

30% BASIS OF DESIGN REPORT – SHERMAN STREET CSO STORAGE TANK

APPENDIX E CSO STORAGE TANK OPTIONS WORKSHOP



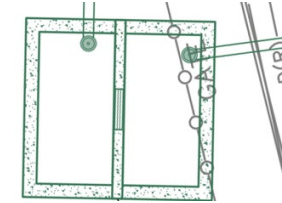
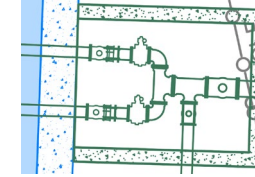
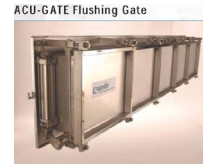
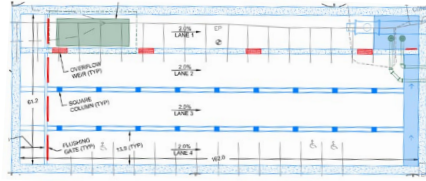
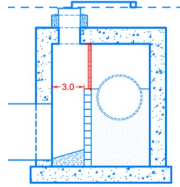
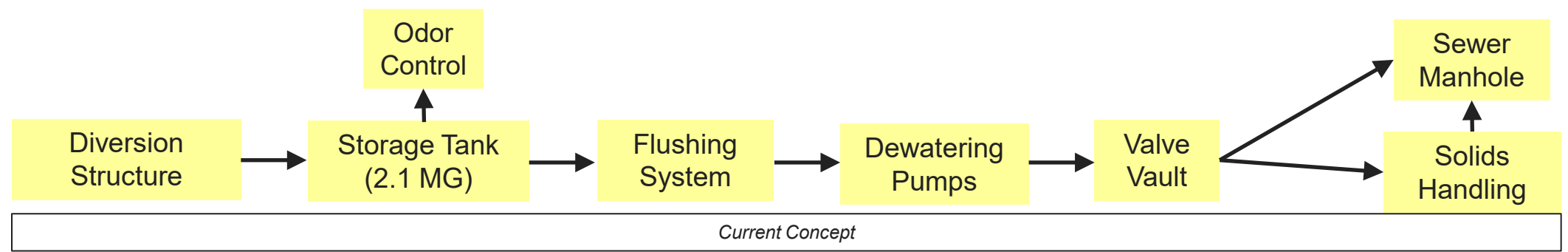
CSO Storage Tank Options

Sherman Tank Preliminary Design
City of Cambridge
May 18, 2026

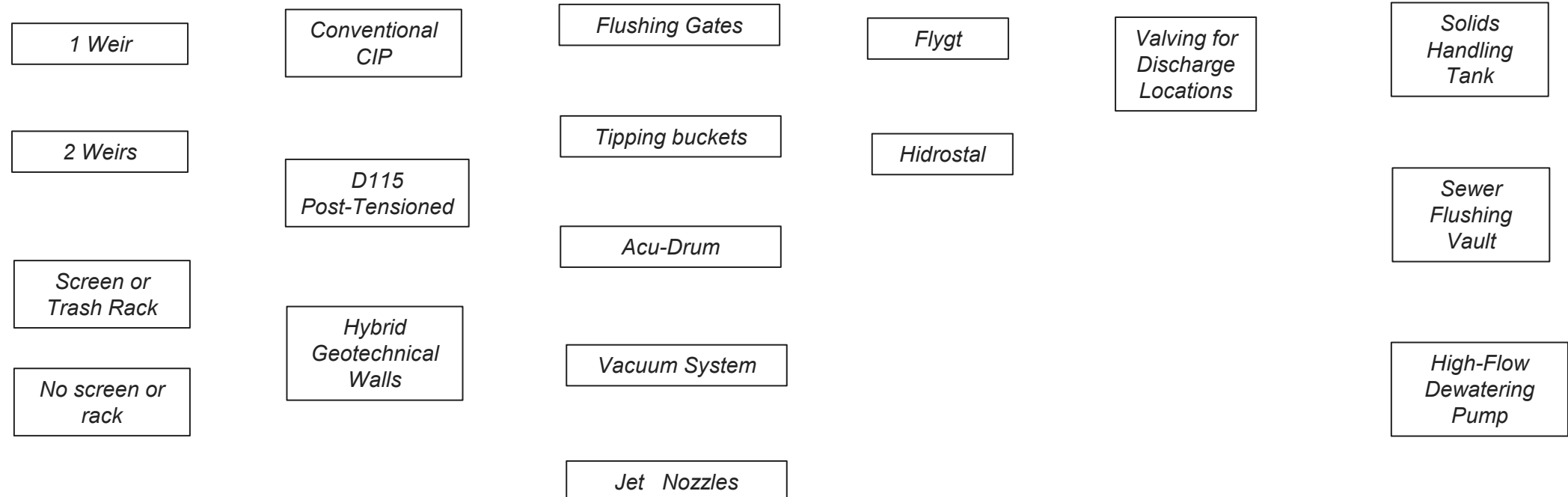


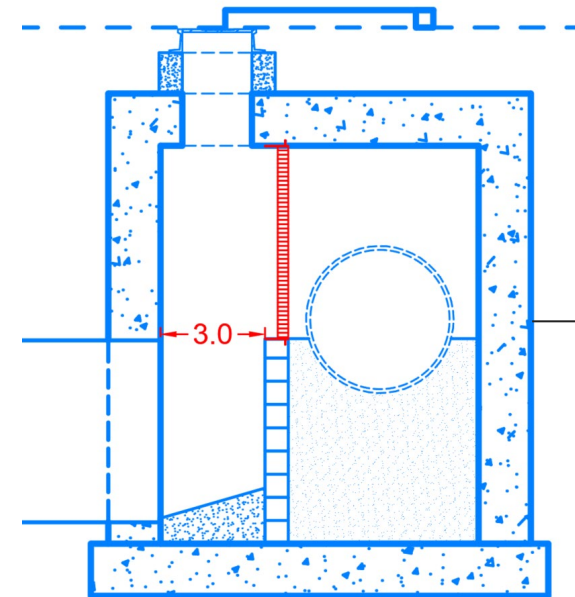
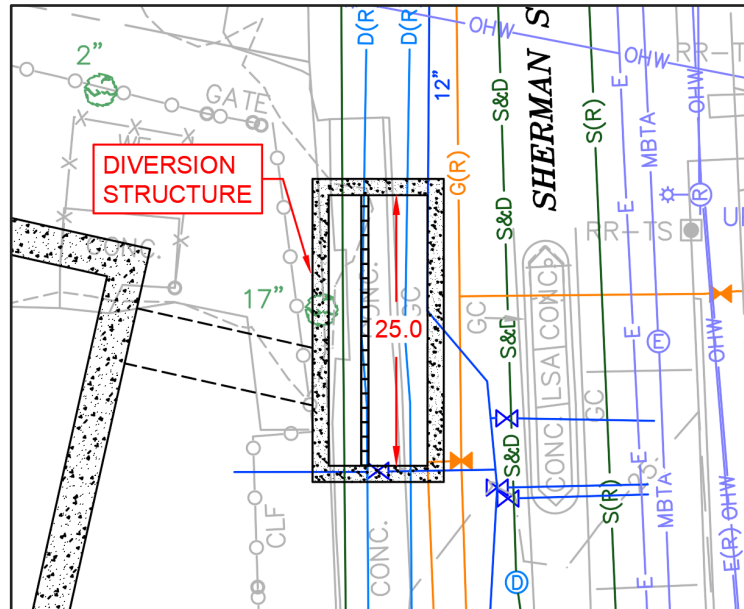
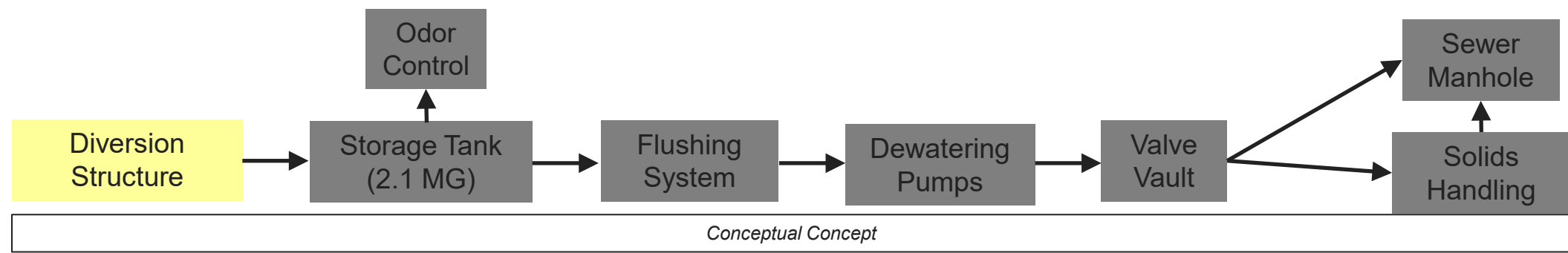
Agenda

1. Design Considerations for:
 - Diversion Structure
 - Tank Geometry and Structure Type
 - Tank Cleaning
 - Dewatering Pumps
 - Solids Handling
 - Odor Control
 - CAM401A
2. Open Discussion



