SHALL BE PLACED SUCH THAT THE "BEST SIDE" IS FACING OUT. ONCE TIMBER STRUCTURE IS ERECTED, LINE INSIDE FACE OF TIMBERS WITH 10-MIL BLACK POLYETHYLENE SHEETING.
3. ALL IRRIGATION PIPING SHALL MAINTAIN POSITIVE SLOPE AND DRAIN TO EITHER THE AUTOMATIC DRAIN VALVE OR THE CURB VALVE. PIPING BETWEEN THE CURB VALVE AND SOLENOID VALVE SHALL DRAIN TO THE CURB VALVE.
4. SEALANT BETWEEN TIMBER COURSES SHALL BE ONE PART POLYURETHANE, EXTRUDABLE SWELLING WATERSTOP SEAL BETWEEN ALL LAYERS EXCEPT TOP COURSE (TWO PARALLEL BEADS).
5. THE SEALANT SHALL BE PLACED BETWEEN THE TIMBER COURSES IN ONE CONTINUOUS STRIP. WHERE IT IS NECESSARY TO JOIN MULTIPLE STRIPS OF SEALANT THE ENDS SHALL BE OVERLAPPED SUFFICIENTLY SO THAT DURING COMPRESSION THE SEALANT MATERIAL WILL FORM A SINGLE, CONTINUOUS BOND.
6. THE SEALANT SHALL BE PLACED SUCH THAT DURING COMPRESSION ANY EXCESS SEALANT IS PUSHED TOWARDS THE INSIDE OF THE FILTER STRUCTURE. ANY MATERIAL PUSHED PAST THE OUTSIDE FACE OF THE FILTER STRUCTURE SHALL BE NEATLY REMOVED. DURING REMOVAL OF ANY EXCESS SEALANT THE INDIVIDUAL TIMBERS SHALL BE PROTECTED FROM DAMAGE DAMAGED TIMBERS SHALL NOT BE APPROVED AND WILL BE REMOVED FROM THE PROJECT.
7. THE SEALANT AND LAG SCREW ASSEMBLIES SHALL BE USED TO FASTEN ALL TIMBER COURSES EXCEPT THE TOP COURSE. THE TOP COURSE OF TIMBERS SHALL BE FASTENED USING GALVANIZED SPIKES AND WILL NOT REQUIRE THE SEALANT.
8. DURING INSTALLATION OF THE TIMBERS ALL NECESSARY PRECAUTIONS SHALL BE MADE TO ENSURE THAT INDIVIDUAL TIMBERS ARE NOT SPLIT. THIS INCLUDES DRILLING ALL PILOT AND COUNTERSINK HOLES. ALL SPLIT TIMBERS SHALL BE REMOVED FROM THE PROJECT.
9. THERE SHALL BE ONE LAG SCREW ASSEMBLY OR SPIKE LOCATED AT THE END OF EACH TIMBER. LAG SCREW ASSEMBLIES SHALL BE SPACED A MINIMUM OF 2 FEET ON CENTER.
10. ALL LAG SCREW ASSEMBLIES SHALL BE TIGHTENED TO ENSURE FULL COMPRESSION OF THE SEAL. THE OUTSIDE FACE OF THE TIMBERS SHOULD REVEAL LESS THAN A 1/8-INCH SPACE.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN SOIL ODOR FILTER STRUCTURE NOTES	REVISED	PS S4-3
	 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	

SOIL ODOR FILTER SECTIONS  
(ABOVE OR BELOW GRADE)

DWG. S5-1A OR 1B

ODOR FILTER PIPING  
TRENCH DETAIL

DWG. S5-2

PROJECT SPECIFIC

WET/DRY WELL

SUBMERSIBLE

ANNE ARUNDEL COUNTY  
DEPARTMENT OF PUBLIC WORKS  
DATE: MAY 2011

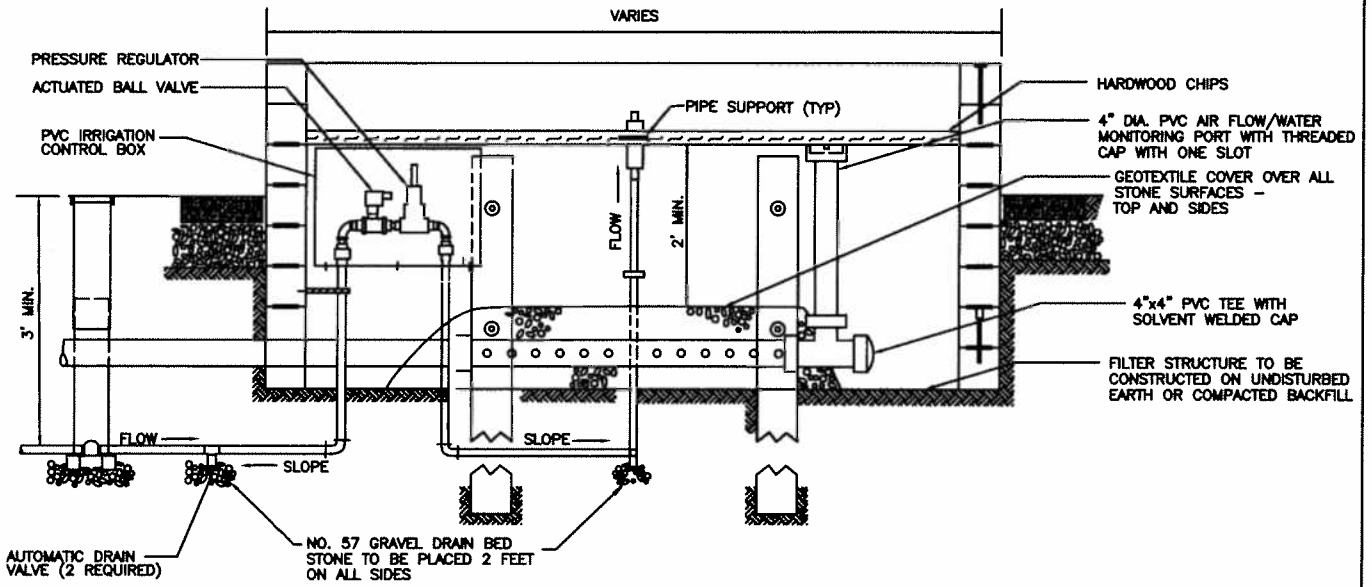
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*[Signature]*  
CHIEF ENGINEER  
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DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
STRUCTURAL  
SOIL ODOR FILTER  
SECTIONS AND DETAILS

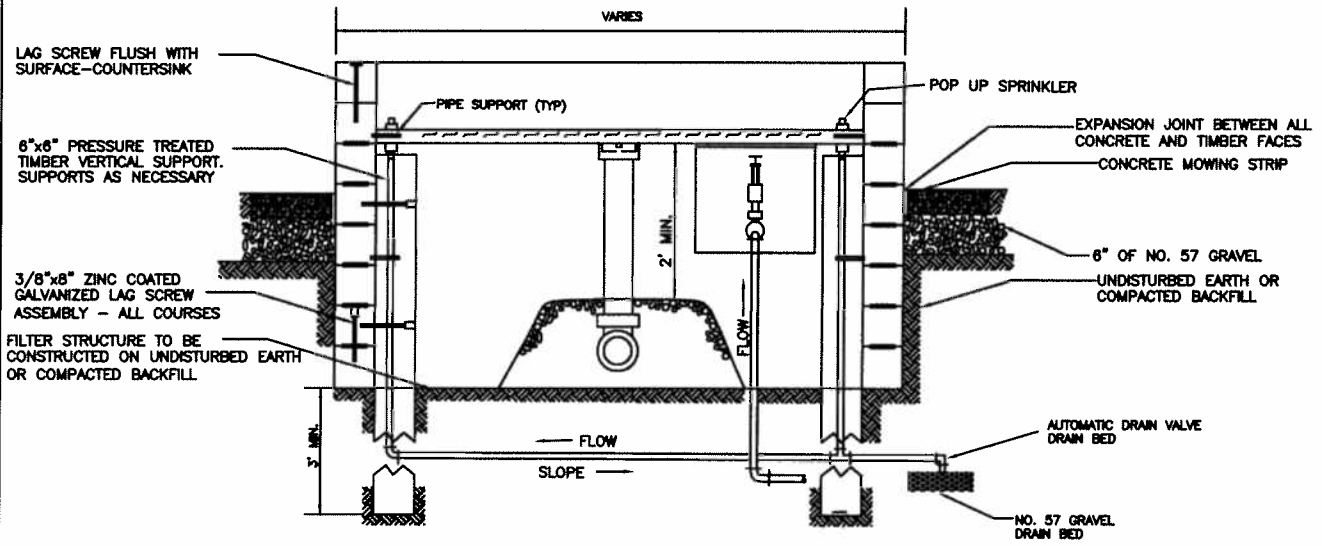
REVISED

PS  
S-5



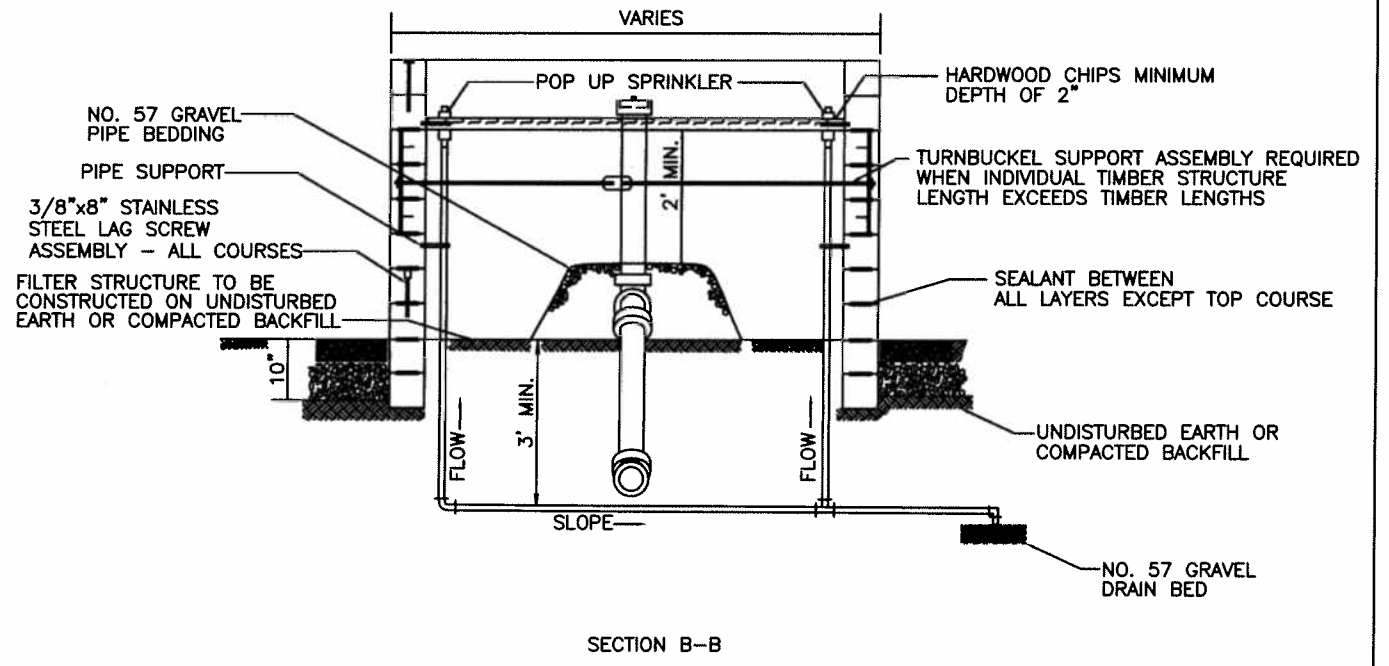
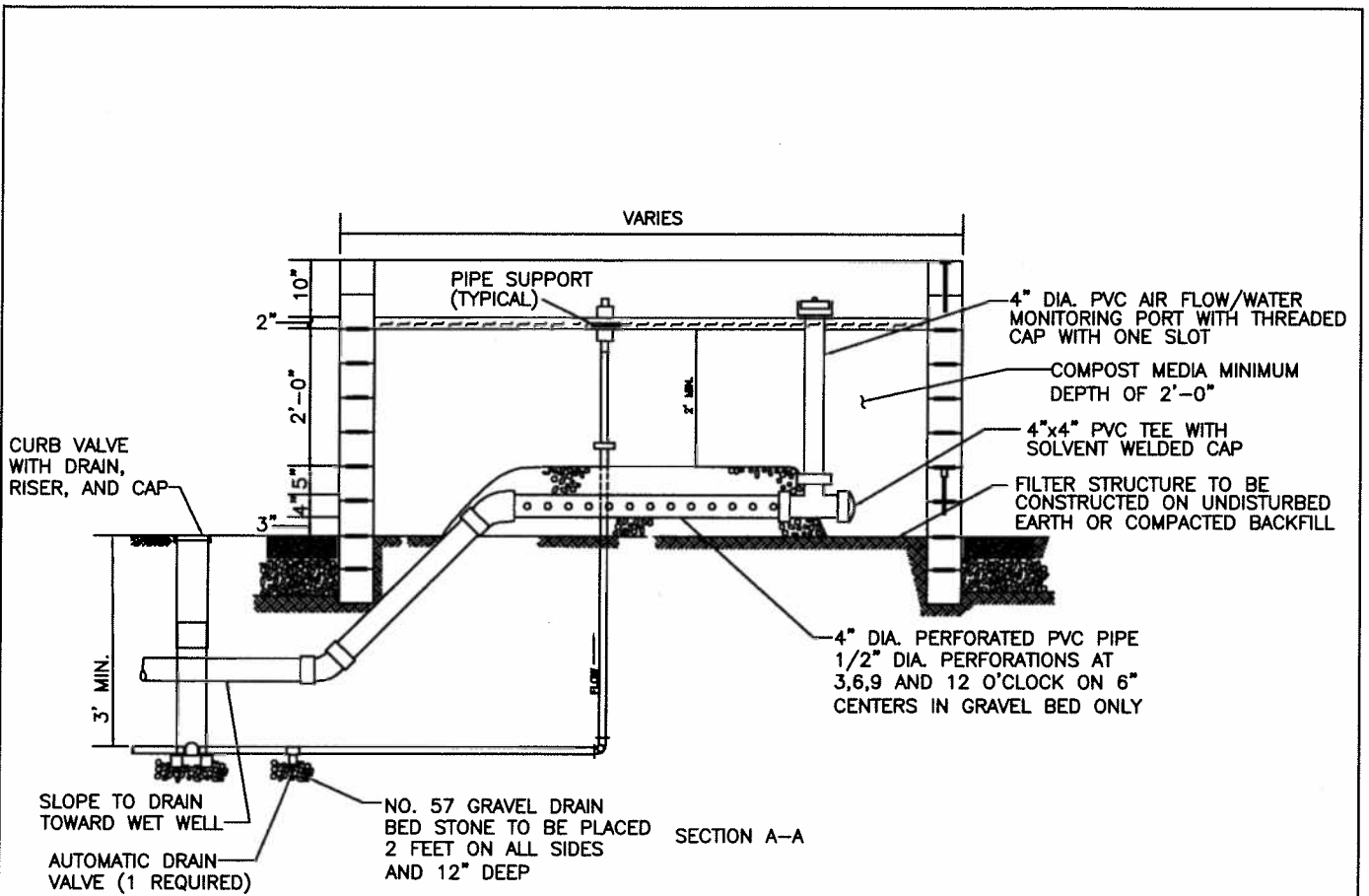


SECTION A-A

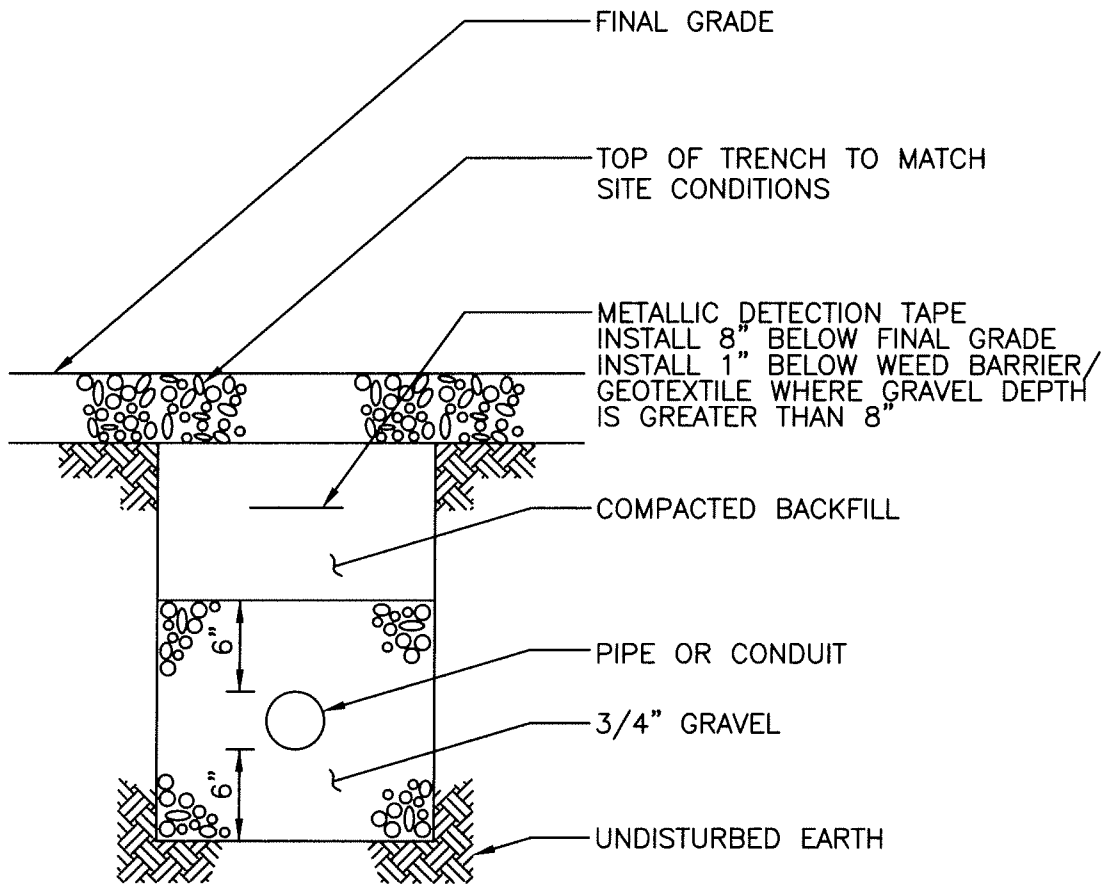


SECTION B-B

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 5/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN SOIL ODOR FILTER BELOW GRADE INSTALLATION SECTIONS	REVISED	PS S5-1A
	DESIGN ENGINEER <i>[Signature]</i>			



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN SOIL ODOR FILTER ABOVE GRADE INSTALLATION SECTIONS	REVISED	PS S5-1B
	<i>[Signature]</i> DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	
	_____		_____	



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>Charles R. ... 3/17/11</i> CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  ODOR FILTER PIPING TRENCH DETAIL	REVISED	PS S5-2
	<i>BEWA 8/10/11</i> DESIGN ENGINEER		 	

PUMP AND  
SYSTEM CURVE  
DWG. M1-1

SERVICE AREA  
DESIGN FLOWS  
DWG. M1-4

BUBBLER LINE  
TRANSITION IN  
WET WELL  
DWG. M1-7



PUMP STATION  
PLAN (TOP SLAB)  
DWG. M1-2A

PUMP STATION  
SECTION  
DWG. M1-5A

PUMP STATION  
PLAN (TOP SLAB REMOVED)  
DWG. M1-3A

PUMP STATION  
SECTION  
DWG. M1-6A

WET/DRY WELL  SUBMERSIBLE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN MECHANICAL PLAN, SECTIONS AND PUMP CURVES	REVISED	PS
	DESIGN ENGINEER 			M-1A

PUMP AND SYSTEM CURVE  
DWG. M1-1

SERVICE AREA DESIGN FLOWS  
DWG. M1-4

BUBBLER LINE TRANSITION IN WET WELL  
DWG. M1-7

PUMP STATION PLAN (TOP SLAB)  
DWG. M1-2B

VALVE VAULT SECTION  
DWG. M1-5B

PUMP STATION PLAN (TOP SLAB REMOVED)  
DWG. M1-3B & 3C

WET WELL/VALVE VAULT SECTION  
DWG. M1-6B

WET/DRY WELL

SUBMERSIBLE

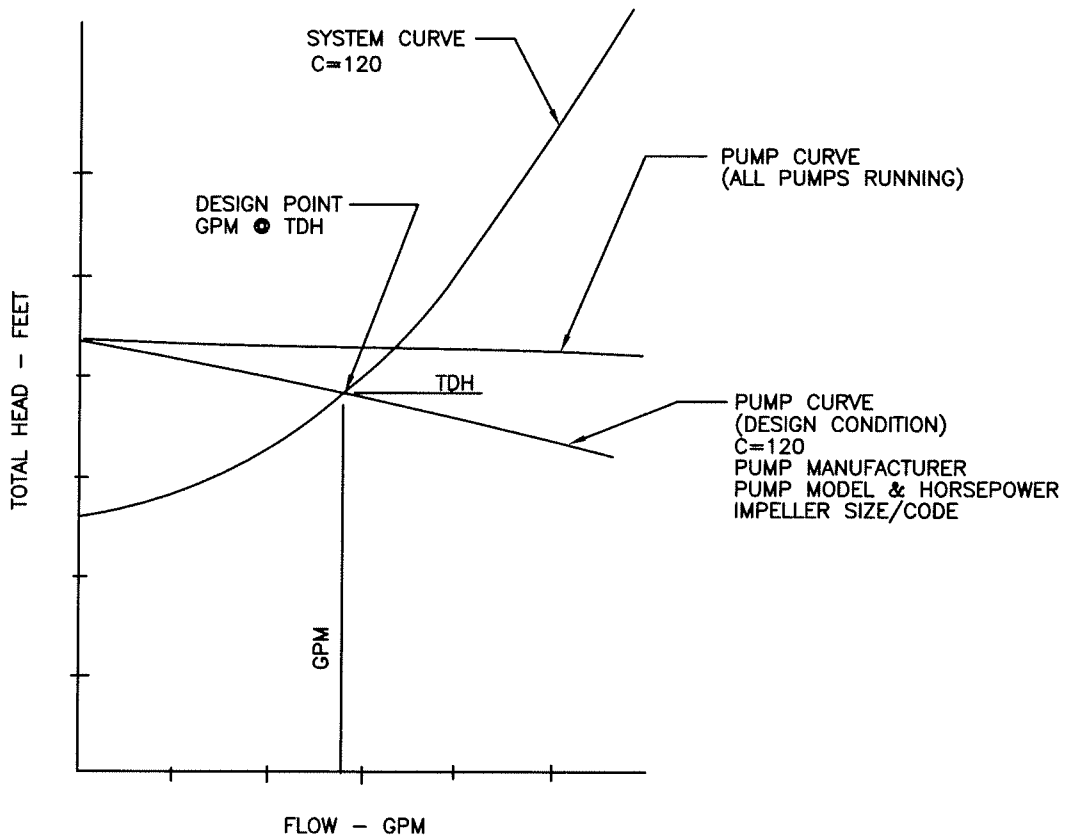
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]* CHIEF ENGINEER  
*[Signature]* DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN MECHANICAL PLAN, SECTIONS AND PUMP CURVES

REVISED

PS  
M-1B



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 3/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN PUMP AND SYSTEM CURVE	REVISED	PS M1-1
	<i>[Signature]</i> DESIGN ENGINEER		_____	
	_____			
	_____			

PUMP STATION  
BUILDING MECHANICAL  
PLAN  
DWG. M2-1

PUMP STATION DRY  
WELL MECHANICAL  
PLAN  
DWG. M2-2A

TIE ROD  
DETAIL  
DWG. M2-3

BUBBLER SYSTEM  
PNEUMATIC DIAGRAM  
(ABOVE OR BELOW GRADE)  
DWG. M2-5

AIR COMPRESSOR  
DIAGRAM  
DWG. M2-6

PRESSURE GAUGE  
DETAIL  
DWG. M2-4

PIPE SUPPORT  
DETAIL  
DWG. M2-7

WET/DRY WELL

SUBMERSIBLE

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY, 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
MECHANICAL  
PLAN AND DETAILS

REVISED

PS  
M-2A

PUMP STATION  
BUILDING MECHANICAL  
PLAN  
  
DWG. M2-1

PUMP STATION WET  
WELL MECHANICAL  
PLAN  
  
DWG. M2-2B

TIE ROD  
DETAIL  
  
DWG. M2-3

BUBBLER SYSTEM  
PNEUMATIC DIAGRAM  
  
DWG. M2-5

AIR COMPRESSOR  
DIAGRAM  
  
DWG. M2-6

PRESSURE GAUGE  
DETAIL  
  
DWG. M2-4

PIPE SUPPORT  
DETAIL  
  
DWG. M2-7

WET/DRY WELL

SUBMERSIBLE

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

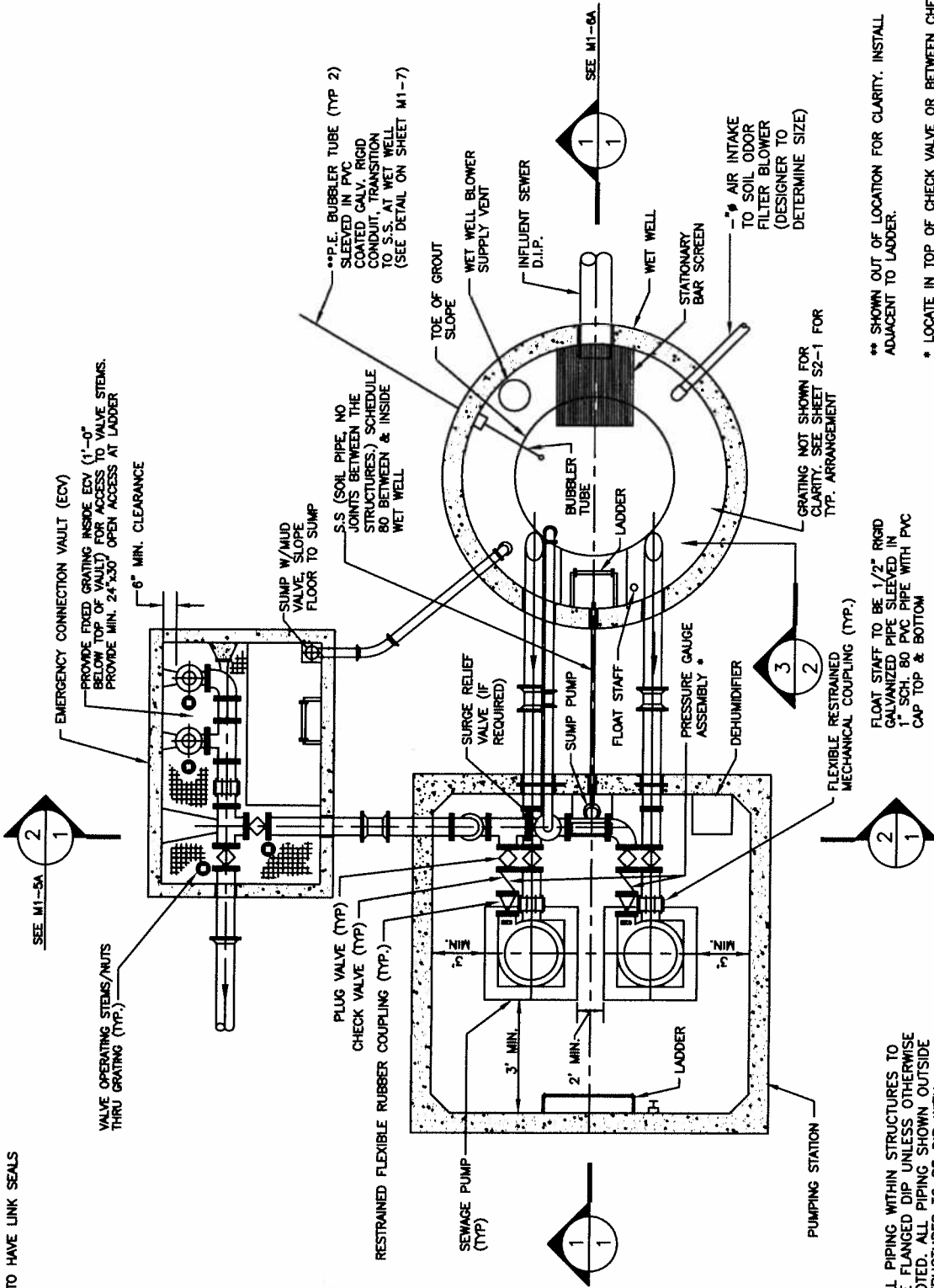
REFERENCE SEWAGE PUMPING STATION DESIGN  
MECHANICAL  
PLAN AND DETAILS

REVISED

PS  
M-2B



• ALL PIPE PENETRATIONS TO HAVE LINK SEALS



\*\* SHOWN OUT OF LOCATION FOR CLARITY. INSTALL ADJACENT TO LADDER.

\* LOCATE IN TOP OF CHECK VALVE OR BETWEEN CHECK VALVE AND PLUG VALVE

ALL PIPING WITHIN STRUCTURES TO BE FLANGED DIP UNLESS OTHERWISE NOTED. ALL PIPING SHOWN OUTSIDE STRUCTURES TO BE DIP WITH RESTRAINED MECHANICAL JOINTS.

APPROVED

*[Signature]* 8/17/11

CHIEF ENGINEER

*[Signature]*

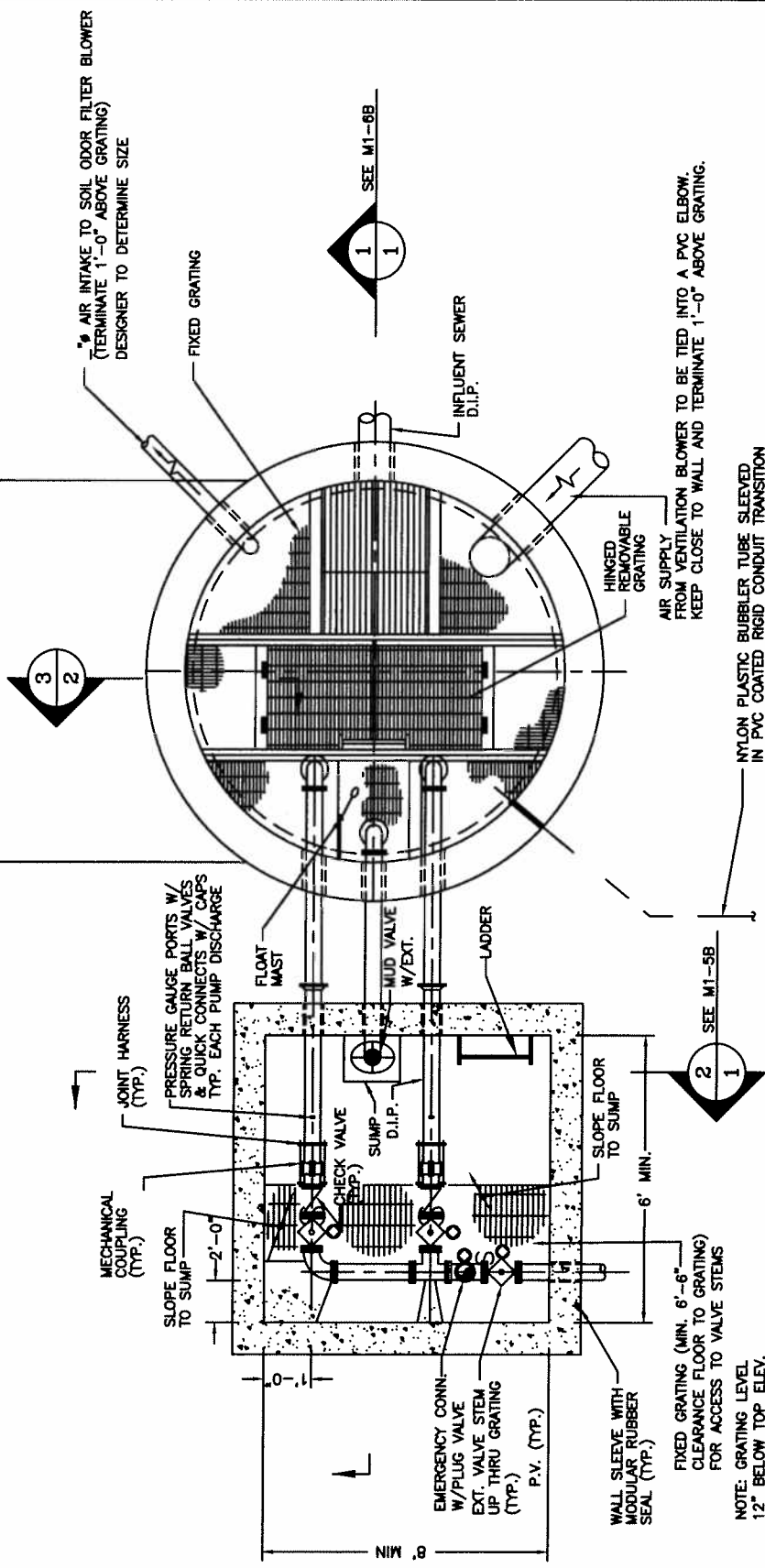
DESIGN ENGINEER

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS  
 DATE: MAY 2011

REFERENCE SEWAGE PUMPING STATION DESIGN  
 PUMP STATION (TOP SLAB REMOVED)  
 PLAN VIEW  
 WET/DRY WELL

REVISED	PS
	M1-3A

\* ALL PIPE PENETRATIONS SHALL HAVE LINK SEALS

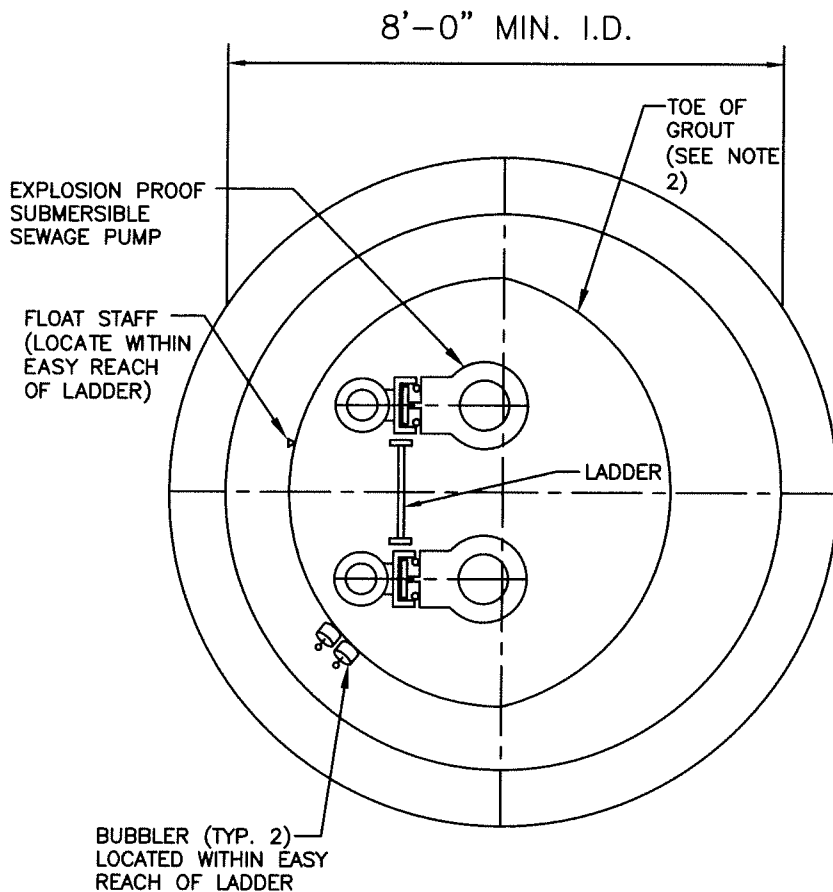


NOTES:

1. ALL PIPING WITHIN STRUCTURE TO BE FLANGED D.I.P. UNLESS OTHERWISE NOTED. ALL PIPING SHOWN OUTSIDE STRUCTURE TO BE D.I.P. WITH RESTRAINED MECHANICAL JOINTS.
2. PROVIDE MAXIMUM OPEN ACCESS TO VALVE VAULT USING ONE OR MORE ALUMINUM HATCHES. ALL EXTENSION STEMS AND LADDERWAY SHALL BE CLEARLY ACCESSIBLE BELOW HATCH OPENING.
3. WETWELL IS RATED CLASS 1, DIVISION 1 HAZARDOUS AREA. ALL EQUIPMENT SHALL BE MINIMUM 5 FEET FROM WETWELL AREA.

S = SEAT SIDE OF VALVE

<p>ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011</p>	<p>APPROVED: <i>[Signature]</i> 5/17/11          CHIEF ENGINEER  <i>[Signature]</i>          DESIGN ENGINEER</p>	<p>REFERENCE SEWAGE PUMPING STATION DESIGN PUMP STATION AND VALVE VAULT ( TOP SLAB REMOVED ) - PLAN VIEW SUBMERSIBLE</p>	<p>REVISED          PS          M1-3B</p>
--	--	--	---



NOTE:



1. NFPA CLASSIFICATION
2. PROVIDE NON-SHRINK GROUT OR CONCRETE FILL WITH MIN. 2" NON-SHRINK GROUT TOPPING

ALL PIPING WITHIN STRUCTURES TO BE FLANGED DIP UNLESS OTHERWISE NOTED. ALL PIPING SHOWN OUTSIDE STRUCTURES TO BE DIP WITH RESTRAINED MECHANICAL JOINTS.

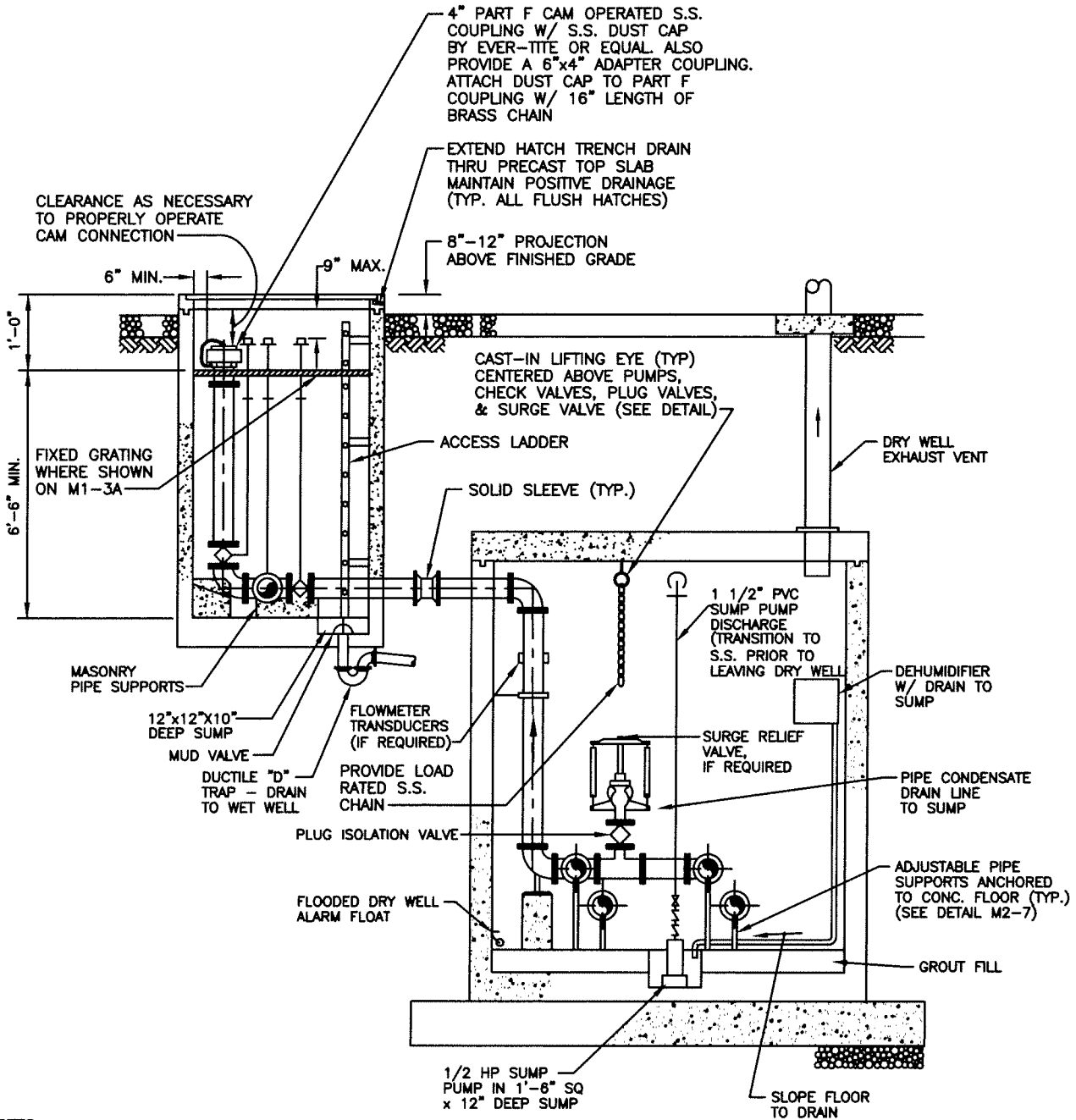
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN PUMP STATION (BELOW GRATING) PLAN VIEW SUBMERSIBLE	REVISED	PS M1-3C
	DESIGN ENGINEER <i>[Signature]</i>			

	PRESENT	ULTIMATE
POPULATION		
AVE. DOMESTIC FLOW, GPCD		
AVG. DOMESTIC FLOW, GPM		
AVG. COMMERCIAL FLOW, GPM		
AVG. INSTITUTIONAL FLOW, GPM		
AVG. TOTAL FLOW, GPM		
PEAK DOMESTIC & COMMERCIAL FLOW, GPM		
INFILTRATION @ 500 GAL/IN. DIA./ MILE PIPE		
DESIGN FLOW GPM		

NOTE: EMERGENCY STORAGE FOR PROTECTION OF SHELLFISH AND SWIMMING WATERS SHALL BE IN ACCORDANCE WITH CURRENT MDE REQUIREMENTS.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  SERVICE AREA DESIGN FLOWS CHART	REVISED	PS M1-4
	 DESIGN ENGINEER			

NOTE: FOR PLAN VIEW, REFER TO M1-3A

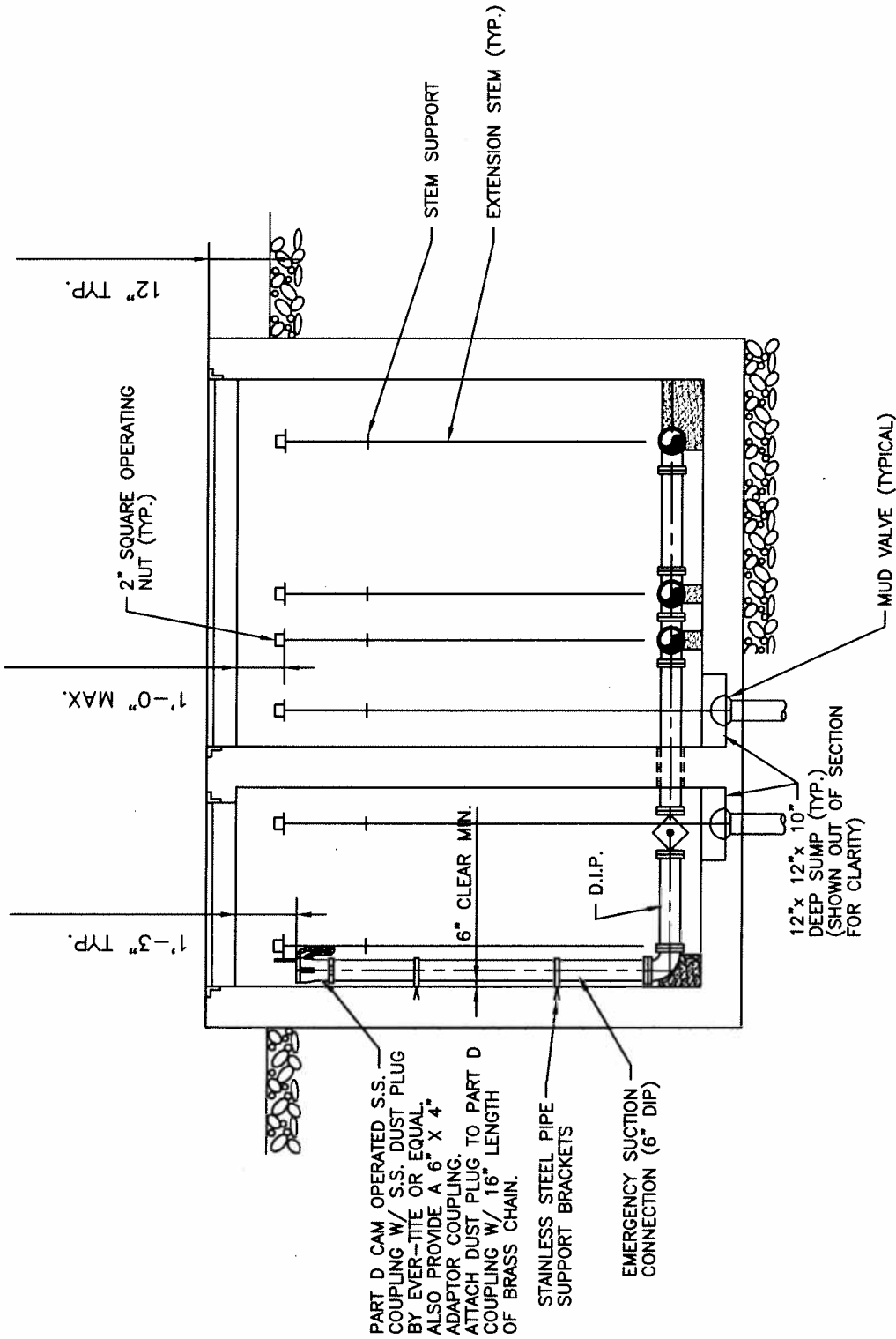


**NOTES:**

1. ALL PIPING WITHIN STRUCTURE TO BE FLANGED D.I.P. UNLESS OTHERWISE NOTED. ALL PIPING SHOWN OUTSIDE STRUCTURE TO BE D.I.P. WITH RESTRAINED MECHANICAL JOINTS.
2. PROVIDE MAXIMUM OPEN ACCESS TO VALVE VAULT USING ONE OR MORE ALUMINUM HATCHES. ALL EXTENSION STEMS AND LADDERWAY SHALL BE CLEARLY ACCESSIBLE BELOW HATCH OPENING.

