

VILLAGE OF VERONA

WASTEWATER TREATMENT PLANT IMPROVEMENTS 2024



PT XX = PRIMARY TANK XX

VILLAGE OF VERONA

VILLAGE OFFICIALS

PRESIDENT:	DENNIS FINCH
CLERK/TREASURER:	COLLEEN LAWRENCE
TRUSTEES:	KEITH JOHNSON
	ERIK LEAKE
	LARRY TURNER
	LARRY PANTI
	ROBERT SCHAFFNIT III
	CHRIS STAPLETON

INDEX OF SHEETS

1	COVER SHEET & LOCATION MAP
2	FILTER BED & RECIRCULATION DETAILS
3	SAND GRADATION INFORMATION
4	DETAILS

10/4/24
Date



Don W. Birby
signature
PROFESSIONAL DESIGN FIRM
LICENSE NO. 184-001717

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Drawing Name: C:\Users\j\Documents\Projects\Verona Wastewater System Improvements\CAD\001-COVER.dwg
Last Modified: Friday, September 27, 2024 8:48:15 AM
Printed On: Friday, October 04, 2024 7:14:28 AM
By: Gregg Hansen



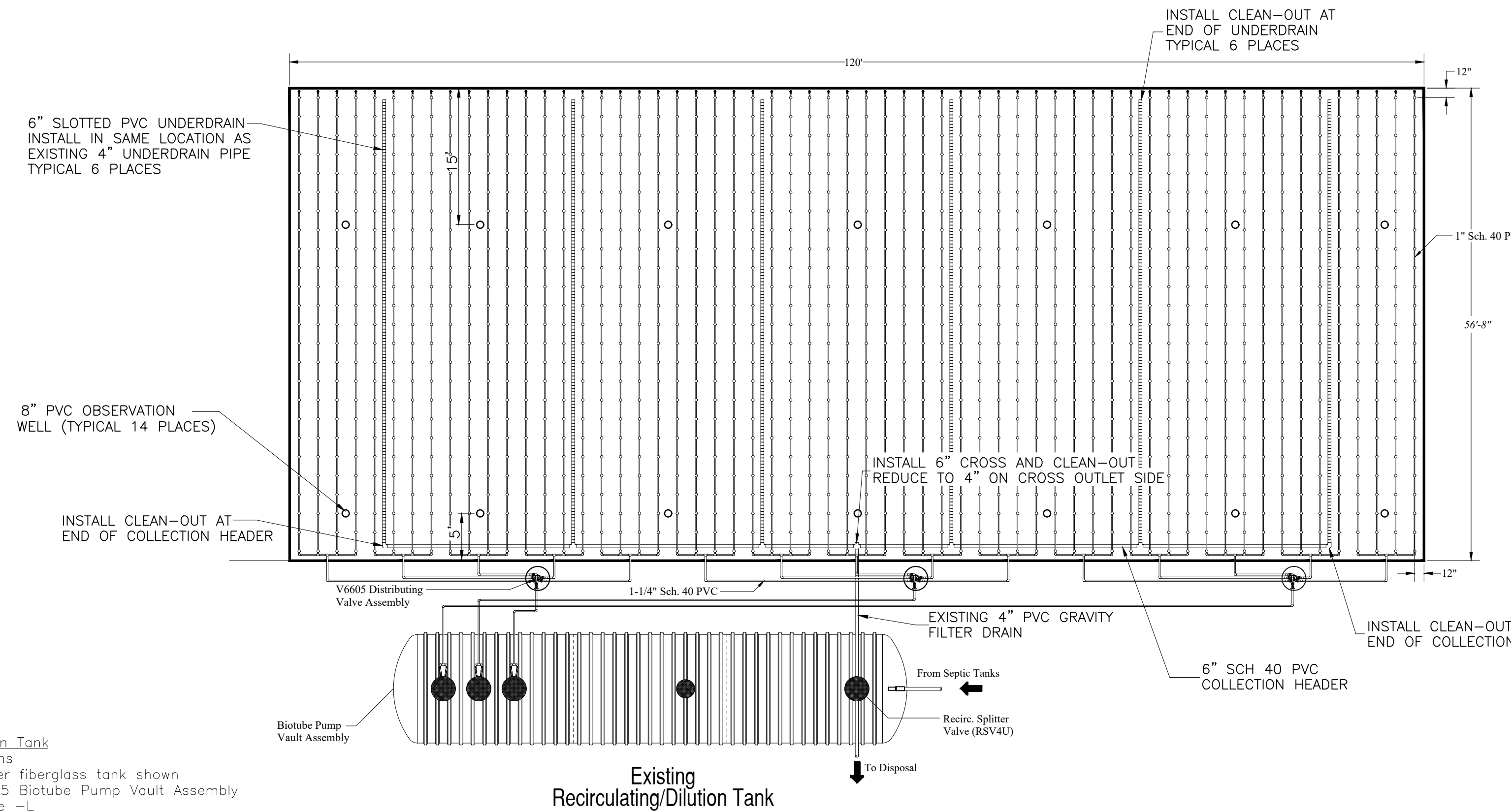
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OTTAWA MORTON
ILLINOIS

DRAWN BY: FDAP	REVISIONS			
CHECKED BY: CHECKED	LEVEL	BY	DATE	DESCRIPTION
DATE: 08/2024				

BIDDING

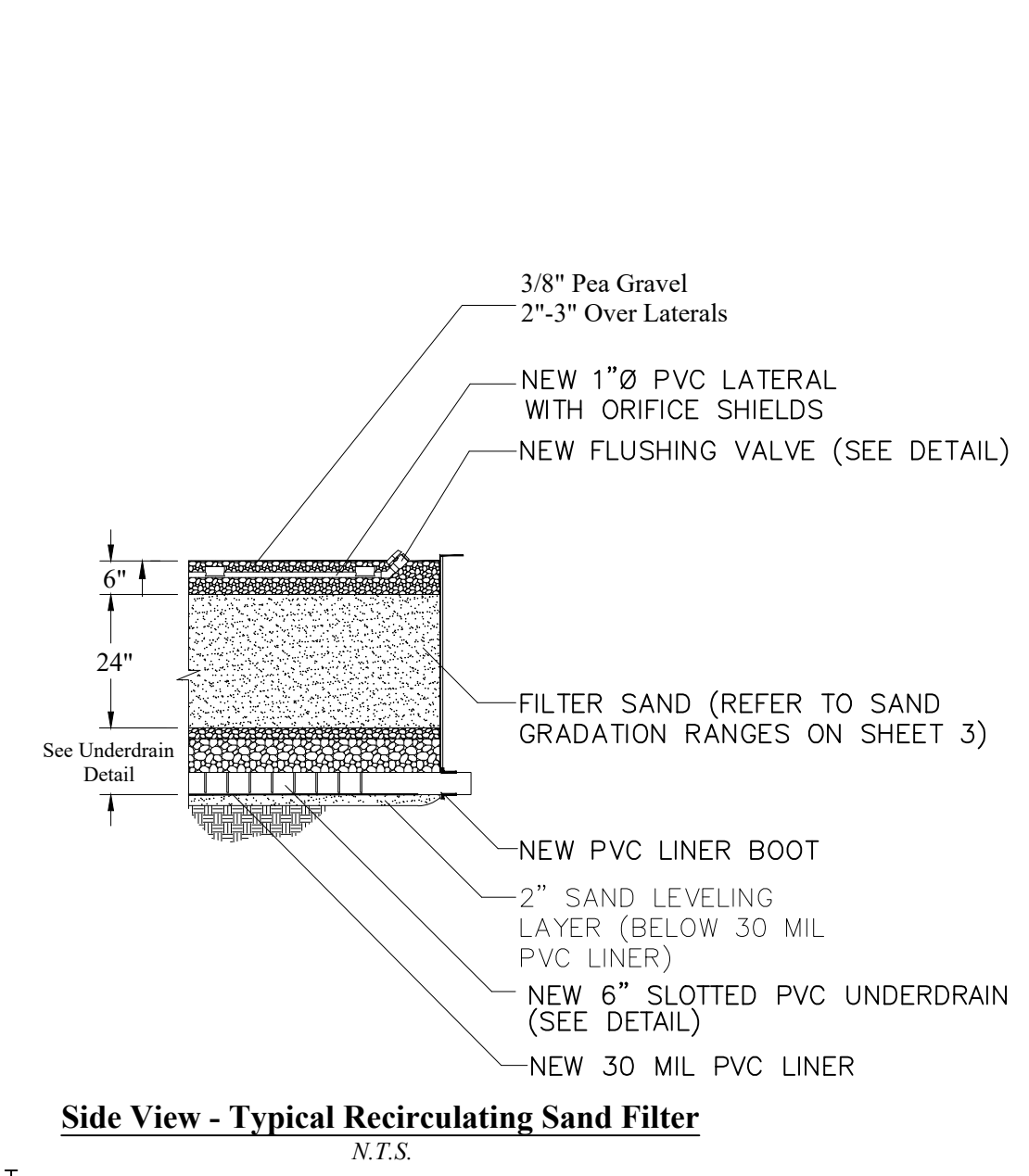
CURRENT AS OF: 10/4/24	
SCALE: AS NOTED	SHEET 1
FILE NO.: 5943.01 Y-	OF 4