Options / Alternatives





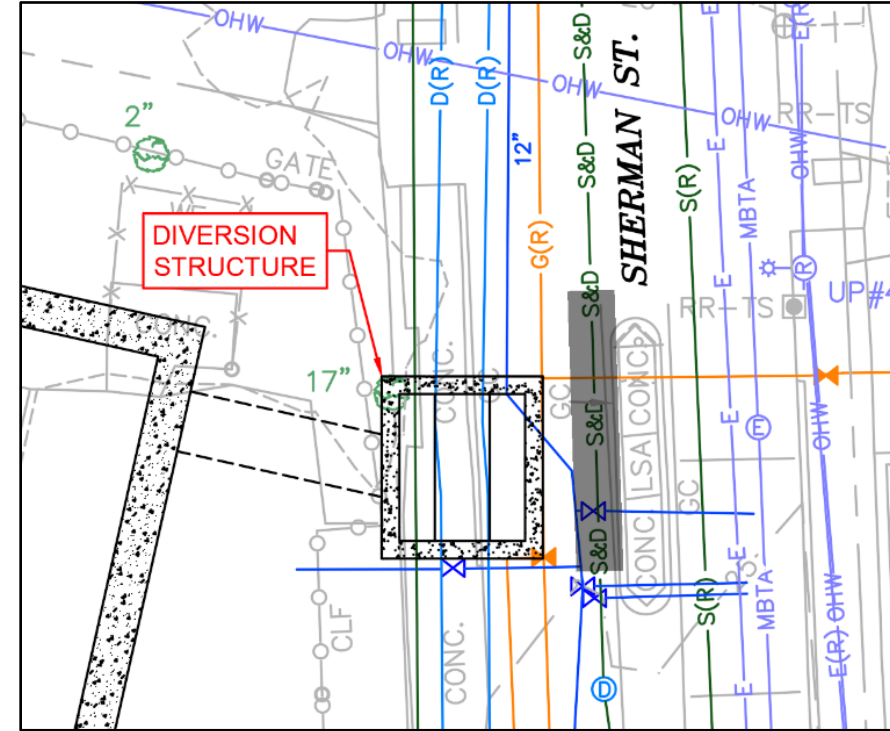
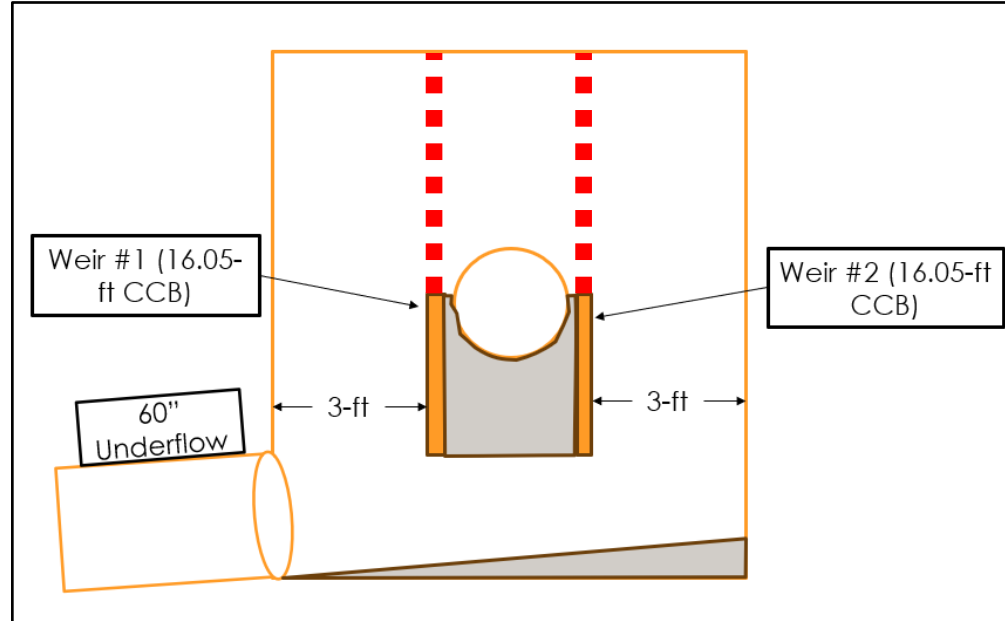
8" trash rack minimizes debris entering tank

Below is a summary of both scenarios for the 2050 TY.

Scenario	Tank Activations (>0.01 MG)	Max Tank Volume (MG)	Min Tank Volume (MG)	Max Tank Level (ft CCB)	Peak Inflow Rate (MGD)	CAM401A Max Level (ft CCB)
2 Diversions	16	2.19	0.01	17.5	42 / 34	18.4
1 Diversion	25	2.23	0.02	18.2	75	18.4



Alternative Concept

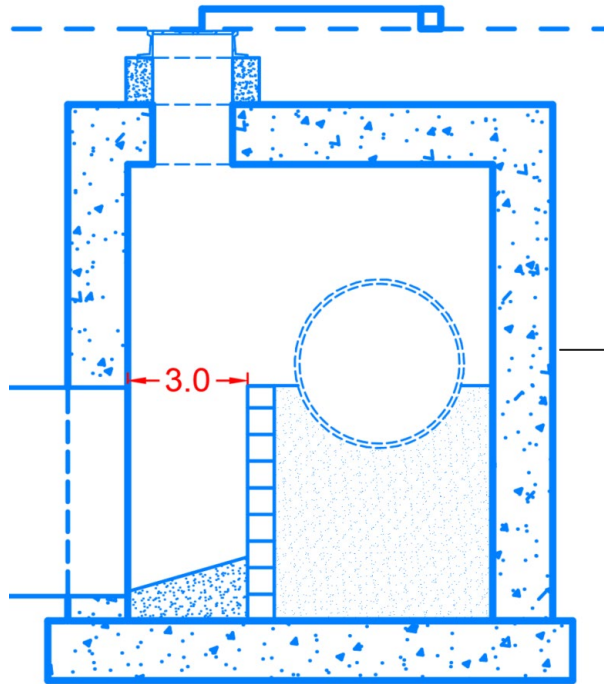


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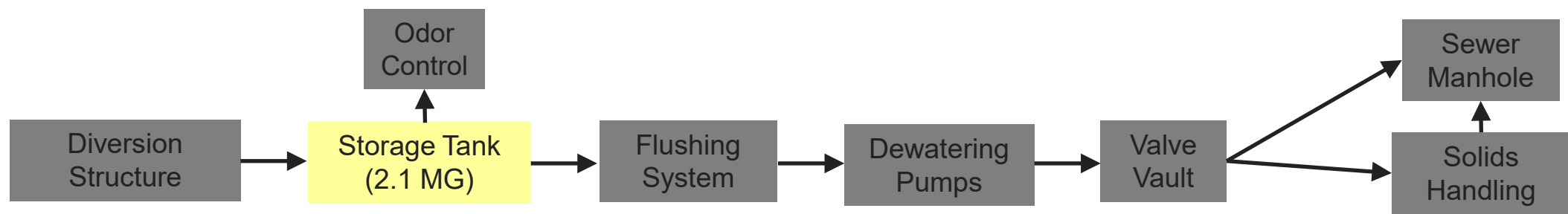
Alternative Concepts



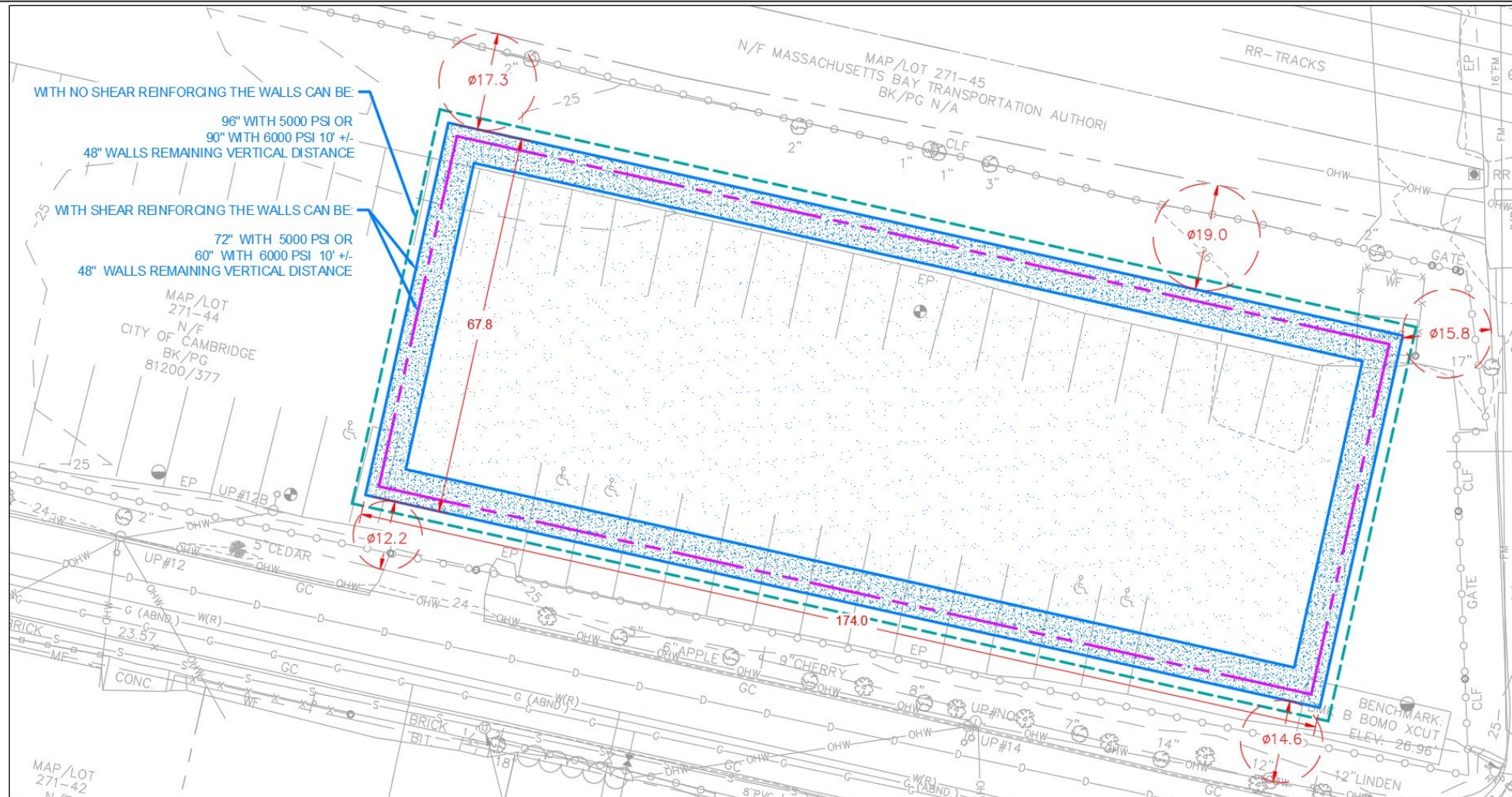
*No trash rack
introduces more
debris in tank*



*1" Screen. Expensive
and introduces major
head loss and significant
O&M obligations.*