2 SECTION  
1 (SEE M1-3A)

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER  DESIGN ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  PUMP STATION SECTION WET/DRY WELL	REVISED    PS  M1-5A
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PART D CAM OPERATED S.S. COUPLING W/ S.S. DUST PLUG BY EVER-TITE OR EQUAL. ALSO PROVIDE A 6" X 4" ADAPTOR COUPLING. ATTACH DUST PLUG TO PART D COUPLING W/ 16" LENGTH OF BRASS CHAIN.

STAINLESS STEEL PIPE SUPPORT BRACKETS

EMERGENCY SUCTION CONNECTION (6" DIP)

D.I.P.

12" x 12" x 10" DEEP SUMP (TYP.) (SHOWN OUT OF SECTION FOR CLARITY)

MUD VALVE (TYPICAL)

SECTION 1/2

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

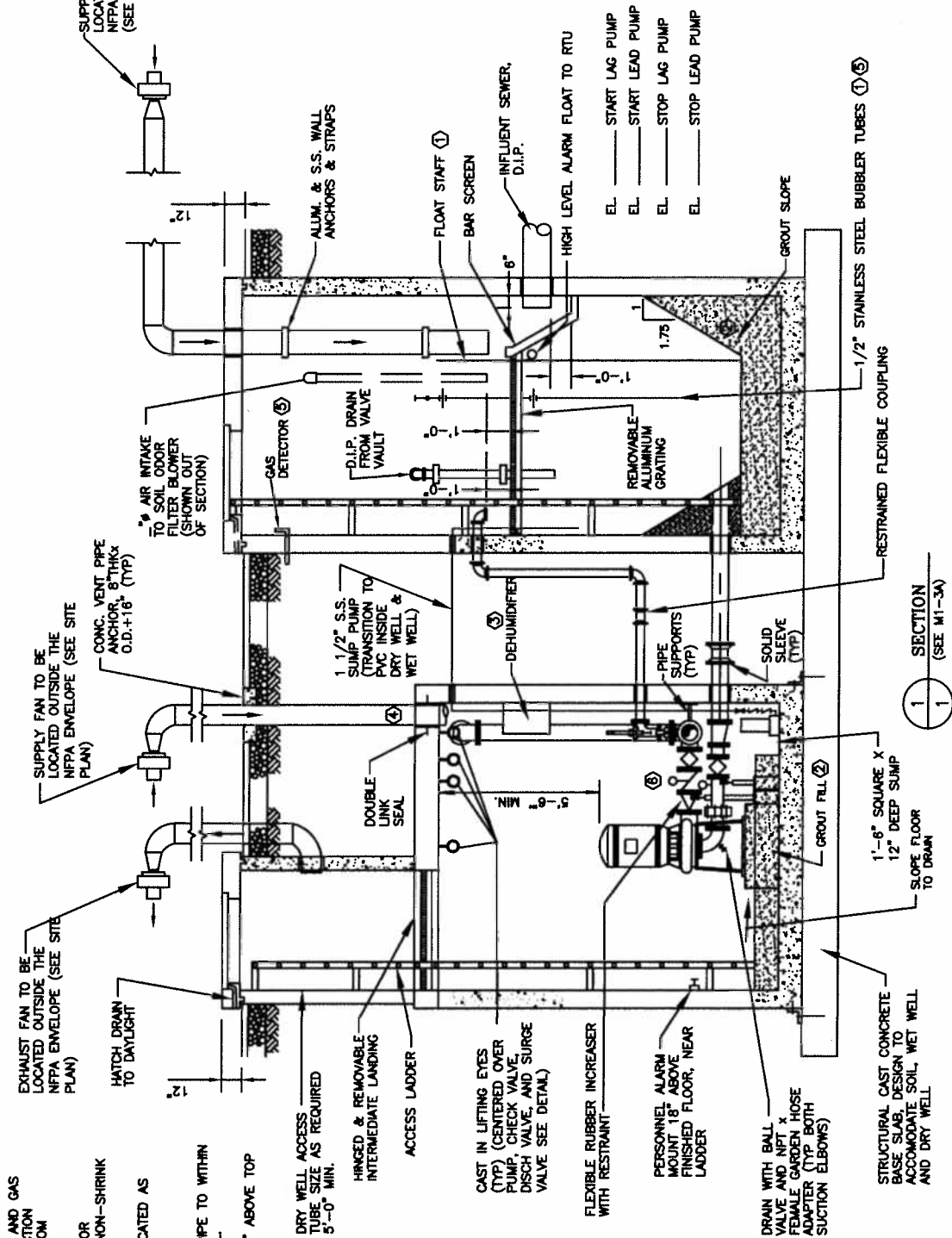
REFERENCE SEWAGE PUMPING STATION DESIGN  
VALVE VAULT SECTION  
SUBMERSIBLE

REVISED

PS  
M1-5B

**NOTES:**

- ① FLOAT STAFF, BUBBLER TUBES AND GAS DETECTOR SHOWN OUT OF SECTION AND SHALL BE ACCESSIBLE FROM LADDER.
- ② PROVIDE NON-SHRINK GROUT OR CONCRETE FILL WITH MIN. 2" NON-SHRINK GROUT TOPPING.
- ③ THE DEHUMIDIFIER WILL BE LOCATED AS APPROVED BY OWNER DURING CONSTRUCTION.
- ④ EXTEND VENTILATION SUPPLY PIPE TO WITHIN 3'-0" OF FLOOR OF DRY WELL.
- ⑤ EXTEND BUBBLER TUBES TO 6" ABOVE TOP OF PUMP SUCTION PIPE.
- ⑥ PROVIDE FOR EACH PUMP: SUCTION AND DISCHARGE PRESSURE GAUGES WITH QUICK CONNECT COUPLINGS AND SPRING RETURN BALL VALVES.

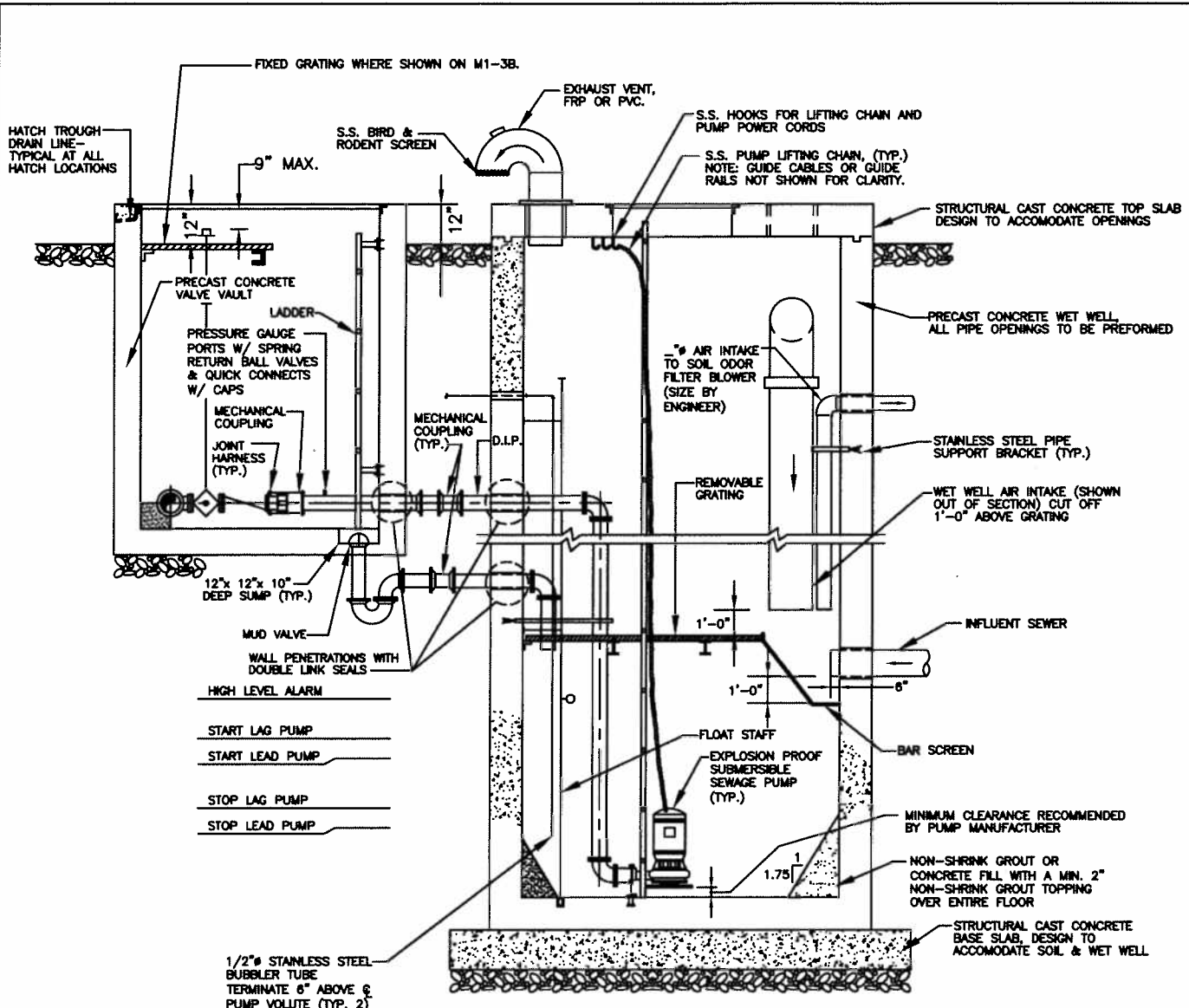


ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS  
 DATE: MAY 2011

APPROVED  
*[Signature]*  
 CHIEF ENGINEER  
*[Signature]*  
 DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
 PUMP STATION SECTION  
 WET/DRY WELL

REVISED	PS
	M1-6A



- \_\_\_\_\_ HIGH LEVEL ALARM
- \_\_\_\_\_ START LAG PUMP
- \_\_\_\_\_ START LEAD PUMP
- \_\_\_\_\_ STOP LAG PUMP
- \_\_\_\_\_ STOP LEAD PUMP

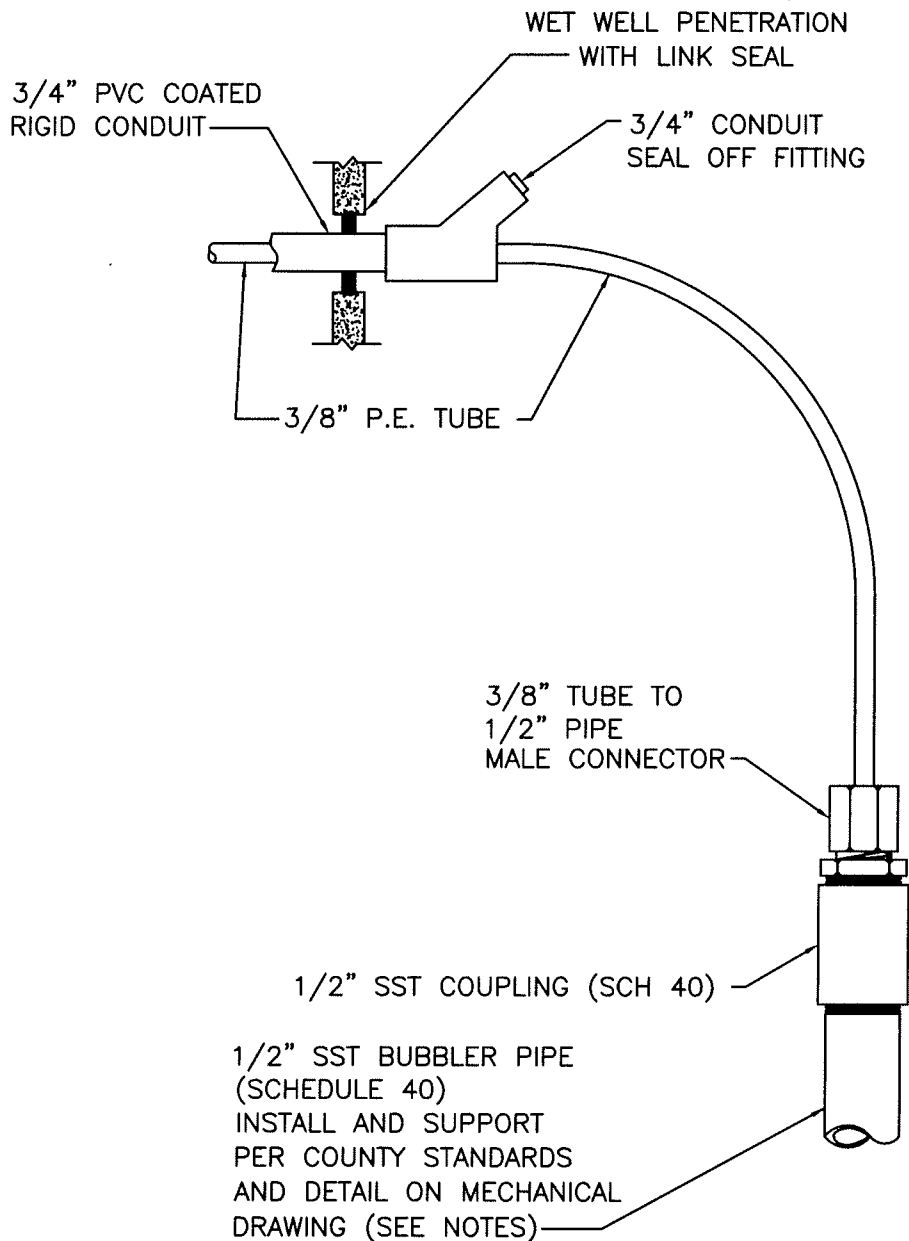
1 SECTION  
1 NOT TO SCALE  
 (SEE M1-3B)

**NOTE:**  
 FLOAT STAFF TO BE 1/2" GALV.  
 PIPE IN 1" SCH. 80 PVC WITH  
 PVC CAP TOP & BOTTOM

- NOTES:**
1. PROVIDE MINIMUM 6" BETWEEN LEVEL CONTROLS. HIGH LEVEL ALARM SHALL BE AT LEAST 6" BELOW BAR SCREEN INVERT.
  2. ALL INTERIOR SURFACES SHALL BE COATED WITH AMINE-CURED EPOXY, EXCEPT FLOOR OF VALVE VAULT. EXTERIOR OF STRUCTURES SHALL BE WATERPROOFED.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER  DESIGN ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN WET WELL/VALVE VAULT SECTION SUBMERSIBLE	REVISED    	PS    M1-6B
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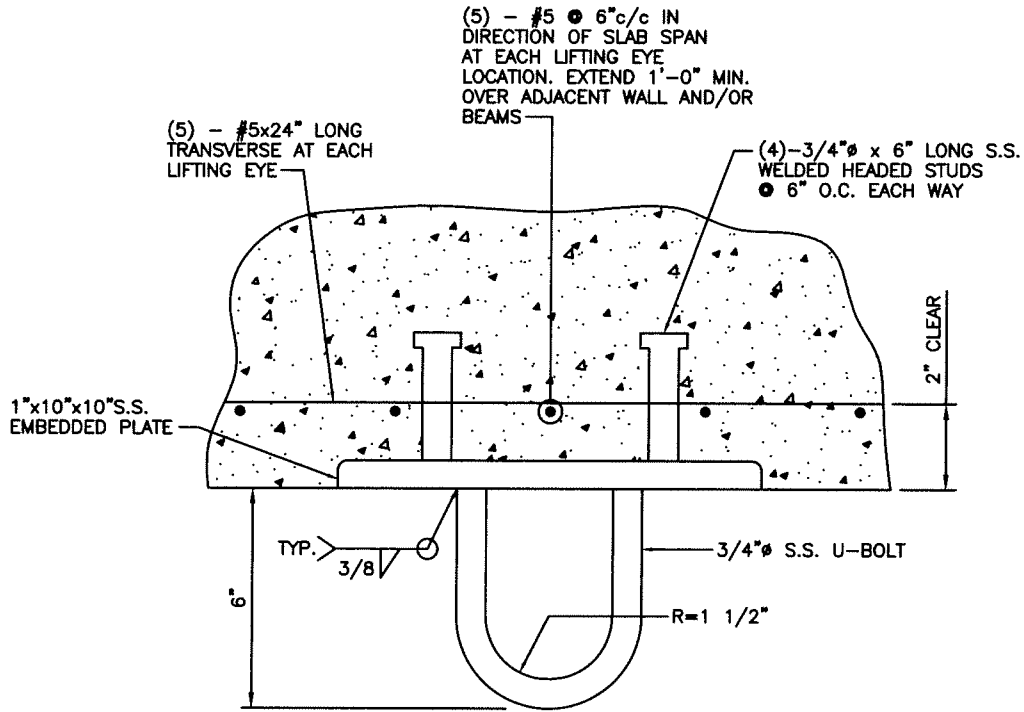
**NOTES:**

1. SST BUBBLER PIPE SHALL BE  $\pm 6$ " FROM WALL.
2. BUBBLER PIPE SUPPORTS IN WETWELL SHALL BE 316 SST AND AT 5 FOOT MAXIMUM SPACING.
3. MOUNT BUBBLER PIPES 12"-18" FROM LADDER

**BUBBLER LINE TRANSITION IN WET WELL (TYP.2)**

NOT TO SCALE



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL BUBBLER LINE TRANSITION IN WET WELL	REVISED	PS M1-7
	 DESIGN ENGINEER			

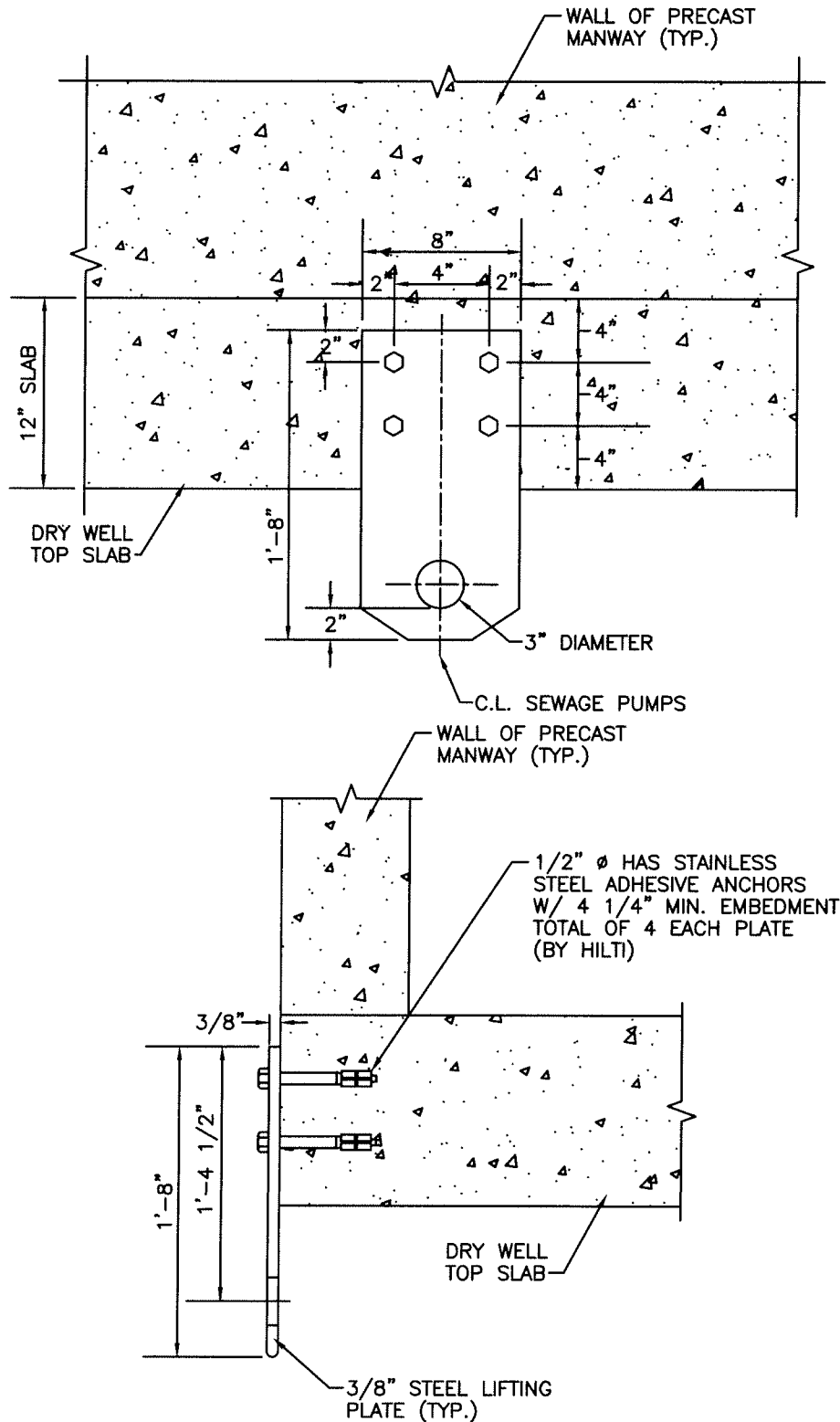


DESIGN CAPACITY = 2 TONS

TYPICAL LIFTING EYE DETAIL

SCALE: N.T.S.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN LIFTING EYE DETAIL	REVISED	PS M1-8
	 DESIGN ENGINEER			



DESIGN CAPACITY = 2 TONS

**LIFTING PLATE DETAIL**

SCALE: N.T.S.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 3/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN LIFTING PLATE DETAIL	REVISED	PS M1-9
	<i>[Signature]</i> DESIGN ENGINEER			

PUMP STATION  
BUILDING MECHANICAL  
PLAN  
DWG. M2-1

PUMP STATION DRY  
WELL MECHANICAL  
PLAN  
DWG. M2-2A

TIE ROD  
DETAIL  
DWG. M2-3

BUBBLER SYSTEM  
PNEUMATIC DIAGRAM  
(ABOVE OR BELOW GRADE)  
DWG. M2-5

AIR COMPRESSOR  
DIAGRAM  
DWG. M2-6

PRESSURE GUAGE  
DETAIL  
DWG. M2-4

PIPE SUPPORT  
DETAIL  
DWG. M2-7

WET/DRY WELL  SUBMERSIBLE

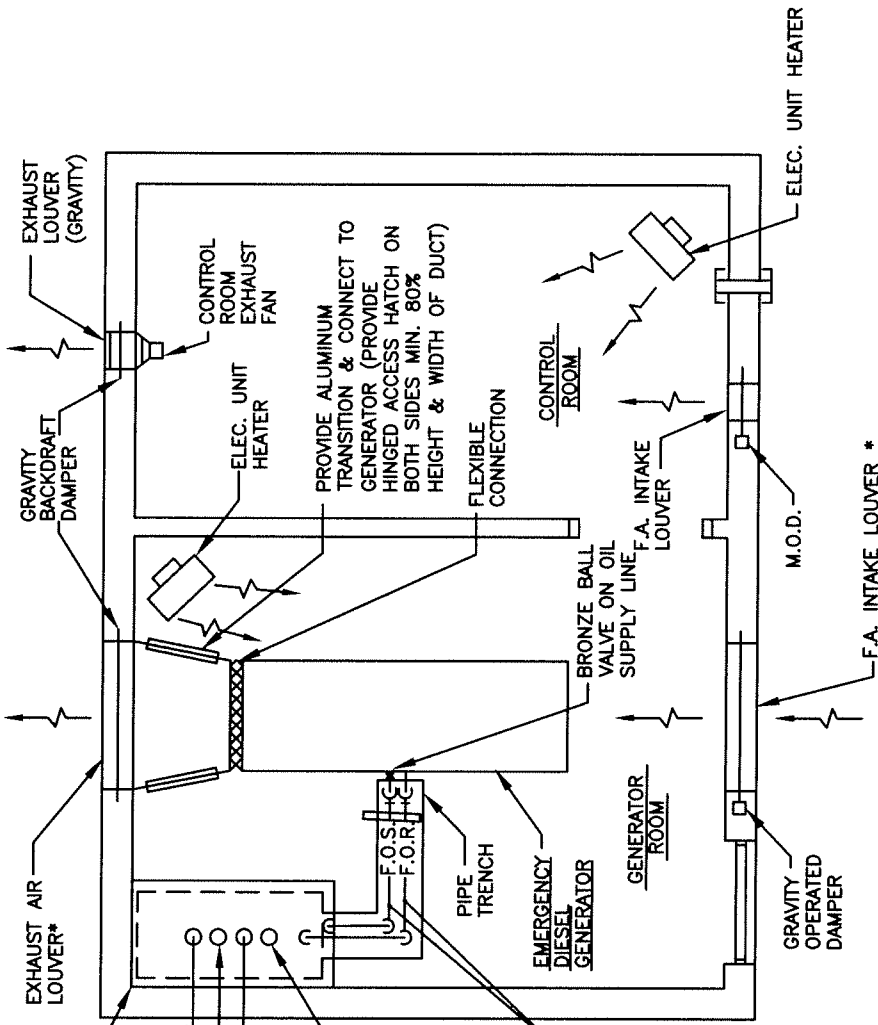
ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
MECHANICAL  
PLAN AND DETAILS

REVISED

PS  
M-2A



DOUBLE WALL OIL TANK (U.L. 142) TANK SHALL BE THE SMALLEST AVAILABLE SIZE TO GIVE 24 HOUR FUEL SUPPLY AT RUNNING LOAD FOR THE GENERATOR SIZE PROVIDED



2" VENT TURN UP 90° AND EXTEND 12" ABOVE GRADE. USE STAINLESS STEEL STANDOFFS FROM BUILDING

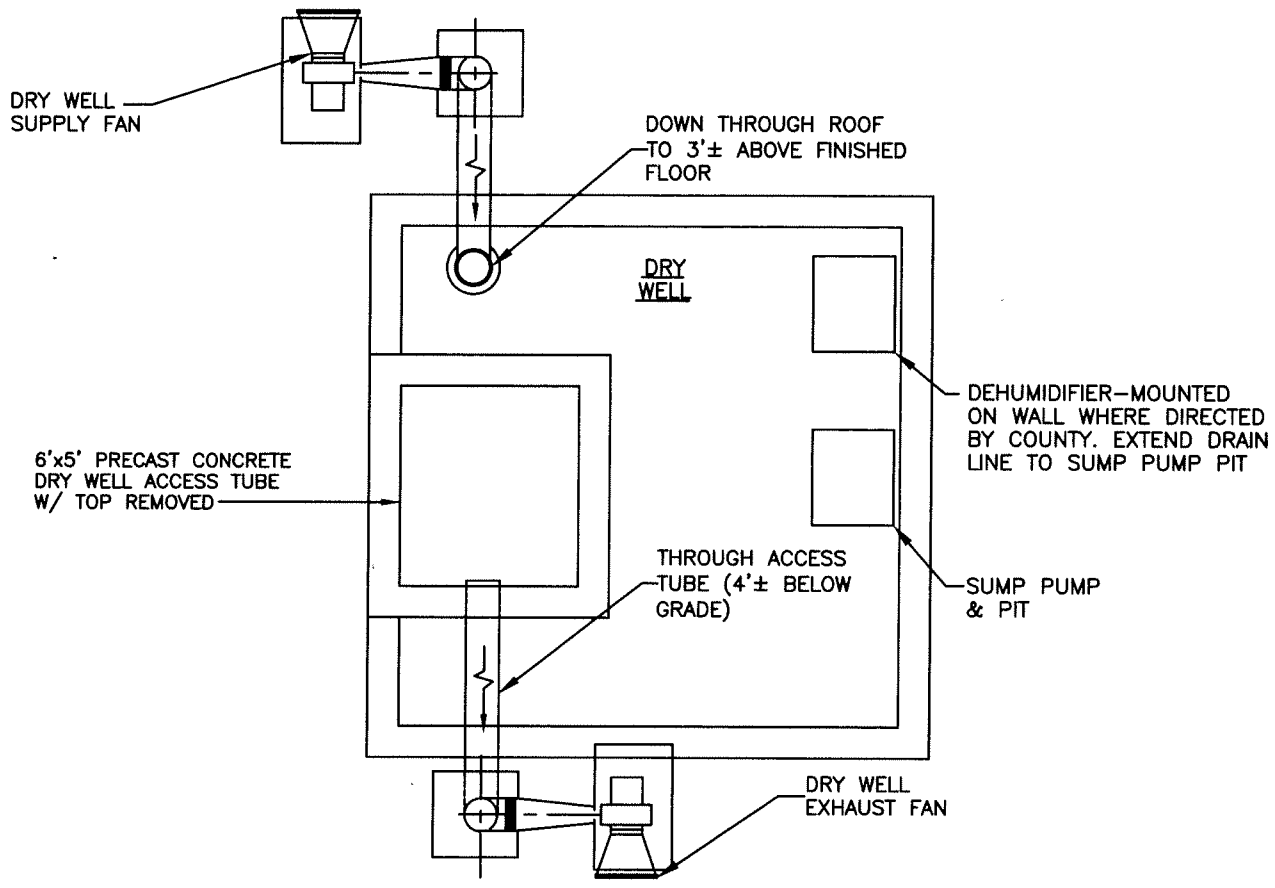
2" FILLER CAP TURN UP 90° (INSTALL AT ACCESSIBLE HEIGHT FOR FILLING OR PROVIDE PRECAST STEPS ON OUTSIDE)

2" CAPPED CONNECTION FOR STICKING

1/2" F.O.S. & F.O.R. PIPING IN FLOOR TRENCH. PROVIDE ALUMINUM CHECKERED PLATE COVER. SEE DETAIL ON DRAWING S2-5

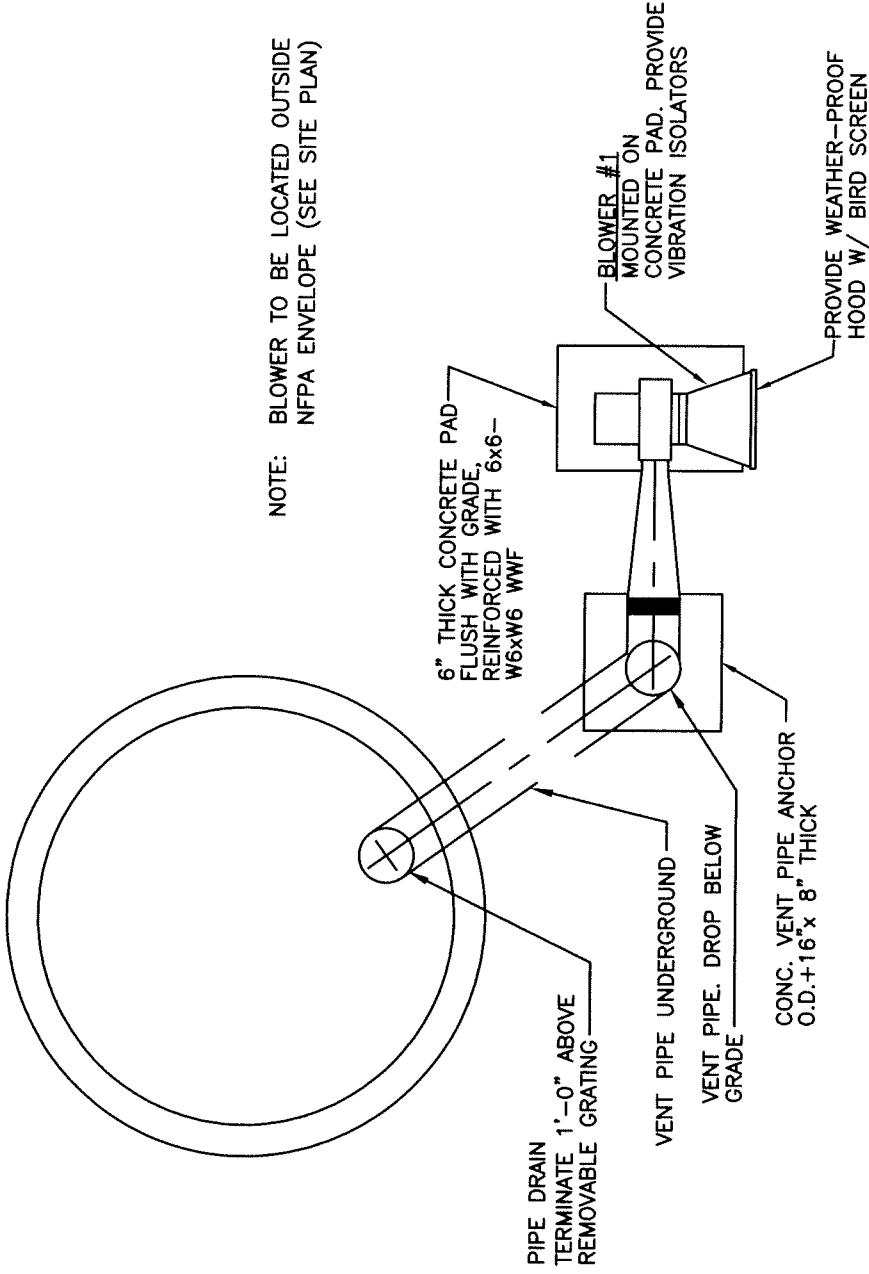
DESIGNER NOTE:  
\*GENERATOR LOUVER WIDTH TO ALLOW GENERATOR REMOVAL

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED	 CHIEF ENGINEER  DESIGN ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN PUMP STATION BUILDING MECHANICAL PLAN	REVISED	PS



NOTE: DRYWELL SUPPLY & EXHAUST FANS TO BE LOCATED AS SHOWN ON SITE PLAN

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 5/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN DRYWELL-MECHANICAL PLAN WET/DRY WELL	REVISED	PS M2-2A
	<i>[Signature]</i> DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	
	_____		_____	



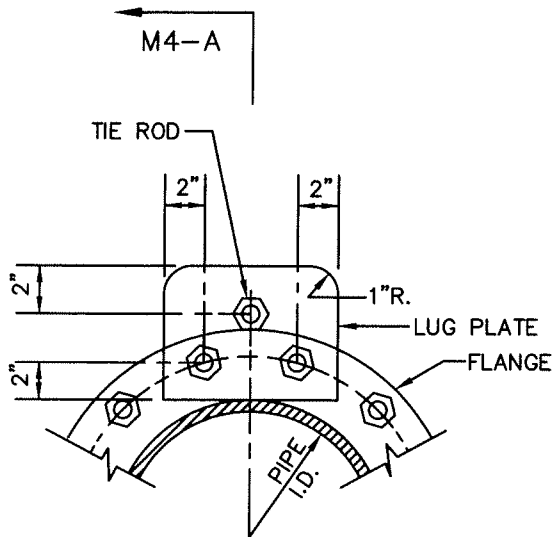
ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
WET WELL - MECHANICAL PLAN  
SUBMERSIBLE

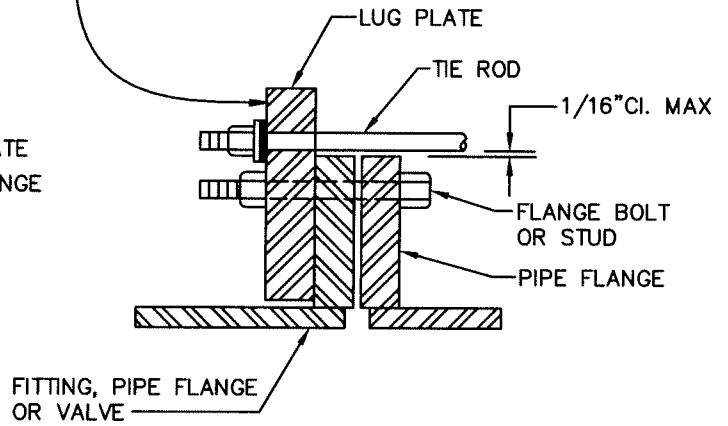
REVISED

PS  
M2-2B

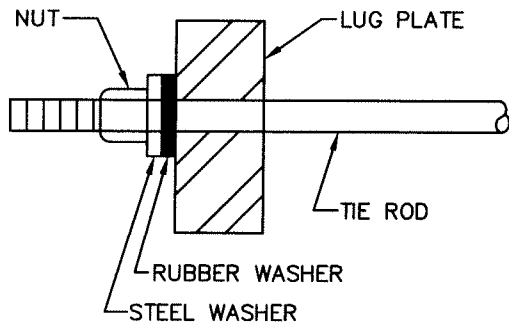


M4-A  
PLAN  
NO SCALE

IF VALVE DOES NOT ALLOW SHOWN MOUNTING OF LUG PLATE, INSTALL LUG PLATE ON BACKSIDE OF PIPE FLANGE.



SECTION M4-A / M4  
NO SCALE



NUT DETAIL (TIE RODS ONLY)  
NO SCALE

PIPE DIA	MAXIMUM OPERATING PRESSURE	NO. OF RODS	DIA. OF RODS	PLATE THICKNESS
4"	125	2	3/4"	3/4"
6"	125	2	3/4"	3/4"
8"	125	2	7/8"	1"
10"	125	2	7/8"	1 1/8"
12"	125	3	7/8"	1 1/8"
14"	125	4	7/8"	1 1/4"
16"	125	4	1"	1 1/4"
18"	125	4	1"	1 1/2"
20"	125	4	1"	1 1/2"
24"	125	6	1"	1 1/2"

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 3/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  TIE ROD DETAIL	REVISED	PS M2-3
	<i>[Signature]</i> DESIGN ENGINEER			



DISCHARGE PRESSURE  
GAUGE WITH QUICK  
CONNECTS.

