

ANNE ARUNDEL COUNTY  
MARYLAND

DEPARTMENT OF PUBLIC WORKS

**CHAPTER IV**

**REFERENCE DRAWINGS**  
**for**  
**GRINDER PUMP**  
**INSTALLATIONS**

**September 2000**

**REFERENCE DRAWINGS FOR  
GRINDER PUMP INSTALLATIONS**

**INDEX OF DRAWINGS**

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GRINDER PUMP  
LOCATION PLAN

SEE REF. DWG.: SS-C-2a & 2b

SEWAGE GRINDER  
PUMP UNIT  
INSTALLATION

SEE REF. DWG.: SS-C-3a & 3b

SEWAGE GRINDER  
PUMP SECTION

SEE REF. DWG.: SS-M-3a & 2b

GENERAL NOTES

SEE REF. DWG.: SS-G-5

GRINDER PUMP  
SEWER HOUSE  
CONNECTION

SEE REF. DWG.: SS-C-4a & 4b

APPROVED

\_\_\_\_\_  
CHIEF ENGINEER

\_\_\_\_\_  
DESIGN ENGINEER

DATE:

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS

REVISED

SS  
L-5

**REFERENCE SANITARY SEWER DESIGN  
GRINDER PUMP DETAILS  
SHEET 1**

INLINE FLUSHING  
CONNECTION

SEE REF. DWG.: SS-S-8

TERMINAL FLUSHING  
CONNECTION

SEE REF. DWG.: SS-S-9

LINK SEAL  
DETAIL

SEE REF. DWG.: SS-S-10

SERVICE VALVE  
ASSEMBLY

SEE REF. DWG.: SS-C-5

CONNECTION FROM SERVICE  
VALVE ASSEMBLY TO  
PRESSURE SEWER MAIN

SEE REF. DWG.: SS-C-6

PRESSURE SEWER  
TRENCH AND  
BEDDING DETAIL

SEE REF. DWG.: SS-C-7

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS

APPROVED  
\_\_\_\_\_  
CHIEF ENGINEER

\_\_\_\_\_  
DESIGN ENGINEER

DATE: \_\_\_\_\_

**REFERENCE SANITARY SEWER DESIGN  
GRINDER PUMP DETAILS  
SHEET 2**

REVISED

**SS**  
**L-6**

ELECTRICAL PANEL  
ARRANGEMENT

SEE REF. DWG: SS-E-8a & 8b

GRINDER PUMP  
CONTROL AND  
ALARM PANEL

SEE REF. DWG: SS-E-9

SERVICE ENTRANCE  
ARRANGEMENT

SEE REF. DWG: SS-E-10

SERVICE ENTRANCE  
WIRING DIAGRAM

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DUPLEX SEWAGE  
GRINDER PUMP  
WIRING DIAGRAM

SEE REF. DWG: SS-E-12

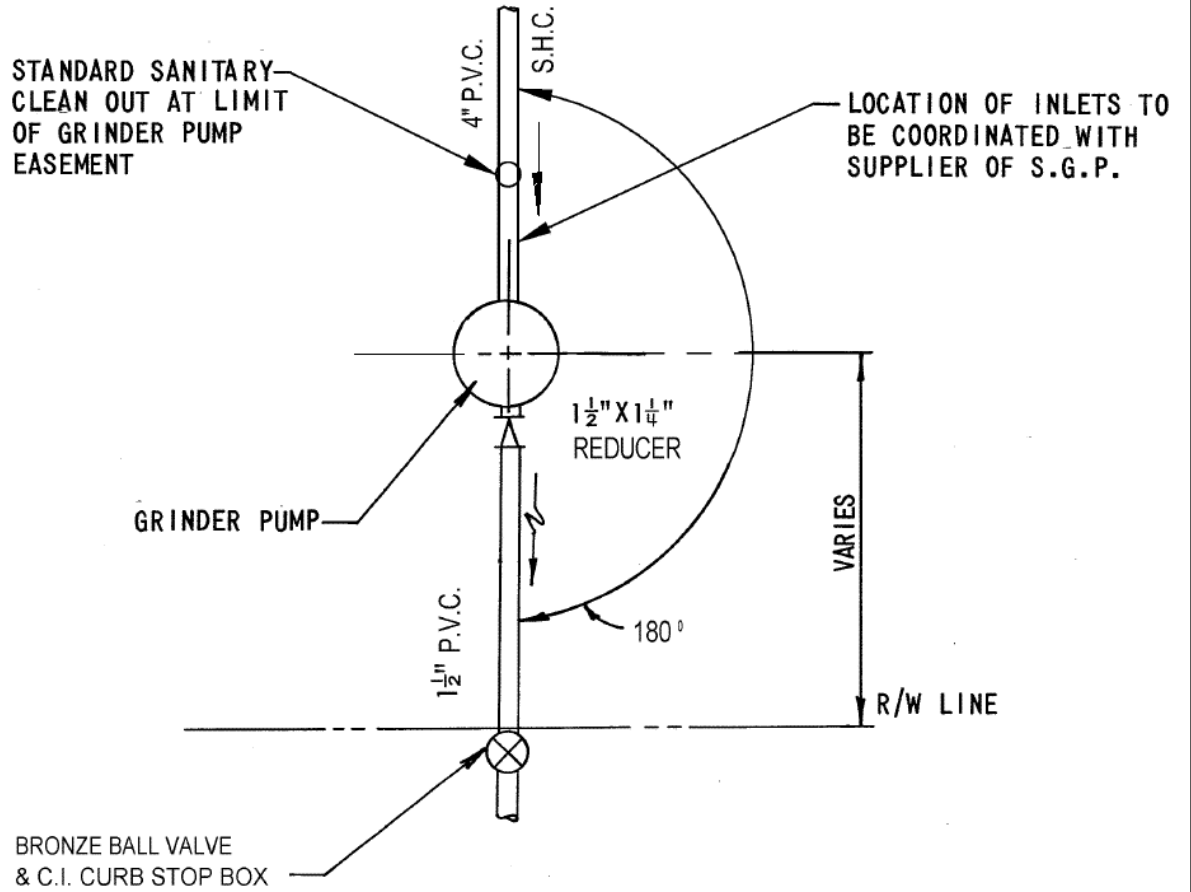
APPROVED \_\_\_\_\_  
CHIEF ENGINEER  
\_\_\_\_\_  
DESIGN ENGINEER  
DATE: \_\_\_\_\_

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS

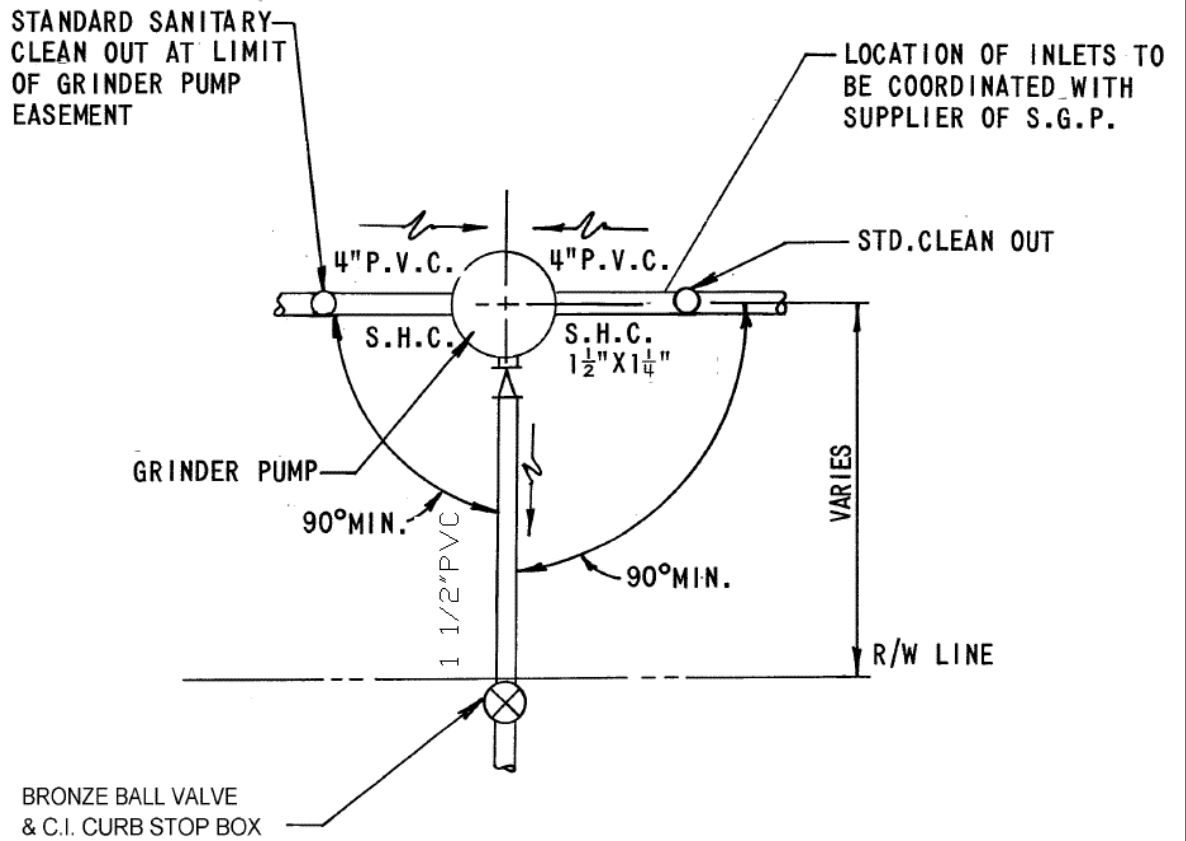
**REFERENCE SANITARY SEWER DESIGN  
GRINDER PUMP DETAILS  
SHEET 3**

