

NOTE: TOTAL SYSTEM CAPACITY: 1,300 GALLONS PER DAY
RATED CAPACITY: 500 GALLONS PER DAY

GENERAL PUMP NOTES

1. **GENERAL**—
FURNISH AND INSTALL A COMPLETE PUMPING SYSTEM CONSISTING OF A SUBMERSIBLE SEWAGE PUMP AND MOTOR, DISCHARGE PIPING AND VALVES, FLOAT SWITCH LEVEL CONTROLS, HIGH WATER ALARM, SIMPLEX CONTROL PANEL AND A PRECAST CONCRETE PUMP CHAMBER. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS AND SHALL BE WARRANTED FOR AT LEAST ONE YEAR. THE CONTRACTOR SHALL PROVIDE A SUFFICIENT QUANTITY OF CLEAN WATER TO CONDUIT TWO PUMP OPERATION TESTS.

2. **PUMP CHAMBER**—
THE PUMP CHAMBER SHALL BE A REINFORCED PRECAST CONCRETE STRUCTURE. CONSTRUCTION JOINTS AND OPENINGS SHALL BE SEALED WITH A HYDRAULIC CEMENT OR OTHERWISE MADE WATERTIGHT.

3. **PUMP AND MOTOR**—
PUMP AND MOTOR SHALL BE MYERS SRM-4 SUBMERSIBLE SEWAGE PUMP CAPABLE OF PASSING 2-INCH SOLIDS. PUMP AND MOTOR SHALL BE FULLY SUBMERSIBLE AND SHALL OPERATE AT 1,000 RPM WITH A 220V, 60 CYCLE, SINGLE PHASE AC POWER SOURCE. (NOTE: ELECTRICAL CONTRACTOR SHALL VERIFY AVAILABLE VOLTAGE AT THE PUMP CONTROL PANEL PRIOR TO CONSTRUCTION.) PUMP SHALL BE RATED AS FOLLOWS:

H.P. 4/10 H.P.
RATE: 67 GPM
TDH: 8.5 FEET
MODEL: MYERS SRM-4 — OR EQUAL (SEE SYSTEM CURVE)

4. **PIPING**—
2-INCH (SCHEDULE 80) PVC PIPE AND FITTINGS SHALL BE USED FOR INTERIOR PUMP STATION DISCHARGE PIPING AND FITTINGS. THE SEWAGE FORCE MAIN SHALL BE 2-INCH DIAMETER SDR 21 PVC PIPE OR EQUAL. THE DISCHARGE LINES WITHIN THE PUMP CHAMBER SHALL INCLUDE THE FOLLOWING:

- 1) IN THE VERTICAL POSITION: A 2-INCH CHECK VALVE.
- 2) IN THE HORIZONTAL POSITION: A 2-INCH BALL VALVE.

ALL PIPING BETWEEN THE PUMP CHAMBER AND THE DISTRIBUTION BOX SHALL BE INSULATED. (SEE NOTE 8)

5. **LEVEL CONTROLS**—
SEALED FLOAT TYPE MECHANICAL SWITCHES SHALL BE SUPPLIED TO CONTROL THE PUMP LEVEL AND ALARM SIGNAL. THREE FLOAT SWITCHES SHALL BE USED TO CONTROL THE PUMP LEVEL: ONE EACH FOR PUMP "ON" AND FOR PUMP "OFF" AND A THIRD SWITCH SHALL BE PROVIDED WITH A POWER SOURCE SEPARATE FROM THE PUMP POWER AND SHALL BE FOR THE ALARM UNIT. THE ALARM SHALL BE LOCATED IN THE BUILDING SERVED BY THE SYSTEM. FLOAT SWITCHES SHALL BE OF THE MECHANICAL TUBE TYPE SEALED IN POLYURETHANE FLOATS. THE FLOAT LEVEL CONTROLS SHALL BE SET TO OPERATE AT THE ELEVATIONS INDICATED ON THE PLANS. FLOATS AND ALARMS SHALL BE WIRED TO THE CONTROL BOX IN THE DWELLING WITHOUT THE USE OF A JUNCTION BOX.

6. **CONTROL PANEL**—
THE SIMPLEX CONTROL PANEL SHALL BE EQUIPPED WITH A RUN LIGHT FOR THE PROPERLY SIZED PUMP CIRCUIT BREAKERS, A TRANSFORMER TO GIVE PROPER VOLTAGE TO THE CONTROL CIRCUITS AND A THREE-WAY HAND CONTROL SWITCH. THE SWITCH POSITIONS SHALL BE AS FOLLOWS:

- 1) PUMP OFF
- 2) AUTOMATIC PUMP ON
- 3) MANUAL PUMP ON

THE CONTROL PANEL SHALL BE HOUSED IN A NEMA-1 CONTROL BOX FOR 220V, SINGLE PHASE OPERATION. PANEL SHALL BE INSTALLED IN A SUITABLE LOCATION INSIDE THE BUILDING.

7. **ALARM**—
A HIGH WATER ALARM SHALL BE SUPPLIED WITH BOTH AUDIBLE AND VISUAL ALARM WITH A SEPARATE POWER SUPPLY FROM THE PUMP. THE ALARMS SHALL BE MOUNTED IN A NEMA-1 ENCLOSURE SEPARATE FROM THE CONTROL PANEL. AN ALARM SILENCER BUTTON SHALL BE PROVIDED TO SILENCE THE AUDIBLE ALARM WHILE THE VISUAL ALARM REMAINS ILLUMINATED UNTIL MANUALLY RESET.

