

FEHR GRAHAM

ENGINEERING & ENVIRONMENTAL

South Beloit Wastewater Treatment Plant

October 17, 2018

Insight ■ Experience ■ Results

Existing Conditions

- » No major improvements since mid-1980's
- » Deferred maintenance from lack of funding

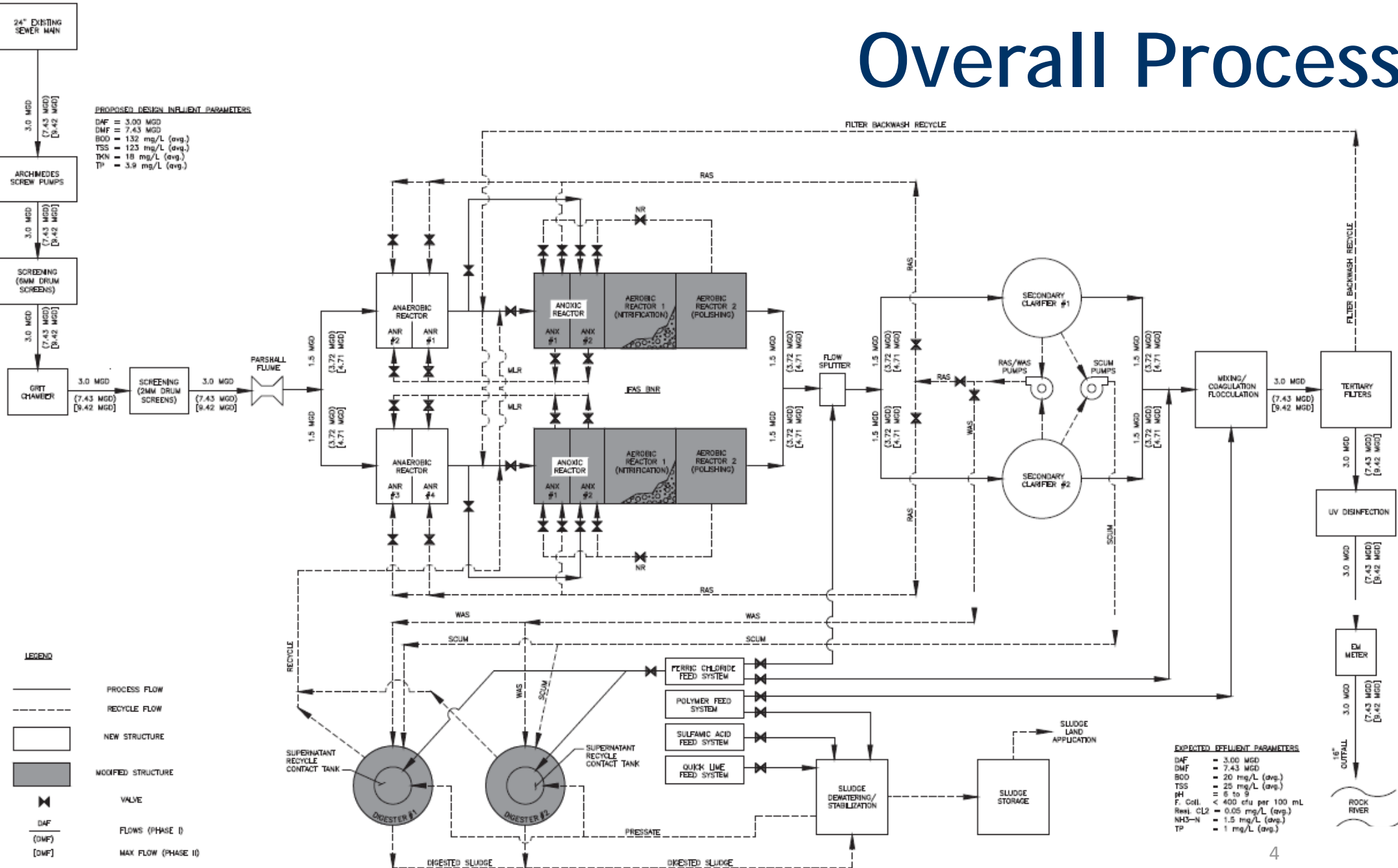


Existing Conditions

- » Ineffective three train split
- » No ability to measure or control solids balance