REVISED

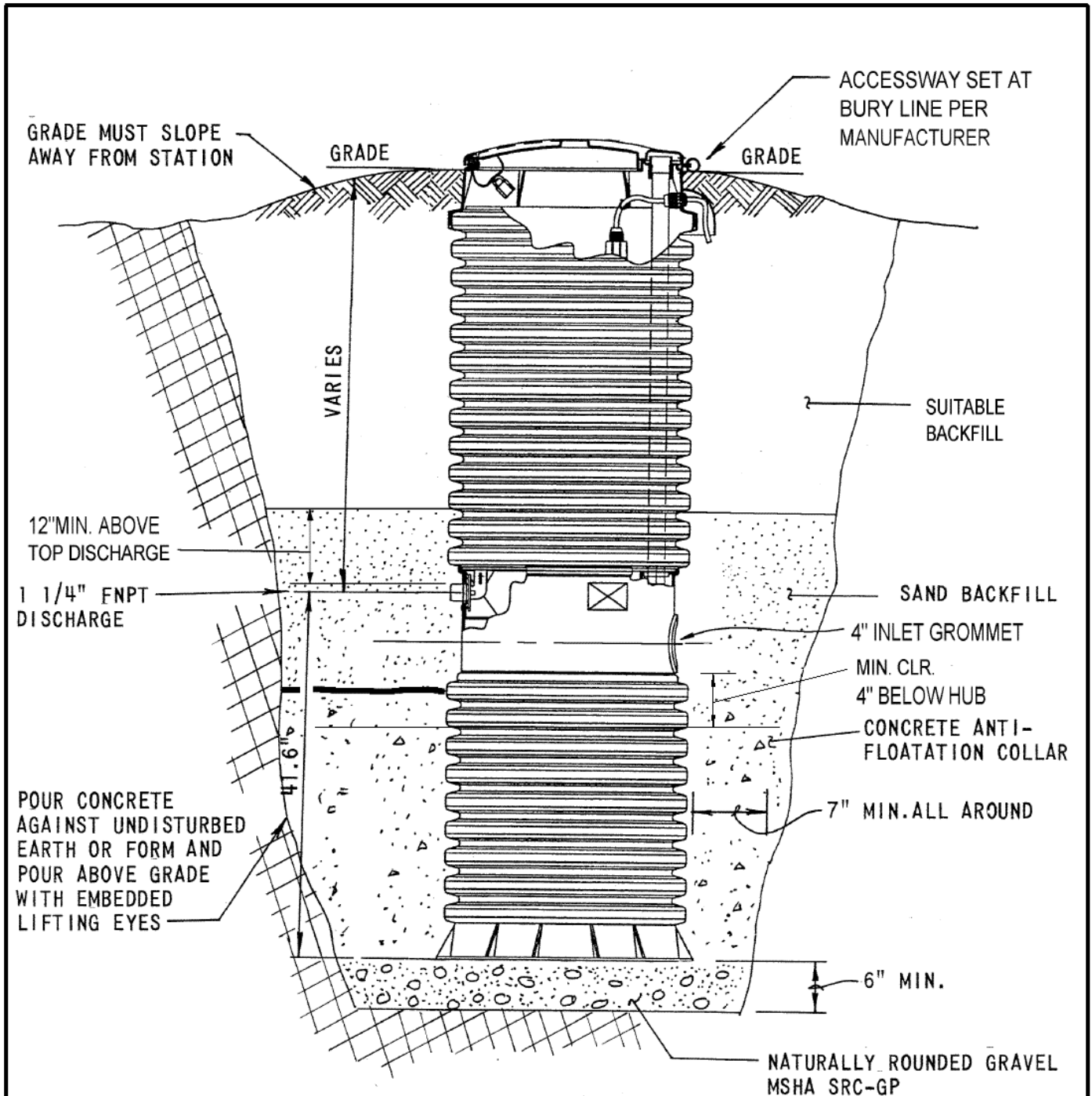
SS  
L-7



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	REFERENCE SANITARY SEWER DESIGN  TYPICAL SIMPLEX GRINDER PUMP LOCATION PLAN	REVISED	<u>SS</u> C-2a
	_____ CHIEF ENGINEER		_____	
	_____ DESIGN ENGINEER		_____	
	DATE: _____		_____	



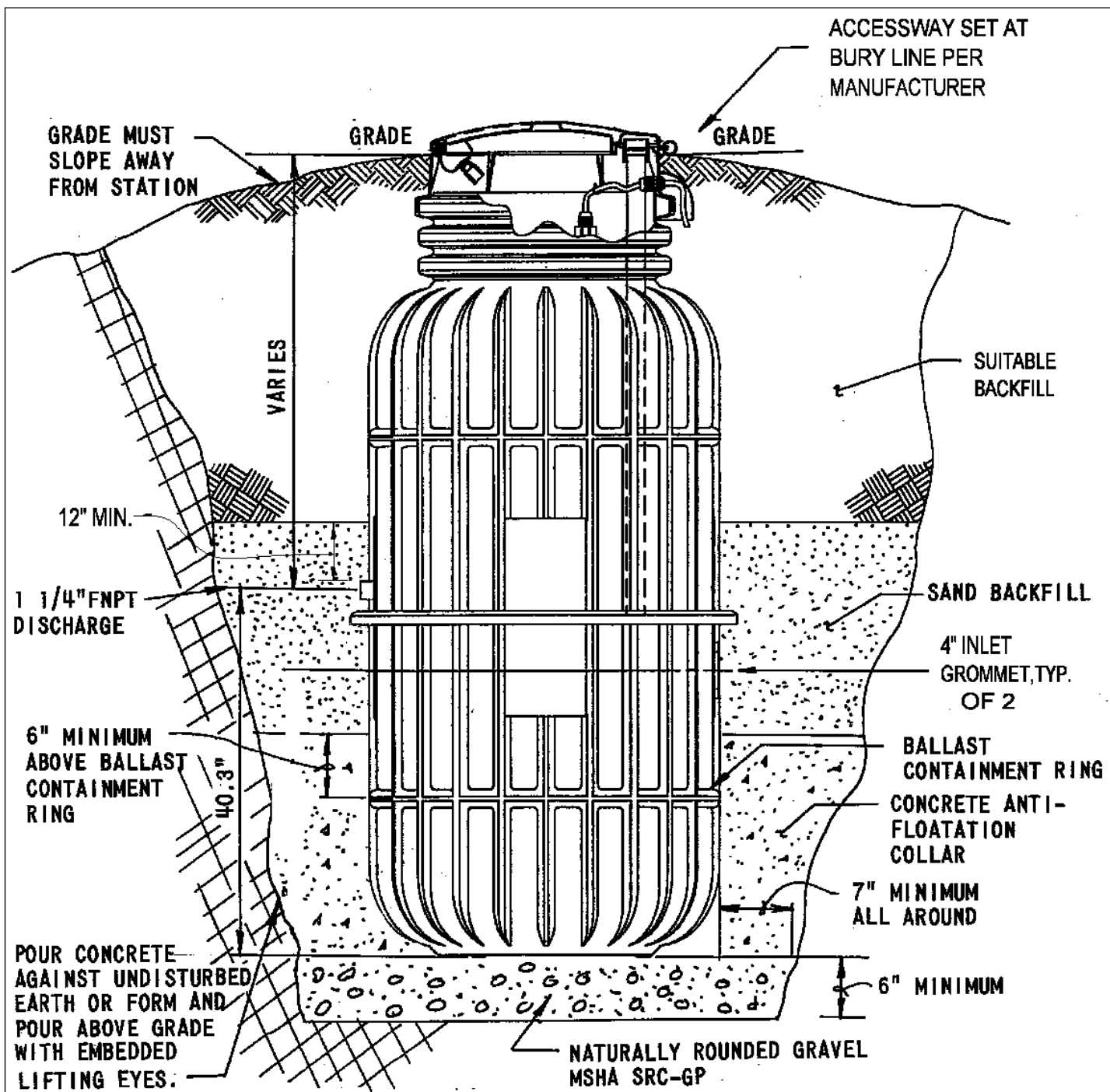
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	<b>REFERENCE SANITARY SEWER DESIGN</b>  <b>TYPICAL DUPLEX GRINDER PUMP LOCATION PLAN</b>	REVISED _____	<u>SS</u> C-2b
	_____ DESIGN ENGINEER		_____	
	DATE: _____		_____	
	_____		_____	
	_____		_____	



- NOTES:
1. DETAIL APPLY TO ENVIRONMENT ONE S.G.P. MODEL 2010.
  2. INSTALL PLUMB-PROVIDE TEMPORARY BRACING TO MATAIN POSITIONING DURING CONCRETE PLACEMENT.
  3. GRINDER PUMP DIMENSIONS ARE SUBJECT TO CHANGE.
  4. SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	<b>REFERENCE SANITARY SEWER DESIGN</b>	REVISED	<b>SS</b>
	CHIEF ENGINEER			
	DESIGN ENGINEER	<b>TYPICAL SIMPLEX GRINDER PUMP INSTALLATION</b>		<b>C-3a</b>
	DATE:			





**NOTES:**

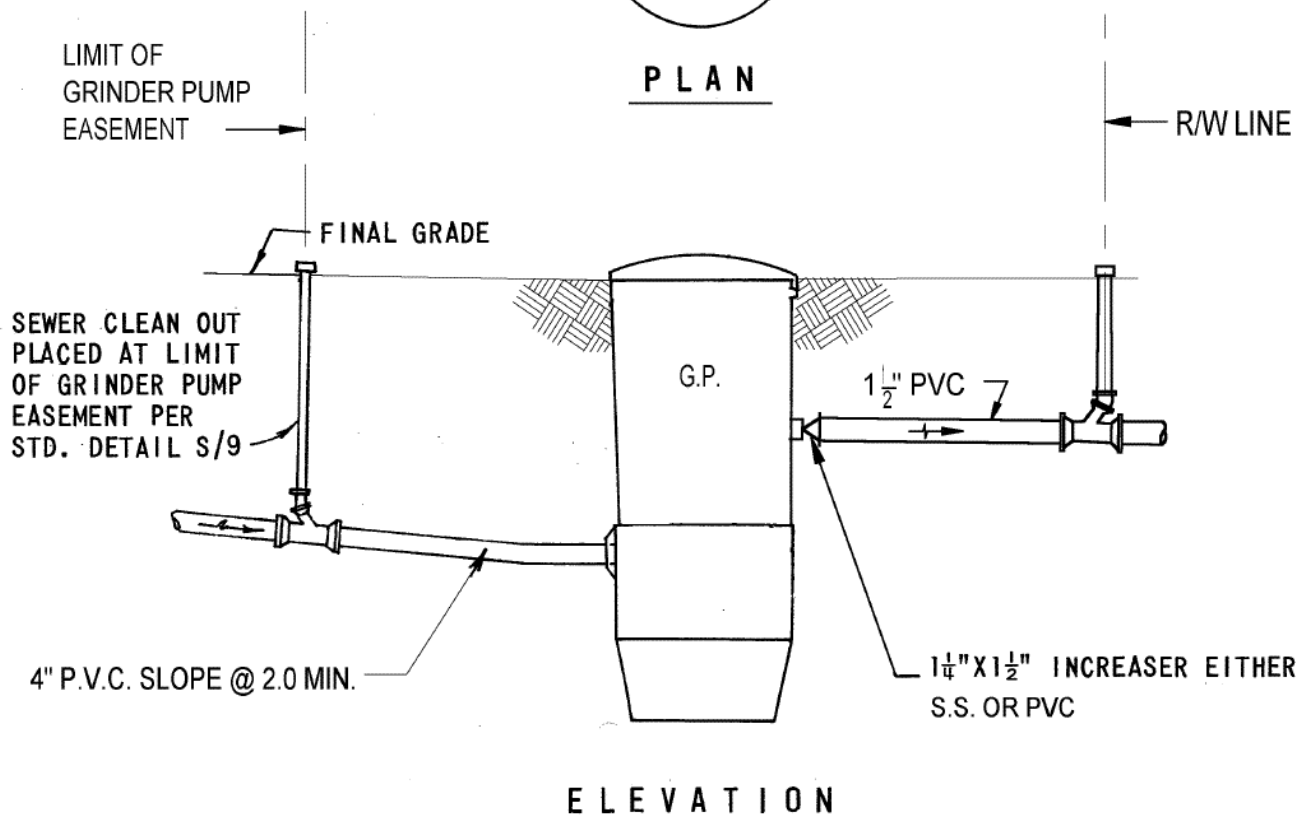
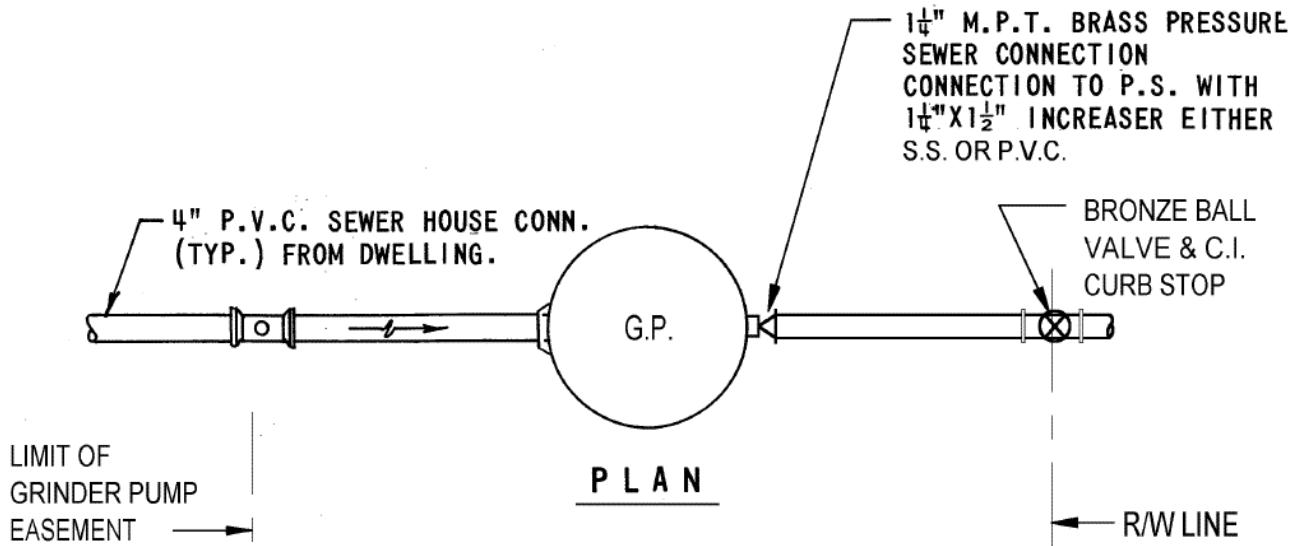
1. DETAILS APPLY TO ENVIRONMENT ONE S.G.P. MODEL 2014.
2. INSTALL PLUMB-PROVIDE TEMPORARY BRACING TO MAINTAIN POSITIONING DURING CONCRETE PLACEMENT.
3. GRINDER PUMP DIMENSIONS ARE SUBJECT TO CHANGE
4. SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS.