Conceptual Concept – Conventional CIP Tank





PL6 Tank w/ Braced SOE

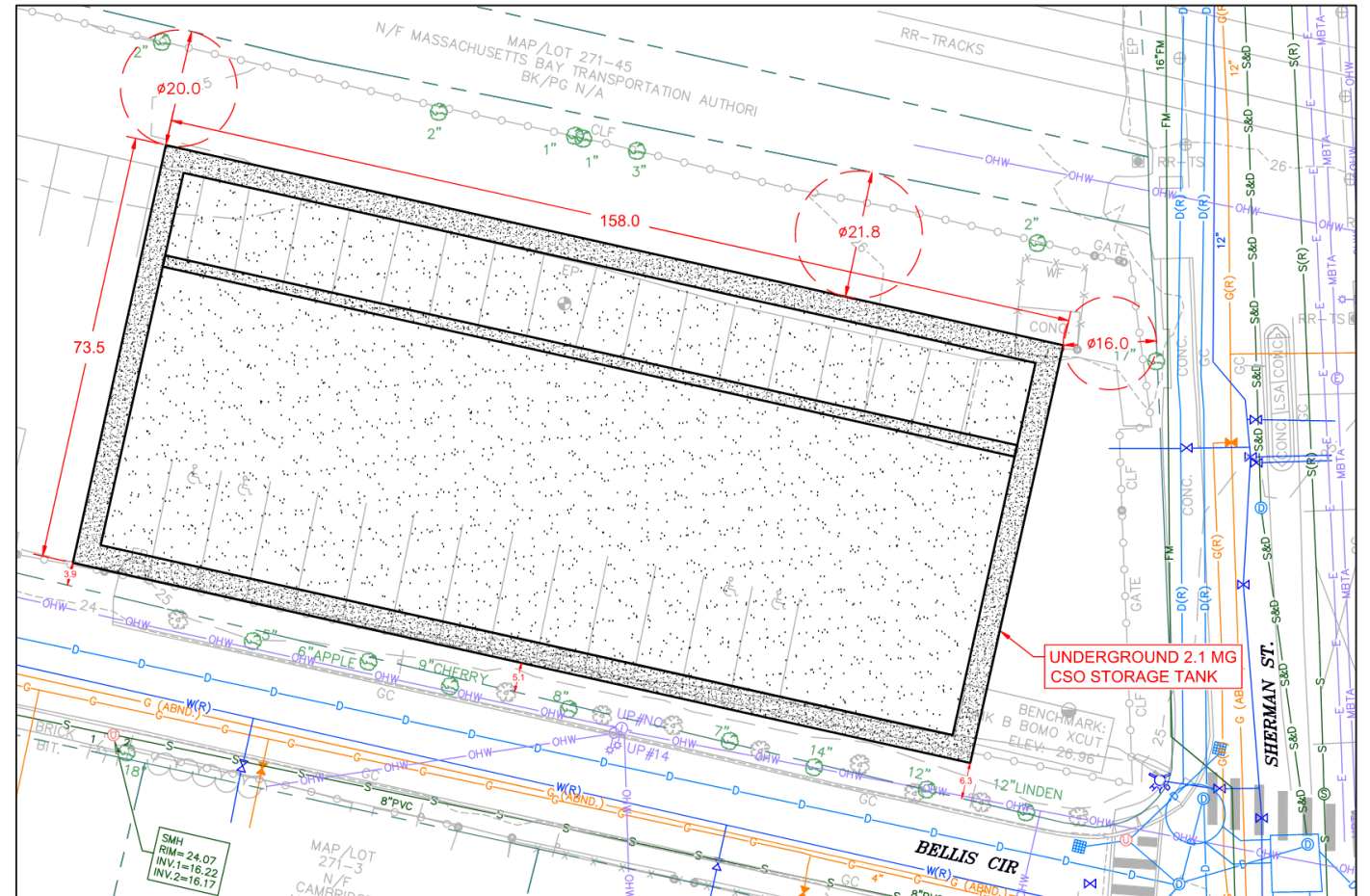


Tobin Tank w/ Braced SOE



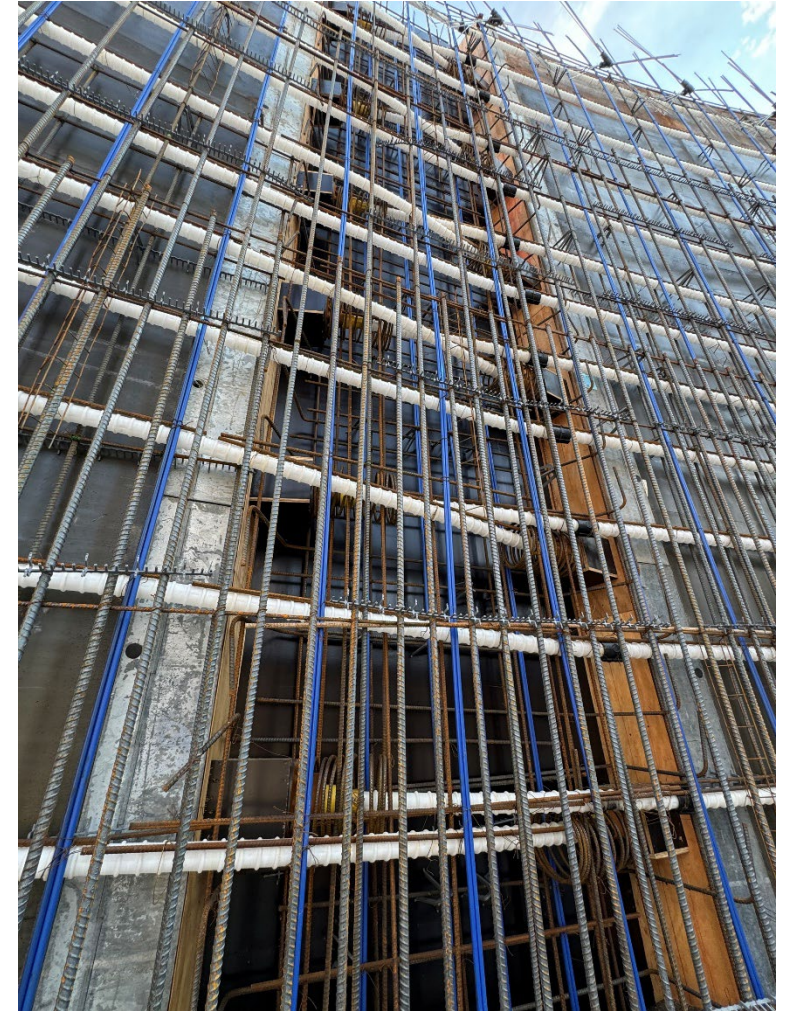


Structure Alternative - Diaphragm Wall Constructed Tank



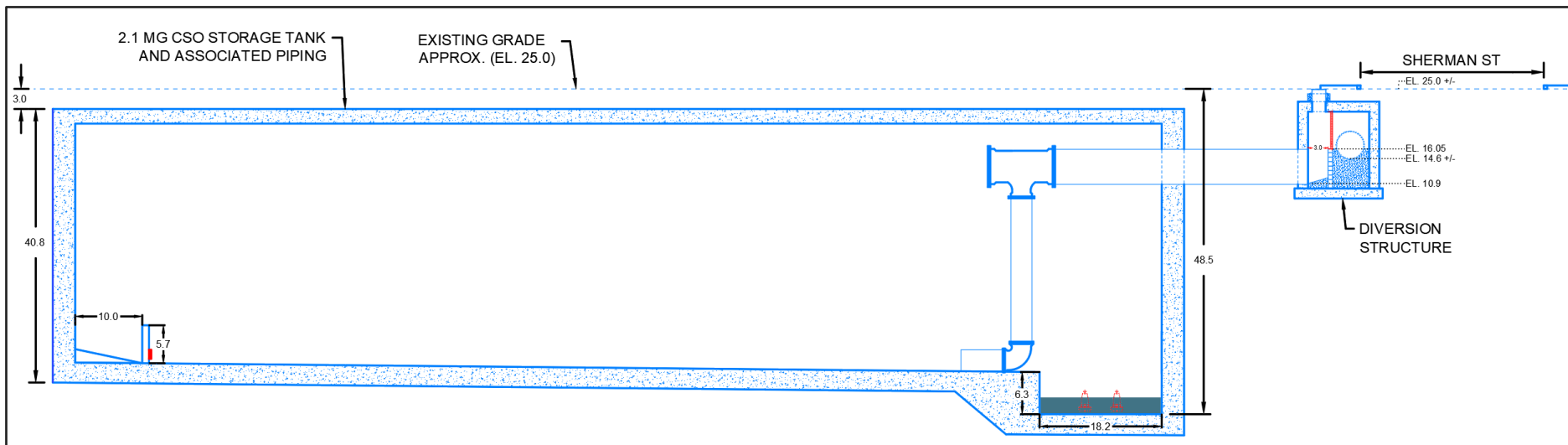
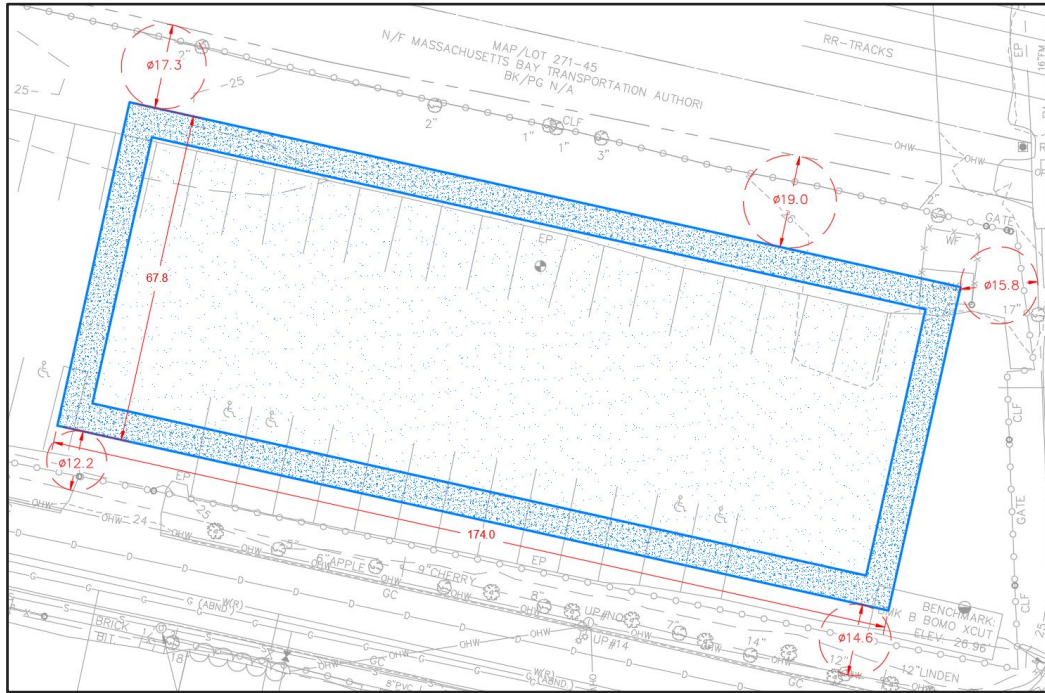