Overall Process Flow

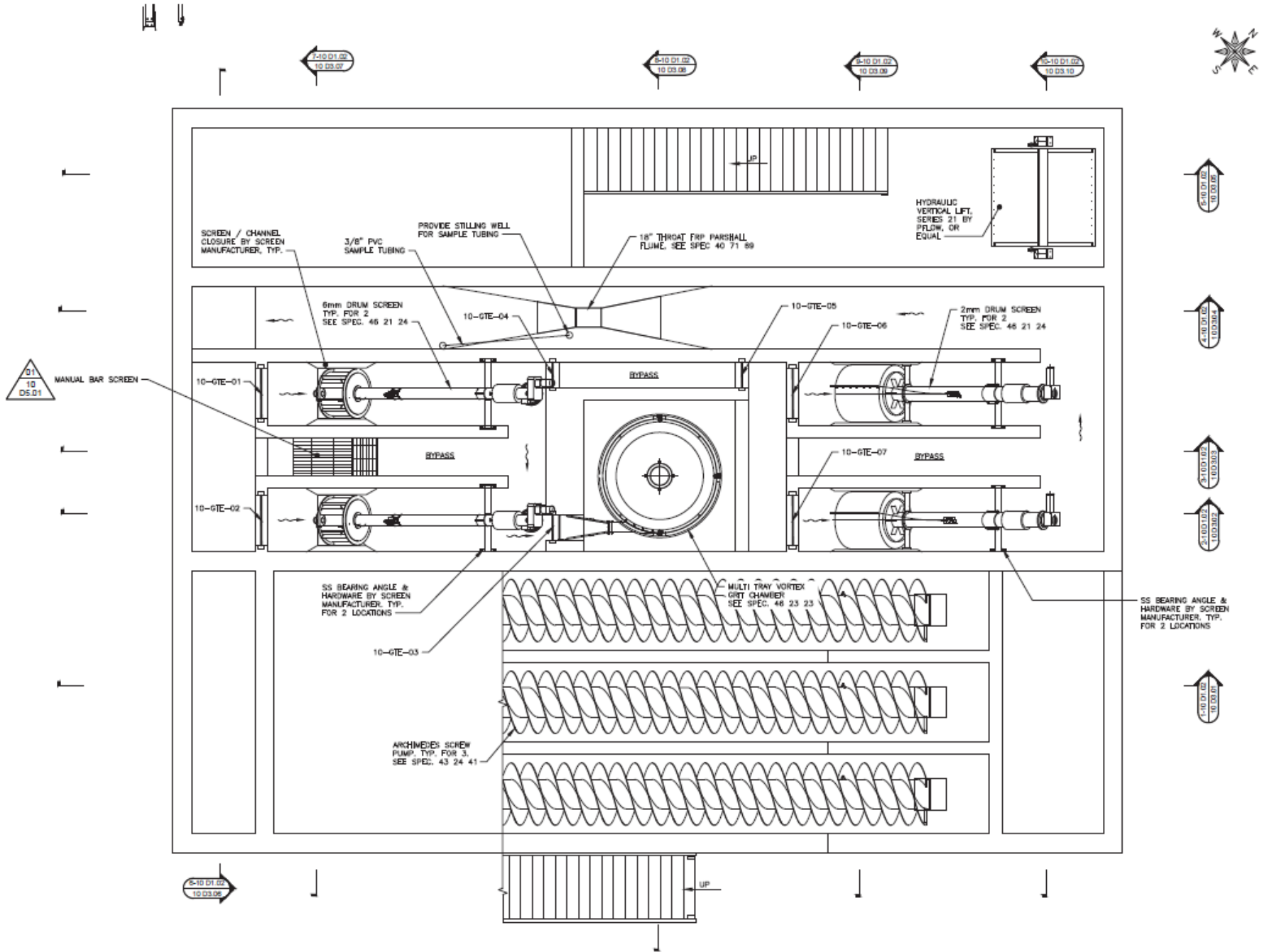


- » Dual screening
- » Multi-tray grit removal
- » Pros and cons

Headworks

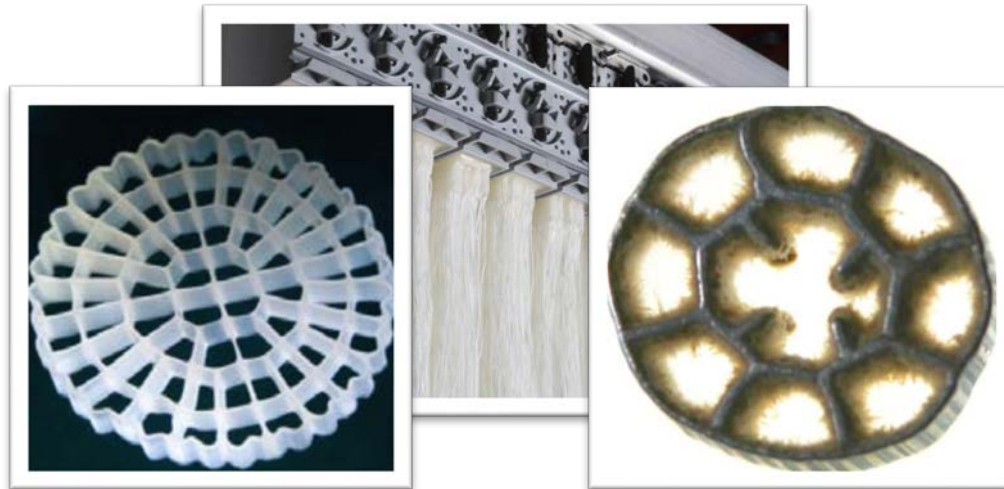


Headworks

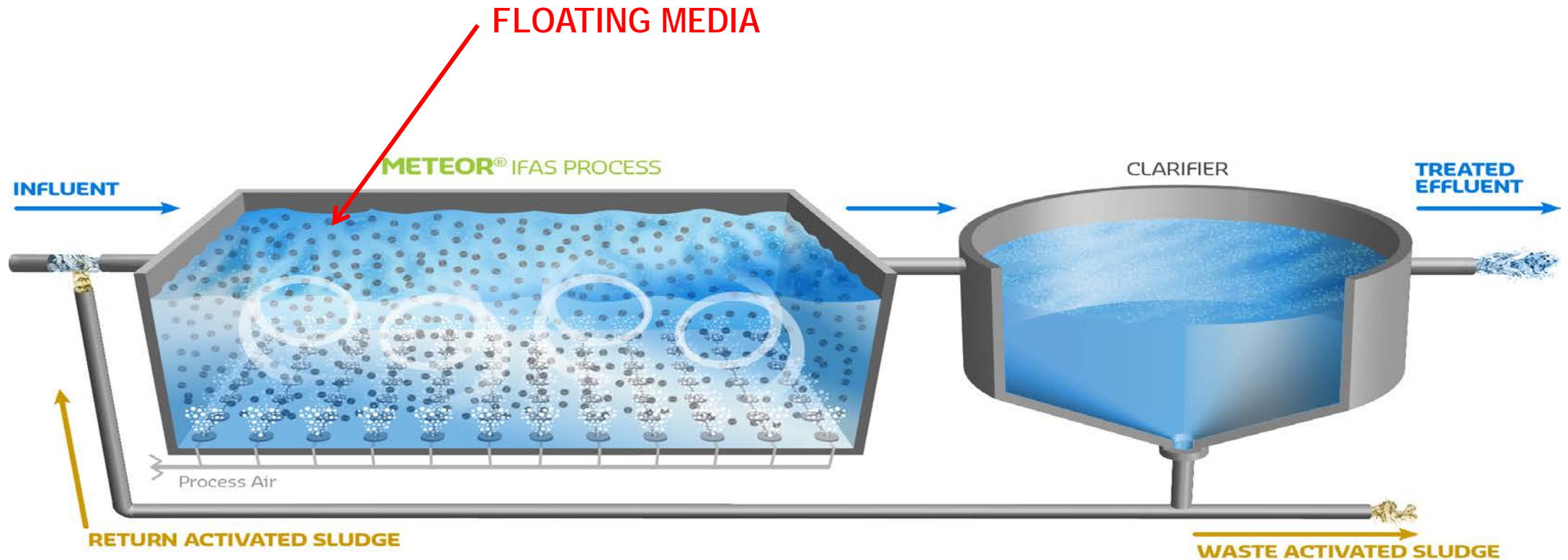


IFAS & MBBR

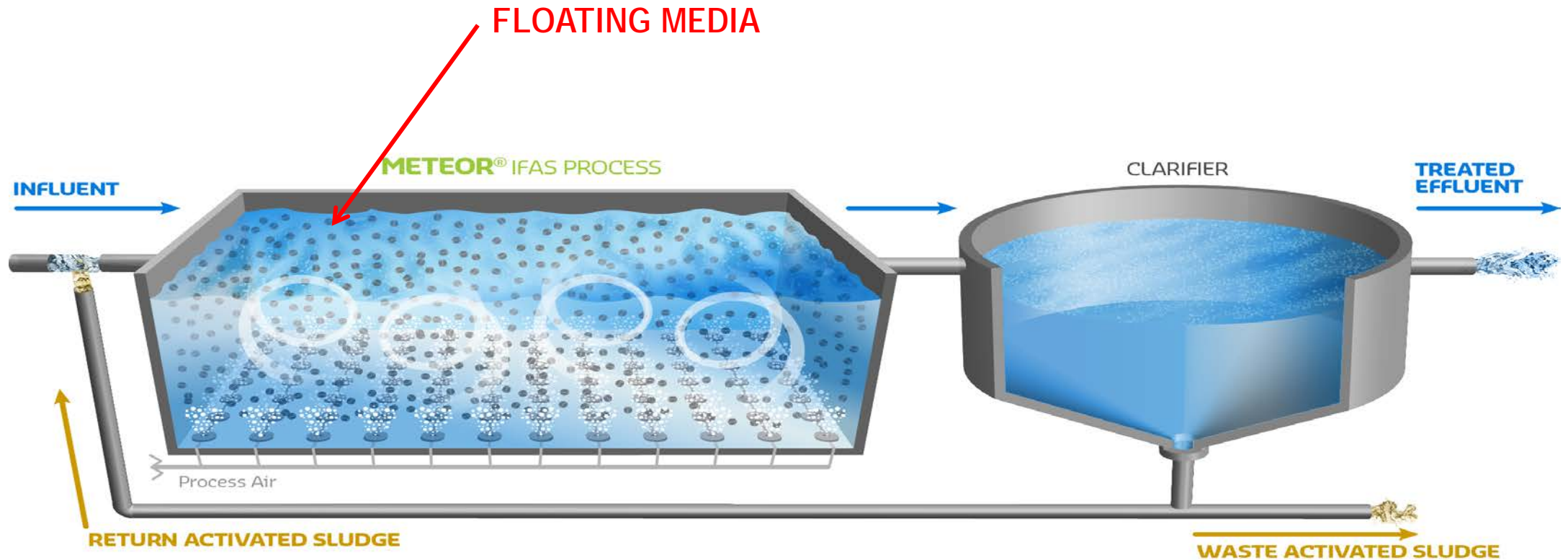
- » Integrated Fixed Film Activated Sludge (IFAS)
 - Suspended-growth biofilm systems that incorporate fixed or free-moving biofilm carriers with high surface area
- » Moving Bed Biofilm Reactor (MBBR)
 - Same concept as IFAS except that return activated sludge is not part of the process