8. **PIPE INSULATION**—
FORCE MAIN SHALL BE COVERED WITH 2-INCH, THICK RIDGED POLYSTYRENE INSULATION.

9. **EFFLUENT TEE FILTER**—
EFFLUENT TEE FILTER SHALL BE ZABEL A-1800 OR EQUAL DEP APPROVED FILTER.

1. **GENERAL**—
FURNISH AND INSTALL COMPLETE NORWECO SINGULAR MODEL TMT-500-600 QPD SYSTEM WITH ALL NECESSARY PARTS AND EQUIPMENT AS DESCRIBED IN THE OWNERS MANUAL. TREATMENT OF WASTEWATER SHALL BE ACCOMPLISHED BY THE EXTENDED AERATION PROCESS WITH NON-MECHANICAL FLOW EQUALIZATION. PRETREATMENT OF THE INFLUENT AND FILTRATION OF THE EFFLUENT. ALL TREATMENT PROCESSES SHALL BE CONTAINED WITHIN REINFORCED PRECAST CONCRETE TANKAGE MEETING REQUIREMENTS OF AQ STANDARD SYS. THE SYSTEM SHALL BE CAPABLE OF REDUCING TOTAL NITROGEN WITHOUT THE ADDITION OF CHEMICALS. SPECIALIZED ADD-ON PROCESSES OR ADDITIONAL COMPONENTS. NITRIFICATION AND DENITRIFICATION SHALL BE ACCOMPLISHED WITH THE CHAMBERS OF THE TREATMENT SYSTEM PRIOR TO EFFLUENT DISPOSAL. THE TREATMENT SYSTEM SHALL INCLUDE PRECAST CONCRETE TANK PROVIDING PRETREATMENT, AERATION AND CLARIFICATION CHAMBERS. PRINCIPLE COMPONENTS SHALL BE 1725 RPM MECHANICAL AERATOR, UL LISTED SERVICE PRO CONTROL CENTER WITH MCD TECHNOLOGY, BIO-STATIC SLUDGE RETURN AND BIO-KINETIC TERTIARY TREATMENT DEVICE FOR FLOW EQUALIZATION AND FINAL FILTRATION OF SYSTEM EFFLUENT.

2. **OPERATING CONDITIONS**—
TOTAL HOLDING CAPACITY SHALL PROVIDE A MINIMUM OF 48 HOUR RETENTION OF THE DAILY FLOW. THE PRETREATMENT CHAMBER SHALL PROVIDE AT LEAST 18 HOUR RETENTION. EXTENDED AERATION CHAMBER SHALL PROVIDE AT LEAST 24 HOUR RETENTION AND THE CLARIFICATION SHALL PROVIDE AT LEAST 6 HOUR RETENTION.

3. **PRETREATMENT CHAMBER**—
PRETREATMENT SHALL BE AN INTEGRAL PART OF THE WASTEWATER TREATMENT SYSTEM. ALL DOMESTIC WASTEWATER SHALL BE PRECONDITIONED AND FLOW EQUALIZED WHILE PASSING THROUGH THE PRETREATMENT CHAMBER PRIOR TO BEING INTRODUCED TO THE EXTENDED AERATION CHAMBER. THE OUTLET OF THE PRETREATMENT CHAMBER SHALL BE EQUIPPED WITH A DISCHARGE TEE THAT EXTENDS VERTICALLY INTO THE LIQUID SO THAT ONLY PRECONDITIONED EQUALIZED FLOW FROM THE CENTER AREA OF THE CHAMBER IS DISPLACED TO THE EXTENDED AERATION CHAMBER. THE DISCHARGE TEE AND TRANSFER PORT SHALL BE OF ADEQUATE SIZE TO HANDLE A PEAK FLOW FACTOR OF FOUR WITHOUT RESTRICTING THE OUTLET AND DISTURBING HYDRAULIC DISPLACEMENT TO THE EXTENDED AERATION CHAMBER. A REMOVABLE INSPECTION COVER SHALL BE CAST INTO THE TOP OF THE TANKS TO ALL TANK AND TRANSFER TEE INSPECTION. AS A SAFETY MEASURE, THE UNCOVERED OPENING SHALL BE SMALL ENOUGH TO INSURE THAT THE TANK CANNOT BE ENTERED FOR INSPECTION OR SERVICE.

4. **AERATION CHAMBER**—
CHAMBER SIZE SHALL BE OF SUFFICIENT SIZE TO PROVIDE A MINIMUM OF 80 CU FT PER POUND OF BOD. LENGTH TO WIDTH RATION SHALL PROVIDE UNIFORM MIXING AND OPTIMUM TREATMENT. CHAMBERS SHALL BE CONSTRUCTED OF REINFORCED 5,000 PSI, 28 DAY COMPRESSIVE STRENGTH PRECAST CONCRETE. CASTING SHALL BE MONOLITHIC WITH EXTERNAL AND INTERNAL WALLS.

5. **FINAL CLARIFICATION CHAMBER**—
FINAL CLARIFICATION CHAMBER SHALL CONSIST OF 5 FUNCTIONALLY INDEPENDENT ZONES OPERATING TOGETHER. LIQUID SHALL BE HYDRAULICALLY DISPLACED FROM THE INLET ZONE TO SLUDGE RETURN ZONE. NON-MECHANICAL EQUALIZATION OF THE FLOW THROUGH ALL 5 INDEPENDENT ZONES SHALL PROVIDE OPTIMAL SETTLING AND CLARIFICATION.