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS

APPROVED  
\_\_\_\_\_  
CHIEF ENGINEER  
\_\_\_\_\_  
DESIGN ENGINEER  
DATE:

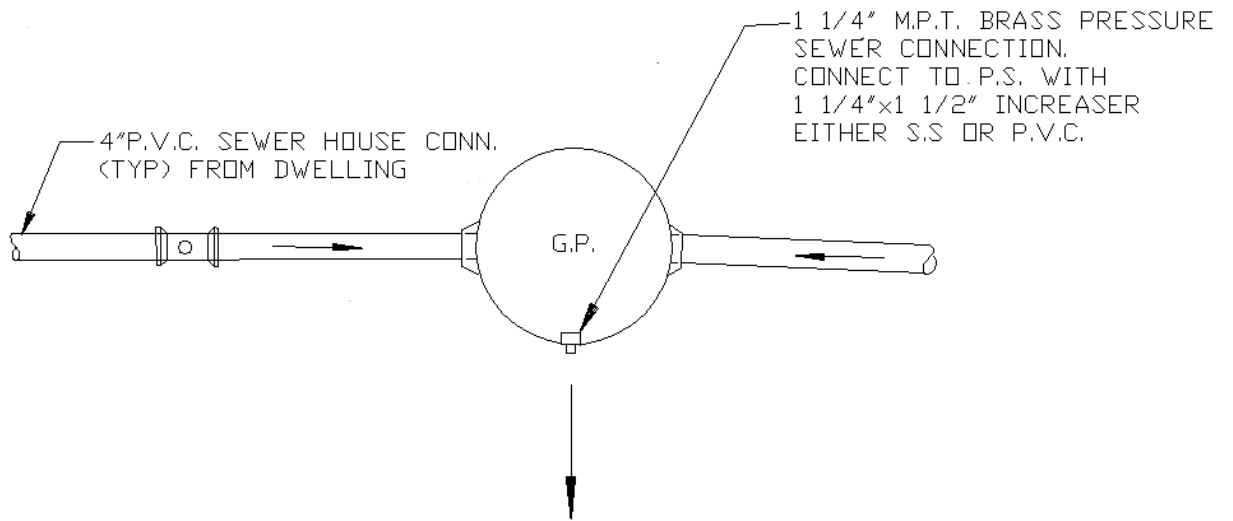
REFERENCE SANITARY  
SEWER DESIGN  
  
TYPICAL DUPLEX GRINDER  
PUMP INSTALLATION

REVISED	
	SS
	C-3b

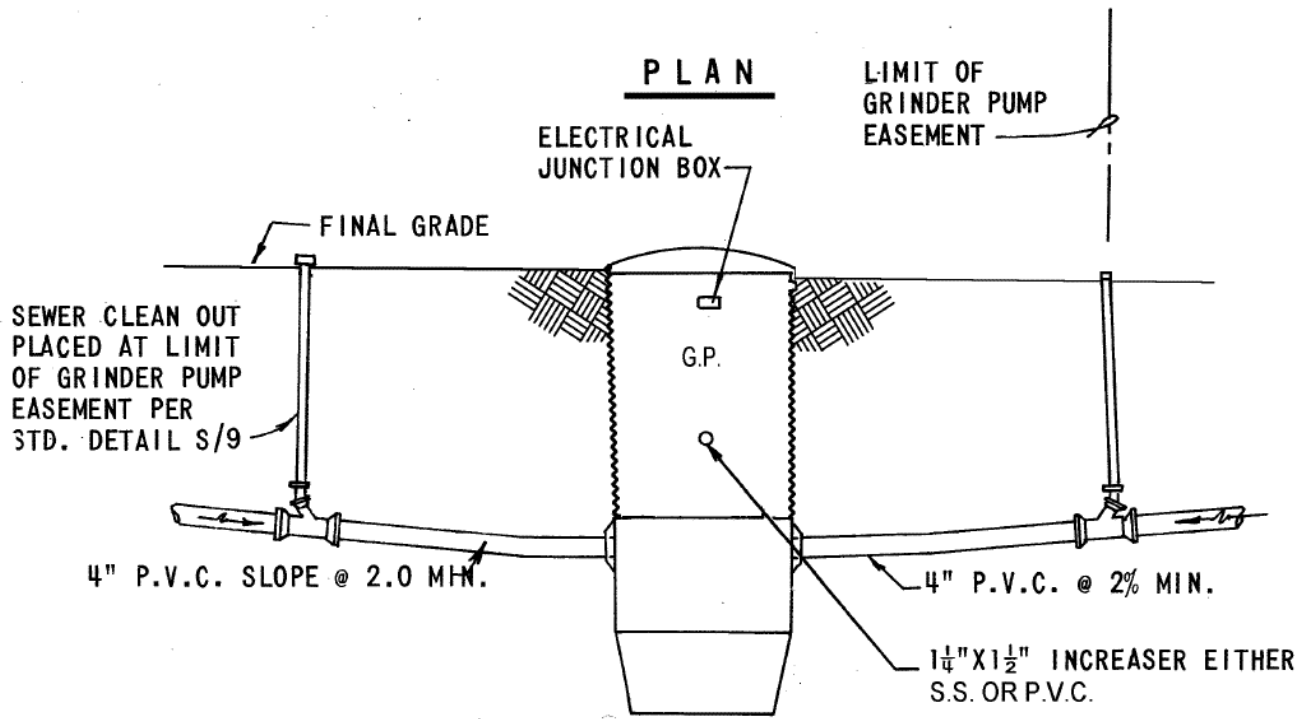


NOTES: 1. SOME SEWER HOUSE CONNECTIONS REQUIRE ONE ADDITIONAL 1/8" HOR, BEND.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	REFERENCE SANITARY SEWER DESIGN  TYPICAL SIMPLEX GRINDER PUMP SEWER HOUSE CONNECTION	REVISED _____	SS C-4a
	_____ DESIGN ENGINEER		_____	
	DATE: _____		_____	
	_____		_____	