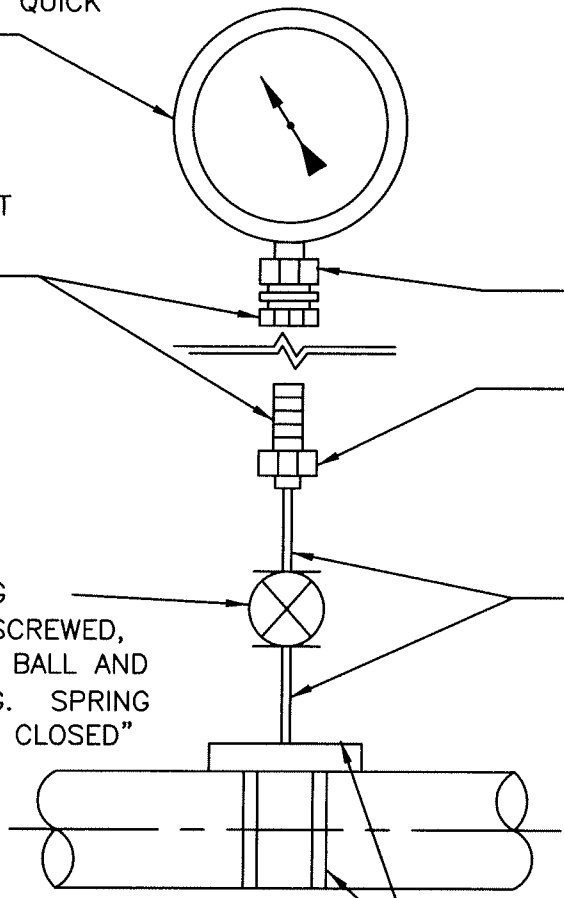
1/2" QUICK CONNECT  
(SWAGELOK "QF"  
SERIES OR EQUAL).

1/2" FEMALE NPT  
BODY WITH PLUG

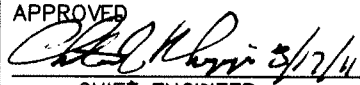

1/2" FEMALE NPT STEM  
WITH PROTECTOR CAP

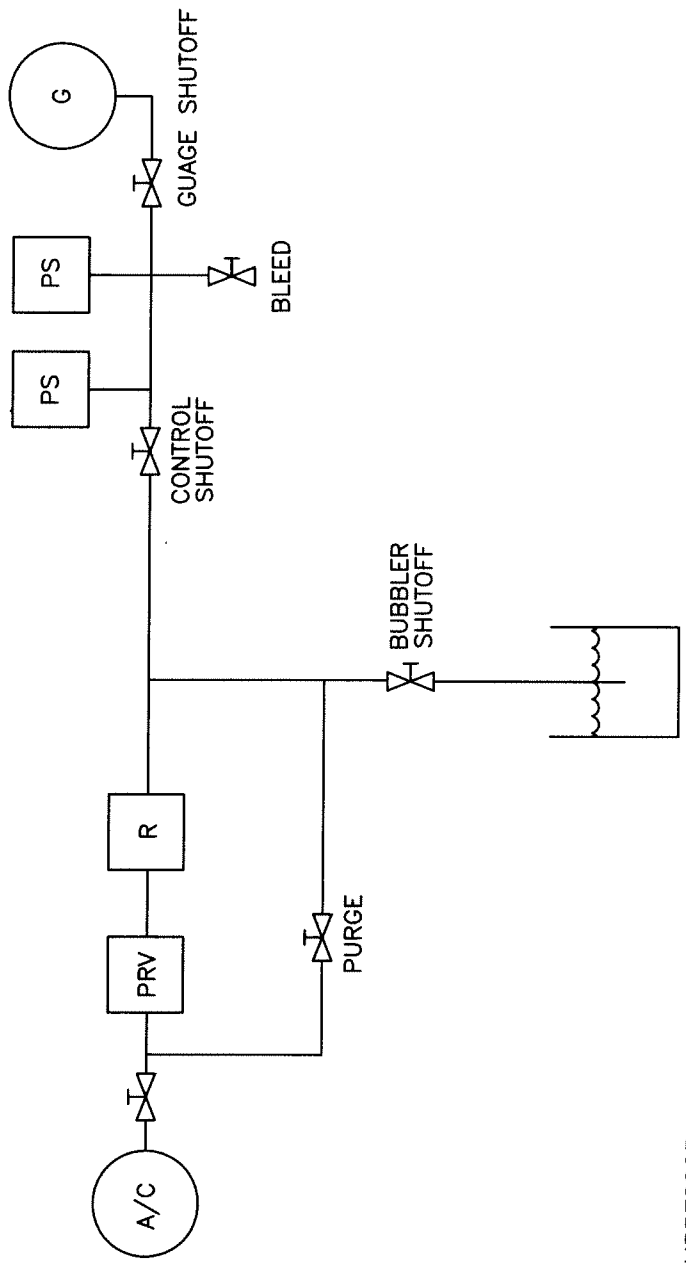
BALL VALVE WITH SPRING  
RETURN HANDLE; 1/2" SCREWED,  
316SS BODY, STEM AND BALL AND  
TEFLON SEAT & PACKING. SPRING  
RETURN HANDLE, "FULLY CLOSED"  
POSITION.

1/2" S.S. NIPPLE (SCH. 80)




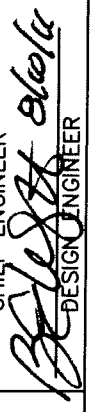
USE NPT THREADED CONNECTIONS  
ON SUCTION SIDE TAPS. USE  
SADDLES ON DISCHARGE SIDE TAPS.

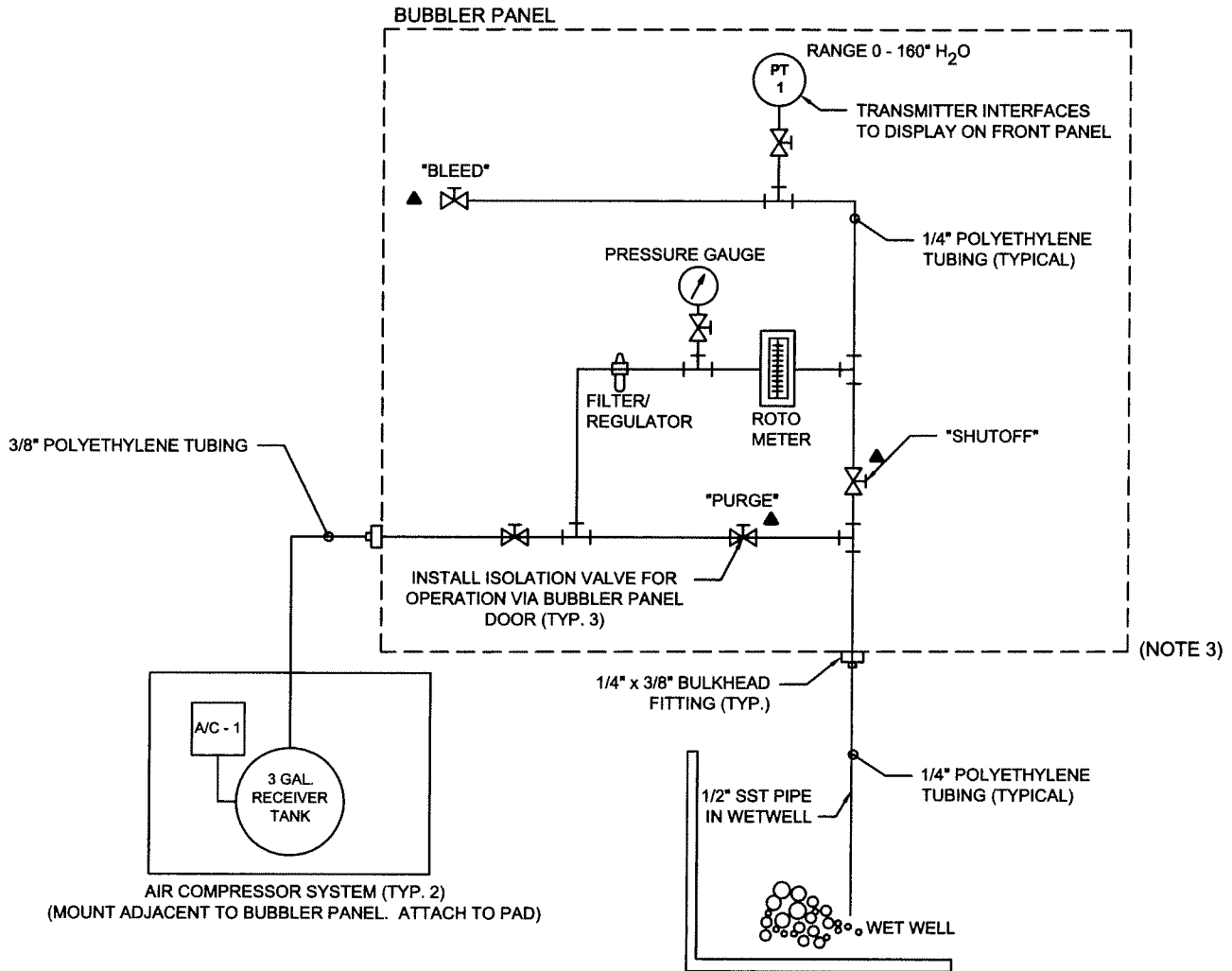
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  HORIZONTAL PIPE PRESSURE GAUGE DETAIL	REVISED	PS M2-4
	 DESIGN ENGINEER			



A/C AIR COMPRESSOR  
 PRV PRESSURE REDUCING/REGULATING VALVE  
 R ROTAMETER  
 PS PRESSURE SWITCH  
 G GAUGE

(NOT REQUIRED FOR ELECTRONIC PRESSURE SWITCH)

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER  DESIGN ENGINEER	REFERENCE SEWAGE PUMPING STATION BUBBLER SYSTEM PNEUMATIC DIAGRAM	REVISED   PS M2-5
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**NOTES:**

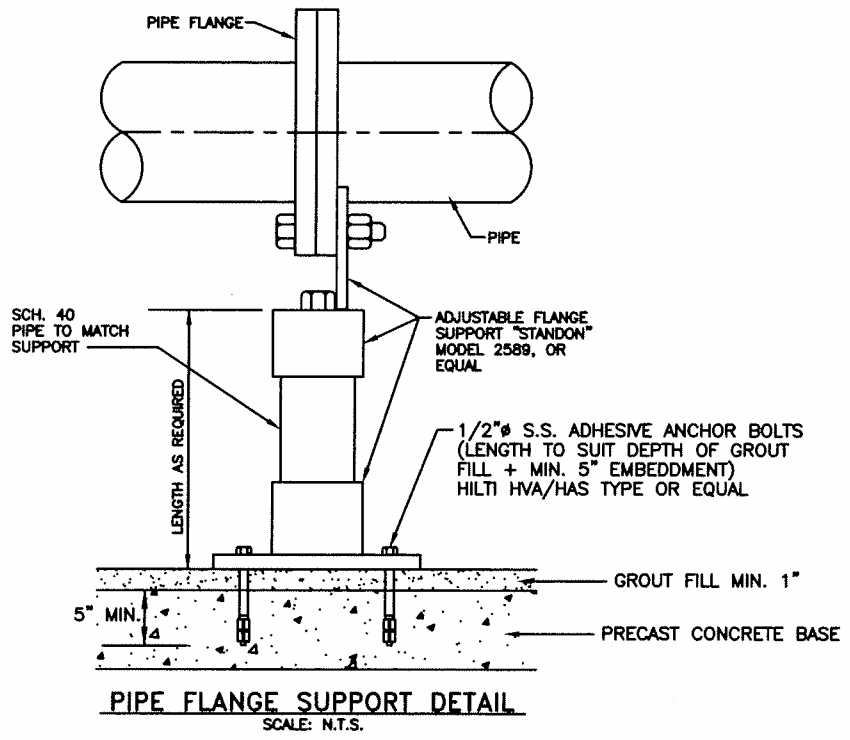
1. SLOPE ALL HORIZONTAL RUNS OF TUBING AND BUBBLER LINE 1/8" PER FOOT TOWARDS WETWELL.
2. PROVIDE 24VDC POWER SUPPLY FROM PUMP CONTROL PANEL FOR TRANSMITTER AND DIGITAL DISPLAY.
3. TYPICAL TWO BUBBLER SYSTEMS. MOUNT IN PUMP CONTROL PANEL. REFER TO DRAWING E100-11.
4. SST BUBBLER PIPE SHALL BE  $\pm 6"$  FROM WALL.
5. BUBBLER PIPE SUPPORTS IN WETWELL SHALL BE 316 SST AND AT 5 FOOT MAXIMUM SPACING.
6. FOR DETAIL OF BUBBLER LINE TRANSITION IN WETWELL, SEE DETAIL M1-7.

▲ -- LOCATED ON BUBBLER PANEL DOOR

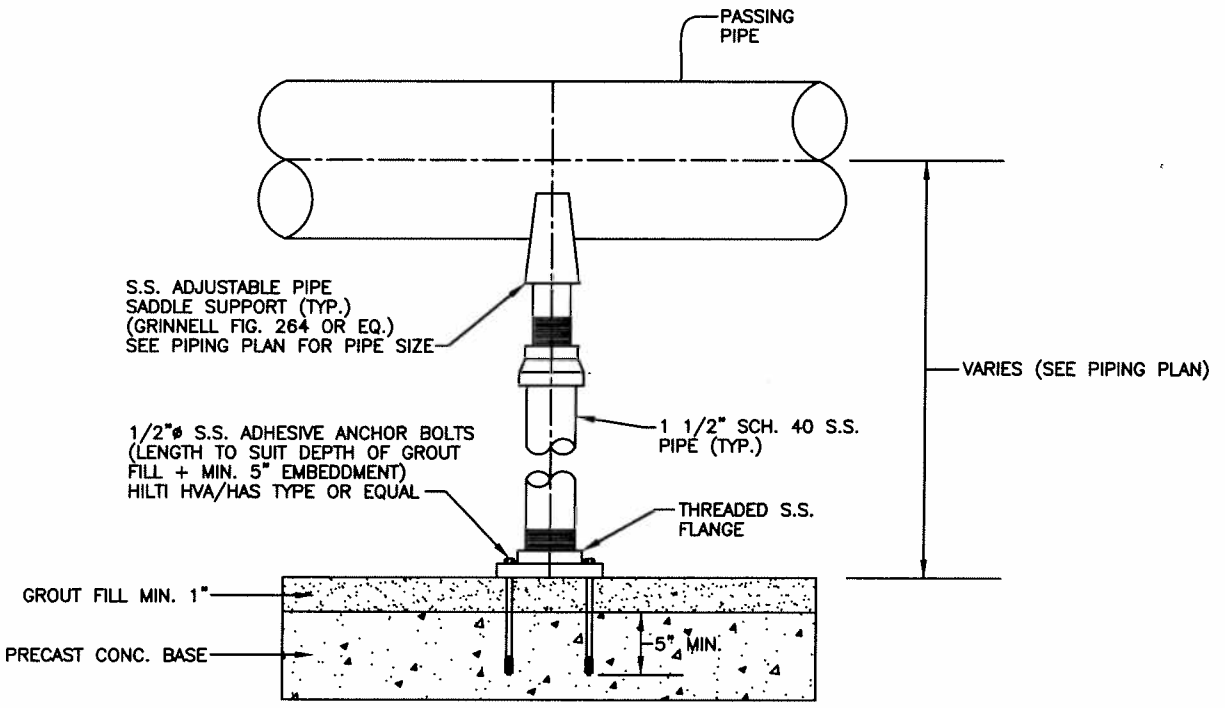
**BUBBLER SYSTEM SCHEMATIC**

NOT TO SCALE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN AIR COMPRESSOR DIAGRAM	REVISED	PS M2-6
	 DESIGN ENGINEER			



**PIPE FLANGE SUPPORT DETAIL**  
SCALE: N.T.S.



**HORIZONTAL PIPE SUPPORT DETAIL**  
SCALE: N.T.S.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 3/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN PIPE SUPPORT DETAILS	REVISED	PS M2-7
	<i>[Signature]</i> DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	
	_____		_____	

PUMP STATION  
BUILDING MECHANICAL  
PLAN  
DWG. M2-1

PUMP STATION WET  
WELL MECHANICAL  
PLAN  
DWG. M2-2B

TIE ROD  
DETAIL  
DWG. M2-3

BUBBLER SYSTEM  
PNEUMATIC DIAGRAM  
DWG. M2-5

AIR COMPRESSOR  
DIAGRAM  
DWG. M2-6

PRESSURE GAUGE  
DETAIL  
DWG. M2-4

PIPE SUPPORT  
DETAIL  
DWG. M2-7

WET/DRY WELL

SUBMERSIBLE

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
MECHANICAL  
PLAN AND DETAILS

REVISED

PS  
M-2B

FERROUS SULFATE STORAGE  
AND FEED SYSTEM -  
PLAN VIEW

DWG. M3-1

SECTION

DWG. M3-2

SECTION

DWG. M3-3

NOMENCLATURE

DWG. M3-4

WET/DRY WELL  SUBMERSIBLE

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED

*[Signature]*  
3/27/11

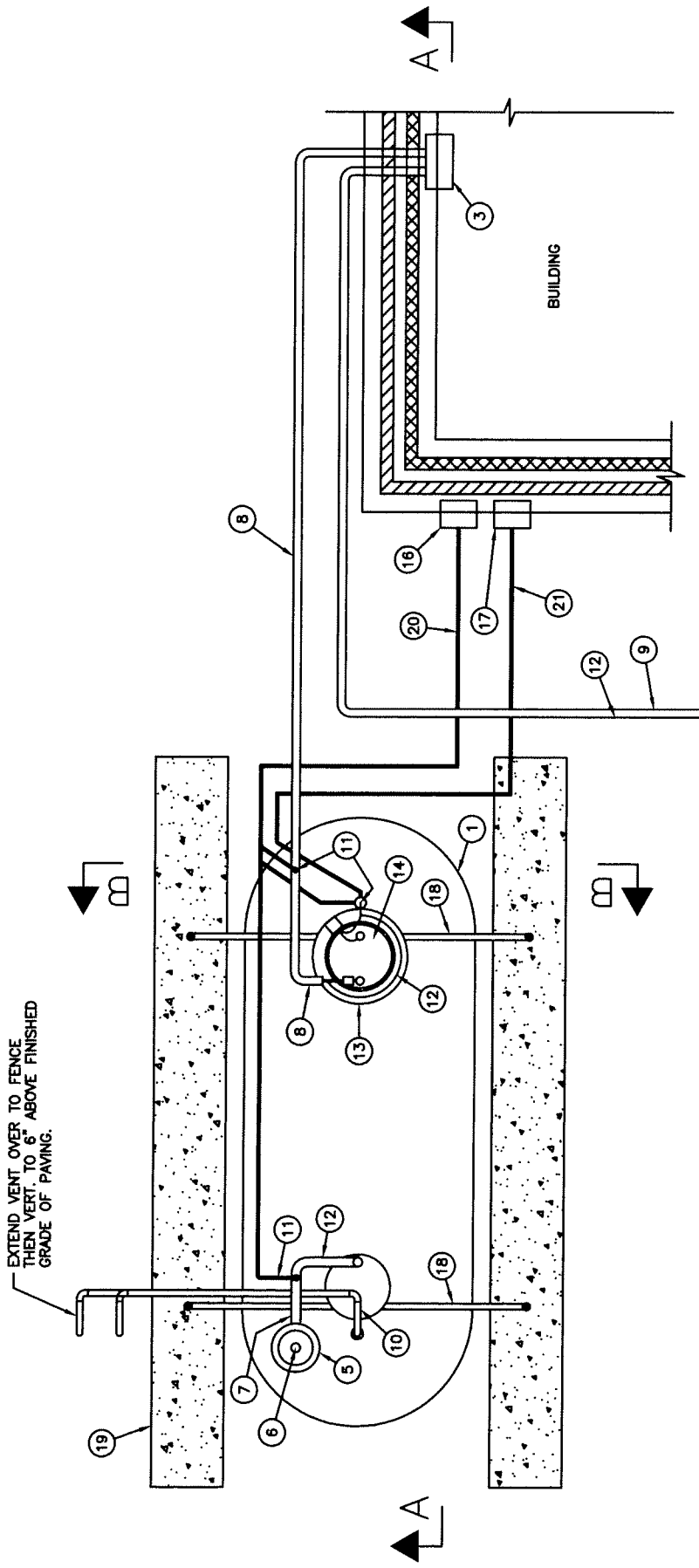
CHIEF ENGINEER

*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
MECHANICAL  
FERROUS SULFATE SYSTEM

REVISED

PS  
M-3



NOTE:  
SEE DRAWING M3-4 FOR NOMENCLATURE.

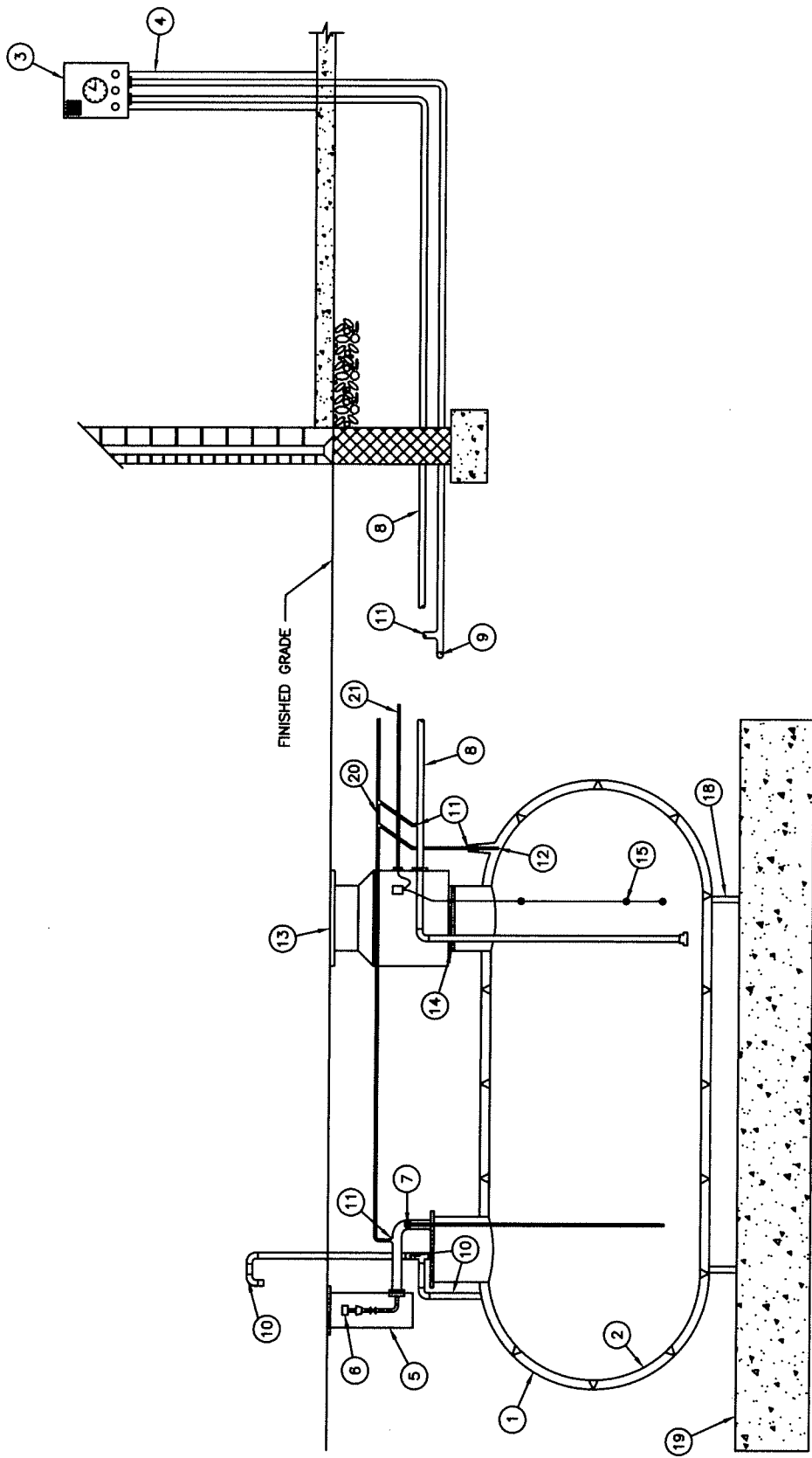
ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]* 5/17/11  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
FERROUS SULFATE STORAGE AND  
FEED SYSTEM - PLAN VIEW

REVISED

PS  
M3-1



2'-0" x 2'-0" x 20'-0" DEADMAN  
REINFORCED WITH 4 - #5 BARS

NOTE:

SEE DRAWING M3-4 FOR NOMENCLATURE.

SECTION A-A

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

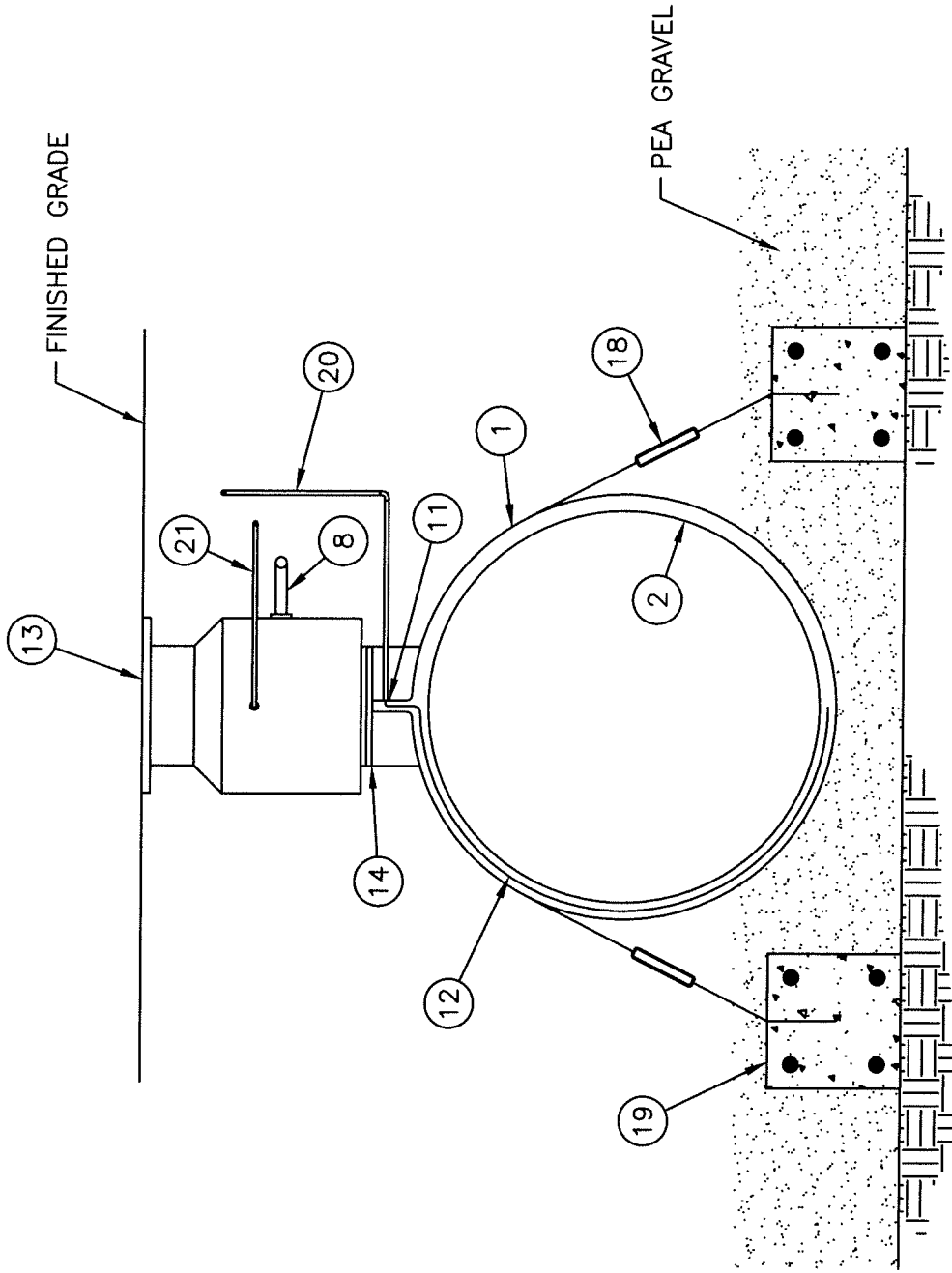
APPROVED  
*[Signature]*  
2/17/11  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
FERROUS SULFATE SYSTEM  
SECTION

REVISED	

PS  
M3-2





NOTE:  
SEE DRAWING M3-4 FOR NOMENCLATURE.

SECTION B-B

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
FERROUS SULFATE SYSTEM  
SECTION

REVISED


PS  
M3-3

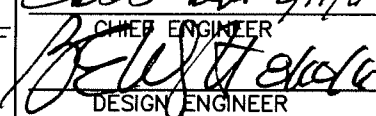
## NOMENCLATURE

- ① DOUBLE WALL FIBERGLASS REINFORCED PLASTIC STORAGE TANK.
- ② VINYLESTER LINING.
- ③ CHEMICAL FEED AND CONTROL UNIT. (INSIDE BUILDING)
- ④ MOUNTING PEDESTAL WITH FLOW CALIBRATION (INSIDE BUILDING)
- ⑤ SPILL CONTAINMENT BASIN
- ⑥ FILL PORT - 2"φ CAMLOCK COUPLING WITH CAP
- ⑦ DOUBLE WALL FILL PIPING - (2"φ IN 4"φ)
- ⑧ DOUBLE WALL SUCTION PIPING - (2"φ IN 4"φ)
- ⑨ DOUBLE WALL FEED PIPING TO INJECTION POINT - (1/2"φ IN 1"φ)
- ⑩ 2" PVC VENT
- ⑪ LEAK DETECTION PROBE CONNECTION POINT
- ⑫ INTERSTITIAL LEAK DETECTION PROBE
- ⑬ ATTACHED MANWAY RISER WITH 22"φ ACCESS OPENING
- ⑭ REMOVABLE BOLTED MANWAY COVER
- ⑮ LIQUID LEVEL SIGNAL FLOATS
- ⑯ LEAK DETECTION MONITOR WITH AUDIBLE/VISIBLE ALARM & LEAK LOCATION INDICATOR
- ⑰ VISIBLE LIQUID LEVEL SIGNALS WITH AUDIBLE HIGH LEVEL ALARM
- ⑱ TIE DOWN SYSTEM
- ⑲ CONCRETE SLAB OR DEADMAN FOR FLOATATION RESISTANCE
- ⑳ CONDUIT FOR LEAK DETECTION WIRING
- ㉑ CONDUIT FOR LEVEL SIGNAL WIRE

## TANK DATA

CAPACITY (GAL.)	DIAMETER	LENGTH
3000	6'-4"	16'-8 1/2"

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  FERROUS SULFATE SYSTEM NOMENCLATURE	REVISED	PS M3-4

  
 DESIGN ENGINEER

SOIL ODOR FILTER  
 BLOWER ASSEMBLY  
 PLAN VIEW  
 DWG. M4-1

BLOWER ASSEMBLY  
 SECTION  
 DWG. M4-2

IRRIGATION CONTROL  
 BOX - PLAN VIEW  
 DWG. M4-3

BLOWER ASSEMBLY  
 SECTION  
 DWG. M4-4



BLOWER ENCLOSURE  
 ANCHOR BOLT DETAIL  
 PLAN VIEW  
 DWG. M4-5

IRRIGATION CONTROL  
 BOX - SECTION  
 DWG. M4-6

WET/DRY WELL

SUBMERSIBLE

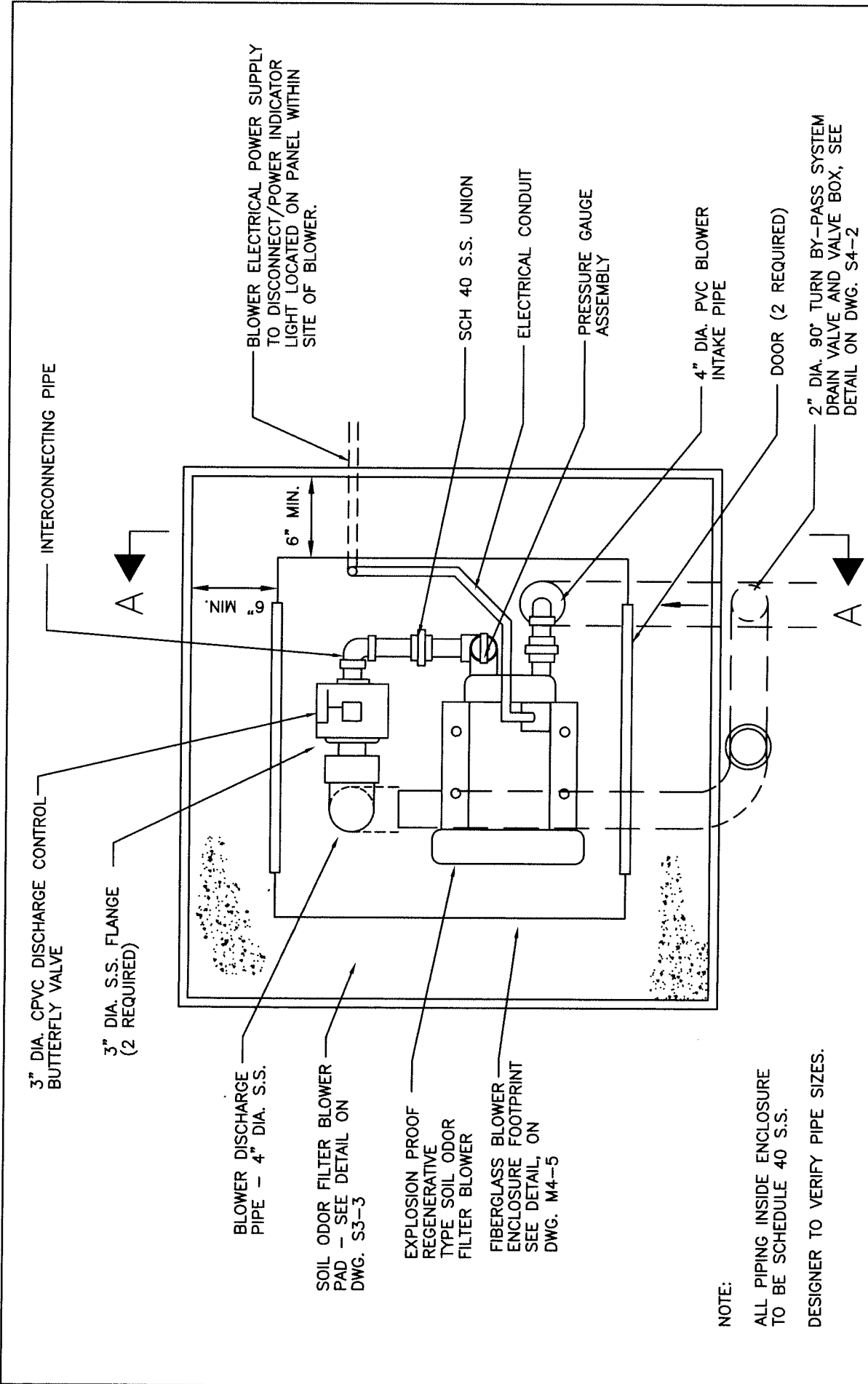
ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS  
 DATE: MAY 2011

APPROVED  
  
 CHIEF ENGINEER  
  
 DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
 MECHANICAL  
 ODOR CONTROL  
 PLANS AND SECTIONS

REVISED

PS  
 M-4



BLOWER ELECTRICAL POWER SUPPLY TO DISCONNECT/POWER INDICATOR LIGHT LOCATED ON PANEL WITHIN SITE OF BLOWER.

SCH 40 S.S. UNION

ELECTRICAL CONDUIT

PRESSURE GAUGE ASSEMBLY

4" DIA. PVC BLOWER INTAKE PIPE

DOOR (2 REQUIRED)

2" DIA. 90° TURN BY-PASS SYSTEM DRAIN VALVE AND VALVE BOX, SEE DETAIL ON DWG. S4-2

INTERCONNECTING PIPE

3" DIA. CPVC DISCHARGE CONTROL BUTTERFLY VALVE

3" DIA. S.S. FLANGE (2 REQUIRED)



BLOWER DISCHARGE PIPE - 4" DIA. S.S.

SOIL ODOR FILTER BLOWER PAD - SEE DETAIL ON DWG. S3-3

EXPLOSION PROOF REGENERATIVE TYPE SOIL ODOR FILTER BLOWER

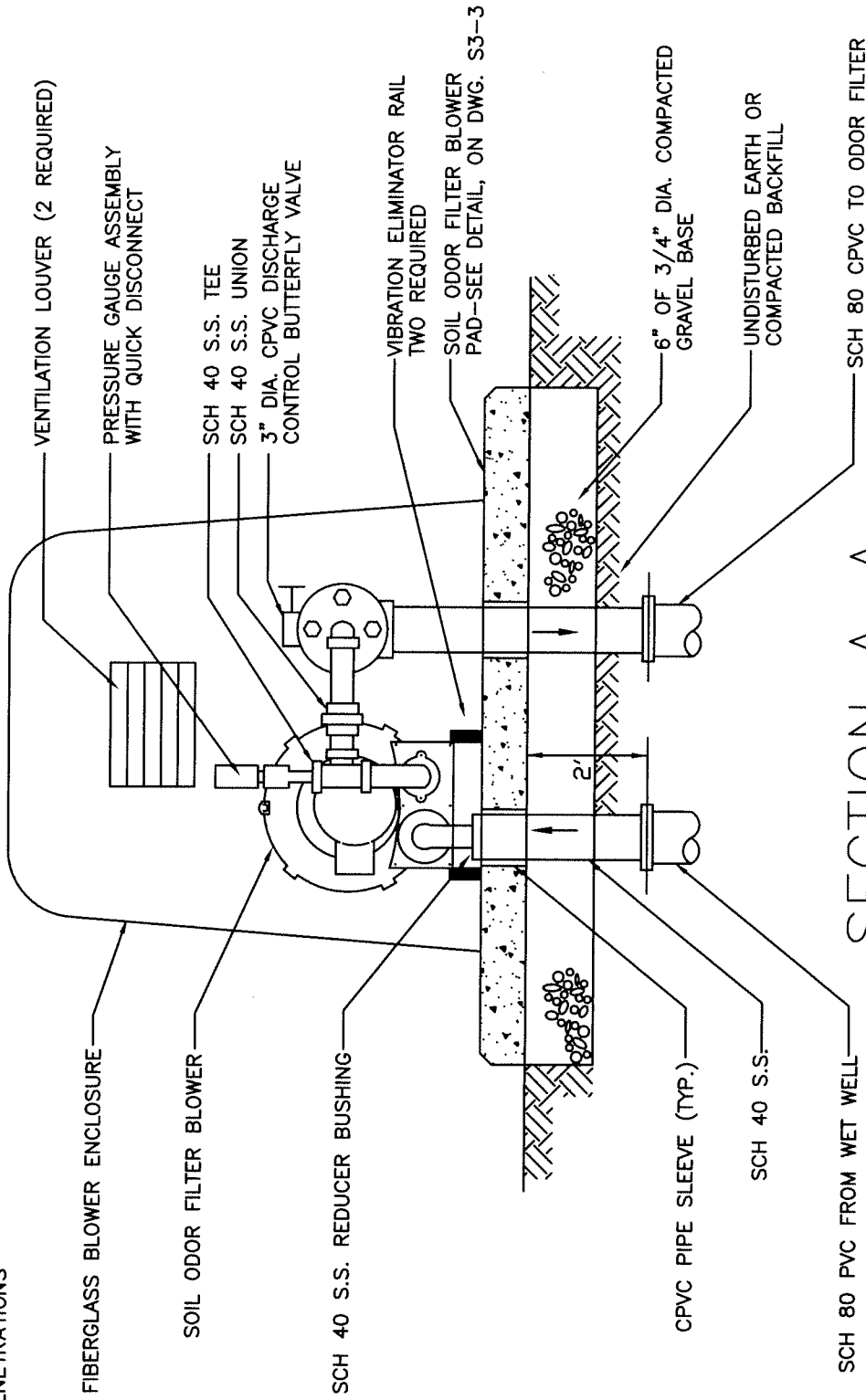
FIBERGLASS BLOWER ENCLOSURE FOOTPRINT SEE DETAIL, ON DWG. M4-5

NOTE:  
ALL PIPING INSIDE ENCLOSURE TO BE SCHEDULE 40 S.S.  
DESIGNER TO VERIFY PIPE SIZES.



