

ANNE ARUNDEL COUNTY
MARYLAND

DEPARTMENT OF PUBLIC WORKS

CHAPTER V

REFERENCE DRAWINGS
for
LIQUID AND GAS
STORAGE TANKS

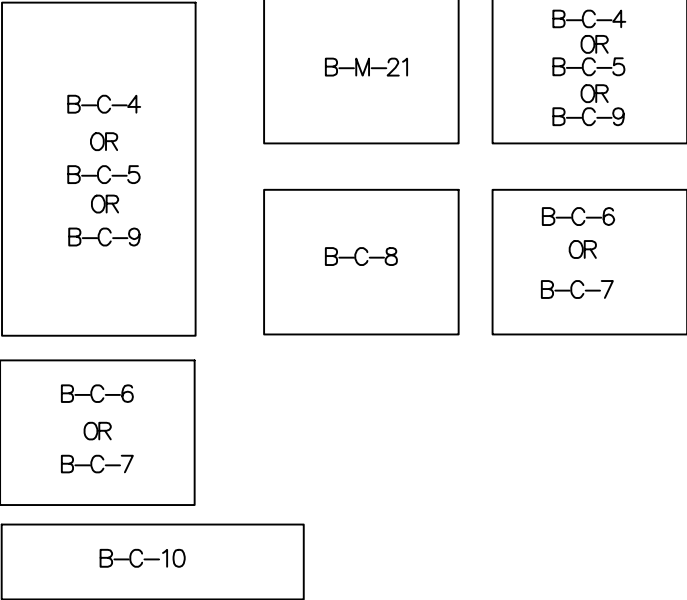
April 2024

**REFERENCE DRAWINGS FOR
LIQUID AND GAS STORAGE TANKS**

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ANNE ARUNDEL
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 DEPARTMENT OF
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APPROVED

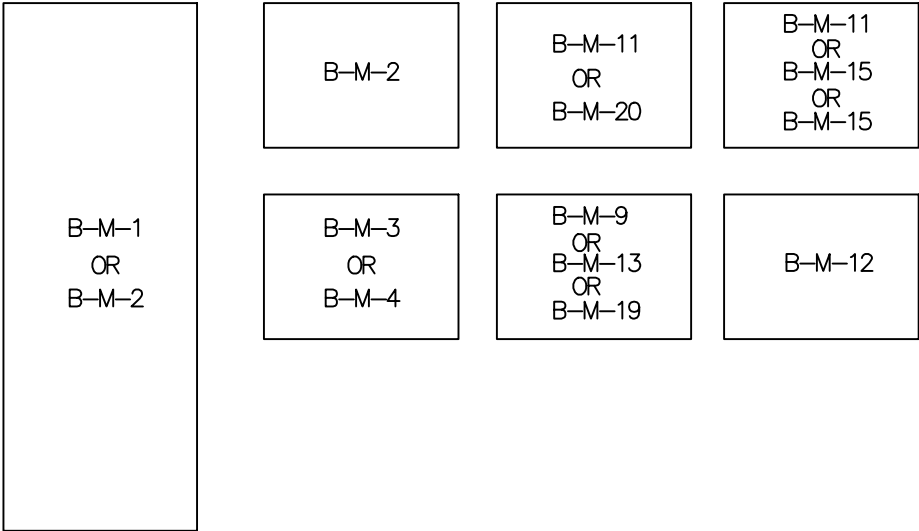
 CHIEF ENGINEER

 DESIGN ENGINEER
 DATE:

LIQUID AND GAS STORAGE TANK
 REFERENCE DRAWING
 CIVIL LAYOUT SHEET

REVISED
 04/2024

B
 C-L1



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED <hr/> CHIEF ENGINEER	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING MECHANICAL LAYOUT SHEET	REVISED 04/2024	<u>B</u> M-L2
	<hr/> DESIGN ENGINEER		<hr/>	
	DATE:		<hr/>	
			<hr/>	

B-C-2

B-C-1

B-M-15

B-M-5

B-M-16

B-M-18

B-M-14

B-M-8

ANNE ARUNDEL
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DEPARTMENT OF
PUBLIC WORKS

APPROVED

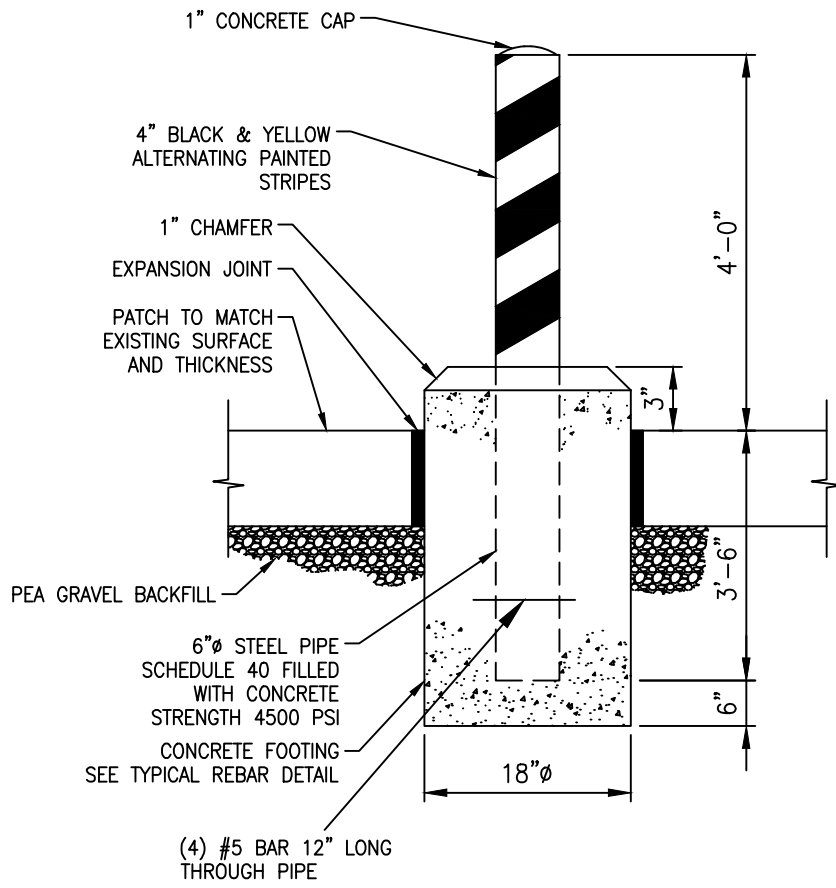
CHIEF ENGINEER

DESIGN ENGINEER
DATE:

LIQUID AND GAS STORAGE TANK
REFERENCE DRAWING
MECHANICAL LAYOUT SHEET

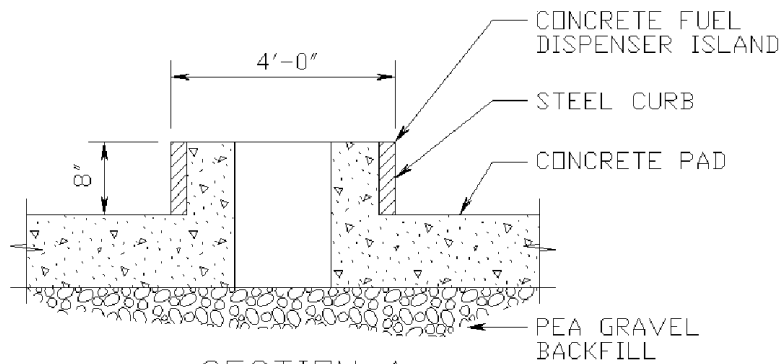
REVISED
04/2024

B
M-L3

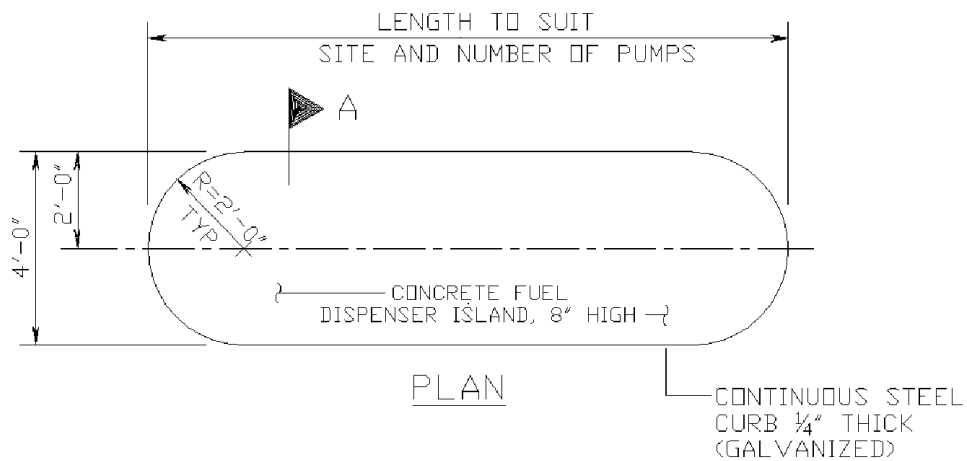


ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING PIPE BOLLARD DETAIL	REVISED	B C-1
	_____		04/2024	
	CHIEF ENGINEER			

	DESIGN ENGINEER			
	DATE:			