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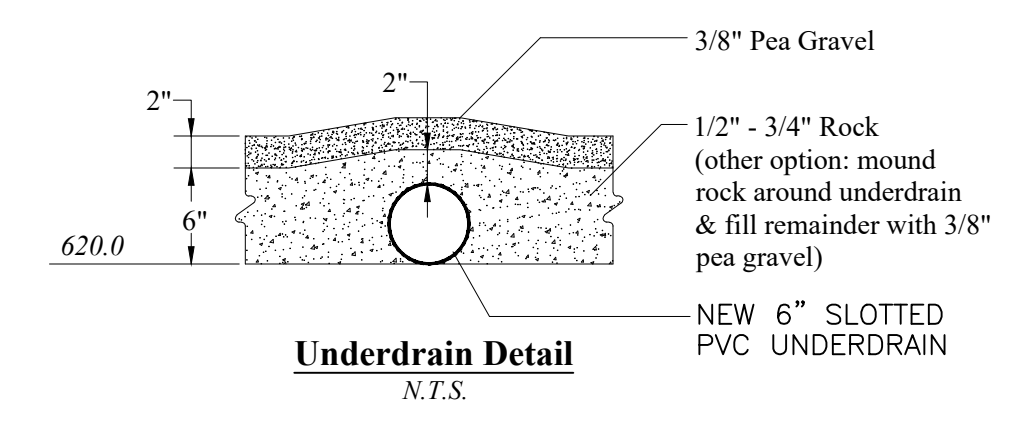


- 1: Recirculation Tank
 - 40,000 gallons
 - 10' diameter fiberglass tank shown
 - PVU95-2425 Biotube Pump Vault Assembly
 - Pump Curve -L
- 2: Recirculating Sand Filter
 - 56'-8" x 120'
 - Automatic Distributing Valve Assembly
 - Sand Gradation Curve
 - Pea Gravel Gradation Curve

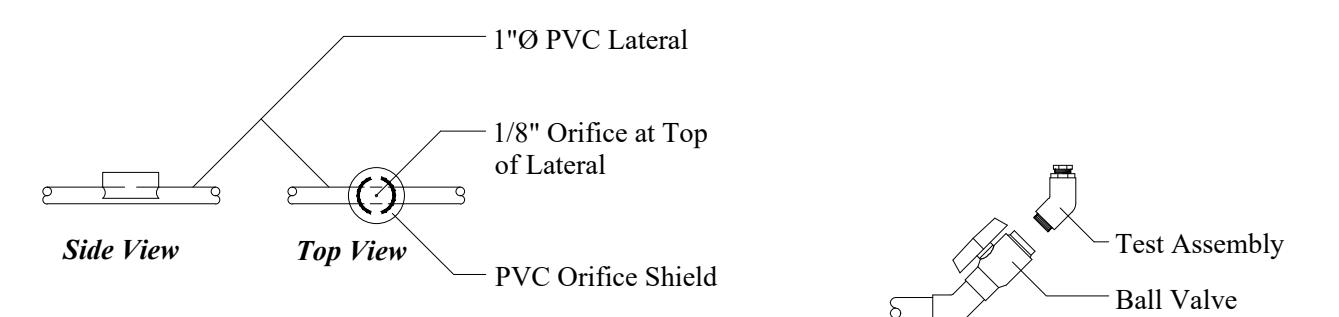
Recirculating Filter System
N.T.S.



Side View - Typical Recirculating Sand Filter
N.T.S.

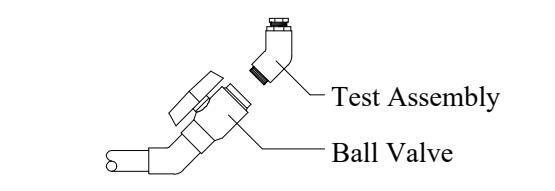


Underdrain Detail
N.T.S.

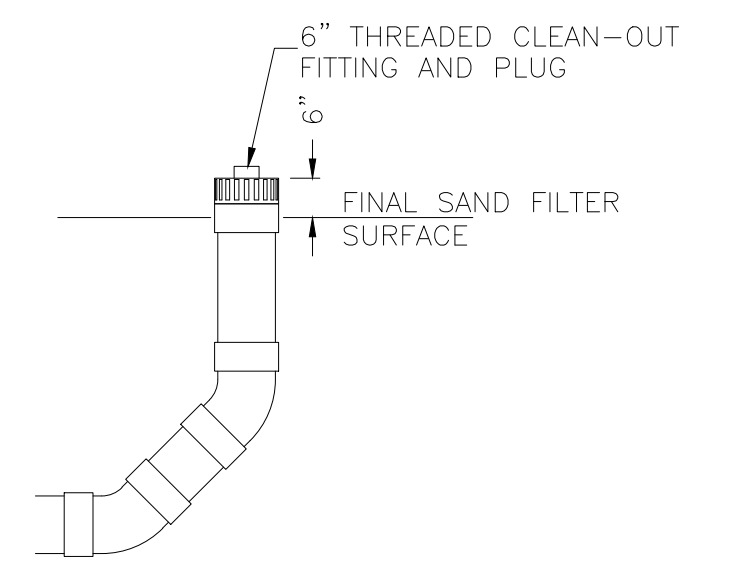


Standard Orifice Shield Detail
N.T.S.