IFAS Process

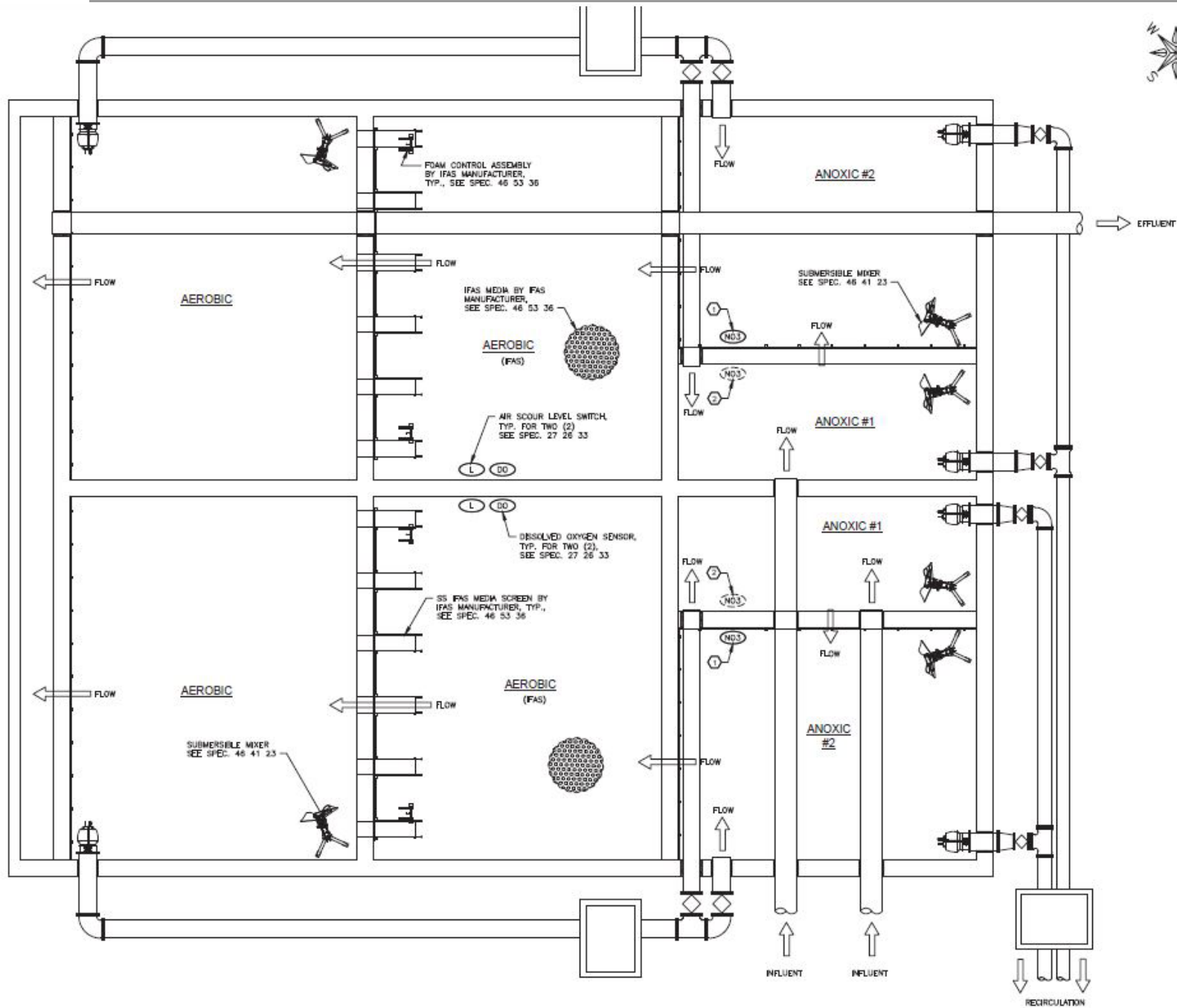


MBBR Process



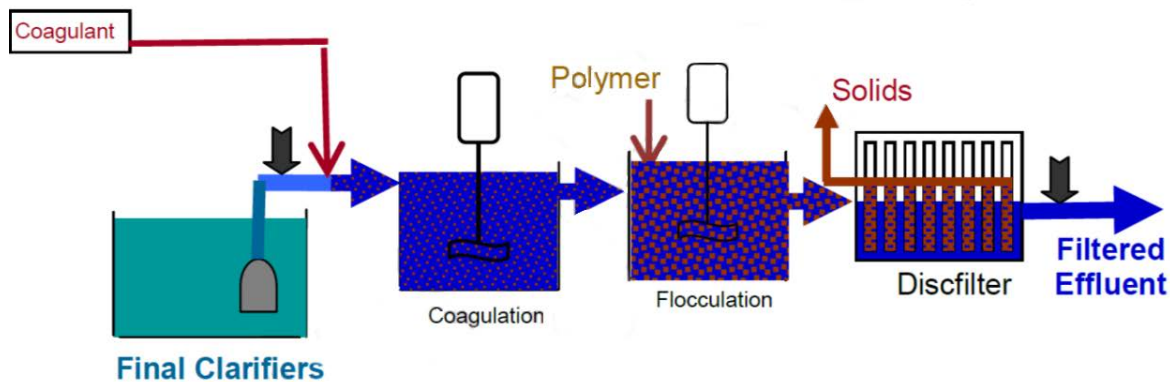