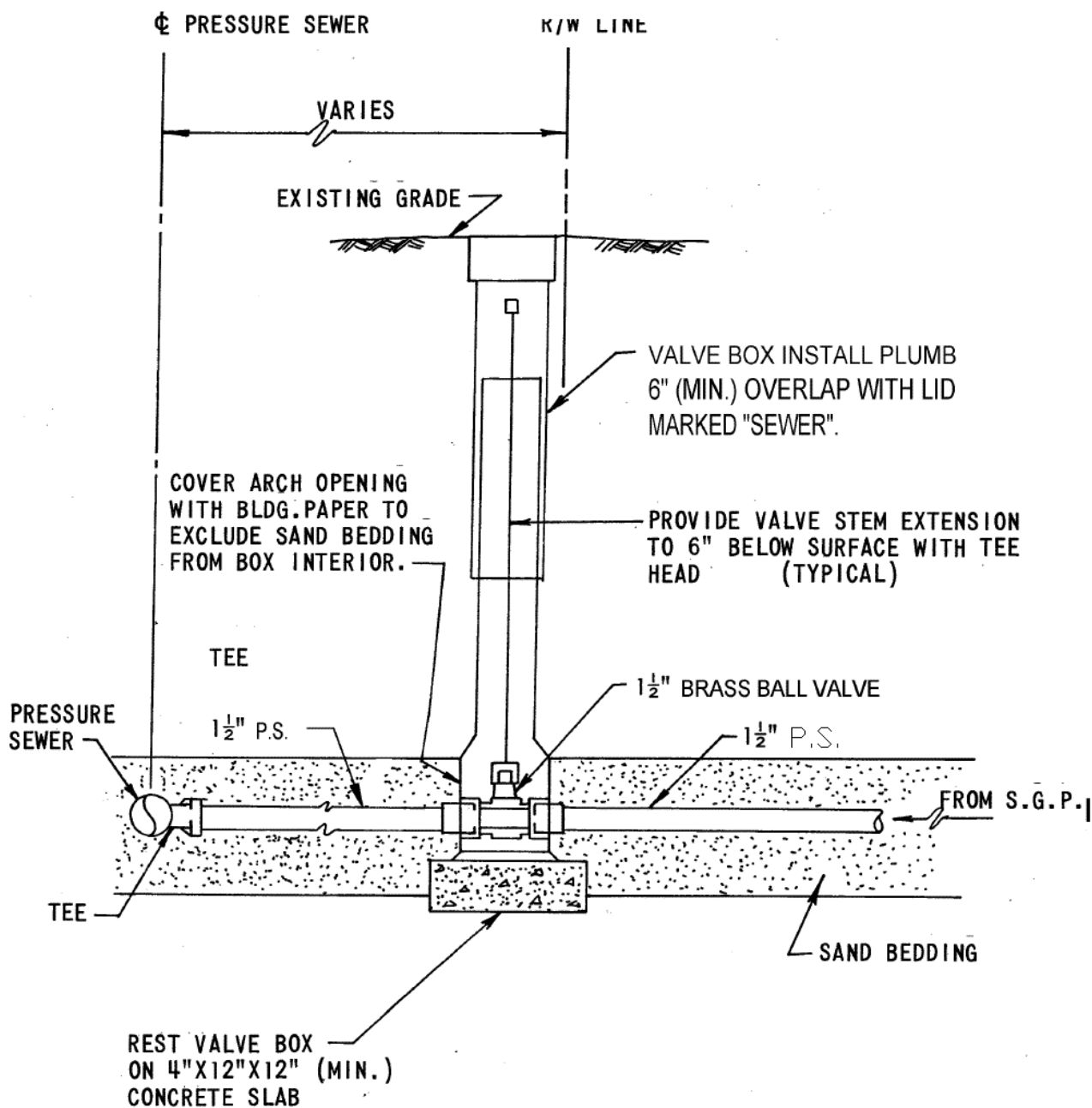
**PLAN**



**ELEVATION**

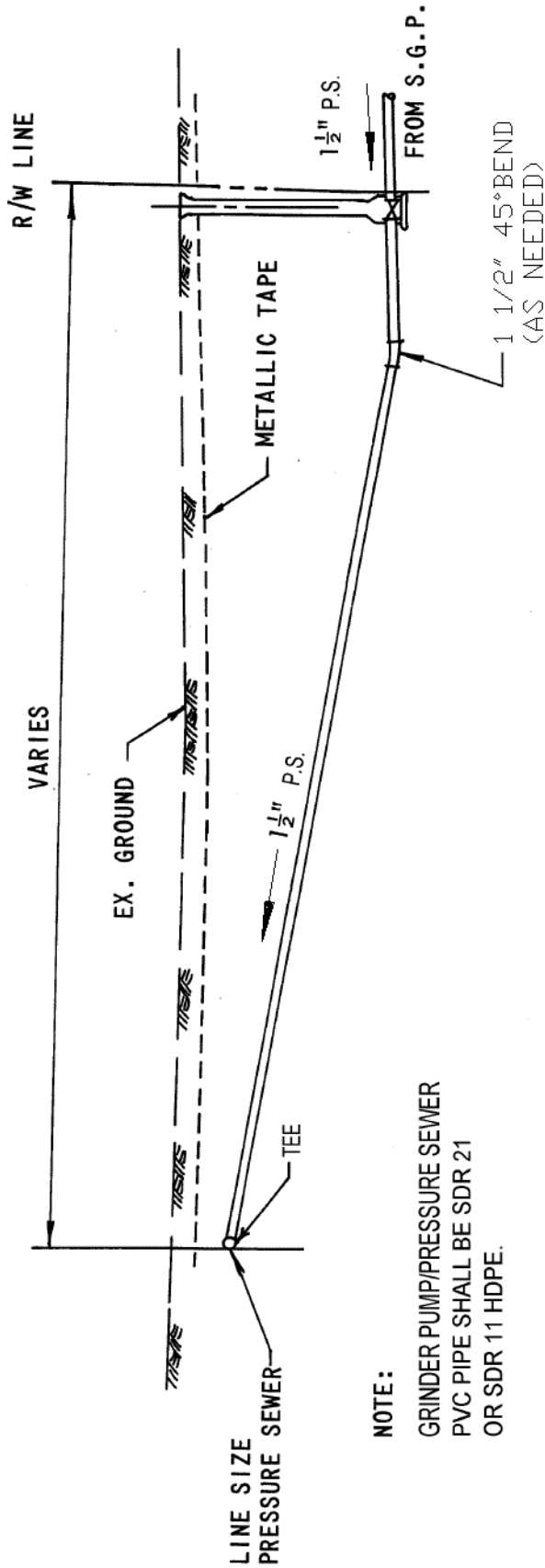
NOTES: 1. SOME SEWER HOUSE CONNECTIONS REQUIRE ONE ADDITIONAL 1/8" HOR, BEND.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	REFERENCE SANITARY SEWER DESIGN  TYPICAL DUPLEX GRINDER PUMP SEWER HOUSE CONNECTION	REVISED _____	SS C-4b
	_____ DESIGN ENGINEER		_____	
	DATE: _____		_____	
	_____		_____	
	_____		_____	



- NOTES: 1. MAINTAIN 3' MIN. COVER OVER PRESSURE SEWER.  
 2. CONCRETE SLAB-ON UNDISTURBED EARTH OR FIRM SUBGRADE.  
 3. ALL CONNECTIONS SHALL BE RUBBER GASKET.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	REFERENCE SANITARY SEWER DESIGN  TYPICAL SERVICE VALVE ASSEMBLY	REVISED	<u>SS</u> C-5
	_____		_____	
	CHIEF ENGINEER		_____	
	DESIGN ENGINEER		_____	
	DATE:			



**NOTE:**

GRINDER PUMP/PRESSURE SEWER  
 PVC PIPE SHALL BE SDR 21  
 OR SDR 11 HDPE.

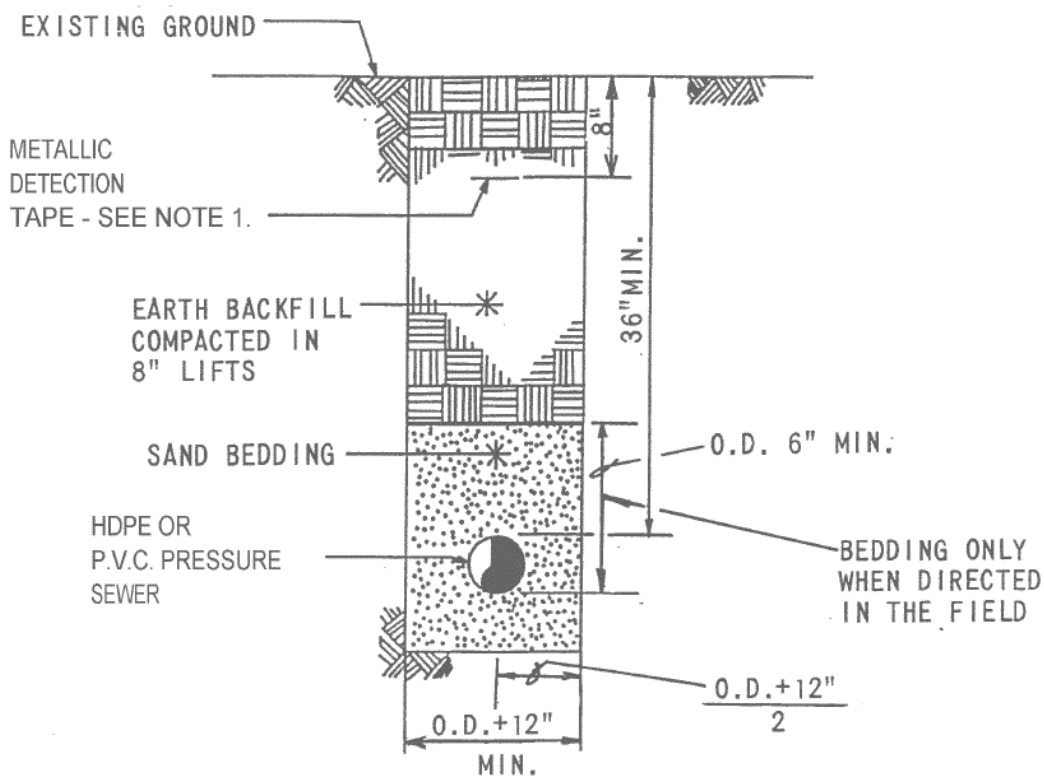
REVISED

**REFERENCE SANITARY SEWER DESIGN  
 CONNECTION FROM SERVICE VALVE ASSEMBLY  
 TO PRESSURE SEWER MAIN**

APPROVED	
	CHIEF ENGINEER
	DESIGN ENGINEER
	DATE:

ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS

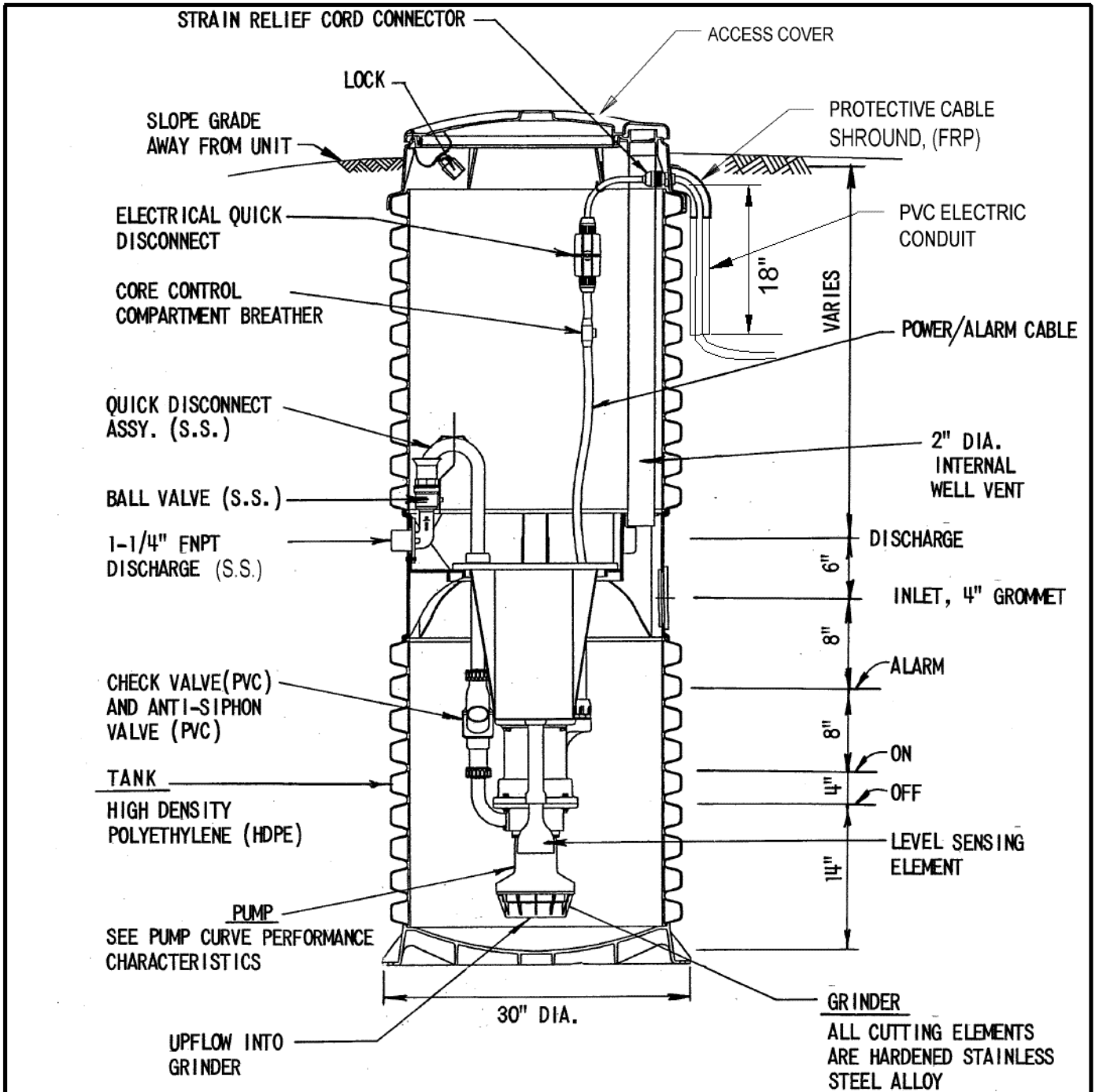
**SS**  
**C-6**



NOTE 1:  
 WHEN INSTALLING PIPE BY DIRECTIONAL  
 DRILLING TECHNIQUES, A COPPER TRACE  
 WIRE SHALL BE PULLED WITH THE PIPE IN  
 LIEU OF THE METALLIC DETECTION TAPE.