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED	REVISIONS
	 CHIEF ENGINEER  DESIGN ENGINEER	PS M4-1
REFERENCE SEWAGE PUMPING STATION DESIGN SOIL ODOR FILTER BLOWER ASSEMBLY - PLAN VIEW		

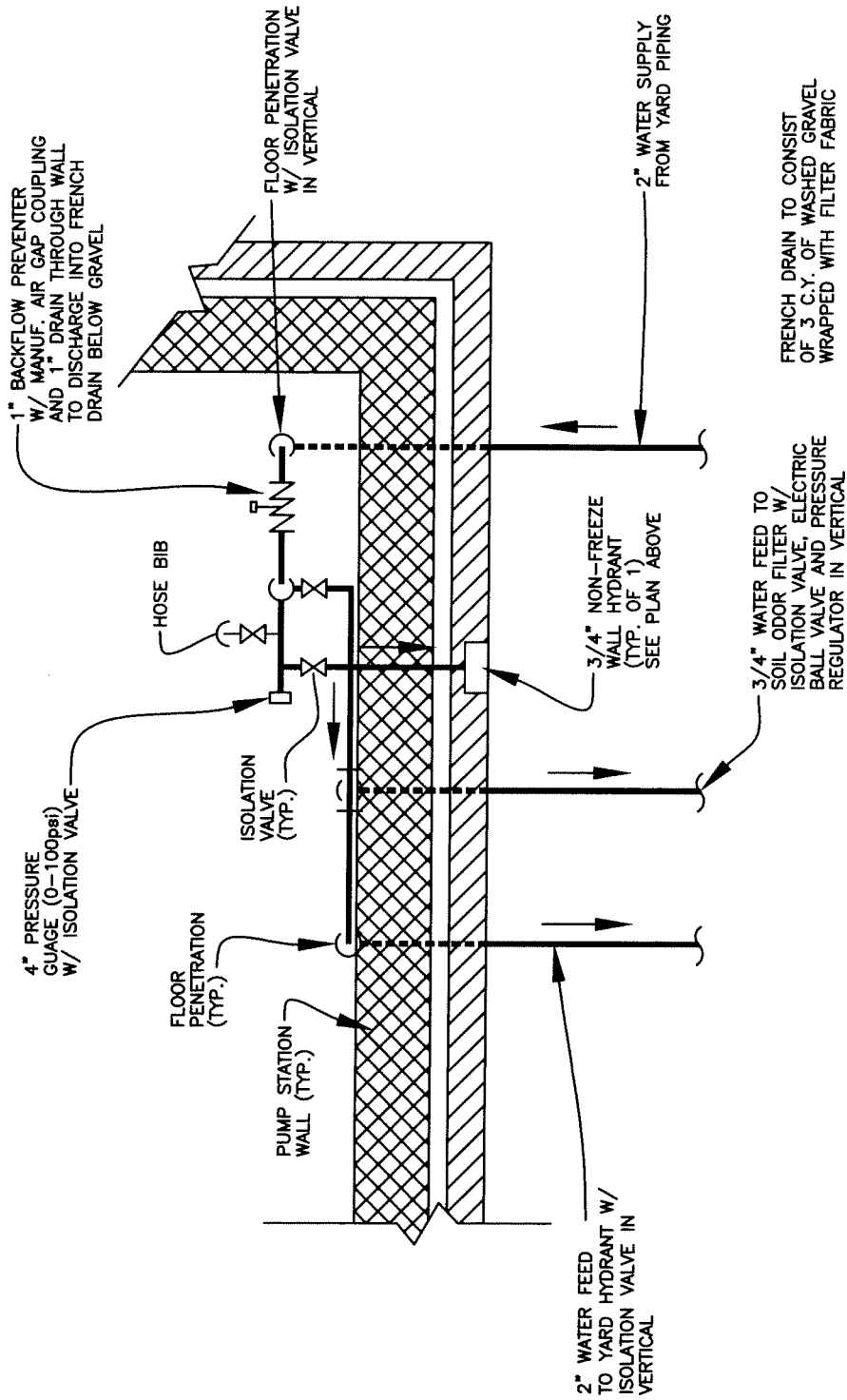
DESIGNER SHALL INCLUDE A SCHEMATIC  
 DIAGRAM SHOWING INVERT ELEVATIONS  
 FOR THE FOLLOWING:

- \*AIR PIPING INVERT AT SOF
- \*INVERT AT BYPASS DRAIN (2)
- \*WET WELL PENETRATIONS





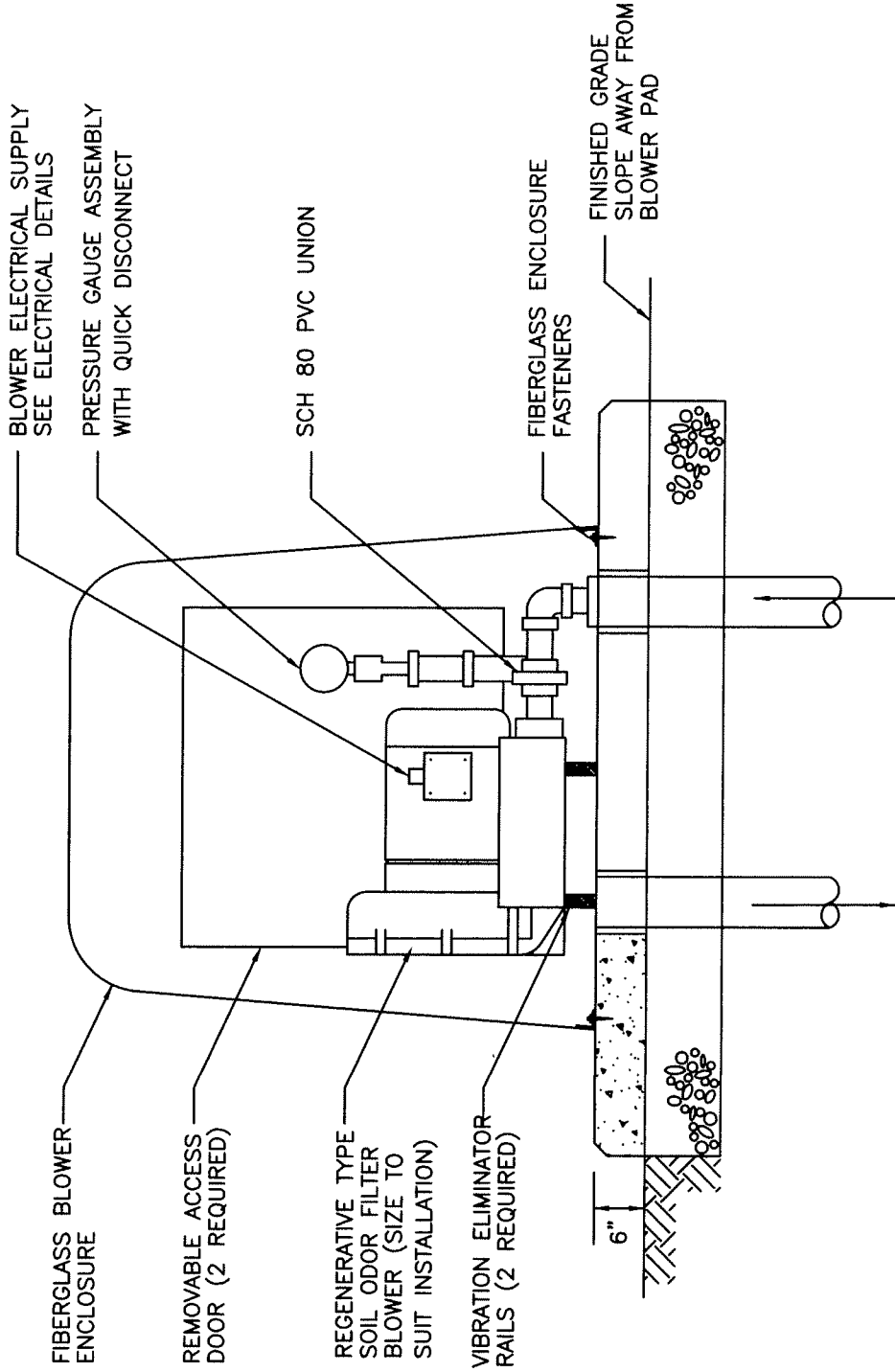
SECTION A-A

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED	REVISIONS
	 CHIEF ENGINEER  DESIGN ENGINEER	PS M4-2
REFERENCE SEWAGE PUMPING STATION DESIGN SOIL ODOR FILTER BLOWER ASSEMBLY - SECTION B		



PLAN  
NOT TO SCALE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER  DESIGN ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN IRRIGATION WATER CONTROL SCHEMATIC	REVISED   PS M4-3
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SECTION A--A

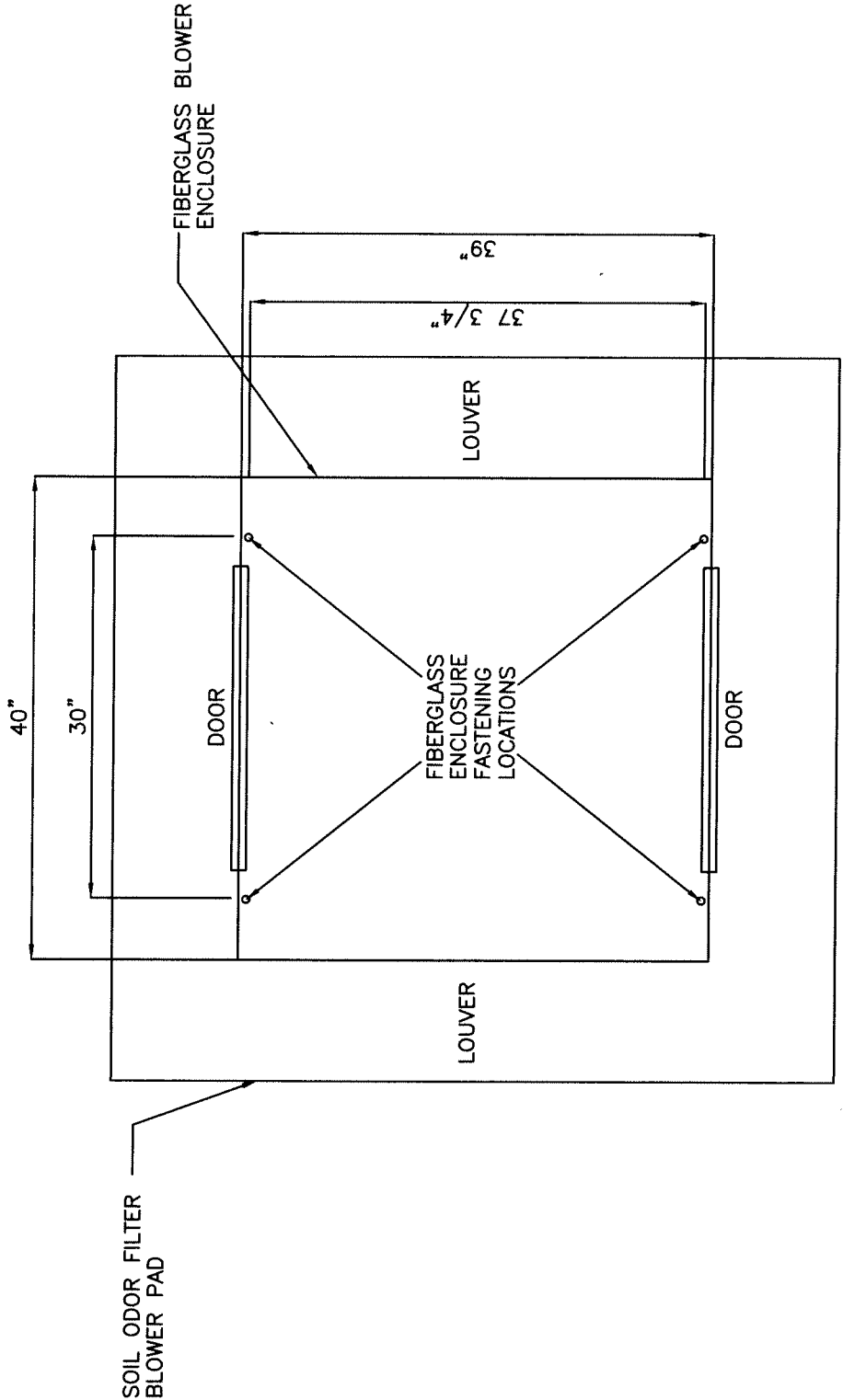
REVISED	

REFERENCE SEWAGE PUMPING STATION DESIGN  
 SOIL ODOR FILTER  
 BLOWER ASSEMBLY - SECTION A

APPROVED  
*[Signature]*  
 CHIEF ENGINEER  
 DESIGN ENGINEER

ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS  
 DATE: MAY 2011

PS  
 M4-4



NOTES

DIMENSIONS PROVIDED ARE APPROXIMATE LOCATIONS. ALL FASTENING LOCATIONS SHOULD BE FIELD DETERMINED BASED ON DELIVERED EQUIPMENT.

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

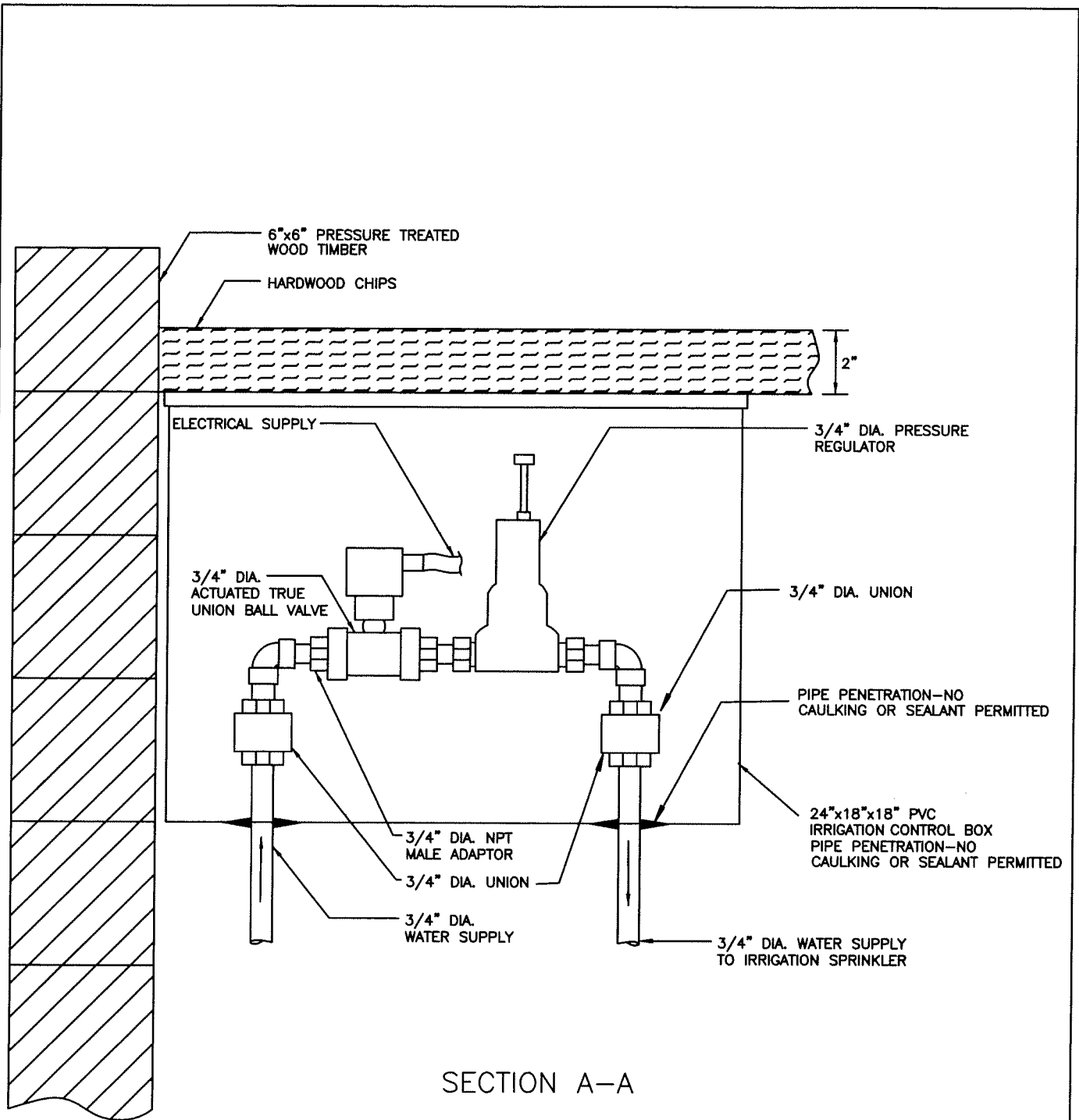
APPROVED  
*[Signature]* 5/17/11  
CHIEF ENGINEER  
*[Signature]* 5/10/11  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
BLOWER ENCLOSURE ANCHOR  
BOLT DETAIL - PLAN VIEW

REVISED

PS  
M4-5





SECTION A-A

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 2/12/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  IRRIGATION CONTROL BOX - SECTION	REVISED	PS M4-6
	<i>[Signature]</i> 8/10/11 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	

**SUPPLY FAN SCHEDULE**

NUMBER	APPROVED	FAN TYPE/MOUNTING ARRANGEMENT	CFM	HP	SP ("WC")	VOLTS	PHASE	FREQUENCY	CONTROL
SF-1	WET WELL	SLAB	X	X	X	120	1	60	CLASS 1, DIV. 1
SF-2	DRYWELL	SLAB	X	X	X	120	1	60	CLASS 1, DIV. 2

**EXHAUST FAN SCHEDULE**


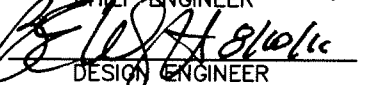
NUMBER	LOCATION	FAN TYPE/MOUNTING ARRANGEMENT	CFM	HP	SP ("WC")	VOLTS	PHASE	FREQUENCY	CONTROL
SF-1	CONTROL ROOM	X	X	X	X	X	1	60	
SF-2	DRYWELL	X	X	X	X	X	1	60	CLASS 1, DIV. 2

**ELECTRIC UNIT HEATER SCHEDULE**

HEATER DATA					FAN MOTOR DATA			TSTAT CONTROL
NUMBER	LOCATION	KW RATING	VOLTAGE	PHASE	VOLTAGE	PHASE	CFM	
UH-1	CONTROL ROOM	X	480	3	120	1		INTEGRAL
UH-2	GENERATOR ROOM	X	480	3	120	1		.

NOTES:

1. RATING TO BE DETERMINED BY ENGINEER TO MEET CONUNTY REQUIREMENTS.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN HEATING/VENTILATION SCHEDULES	REVISED	PS M-5
	 DESIGN ENGINEER			

PUMP STATION  
BUILDING ELECTRICAL  
PLAN  
DWG. E1-1

PUMP STATION WET  
WELL ELECTRICAL  
PLAN  
DWG. E1-2A & 2B

FLOAT MAST  
ASSEMBLY  
DETAIL  
DWG. E1-3

ELECTRICAL  
LEGEND  
DWG. E1-4

EXPLOSION  
PROOF JUNCTION  
BOX DETAIL  
DWG. E1-5

LIGHTING FIXTURE  
SCHEDULE  
DWG. E1-6

WET WELL  
ELECTRICAL  
CONDUIT  
ENTRY DETAIL  
DWG. E1-7

WET/DRY WELL  SUBMERSIBLE

APPROVED *[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
ELECTRICAL  
PLANS, DETAILS AND SCHEDULES

REVISED	PS
	E-1A

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

PUMP STATION  
BUILDING ELECTRICAL  
PLAN  
DWG. E1-1

PUMP STATION WET  
WELL ELECTRICAL  
PLAN  
DWG. E1-2C

FLOAT MAST  
ASSEMBLY  
DETAIL  
DWG. E1-3

ELECTRICAL  
LEGEND  
DWG. E1-4

EXPLOSION  
PROOF JUNCTION  
BOX DETAIL  
DWG. E1-5

LIGHTING FIXTURE  
SCHEDULE  
DWG. E1-6

WET WELL  
ELECTRICAL  
CONDUIT  
ENTRY DETAIL  
DWG. E1-7

WET/DRY WELL

SUBMERSIBLE

ANNE ARUNDEL  
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PUBLIC WORKS  
DATE: MAY 2011

APPROVED

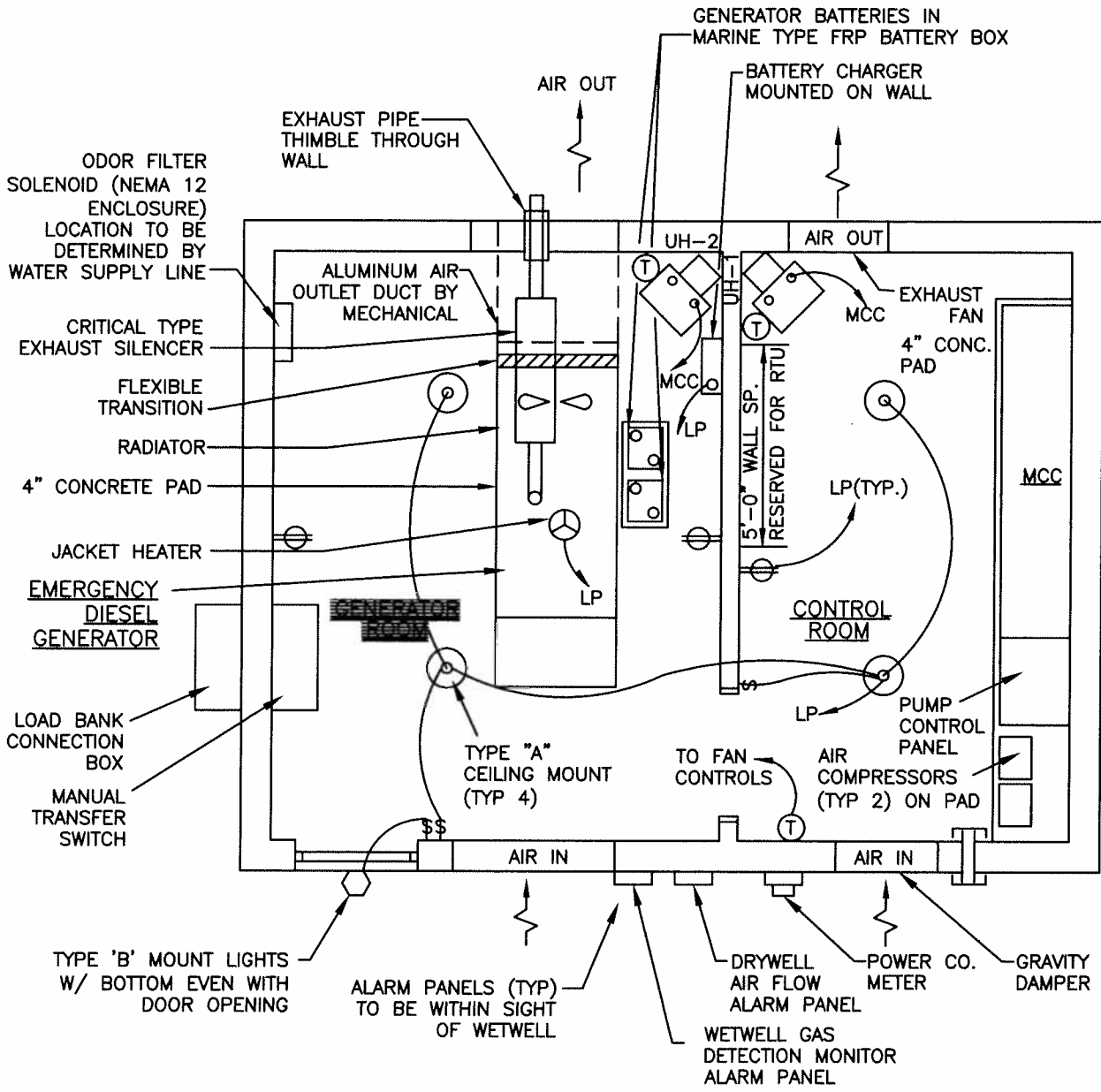
*[Signature]*  
9/17/14  
CHIEF ENGINEER

*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
ELECTRICAL  
PLANS, DETAILS AND SCHEDULES

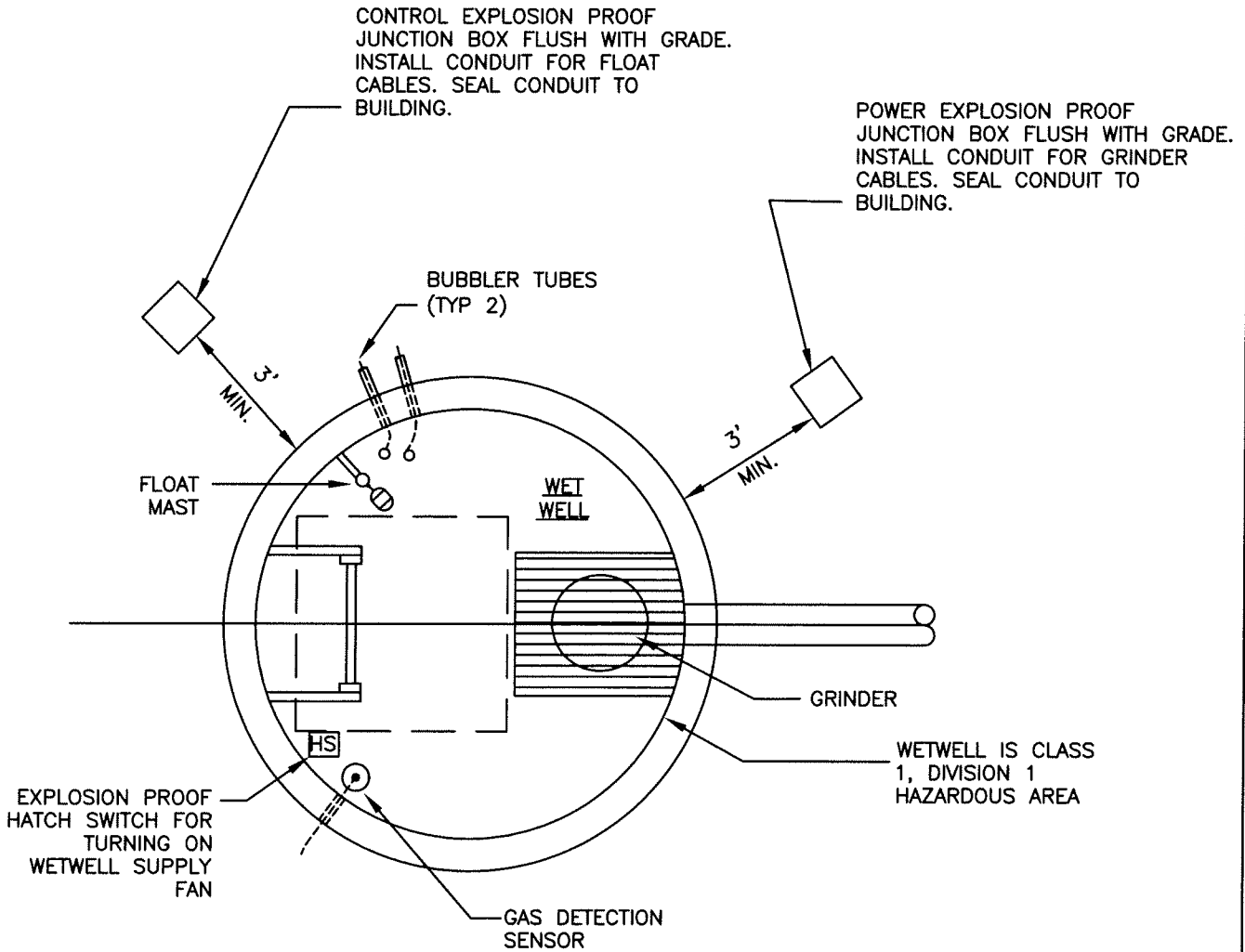
REVISED

PS  
E-1B



NOTE:  
 1. MINIMUM SIZE OF LOUVER IS FOR REMOVAL OF GENERATOR.

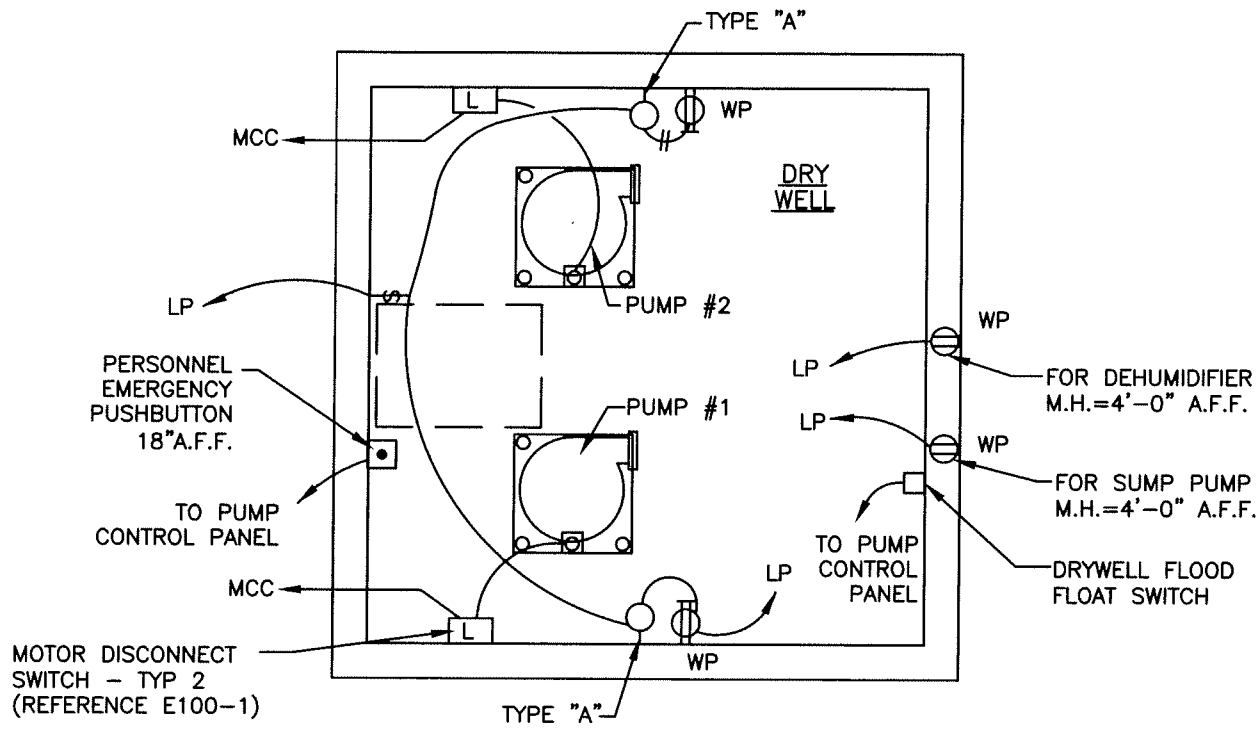
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 3/17/14 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL PUMP STATION BUILDING ELECTRICAL PLAN	REVISED	PS E1-1
	<i>[Signature]</i> DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	



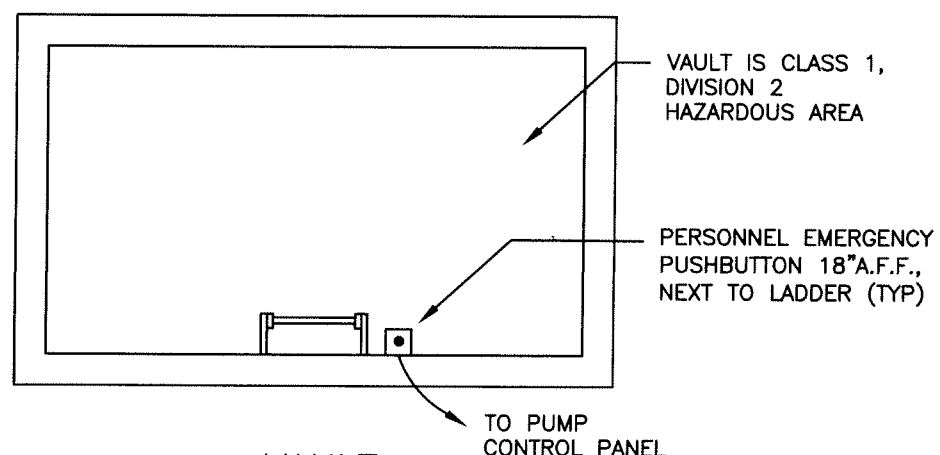
**NOTES:**

1. SEE DRAWING E1-4 FOR LEGEND
2. FLOAT MAST, BUBBLER TUBES, AND GAS DETECTION SENSOR AND CONDUIT ENTRIES SHALL BE MOUNTED WITHIN 18" OF LADDER.
3. PROVIDE EXPLOSION PROOF JUNCTION BOX FOR GRINDER, IF INSTALLED.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>Charles Harris</i> 8/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  WET WELL-ELECTRICAL PLAN WET/DRY WELL	REVISED	PS E1-2A
	<i>ASDA</i> 8/10/11 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	





DRYWELL



VAULT

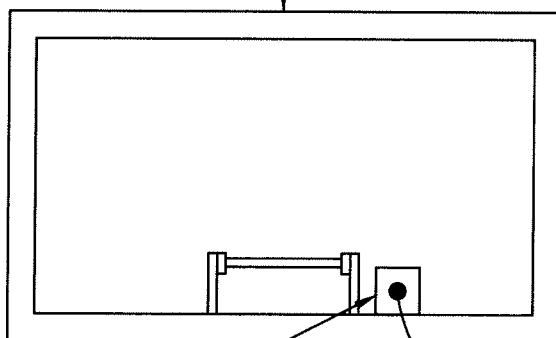
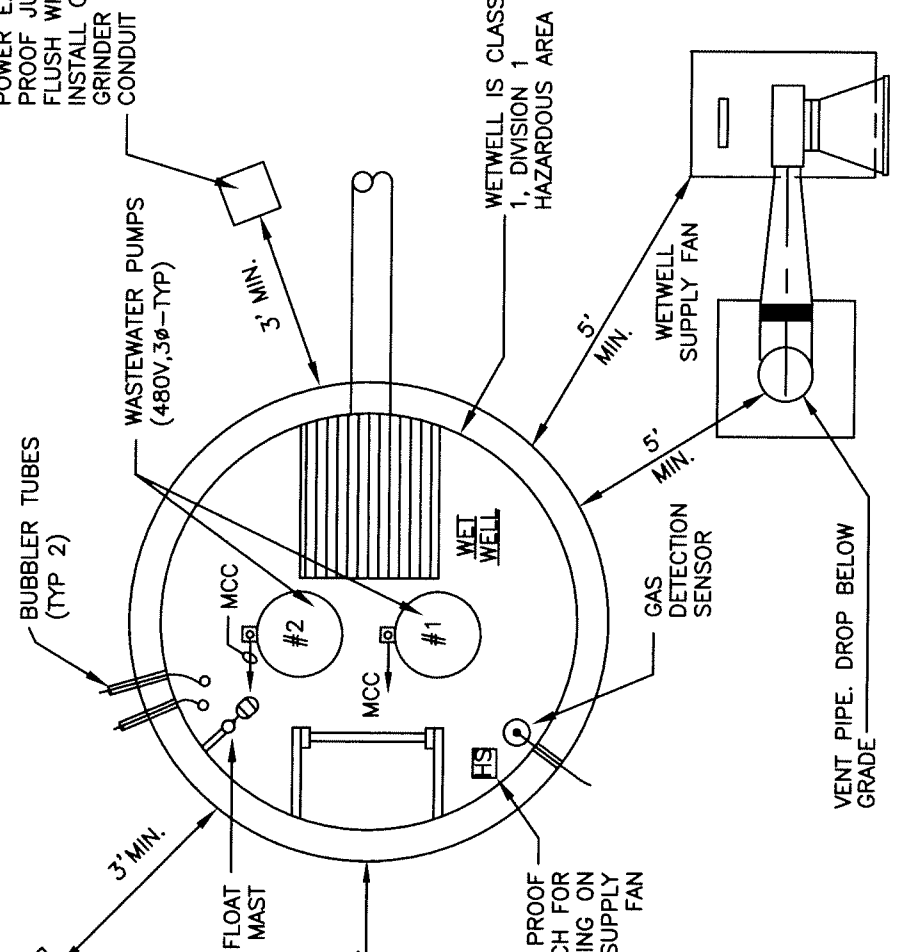
NOTES:

1. SEE DRAWING E1-4 FOR LEGEND
2. REFER TO DRAWING E100-1 FOR MOTOR DISCONNECT MOUNTING & WIRING.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  DRYWELL-ELECTRICAL PLAN WET/DRY WELL	REVISED	PS E1-2B
	 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	

CONTROL EXPLOSION PROOF  
JUNCTION BOX FLUSH WITH GRADE.  
INSTALL CONDUIT FOR FLOAT CABLES.  
SEAL CONDUIT TO BUILDING.

POWER EXPLOSION  
PROOF JUNCTION BOX  
FLUSH WITH GRADE.  
INSTALL CONDUIT FOR  
GRINDER CABLES. SEAL  
CONDUIT TO BUILDING.



PERSONNEL  
EMERGENCY  
PUSHBUTTON  
18" A.F.F. NEXT  
TO LADDER

TO PUMP  
CONTROL PANEL

VAULT IS CLASS 1,  
DIVISION 2 HAZARDOUS  
AREA

NOTES:  
1. SEE DRAWING E1-4 FOR LEGEND  
2. SEE NOTES 2 AND 3, DRAWING E1-2A

ANNE ARUNDEL  
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PUBLIC WORKS  
DATE: MAY 2011

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*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
WET WELL ELECTRICAL PLAN  
SUBMERSIBLE

REVISIONS  
PS  
E1-2C



CONTROL  
EXPLOSION PROOF  
JUNCTION BOX  
(SEE DRAWING E1-5)

JUNCTION BOX TO BE SET MINIMUM  
36" FROM WET WELL

CONDUIT WITH BUSHING (SEE DETAIL)

1" RIGID PVC SCHD. 80 PIPE W/ 1/2"  
GALV. PIPE INSIDE PVC CAP TOP & BOTTOM

J.M. GILLIN P.N. 874862W - BR

WETWELL AREA IS CLASS 1,  
DIVISION 1, GROUP D  
HAZARDOUS AREA

2'-0"

WET WELL LANDING  
OR HIGHEST INFLUENT  
PIPE (NO LANDING)

DIRECT ACTING FLOAT SWITCH MODEL  
9G-EF STAINLESS STEEL FLOAT.

HIGH LEVEL ALARM - FS1

12"

STAINLESS STEEL  
FLOAT CLAMP  
APPROVED FOR  
THE PURPOSE

**NOTES:**

1. FLOAT MAST GREATER THAN 12" FROM WALL AND MOUNTED SO NO OBSTRUCTION WILL INTERFERE WITH FLOAT MOVEMENT.
2. FLOAT MAST AND CONDUIT ENTRY SHALL BE LOCATED MAXIMUM 18" FROM WET WELL LADDER OR STEPS.

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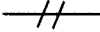
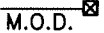








APPROVED  
*[Signature]* 5/17/11  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER


REFERENCE SEWAGE  
PUMPING STATION DETAIL  
FLOAT MAST  
ASSEMBLY DETAIL

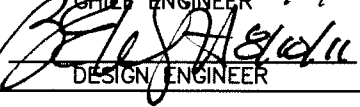
REVISED

PS  
E1-3

## LEGEND

-  CEILING TYPE "A" FIXTURE
-  SWITCH SINGLE POLE
-  DUPLEX RECEPTACLE - 20A, 125V, 3W
-  CONDUIT & WIRING
- EXP. EXPLOSION PROOF
-  M.O.D. MOTOR OPERATED DAMPER (M.O.D.)
-  THERMOSTAT
- N.T.S. NOT TO SCALE
-  CONTROL DEVICE
-  DISCONNECT SWITCH
-  MOTOR
-  (A)
  (B) WALL MOUNTED FIXTURES—  
A: INCANDESCENT, B: H.I.D.
-  FOS FUEL OIL SUPPLY
-  FOR FUEL OIL RETURN
- N.O. NORMALLY OPEN

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  3/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  ELECTRICAL LEGEND	REVISED	PS E1-4

APPROVED  
  
 DESIGN ENGINEER

12"x12"x8", NEMA 7, CLASS I,  
GROUP D JUNCTION BOX  
(CROUSE-HINDS EJB STYLE C  
OR EQUAL)

STAINLESS STEEL  
COVER BOLTS, TYP.

1/4" MIN.

SLOPE CONCRETE AWAY  
FROM JUNCTION BOX  
ON ALL SIDES

MIN. 6" CONCRETE ALL  
SIDES & BOTTOM

CONDUIT SEALING  
BUSHING ASSEMBLY  
(O.Z.GEDNEY TYPE  
CSBC, OR EQUAL)

CONDUIT SEALING HUB CLASS 1,  
GROUPS C & D WITH  
LOCK NUT (CROUSE  
HINDS ES76 OR EQUAL)

RIGID PVC COATED GALVANIZED  
STEEL CONDUIT TO  
MOTOR CONTROL CENTER (TYP.)

CONDUIT TO WET WELL

NOTES  
1. PROVIDE SEPARATE JUNCTION BOXES FOR  
PUMP POWER, GRINDER POWER AND FLOAT  
CONTROL SIGNALS.

2. MOUNT JUNCTION BOX MINIMUM 3' FROM  
WETWELL

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*[Signature]* 5/27/11  
CITY ENGINEER  
*[Signature]*  
DESIGN ENGINEER

ANNE ARUNDEL  
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DATE: MAY 2011

REFERENCE SEWAGE PUMPING STATION  
EXPLOSION PROOF  
JUNCTION BOX DETAIL

REVISED


PS  
E1-5

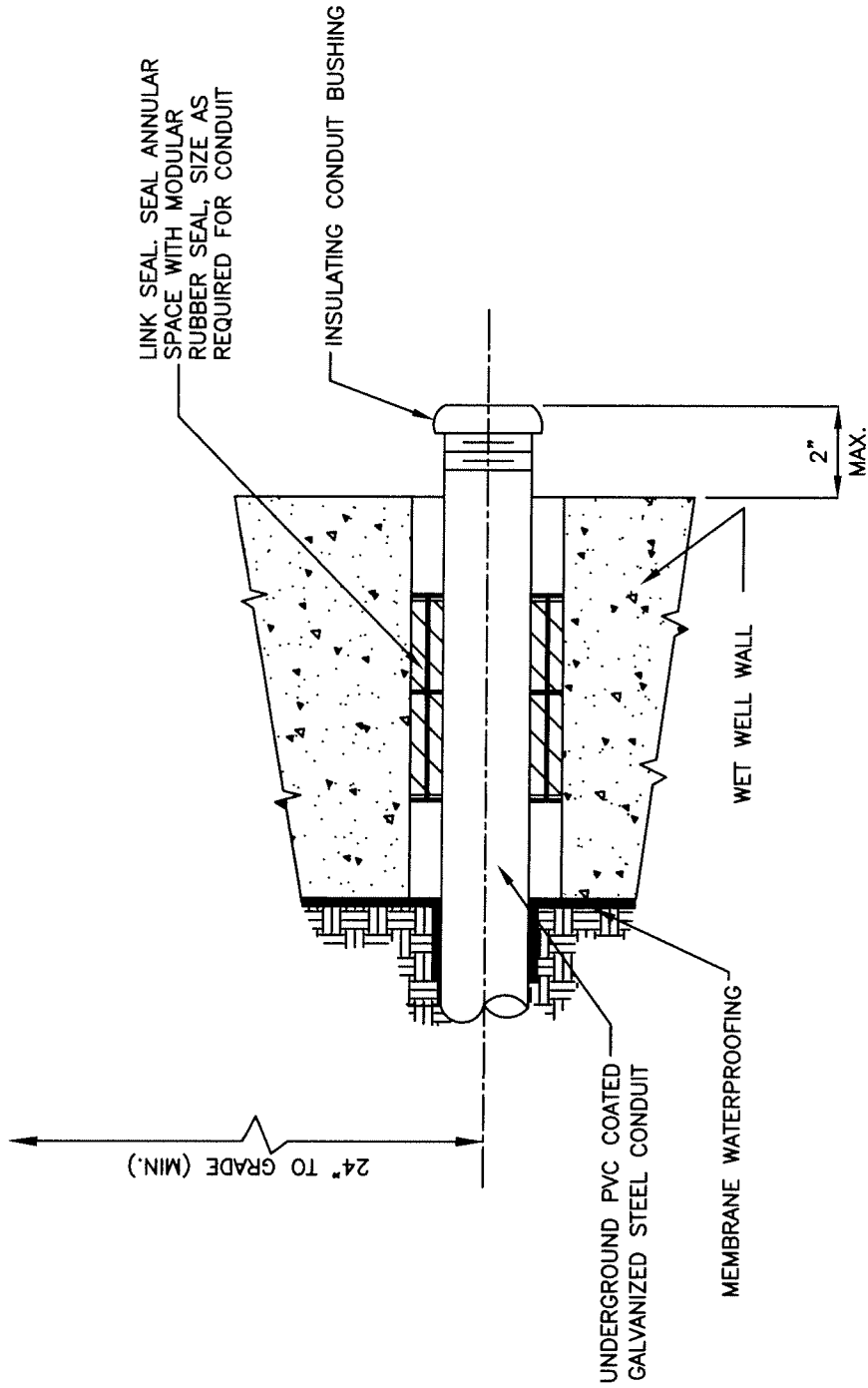
### LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	LAMP	MANUFACTURER & CATALOG NUMBER	AREA TO BE LIT
A	CEILING OR WALL MOUNTED VAPORPROOF INCANDESCENT W/ GUARD & WHITE GLOBE (NOTE 1)	150W INCANDESCENT	CROUSE-HINDS VXHT15GP	DRYWELL, BUILDING INTERIOR
B	WALL MOUNTED HPS POLYCARBONATE DIFFUSER WITH PHOTO CELL	100W-HPS	LITHONIA TWAC	EXTERIOR WALL OF PUMP STATION
C	POLE TYPE FLOOD LIGHTS, 1 OR 2 HEAD AS REQUIRED WITH PHOTOCELL ON 15' ALUMINUM POLE.	1-200W, HPS	LITHONIA RSA-16-5E-DM19 OR 29	FACILITY GROUNDS/ WETWELL EXTERIOR/ BUILDING EXTERIOR/ DOORWAYS.

