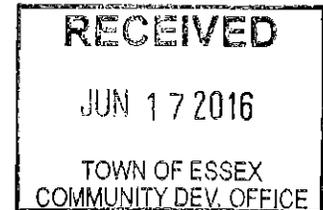


10 OLD STAGE ROAD



The property is located at the intersection of Old Stage and Lost Nation Roads, with frontage on both roads. The parcel contains 3.15 acres.

Presently, a single family dwelling with several barns are situated on the east side of the parcel with the balance of the lot an open meadow that is surrounded, for the most part, with a mixture of mature trees and scrub brush. The land slopes gently from east to west with a small area of wetland vegetation near the west side of the lot. That resource has been delineated and classified a Class III wetland.

The entire parcel is located in the Mixed-Use PUD District. With off-site water and sewer, the minimum lot size for a potential subdivision is 20,000 square feet (SF). While located in the sewer district, the property was assigned only one dwelling unit for sewer connection; therefore, additional allocation to support further subdivision of the property has been secured by authority of the Selectboard. A gravity sewer would be constructed to serve all lots with the line running along the south side of the lots and terminating in a new pump station. A small diameter force main would be installed adjacent to the gravity line; then run along Old Stage Road (within the ROW); and east on Craftsbury Court to a municipal manhole. Water supply will be provided to the lots through individual services connected to an extension of the Lost Nation Road 8" water main. All sewer improvements will be privately owned, operated and maintained.

The parcel is to be divided into six (6) lots with one for the existing house/buildings and five (5) new single family dwellings. Each lot will have an individual driveway and have minimum lot area of 20,000 SF. Driveways have been planned to avoid existing mature vegetation wherever possible.

Stormwater will be directed to grassed areas next to houses and driveways for absorption and overland flow with any residual runoff directed to a infiltration trench keyed into the native soils. The parcel topography does not allow the use of a central detention basin due to the lack of sufficient elevation differential between the west side of the property to the available receiving stream located at the northwest corner. The impervious area for the new construction is 0.375 acres which is below the Town and State regulatory threshold (0.5 and 1.0 acres, respectively); therefore, the planned construction does not require a stormwater discharge permit. However, the all stormwater improvements have been designed in accordance with The Vermont Stormwater Management Manual. The wetland area has been preserved by the Lot 6 building envelope and will be protected during construction by the installation of a silt fence adjacent to the construction area.

10 Old Stage Road
Page 2

Easements would be provided for 1) gravity and force main sewer lines, 2) gas service, 3) buried electric/telephone lines, 4) stormwater and 5) a future bicycle path located on the north side of the lots. Off-lot construction for water and sewer improvements will occur within existing municipal rights-of-way.

10 Old Stage Road

Individual House Service Line

Typical House: Two (2) full baths (WC, lavatory, shower); kitchen sink, dishwasher, clothes washer; exterior hose bib

Total fixture units: 42 FU's

Flow requirement: ~20 GPM (ASHRAE)

Water service length:

Lots 2-4: 90 feet

Lots 5-6: 160 feet

Available water pressure: 44 psi (Public Works @ hydrant)

Water service diameter:

Lots 2-4: 1 1/4" (37 psi available at house)

Lots 5-6: 1 1/2" (38 psi available at house)

LIFT STATION DESIGN CRITERIA

Project Name: 10 Old Stage Road Subdivision
Essex, VT

A. Design Flow:

6 lots @ 200 GPD/lot	1,200 Gallons per Day
T O T A L	1,200 Gallons per Day

B. Required Tank Capacity:

Pumping dose:

1,200/4 doses daily = 400 Gallons

Emergency storage (6 hours) 300 Gallons

Required volume:

Dose + Emergency + 1.08' (Pump 'Off') = 1,235 gallons

Use 2,000 gallon tank (Available storage: 2,306 gallons)

C. Pump System Characteristics:

Discharge elevation: 542'

Pump 'Off' elevation: 517.33'

Differential: ~26'

Force main (2" x 1,400')

Elevation Differential ~26'