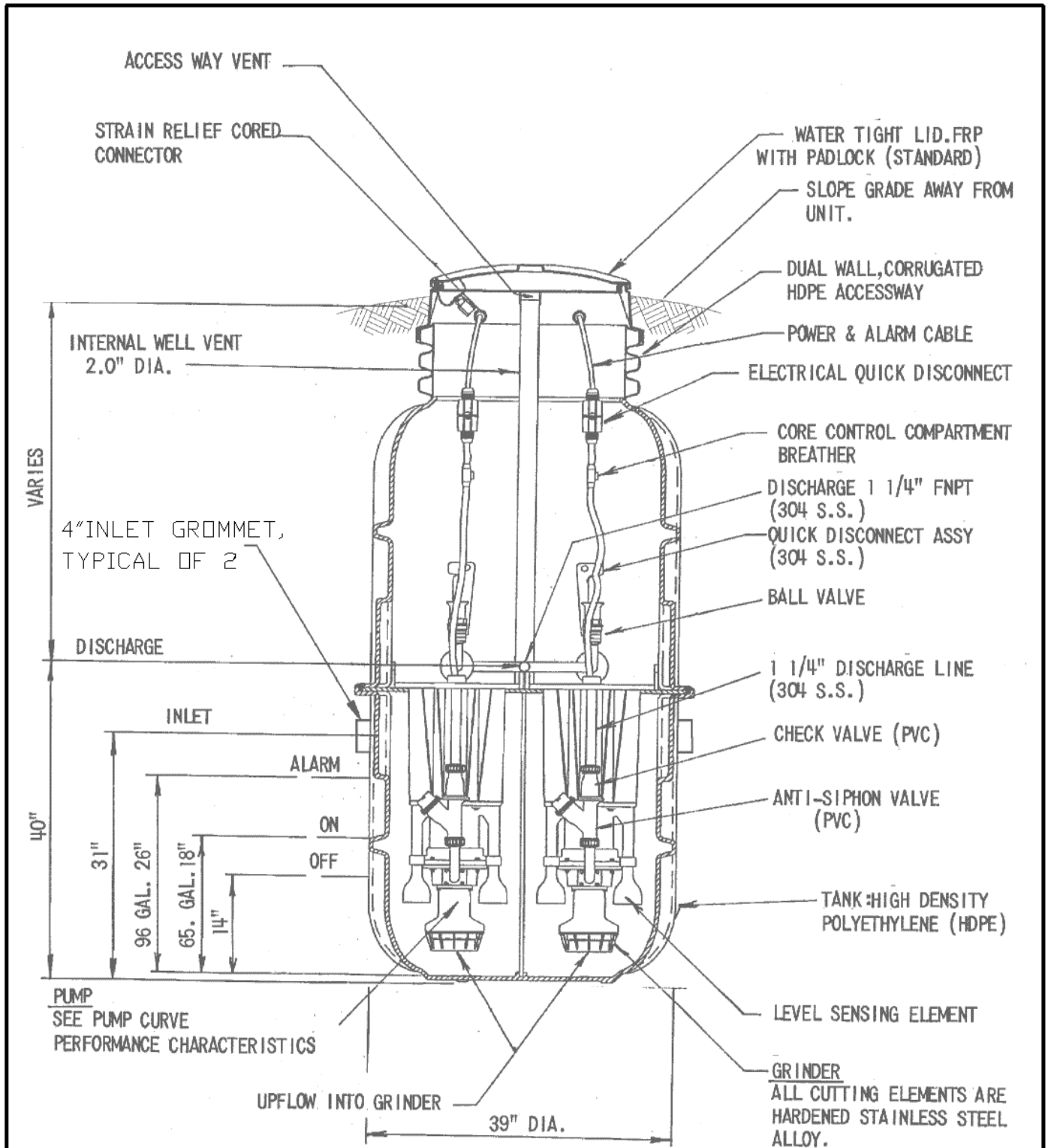
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	<b>REFERENCE SANITARY                  SEWER DESIGN</b>  <b>PRESSURE SEWER TRENCH                  AND BEDDING DETAIL</b>	REVISED _____	<b>SS</b> <b>C-7</b>
	_____ DESIGN ENGINEER		_____	
	DATE:		_____	
	_____		_____	
	_____		_____	

Published: 01/01    Revised:



**NOTE:**  
GRINDER PUMP UNIT DIMENSIONS ARE BASED ON ENVIRONMENT ONE AND ARE SHOWN FOR GENERAL PURPOSES ONLY.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	<b>REFERENCE SANITARY SEWER DESIGN</b>  <b>TYPICAL SIMPLEX SEWAGE GRINDER PUMP SECTION</b>	REVISED _____	<b>SS</b> <b>M-3a</b>
	_____ DESIGN ENGINEER		_____	
	DATE: _____		_____	
	_____		_____	

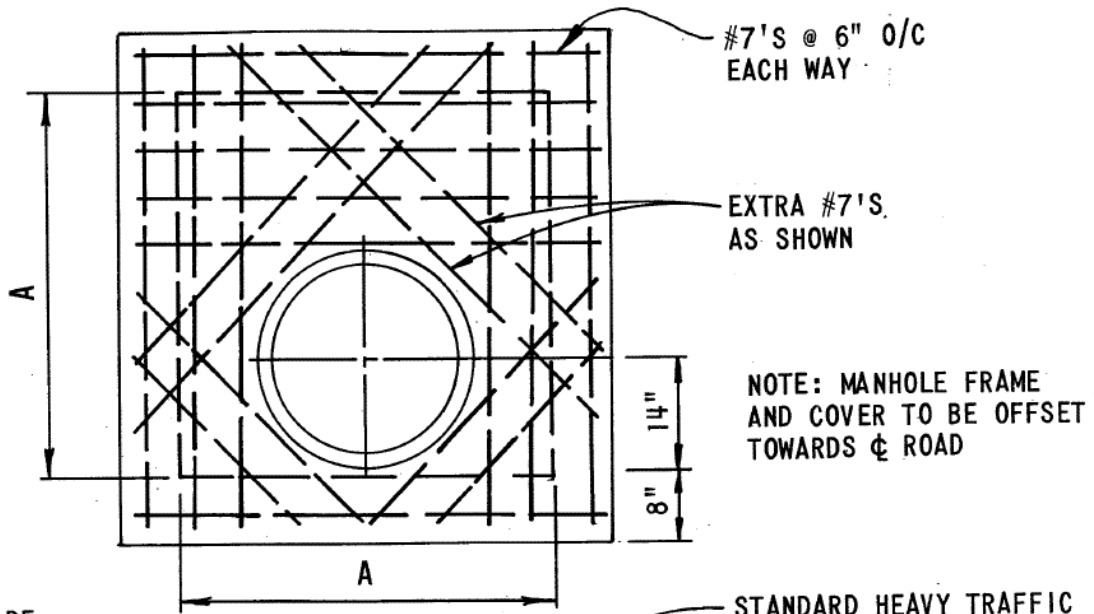


**NOTE:**

GRINDER PUMP UNIT DIMENSIONS ARE BASED ON ENVIRONMENT ONE AND ARE SHOWN FOR GENERAL PURPOSES ONLY.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER _____ DESIGN ENGINEER DATE: _____	<b>REFERENCE SANITARY SEWER DESIGN</b> <b>TYPICAL DUPLEX SEWAGE GRINDER PUMP INSTALLATION</b> <b>RESIDENTIAL APPLICATION</b>	REVISED _____ _____ _____	<b>SS</b> <b>M-3b</b>
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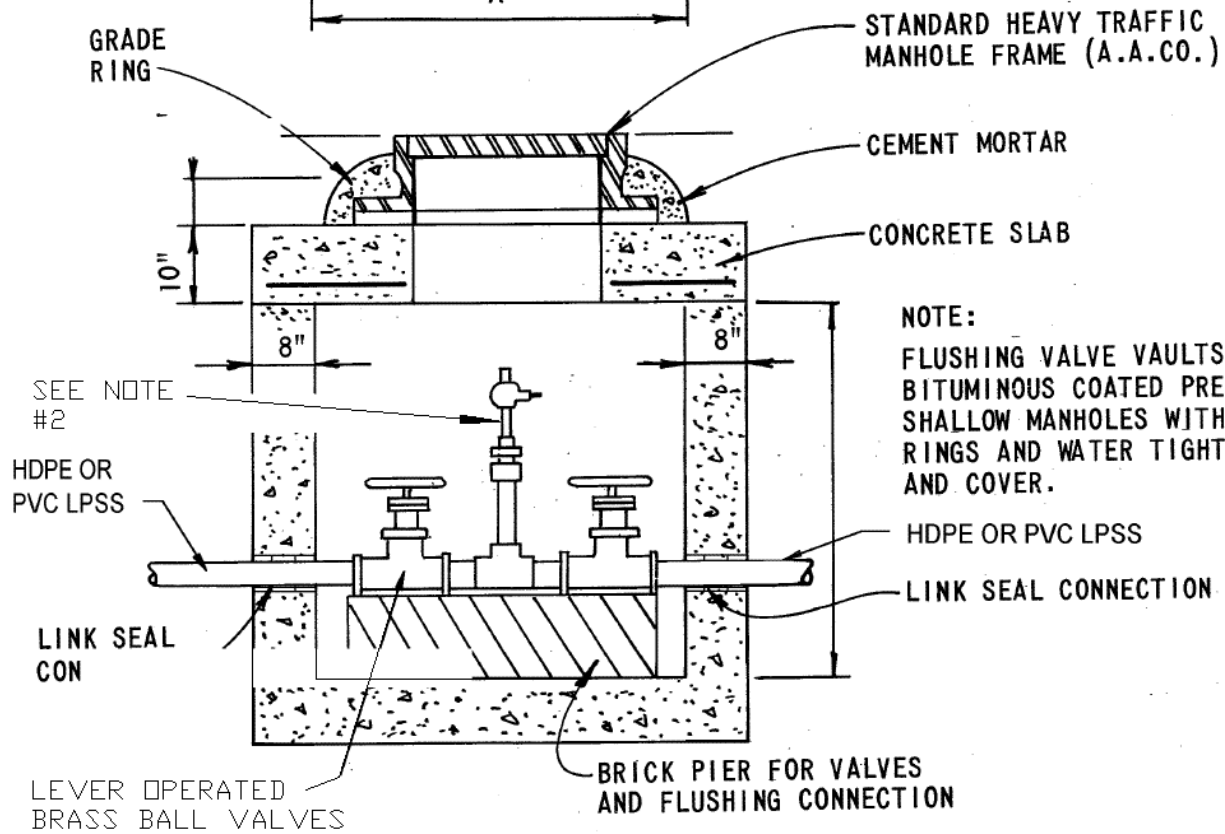




#7'S @ 6" O/C  
EACH WAY

EXTRA #7'S  
AS SHOWN

NOTE: MANHOLE FRAME  
AND COVER TO BE OFFSET  
TOWARDS  $\phi$  ROAD



STANDARD HEAVY TRAFFIC  
MANHOLE FRAME (A.A.CO.)

CEMENT MORTAR

CONCRETE SLAB

NOTE:  
FLUSHING VALVE VAULTS TO BE  
BITUMINOUS COATED PRE CAST  
SHALLOW MANHOLES WITH GRADE  
RINGS AND WATER TIGHT FRAME  
AND COVER.