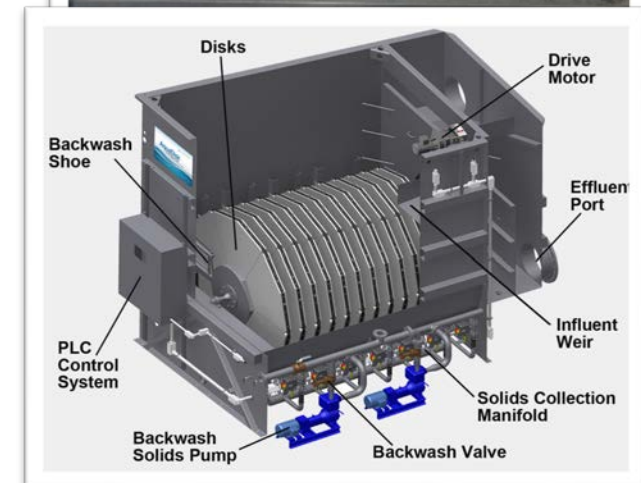
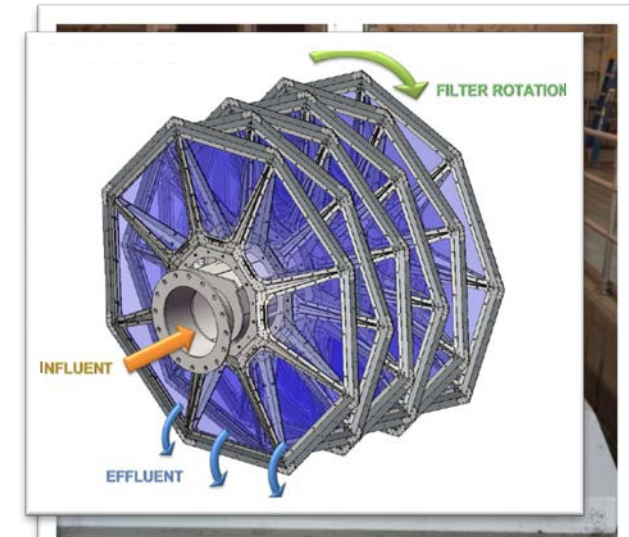