**NOTES:**

1. PROVIDE MOTION SENSORS IN BUILDINGS TO ACTIVATE LIGHTS.
2. COORDINATE USE OF PHOTOCELL FOR EXTERIOR LIGHTING.
3. USE TYPE C FIXTURES FOR FACILITY SITE LIGHTING.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  DAVID A. STOLIC DESIGN ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN LIGHTING FIXTURE SCHEDULE	REVISED <table border="1" style="width: 100%; height: 40px;"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table>				
			PS E1-6				



**NOTES:**

1. TYPICAL FOR PUMP CABLES, GAS DETECTION, COMMUNICATOR (GRINDER) CABLES AND FLOAT CABLES.
2. SIMILAR FOR BUBBLER LINES, REFER TO DRAWING M1-7.

ANNE ARUNDEL  
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 PUBLIC WORKS  
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*[Signature]*  
 CHIEF ENGINEER  
*[Signature]*  
 DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
 TYPICAL WET WELL ELECTRICAL  
 CONDUIT ENTRY DETAIL

REVISED

PS  
 E1-7

BUBBLER  
SYSTEM  
CONTROL  
DIAGRAM

DWG. E2-1A & 1B

FLOAT  
SYSTEM  
CONTROL  
DIAGRAM

DWG. E2-2

PUMP ONE  
CONTROL  
DIAGRAM

DWG. E2-3A

PUMP TWO  
CONTROL  
DIAGRAM

DWG. E2-4A

WET/DRY WELL

SUBMERSIBLE

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED



CHIEF ENGINEER



DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
ELECTRICAL  
CONTROL DIAGRAMS

REVISED

PS  
E-2A

BUBBLER  
SYSTEM  
CONTROL  
DIAGRAM

DWG. E2-1A

FLOAT  
SYSTEM  
CONTROL  
DIAGRAM

DWG. E2-2

PUMP ONE  
CONTROL  
DIAGRAM

DWG. E2-3B

PUMP TWO  
CONTROL  
DIAGRAM

DWG. E2-4B

WET/DRY WELL

SUBMERSIBLE

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

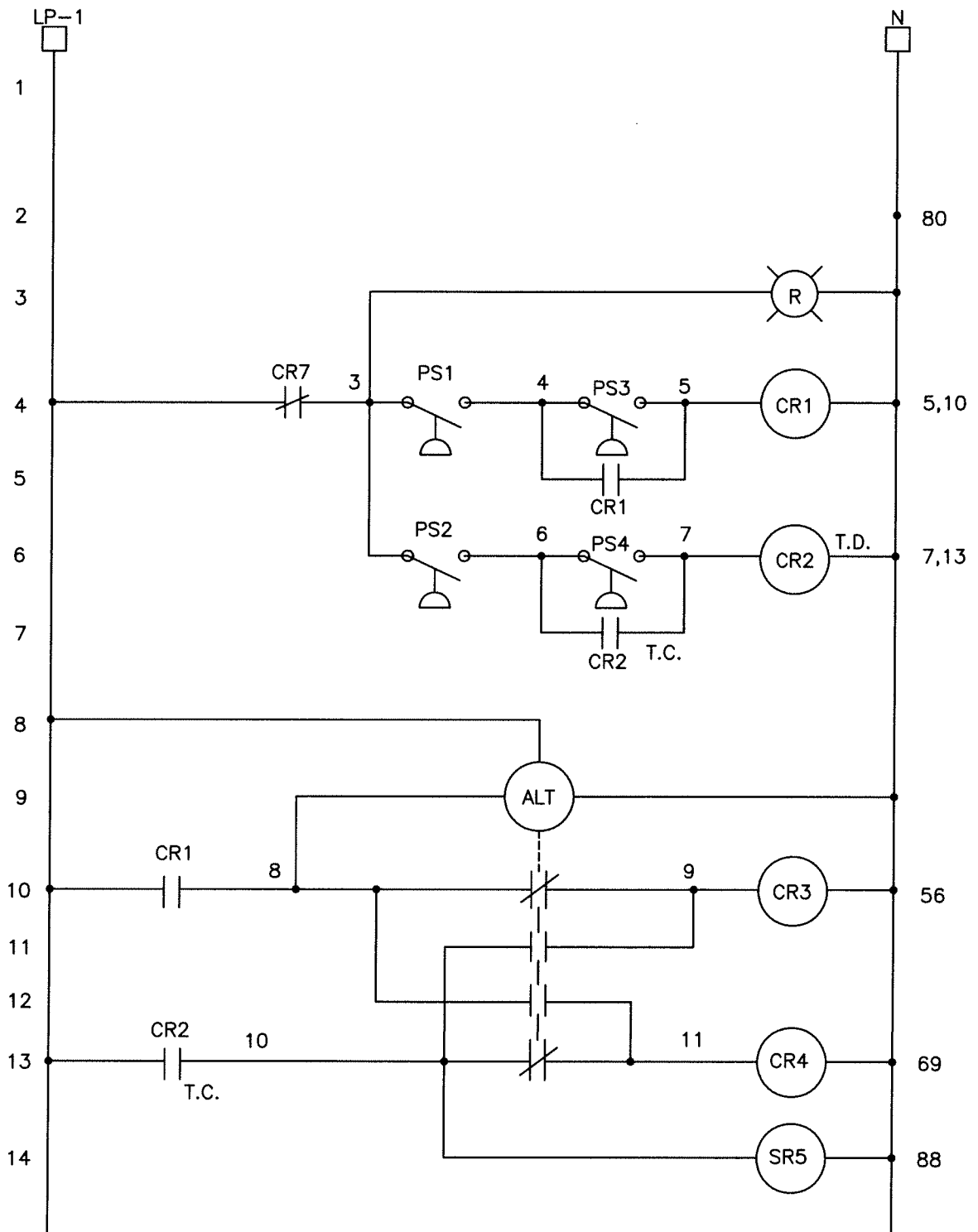
APPROVED  
*[Signature]*  
CITY ENGINEER

*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
ELECTRICAL  
CONTROL DIAGRAMS

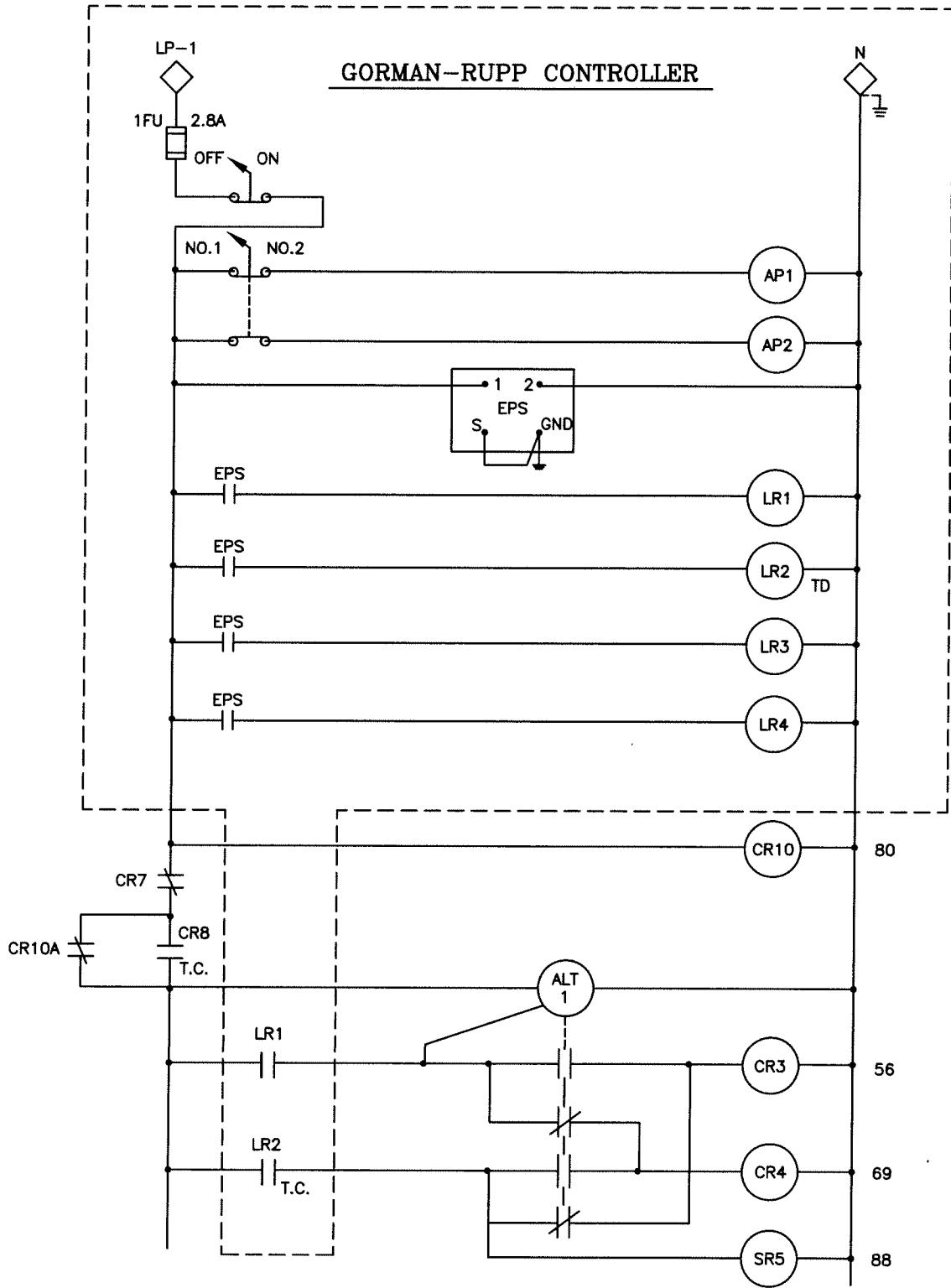
REVISED

PS  
E-2B



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>Chad Harris 3/7/11</i> CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN BUBBLER SYSTEM CONTROL DIAGRAM (W/PNEUMATIC PRESSURE SWITCHES)	REVISED	PS E2-1A
	<i>[Signature]</i> DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	
	_____		_____	





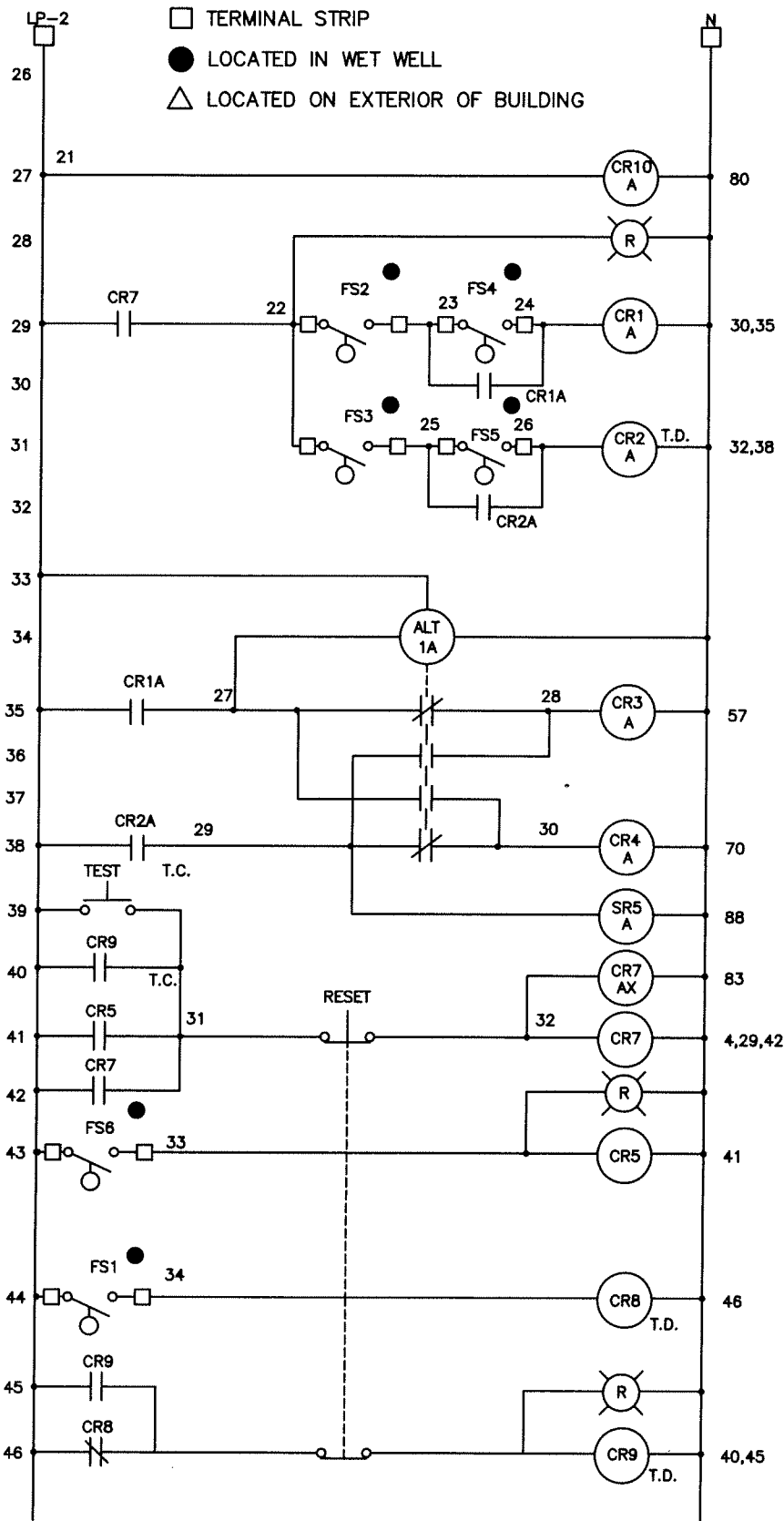
ANNE ARUNDEL  
 COUNTY  
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 DATE: MAY 2011

APPROVED  
*[Signature]* 5/12/11  
 CHIEF ENGINEER  
*[Signature]* 5/10/11  
 DESIGN ENGINEER

REFERENCE SEWAGE  
 PUMPING STATION DESIGN  
 BUBBLER SYSTEM CONTROL DIAGRAM  
 (W/ELECTRIC PRESSURE SWITCHES)  
 WET/DRY WELL

REVISED  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

PS  
 E2-1B

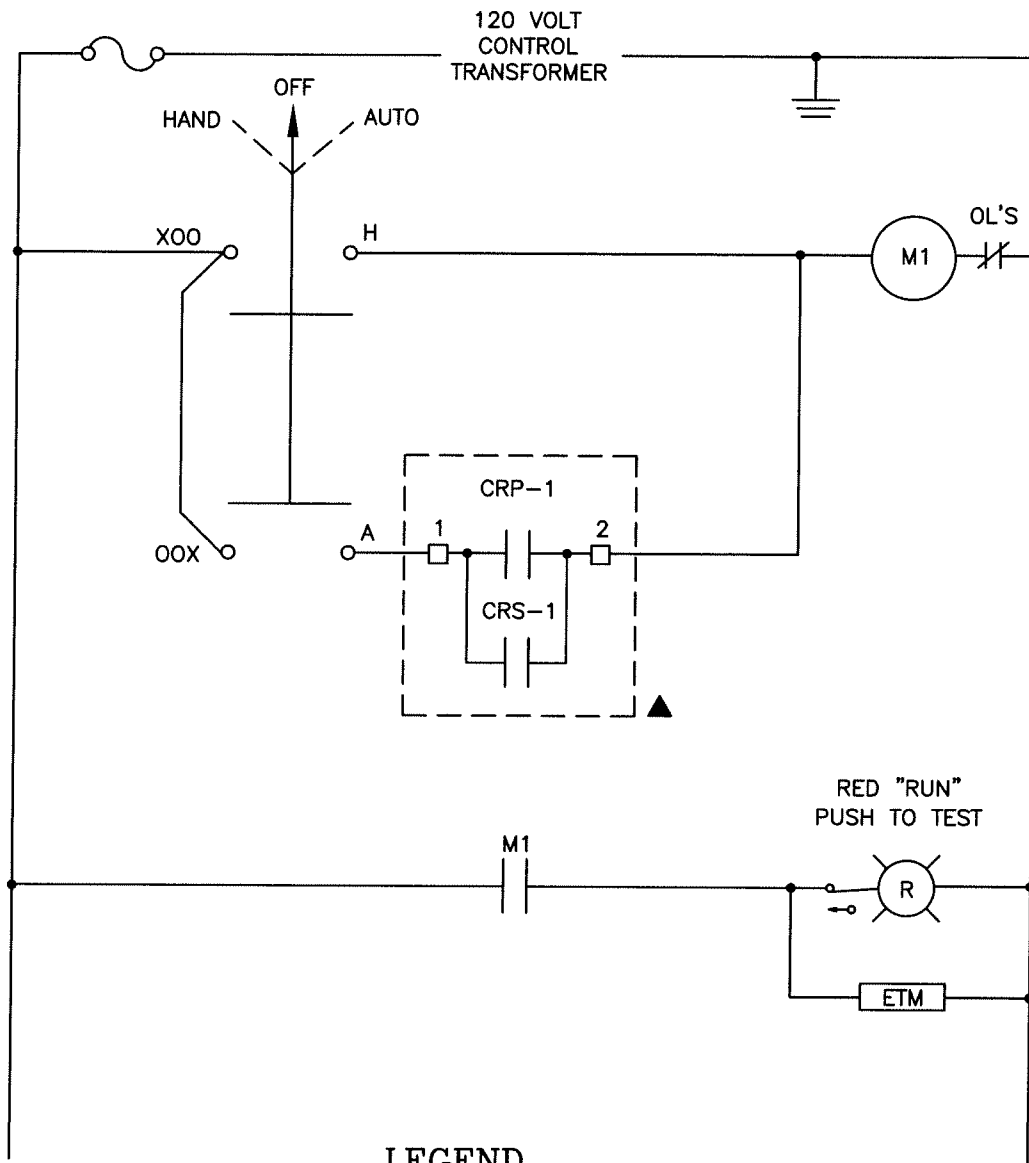


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 DATE: MAY 2011

APPROVED  
*[Signature]* 5/17/11  
 CHIEF ENGINEER  
*[Signature]*  
 DESIGN ENGINEER

REFERENCE SEWAGE  
 PUMPING STATION DESIGN  
 FLOAT SYSTEM  
 CONTROL DIAGRAM



REVISED	PS E2-2

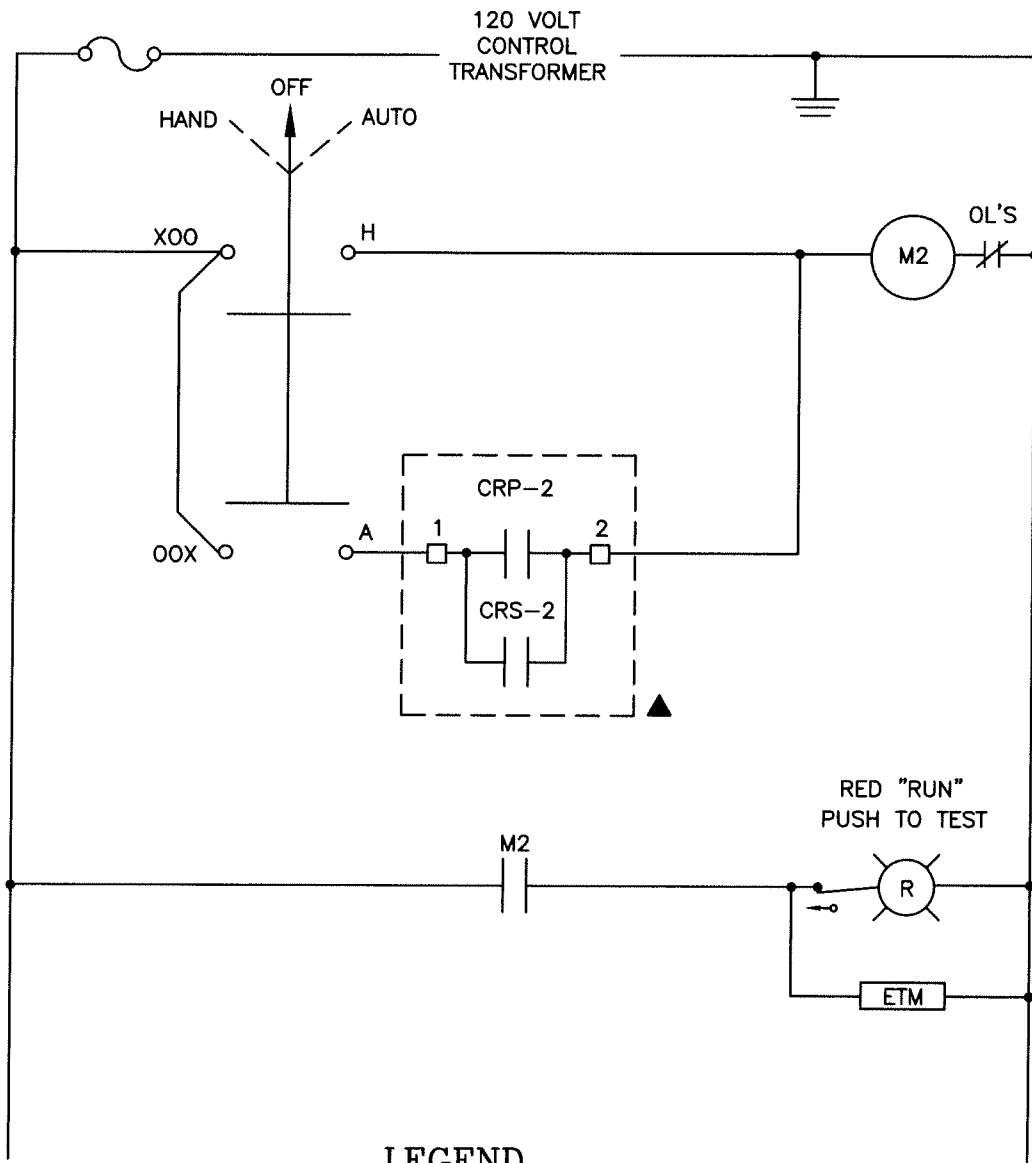


**LEGEND**

▲ LOCATED IN PUMP CONTROL PANEL

□ TERMINAL STRIP

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL PUMP ONE CONTROL DIAGRAM	REVISED	PS E2-3A
	 DESIGN ENGINEER			



**LEGEND**

▲ LOCATED IN PUMP CONTROL PANEL

□ TERMINAL STRIP

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 3/2/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL PUMP TWO CONTROL DIAGRAM	REVISED	PS E2-3B
	<i>[Signature]</i> 3/10/11 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	

REMOTE  
MONITOR  
CONNECTIONS

DWG. E3-1A

WET WELL  
BLOWER AND LIGHTS

DWG. E3-2

DRY WELL  
BLOWER AND LIGHTS

DWG. E3-3

MOTOR OPERATED  
DAMPER GENERATOR  
INTAKE LOUVER

DWG. E3-4

MOTOR OPERATED  
DAMPER AND  
EXHAUST FAN -  
CONTROL ROOM

DWG. E3-4

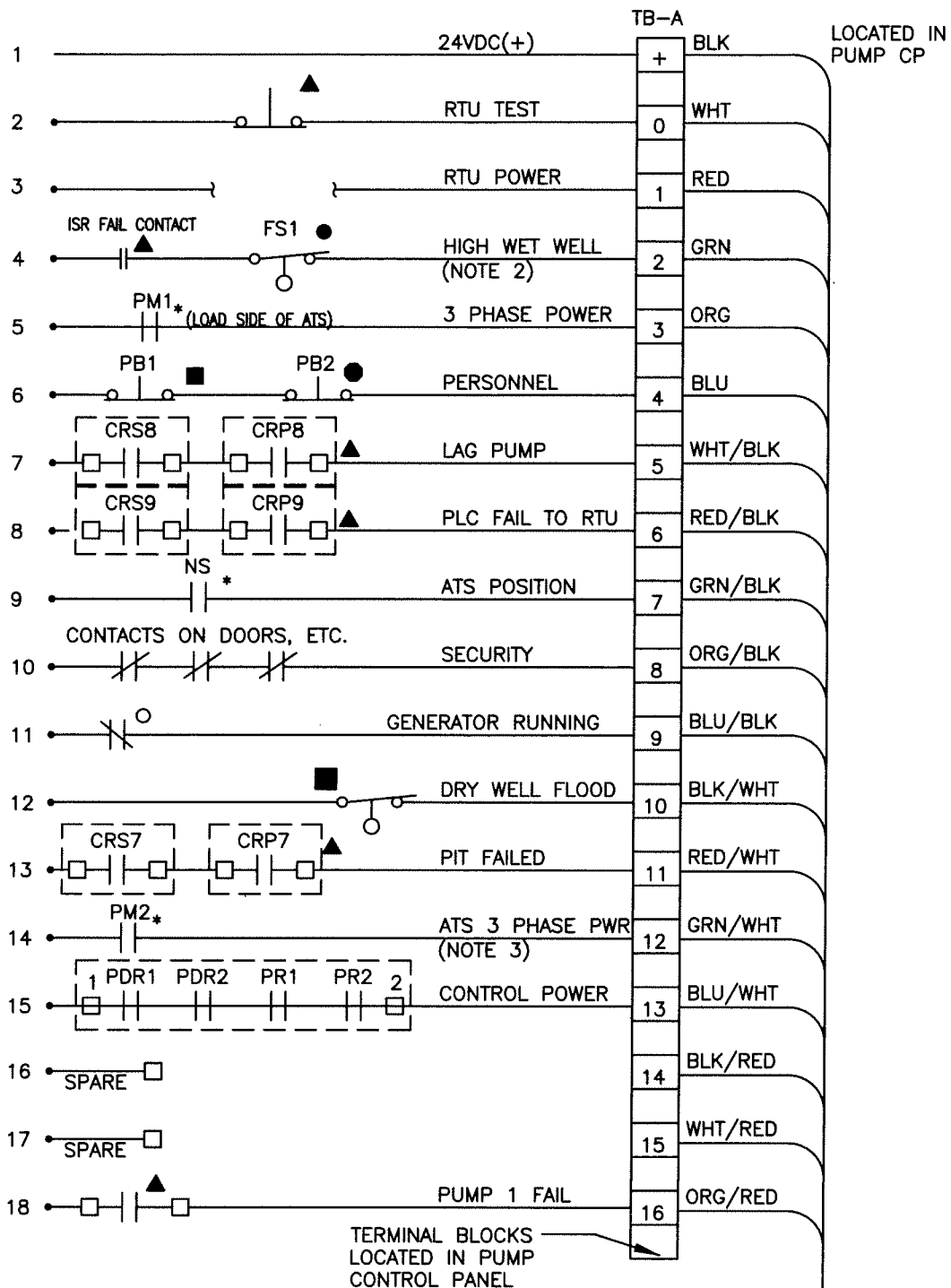
WET/DRY WELL  SUBMERSIBLE

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
ELECTRICAL  
CONTROL DIAGRAMS

REVISED	PS
	E-3A



**LEGEND:**

- \* - LOCATED IN AUTOMATIC TRANSFER SWITCH (ATS)
- - LOCATED IN DRY WELL (IF APPLICABLE)
- ▲ - LOCATED IN BUBBLER CONTROL CABINET
- - LOCATED IN VAULTS AS REQUIRED
- - LOCATED IN WET WELL
- - LOCATED AT GENERATOR

**NOTES:**

1. DESIGNER TO COORDINATE WITH COUNTY FOR SPS, NOT ALL POINTS APPLY TO EXISTING SITES.
2. CONNECT VIA INTRINSICALLY SAFE RELAY.
3. MONITOR SECONDARY BGE SERVICE IF APPLICABLE.
4. LOCATED IN GRINDER CONTROL CABINET (MOTOR STARTER AUX CONTACT.)

TO E3-1B

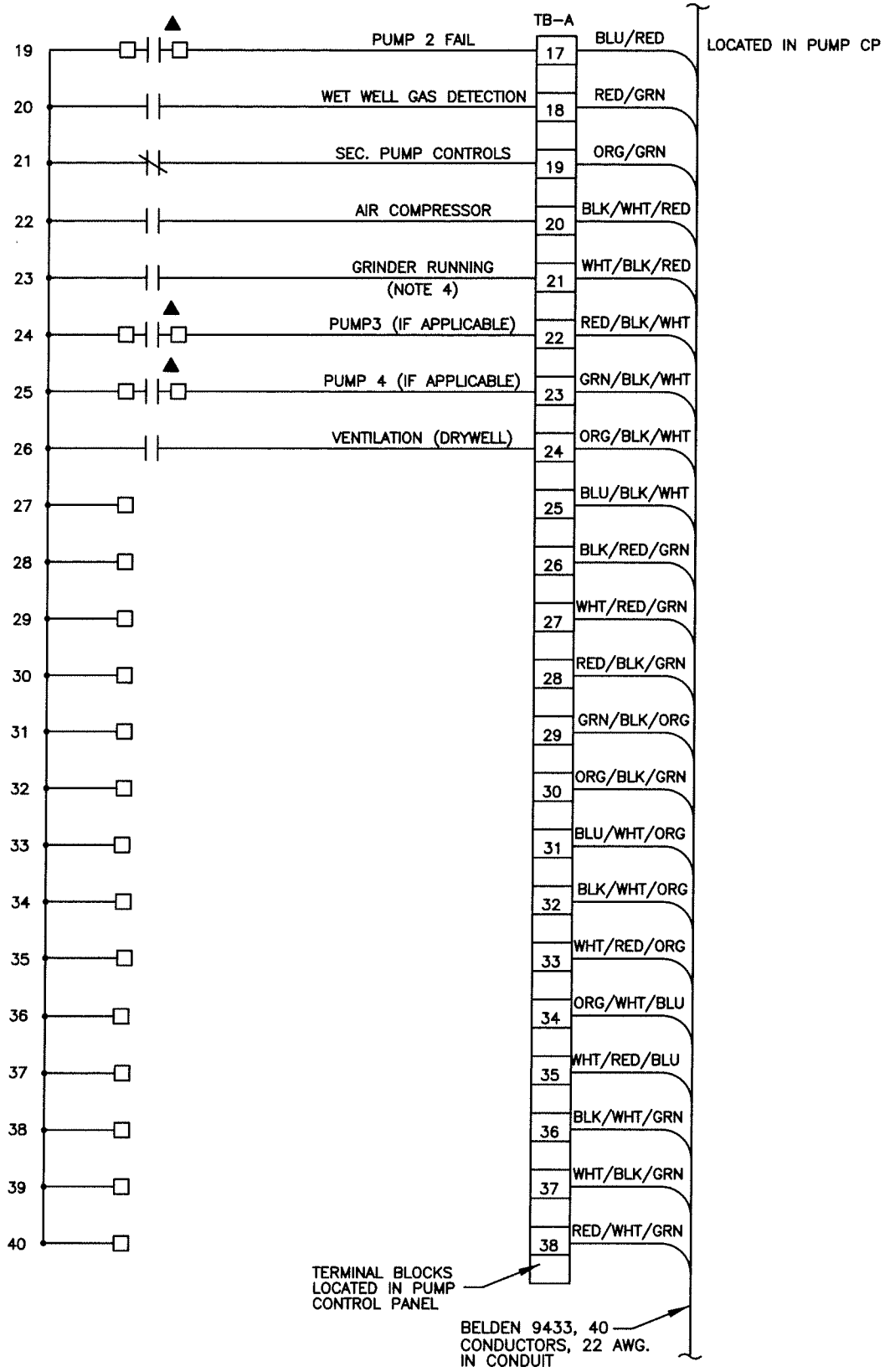
ANNE ARUNDEL COUNTY  
DEPARTMENT OF PUBLIC WORKS  
DATE: MAY 2011

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*[Signature]* 5/12/11  
CHIEF ENGINEER  
*[Signature]* 5/12/11  
DESIGN ENGINEER

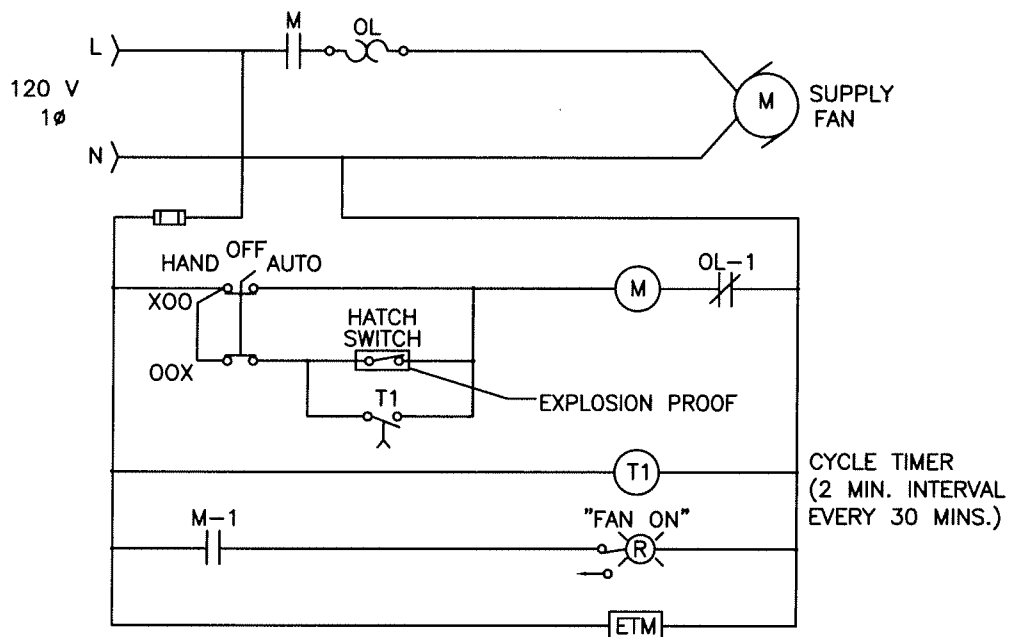
REFERENCE SEWAGE PUMPING STATION DETAIL  
REMOTE MONITOR CONNECTIONS

REVISED

PS  
E3-1A





ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  REMOTE MONITOR CONNECTIONS SUBMERSIBLE	REVISED	PS E3-1B
	<i>[Signature]</i> DESIGN ENGINEER			

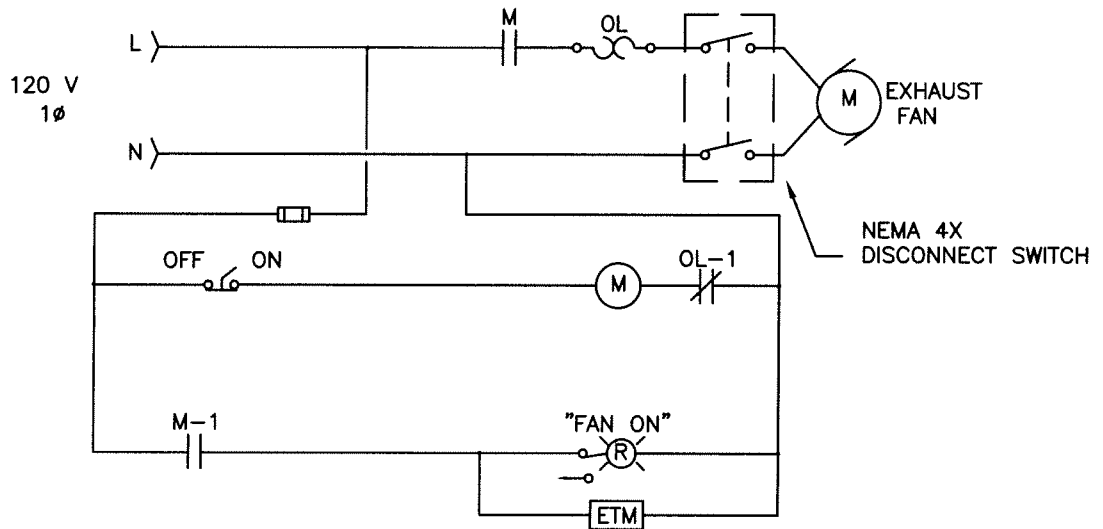


**NOTES:**

1. FOR WETWELL FAN OPERATION, HATCH SWITCH SHALL ENERGIZE SUPPLY FAN WHEN HATCH IS OPENED.
2. FAN CONTROLS LOCATED IN FAN CONTROL PANEL OR MOTOR CONTROL CENTER.
3. FAN SHALL SUPPLY TWO AIR CHANGES PER HOUR VIA CYCLE TIMER WHEN HATCH SWITCH NOT ACTIVATED.
4. SINGLE PHASE POWER SHOWN FOR REFERENCE ONLY, COORDINATE WITH FAN.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL WET WELL SUPPLY FAN CONTROL DIAGRAM	REVISED	PS E3-2
	 DESIGN ENGINEER			





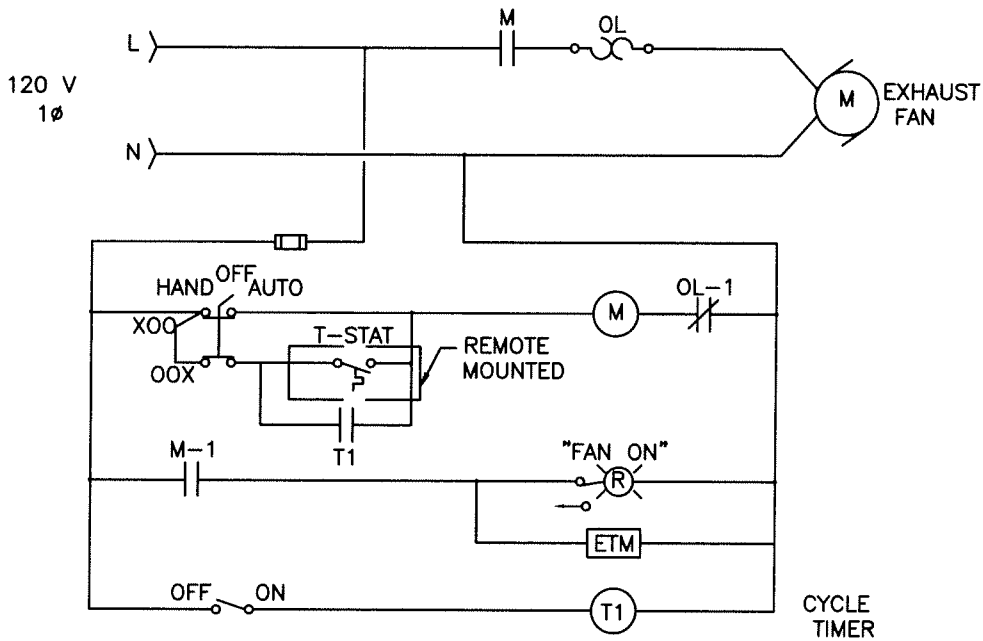


TYPICAL SUPPLY AND EXHAUST FAN

NOTES:



1. DRYWELL SHALL HAVE BOTH EXHAUST AND SUPPLY FAN.
2. THE DRYWELL FANS SHALL OPERATE CONTINUOUSLY.
3. FANS SHALL PROVIDE MINIMUM 6 AIR CHANGES PER HOUR.
4. FAN CONTROLS SHALL BE MOUNTED IN FAN CONTROL PANEL OR MOTOR CONTROL CENTER.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL DRY WELL VENTILATION FANS CONTROL DIAGRAM	REVISED	PS E3-3
	 DESIGN ENGINEER			



**NOTES:**

1. COORDINATE CYCLE TIMER DURATION DURING DESIGN.
2. FAN CONTROLS SHALL BE MOUNTED IN FAN CONTROL PANEL OR MOTOR CONTROL CENTER.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL PUMP STATION EXHAUST FAN CONTROL DIAGRAM	REVISED	PS E3-4
	 DESIGN ENGINEER			

REMOTE  
MONITOR  
CONNECTIONS

DWG. E3-1B

WET WELL  
BLOWER AND LIGHTS

DWG. E3-2

PROJECT SPECIFIC

MOTOR OPERATED  
DAMPER GENERATOR  
INTAKE LOUVER

DWG. E3-4

MOTOR OPERATED  
DAMPER AND  
EXHAUST FAN -  
CONTROL ROOM

DWG. E3-4

WET/DRY WELL

SUBMERSIBLE

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
ELECTRICAL  
CONTROL DIAGRAMS

REVISED

PS  
E-3B

MOTOR CONTROL CENTER  
ONE LINE DIAGRAM

DWG. E4-1

MOTOR  
CONTROL  
CENTER  
SCHEDULE

DWG. E4-2

SCHEDULE  
OF PANEL  
"LP-1"

DWG. E4-3A



MCC  
ELEVATION

DWG. E4-4

SCHEDULE  
OF PANEL  
"LP-2"

DWG. E4-5

WET/DRY WELL  SUBMERSIBLE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  ELECTRICAL DIAGRAMS AND SCHEDULES	REVISION	PS E-4A
	DESIGN ENGINEER 			

MOTOR CONTROL CENTER  
ONE LINE DIAGRAM

DWG. E4-1

MOTOR  
CONTROL  
CENTER  
SCHEDULE

DWG. E4-2

SCHEDULE  
OF PANEL  
"LP-1"

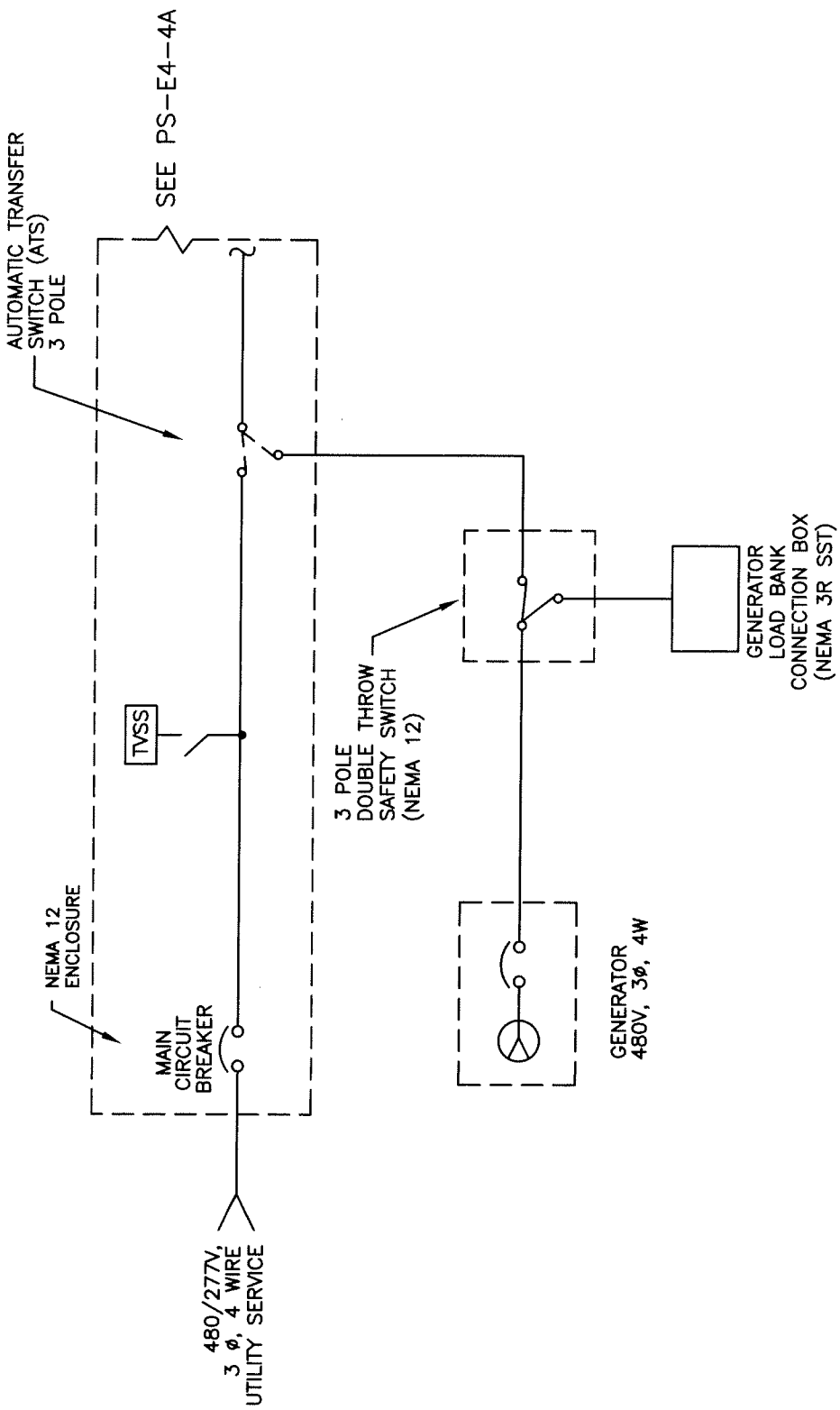
DWG. E4-3B

MCC  
ELEVATION

DWG. E4-4

WET/DRY WELL  SUBMERSIBLE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> CHIEF ENGINEER <i>[Signature]</i> DESIGN ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  ELECTRICAL DIAGRAMS AND SCHEDULES	REVISED _____ _____ _____ _____ PS E-4B
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NOTES:

1. MAIN BREAKER, TVSS, AND ATS CAN BE MOUNTED IN MOTOR CONTROL CENTER.
2. PROVIDE NEMA 3R SST FOR EQUIPMENT MOUNTED OUTSIDE.