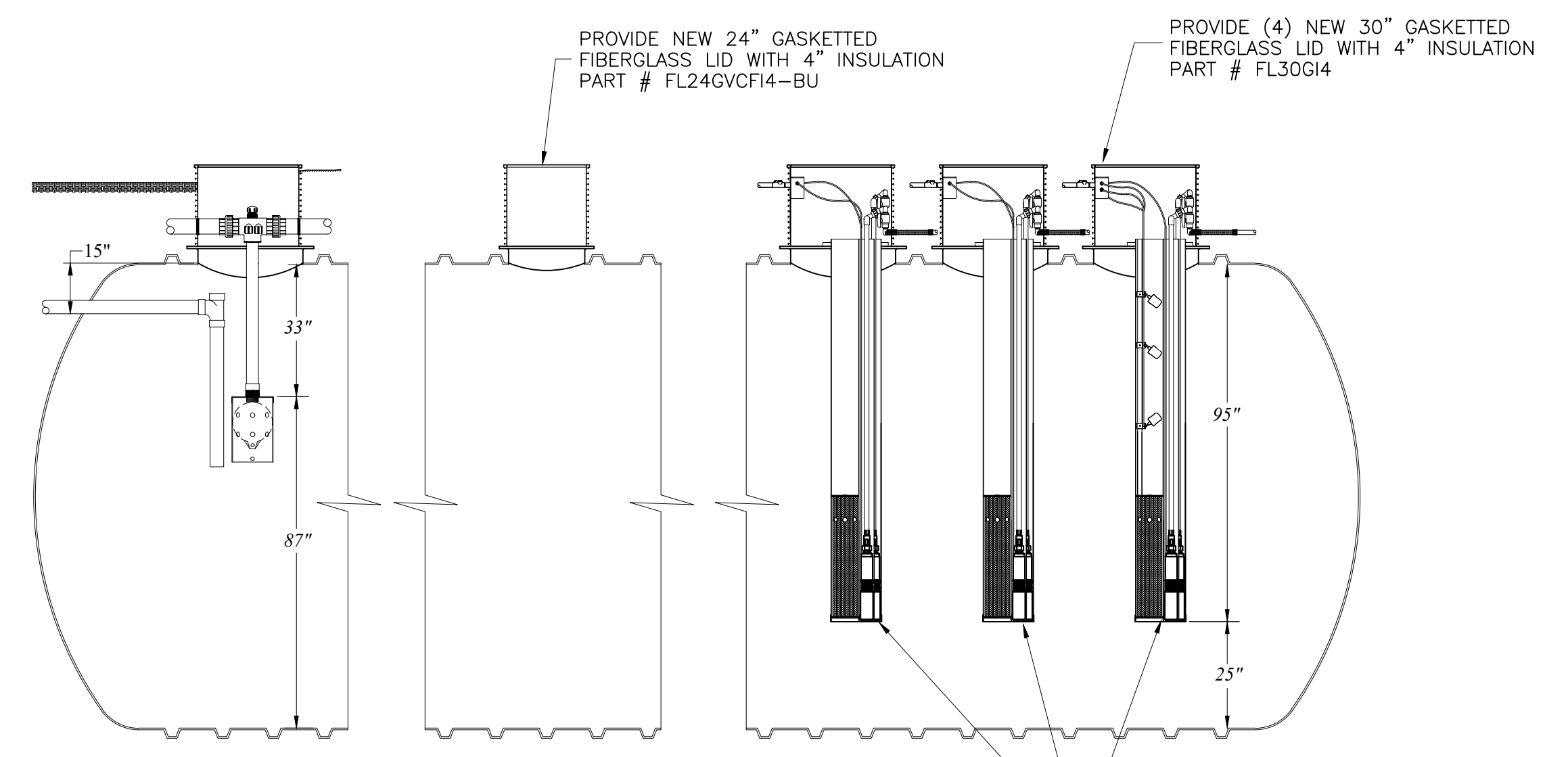
Note: Shield and orifice should be oriented below lateral for cold weather application



Flushing Valve Detail
N.T.S.