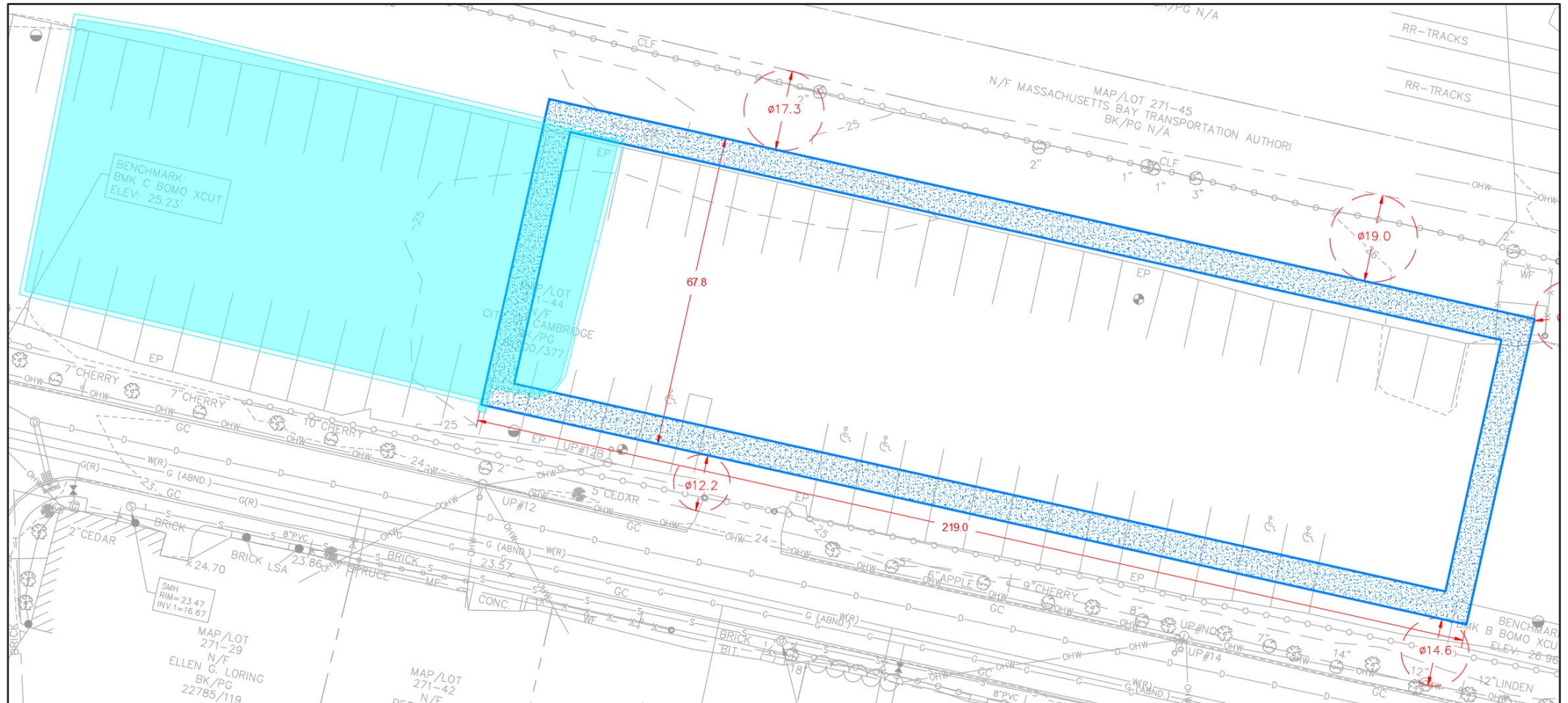
Structure Alternative - D115 Rectangular Tank

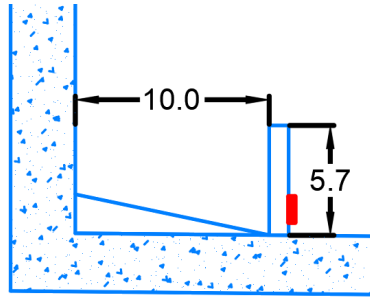
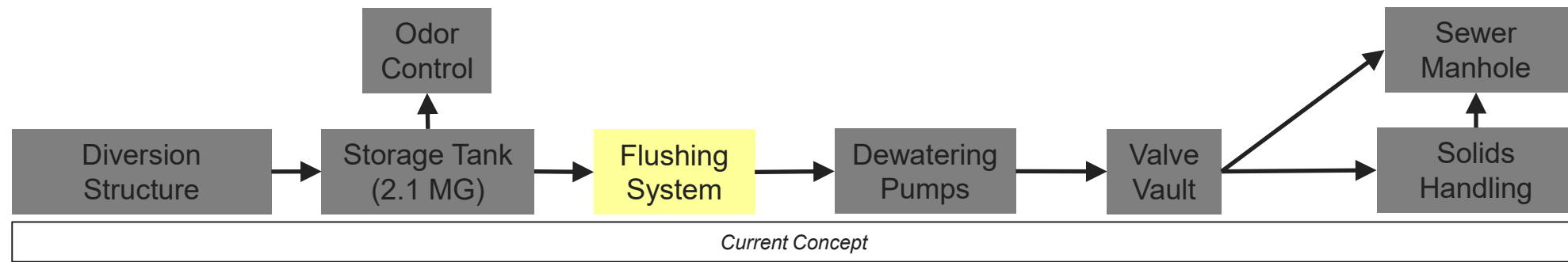




Sump Cleaning







ACU-GATE Flushing Gate



Grande ACU-GATE technology minimizes stuck latches due to the dual cylinder open and close functionality

Flushing Alternatives

Tipping buckets

Acu-Drum

Vacuum System

Jet Nozzles



Tipping Buckets



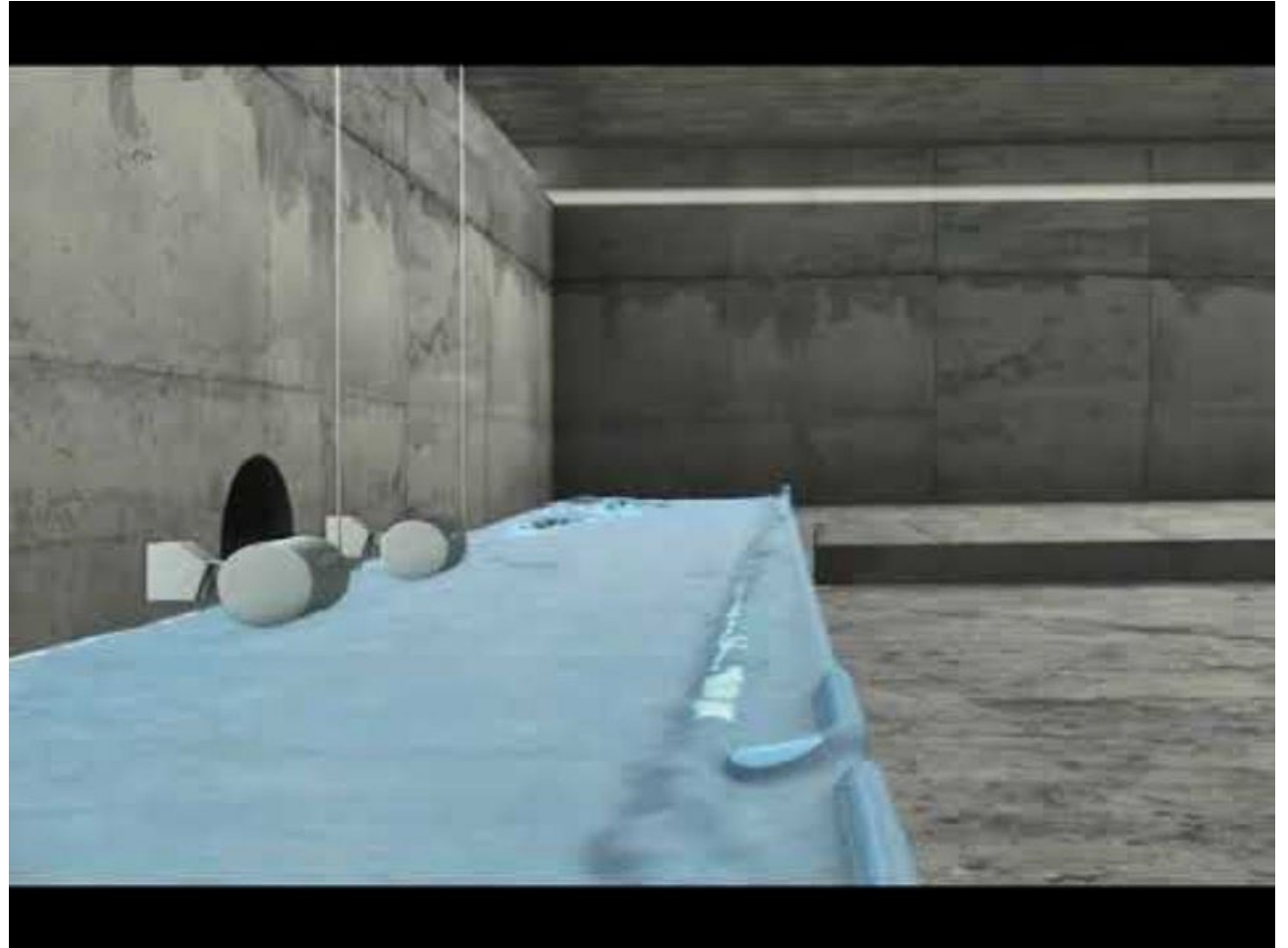
Sewer debris/solids do not impact operation

Minimal maintenance, however, access points required at each end of tipping bucket to grease bearings and/or additional maintenance. Option to place “pent house” walkway in tank for maintenance.



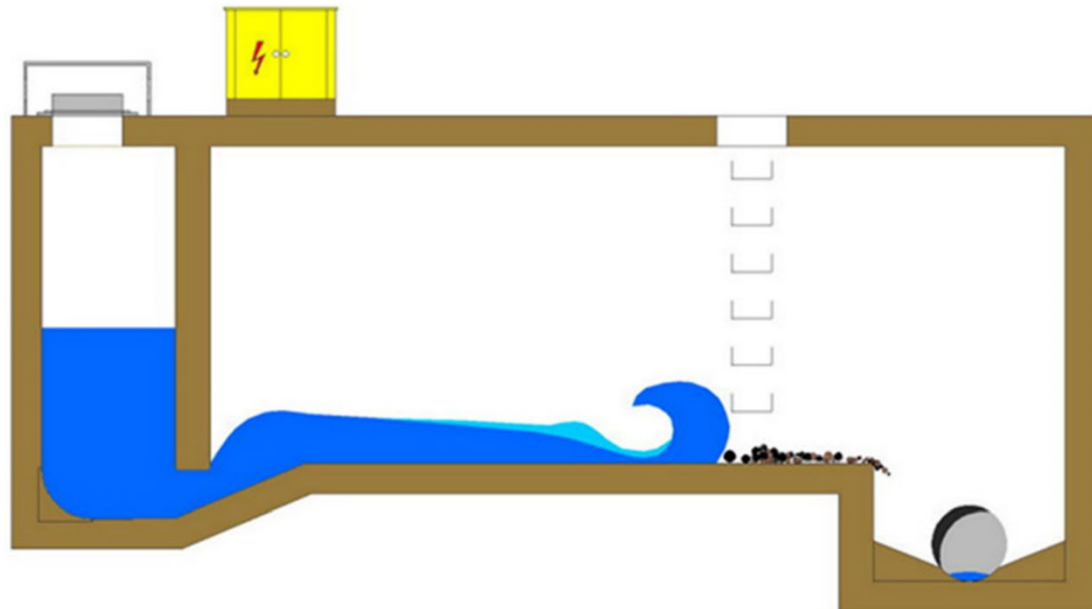


Acu-Drum





VacFlush



(Can position vacuum chamber at the center of circular tank)

“Boutique” cleaning approach. Leaks can be difficult to detect in water column leading to equipment downtime.