6. **BIO-STATIC SLUDGE RETURN**—
SHALL BE INSTALLED INTO THE CAST IN PLACE OPENINGS IN THE AERATION/CLARIFICATION CHAMBER WALL TO PROVIDE POSITIVE RETURN OF SETTLED SOLIDS. AERATION CHAMBER HYDRAULIC CURRENTS SHALL ENTER THE SLUDGE RETURN AND BE DIRECTED INTO THE SLUDGE RETURN ZONE OF THE CLARIFICATION CHAMBER. BIO-STATIC SLUDGE RETURN SHALL ACCOMPLISH RESUSPENSION AND RETURN OF SETTLED SOLIDS WITHOUT DISTURBING THE CLARIFIED LIQUID IN THE FINAL SETTLING ZONE AND OUTLET.

7. **MECHANICAL AERATOR**—
SINGULAR AERATION SHALL BE INSTALLED IN A CONCRETE AERATOR MOUNTING CASTING ABOVE THE AERATION CHAMBER. FRESH AIR SHALL BE SUPPLIED THROUGH A MOLDED PLASTIC VENT ASSEMBLY CAST INTO THE CONCRETE ACCESS COVER ABOVE THE AERATOR. SINGULAR AERATOR SHALL INCLUDE PLATED MOUNTING BRACKETS, NEMA 6 RATED ELECTRICAL CONNECTORS, UL RECOGNIZED FRACTIONAL HORSEPOWER MOTOR, MOLDED PLASTIC LIFTING HANDLE, MOLDED PLASTIC AIR INTAKE SCREENS, MOLDED PLASTIC FOAM RESTRICTOR, STAINLESS STEEL ASPIRATOR SHAFT AND MOLDED GLASS-FILLED NYLON ASPIRATOR TIP. THE MOTOR SHALL CONTAIN PRECISION MANUFACTURED O-RING TYPE SEALS INSTALLED BETWEEN THE MOTOR SHELL AND THE MACHINED ALUMINUM ENDBELLS TO ENSURE WATERTIGHT INTEGRITY. MOLDED NYLON SHAFT SEALS SHALL BE UTILIZED TO PROTECT THE BEARINGS FROM CONTAMINATION. ONLY THE STAINLESS STEEL ASPIRATOR SHAFT AND GLASS FILLED NYLON ASPIRATOR TIP SHALL BE INSTALLED IN CONTACT WITH THE LIQUID. SUBMERGED ELECTRICAL MOTORS, BEARINGS OR FIXED AIR PIPING SHALL NOT BE SUBMERGED. AERATOR MOTORS SHALL NOT BE DESIGNED TO EXCEED MOTOR NAMEPLATE RATING WHEN INSTALLED AND OPERATED AS RECOMMENDED FOR THE SYSTEM. FRACTIONAL HORSEPOWER MOTOR AERATOR MOTOR SHALL BE EQUIPPED WITH A FOAM RESTRICTOR TO PROTECT THE MOTOR AGAINST HIGH WATER AND FOAM. THE MOTOR POLE SHALL BE 4-POLE 1725 RPM 115 VOLT, 60 HERTZ SINGLE PHASE. BALL BEARING CONSTRUCTED WITH A 1.0 SERVICE FACTOR. IT SHALL DRAW LESS THAN 4.0 AMPS WHEN OPERATING AT THE RATED NAMEPLATE VOLTAGE. AERATOR MOTORS WITHOUT UL LISTING SHALL NOT BE CONSIDERED FOR THIS APPLICATION.