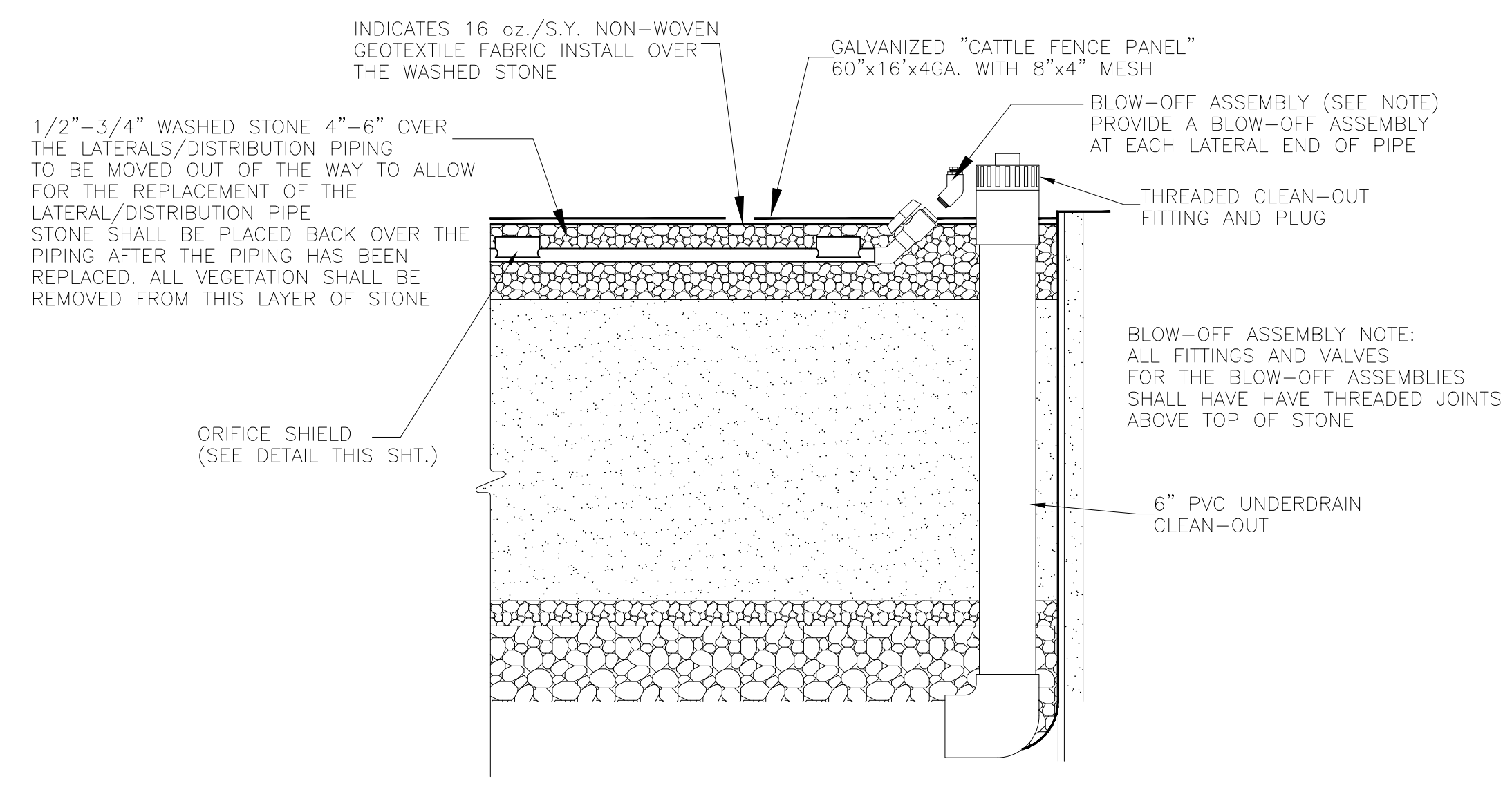


TYPICAL CLEAN-OUT DETAIL
NOT TO SCALE

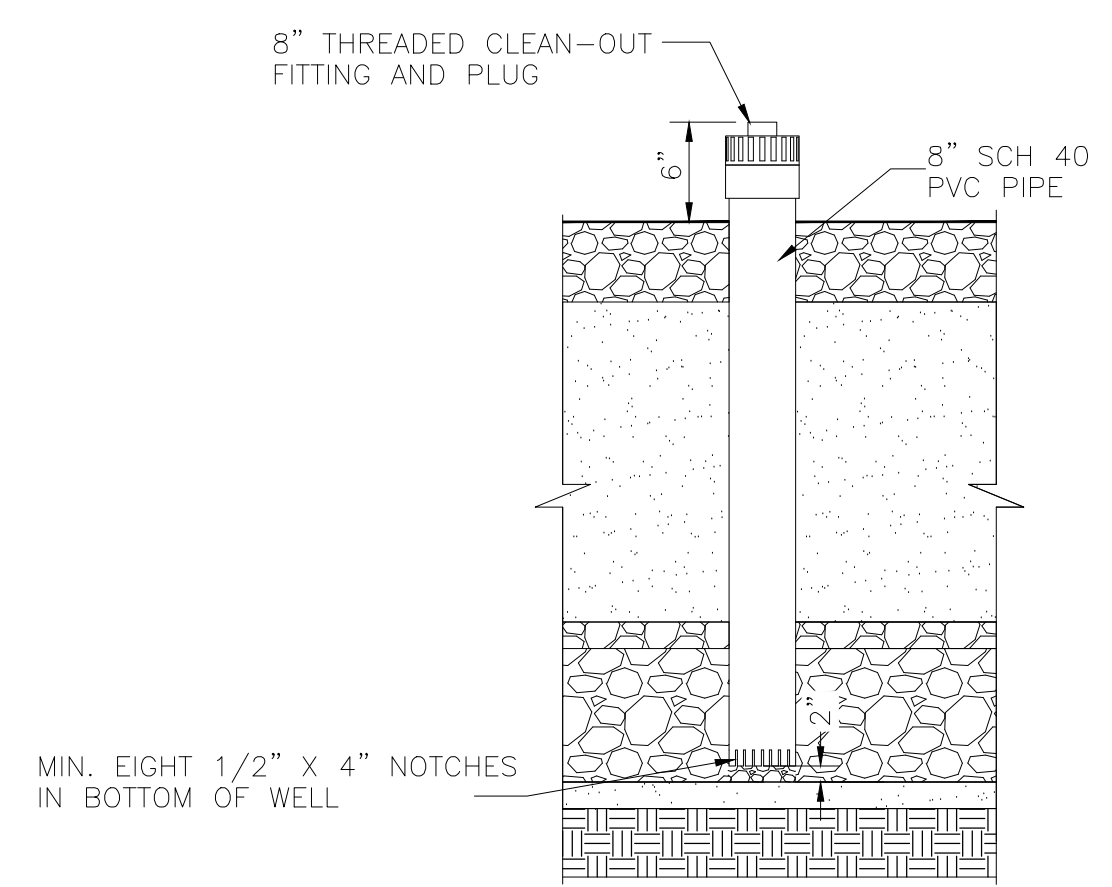


Recirculating Dilution Tank
N.T.S.

REMOVE AND REPLACE (6) 50 GPM PUMPS
EXISTING PUMPS SHALL BE CLEANED AND
TURNED OVER TO THE PLANT OPERATOR
PART #P500712-20 EFFLUENT PUMP
50 GPM, 3/4hp, 230V




LATERAL PIPE REPLACEMENT DETAIL
NOT TO SCALE



8" PVC OBSERVATION WELL (TYPICAL)

DETAILS ON THIS SHEET DRAWN BY:

U.S. Patents
 5,480,561
 4,439,323 and 5,492,635
 Other Patents Pending
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ANY PART NUMBER SHOWN ON PLAN HAS
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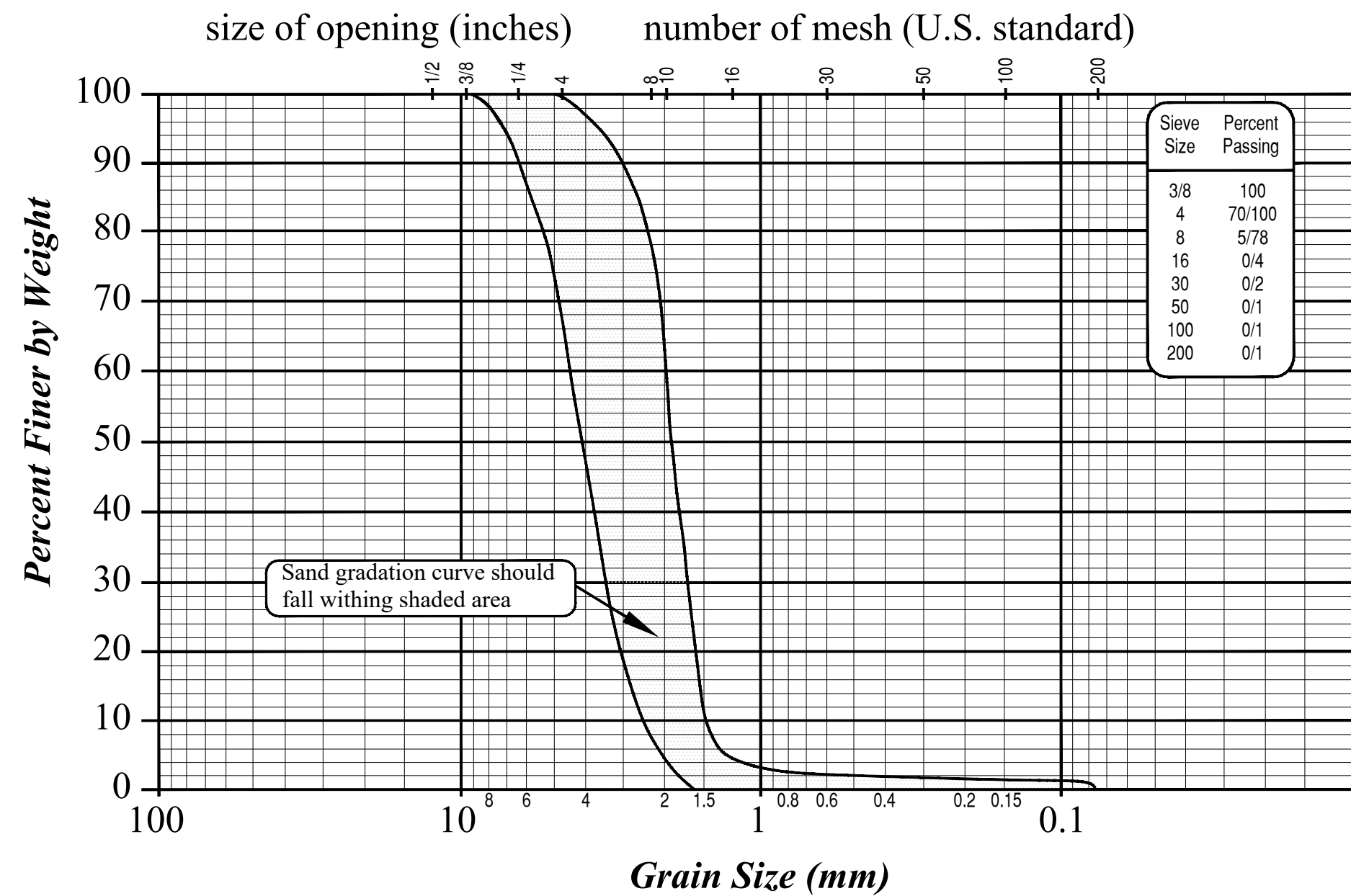
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**FILTER BED AND RECIRCULATION
TANK DETAILS**