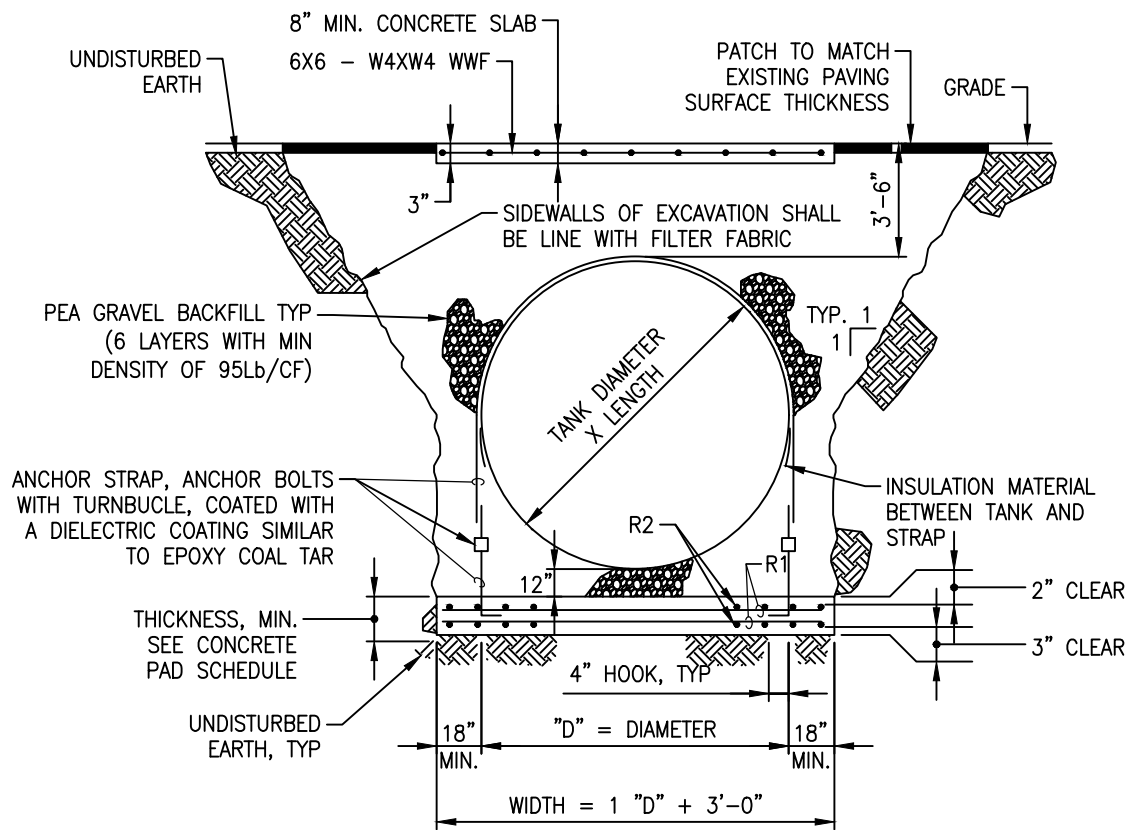


SECTION A



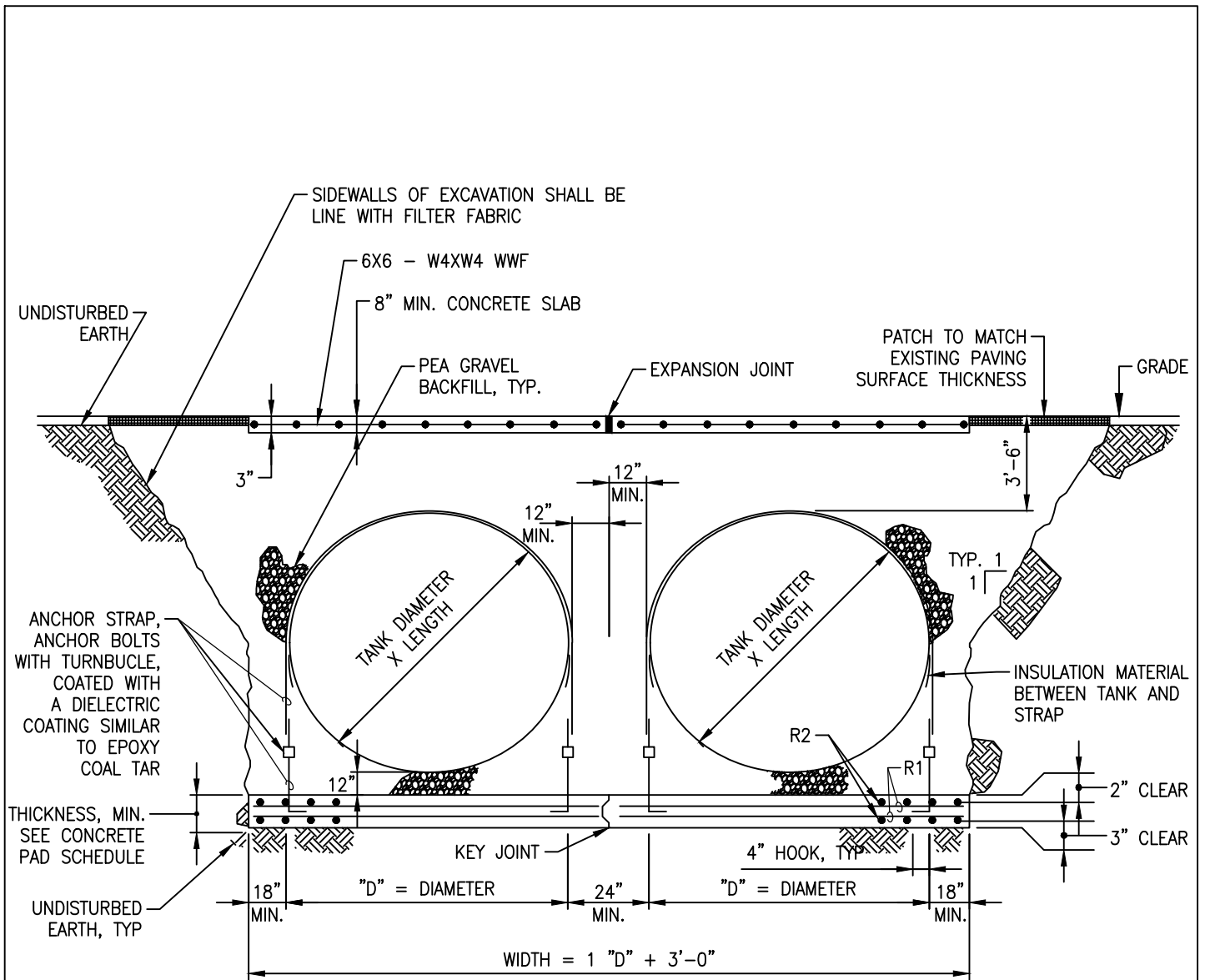
PLAN

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING FUEL DISPENSER ISLAND DETAIL	REVISED	<u>B</u> C-2
	_____		04/2024	
	CHIEF ENGINEER		_____	
	DESIGN ENGINEER		_____	
DATE:	_____			

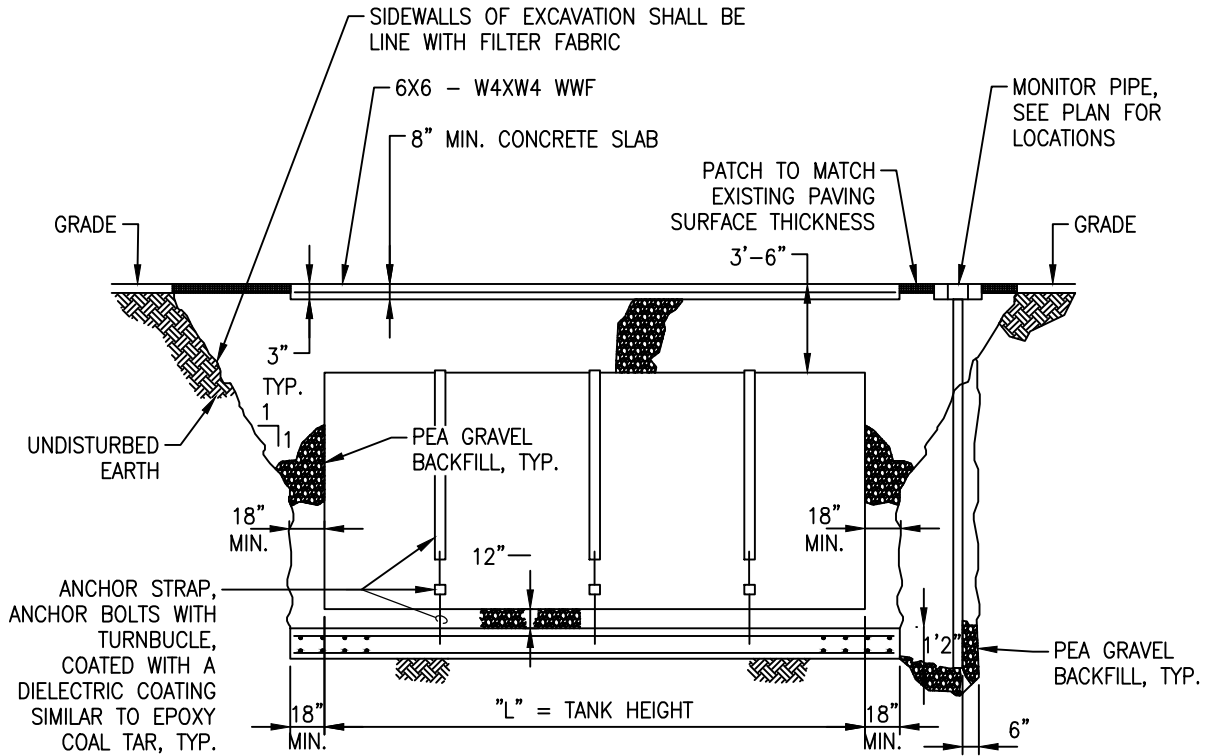


NOTE:
SEE FUEL TANK CONCRETE BALLAST PAD SCHEDULE FOR CONCRETE PAD AND TANK ANCHOR SIZES

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING TANK INSTALLATION WITH CONCRETE PAD	REVISED	B C-4
	_____		04/2024	
	CHIEF ENGINEER		_____	
	_____		_____	
	DESIGN ENGINEER		_____	
DATE:	_____			

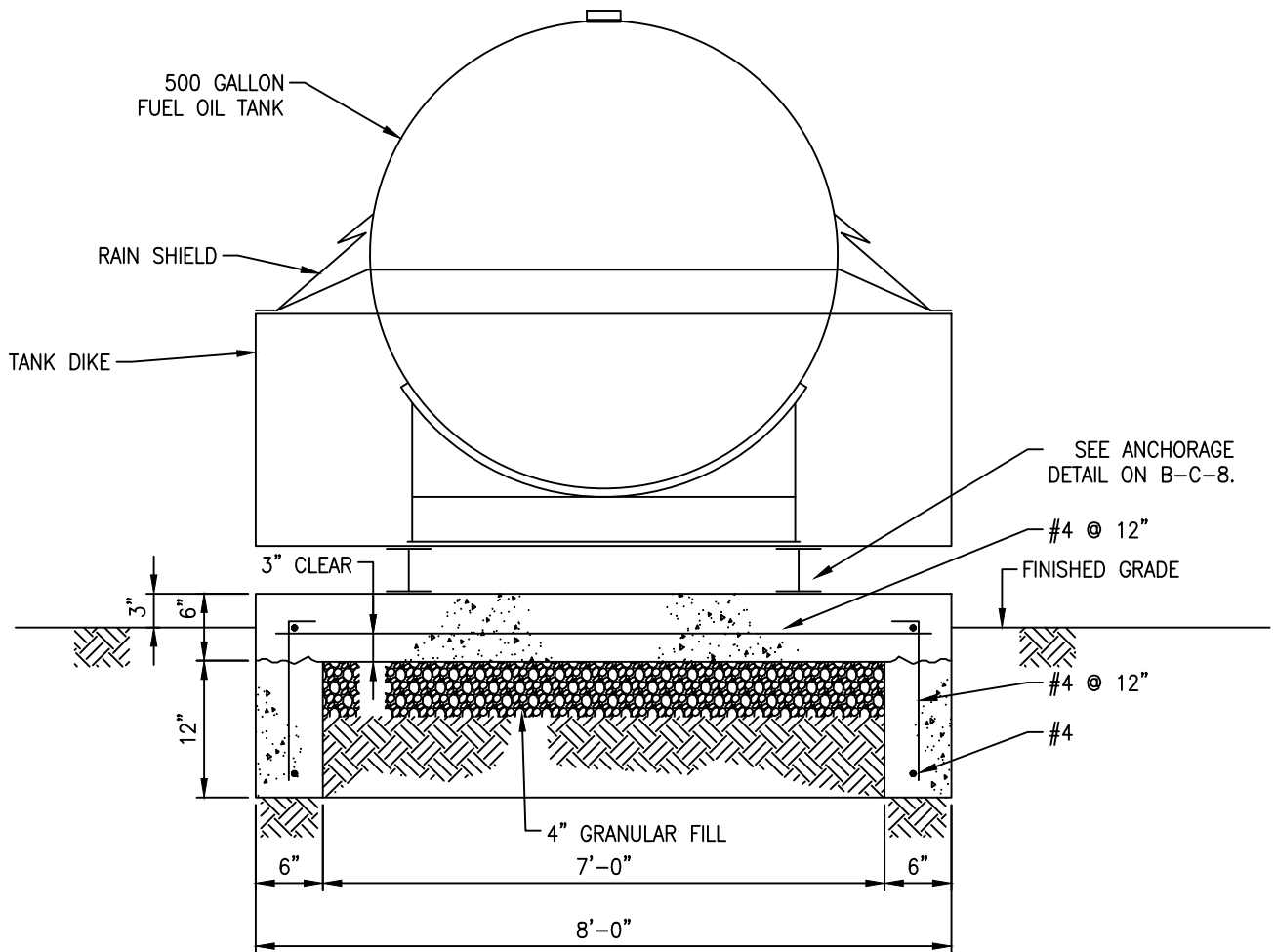


ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING TWIN TANK INSTALLATION WITH CONCRETE PAD	REVISED 04/2024	$\frac{B}{C-5}$
	_____ DESIGN ENGINEER		_____	
	DATE:		_____	
	_____		_____	
	_____		_____	



NOTE:
SEE FUEL TANK CONCRETE BALLAST PAD SCHEDULE FOR CONCRETE PAD AND TANK ANCHOR SIZES.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING TWIN TANK INSTALLATION WITH CONCRETE PAD - SIDE VIEW	REVISED	$\frac{B}{C-6}$
	_____ CHIEF ENGINEER		04/2024	
	_____ DESIGN ENGINEER			
	DATE:			



ANNE ARUNDEL
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 DEPARTMENT OF
 PUBLIC WORKS