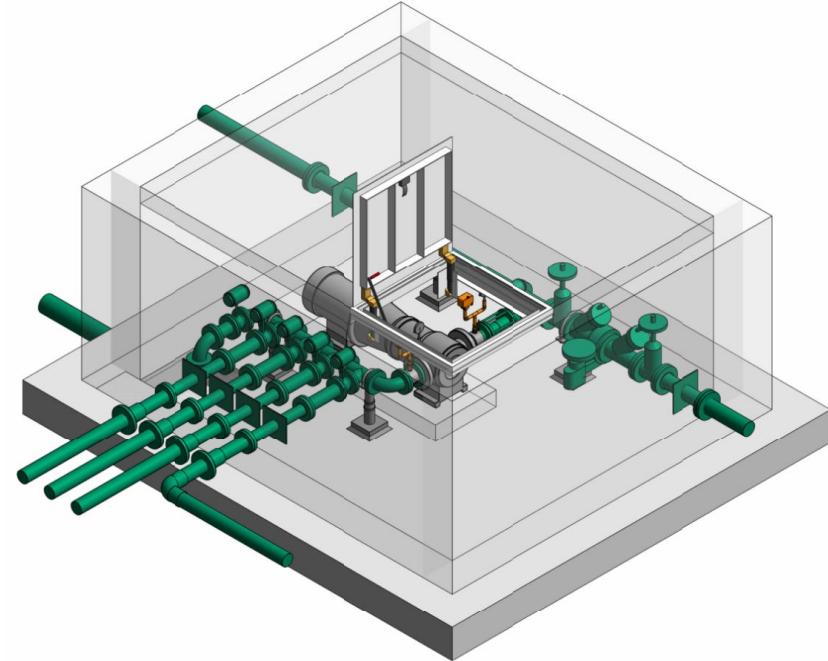
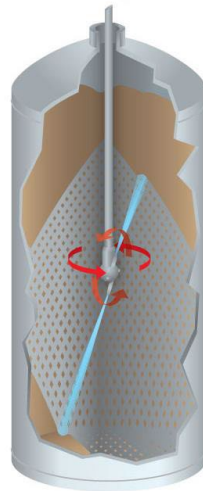
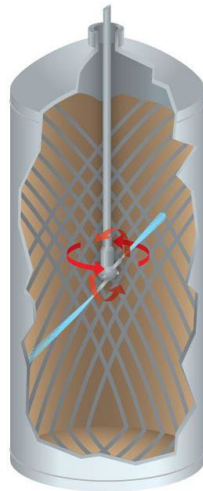
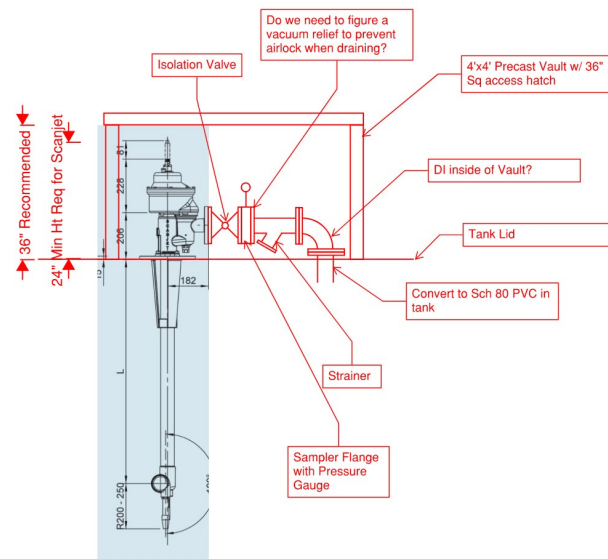


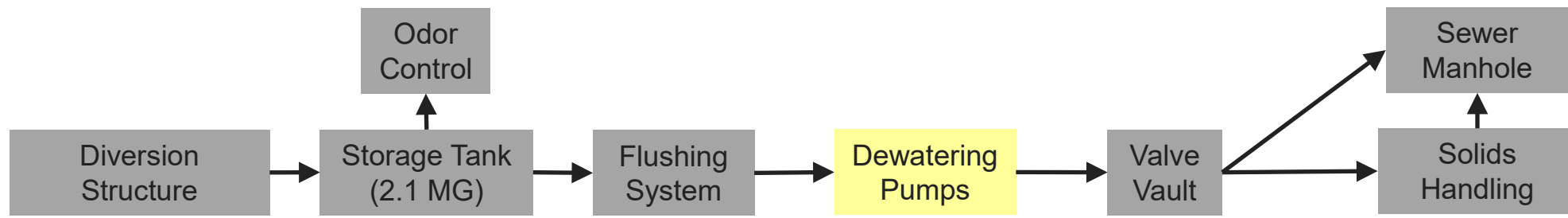
Scanjet Tank Cleaning Technologies





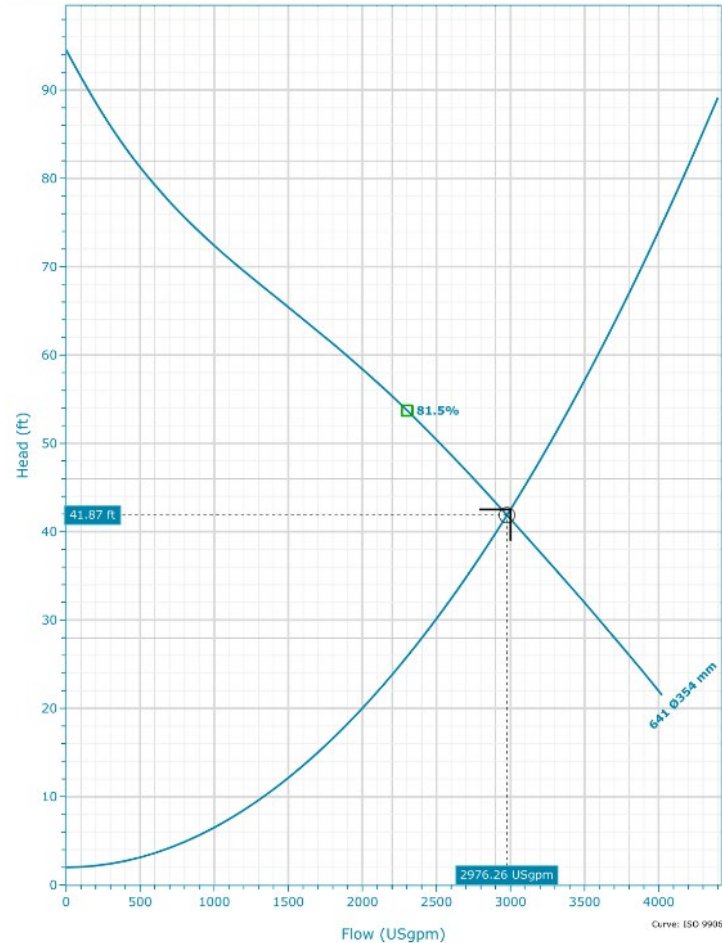
Scanjet Tank Cleaning Technologies





Current Concept – Flygt N-Pump 3202 MT 3~ 641

NP 3202 MT 3~ 641 | Duty Analysis



- Power = 45HP, Discharge DN = 8"
- Duty Point 3000 USGPM @ 38 ft TDH
- Maximum **Solid diameter 2.5" with self cleansing** N impeller
- Typically municipal sewer install (residential system)



BETTER HEAT TRANSFER

Our specially designed and manufactured motor provides enhanced cooling because heat losses are concentrated around the stator. Trickle impregnated in resin (Class H insulation), the stator windings are rated at 180°C (355°F) and enable up to 30 starts per hour.

EFFICIENT COOLING

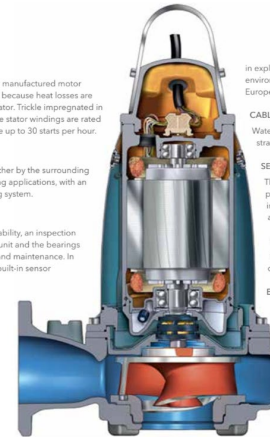
These pumps are cooled either by the surrounding liquid or, in more demanding applications, with an internal closed-loop cooling system.

INSPECTION CHAMBER

To increase operational reliability, an inspection chamber between the seal unit and the bearings enables rapid spot checks and maintenance. In the case of a seal failure, a built-in sensor provides an early warning of any fluid buildup, thus reducing the risk of expensive repair work.

COMPLIANCE

Each pump is tested and approved in accordance with national and international standards, including IEC60034-1 and CSA. Pumps are available



In explosion-proof versions for use in hazardous environments, and are approved by the Factory Mutual, European Standard and IEC.

CABLE ENTRY

Water-resistant cable entry provides both sealing and strain relief functions to ensure a safe installation.

SENSORS

Thermal sensors embedded in the stator windings prevent overheating, and a leakage sensor in the inspection chamber minimizes the risk for bearing and stator failure.

LONG-LIFE BEARINGS

Durable bearings provide a minimum service life of 50,000 hours.

ENDURING SEALS

The Flygt Plug-in™ seal with the Active Seal™ system offers increased sealing reliability and zero leakage into the motor, thereby reducing the risk of bearing and stator failure.





Performance Data



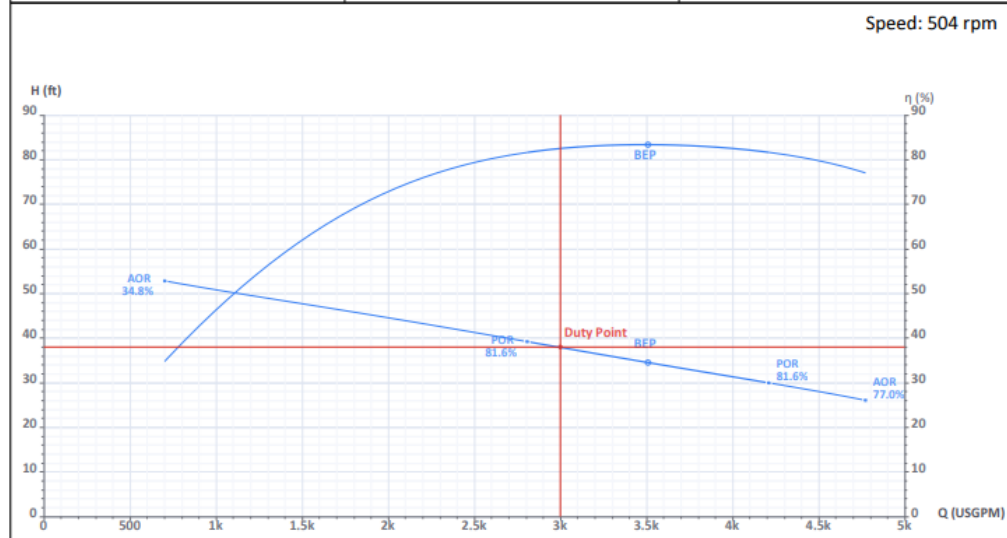
L12F-VM

Project:
Customer:
Date created: 28.04.26

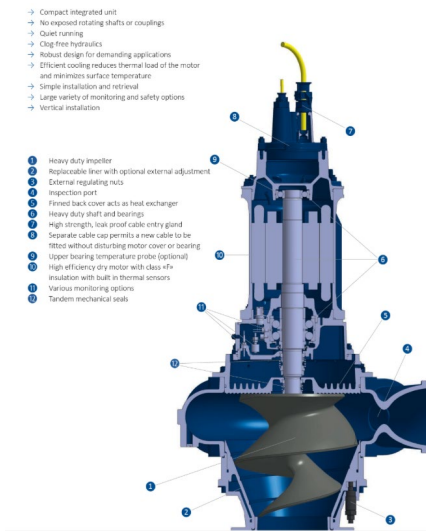
Disclaimer: The curves shown represent the hydraulic performance for water at 20°C. All measured values apply to Hidrostal standard cast materials. Pump tests are carried out in accordance with ISO 9906:2012.