BIDDING	CURRENT AS OF: 10/4/23	SHEET 2
	SCALE: AS NOTED	OF 4
	FILE NO.: 5943.01	Y- OF

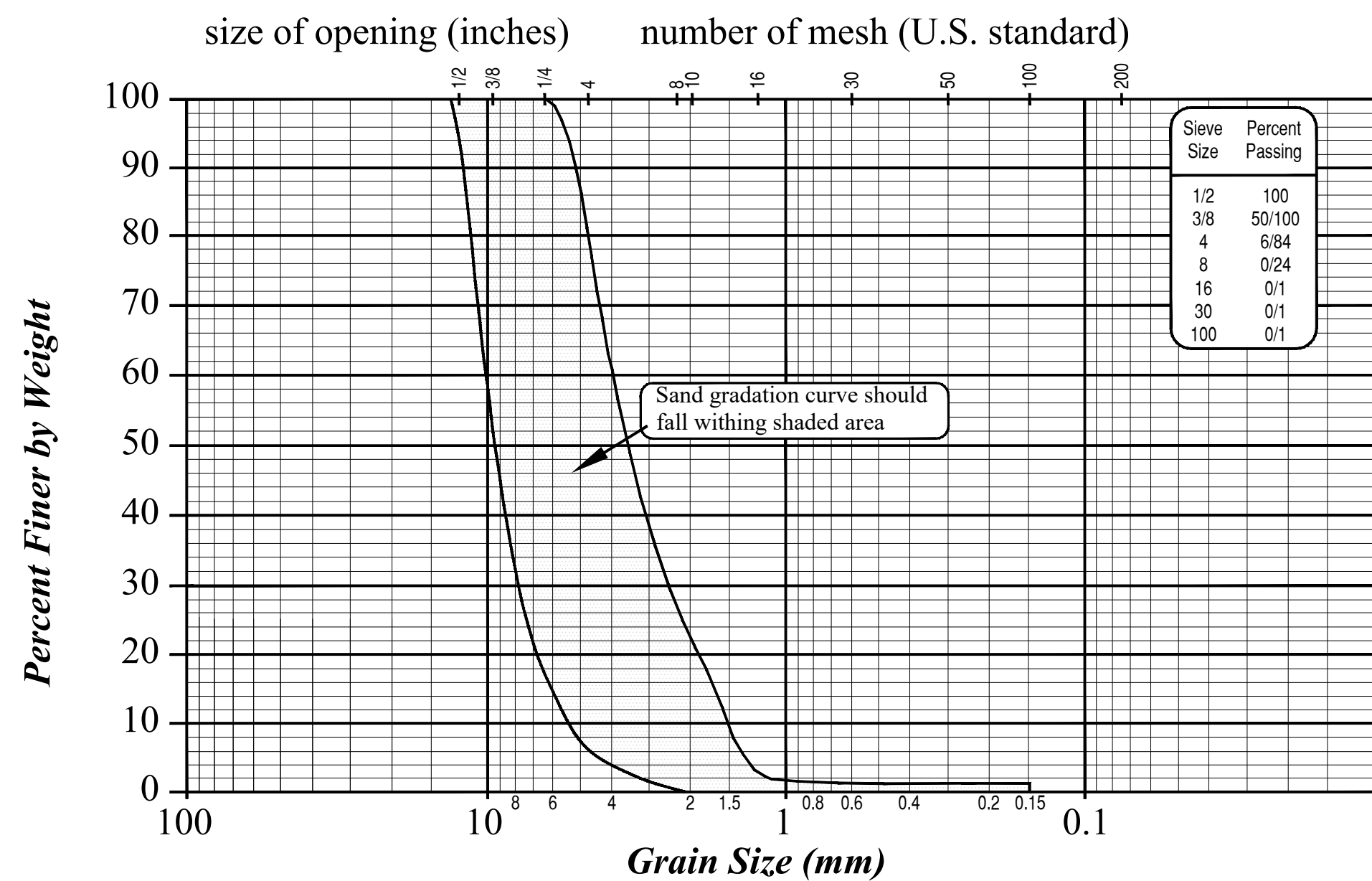
Village of Verona: Recirculating Sand Filter Treatment System
Sand gradation, Pea-gravel gradation, and Pump curve

Sand Gradation Range for Recirculating Sand Filter Media
Loaded up to 5 gpd/ft² *(D₁₀ = 1.5 to 2.5 mm; Cu = 1 to 3)
 * Follow complete Recirculating Sand Filter design criteria.



Note: To ensure the sand consolidates sufficiently, keep it wetted while placing.

Pea Gravel Gradation Range for Supporting Sand Filter Treatment Media



Note: Gravel in sand filters must be well washed.

Prepared for you by Systems Engineering 7/18/02
 Pump Selection for Pressurized System

- Orifice Size: 0.125 feet
- Residual Head at Last Orifice: 5.00 feet
- Lateral Length: 49 feet
- Total Number of Laterals per Cell: 20
- Orifice Spacing: 2.00 feet
- Distributing Valve Model (# of Zones): 6605
- Lift to Manifold: 12 feet
- Discharge Assembly Size: 2.00
- Transport Line Size: 2.00 inches
- Pipe Class/Schedule: 40
- Transport Length: 75 feet
- Manifold Size: 1.25 inches
- Pipe Class/Schedule: 40
- Distribution Header Length: 6 feet
- Lateral Size: 1.00 inches
- Pipe/Class/Schedule: 40
- Flowmeter: none

Calculation

- Minimum Flow Rate per Orifice: 0.43 gpm
- Number of Orifice per Zone: 100
- Total Actual Flow Rate: 44.5 gpm
- Number of Lines per Zone: 4

Total Dynamic Head

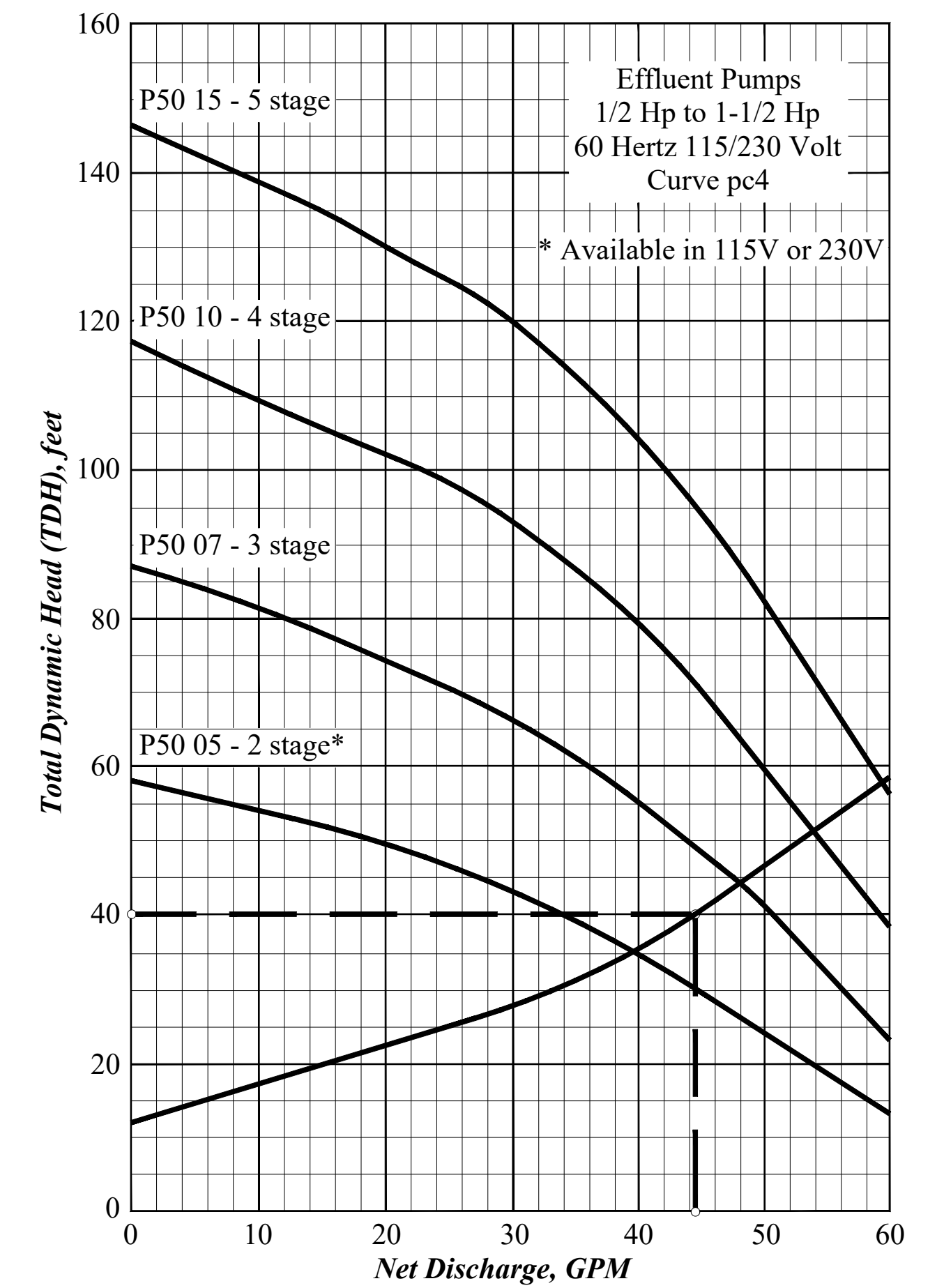
- Lift to Manifold: 12.0 feet
- Residual Head at Last Orifice: 5.0 feet

Frictional Head Losses

- Head Loss in Transport Pipe: 2.4 feet
- Head Loss through Discharge Assembly: 4.0 feet
- Head Loss in Manifold: 0.4 feet
- Head Loss in Laterals: 1.2 feet
- 0.00: 0.0 feet
- Head Loss through Distributing Valve: 15.1 feet
- Head Loss through Flowmeter: 0.0 feet None Used