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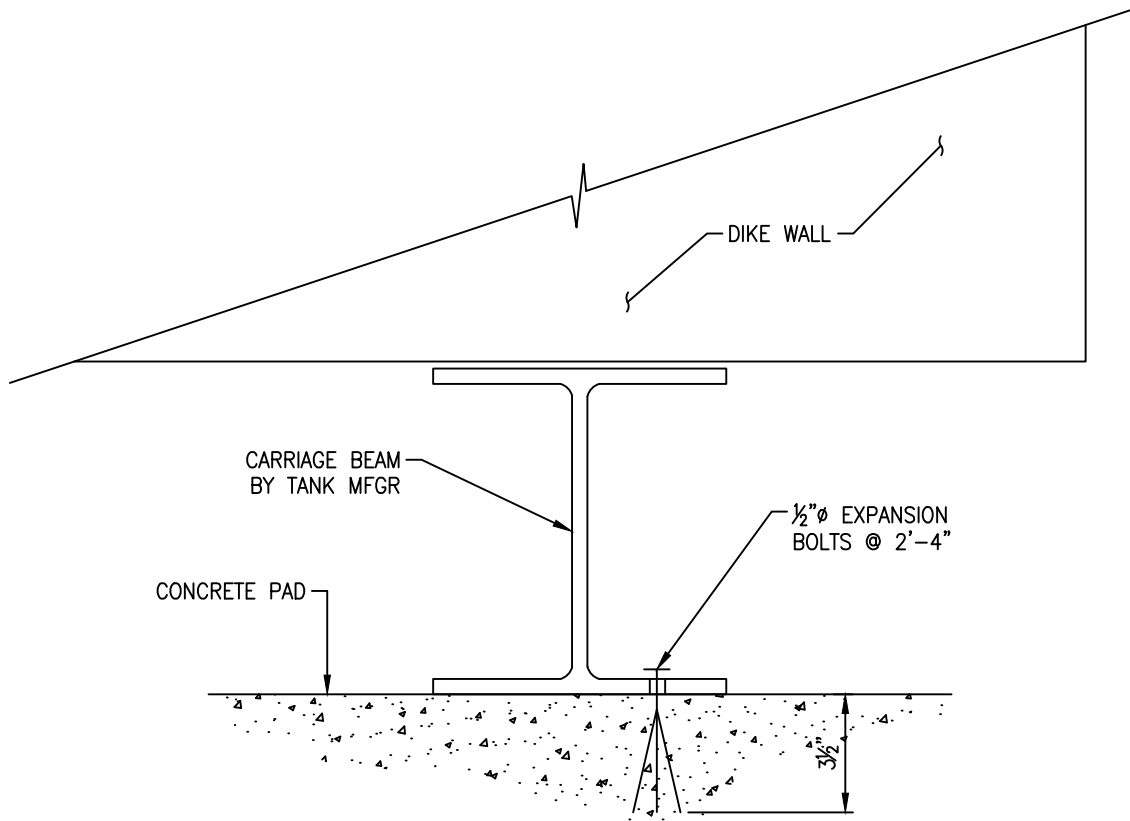
 CHIEF ENGINEER

 DESIGN ENGINEER
 DATE:

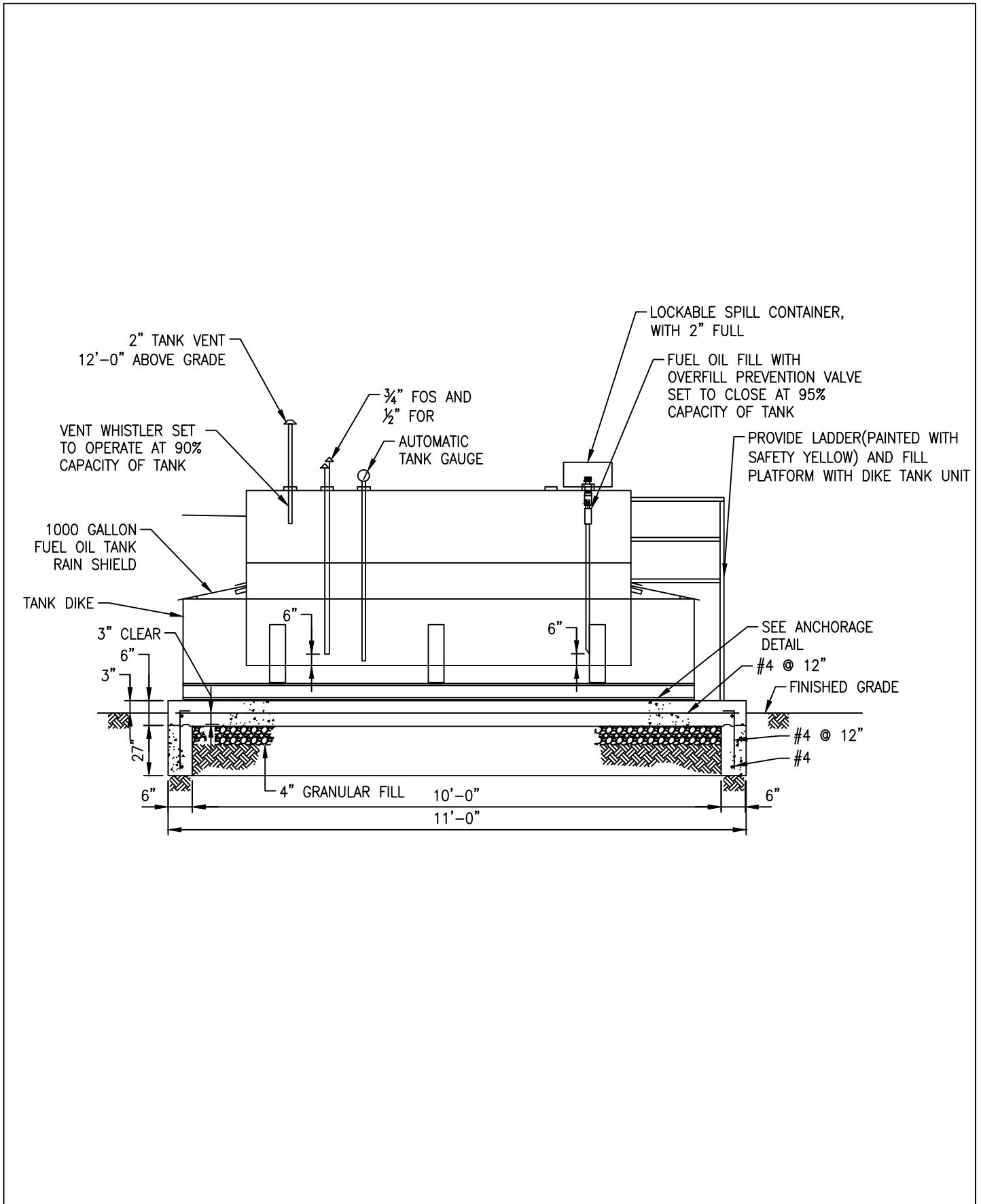
LIQUID AND GAS STORAGE TANK
 REFERENCE DRAWING
 AST DETAIL 1 ABOVE GROUND
 DIKE TANK INSTALLATION
 ON CONCRETE PAD

REVISED
 04/2024

B
 C-7



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING ANCHORAGE DETAIL	REVISED 04/2024	<u>B</u> C-8
	_____ DESIGN ENGINEER		_____	
	DATE:		_____	
	_____		_____	

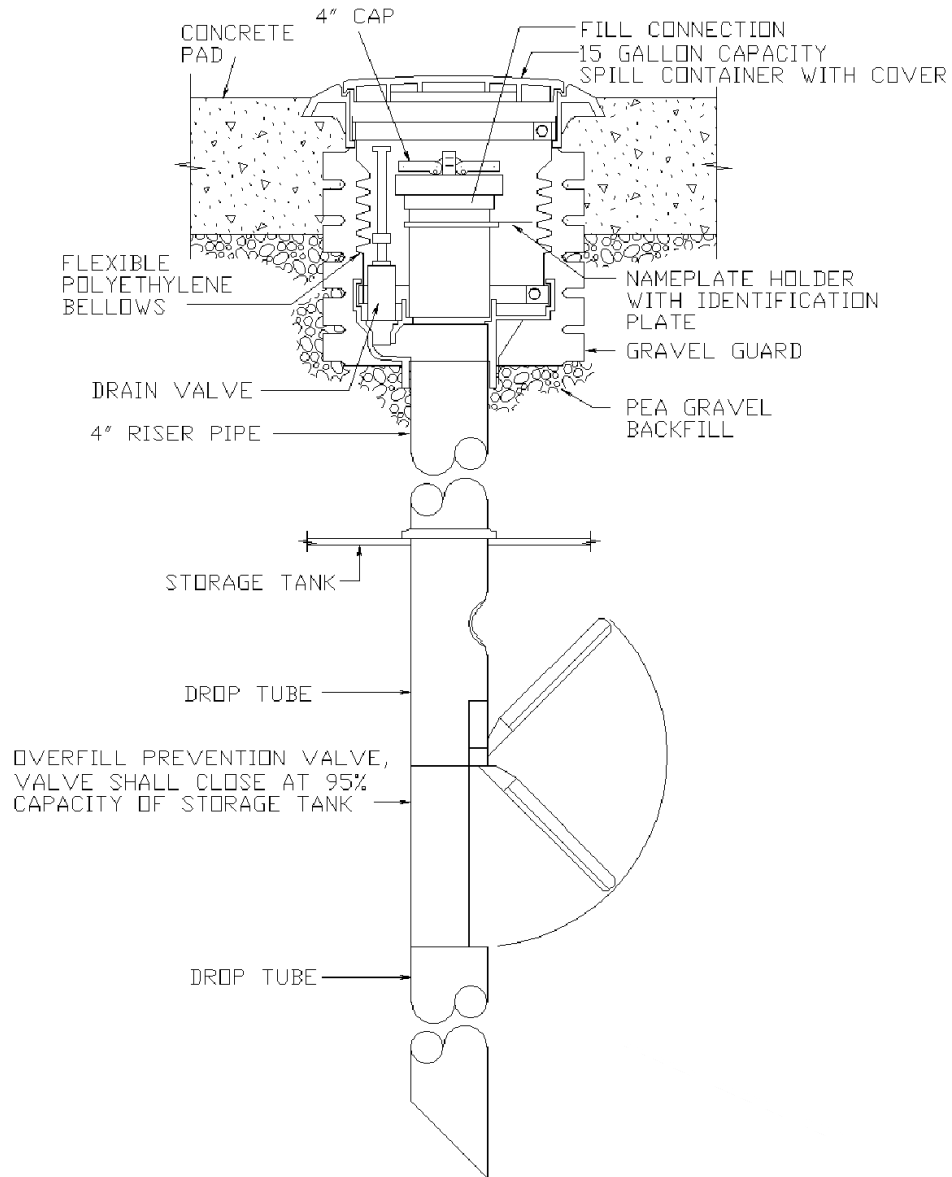


ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING AST DETAIL 2 SIDE VIEW ABOVE GROUND DIKE TANK INSTALLATION ON CONC. PAD	REVISED	B C-9
	_____ CHIEF ENGINEER		04/2024	
	_____ DESIGN ENGINEER			
	DATE:			

FUEL TANK CONCRETE BALLAST PAD SCHEDULE

TANK LOCATION	TANK SIZE (GALLONS)	NOMINAL DIA x LENGTH	CONCRETE PAD				STRAP ANCHOR		
			WIDTH	LENGTH	THICKNESS	REINFORCEMENT	BOLT SIZE	# OF STRAPS	SPACING

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING FUEL TANK CONCRETE BALLAST PAD SCHEDULE	REVISED 04/2024	B C-10
	_____ DESIGN ENGINEER			
	DATE:			