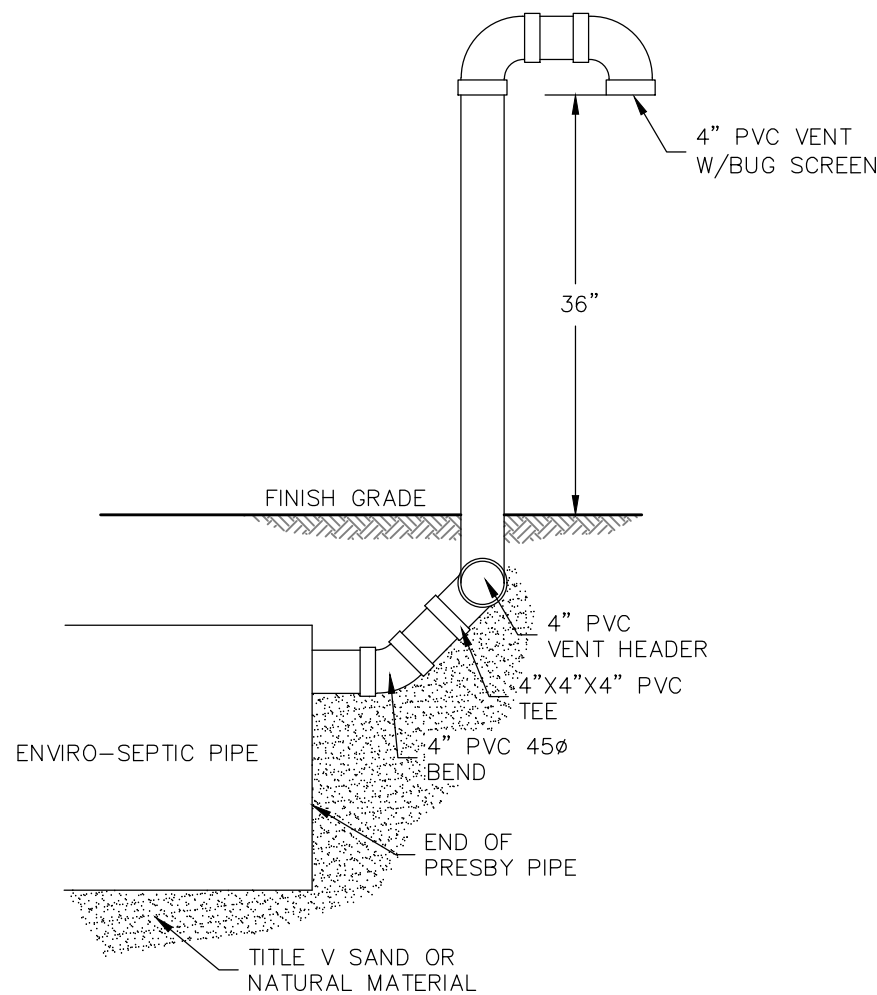
8. **SERVICE PRO CONTROL CENTER**—
SERVICE PRO CENTER WITH MCD TECHNOLOGY SHALL PROVIDE MONITORING, COMPLIANCE AND DIAGNOSTIC FUNCTIONS FOR THE SINGULAR TREATMENT USING A MICROPROCESSOR BASED PLATFORM. CONTROL CENTER SHALL CONTAIN NONVOLATILE MEMORY TO PREVENT LOSS OF PROGRAMMING IN THE EVENT OF A POWER FAILURE. PRE-WIRED CONTROLS SHALL BE MOUNTED IN A LOCKABLE NEMA RATED ENCLOSURE DESIGNED SPECIFICALLY FOR OUTDOOR USE. CONTROL CENTER SHALL BE UL LISTED AND INCLUDE FACTORY PROGRAMMED TIMER, ALARM LIGHT, RESET BUTTON, POWER SWITCH, POWER LIGHT, PHONE LIGHT, AERATOR ALARM LIGHT AND THREE AUXILIARY ALARM LIGHTS. CONTROL CENTER SHALL MONITOR ALL TREATMENT SYSTEMS INCLUDING AERATOR OVER CURRENT, AERATOR UNDER CURRENT AND OPEN MOTOR CIRCUIT. POWER TO THE AERATOR SHALL BE INTERRUPTED AND A DIAGNOSTIC SEQUENCE SHALL BEGIN AND VISUAL ALARM ACTIVATED IN THE EVENT THE CONTROL CENTER DETECTS AN ALARM. ALARM AND CONTROL CIRCUITS ARE TO BE CONNECTED TO INDEPENDENT POWER SOURCES FROM THE MAIN POWER SOURCE OF THE FACILITY.

9. **AERATOR TIME CYCLE**—
FACTORY PROGRAMMED TIMER BUILT INTO THE SERVICE PRO CONTROL CENTER SHALL PROVIDE A TOTAL OF 12 HOURS OF AERATOR OPERATION PER DAY. A NON-ADJUSTABLE TIMER SHALL CREATE A 60 MINUTE AERATION CYCLE FOLLOWED BY A 60 MINUTE ANOXIC CYCLE DURING WHICH THE AERATOR SHALL BE OFF. SYSTEMS THAT HAVE NOT BEEN PERFORMANCE CERTIFIED, AT A TIMER AERATION CYCLE, BY AN INDEPENDENT ANSI ACCREDITED TESTING LABORATORY SHALL NOT BE CONSIDERED FOR THIS APPLICATION.

10. **SERVICE PRO MONITORING CENTER**—
MONITORING CENTER SHALL CONTAIN A 128 BIT ENCRYPTED PASSWORD PROTECTED WEB SITE FOR INTERFACE WITH THE MONITORING CENTER DATABASE.