IFAS & MBBR



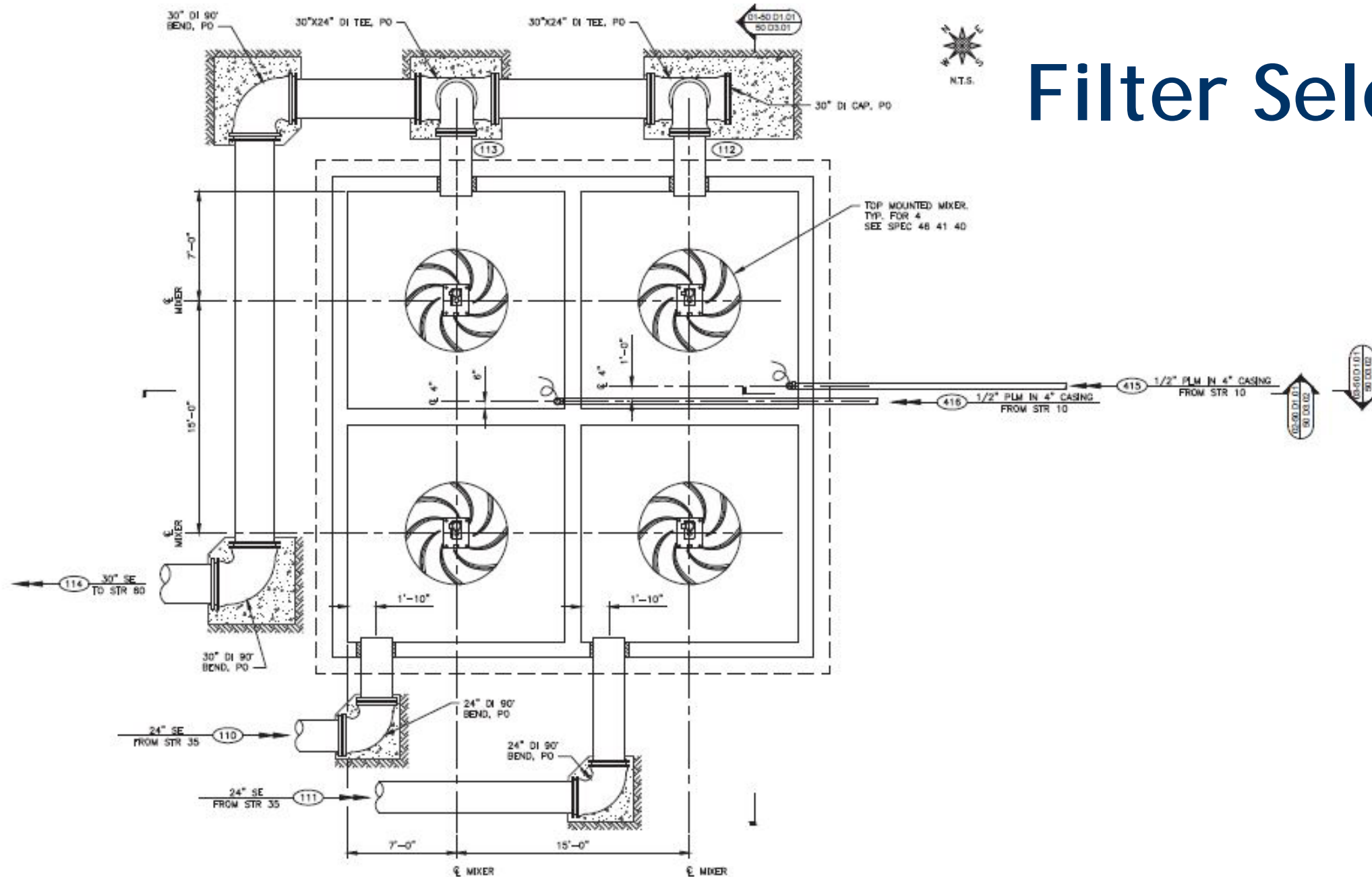
Filter Selection

- » Conventional Coagulation - Flocculation - Filtration for TPWQBEL
- » Inside/out
 - Backwash method
- » Media types
- » Potential for EF treatment