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APPROVED

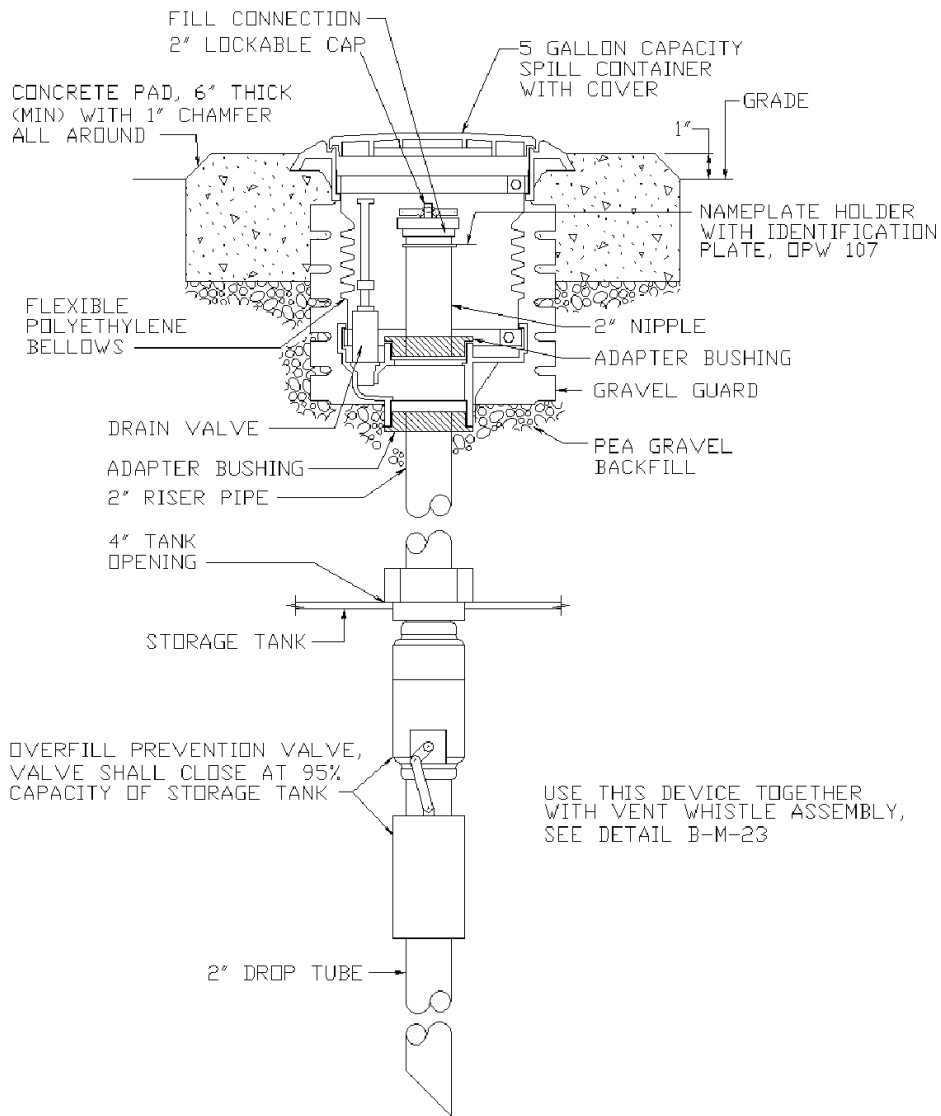
 CHIEF ENGINEER

 DESIGN ENGINEER
 DATE: _____

LIQUID AND GAS STORAGE TANK
 REFERENCE DRAWING
 FILL CONNECTION
 GRAVITY DELIVERY

REVISED
 04/2024

B
 M-1



USE THIS DEVICE TOGETHER WITH VENT WHISTLE ASSEMBLY, SEE DETAIL B-M-23

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

APPROVED

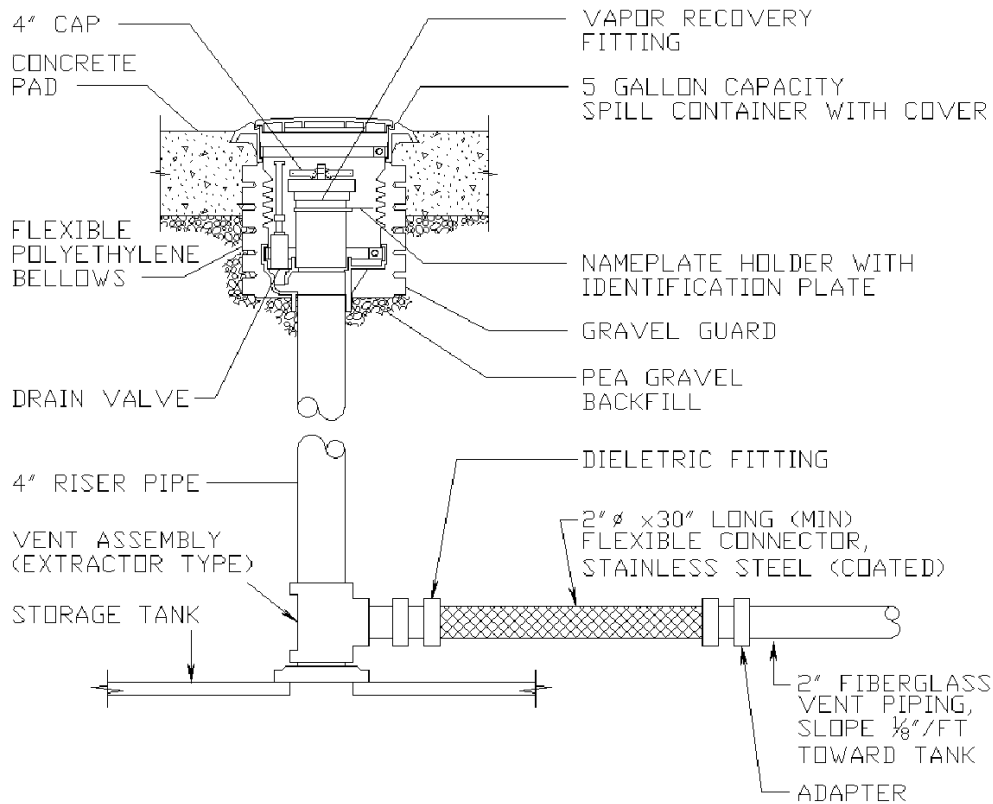
CHIEF ENGINEER

DESIGN ENGINEER
DATE:

LIQUID AND GAS STORAGE TANK
REFERENCE DRAWING
FILL CONNECTION
PUMPED DELIVERY

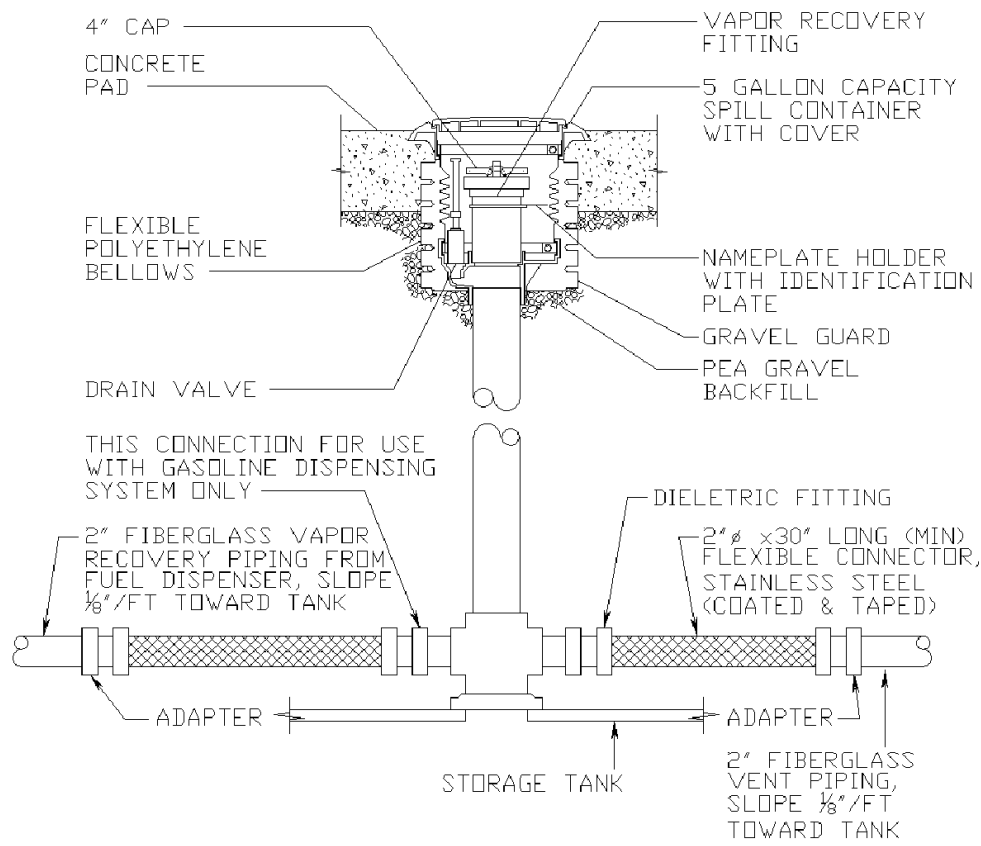
REVISED
04/2024

B
M-2

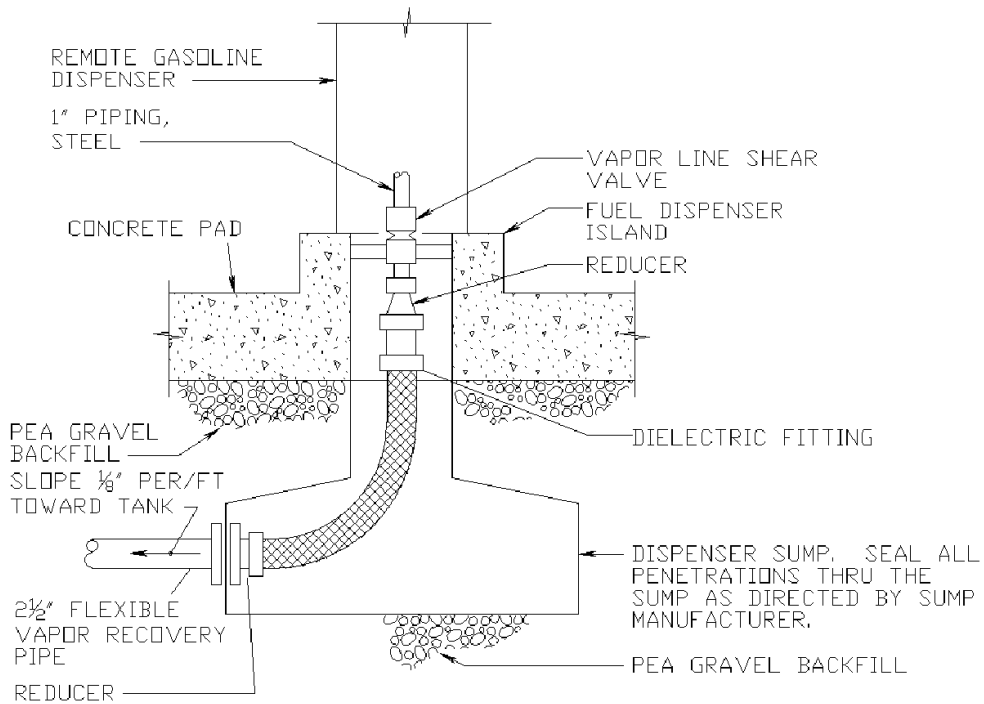


ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING VAPOR RECOVERY CONNECTION DETAIL	REVISED	$\frac{B}{M-3}$
	_____		04/2024	
	CHIEF ENGINEER			

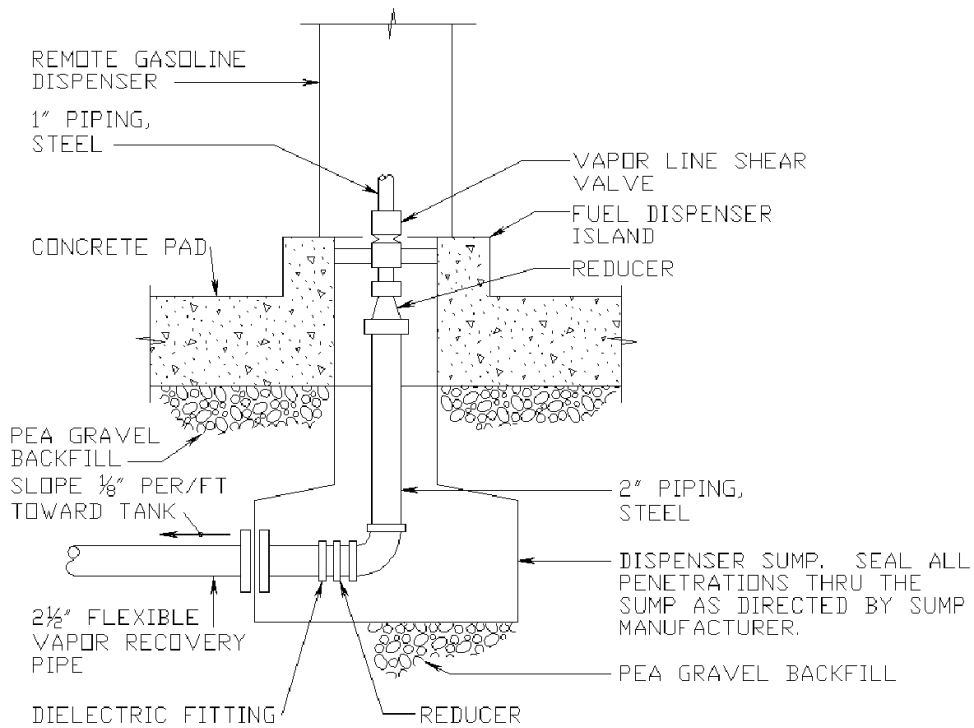
	DESIGN ENGINEER			
DATE:				