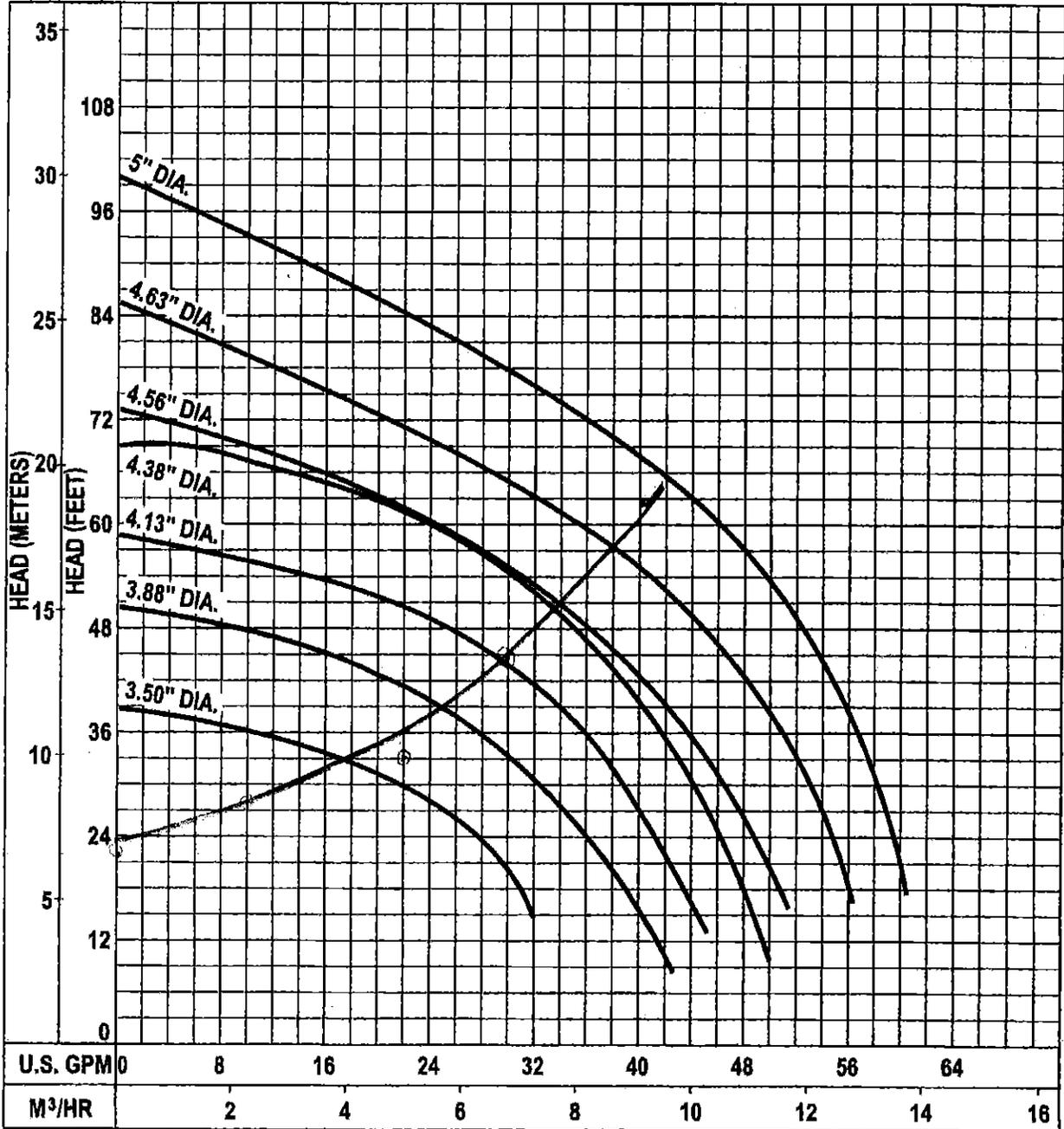
Miscellaneous 2'

TDH 28 GPM @ 45'

Performance Curve - HPGX

RPM: 3450 DISCHARGE: 1-1/4"

10 OLD STAGE ROAD
02/10/2016



The curves reflect maximum performance characteristics without exceeding full load (Nameplate) horsepower. All pumps have a service factor of 1.2. Operation is recommended in the bounded area with operational point within the curve limit. Performance curves are based on actual tests with clear water at 70° F and 1280 feet site elevation.