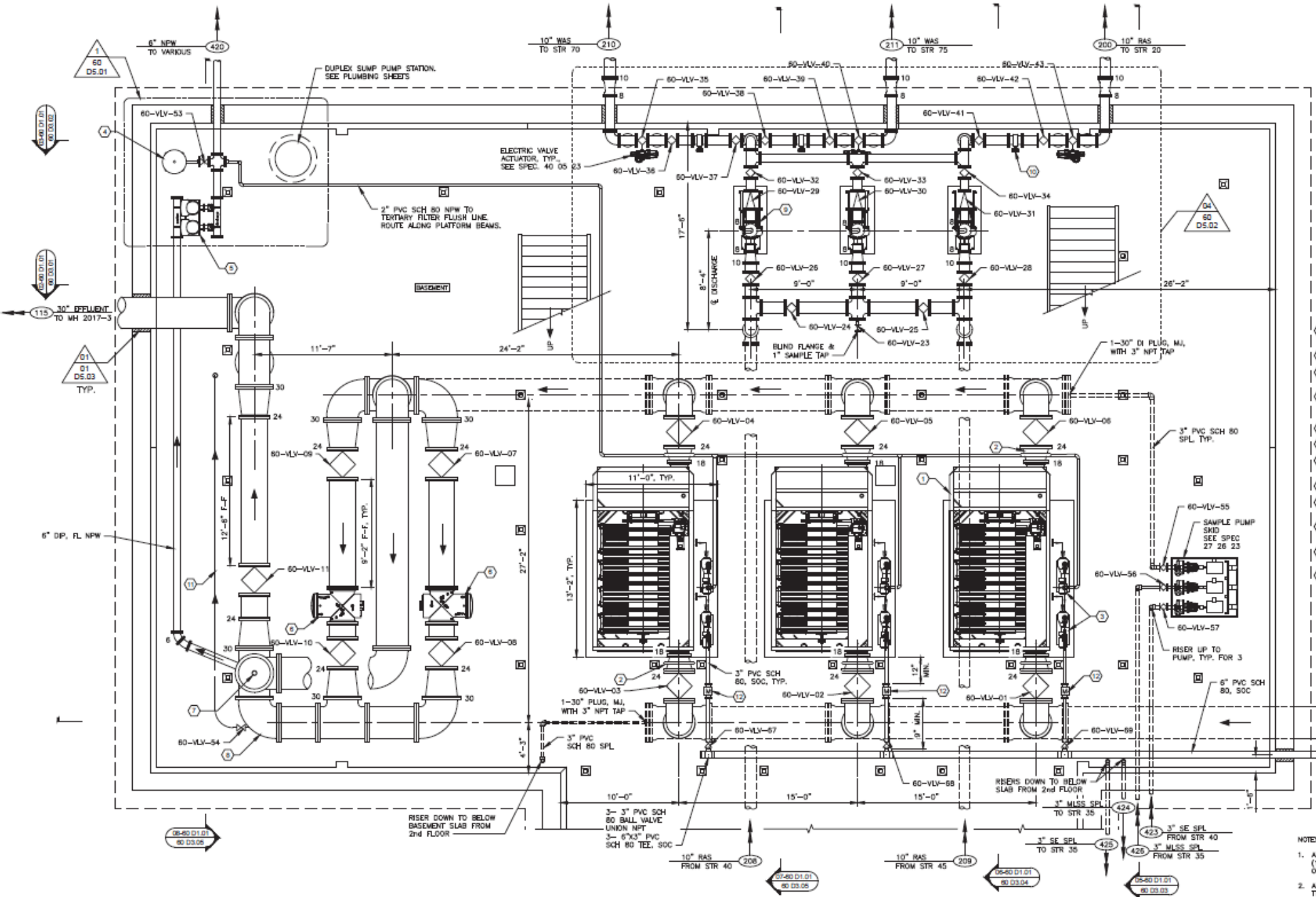
↓ Laboratory Sample:
TP and OP

Filter Selection





Filter Selection



KEYED NOTES

- 1 TERTIARY FILTER. SEE SPEC 46 61 41. TYP. FOR THREE (3).
- 2 24"x18" FLEXIBLE EXPANSION JOINT REDUCER.
- 3 BACKWASH/SOLID WASTE PUMPS, BY FILTER MANUFACTURER. SEE SPEC. 46 61 41
- 4 100 GAL. BLADDER TYPE EXPANSION TANK. 85 PSIG - 85 PSIG, BY NPW BOOSTER SYSTEM MANUFACTURER. SEE SPEC 40 23 20
- 5 NPW BOOSTER SYSTEM. SEE SPEC. 40 23 20
- 6 UV DISINFECTION VESSEL SEE SPEC. 46 66 13
- 7 BLIND FLANGE THREADED FOR 4" PVC DHW TO VENT.
- 8 90° BEND WITH 3/8" TAP AND BALL VALVE.
- 9 RAS/WAS PUMP. SEE SPEC. 43 26 14.01 TYP. FOR 3
- 10 MAGNETIC FLOWMETER. SEE SPEC. 40 71 13. TYP. FOR 3
- 11 3/4" VINYL SAMPLE TUBING TO COMPOSITE SAMPLER ON GROUND LEVEL.