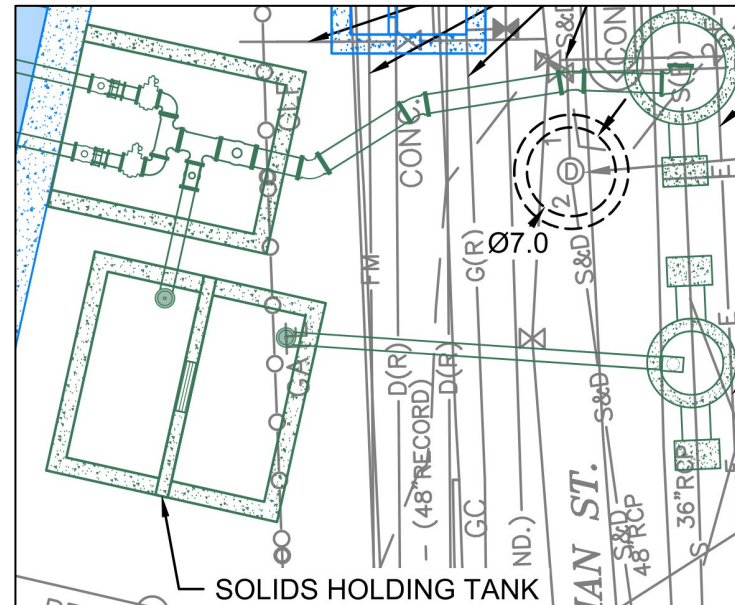
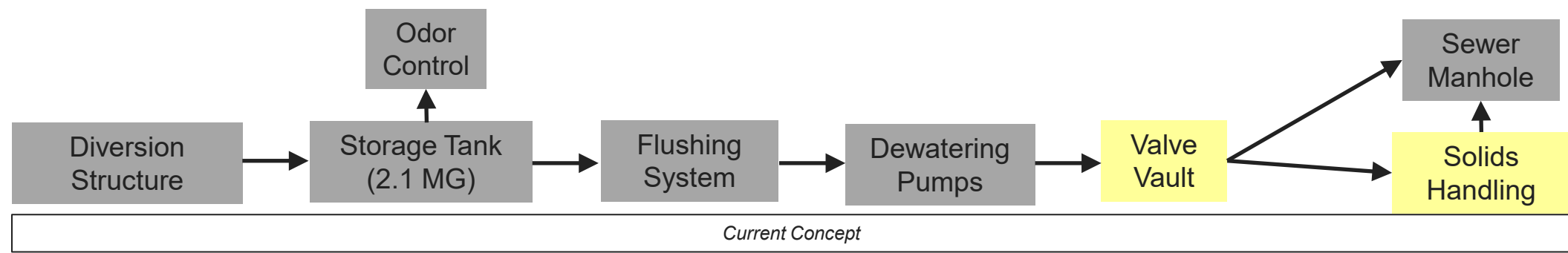


D = 200 mm

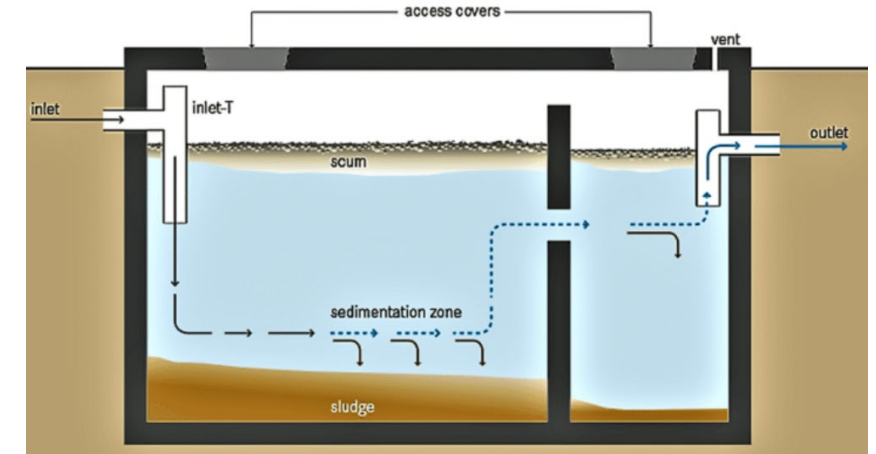


- Power 40 HP Discharge DN 12"
- Duty Point 3000 GPM @ 38 ft TDH
- Larger **solids passing diameter (8")** screw type impeller
- Higher max flow pump curve should operate better at high water level