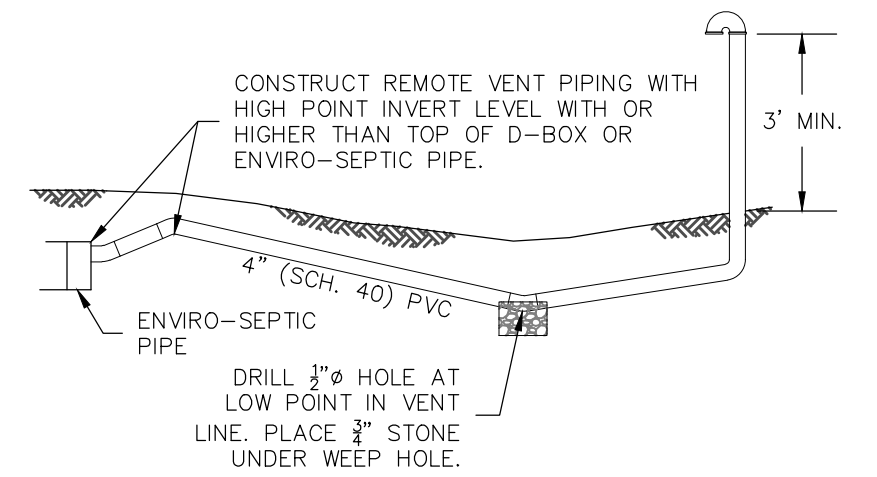
11. **BIO-KINETIC SYSTEM**—
BIO-KINETIC SYSTEM SHALL BE INSTALLED IN THE MOUNTING CASTING(S) ABOVE THE CLARIFICATION CHAMBER. EACH BIO-KINETIC SYSTEM SHALL PROVIDE NON-MECHANICAL FLOW EQUALIZATION THROUGH ALL PLANT PROCESSES INCLUDING PRETREATMENT, AERATION, CLARIFICATION, TERTIARY FILTRATION, CHLORINATION AND DECHLORINATION. THE ASSEMBLY SHALL BE SUPPLIED WITH LOCKING LUGS AND REMOVABLE MOISTURE/VAPOUR SHIELD AND SHALL CONSIST OF A DESIGN FLOW AND PEAK FLOW MICROWELDED MOLDED FILTER, BAFFLED PERIMETER SETTLING ZONE, FLOW DISTRIBUTION DECK, LIFTING HANDLES, LEVEL INDICATOR, ADJUSTMENT LUGS, OPTIONAL CHLORINATION FEED TUBE, UNBAFFLED PERIMETER SETTLING ZONE, SOLIDS CONTACT ZONE, VERTICAL INLET ZONE, COMPARTMENTED SETTLING ZONE CONSISTING OF 42 BAFFLED CHAMBER PLATES, EFFLUENT STILLING WELL, FINAL DISCHARGE ZONE, ADJUSTABLE TEE, OPTIONAL RECYCLING FEED TUBE, OUTLET ZONE AND CASKETED DISCHARGE FLANGE. ALL COMPONENTS SHALL BE MANUFACTURED FROM INERT SYNTHETIC MATERIALS OR RUBBER, ASSEMBLED IN CIRCULAR FASHION AND CONNECTED TO A PLASTIC OUTLET COUPLING. THE OUTLET COUPLING SHALL ACCEPT A 4" DIAMETER, SCHEDULE 40, PVC PIPE. EACH BIO-KINETIC SYSTEM SHALL BE INSTALLED WITH THE INVERTS OF THE DESIGN FLOW EQUALIZATION PORTS LOCATED AT THE NORMAL LIQUID LEVEL OF THE CLARIFIER. IF INTERMITTENT FLOW RATES EXCEED THE CAPACITY OF THE DESIGN FLOW PORTS, FLOW SHALL BE HELD UPSTREAM UNTIL THE INTERMITTENT FLOW DISAPPEARS. IF THE INTERMITTENT FLOW CONTINUES TO INCREASE, THE LIQUID LEVEL MAY REACH A PAIR OF SUSTAINED FLOW EQUALIZATION PORTS. WITH FOUR PORTS IN USE, FLOW THROUGH THE SYSTEM INCREASES WHILE CONTINUING TO PROVIDE FLOW EQUALIZATION TO ALL UPSTREAM AND DOWNSTREAM PROCESSES. PEAK FLOW EQUALIZATION PORTS ARE SUPPLIED BUT SHOULD NOT BE REQUIRED IN A PROPERLY SIZED SYSTEM. OPTIONAL BLUE CRYSTAL AND BIO-NEUTRALIZER TABLET FEED TUBES SHALL BE POSITIONED SUCH THAT THE FLOW-ACTIVATED CHEMICAL CANNOT MAKE CONTACT WITH THE LIQUID UPSTREAM OF THE FEED TUBES.

12. **FLOW EQUALIZATION**—
THE WASTEWATER TREATMENT SYSTEM SHALL INCLUDE A NON-MECHANICAL DEMAND USE, FLOW EQUALIZATION DEVICE. THE DEVICE SHALL CONTROL NORMAL RESIDENTIAL FLOW RATES AND REDUCE TYPICAL RESIDENTIAL FLOW SURGES. THE FLOW EQUALIZATION RATE SHALL BE DEPENDENT UPON THE SPECIFIC LOADING PATTERN AND THE DURATION OF FLOW SURGES. AT THE 600 GALLON PER DAY DESIGN LOADING SCHEDULE OF NSF STANDARD 40 AND NSF STANDARD 245, MINIMUM PERFORMANCE OF THE DEVICE SHALL EQUALIZE DAILY FLOW AN AVERAGE OF 50%.