- 12 FILTER BACKWASH FLOW METER, BY FILTER MANUFACTURER. SEE SPEC. 46 81 41

NOTES:

- 1. ALL BELOW-GRADE PIPING IS PVC C900/905, DR 25 (12" AND LESS), DR41 (14" AND ABOVE), UNLESS OTHERWISE NOTED.
- 2. ALL BELOW-GRADE FITTINGS ARE D.I. PUSH-ON WITH THRUST BLOCKING.

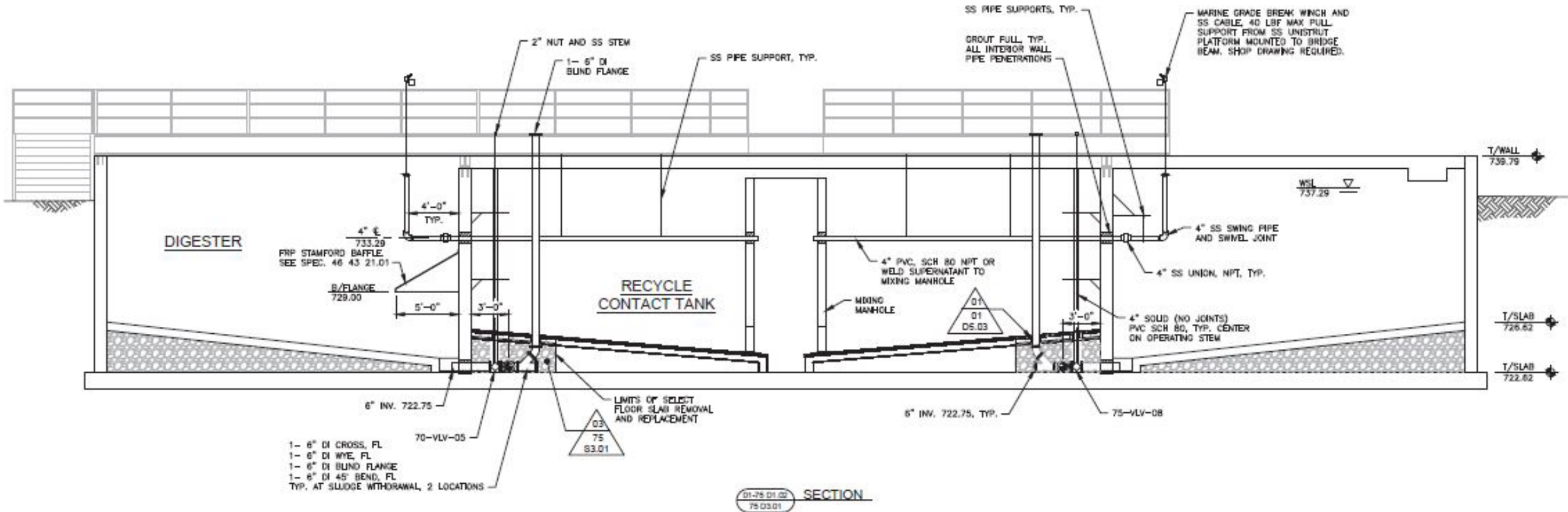
Cyclic Anoxic/Aerobic Digestion

- » Sequencing AX/AR in time
- » DO/ORP Control
- » Solids reduction/oxygen reduction/alkalinity recovery

Class A/Class B Dewatering

- » Conventional screw press
- » Alkaline stabilization/pasteurization
- » Flexibility

Cyclic Anoxic/Aerobic Digestion



Class A/Class B Dewatering

» Class A without pressing



Class A/Class B Dewatering

» Class B without alkaline