HDPE OR PVC LPSS

LINK SEAL CONNECTION

SEE NOTE  
#2

HDPE OR  
PVC LPSS

LINK SEAL  
CON

LEVER OPERATED  
BRASS BALL VALVES

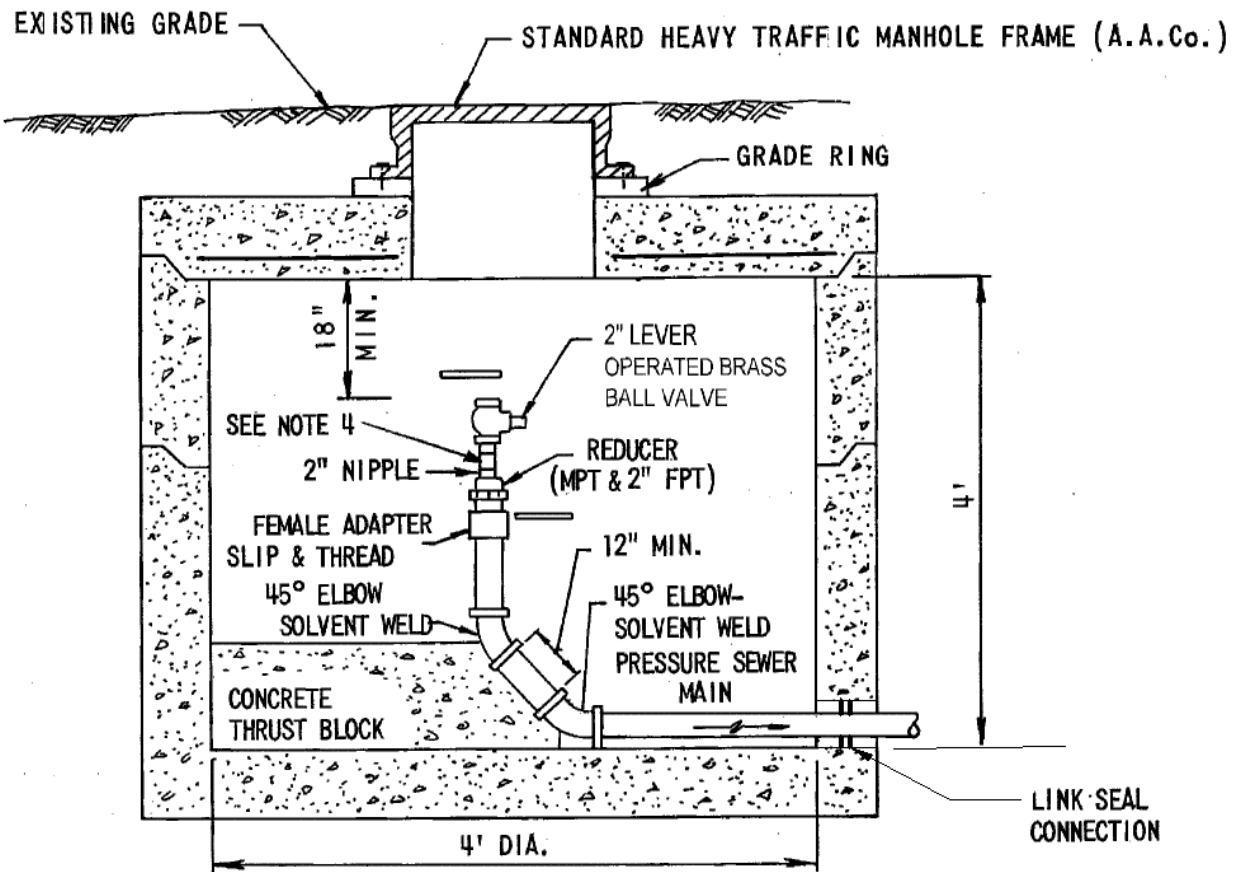
BRICK PIER FOR VALVES  
AND FLUSHING CONNECTION

**SECTION**

NOTES:

1. ALL PVC PIPE AND APPURTENANCES IN VAULT TO BE SCH.80 AND SOLVENT WELD OR HPDE W/ELECTROFUSION COUPLING
2. AIKENSTRUT CROSS SUPPORT WITH FRP PIPE STRAP TO SUPPORT RISER PIPE, ANCHOR FRP MEMBERS OF VAULT WITH S.S. ANCHOR BOLTS.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	<b>REFERENCE SANITARY SEWER DESIGN</b>  <b>TYPICAL INLINE FLUSHING CONNECTION</b>	REVISED _____	<b>SS</b>  <b>S-8</b>
	_____ DESIGN ENGINEER		_____	
	DATE: _____		_____	
	_____		_____	

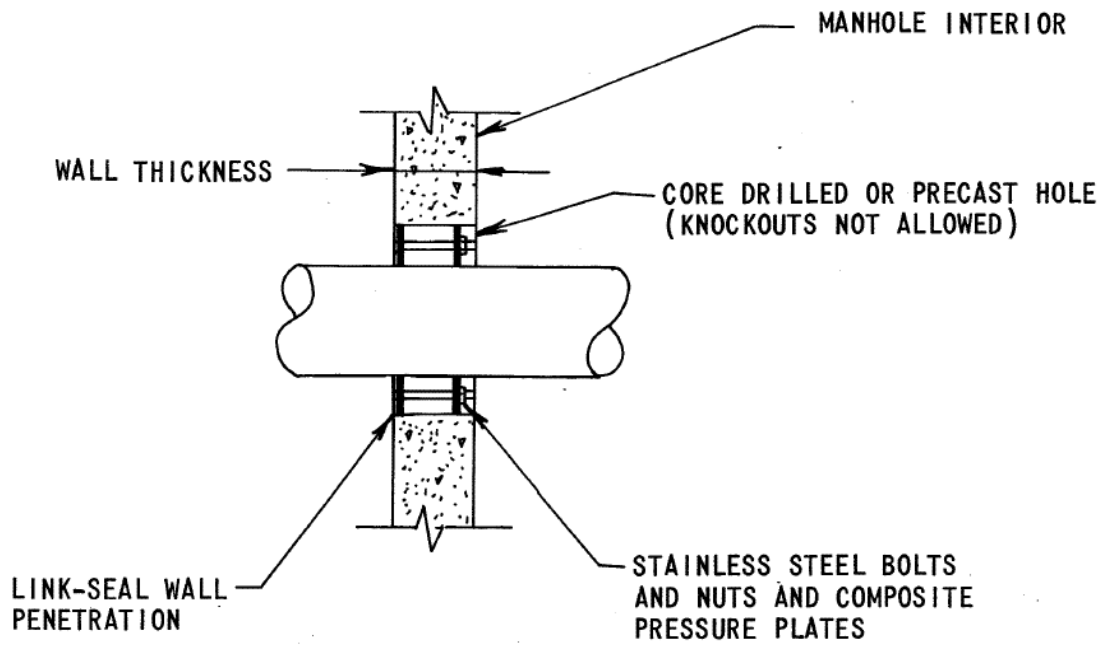


NOTE: ALL P.V.C. CONNECTIONS IN VAULT TO BE SOLVENT WELD  
SCH. 80 P.V.C. OR HDPE WITH HDPE x S.S. TRANSITION PIECES.

**NOTES:**

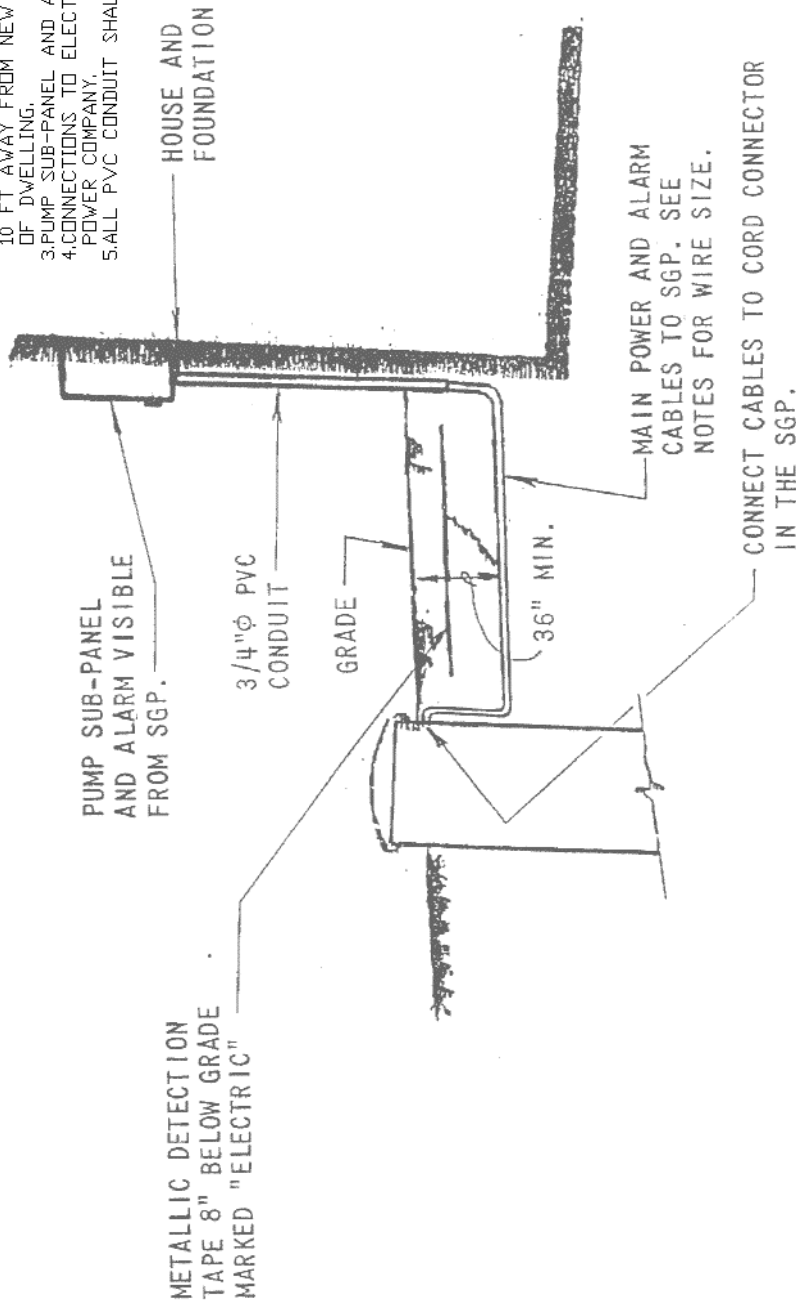
1. LOCATE FLUSHING CONNECTION FOR EASY HOSE ATTACHMENT BUT DON NOT BLOCK ACCESS VIA LADDER.
2. APPLY TWO (2) COATS OF A WATERPROOF BITUMOSTIC COMPOUND OVER CEMENT MORTAR.
3. MODIFIED SHALLOW PRECAST MANHOLE. SEE STANDARD DETAIL S/12.
4. AIKEN STRUT CROSS SUPPORT WITH FRP PIPE STRAP TO SUPPORT RISER PIPE. ANCHOR FRP MEMBERS TO WALL OF VAULT WITH S.S. ANCHOR BOLTS.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	REFERENCE SANITARY SEWER DESIGN  TERMINAL FLUSHING CONNECTION	REVISED	<u>SS</u> S-9
	_____		_____	
	CHIEF ENGINEER		_____	
	_____		_____	
	DESIGN ENGINEER			
	DATE:			



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	<b>REFERENCE SANITARY SEWER DESIGN</b>  <b>LINK SEAL DETAIL</b>	REVISED _____	<u>SS</u> S-10
	_____ DESIGN ENGINEER		_____	
	DATE: _____		_____	
	_____		_____	
	_____		_____	

- NOTES: 1. USE TYPE "A" CONFIGURATION WHERE PUMP SUB-PANEL IS WITHIN 10 FT OF NEW SERVICE ENTRANCE.  
 2. USE TYPE "B" CONFIGURATION WHERE PUMP SUB-PANEL IS MORE THAN 10 FT AWAY FROM NEW SERVICE ENTRANCE. ALL WIRE TO BE OUTSIDE OF DWELLING.  
 3. PUMP SUB-PANEL AND ALARM PANEL SHALL BE VISIBLE FROM S.G.P.  
 4. CONNECTIONS TO ELECTRIC METER SHALL BE COORDINATED WITH POWER COMPANY.  
 5. ALL PVC CONDUIT SHALL TERMINATE 24" BELOW GROUND.