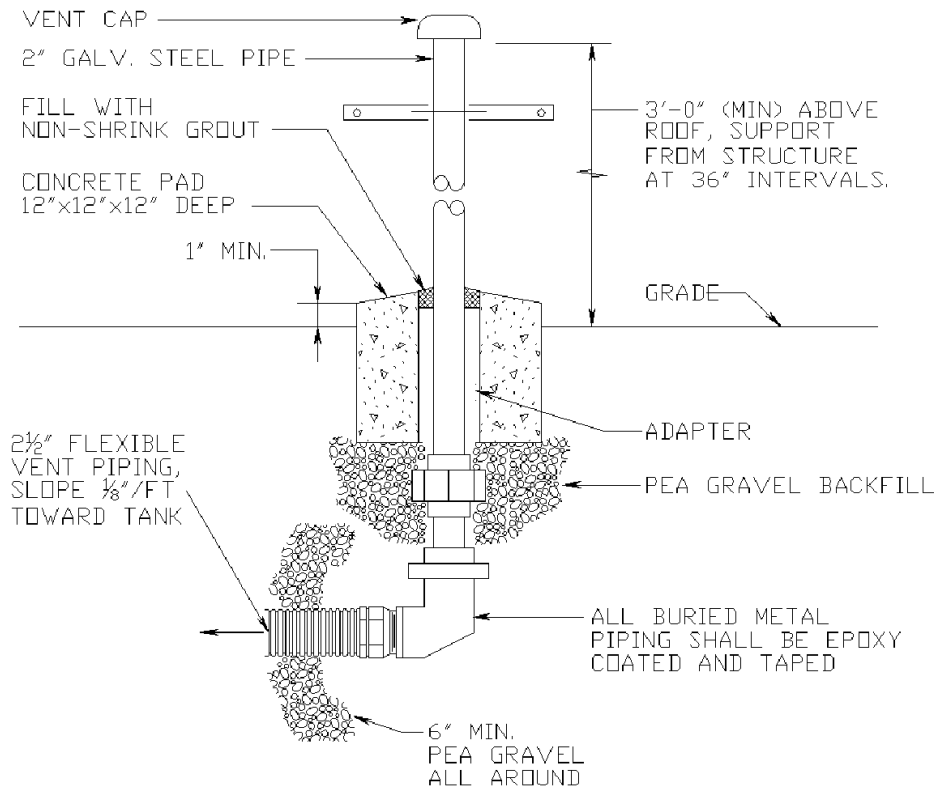
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING VAPOR RECOVERY CONNECTION DETAIL	REVISED 04/2024	$\frac{B}{M-4}$
	_____ DESIGN ENGINEER		_____	
	DATE: _____		_____	
	_____		_____	



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING VAPOR RECOVERY PIPING PHASE 2 DETAIL	REVISED	B M-5
	_____		04/2024	
	CHIEF ENGINEER		_____	
	DESIGN ENGINEER		_____	
	DATE:			

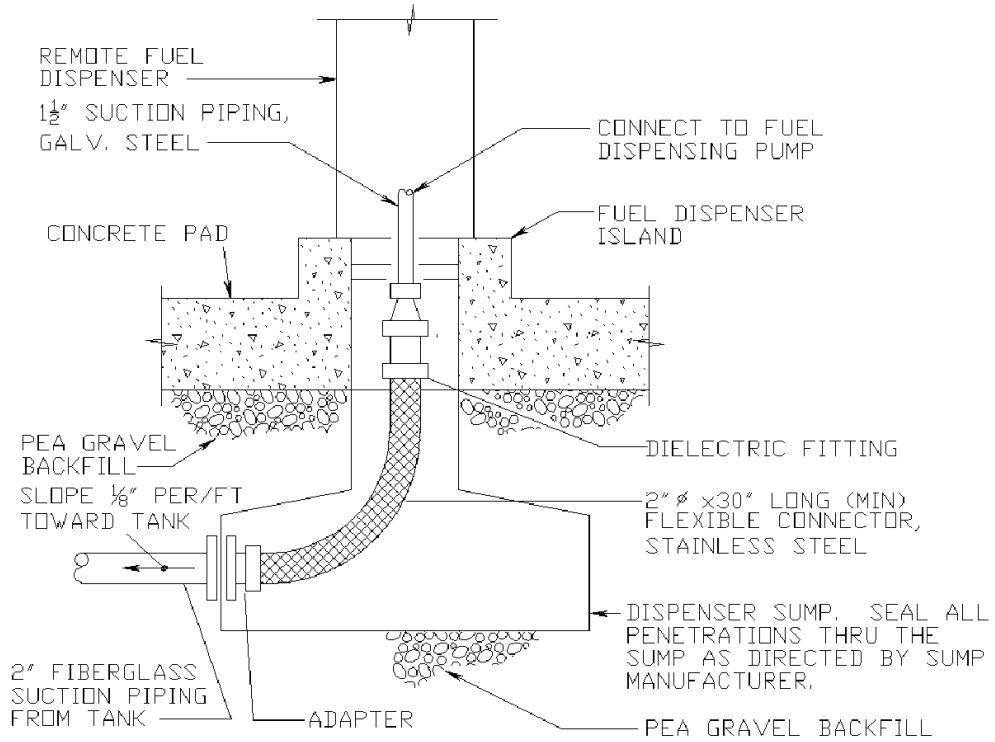


ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING VAPOR RECOVERY PIPING PHASE 2 DETAIL	REVISED	B M-5A
	_____		04/2024	
	CHIEF ENGINEER			
	DESIGN ENGINEER			
	DATE:			

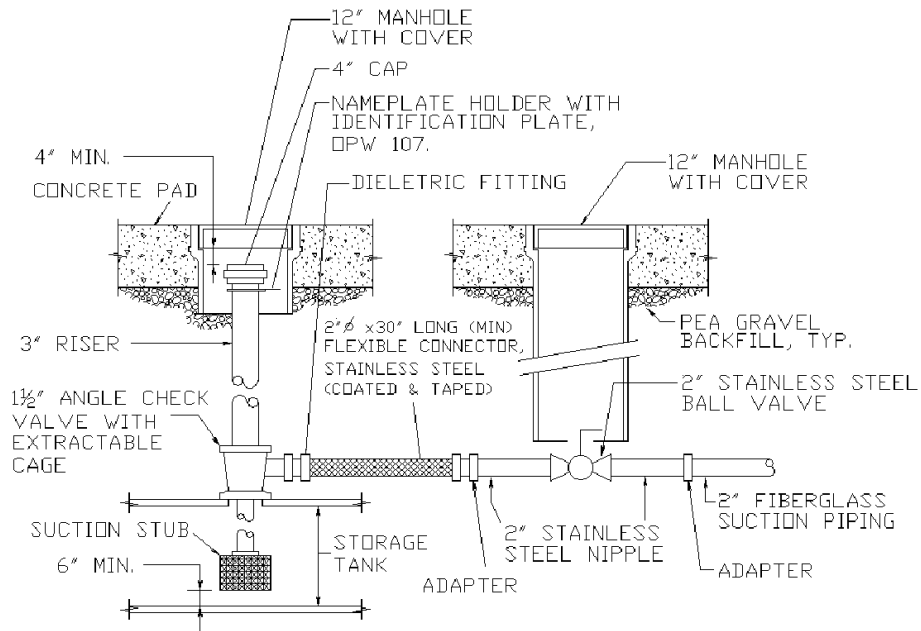


ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING VENT PIPING DETAIL	REVISED	B M-7
	_____		04/2024	
	CHIEF ENGINEER			

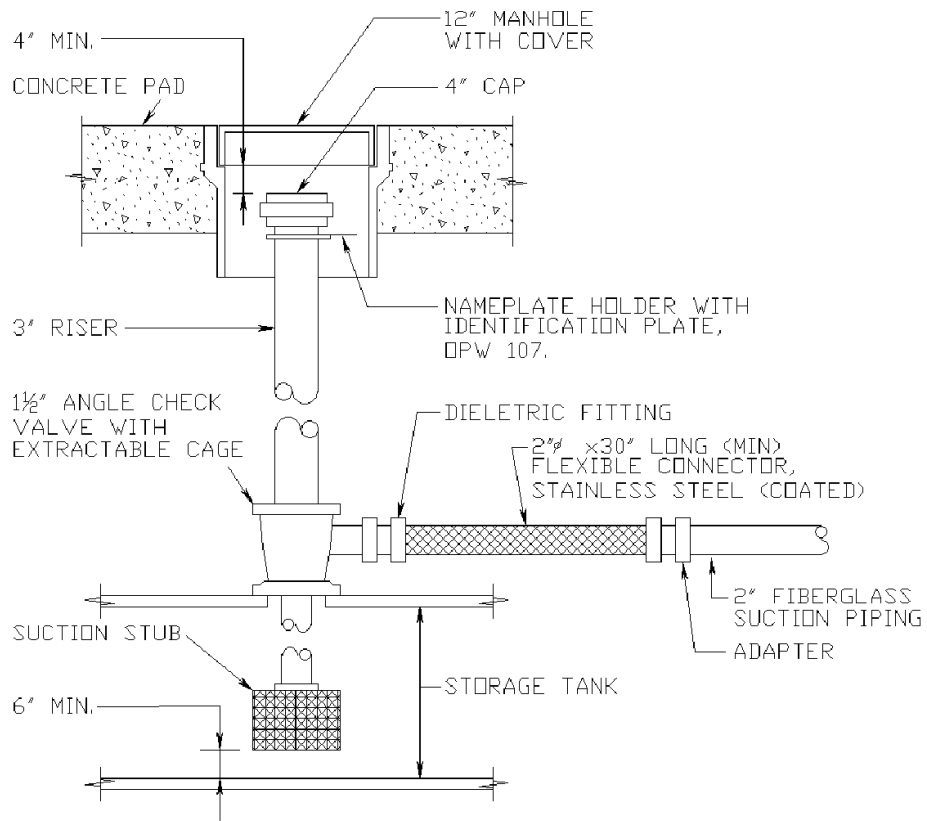
	DESIGN ENGINEER			
	DATE:			



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING SUCTION PIPING DETAIL	REVISED	B M-8
	_____		04/2024	
	CHIEF ENGINEER		_____	
	DESIGN ENGINEER		_____	
DATE:	_____			



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED _____ CHIEF ENGINEER	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING SUCTION PIPING CONNECTION AT TANK DETAIL(GASOLINE ONLY)	REVISED 04/2024	$\frac{B}{M-9}$
	_____ DESIGN ENGINEER		_____	
	DATE:		_____	
	_____		_____	



ANNE ARUNDEL
COUNTY
DEPARTMENT OF
PUBLIC WORKS

APPROVED

CHIEF ENGINEER

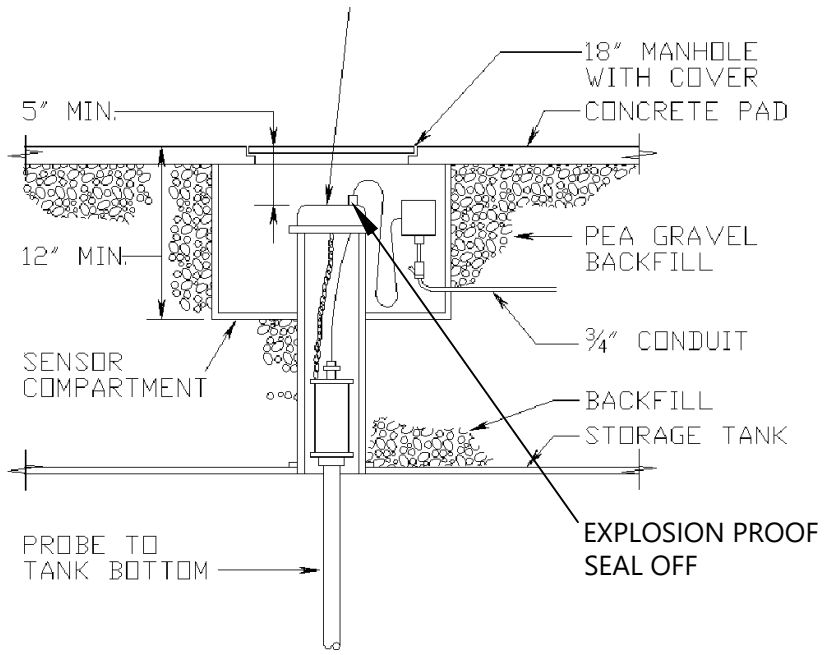
DESIGN ENGINEER
DATE:

LIQUID AND GAS STORAGE TANK
REFERENCE DRAWING
SUCTION PIPING CONNECTION
AT TANK DETAIL

REVISED
04/2024

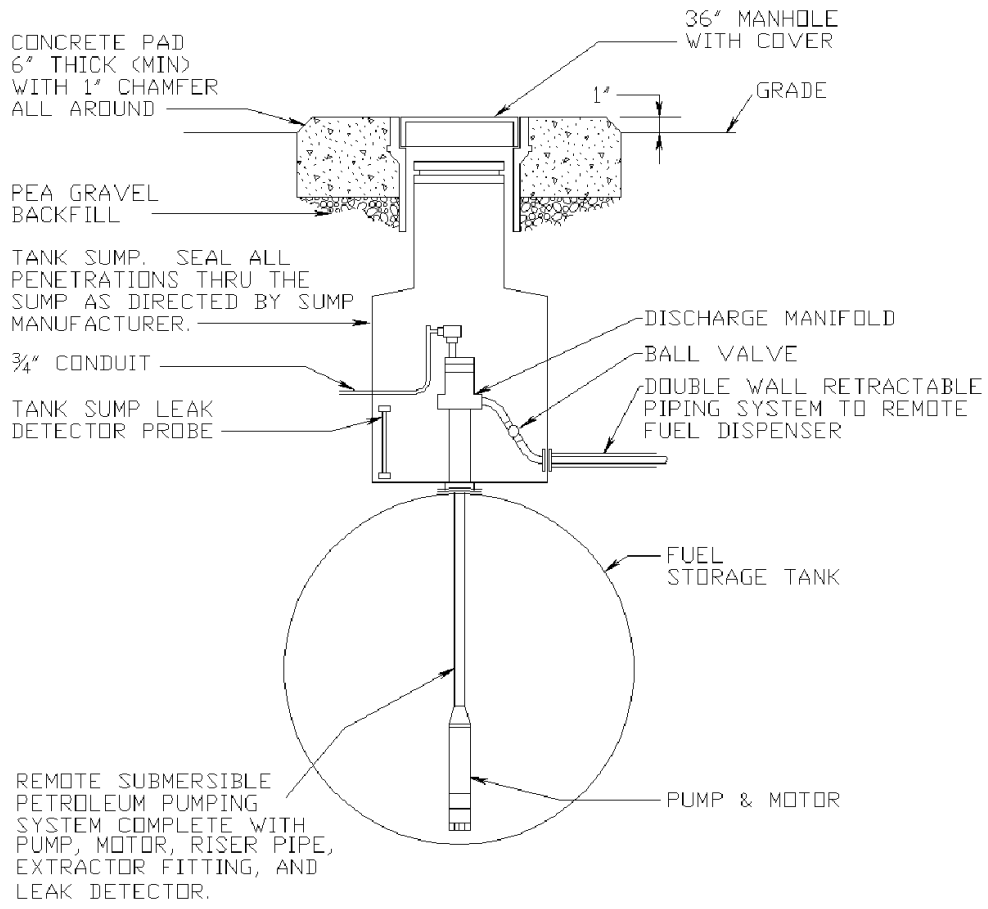
B
M-11

TANK LEVEL SENSOR, VEEDER-ROOT MODEL NUMBER TO BE PROVIDED BY THE COUNTY, MANHOLE, RISER PIPE, SENSOR COMPARTMENT, AND CONDUIT SHALL BE INSTALLED IN ACCORDANCE WITH CONTRACT DOCUMENTS.



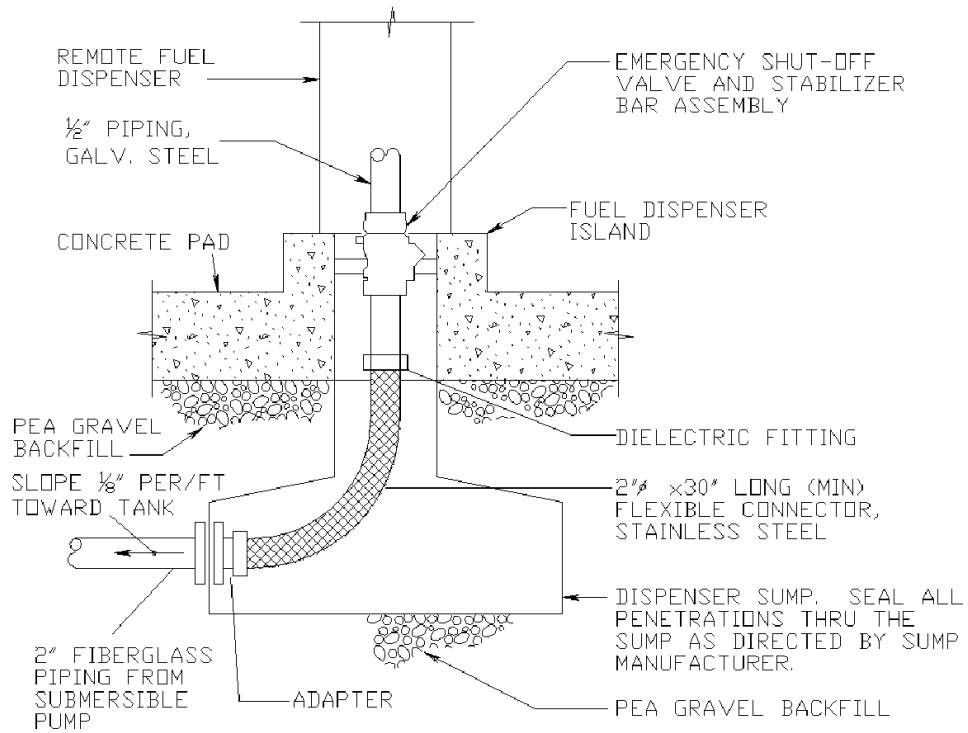
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING ELECTRONIC LEAK DETECTOR WELL DETAIL	REVISED	B M-12
	_____		04/2024	
	CHIEF ENGINEER			

	DESIGN ENGINEER			
	DATE:			



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING REMOTE SUBMERSIBLE PUMP DETAIL	REVISED	B M-13
	_____		04/2024	
	CHIEF ENGINEER			

	DESIGN ENGINEER			
	DATE:			



ANNE ARUNDEL
 COUNTY
 DEPARTMENT OF
 PUBLIC WORKS

APPROVED

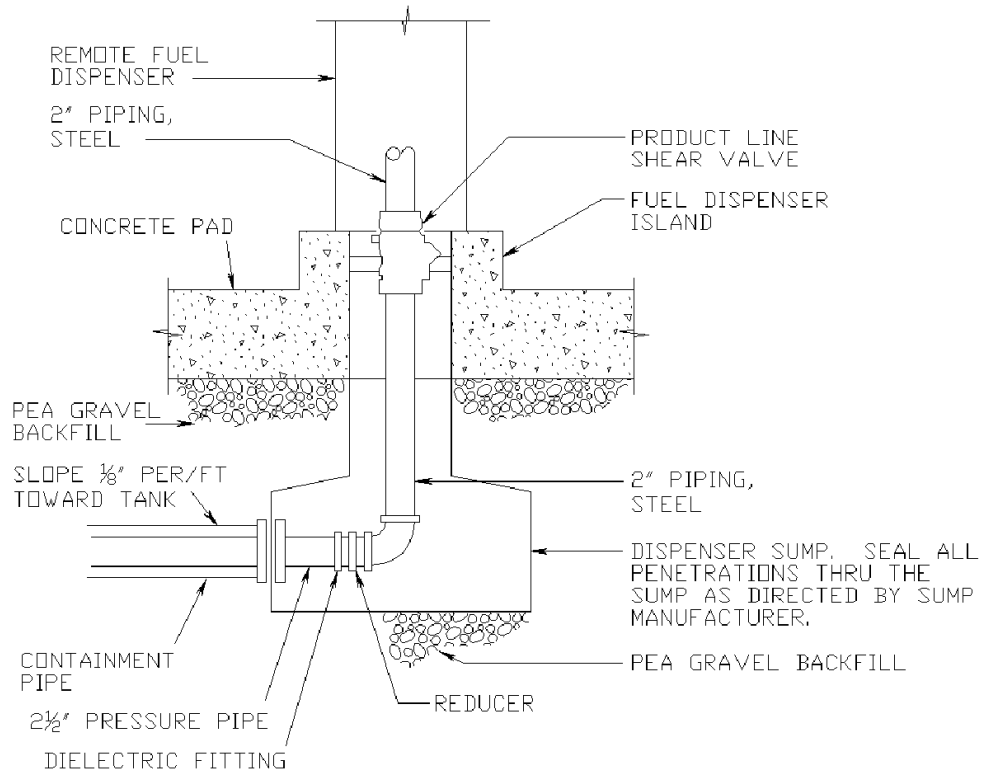
 CHIEF ENGINEER

 DESIGN ENGINEER
 DATE: _____

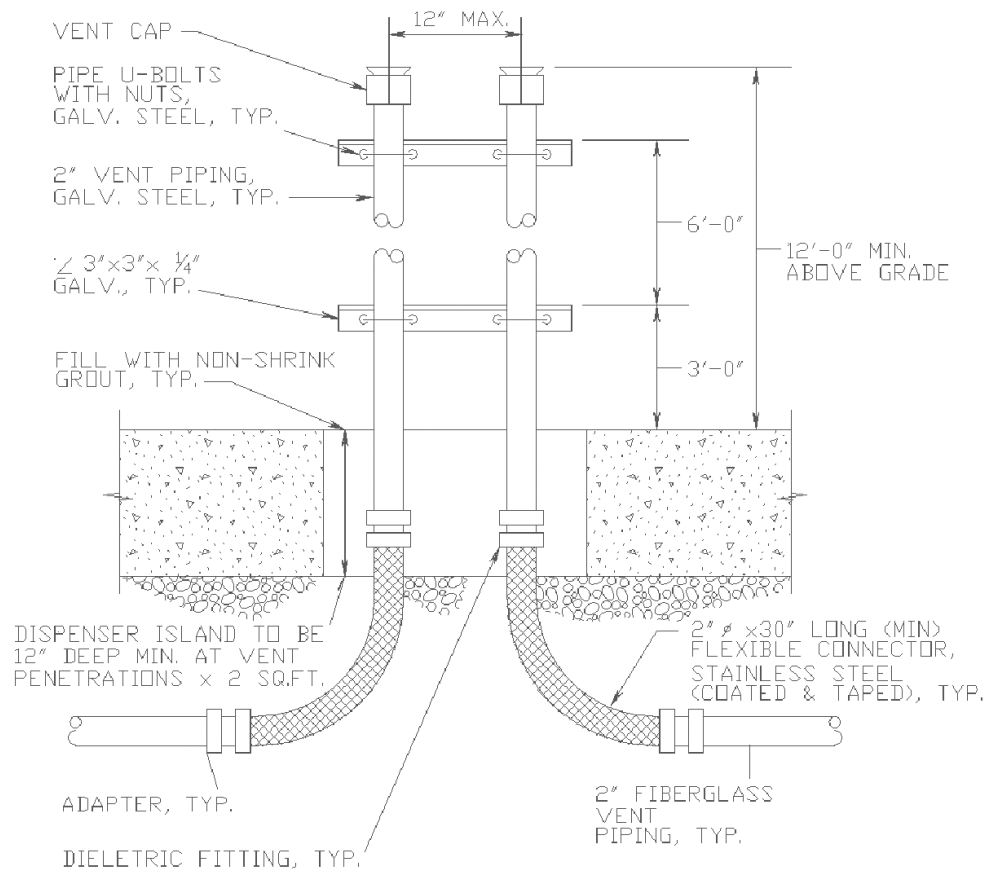
LIQUID AND GAS STORAGE TANK
 REFERENCE DRAWING
 EMERGENCY SHUT-OFF VALVE
 DETAIL