Size Pump for:
Total Flow Rate: 44.5 gpm
 @
Total Dynamic Head: 40.2 feet

Village of Verona RSF Design



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 Drawing Name: G:\Users\j3943-01\Verona Wastewater System Improvements\CAD\003-GRAPH.dwg Last Modified: Friday, September 27, 2024 8:48:07 AM Plotted On: Friday, October 04, 2024 7:10:07 AM by Gregg Hensen

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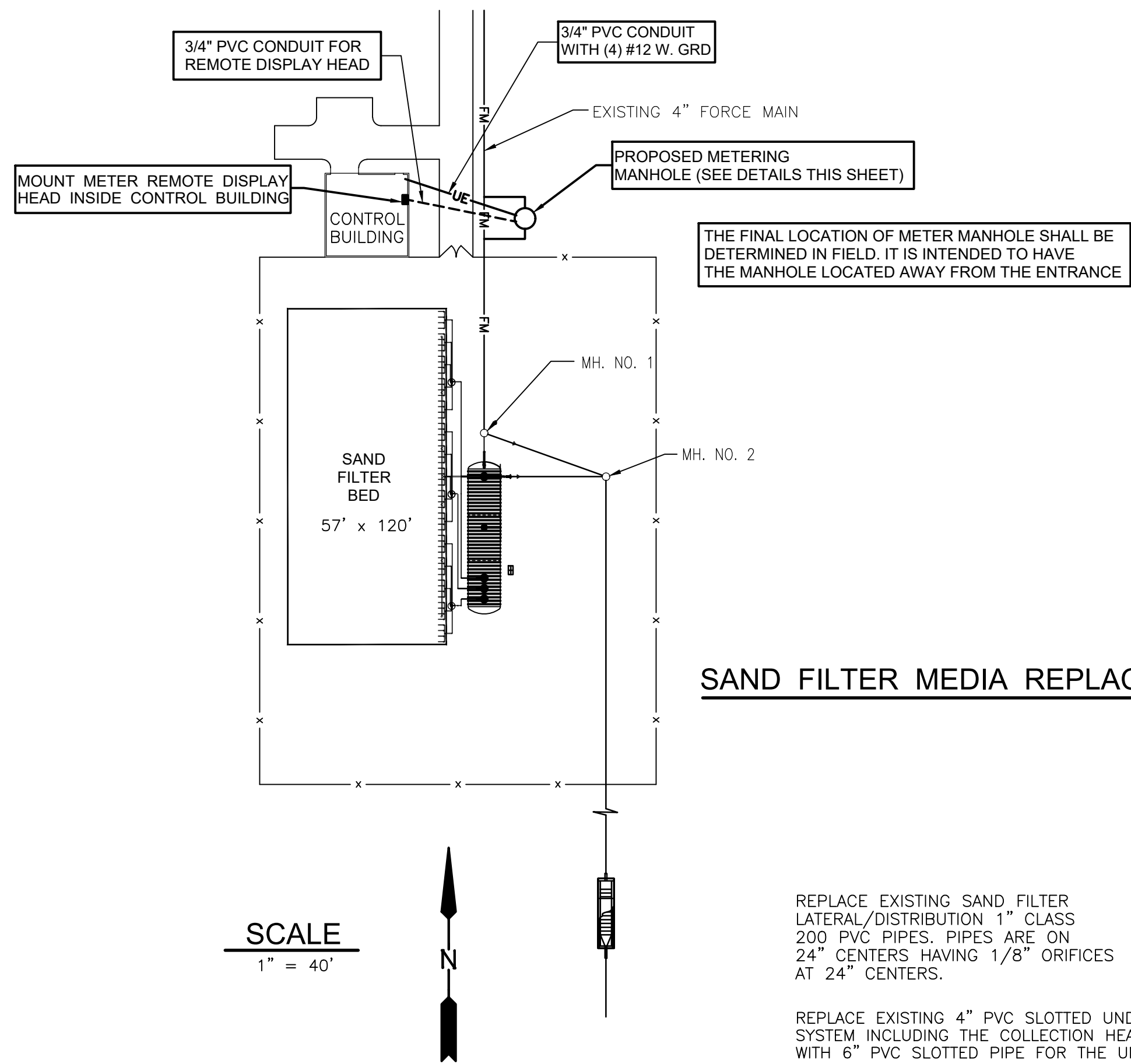


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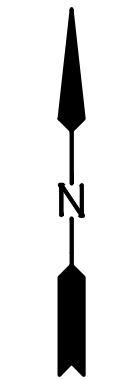
SAND GRADATION INFORMATION

BIDDING
 CURRENT AS OF: 10/4/24
 SCALE: AS NOTED SHEET 3
 FILE NO.: 5943.01 Y- OF 4

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SCALE
1" = 40'



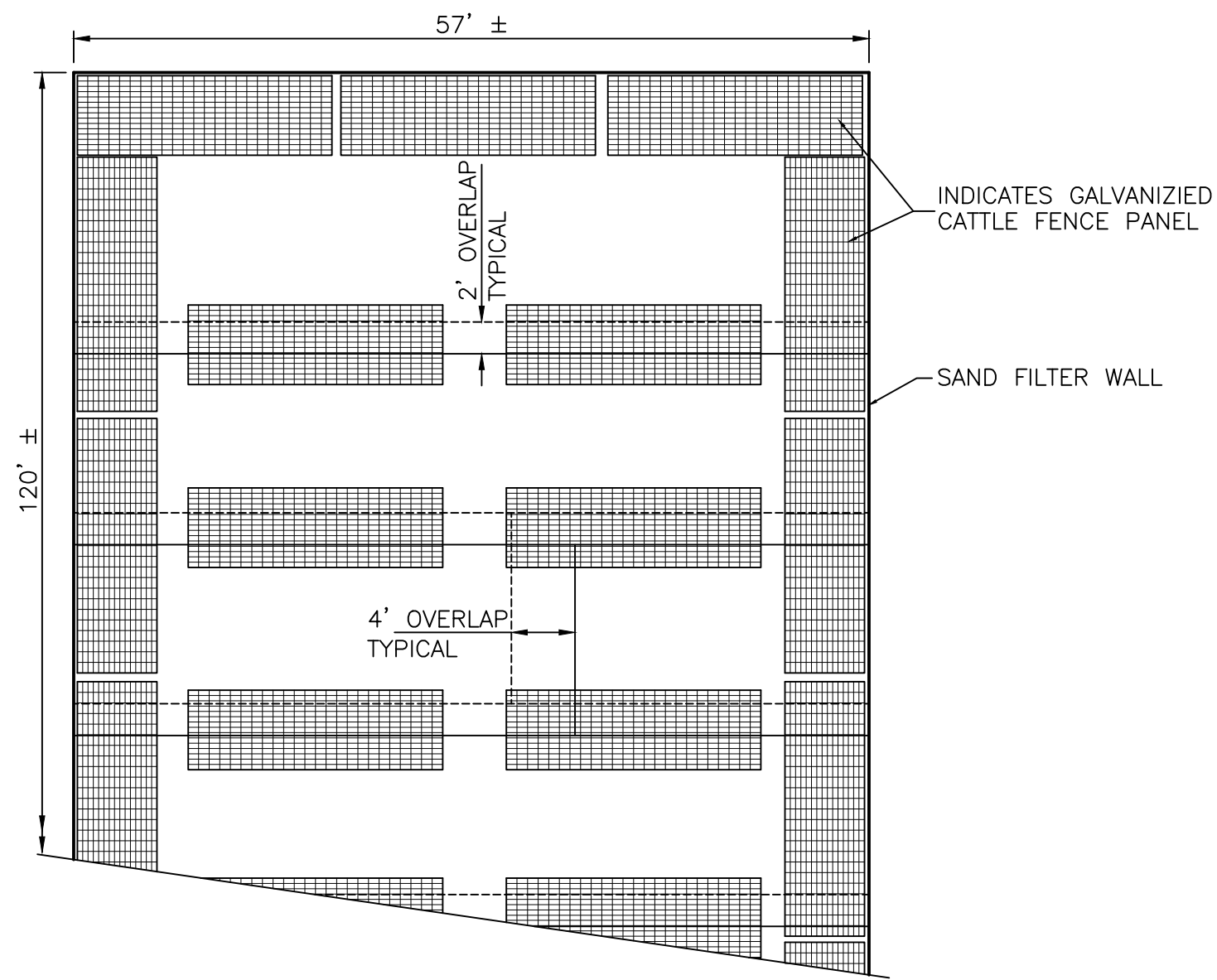
SAND FILTER MEDIA REPLACEMENT

REPLACE EXISTING SAND FILTER LATERAL/DISTRIBUTION 1" CLASS 200 PVC PIPES. PIPES ARE ON 24" CENTERS HAVING 1/8" ORIFICES AT 24" CENTERS.