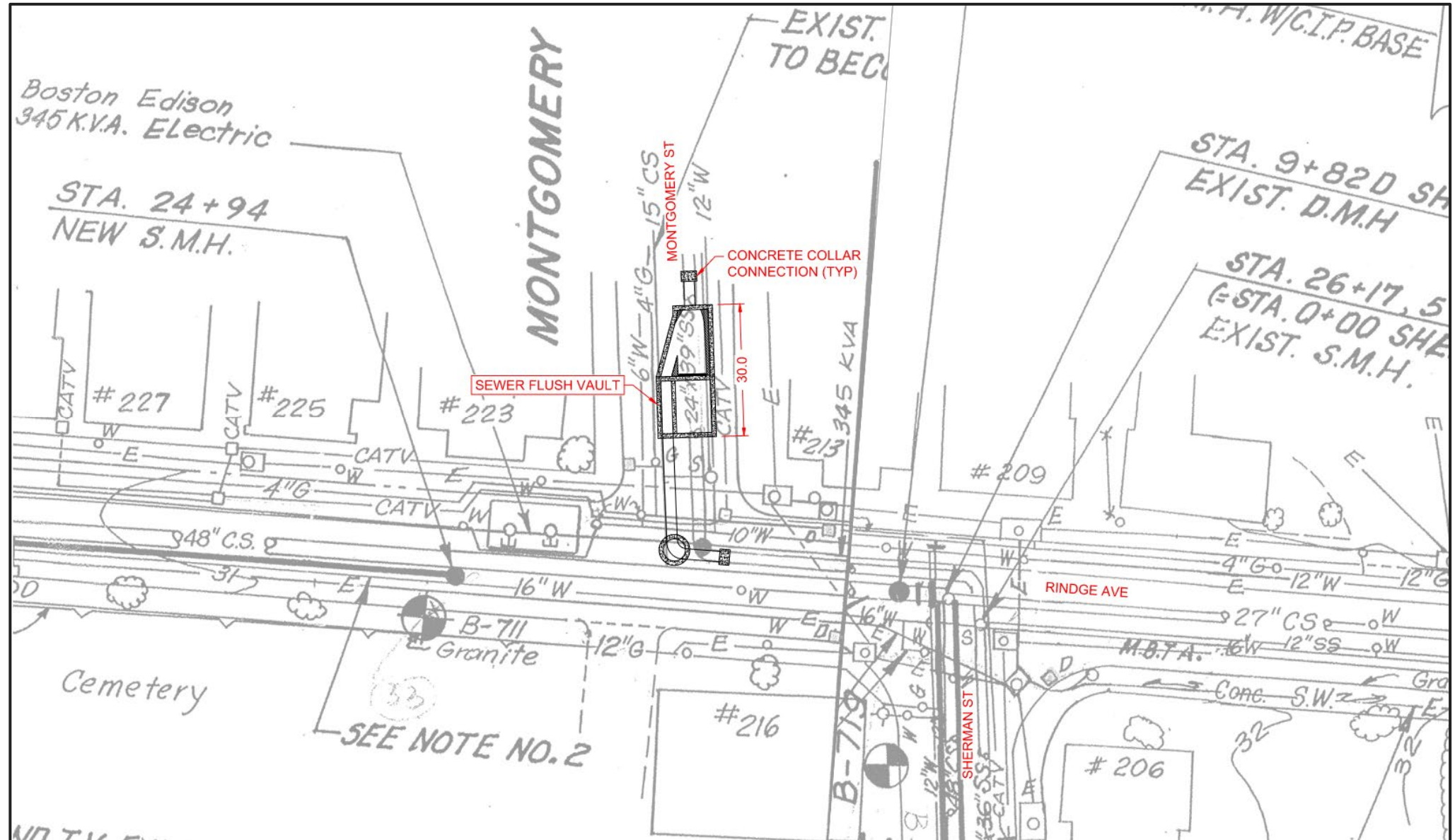


*Ultimately very small dry weather volume
connected to combined sewer*



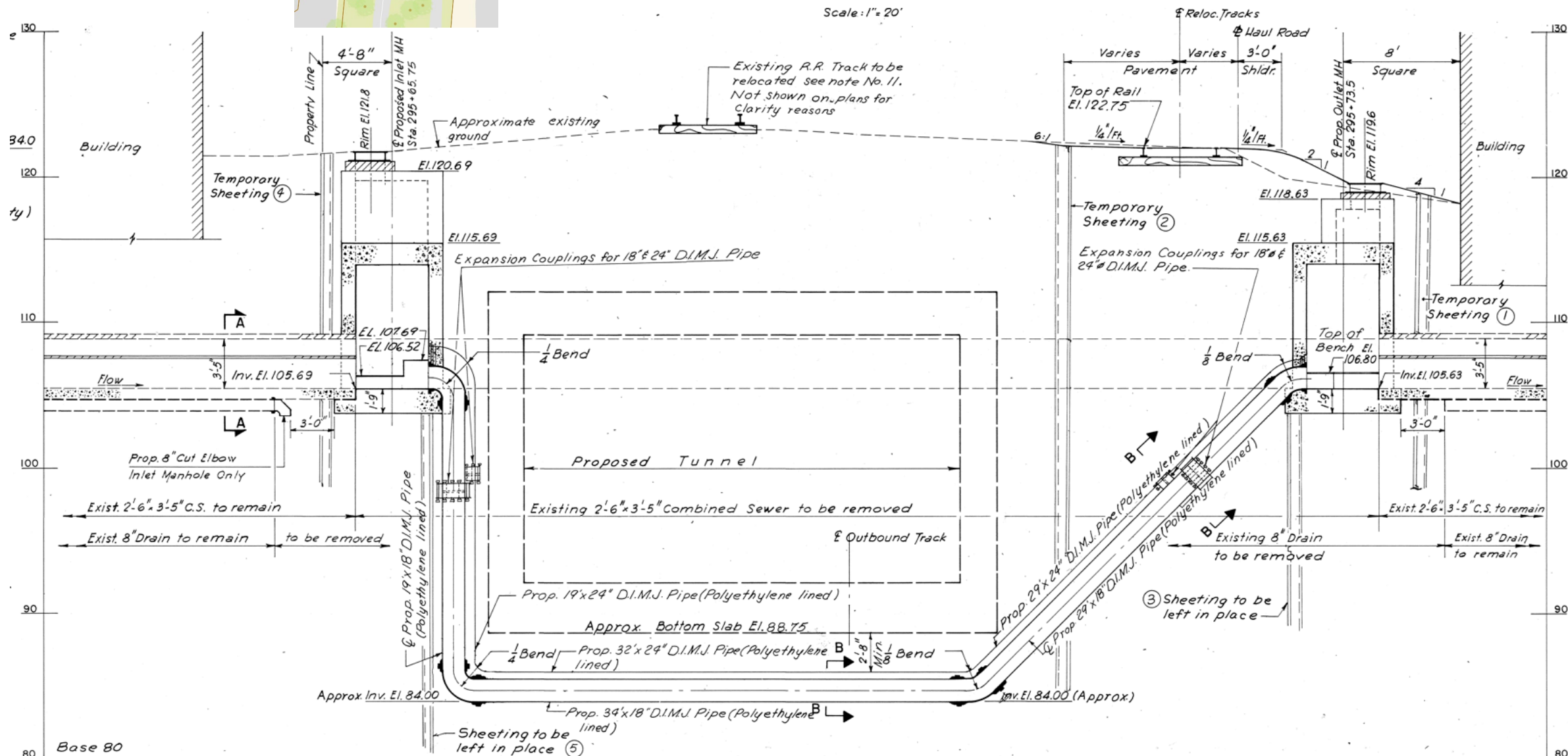


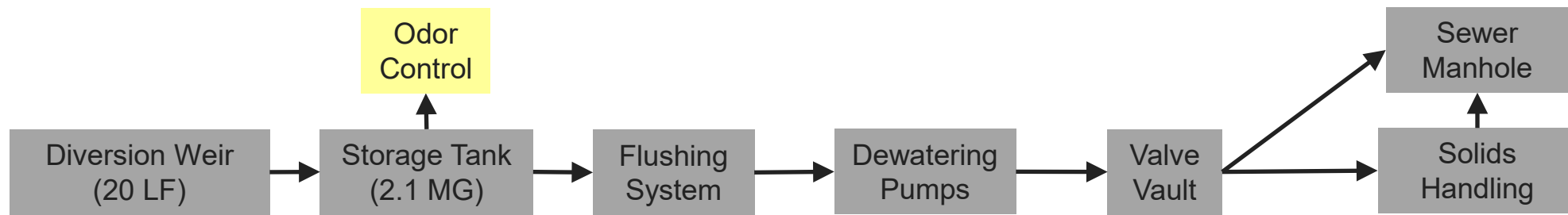
Solids Handling Alternatives





Scale: 1" = 20'





Current Concept – Rectangular Pure Air Model 7102



- Width = 11', Length = 29'-5", and Height = 10'-5"
- Recommended 3' continuous clearance around unit
- Larger footprint, lower profile, easier maintenance

Odor Control Alternative – Radial Pure Air Model 0810



- Width = 14'-2", Length = 13', Height = 13'-5"
- Recommended 3' continuous clearance around unit
- Smaller footprint, higher profile, more challenging maintenance



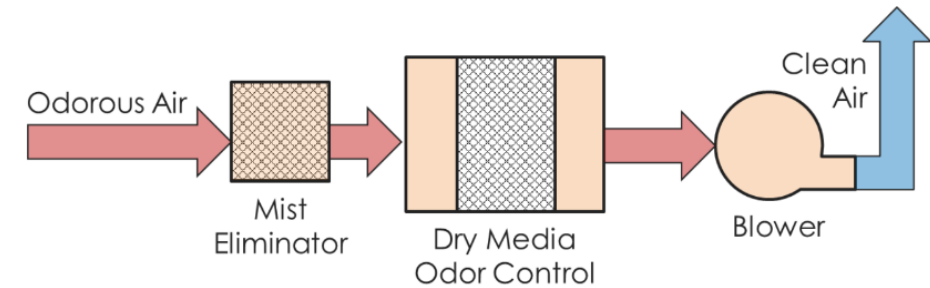
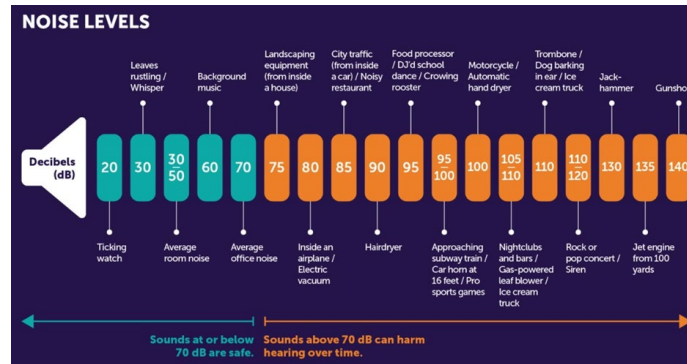
Perimeter enclosure

- Easy walk-in access
- Provides sound protection and visual screening from public



Motor Enclosure

- Classified space and requires dedicated ventilation and electrical classification for safety.
- Can have an open top but then water, snow, debris gets trapped
- Enclosure must be fully removed for fan/motor repairs.
- Additional site screening fence or security fence still required



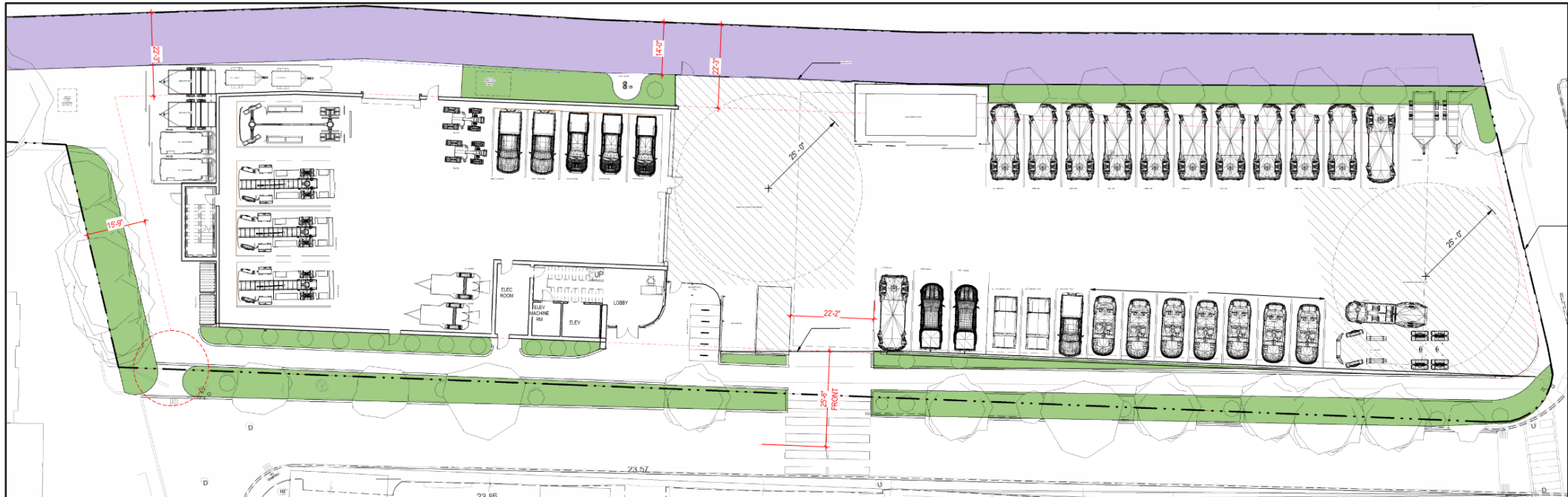
- Odor Control Discharge Sound Pressure = 94 dBA @ 5-ft
- Odor Control Radiated Sound Pressure = 82 dBA @ 5-ft
- Noise Control Ordinance for a Residential Area = 50 dBA
- Both enclosure options should drop sound pressure well below the noise ordinance level. Sound test study can be accomplished to confirm.

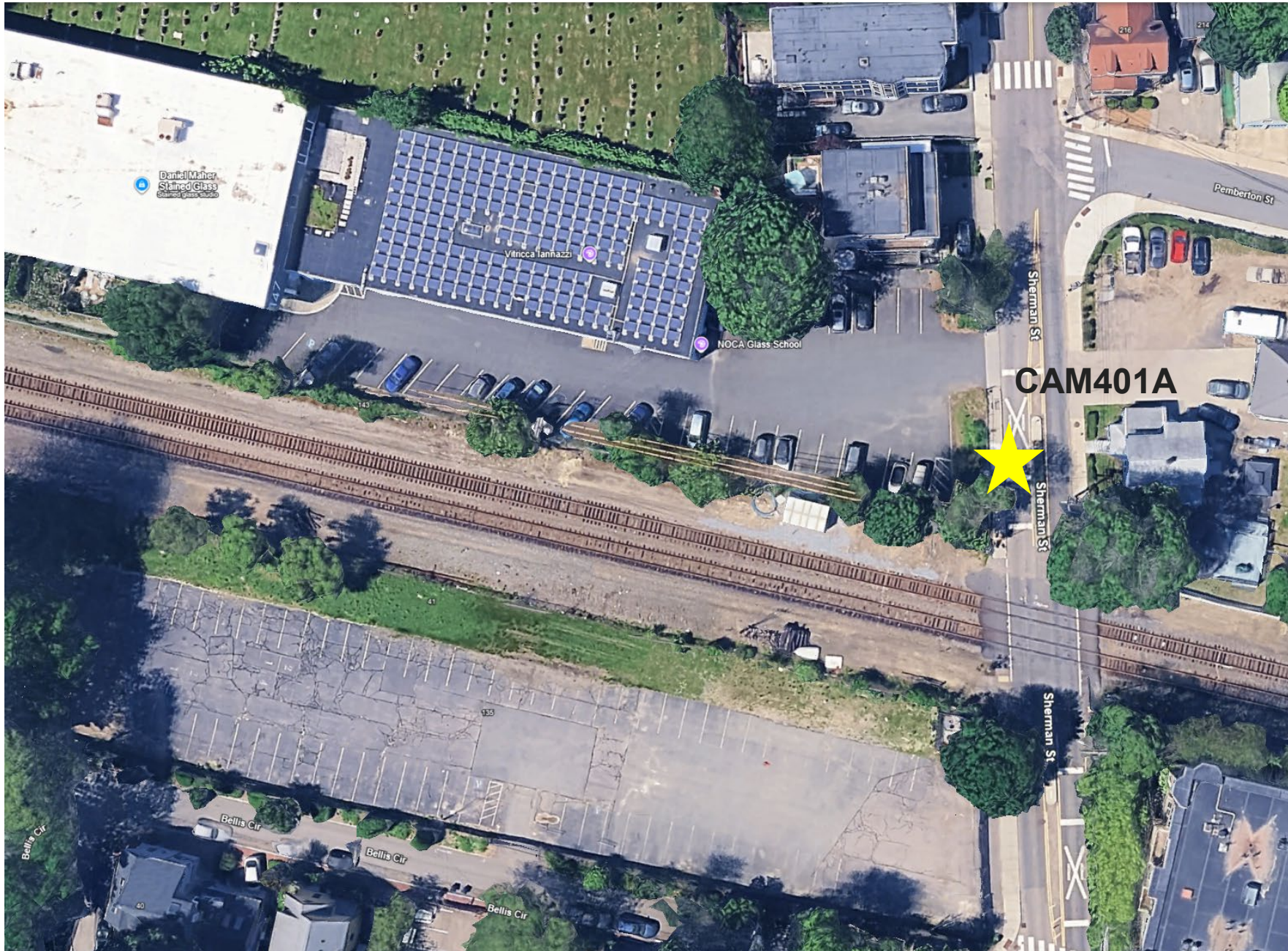
- Blower shall operate during:
 - tank filling
 - tank dewatering
 - tank cleaning
- Blower will not operate during dry weather