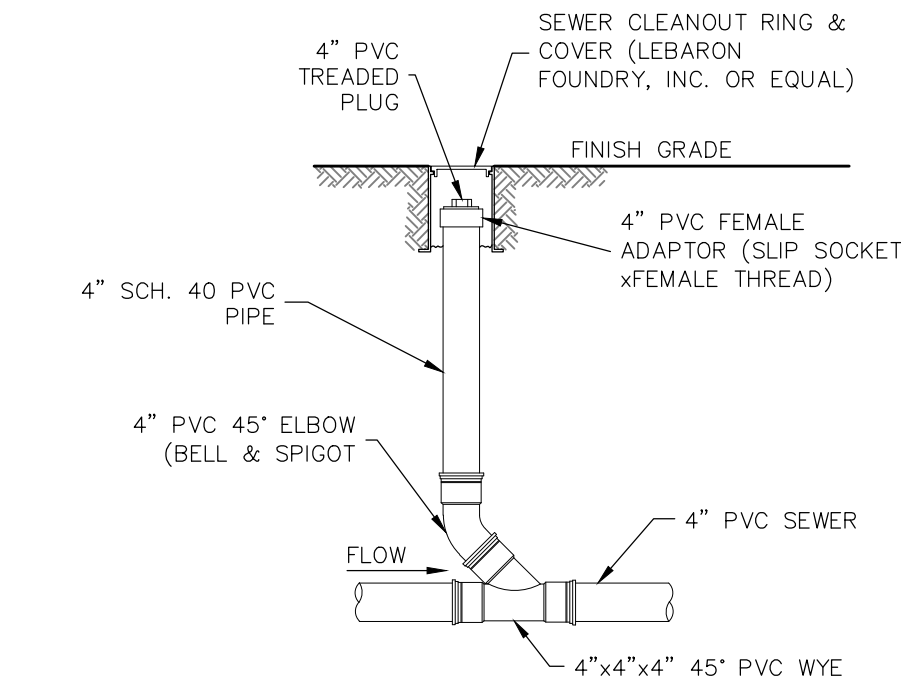
LOW VENT DETAIL

NOT TO SCALE



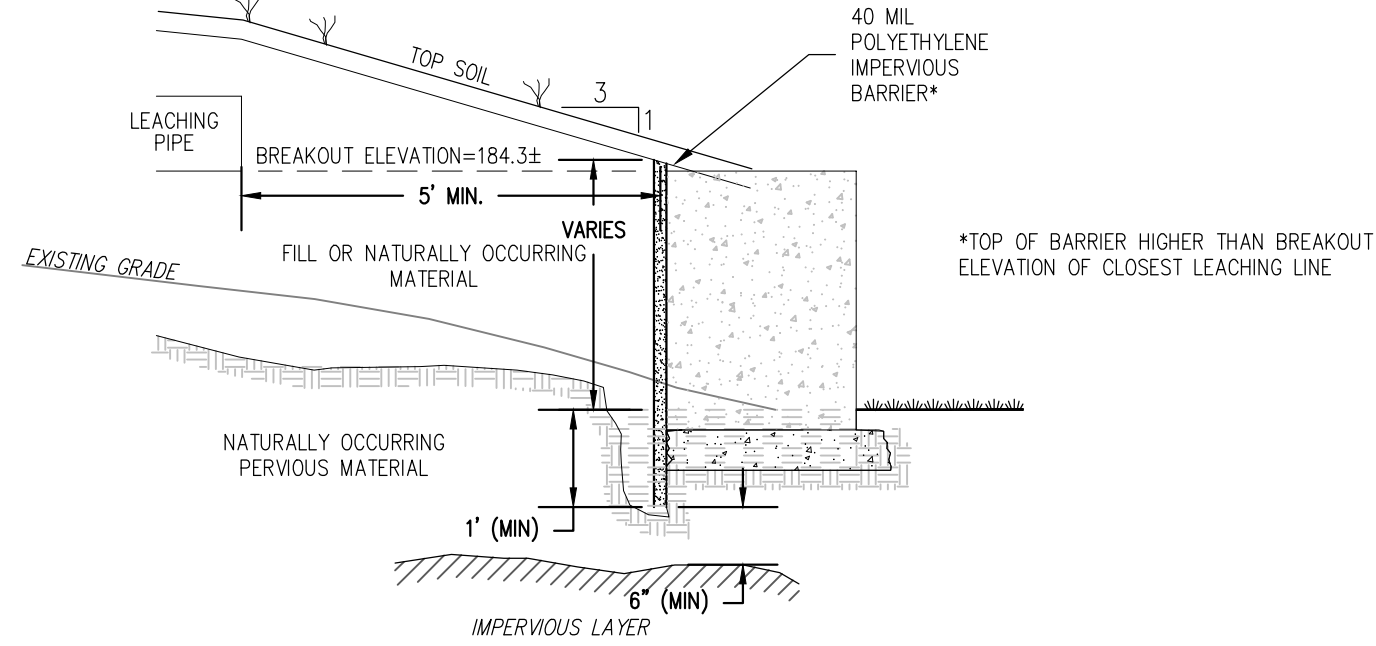
REMOTE VENTING DETAIL

NOT TO SCALE.