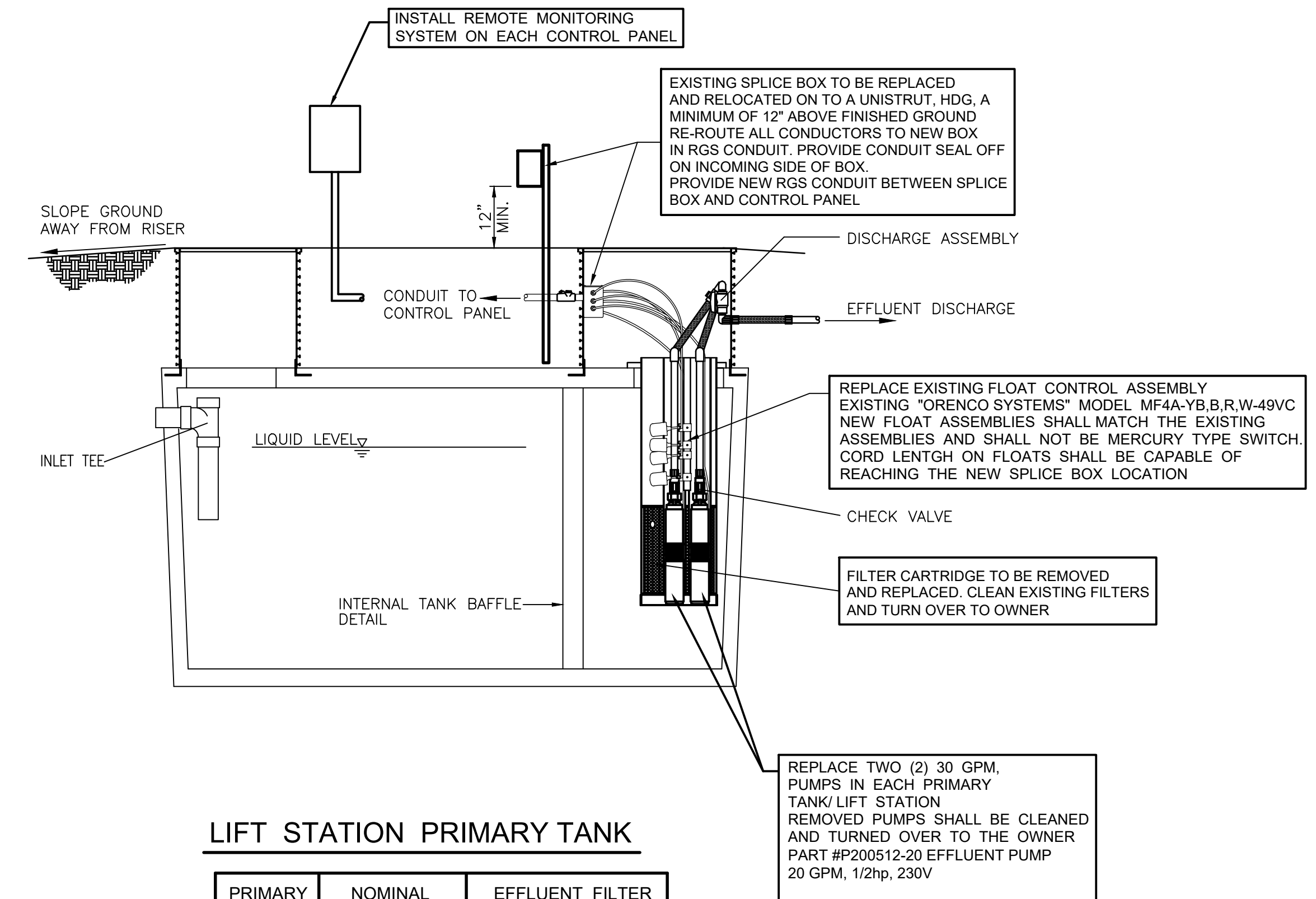
REPLACE EXISTING 4" PVC SLOTTED UNDERDRAIN SYSTEM INCLUDING THE COLLECTION HEADER WITH 6" PVC SLOTTED PIPE FOR THE UNDERDRAIN AND SOLID PIPE FOR THE COLLECTION HEADER ALL PIPES SHALL BE SCH 40 PVC.

INSTALL CLEANOUTS AT ALL END OF RUNS OR CHANGE OF DIRECTION IN THE PIPING

COVER THE ENTIRE SAND FILTER WITH A 16 OZ./S.Y. NON-WOVEN GEOTEXTILE FABRIC. PLACE GALVANIZED "CATTLE FENCE" PANELS ALONG ALL EDGES AND OVER LAP JOINTS IN FABRIC. CATTLE FENCE PANELS SHALL BE A MINIMUM OF 60" x 16" WITH 4 GA. WIRE AND A 8"x4" MESH.



GEOTEXTILE FABRIC LAYOUT PLAN
NOT TO SCALE



LIFT STATION PRIMARY TANK

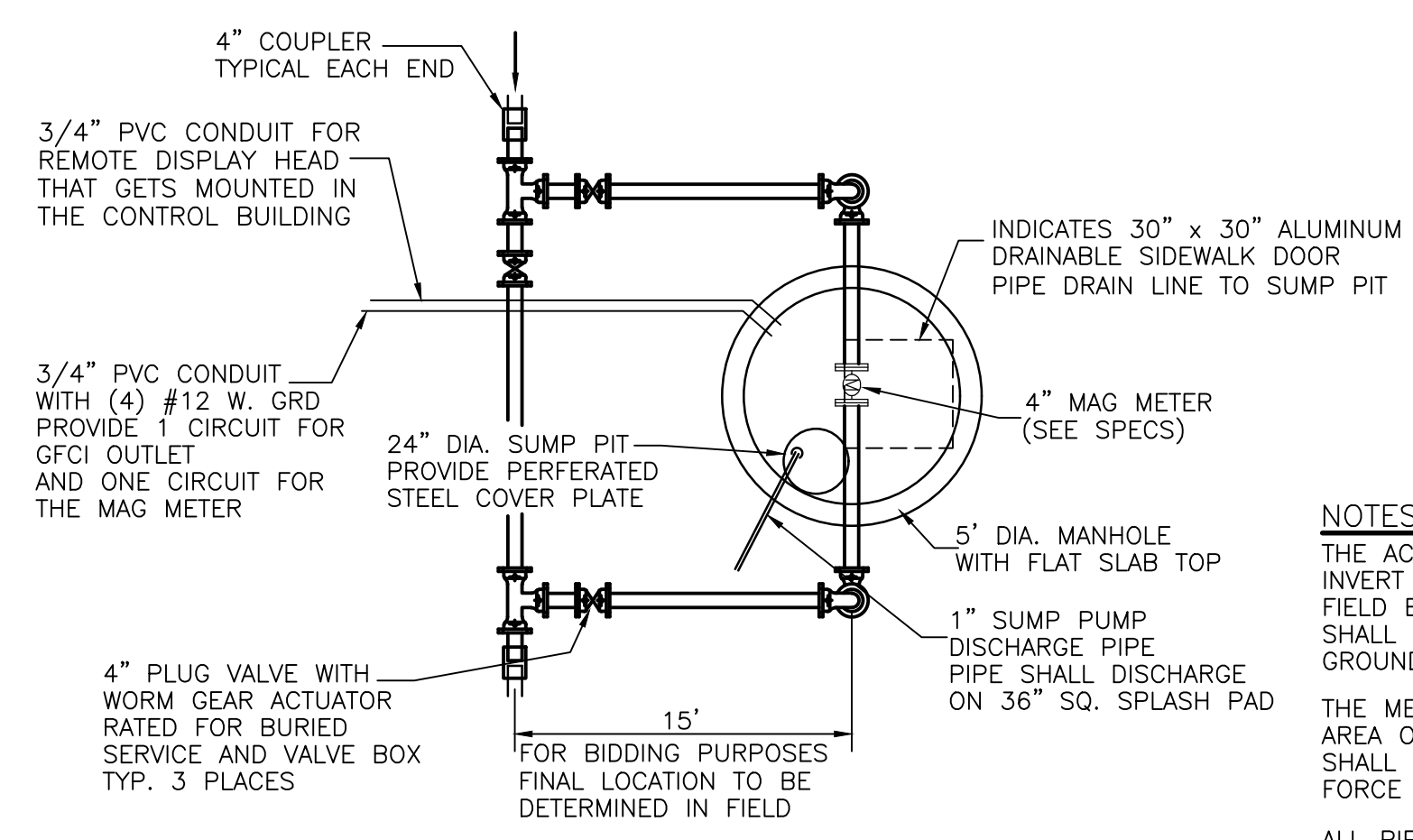
PRIMARY TANK	NOMINAL CAPACITY	EFFLUENT FILTER MODEL NUMBER
1	8000 GAL.	FT1554-36
2	8000 GAL.	FT1554-36
3	9000 GAL.	FT1554-36
4	9000 GAL.	FT1554-36
5	10,000 GAL.	FT1554-36
6	5000 GAL.	FT1254-36
7	5000 GAL.	FT1254-36
8	5000 GAL.	FT1254-36
9	5000 GAL.	FT1254-36
10	6000 GAL.	FT1254-36