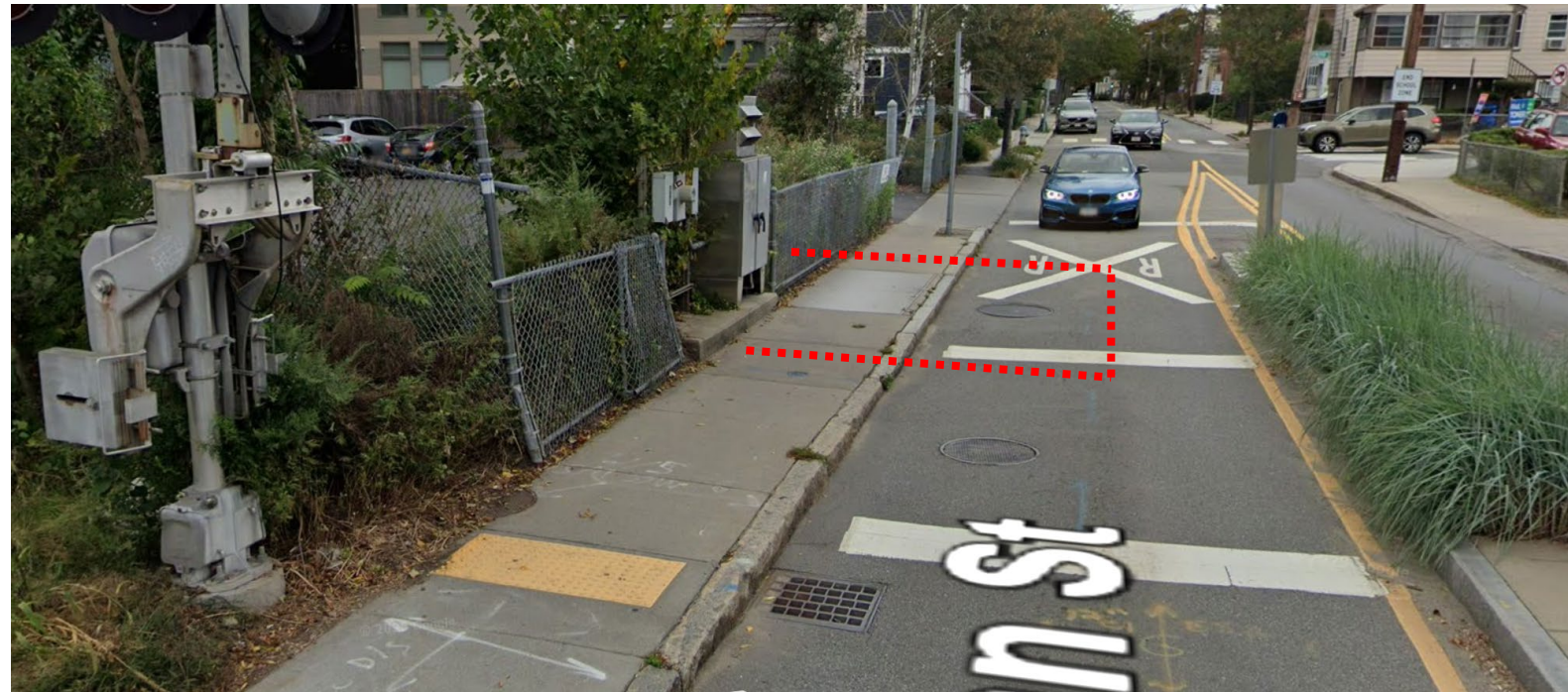
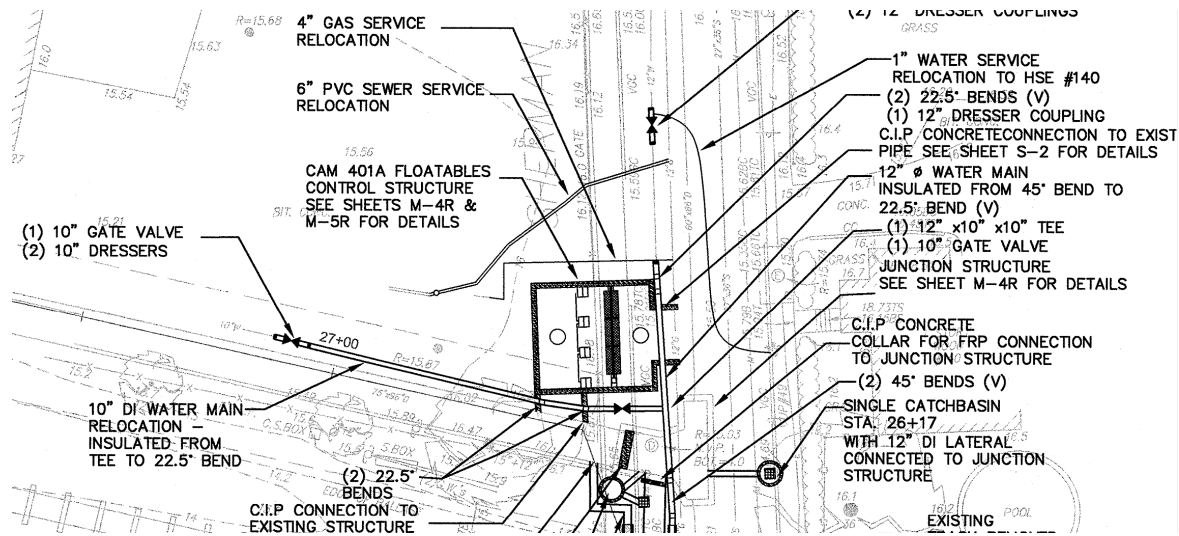


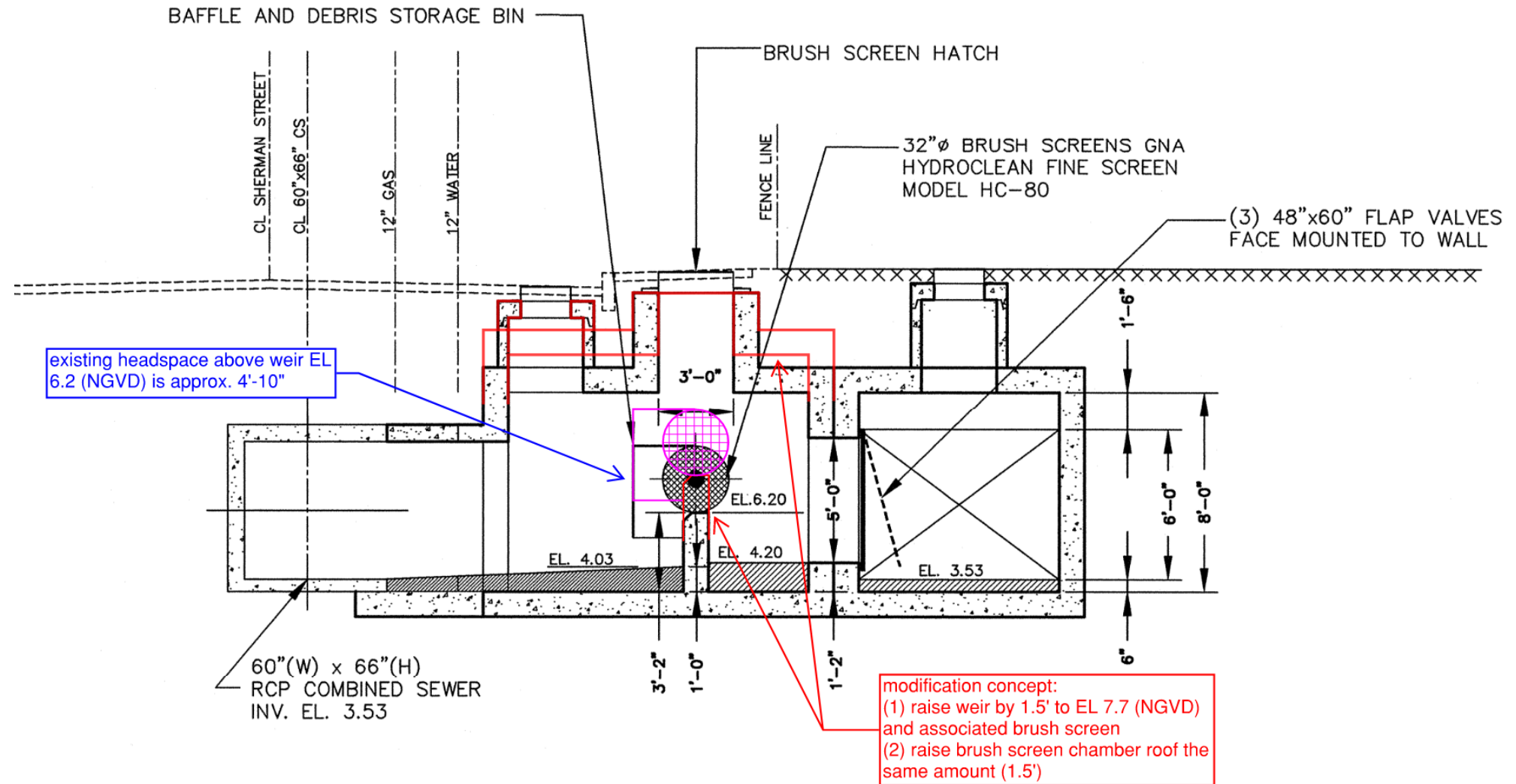
Open discussion DPW Building and Storage Tank:

- Electrical Loading confirmed (building and tank) – *Eversource contact representative for City of Cambridge?*
- Site use – parking lot with DPW vehicles. *Stockpile yard?*













Open Discussion