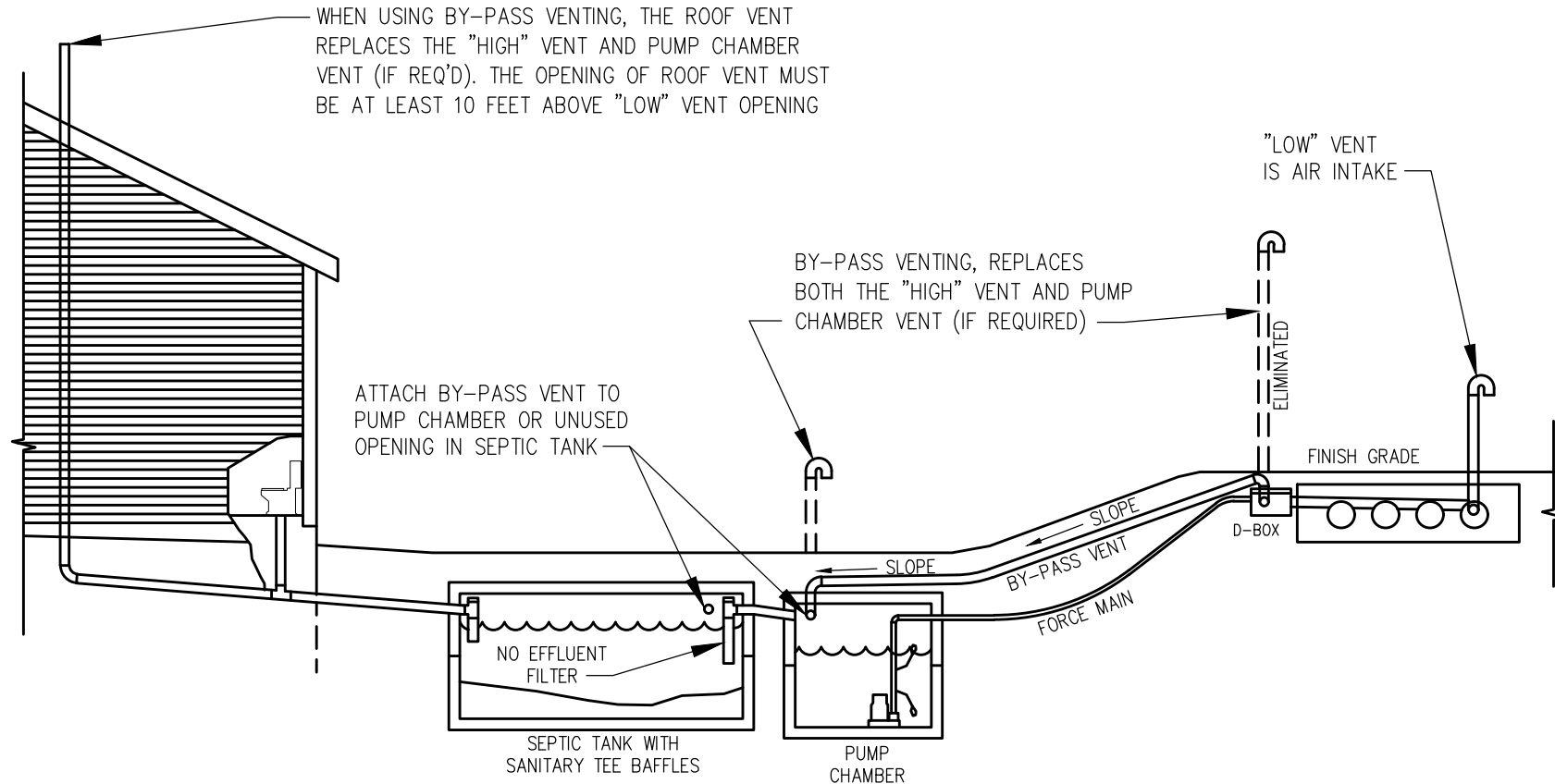
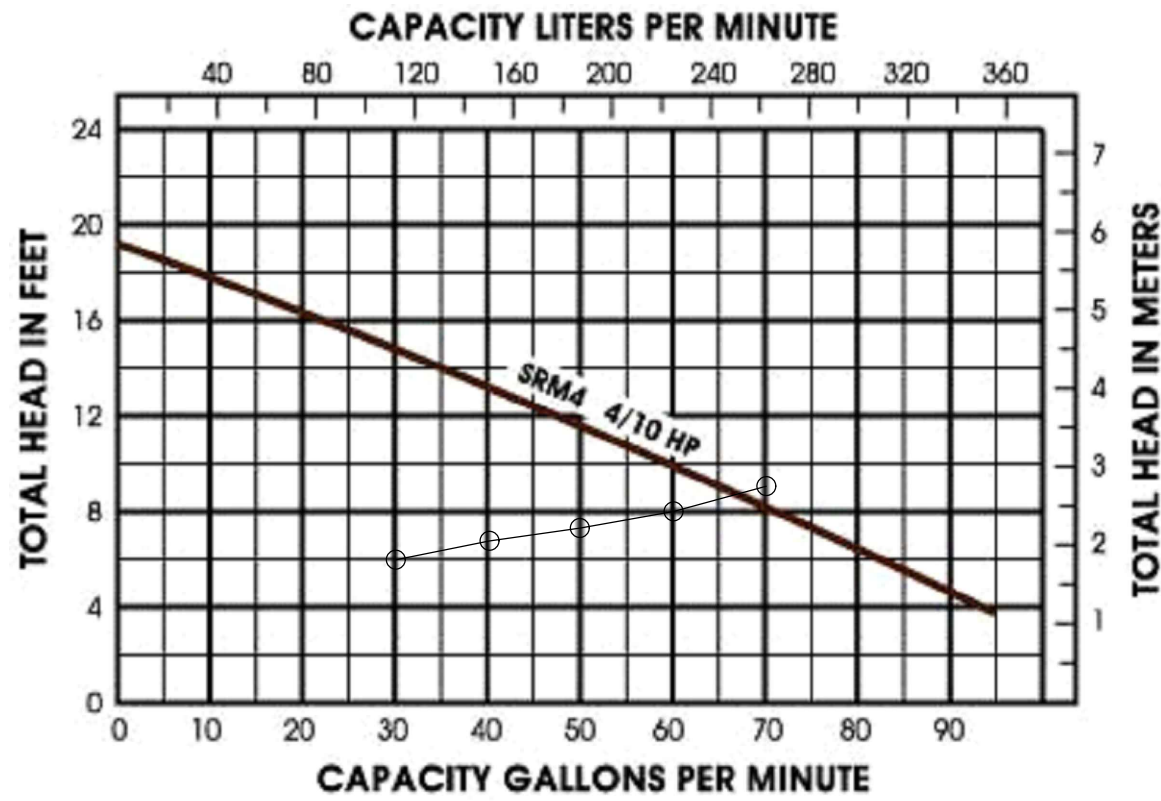
SEWER CLEANOUT DETAIL