CONTRACTOR SHALL PROVIDE TO THE OWNER
 6 EA. FLG2414-4BU - FIBERGLASS LID, 24" DIA. WITH 4" INSULATION
 6 EA. FL24GVCFI4-4BU - FIBERGLASS LID, 24" DIA. V, CF, W/4" INSULATION
 6 EA. FL30GI4 - FIBERGLASS LID, 30" DIA. WITH 4" INSULATION

REPLACE EXISTING FLOAT CONTROL ASSEMBLY EXISTING "ORENCO SYSTEMS" MODEL MF4A-YB,B,R,W-49VC NEW FLOAT ASSEMBLIES SHALL MATCH THE EXISTING ASSEMBLIES AND SHALL NOT BE MERCURY TYPE SWITCH. CORD LENGTH ON FLOATS SHALL BE CAPABLE OF REACHING THE NEW SPLICE BOX LOCATION

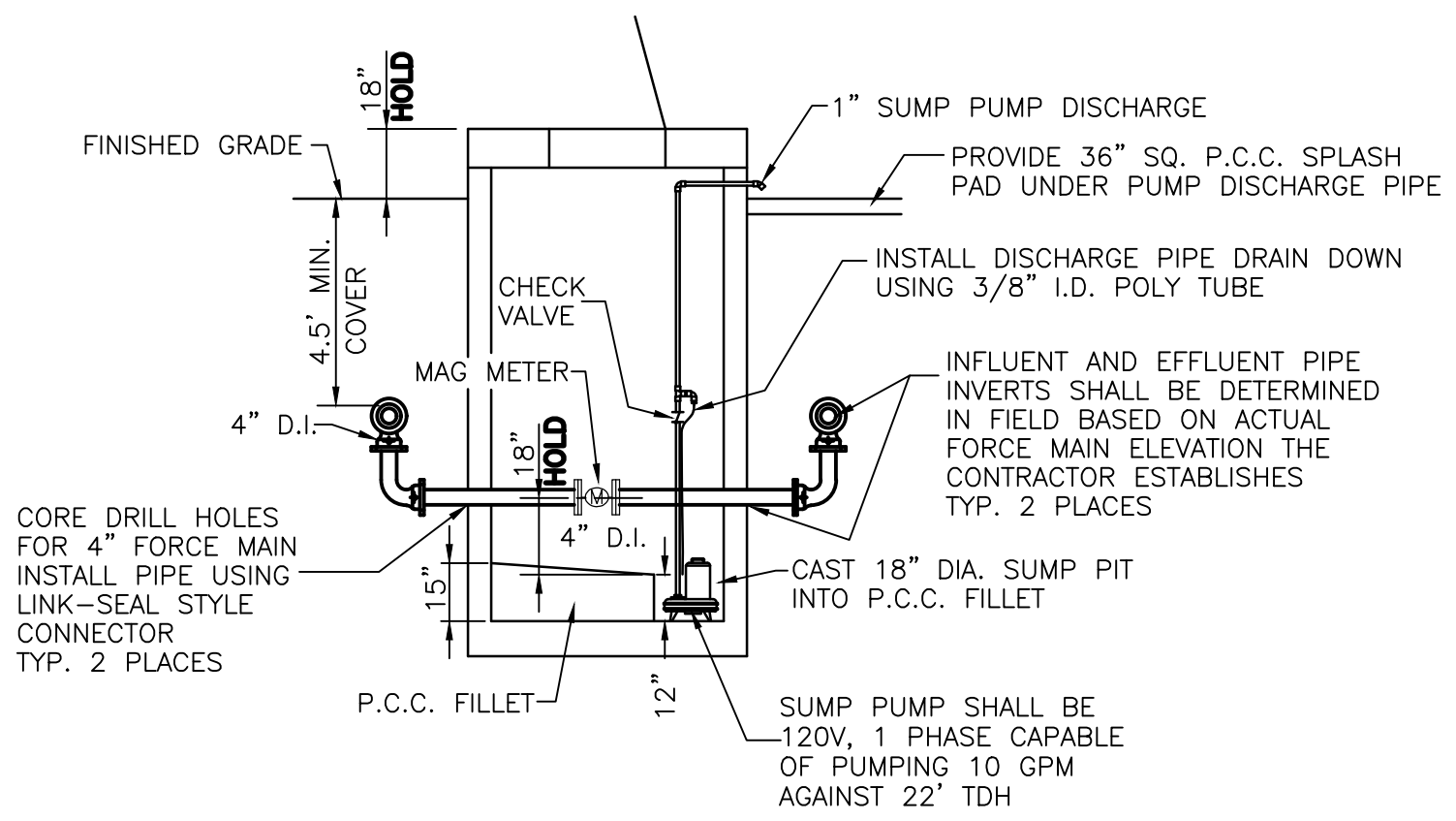
FILTER CARTRIDGE TO BE REMOVED AND REPLACED. CLEAN EXISTING FILTERS AND TURN OVER TO OWNER

REPLACE TWO (2) 30 GPM PUMPS IN EACH PRIMARY TANK/LIFT STATION REMOVED PUMPS SHALL BE CLEANED AND TURNED OVER TO THE OWNER PART #P200512-20 EFFLUENT PUMP 20 GPM, 1/2hp, 230V



METERING MANHOLE PLAN VIEW
N.T.S.

NOTES:
 THE ACTUAL TOP SLAB ELEVATION AND PIPE INVERT ELEVATIONS SHALL BE DETERMINED IN FIELD BY THE CONTRACTOR. THE TOP SLAB SHALL BE SET 18" ABOVE EXISTING/FINAL GROUND GRADE.
 THE METER SHALL BE INSTALLED IN A LOW AREA OF PIPING AS SHOWN. PIPE INVERTS SHALL BE DETERMINED FROM THE ACTUAL FORCE MAIN ELEVATION
 ALL PIPE AND CONDUIT HOLES SHALL BE CORE DRILLED IN FIELD.
 THE FINAL DEPTH OF THE MANHOLE SHALL BE DETERMINED BY THE CONTRACTOR



METERING MANHOLE SECTION VIEW
N.T.S.

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MISCELLANEOUS DETAILS

BIDDING
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 FILE NO.: 5943.01 Y- OF 4