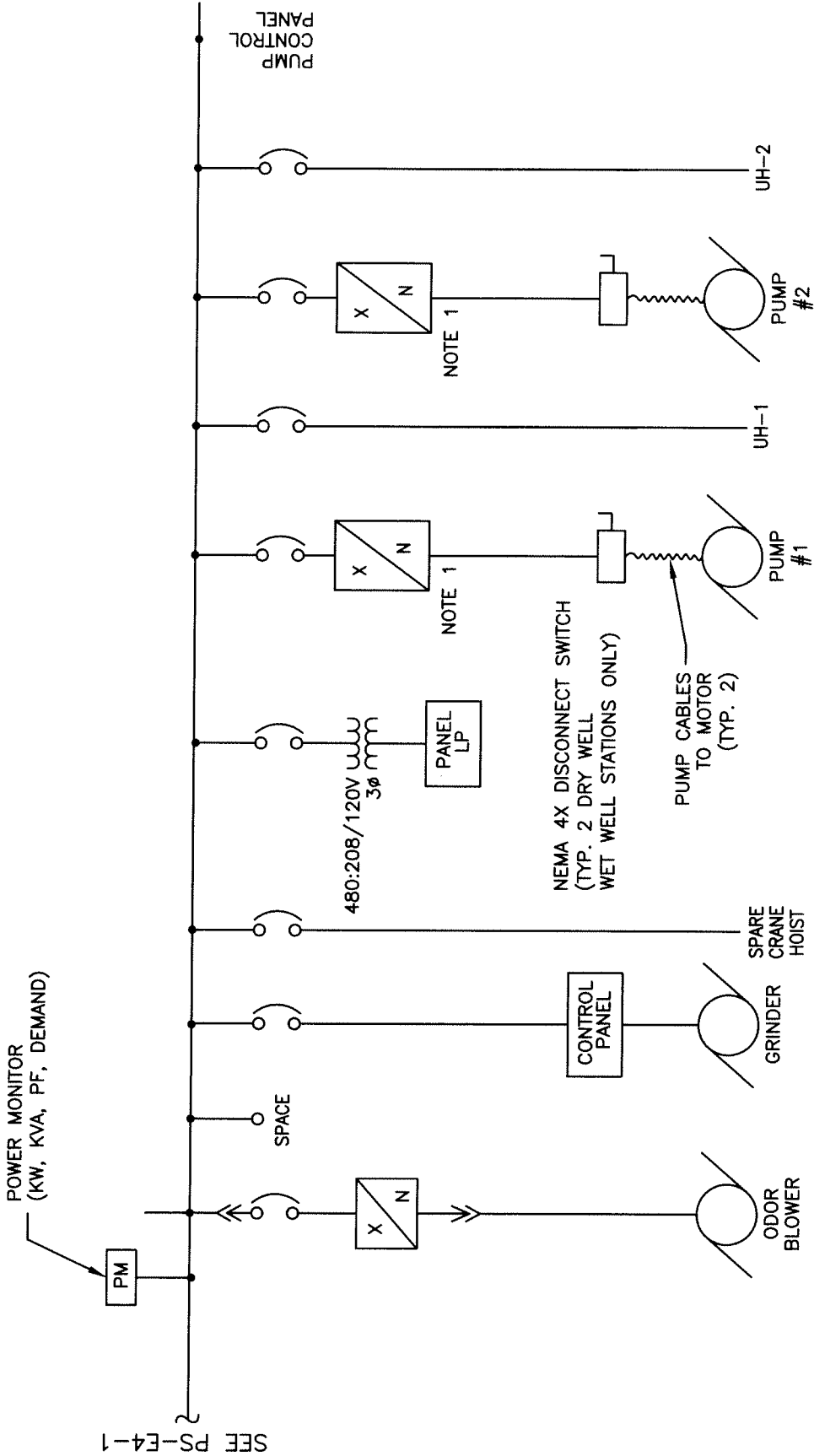
ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS  
 DATE: MAY 2011

APPROVED  
*[Signature]*  
 CHIEF ENGINEER  
*[Signature]*  
 DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
 LOAD BANK CONNECTION  
 ONE-LINE DIAGRAM

REVISED

PS  
 E4-1



SEE PS-E4-1

NOTES:

1. PROVIDE VFD'S WHEN REQUIRED FOR PUMP OPERATION, NO REDUCED VOLTAGE STARTERS TO BE USED.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS  
DATE: MAY, 2011

APPROVED: *[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER



REFERENCE SEWAGE PUMPING STATION DESIGN  
MOTOR CONTROL CENTER  
ONE-LINE DIAGRAM

REVISED

PS  
E4-1A

**MOTOR CONTROL CENTER  
480/277V, 3 $\phi$ , 3W, W/GROUND BUS**

SECT.	NAMEPLATE	HP	KW	NEMA STARTER SIZE	CIRC. BRKR.		COMMENTS
					FRAME	TRIP	
-	MAIN BREAKER				X	X	SERVICE ENTRANCE
-	TVSS						
-	AUTOMATIC TRANSFER SWITCH						NON-DELAY, OPEN TRANSITION
-	POWER MONITOR						KW, KVA, P.F., DEMAND, KWH
-	ODOR BLOWER	X		X	X	X	IN MCC STATION OR SEPARATE ENCLOSURE
-	GRINDER	X			X	X	
-	SPARE				X	X	
-	XFMR FEEDER		X		X	X	
-	PANEL LP				X	X	
-	TRANSFORMER		X		X	X	
-	SEWAGE PUMP #1	X		X	X	X	
-	UNIT HEATER UH-1		X		X	X	
-	SEWAGE PUMP #2	X		X	X	X	
-	UNIT HEATER UH-2		X		X	X	
-	PUMP CONTROLS						IN MCC STATION OR SEPARATE ENCLOSURE

APPROVED  
  
 CHIEF ENGINEER  
  
 DESIGN ENGINEER

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS  
 DATE: MAY 2011

REFERENCE SEWAGE PUMPING STATION DESIGN  
 MOTOR CONTROL CENTER SCHEDULE

REVISIONS


PS  
E4-2





PANEL LP  
 208/120 VOLT, THREE PHASE, 4 WIRE  
 100A MAIN CIRCUIT BREAKER  
 36 CIRCUIT



CKT #	BREAKER			SERVING
	POLE	FRAME	TRIP	
1	1	100	20	INTERIOR LIGHTING—CONTROL ROOM
2	1	100	20	INTERIOR LIGHTING—GENERATOR ROOM
3	1	100	20	RECEPTACLES—CONTROL ROOM
4	1	100	20	RECEPTACLES—GENERATOR ROOM
5	1	100	20	DEHUMIDIFIER
6	1	100	20	CHART RECORDER AND FLOW TRANSMITTER
7	1	100	20	DRYWELL LIGHTING
8	1	100	20	GENERATOR—BATTERY CHARGER
9	1	100	20	EXTERIOR BUILDING LIGHTING
10	1	100	20	RTU
11	1	100	20	BUBBLER SYSTEM #1 - COMPRESSOR
12	1	100	20	BUBBLER SYSTEM #2 - COMPRESSOR
13	1	100	20	ODOR BLOWER CONTROL PANEL
14	1	100	20	PUMP CONTROL PANEL - CIRCUIT 1 (TVSS1)
15	1	100	20	PUMP CONTROL PANEL - CIRCUIT 2 (TVSS2)
16	1	100	20	PUMP CONTROL PANEL - CIRCUIT 3 (INT. REAR)
17	1	100	20	SUMP PUMP RECEPTACLE
18	1	100	20	EXTERIOR SITE LIGHTING
19	1	100	20	GAS MONITOR
20	1	100	20	EXHAUST FAN CONTROL ROOM
21	1	100	20	EXHAUST FAN - DRYWELL
22	1	100	20	SUPPLY FAN - WETWELL
23	1	100	20	SUPPLY FAN - DRYWELL
24	2	100	20	GENERATOR JACKET WATER HEATER
25	1	100	20	SPARE
26	2	100	20	GENERATOR JACKET WATER HEATER
27	1	100	20	SPARE
28	1	100	20	DRYWELL RECEPTACLES
29	1	100	20	SPARE
30	1	100	20	SPARE
31	-	-	-	SPACE
32	-	-	-	SPACE
33	-	-	-	SPACE
34	-	-	-	SPACE
35	-	-	-	SPACE
36	-	-	-	SPACE

① - PROVIDE PANELBOARD WITH INTEGRAL TVSS, INCLUDING ALL WIRING AND OVER CURRENT PROTECTION.

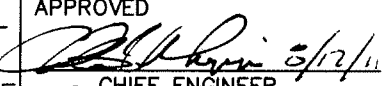

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  SCHEDULE OF PANEL "LP" WET WELL/DRYWELL	REVISED	PS E4-3A
	 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	

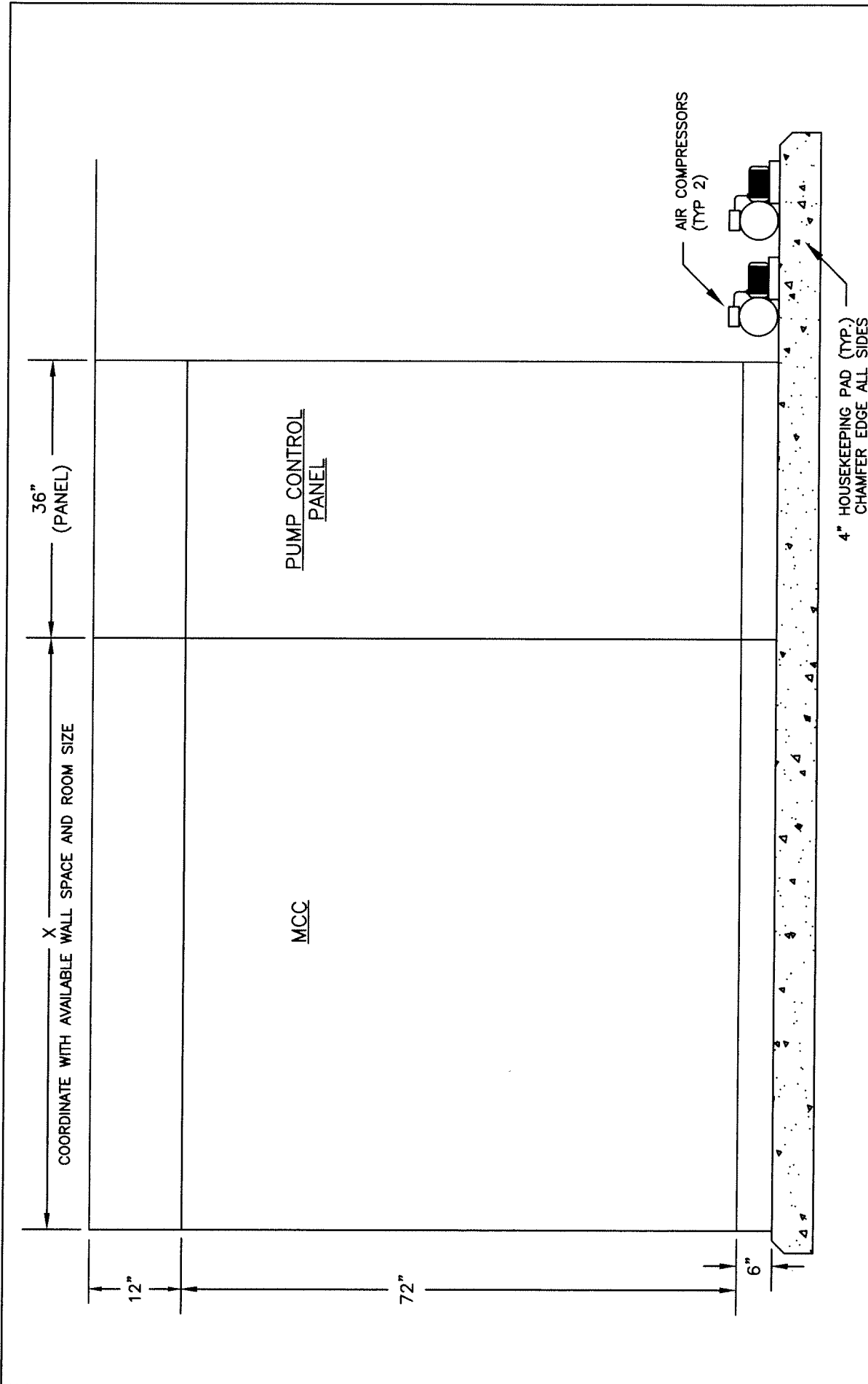
PANEL LP  
 208/120 VOLT, THREE PHASE, 4 WIRE  
 100A MAIN CIRCUIT BREAKER  
 36 CIRCUIT

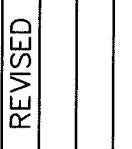


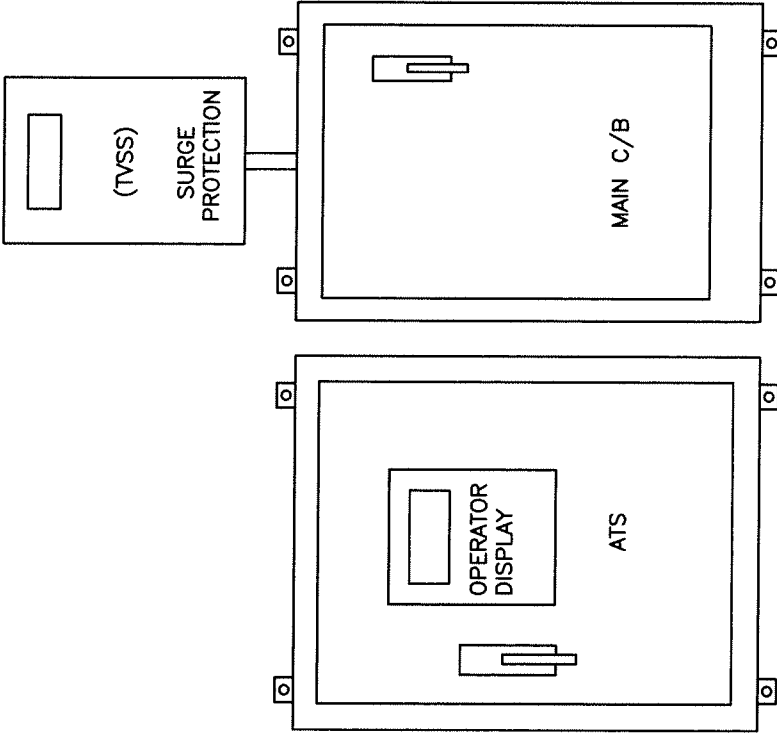
CKT #	BREAKER			SERVING
	POLE	FRAME	TRIP	
1	1	100	20	INTERIOR LIGHTING--CONTROL ROOM
2	1	100	20	INTERIOR LIGHTING--GENERATOR ROOM
3	1	100	20	RECEPTACLES--CONTROL ROOM
4	1	100	20	RECEPTACLES--GENERATOR ROOM
5	1	100	20	SPARE
6	1	100	20	CHART RECORDER AND FLOW TRANSMITTER
7	1	100	20	SPARE
8	1	100	20	GENERATOR
9	1	100	20	EXTERIOR LIGHTING
10	1	100	20	RTU
11	1	100	20	BUBBLER SYSTEM #1 - COMPRESSOR
12	1	100	20	BUBBLER SYSTEM #2 - COMPRESSOR
13	1	100	20	ODOR BLOWER CONTROL PANEL
14	1	100	20	PUMP CONTROL PANEL - CIRCUIT 1 (TVSS1)
15	1	100	20	PUMP CONTROL PANEL - CIRCUIT 2 (TVSS2)
16	1	100	20	PUMP CONTROL PANEL - CIRCUIT 3 (INT. RUB)
17	1	100	20	SPARE
18	1	100	20	EXTERIOR SITE LIGHTING
19	1	100	20	GAS MONITOR
20	1	100	20	EXHAUST FAN CONTROL ROOM
21	1	100	20	EXHAUST FAN - DRYWELL
22	1	100	20	SUPPLY FAN - WETWELL
23	1	100	20	SUPPLY FAN - DRYWELL
24	1	100	20	GENERATOR JACKET WATER HEATER
25	1	100	20	SPARE
26	1	100	20	GENERATOR JACKET WATER HEATER
27	1	100	20	SPARE
28	1	100	20	SPARE
29	1	100	20	SPARE
30	1	100	20	SPARE
31	-	-	-	SPACE
32	-	-	-	SPACE
33	-	-	-	SPACE
34	-	-	-	SPACE
35	-	-	-	SPACE
36	-	-	-	SPACE

① - PROVIDE PANELBOARD WITH INTEGRAL TVSS, INCLUDING ALL WIRING AND OVER CURRENT PROTECTION.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL SCHEDULE OF PANEL "LP" SUBMERSIBLE	REVISED	PS E4-3B
	 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN MCC ELEVATION	REVISED    	PS E4-4
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SCALE: NONE

NOTES:

1. EQUIPMENT CAN BE PROVIDED IN MCC SECTIONS.

ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
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 DATE: MAY 2011

APPROVED  
*[Signature]*  
 CHIEF ENGINEER  
*[Signature]*  
 DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
 MCC ELEVATION  
 (Sht 2 of 2)

REVISED

PS  
 E4-4A  
 Sht 2 of 2

PROCESS AND  
INSTRUMENTATION  
DIAGRAM  
AND  
LEGEND  
  
DWG. E5-1A AND 1B

FILTER CONTROL  
DIAGRAM  
AND  
LEGEND  
  
DWG. E5-2

ELECTRICAL  
NOTES  
  
DWG. E5-3

BLOWER MANUAL  
STARTER DETAIL  
  
DWG. E5-4

FILTER  
CONTROLLER DETAIL  
  
DWG. E5-5

WET/DRY WELL

SUBMERSIBLE

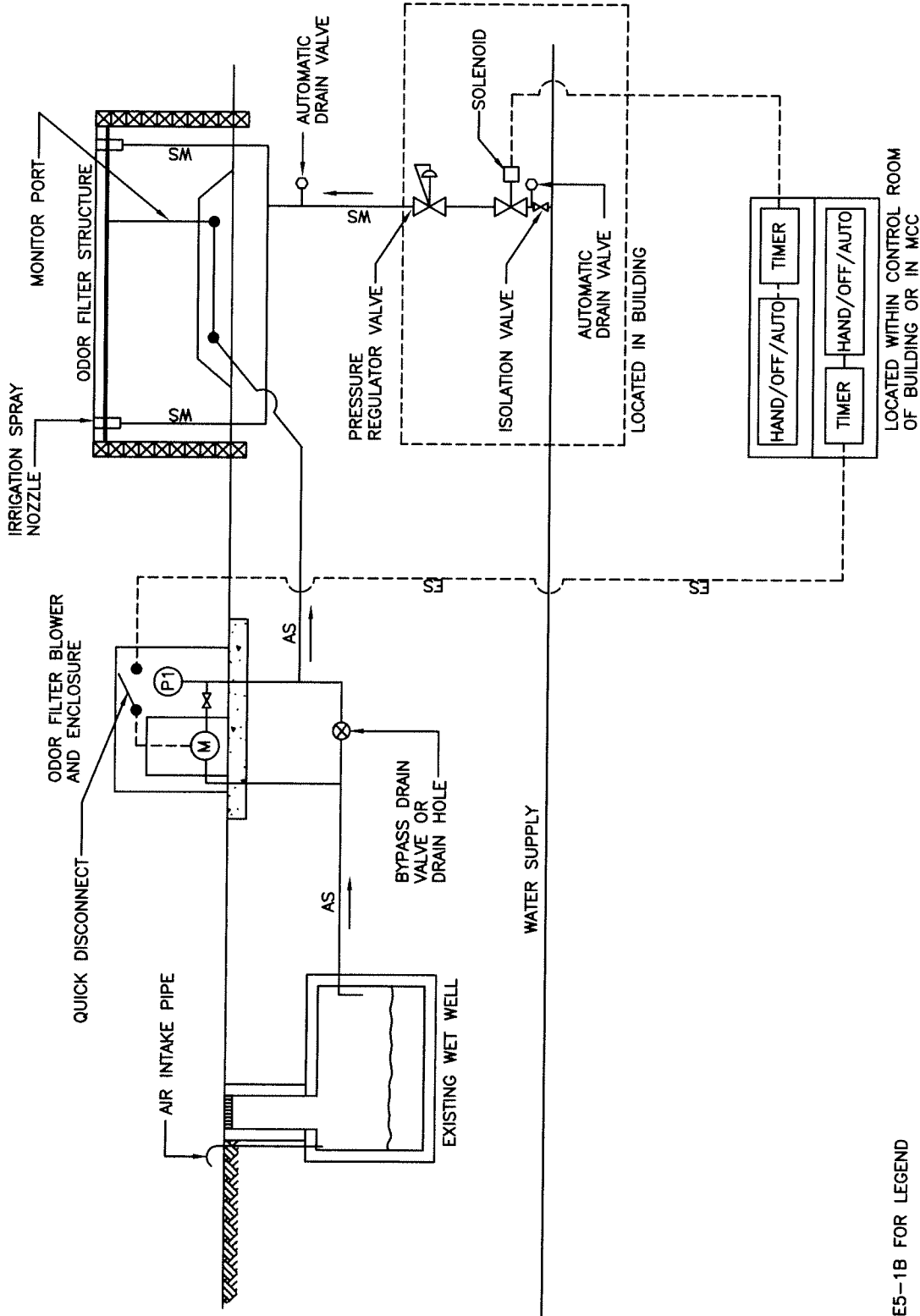
ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
ELECTRICAL  
P. & I.D. DETAILS AND DIAGRAMS

REVISED

PS  
E-5



NOTE:  
SEE DRAWING E5-1B FOR LEGEND

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COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

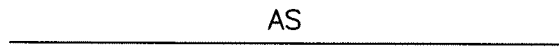
APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE PUMPING STATION DESIGN  
PROCESS & INSTRUMENTATION  
DIAGRAM

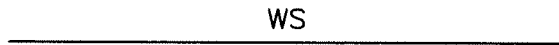
REVISED

PS  
E5-1A

# P & ID LEGEND



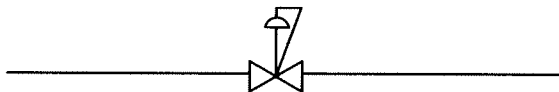
AIR SUPPLY LINE



WATER SUPPLY LINE



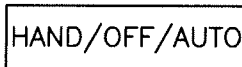
ELECTRICAL SUPPLY



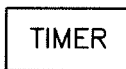
PRESSURE REDUCING REGULATOR  
SELF CONTAINED



BLOWER MOTOR



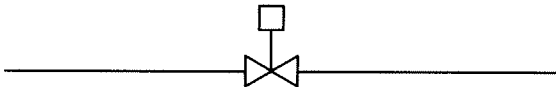
HAND/OFF/AUTO SWITCH



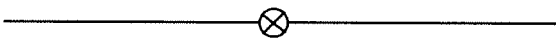
TIMER



PRESSURE INDICATOR



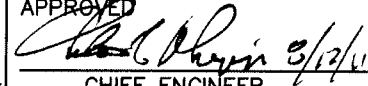

ELECTRICALLY ACTUATED BALL VALVE

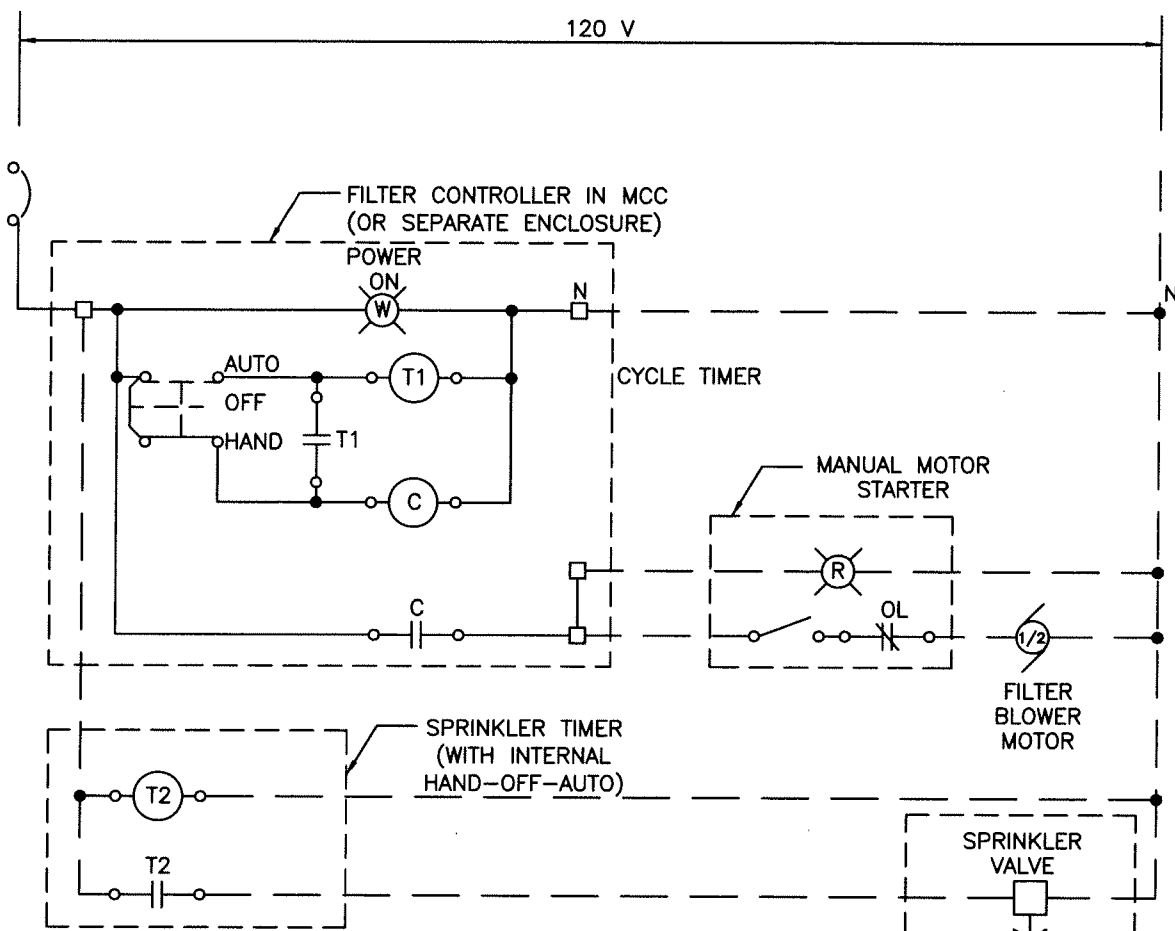


BY-PASS DRAIN VALVE WITH  
VALVE BOX



IRRIGATION SPRAY VALVE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  P & ID LEGEND	REVISED	PS E5-1B
	 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	



REFER TO E5-3 FOR NOTES

**LEGEND**

- CIRCUIT BREAKER
- TIMER COIL
- CONTACTOR COIL
- RELAY COIL
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- SPST SWITCH
- PILOT LIGHT (COLOR INDICATED)
- ACTUATED BALL VALVE
- NOTE
- MOTOR (HP INDICATED)
- TERMINAL
- PIN
- PANEL WIRE
- FIELD WIRE
- ENCLOSURE BOUNDARY

LOCATED MIN. 3' FROM ODOR FILTER IN NEMA 4X ENCLOSURE (HEAT TRACE AS REQUIRED)

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL FILTER CONTROL DIAGRAM AND LEGEND	REVISED	PS E5-2
	 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	





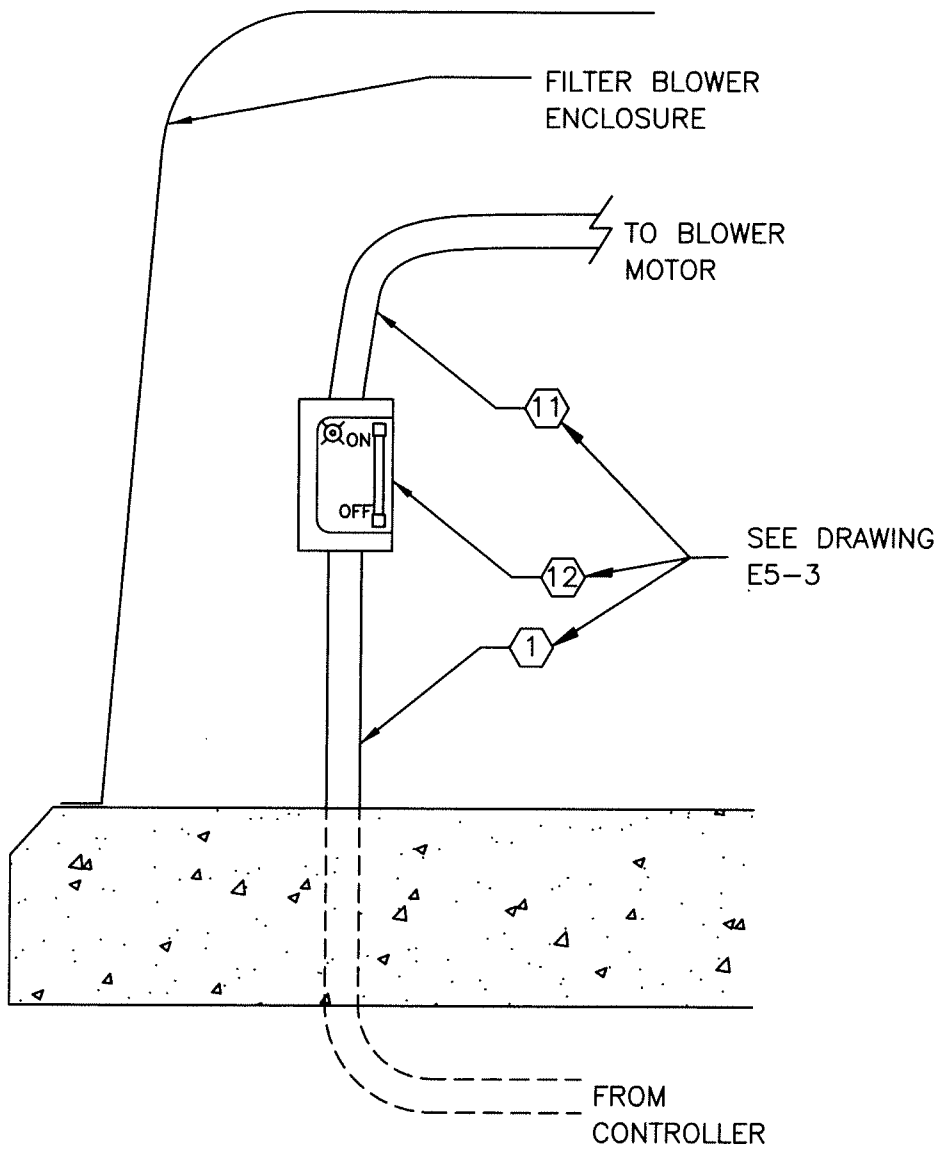
GENERAL NOTES

1. ALL DEVICES TO BE HEAVY DUTY, 30.5mm, OILTIGHT, NEMA 4X TYPE.

CODED NOTES

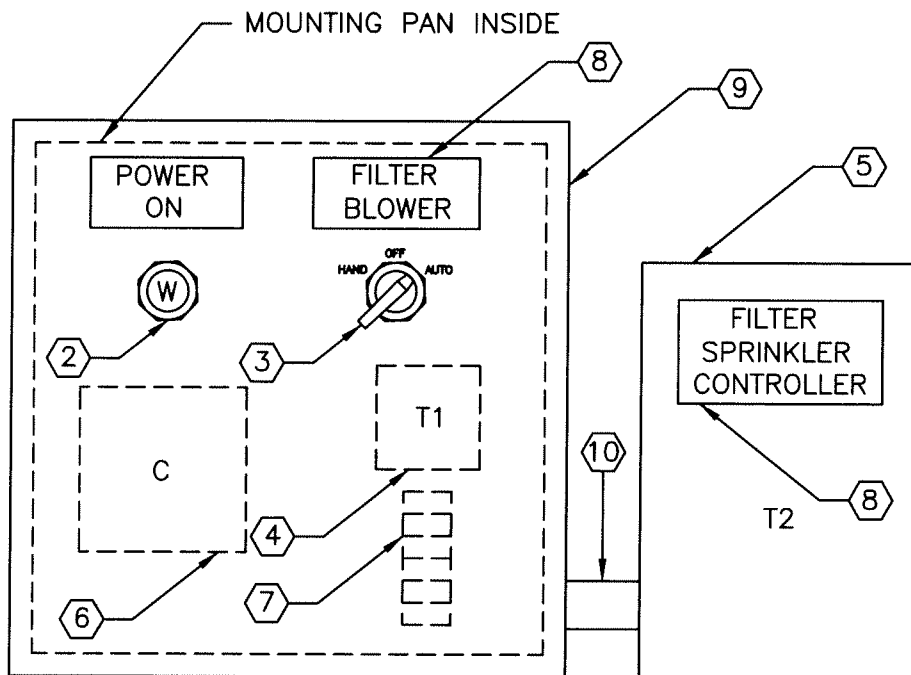
- ① ¾" C. WITH (5) #12 THWN AND (2) #12 GROUND.
- ② PILOT LIGHT, WHITE LEGEND PLATE TO READ "POWER ON".
- ③ THREE-POSITION SELECTOR SWITCH, WITH LEGEND PLATE TO READ "HAND-OFF-AUTO"
- ④ TIMING RELAY, REPEAT CYCLE TYPE, 2-DPDT 1/3 CONTACTS, 120V, 2 TO 60 MINUTE INDEPENDENTLY ADJUSTABLE ON AND OFF TIME RANGES, DUAL KNOBS.
- ⑤ SPRINKLER CONTROLLER, 120V, 5A CONTACTS, ON-OFF AND MANUAL-AUTOMATIC SWITCHES, 24-HOUR TIME DIAL. 14 DAY SKIPPER FEATURE.
- ⑥ MAGNETIC CONTACTOR, OPEN TYPE, 120V, 1-POLE, 1HP, NEMA 1 SIZE.
- ⑦ TERMINAL BLOCKS.
- ⑧ WHITE ON BLACK ENGRAVED PHENOLIC NAMEPLATE, ¾" HIGH LETTERING TO READ AS SHOWN. SCREW MOUNT TO ENCLOSURE DOOR.
- ⑨ NEMA 12 ENCLOSURE MIN. 12"Hx12"Wx6"D WITH MOUNTING FAN. MOUNT TOP AT 6'-0" ABOVE FLOOR UNLESS INDICATED OTHERWISE.
- ⑩ ¾" C., WITH (3) #12 THWN AND (1) #12 GROUND.
- ⑪ ¾" LIQUIDTIGHT FLEXIBLE METAL CONDUIT WITH (2) #12 THWN AND (1) #12 GROUND.
- ⑫ NEMA 4X MANUAL STARTER WITH OVERLOAD PROTECTION AND PILOT LIGHT. 115 VOLT, RATED 1 HP MINIMUM. WITH CONDUIT OPENINGS TOP AND BOTTOM.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  5/12/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL ELECTRICAL NOTES FOR THE ODOR BLOWER MANUAL STARTER AND FILTER CONTROLLER	REVISED	PS E5-3
	 8/10/11 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	



NOTE: ARRANGE ELECTRICAL INSTALLATION UNDER BLOWER ENCLOSURE TO PROVIDE EASY ACCESS TO MOTOR SWITCH WHILE MAXIMIZING ACCESS TO BLOWER.