NOT TO SCALE



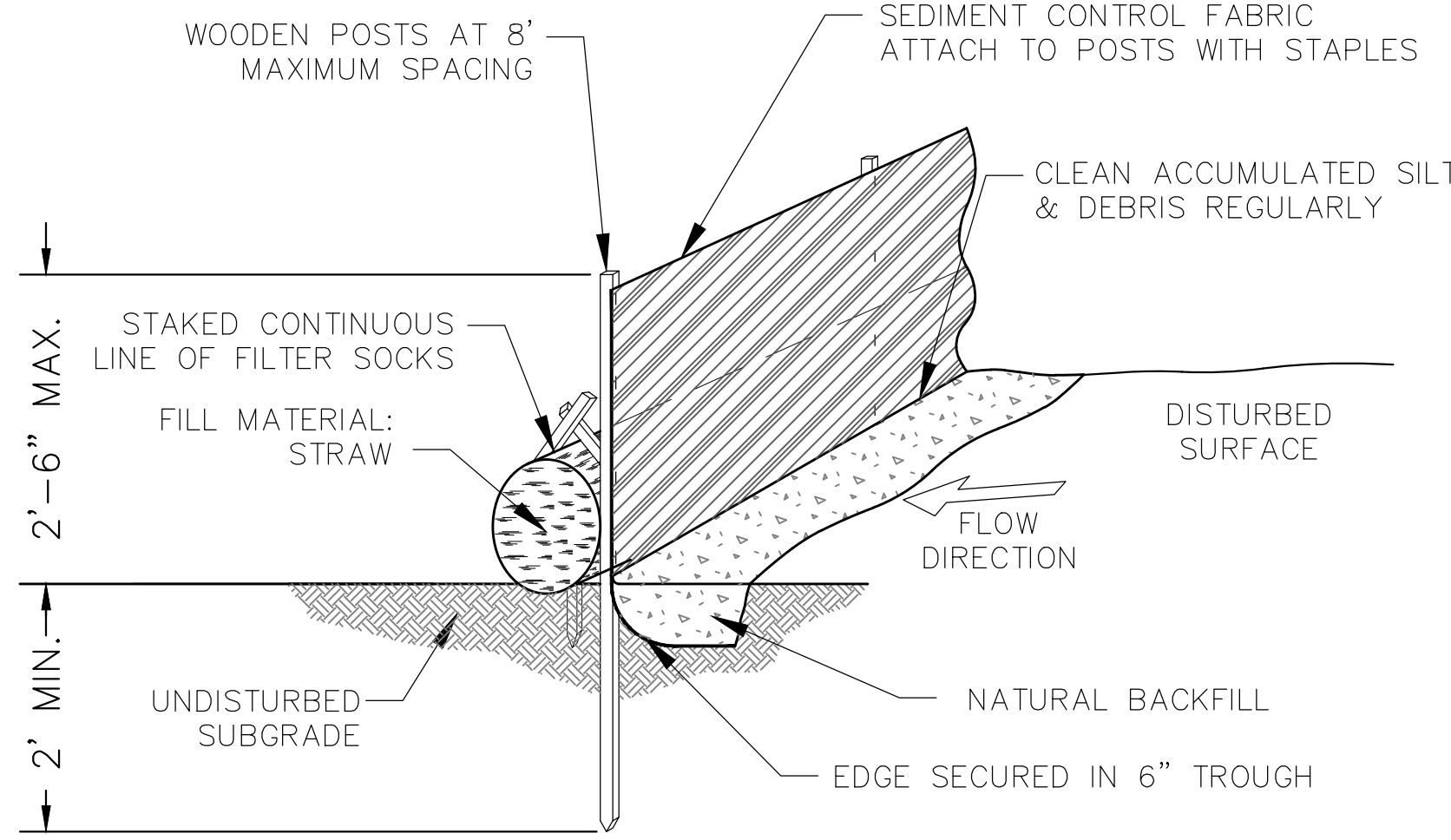
IMPERVIOUS BARRIER DETAIL

CROSS-SECTION
NOT TO SCALE



BY-PASS VENT DETAIL

NOT TO SCALE



SILTATION BARRIER

NOT TO SCALE

PREPARED BY:



CIVIL ENGINEERS LAND SURVEYORS WETLAND CONSULTANTS
1 MAIN STREET, SUITE 1 LUNENBURG, MA 01462
PHONE: (978) 779-6091
www.dillisondroy.com

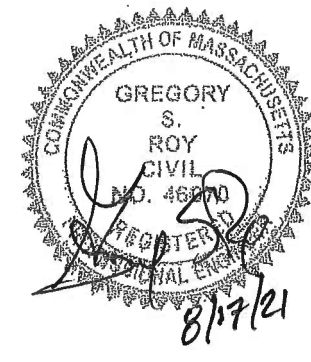
OWNER:

COHEN FAMILY REVOCABLE TRUST
479-483 GLEASONDALE ROAD
STOW, MASSACHUSETTS

APPLICANT:

COHEN FAMILY REVOCABLE TRUST
479-483 GLEASONDALE ROAD
STOW, MASSACHUSETTS

COPYRIGHT DILLIS & ROY CIVIL DESIGN GROUP, INC 2021



DATE:	5/17/2021
DESIGN BY:	WJM
DRAWN BY:	WJM
CHECKED BY:	GSR

SEWAGE DISPOSAL SYSTEM DESIGN 479-483 GLEASONDALE ROAD(M:U8, P:6) STOW, MASSACHUSETTS			
NO.	DATE	DESCRIPTION	BY
1.	8/17/2021	REVISED PLAN AS PER NABOH COMMENTS, TREATMENT TANK, ETC.	WJM

JOB NO.	6663
DRAWING NO.	6663-SDS
SHEET NO.	2
OF 2	