REVISED
 04/2024

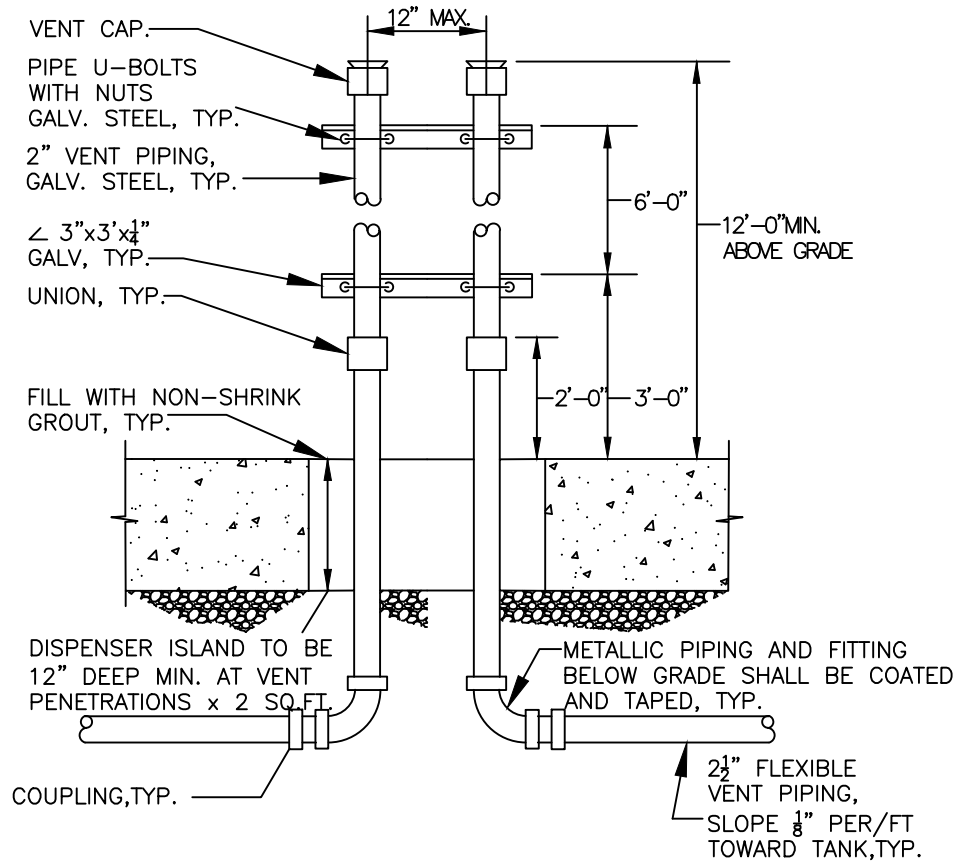
B
 M-14



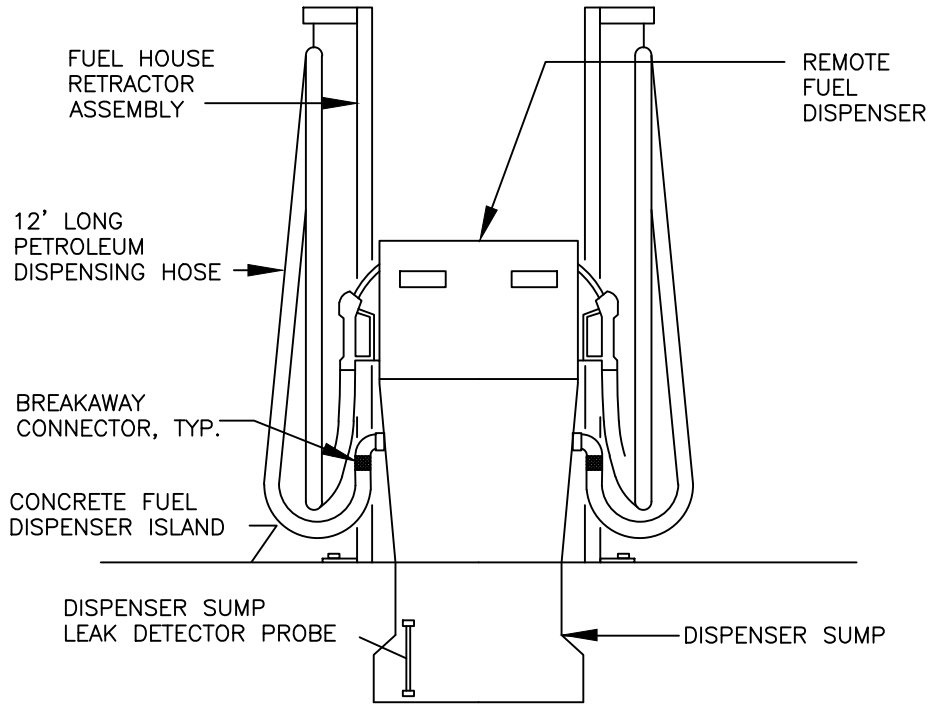
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING EMERGENCY SHUTOFF VALVE DETAIL	REVISED	B M-14A
	_____		04/2024	
	CHIEF ENGINEER		_____	
	DESIGN ENGINEER		_____	
DATE:	_____			



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING ISLAND DUAL VENT PENETRATION	REVISED	B M-15
	_____		04/2024	
	CHIEF ENGINEER			
	DESIGN ENGINEER			
DATE:				



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING ISLAND DUAL VENTURE PENETRATION DETAIL	REVISED	B M-15A
	_____ CHIEF ENGINEER		04/2024	
	_____ DESIGN ENGINEER			
	DATE:			



NOTES:

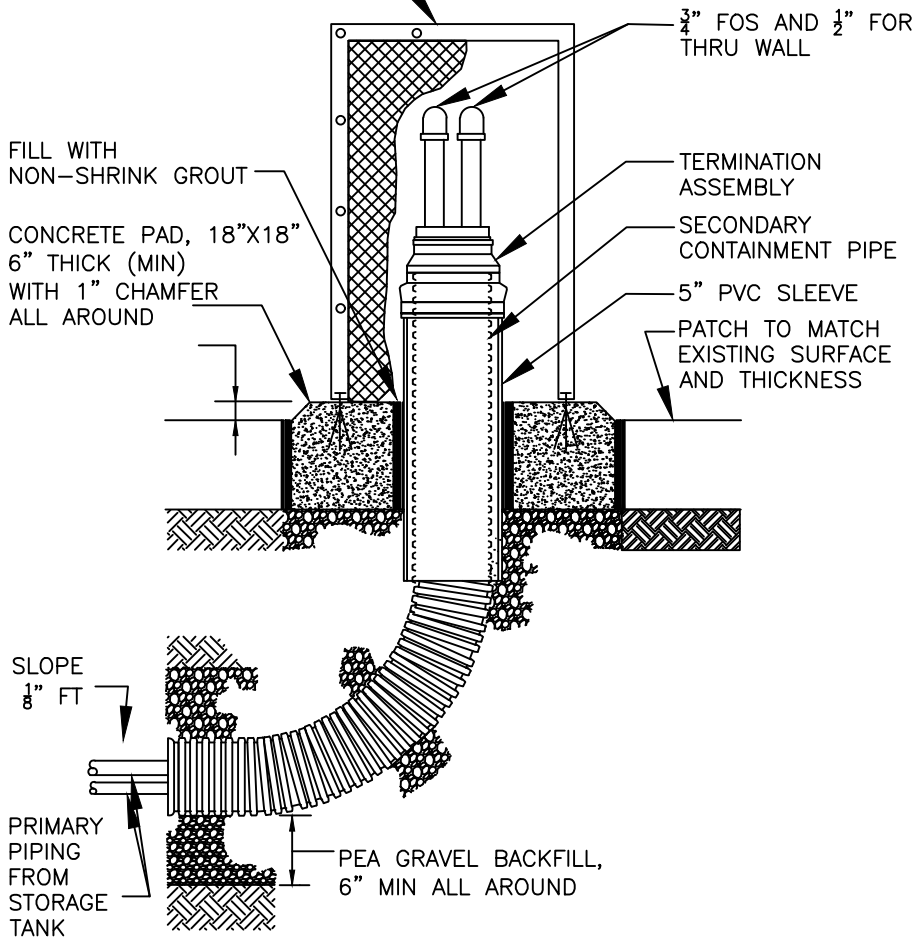
DIESEL FUEL DISPENSER SHOWN. GASOLINE DISPENSER SHALL HAVE ALL NECESSARY EQUIPMENT FOR STAGE II VAPOR RECOVERY OPERATION.

REMOTE FUEL DISPENSER WITH HOSE RETRACTOR ASSEMBLY
DETAIL

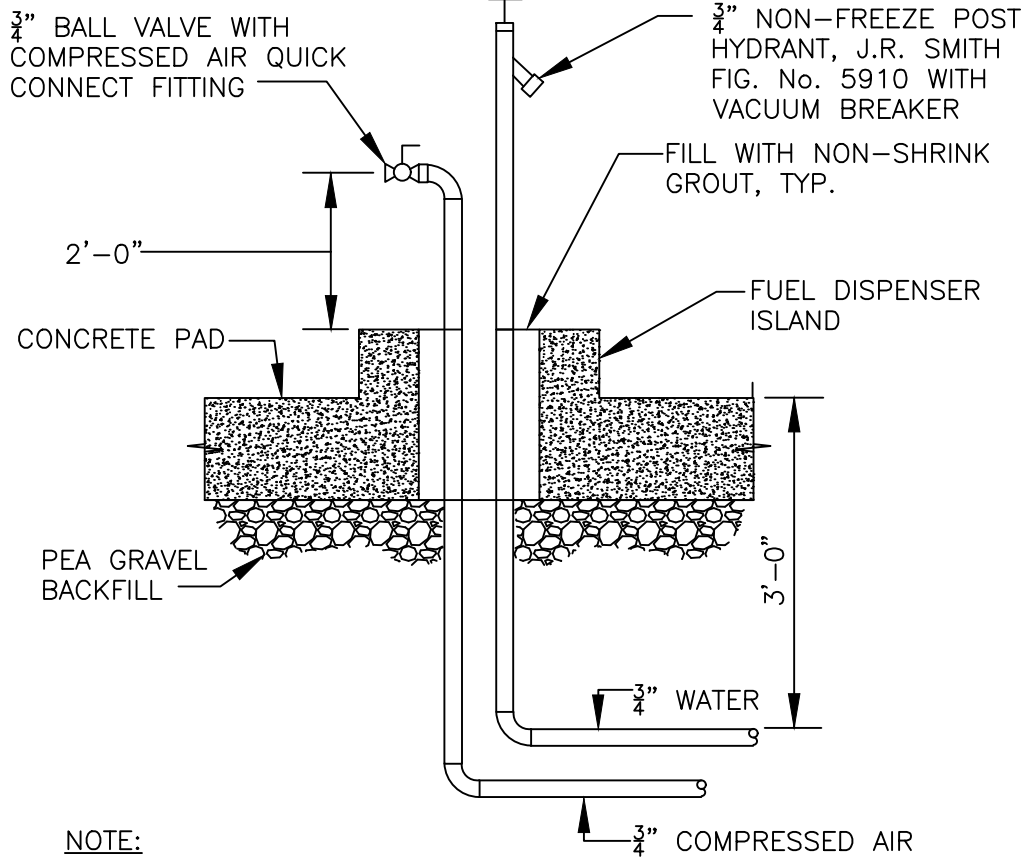
NOT TO SCALE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING REMOTE FUEL DISPENSER ASSEMBLY DETAIL	REVISED	B M-16
	_____ CHIEF ENGINEER		04/2024	
	_____ DESIGN ENGINEER			
	DATE:			

PROVIDE EXPANDED METAL ENCLOSURE AROUND PIPING ASSEMBLY, ANCHOR SECURELY TO BUILDING AND CONCRETE PAD WITH $\frac{1}{4}$ " x $2\frac{1}{2}$ " EXPANSION BOLTS.

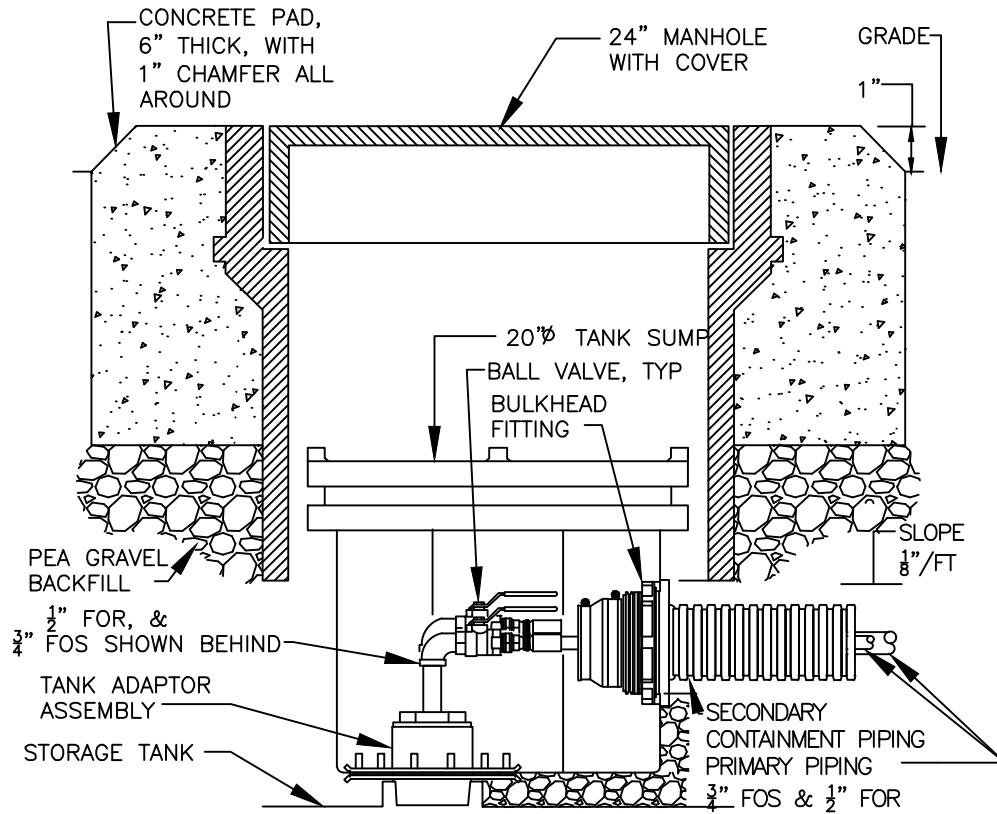


ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING PIPING ENTRANCE AT BUILDING DETAIL	REVISED	B M-17
	_____ CHIEF ENGINEER		04/2024	
	_____ DESIGN ENGINEER			
	DATE:			