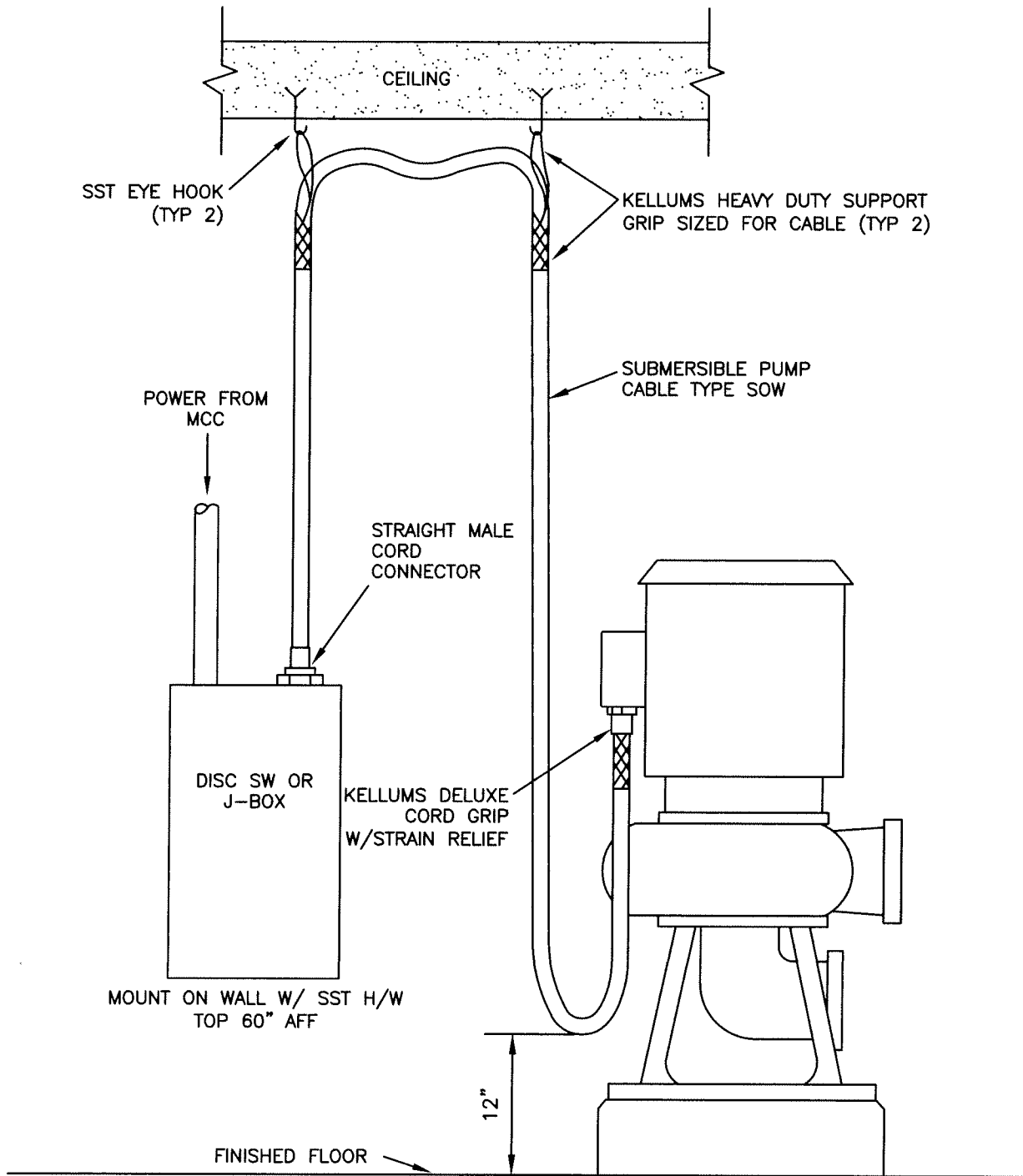
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL BLOWER MANUAL STARTER DETAIL	REVISED	PS E5-4
	<i>[Signature]</i> DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	



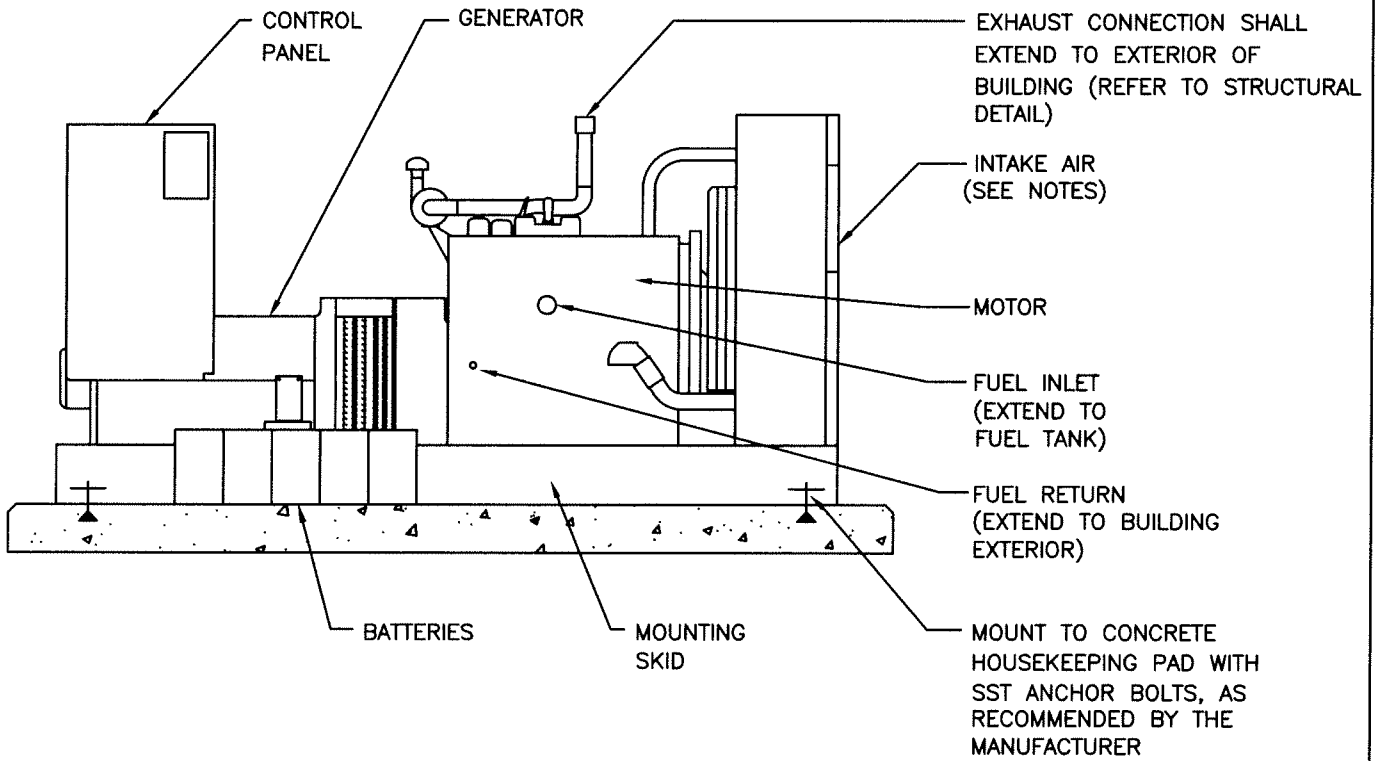
NOTE:

1. SEE DRAWING E5-3 FOR ELECTRICAL NOTES.
2. FILTER SPRINKLER CONTROL (5) CAN BE INSTALLED IN NEMA 12 ENCLOSURE (9) AS PRACTICAL FOR APPLICATION.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 9/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DESIGN  TYPICAL FILTER CONTROLLER	REVISED	PS E5-5
	<i>[Signature]</i> 8/10/11 DESIGN ENGINEER			





ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/12/10 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL PUMP MOTOR POWER CONN. WET/DRY WELL	REVISED	PS E100-1
	<i>[Signature]</i> 8/10/10 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	
	_____		_____	



**NOTE:**

1. DUCT INTAKE AIR TO LOUVER WITH ALUMINUM DUCT AND ACCESS DOORS.

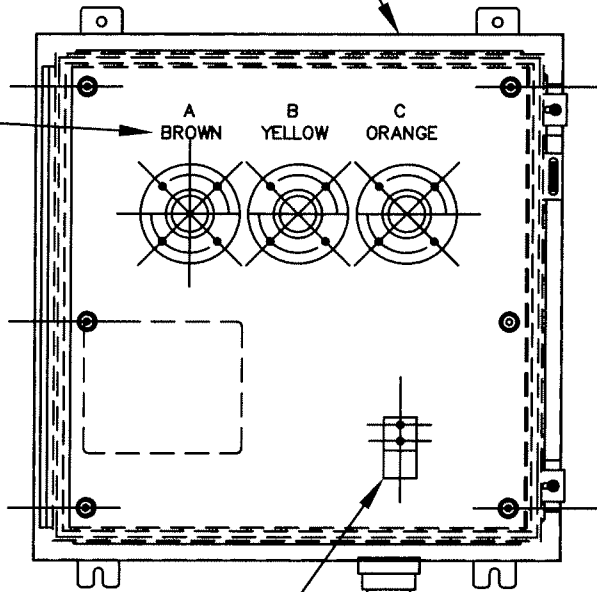
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  GENERATOR	REVISED	PS E100-2
	 DESIGN ENGINEER		 	

3/8 STAINLESS STEEL BOLTS  
(TYP.), SET SIDEWALL THRU  
BOLTS W/WASHERS & SILICONE  
RUBBER SEALANT  
STEEL MOUNTING ANGLES (TYP. 6)

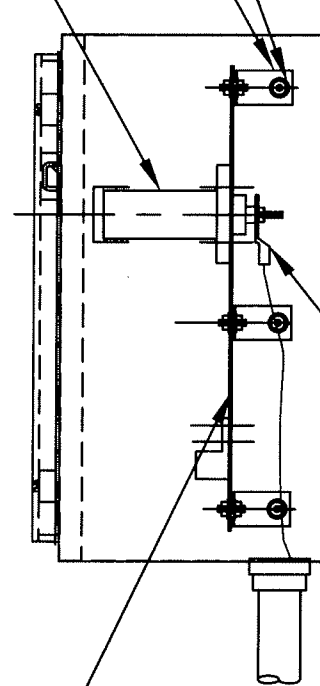
LEVITON SINGLE POLE 16 OR 17 SERIES  
FEMALE PANEL MOUNT. TAPER NOSE CAM  
CONNECTOR (TYP. 4) COLOR AS NOTED.  
FURNISH MATCHING CAP FOR EACH  
CONNECTOR.

24"x24"x12" (MIN.) NEMA 3R SST  
PANEL ENCL. W/PADLOCK HASP DOOR,  
HOFFMAN A-242412LP OR EQUAL  
(IF LOCATED INSIDE - NEMA 12)

PHASE & COLOR  
(TYP.)



2 CONDUCTOR COPPER GROUNDING  
LUGS, SECURE TO PANEL USING  
STAR TOOTH LOCK WASHERS



LONG BARREL  
COMPRESSION  
LUGS (TYP.)

11 GA. STEEL  
BACK PANEL

## GENERATOR LOAD TEST CONNECTION BOX

SCALE: NOT TO SCALE

### NOTES:

1. USE LEVITON 16 SERIES FOR GENERATORS 275 kW OR LESS. USE LEVITON 17 SERIES FOR GENERATORS ABOVE 275 kW.

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED

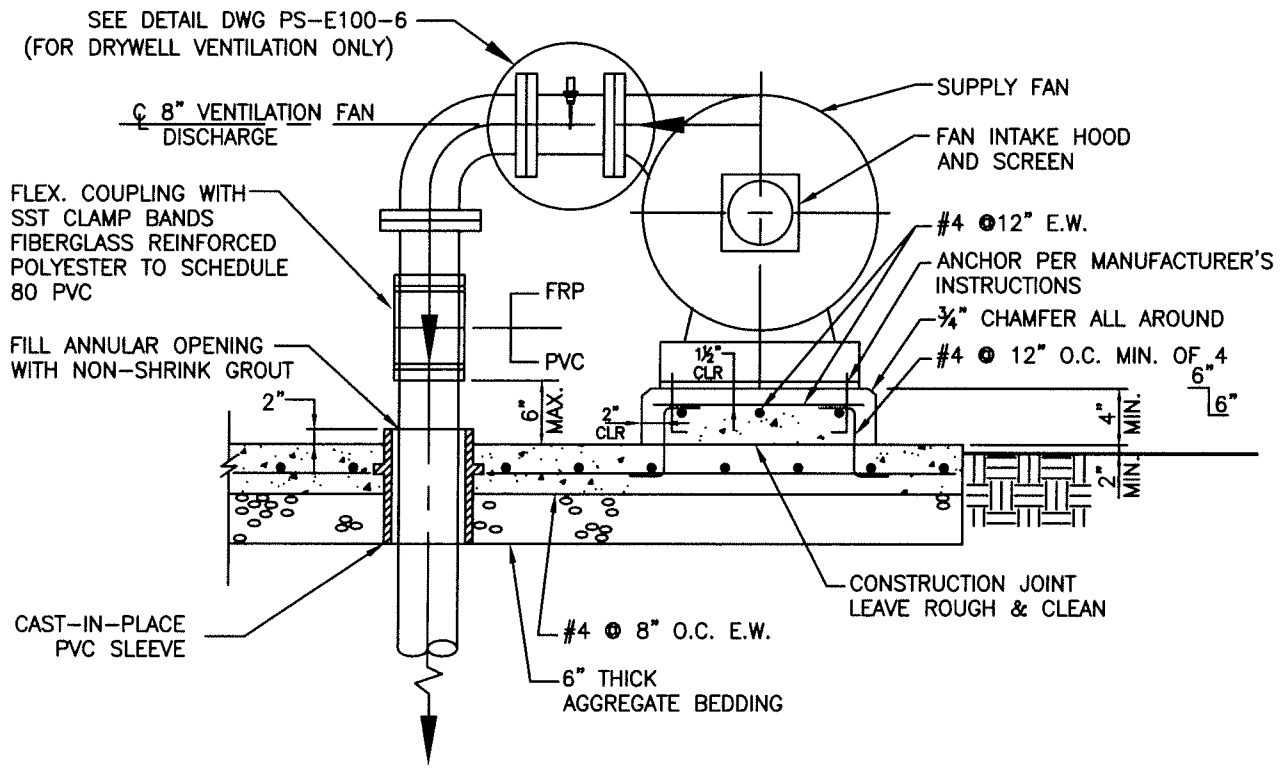
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE  
PUMPING STATION DETAIL  
GENERATOR LOAD TEST  
CONNECTION BOX

REVISED


PS



E100-3

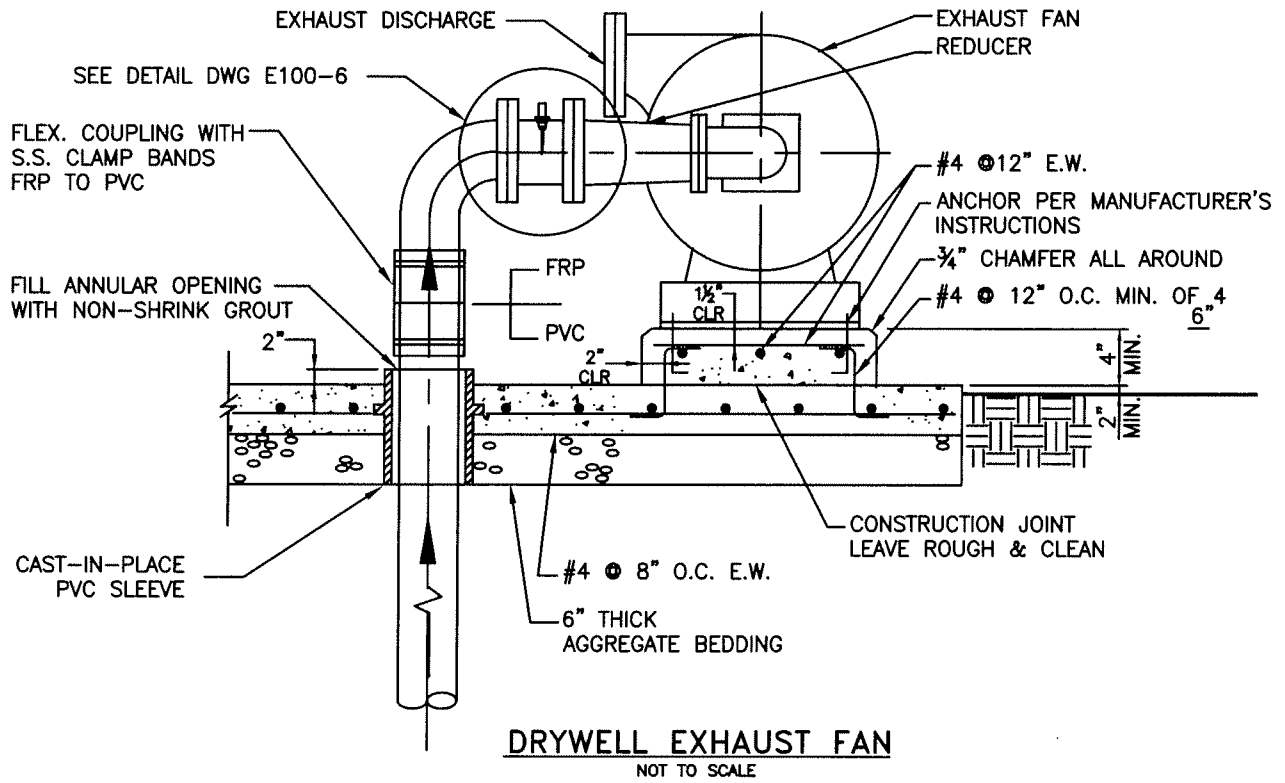


**SUPPLY FAN**  
NOT TO SCALE

**NOTES:**

1. SUPPLY FAN DUCT SHALL EXTEND TO 12" ABOVE HIGH WATER LEVEL.
2. SUPPLY FAN DUCT SHALL BE INSTALLED APPROXIMATELY 3' ABOVE FINISHED FLOOR IN DRY WELL.
3. SUPPLY FAN MOTOR SHALL BE RATED FOR INSTALLATION IN A CLASS 1, DIVISION 2 HAZARDOUS AREA FOR DRYWELL AND A CLASS 1, DIVISION 1 HAZARDOUS AREA FOR WETWELL. FANS SHALL BE FRP TYPE WITH NON SPARKING COMPONENTS.
4. SUPPLY FAN SHALL BE EQUIPPED WITH AN INTRINSICALLY SAFE OR EXPLOSION PROOF AIR FLOW SWITCH, MOUNTED IN THE AIR DUCT IMMEDIATELY ADJACENT TO THE FAN.



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  SUPPLY FAN WET/DRY WELL	REVISED	PS E100-4
	 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	



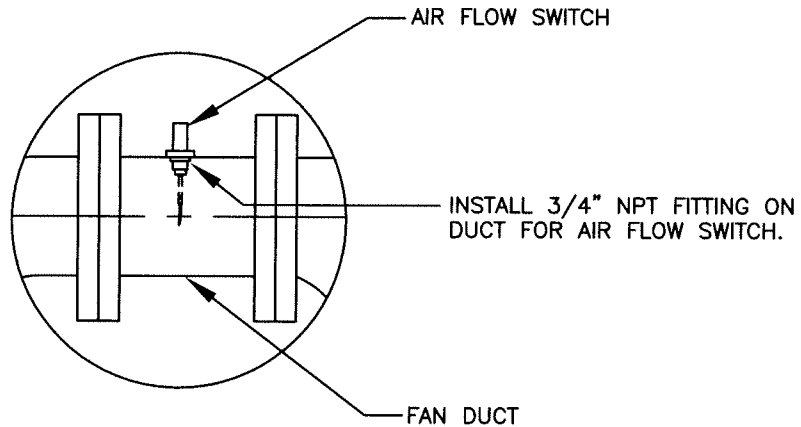
**DRYWELL EXHAUST FAN**  
NOT TO SCALE

**NOTES:**

1. EXHAUST FAN SHALL PROVIDE A GREATER AIR FLOW THAN THE DRY WELL SUPPLY FAN, HENCE MAINTAINING A NEGATIVE PRESSURE IN THE DRY WELL OF APPROXIMATELY 0.1 INCHES OF WATER,
2. EXHAUST FAN DUCT SHALL BE INSTALLED APPROXIMATELY 3' FROM THE TOP SLAB.
3. EXHAUST FAN MOTOR SHALL BE RATED FOR INSTALLATION IN A CLASS 1, DIVISION 2 HAZARDOUS AREA. FANS SHALL BE FRP TYPE WITH NON SPARKING COMPONENTS.
4. EXHAUST FAN SHALL BE EQUIPPED WITH AN INTRINSICALLY SAFE AIR FLOW SWITCH, MOUNTED IN THE AIR DUCT IMMEDIATELY ADJACENT TO THE FAN.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  EXHAUST FAN DRYWELL	REVISED	PS E100-5
	 DESIGN ENGINEER			







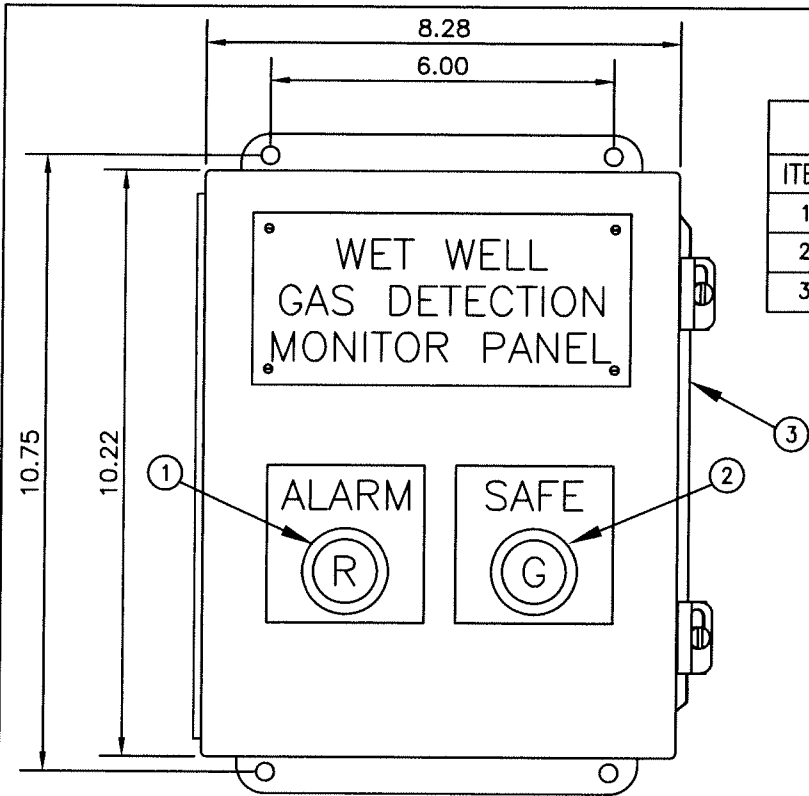
**AIR FLOW SWITCH**

NOT TO SCALE

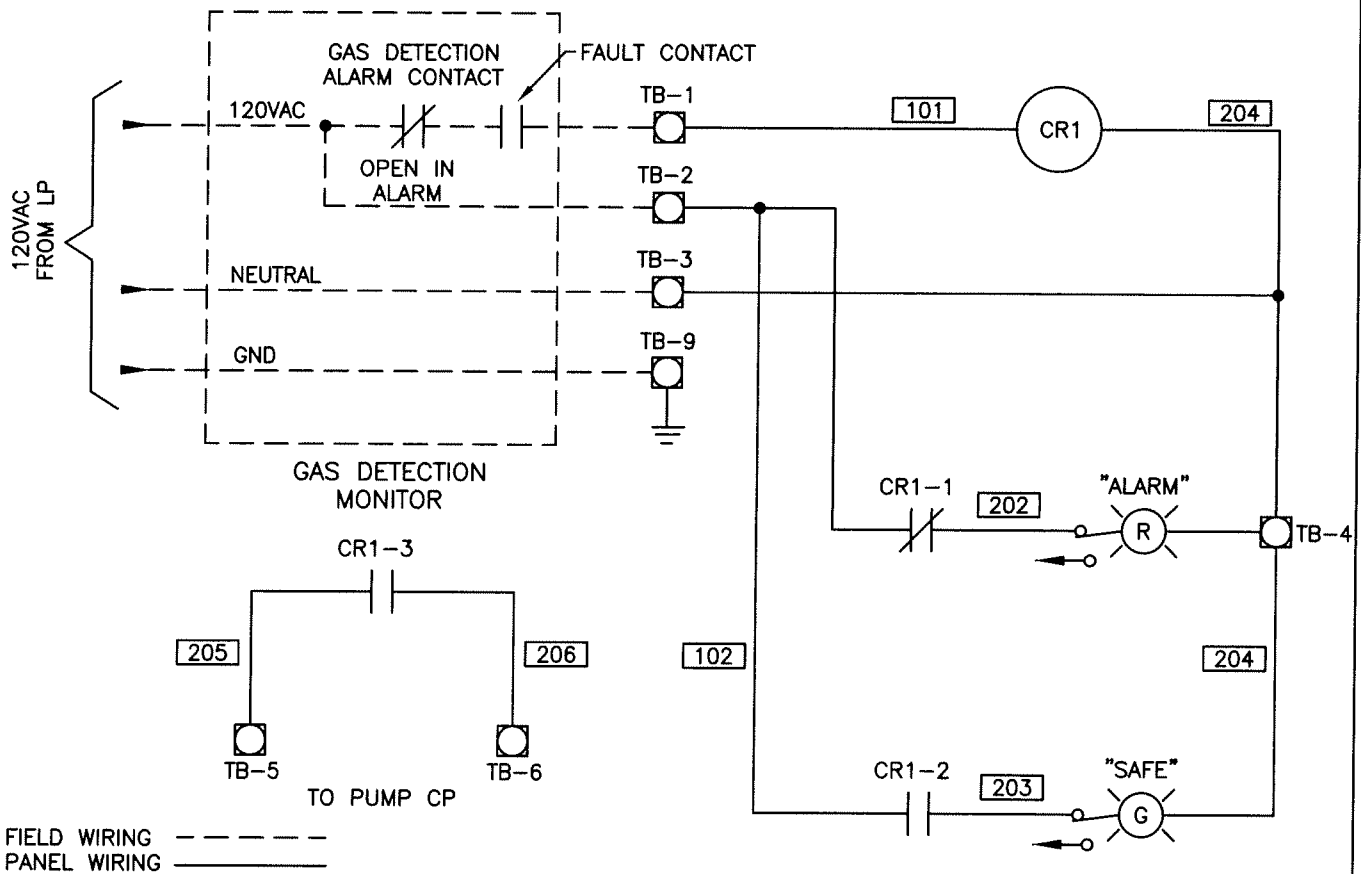
**NOTES:**

1. AIR FLOW SWITCHES SHALL BE RATED FOR INSTALLATION IN A CLASS 1, DIVISION 2 AREA.
2. AIR FLOW SWITCH CIRCUITRY SHALL BE INTRINSICALLY SAFE.
3. THE LOW FLOW SWITCHES SHALL BE AN INPUT INTO THE SCADA SYSTEM FOR REMOTE MONITORING.
4. LOW OR NO AIR FLOW IN EITHER THE SUPPLY OR EXHAUST AIR DUCT SHALL BE INDICATED ON THE AIR FLOW PANEL, (ALARM OR SAFE INDICATOR LIGHTS), MOUNTED OUTSIDE OF THE CONTROL BUILDING, IN SIGHT OF THE DRY WELL. REFER TO DRAWING E100-8.)
5. AIR FLOW SWITCHES REQUIRED FOR DRYWELL VENTILATION ONLY, SUPPLY AND EXHAUST.

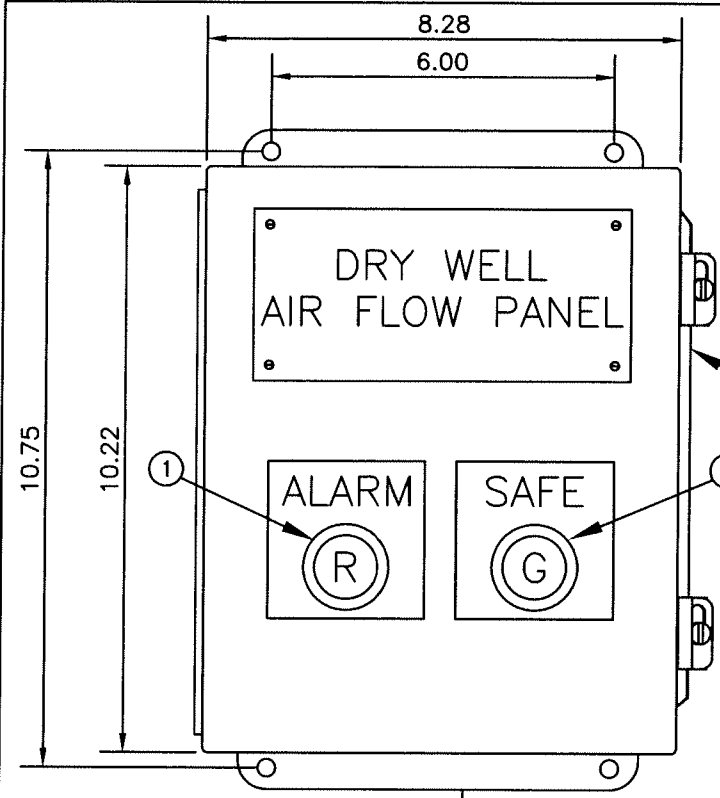
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL DRYWELL AIR FLOW SWITCH	REVISED	PS E100-6
	 DESIGN ENGINEER			



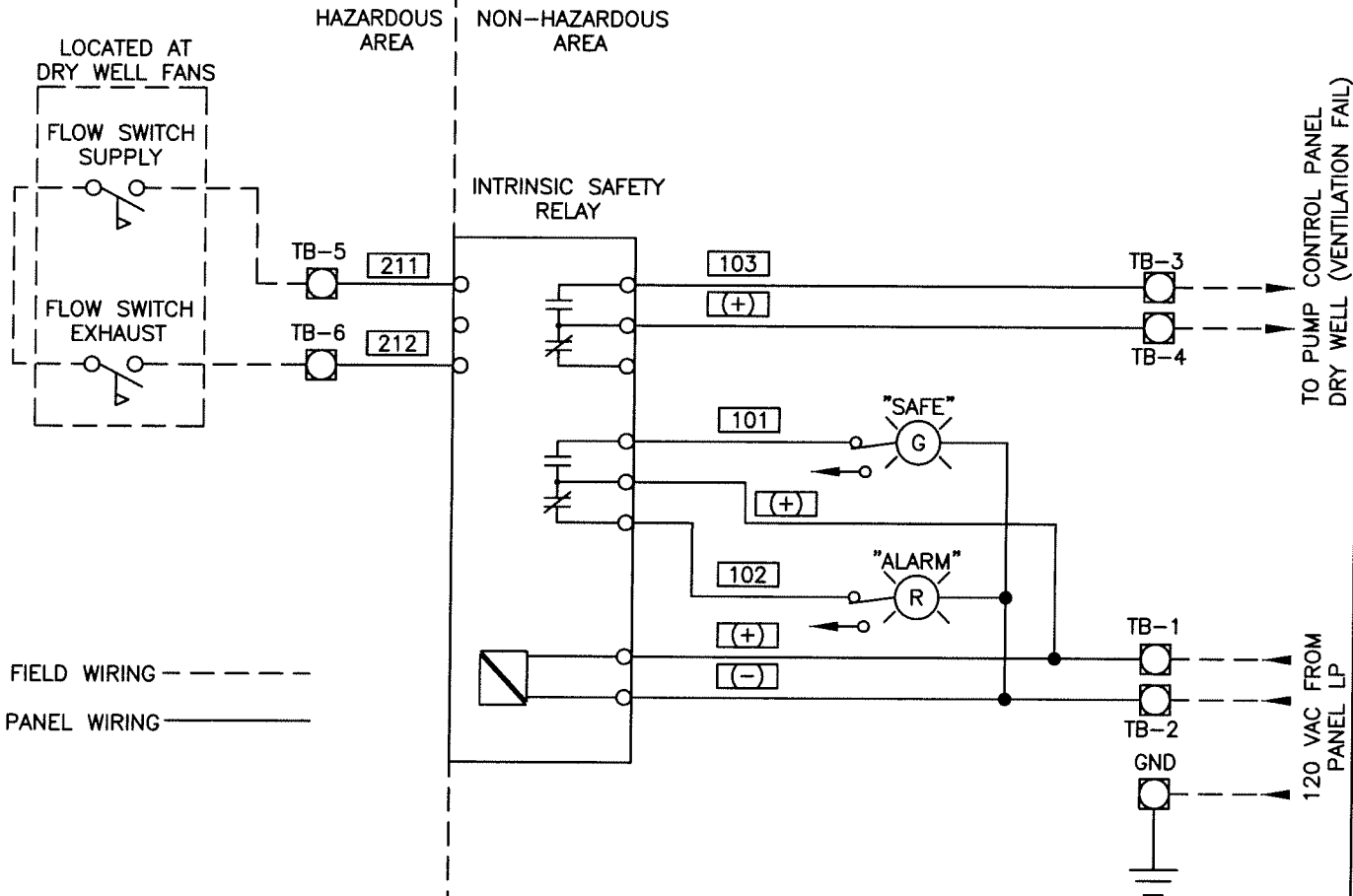
BILL OF MATERIAL		
ITEM	QTY	DESCRIPTION
1	1	PILOT LIGHT, PUSH-TO-TEST - RED
2	1	PILOT LIGHT, PUSH-TO-TEST - GREEN
3	1	NEMA 3R-SST ENCLOSURE



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL GAS DETECTION MONITOR ALARM PANEL WET WELL	REVISED	PS E100-7
	<i>[Signature]</i> 8/16/11 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	



BILL OF MATERIAL		
ITEM	QTY	DESCRIPTION
1	1	PILOT LIGHT, PUSH-TO-TEST - RED
2	1	PILOT LIGHT, PUSH-TO-TEST - GREEN
3	1	NEMA 3R-SST ENCLOSURE

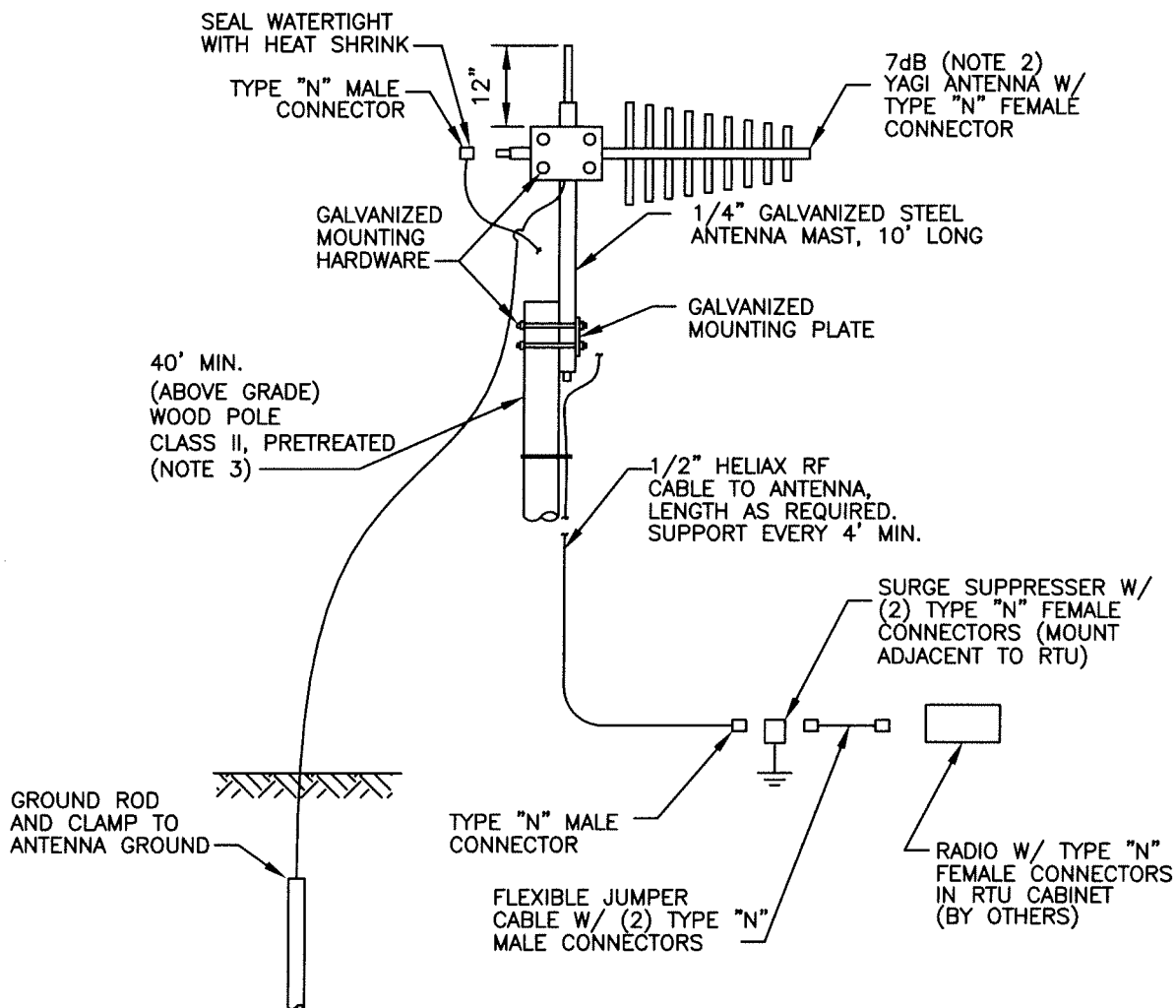


ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE  
PUMPING STATION DETAIL  
  
AIR FLOW PANEL  
DRY WELL

REVISED  
  
  
  
PS  
E100-8



RADIO ANTENNA

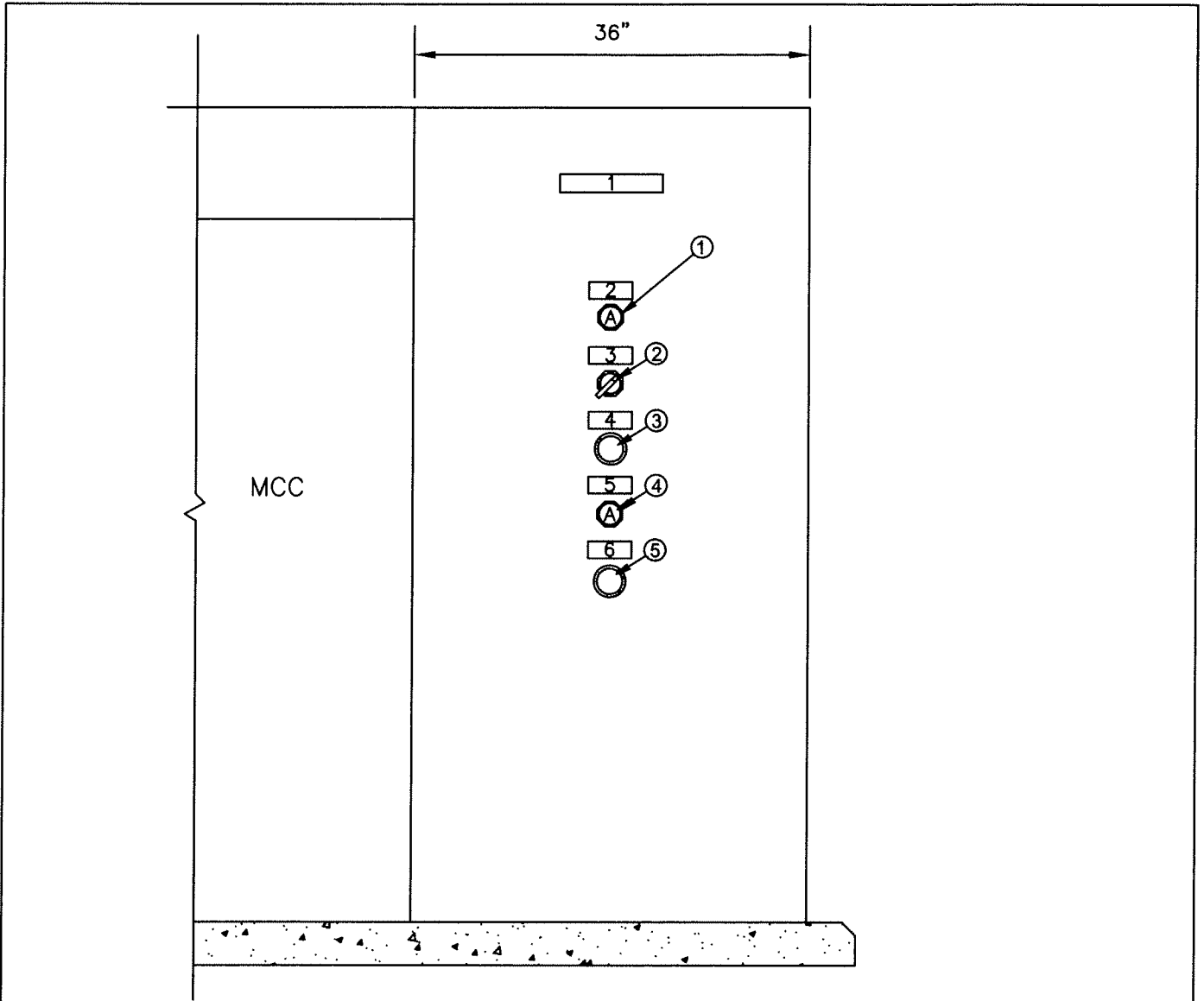
INSTALLATION DETAIL

SCALE: NOT TO SCALE

NOTE:

1. PROVIDE AND INSTALL ALL RADIO COMMUNICATIONS EQUIPMENT SHOWN. COUNTY WILL PROVIDE RTU FOR INSTALLATION BY CONTRACTOR.
2. ANTENNA SUPPLIED BY COUNTY.
3. COORDINATE HEIGHT DURING DESIGN.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/17/14 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL RADIO ANTENNA INSTALLATION DETAIL	REVISED	PS E100-10
	<i>[Signature]</i> DESIGN ENGINEER			



LEGEND	DESCRIPTION
①	AMBER PILOT LIGHT
②	3 POSITION SELECTOR SWITCH
③	YELLOW PUSH BUTTON
④	AMBER PILOT LIGHT
⑤	BLACK PUSH BUTTON

NAMEPLATE	DESCRIPTION
1	PUMP CONTROL PANEL
2	HIGH WET WELL
3	PUMP ALTERNATOR
4	RTU TEST
5	PT FAIL
6	PT RESET

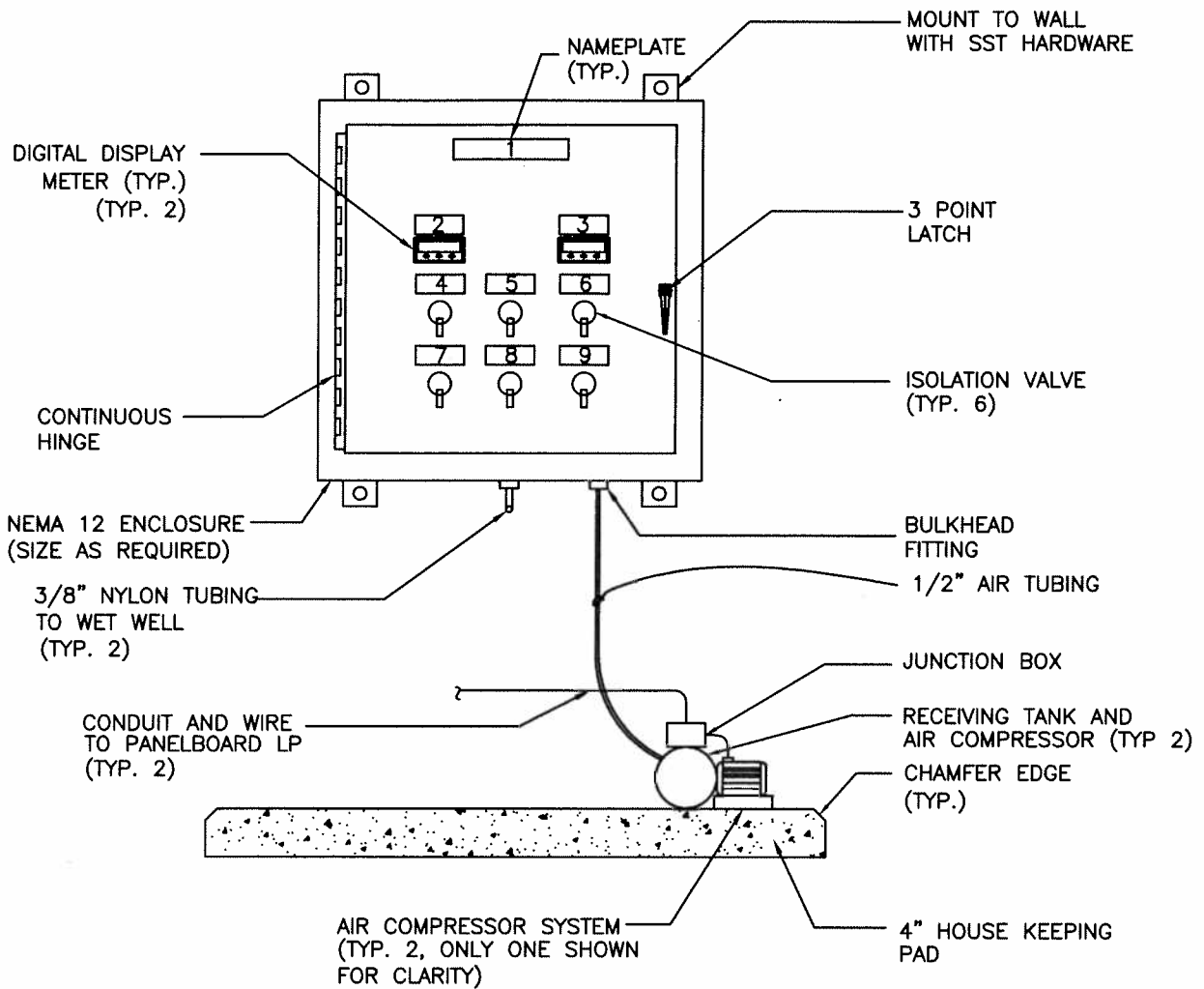
ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS  
 DATE: MAY 2011