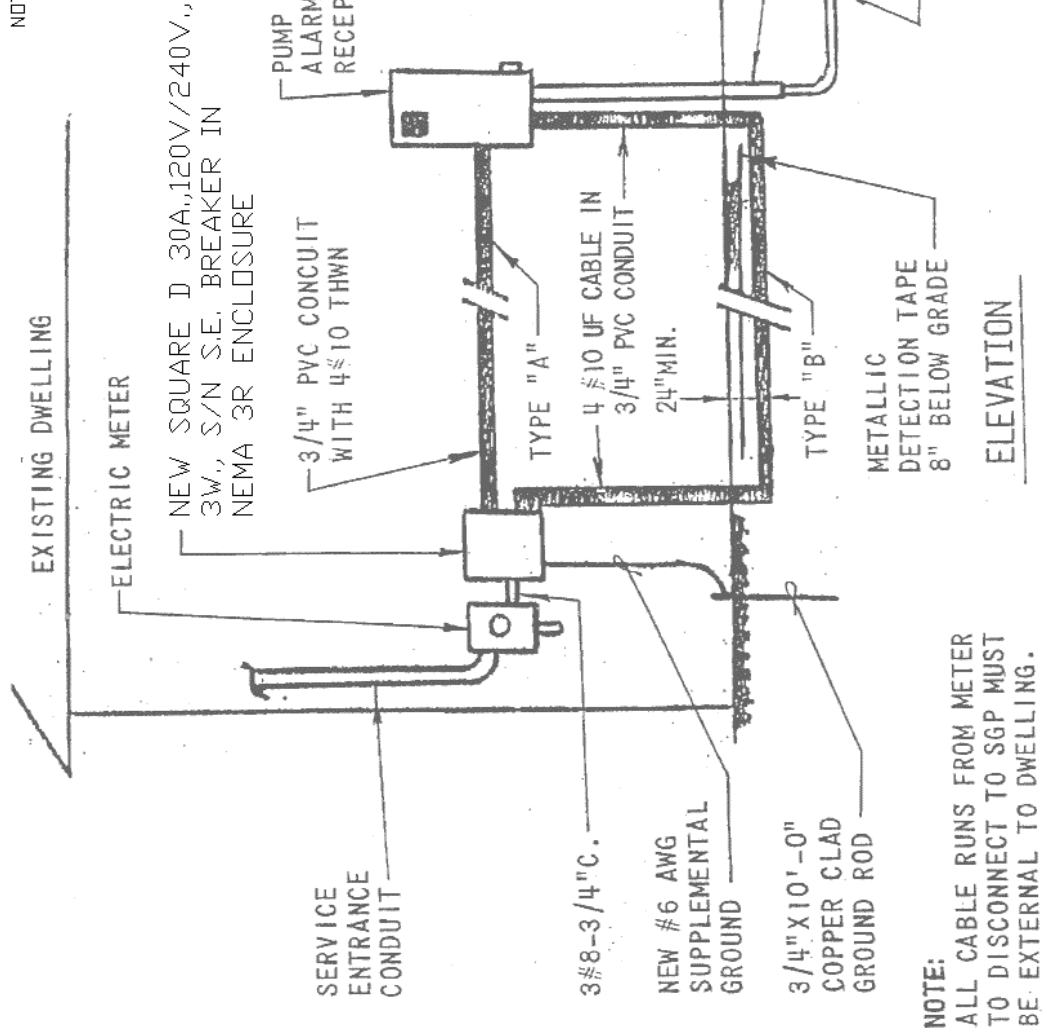


SECTION

TYPICAL ELECTRICAL PANEL ARRANGEMENT

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER  _____ DESIGN ENGINEER DATE:	REFERENCE SANITARY SEWER DESIGN  TYPICAL ELECTRICAL PANEL ARRANGEMENT	REVISED _____ _____ _____ _____ SS E-8a
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- NOTES: 1. USE TYPE "A" CONFIGURATION WHERE PUMP SUB-PANEL IS WITHIN 10 FT. OF NEW SERVICE ENTRANCE.  
 2. USE TYPE "B" CONFIGURATION WHERE PUMP SUB-PANEL IS MORE THAN 10 FT. AWAY FROM NEW SERVICE ENTRANCE. ALL WIRE TO BE OUTSIDE OF DWELLING.  
 3. PUMP SUB-PANEL AND ALARM PANEL SHALL BE VISABLE FROM S.G.P.  
 4. CONNECTIONS TO ELECTRIC METER SHALL BE COORDINATED WITH POWER COMPANY.  
 5. ALL PVC CONDUIT SHALL TERMINATE 24" BELOW GROUND.



**NOTE:**  
 ALL CABLE RUNS FROM METER TO DISCONNECT TO SGP MUST BE EXTERNAL TO DWELLING.

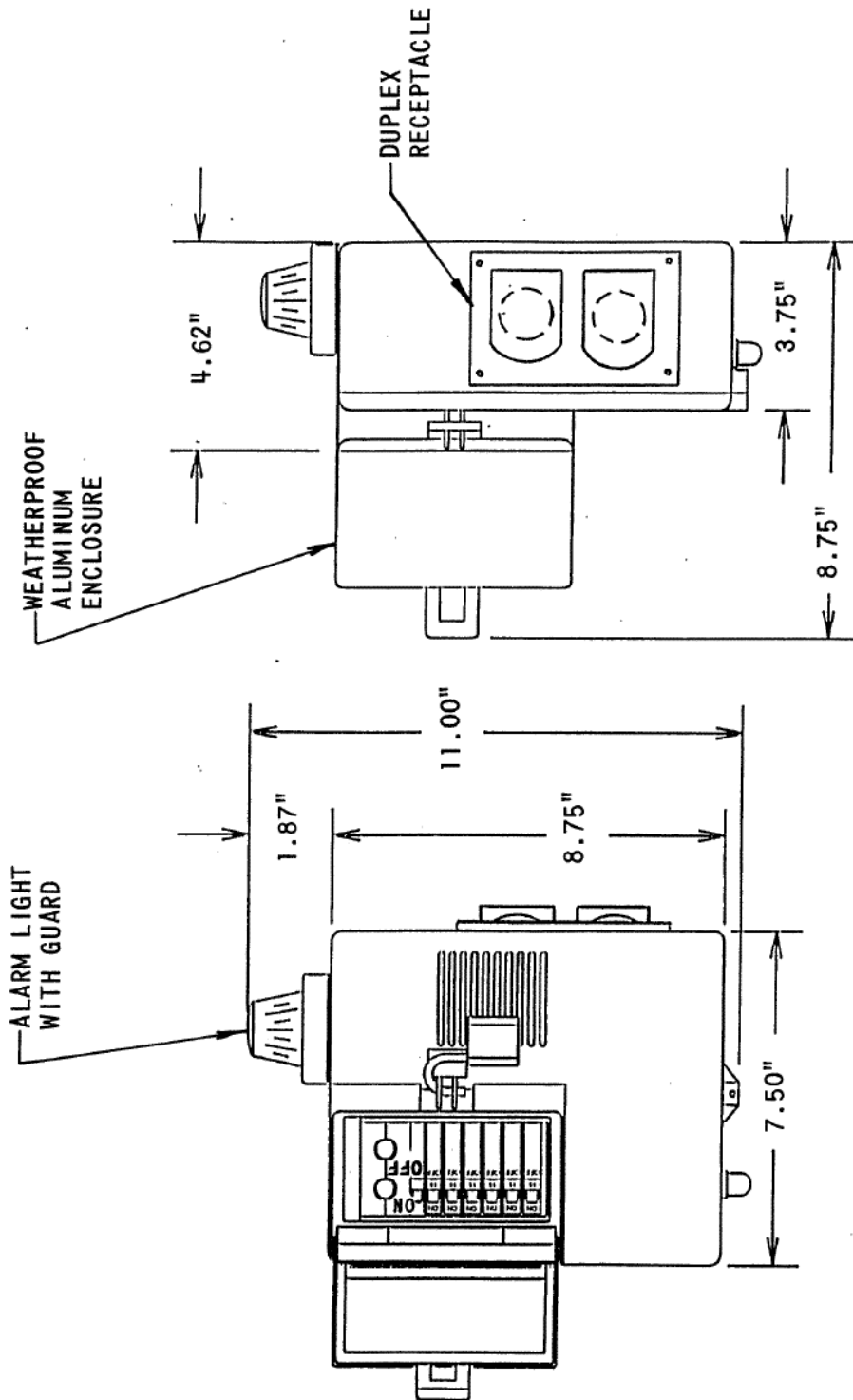
TYPICAL ELECTRICAL PANEL ARRANGEMENT

REVISED

REFERENCE SANITARY SEWER DESIGN  
 TYPICAL ELECTRICAL PANEL ARRANGEMENT

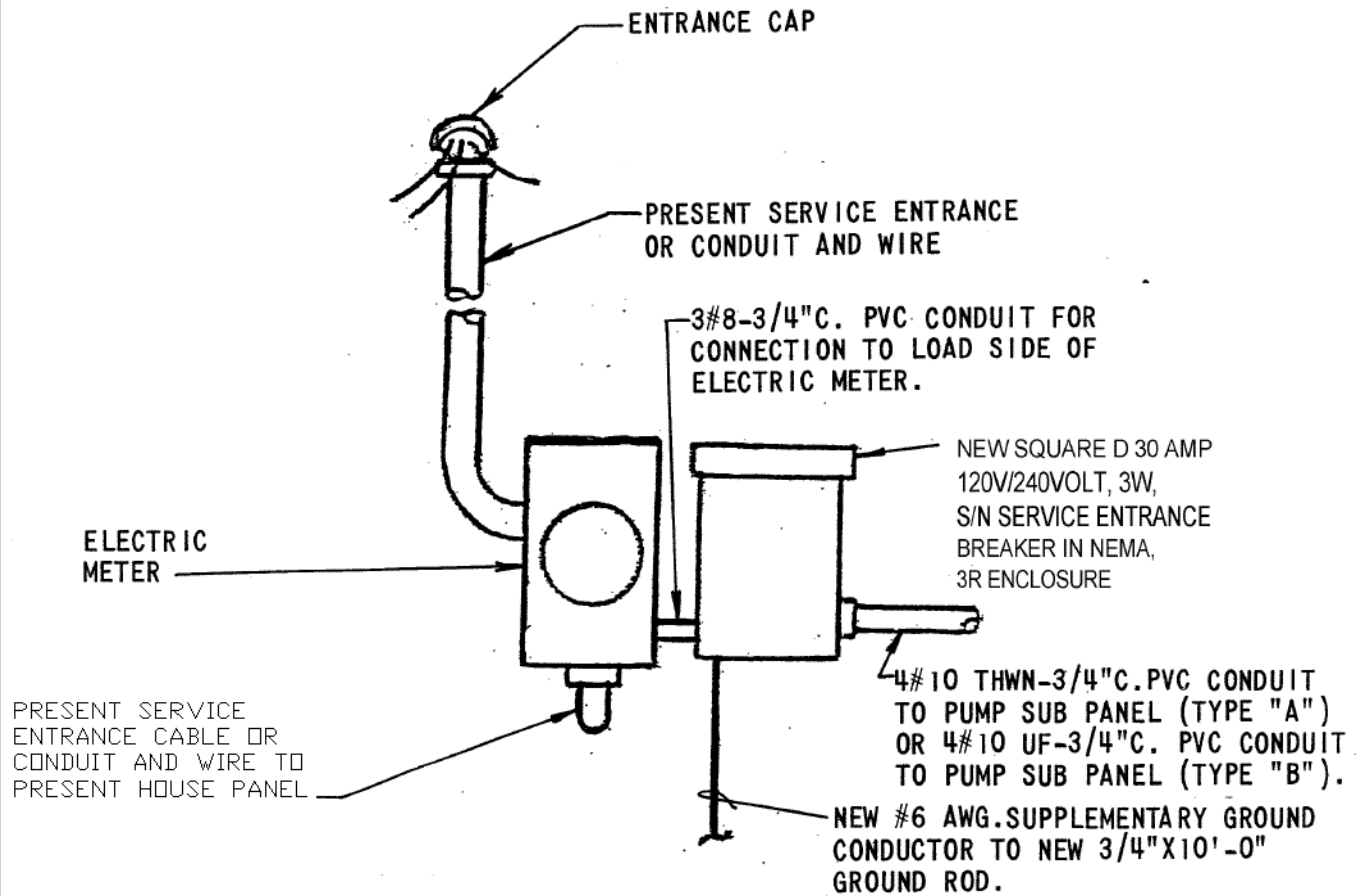
APPROVED	ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF ENGINEER	
DESIGN ENGINEER	
DATE:	