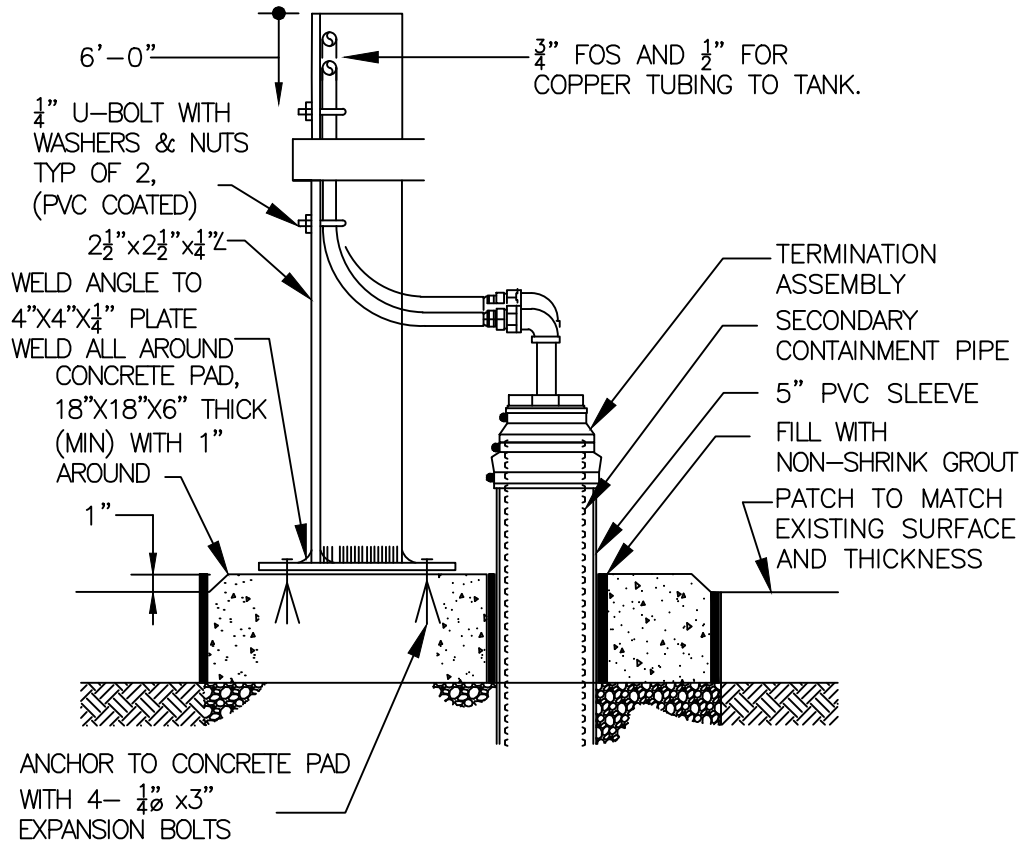


NOTE:
 $\frac{3}{4}$ " COPPER PIPE, TYPE M WITH FITTINGS

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING AIR & WATER AT FUEL DISPENSER ISLAND DETAIL	REVISED	B M-18
	_____ CHIEF ENGINEER		04/2024	
	_____ DESIGN ENGINEER			
	DATE:			



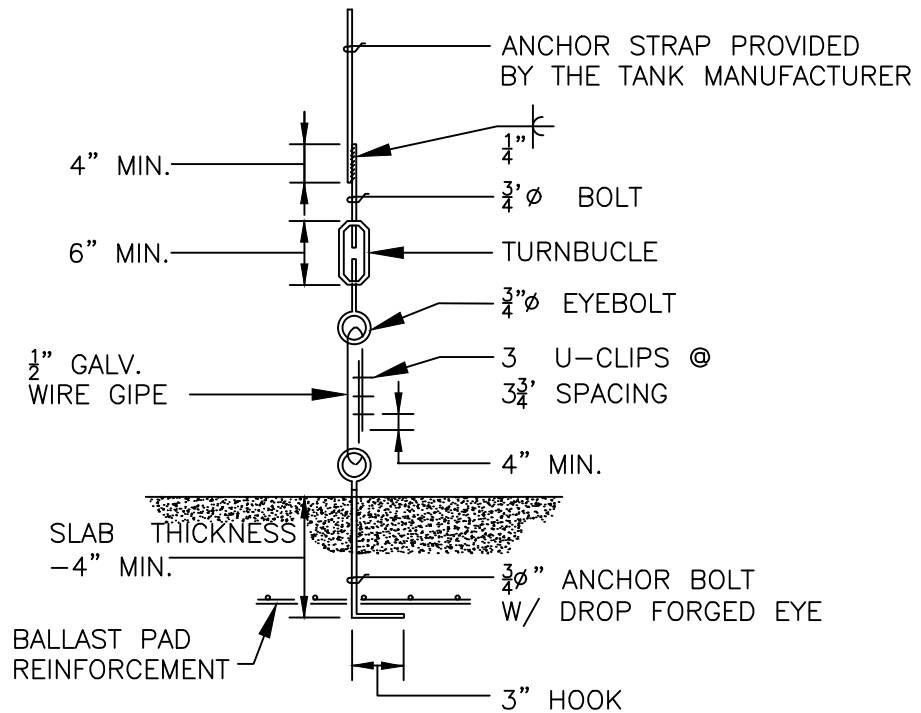
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING FOS & FOR PIPING AT U/G TANK DETAIL	REVISED	B M-19
	_____ CHIEF ENGINEER		04/2024	
	_____ DESIGN ENGINEER			
	DATE:			



PIPING TO UNDERGROUND
DETAIL

NOT TO SCALE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING PIPING TO UNDERGROUND DETAIL	REVISED	B M-20
	CHIEF ENGINEER		04/2024	
	DESIGN ENGINEER			
	DATE:			



TYPICAL STRAP ANCHOR DETAIL

NOT TO SCALE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING TYPICAL STRAP ANCHOR DETAIL	REVISED	B <hr/> M-21
	CHIEF ENGINEER		04/2024	
	DESIGN ENGINEER			
	DATE:			

12" ROUND MONITOR
MANHOLE ASSEMBLY

CONCRETE PAD, 2'-4"X2'-4"X6" THICK,
PAD SHALL BE FLUSH WITH AND AT THE
SAME HEIGHT AS ADJACENT CONCRETE PAD.

CONCRETE PAD

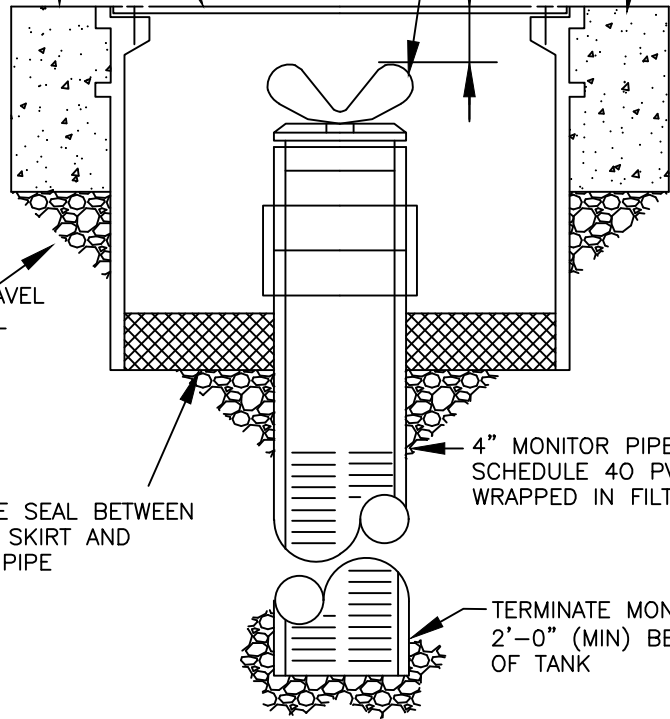
4" LOCKABLE CAP 4" MIN

PEA GRAVEL
BACKFILL

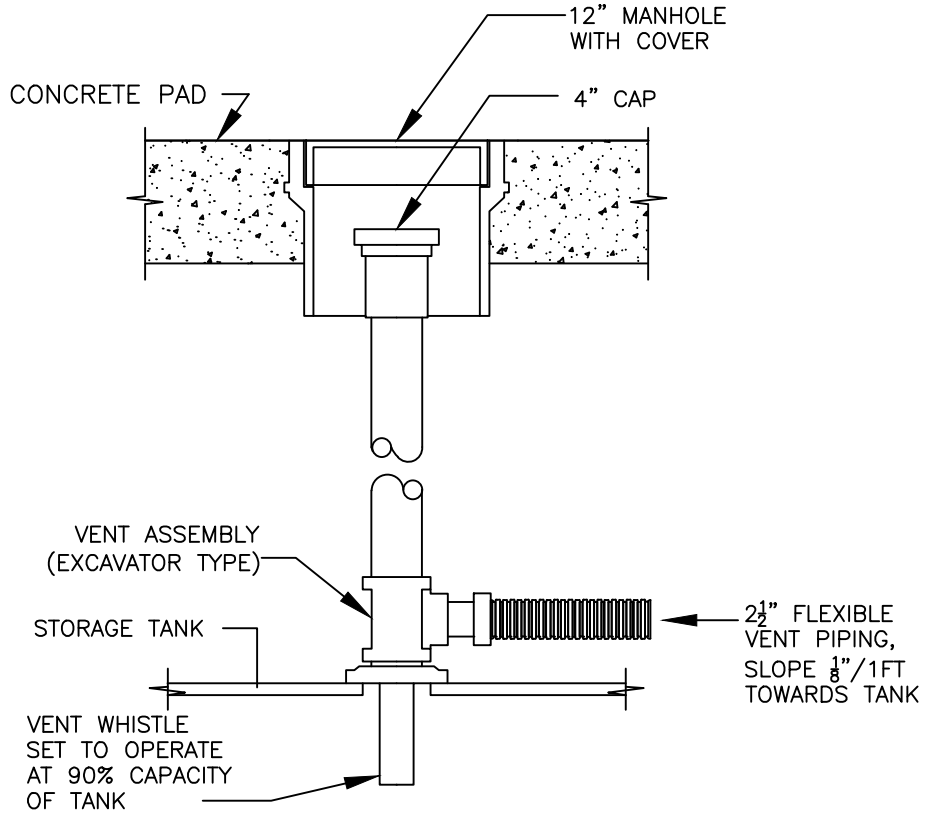
BENTONITE SEAL BETWEEN
MANHOLE SKIRT AND
MONITOR PIPE

4" MONITOR PIPE
SCHEDULE 40 PVC-SLOTTED,
WRAPPED IN FILTER FABRIC.

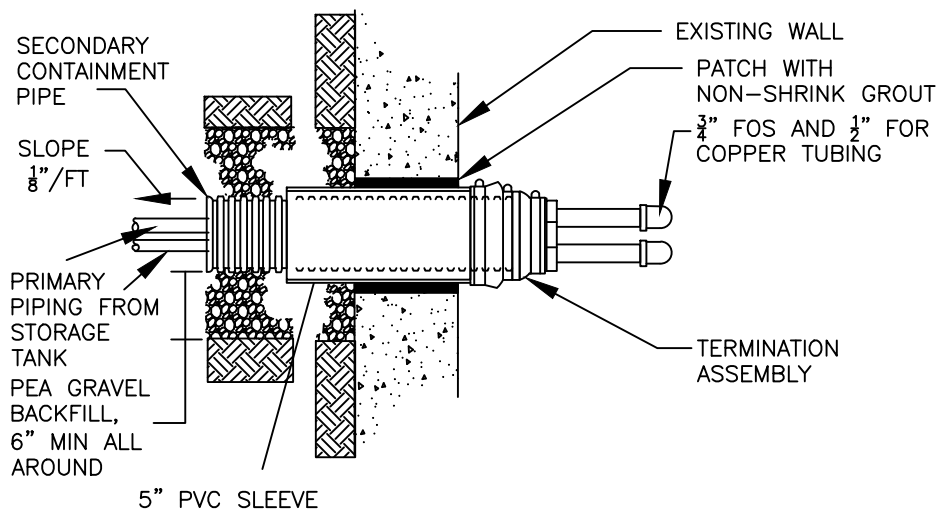
TERMINATE MONITOR PIPE
2'-0" (MIN) BELOW BOTTOM
OF TANK



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING MONITORING PIPE	REVISED	B M-22
	_____ CHIEF ENGINEER		04/2024	
	_____ DESIGN ENGINEER			
	DATE:			



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING VENT CONNECT WITH WHISTLE	REVISED	B M-23
	_____ CHIEF ENGINEER		04/2024	
	_____ DESIGN ENGINEER			
	DATE:			



ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS	APPROVED	LIQUID AND GAS STORAGE TANK REFERENCE DRAWING PIPING TERMINATION ASSEMBLY DETAIL	REVISED	B M-24
	_____ CHIEF ENGINEER		04/2024	
	_____ DESIGN ENGINEER			
	DATE:			