APPROVED  
*[Signature]*  
 CHIEF ENGINEER  
*[Signature]*  
 DESIGN ENGINEER

REFERENCE SEWAGE  
 PUMPING STATION DETAIL  
 BUBBLER CONTROL PANEL

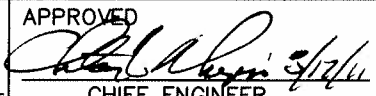

REVISED  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

PS  
 E100-11



NAMEPLATE	DESCRIPTION
1	BUBBLER PANEL
2	WET WELL LEVEL-1
3	WET WELL LEVEL-2
4	PURGE-1
5	SHUT-OFF-1
6	BLEED-1
7	PURGE-2
8	SHUT-OFF-2
9	BLEED-2

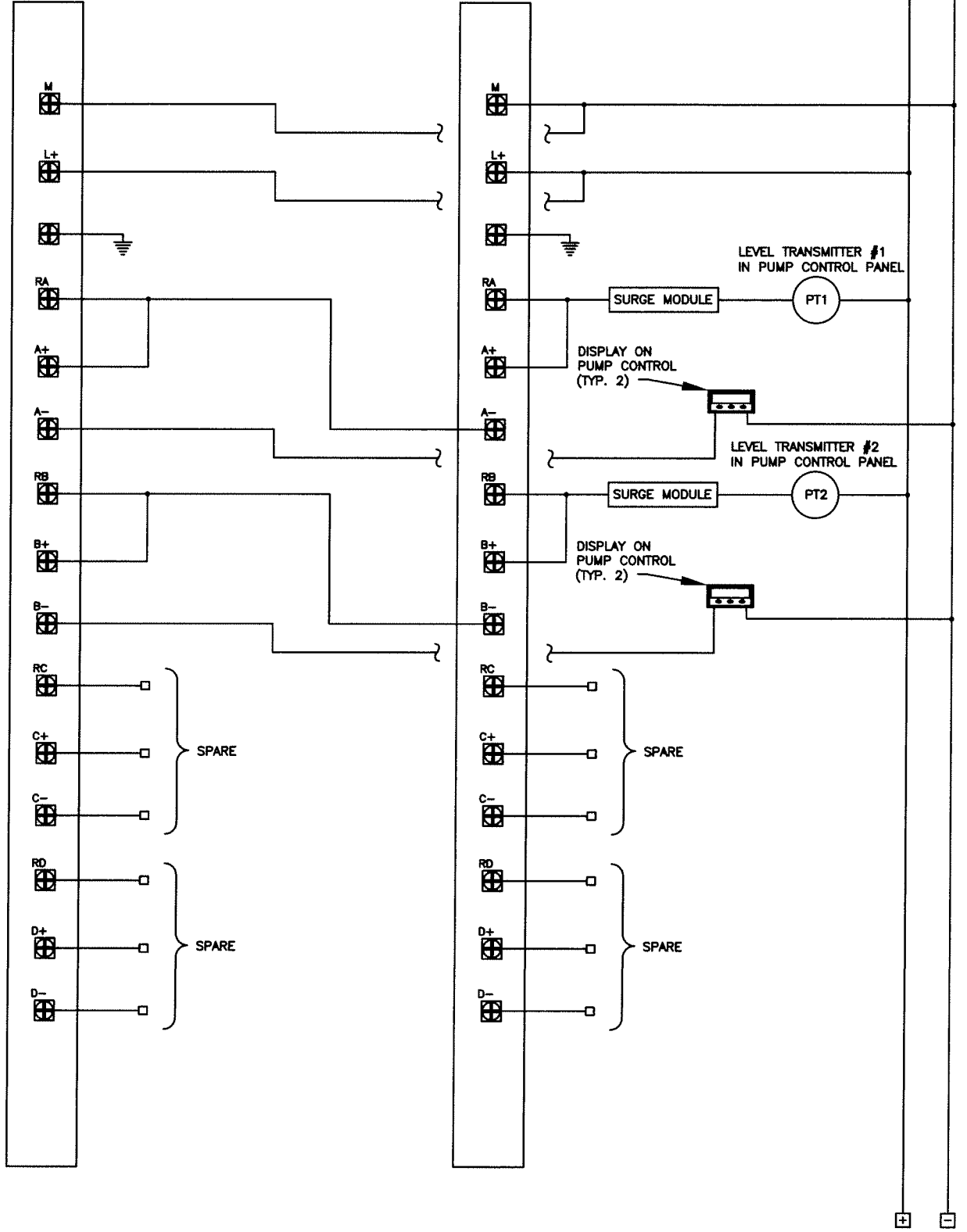
**BUBBLER CONTROL PANEL**  
NOT TO SCALE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL BUBBLER CONTROL PANEL	REVISED	PS E100-11A
	 DESIGN ENGINEER			

PRIMARY  
4-20mA  
ANALOG INPUT

SECONDARY  
4-20mA  
ANALOG INPUT

24VDC



ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

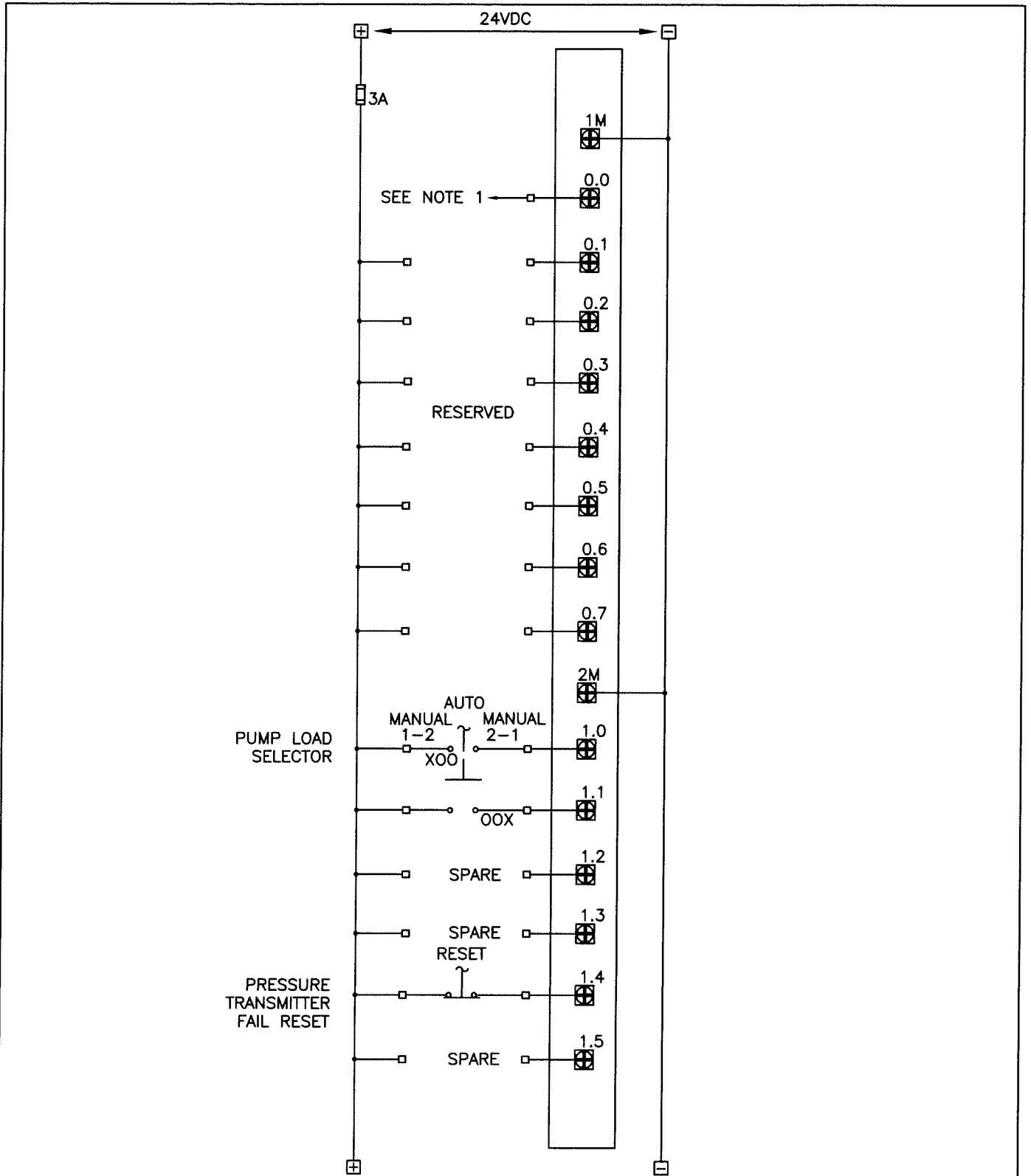
APPROVED  
*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE  
PUMPING STATION DETAIL  
PUMP CONTROL PANEL  
PRIMARY/SECONDARY PLC  
ANALOG INPUT MODULE



REVISED

PS

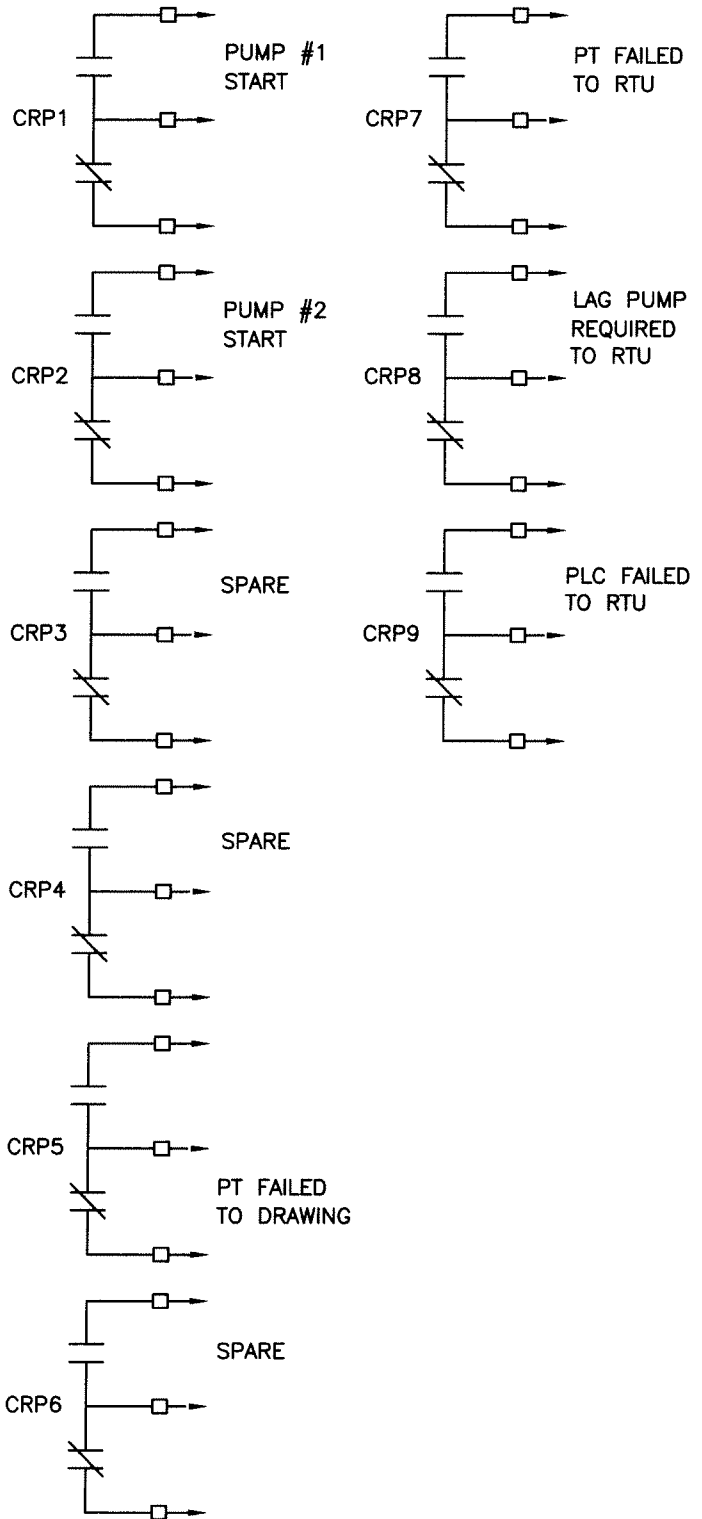
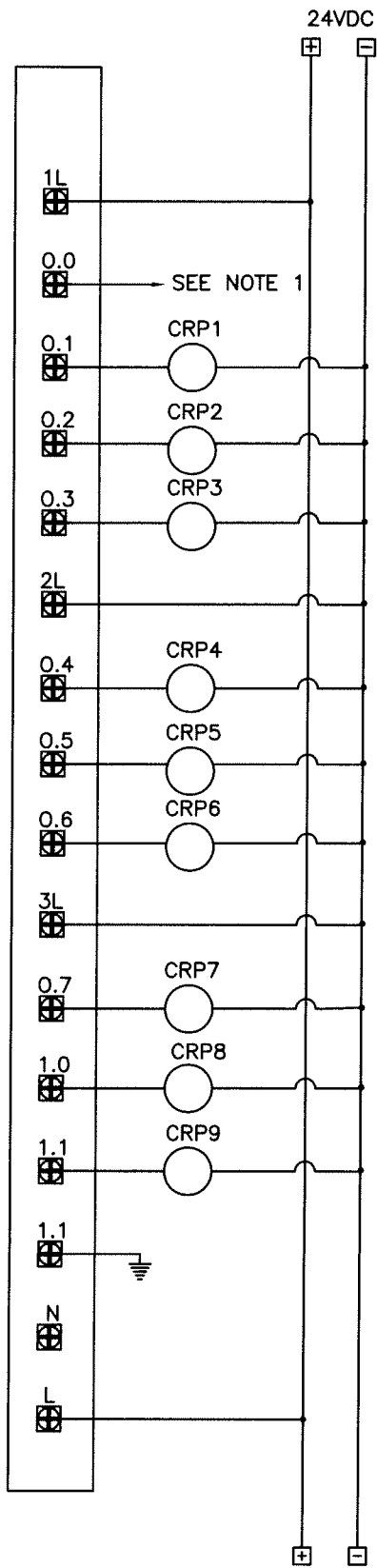
E100-12



NOTES:  
 1. SECONDARY PLC OUTPUT 0.0 TO PRIMARY PLC INPUT 0.0.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL PUMP CONTROL PANEL PRIMARY/SECONDARY PLC DIGITAL INPUT MODULE	REVISED	PS E100-13
	 DESIGN ENGINEER			





NOTES:

1. PRIMARY PLC OUTPUT 0.0 TO SECONDARY PLC INPUT 0.0.

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

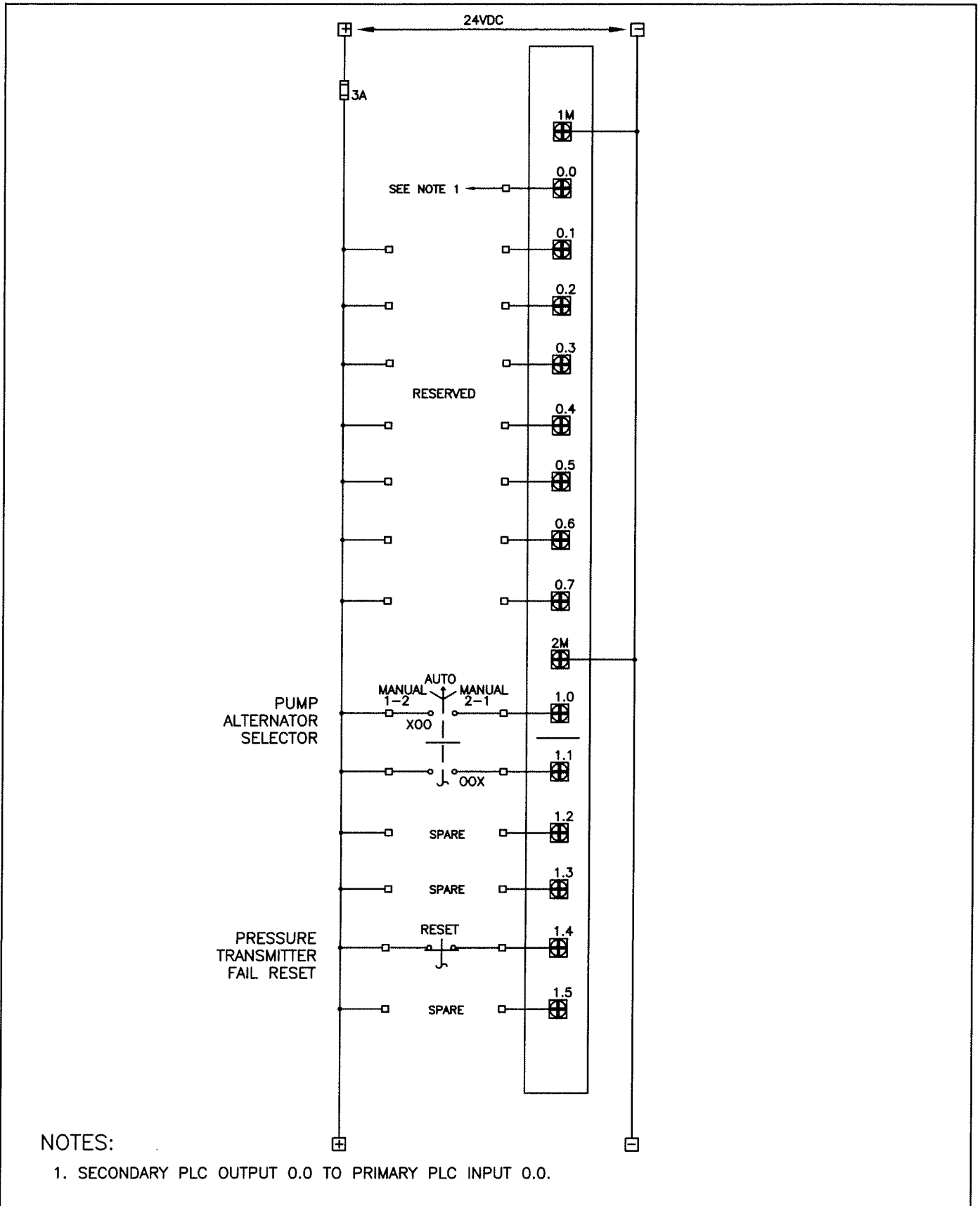
APPROVED  
*[Signature]*  
CHIEF ENGINEER  
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DESIGN ENGINEER

REFERENCE SEWAGE  
PUMPING STATION DETAIL  
PUMP CONTROL PANEL  
PRIMARY PLC  
DIGITAL INPUT MODULE

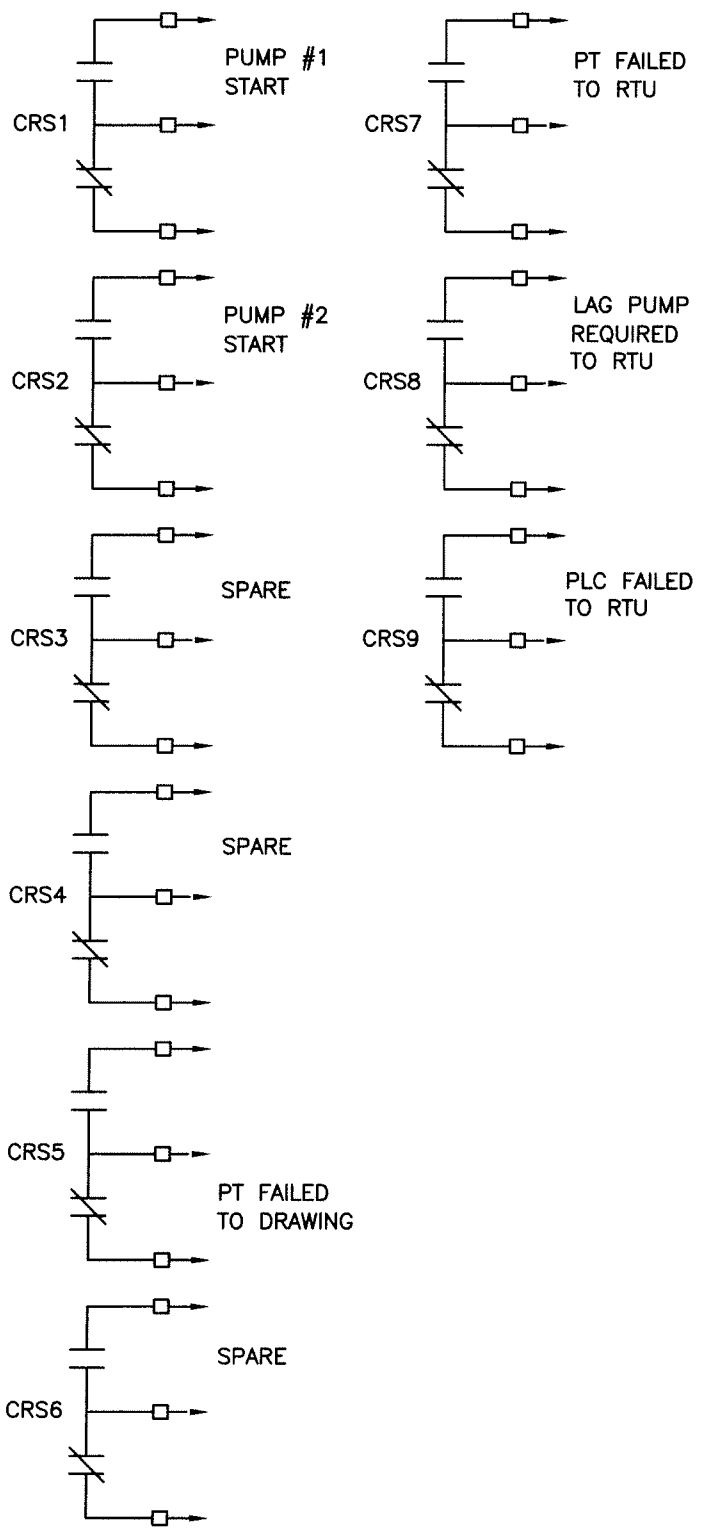
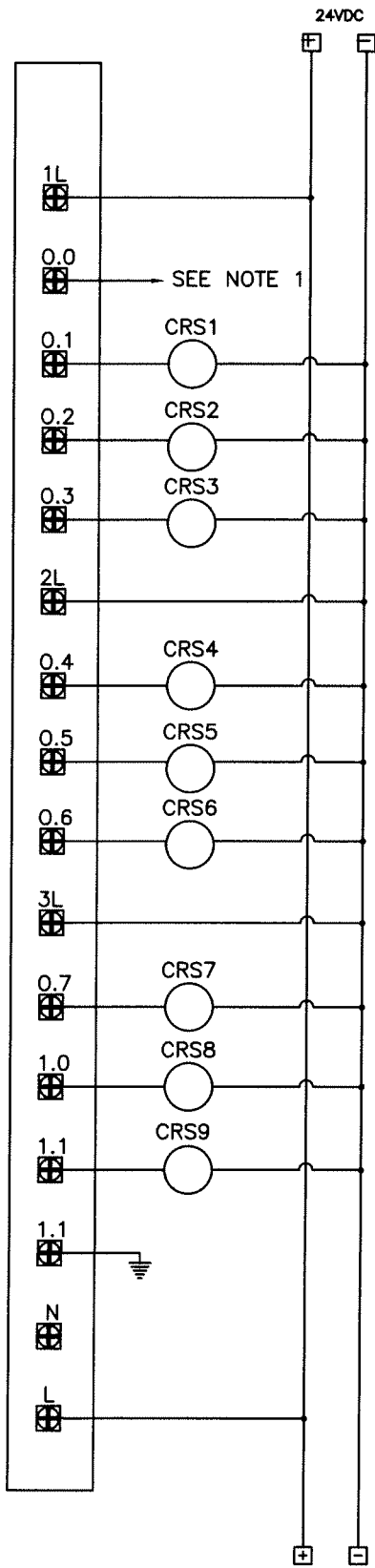
REVISED

PS

E100-14



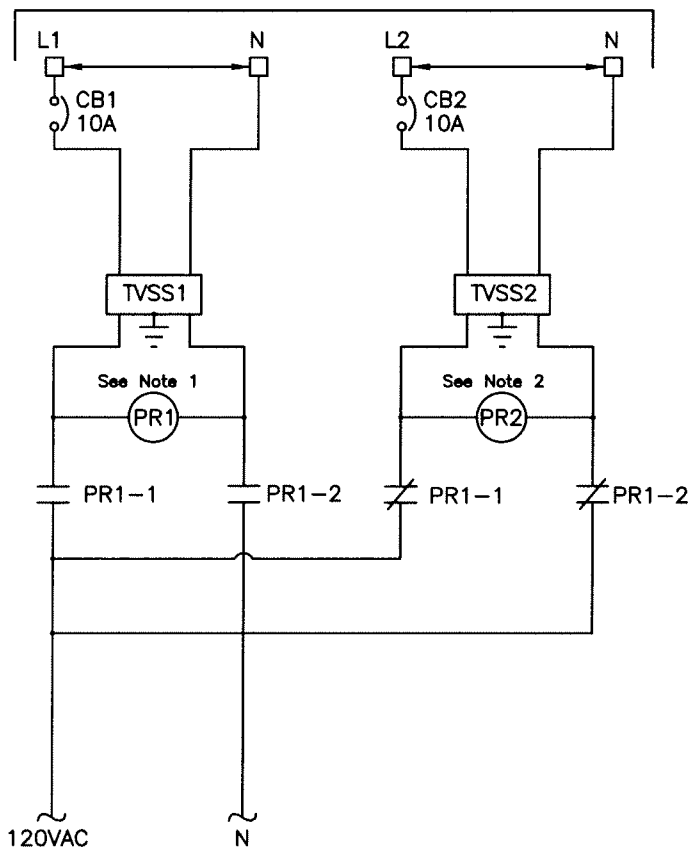
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 5/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL PUMP CONTROL PANEL SECONDARY PLC DIGITAL INPUT MODULE	REVISED	PS E100-15
	<i>[Signature]</i> DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	



NOTES:  
 1. PRIMARY PLC OUTPUT 0.0 TO SECONDARY PLC INPUT 0.0.

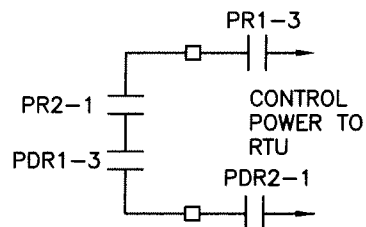
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 8/17/11 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL PUMP CONTROL PANEL SECONDARY PLC DIGITAL OUTPUT MODULE	REVISED	PS E100-16
	DESIGN ENGINEER <i>[Signature]</i>			



2 CIRCUITS FROM PANEL LP

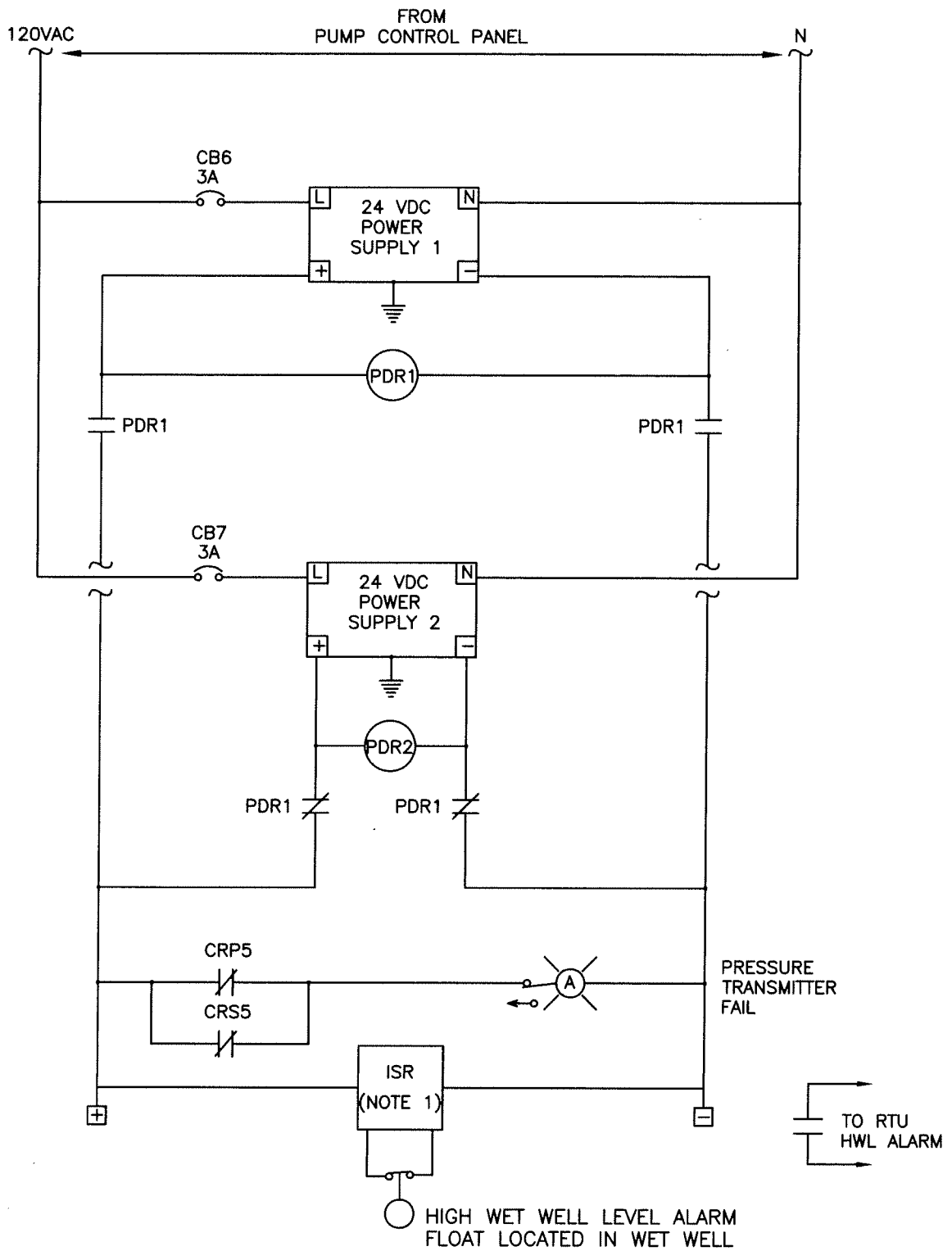


NOTES:

1. 3-POLE RELAY.
2. PR2 IS USED TO MONITOR SECOND POWER FEED THROUGH CB2 ONLY FOR ALARM PURPOSES TO RTU.


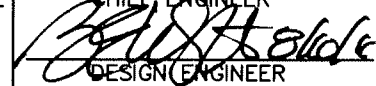


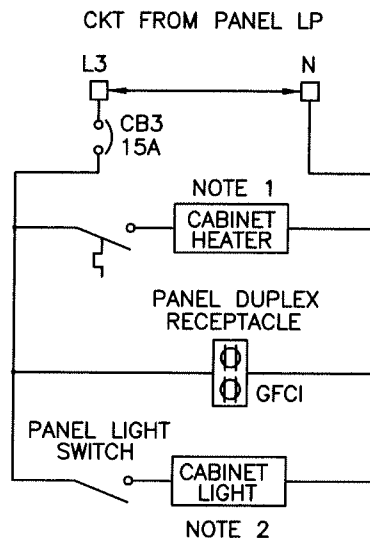
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  PUMP CONTROL PANEL REDUNDANT POWER	REVISED	PS E100-17
	 DESIGN ENGINEER		_____	
	_____		_____	
	_____		_____	
	_____		_____	



NOTES:



1. INTRINSICALLY SAFE RELAY-TURCK  
MODEL IM1-22EX-R

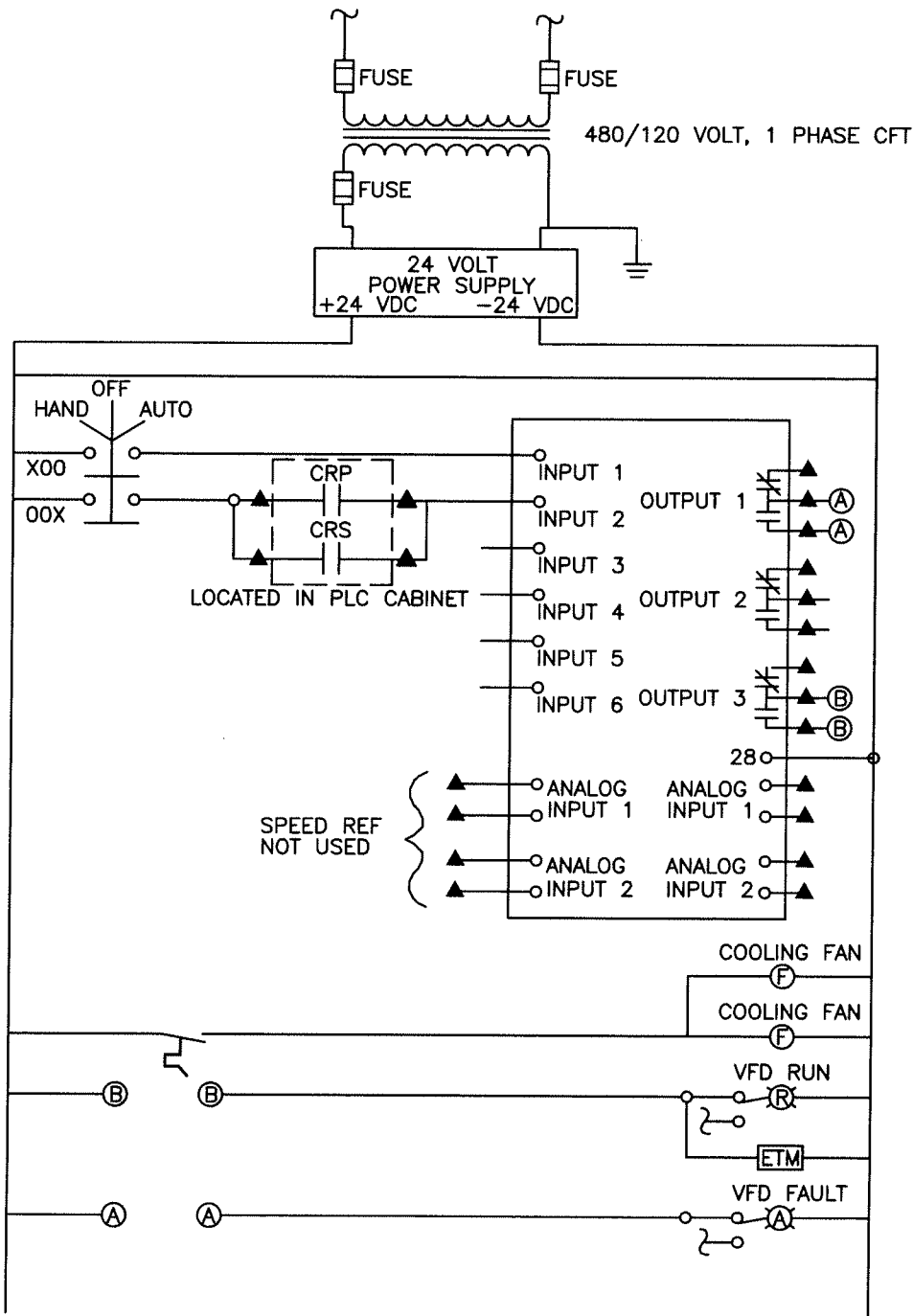
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL  PUMP CONTROL PANEL 24VDC REDUNDANT POWER	REVISED	PS E100-18
	 DESIGN ENGINEER		 	



NOTES:

1. HEATER AND THERMOSTAT ONLY REQUIRED IF CONTROL CABINET IS LOCATED OUTSIDE, OR REQUIRED FOR APPLICATION.
2. LIGHT LOCATED IN CONTROL CABINET WITH SWITCH TO TURN LIGHT ON WHEN DOOR IS OPENED.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED  CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL PUMP CONTROL PANEL INTERIOR POWER	REVISED	PS E100-19
	 DESIGN ENGINEER			



TYP VFD PUMP CONTROL  
(SOFT STARTING ONLY)

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS  
DATE: MAY 2011

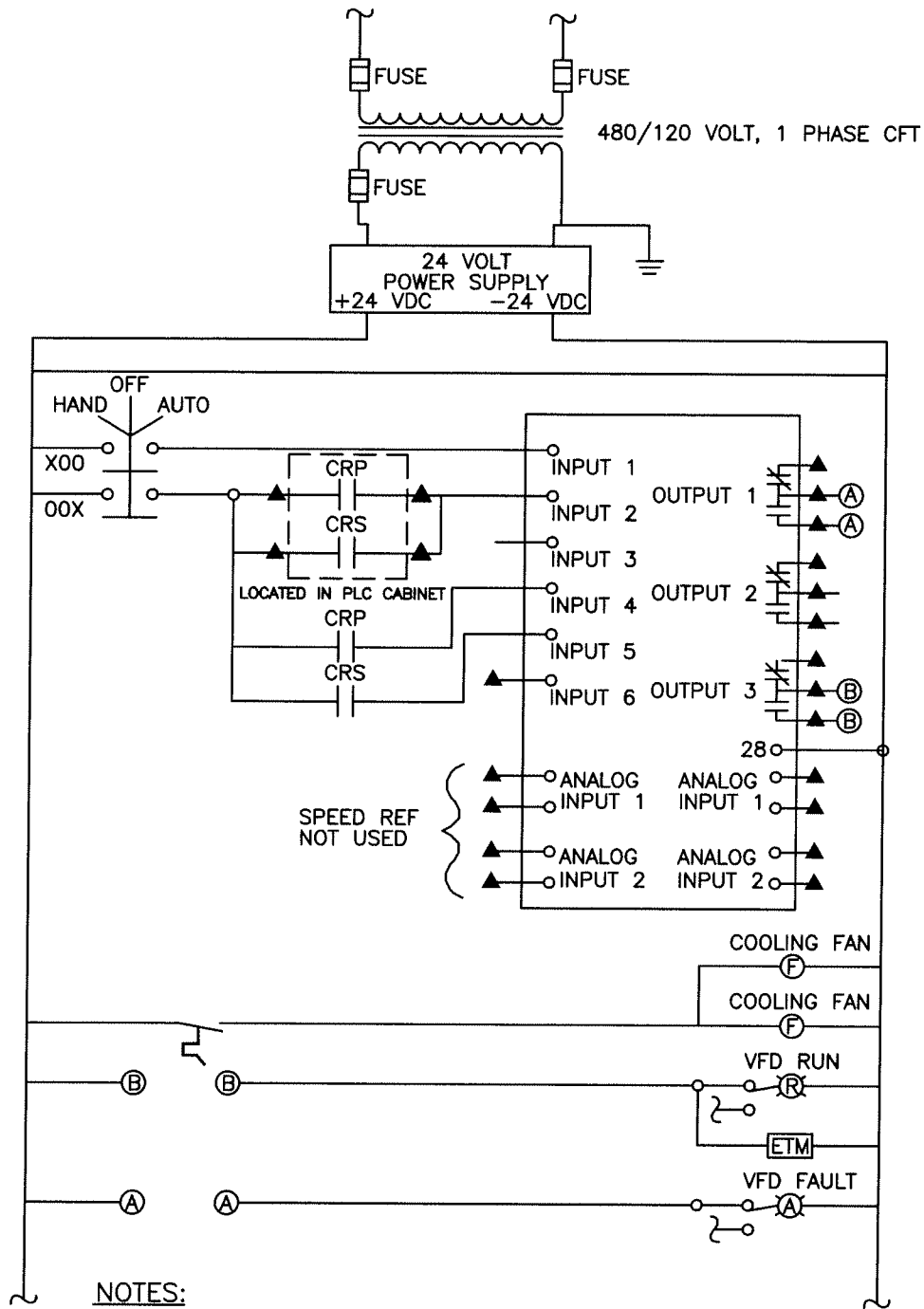
APPROVED

*[Signature]*  
CHIEF ENGINEER  
*[Signature]*  
DESIGN ENGINEER

REFERENCE SEWAGE  
PUMPING STATION DETAIL  
TYP VFD PUMP CONTROL

REVISED

PS  
E100-20



1. DRAWING IS TYPICAL FOR A SIEMENS MICROMASTER.
2. CONNECTIONS FOR AN ALLEN BRADLEY DRIVE SHALL BE SIMILAR TO ACHIEVE THE SAME CONTROL FUNCTION.

TYP VFD PUMP CONTROL  
FLOW MATCHING

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS DATE: MAY 2011	APPROVED <i>[Signature]</i> 2/12/14 CHIEF ENGINEER	REFERENCE SEWAGE PUMPING STATION DETAIL TYP VFD PUMP CONTROL FLOW MATCHING	REVISED	PS E100-21
	<i>[Signature]</i> 2/10/11 DESIGN ENGINEER			