SS  
 E-8b



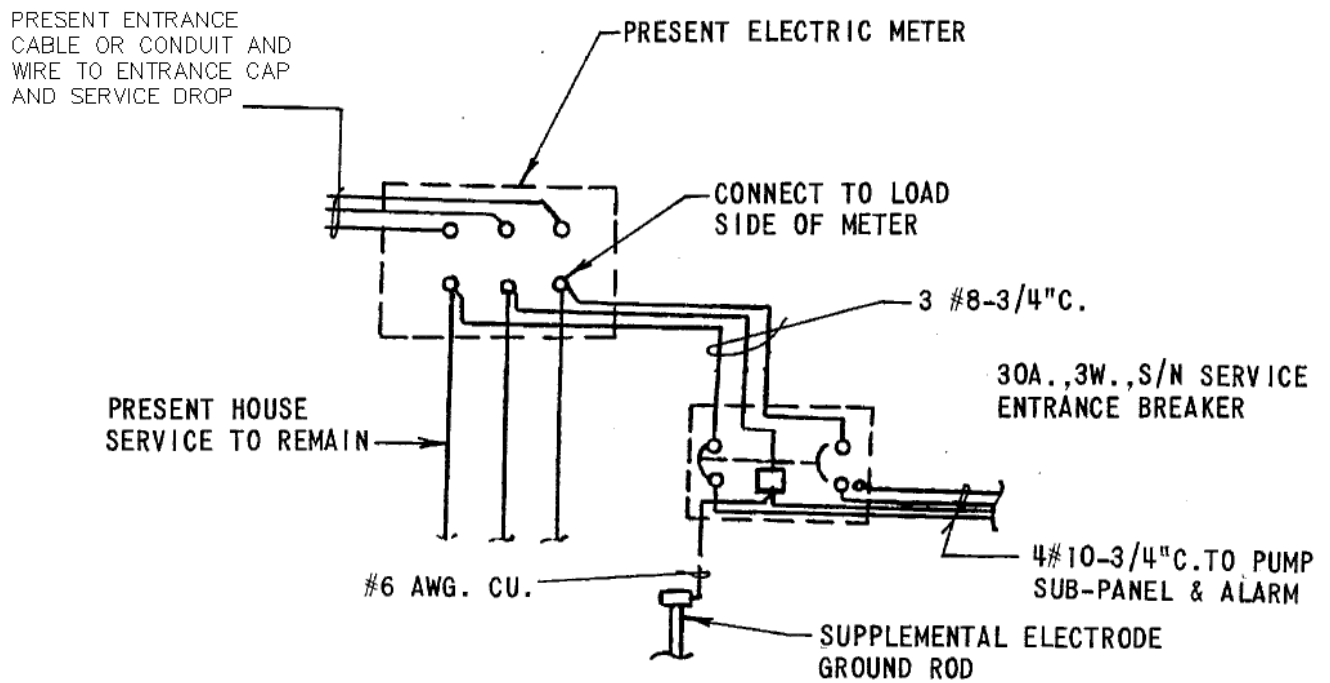
**NOTE: S.G.P. PANEL TO BE MOUNTED ON OUTSIDE WALL OF DWELLING. PLACEMENT MUST BE POSITIONED TO ALLOW A CLEAR LINE OF SITE FROM GRINDER PUMP TO PANEL.**

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	REFERENCE SANITARY SEWER DESIGN	REVIS
	_____ CHIEF ENGINEER		_____ E-9
	_____ DESIGN ENGINEER	GRINDER PUMP CONTROL AND ALARM PANEL	_____ DATE:



SERVICE ENTRANCE ARRANGEMENT

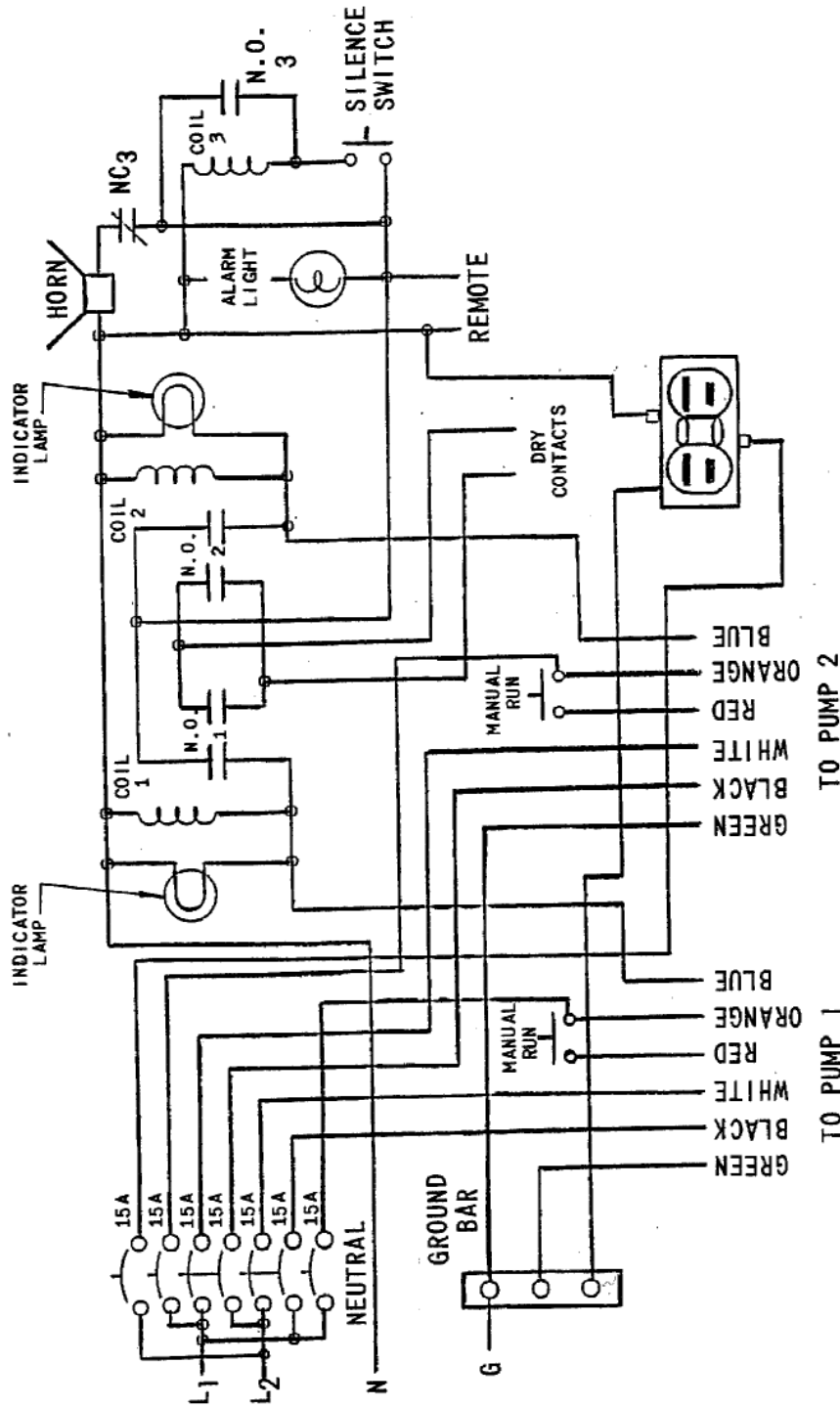
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	REFERENCE SANITARY SEWER DESIGN  SERVICE ENTRANCE ARRANGEMENT	REVISED _____	SS E-10
	_____ DESIGN ENGINEER		_____	
	DATE:		_____	
	_____		_____	



SERVICE ENTRANCE  
WIRING DIAGRAM

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	REFERENCE SANITARY SEWER DESIGN  SERVICE ENTRANCE WIRING DIAGRAM	REVISED _____	SS E-11
	_____ DESIGN ENGINEER		_____	
	DATE: _____		_____	
	_____		_____	
	_____		_____	





DUPLEX SEWAGE GRINDER PUMP WIRING DIAGRAM  
(SIMPLEX SIMILAR)

REVISED	SS
	E-12

REFERENCE SANITARY SEWER DESIGN  
**DUPLEX SEWAGE GRINDER PUMP  
 WIRING DIAGRAM**

APPROVED	DATE:
_____	_____
CHIEF ENGINEER	DESIGN ENGINEER

ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS

NOTES :

1. EACH GRINDER PUMP UNIT IS TO BE SUPPLIED WITH A ONE PIECE WRENCH SIZED TO FIT THE UNIT IT IS TO SERVE.
2. PAD LOCKS KEYED TO THE COUNTY SYSTEM ARE TO BE FURNISHED FOR:
  - A. THE GRINDER PUMP LID.
  - B. THE ALARM SUBPANEL
  - C. THE MAIN DISCONNECT
3. NO MODIFICATIONS FOR ALTERATIONS ARE TO BE MADE TO THE GRINDER PUMP OR CASING WITHOUT WRITTEN APPROVAL OF ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS.
4. BLOCKING OF RESTRAINT JOINT PIPE IS NOT REQUIRED. BLOCKING OF UNRESTRAINT JOINT PIPE SHALL BE AS SHOWN ON THE ANNE ARUNDEL COUNTY, DEPARTMENT OF UTILITIES STANDARD SANITARY SEWER DETAIL S/28 FOR PIPE SIZES 1 1/4" TO 4" AND STANDARD WATER DETAIL W/2 AND W/3 FOR PIPE SIZES 6" AND UP.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER  _____ DESIGN ENGINEER DATE:	<b>REFERENCE SANITARY SEWER DESIGN</b>  <b>GENERAL NOTES</b>	REVISED _____ _____ _____ _____	<b>SS</b>  <b>G-5</b>
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