Conditions of Service:

Sent 6/20/16
Mike Hayward
John Stark

Jennifer Booker

From: Essex Fire Chief <ccole183@comcast.net>
Sent: Monday, June 20, 2016 12:33 PM
To: Jennifer Booker
Cc: Aaron Martin; Allyson Vile; Brad Larose; Gregory Duggan; Sharon Kelley
Subject: Re: 10 Old Stage Final Subdivision

The Fire Department has no further comments that haven't already been submitted. Just please remember to make a condition that the physical street address should be clearly marked out at the road edge and visible from both directions.

Thank you.

Charlie

From: "Jennifer Booker" <JBooker@ESSEX.ORG>
To: "Aaron Martin" <amartin@ESSEX.ORG>, "Allyson Vile" <avile@ESSEX.ORG>, "Charlie Cole" <ccole183@comcast.net>, "Brad Larose" <blarose@ESSEX.ORG>
Cc: "Gregory Duggan" <gduggan@ESSEX.ORG>, "Sharon Kelley" <skelley@ESSEX.ORG>
Sent: Monday, June 20, 2016 10:40:07 AM
Subject: 10 Old Stage Final Subdivision

Please see attachments for 10 Old Stage Road Plans and Narrative for the final subdivision.

Please have comments back by July 1st.

Thanks,

Hard Copies will be in the mailboxes ☺

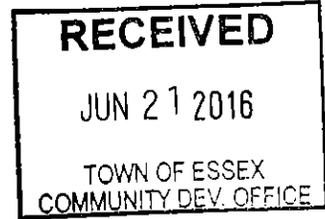
Thanks,

Jenn Booker
Community Development Secretary
81 Main Street. Essex Junction VT 05452
802-878-1343
Jbooker@essex.org

Sent to
John & Mike
6/21/16

Jennifer Booker

From: Brad Larose
Sent: Tuesday, June 21, 2016 8:09 AM
To: Jennifer Booker
Subject: RE: 10 Old Stage Final Subdivision



Jenn –

The police department has no further comments regarding this subdivision.

Thanks

Chief Bradley J. LaRose
Essex Police Department
145 Maple Street
Essex Junction, Vermont 05452
blarose@essex.org
(802) 857-0093 direct

From: Jennifer Booker
Sent: Monday, June 20, 2016 10:40 AM
To: Aaron Martin; Allyson Vile; Charlie Cole; Brad Larose
Cc: Gregory Duggan; Sharon Kelley
Subject: 10 Old Stage Final Subdivision

Please see attachments for 10 Old Stage Road Plans and Narrative for the final subdivision.

Please have comments back by July 1st.

Thanks,

Hard Copies will be in the mailboxes ☺

Thanks,

Jenn Booker
Community Development Secretary
81 Main Street. Essex Junction VT 05452
802-878-1343
Jbooker@essex.org

Sent 7/5/16
John & Nate

Memorandum

To: Dana Hanley, Community Development Director
Sharon Kelley, Zoning Administrator
Greg Dugan, Town Planner

From: Dennis Lutz, P.E., Public Works Director 
Aaron K. Martin, P.E., Utilities Director / Town Engineer 

Date: June 30, 2016

Subject: 10 Old Stage Road
Final Plan Review

Public Works staff has reviewed the Preliminary Plan application for the above referenced proposed subdivision and offers the following comments:

Traffic:

1. As stated in the previous review memo from Public Works, this subdivision lies adjacent to the small paved area on Lost Nation Road near Old Stage Road. The 5 new residences account for 50 trip ends per the ITE Trip Generation manual. Existing ADT traffic on the road is 390 at last count. Due to the nearby location of pavement and the approximate 11% traffic impact, it is our opinion that the traffic impact should be based not on adding gravel but on future pavement of this road between the end of the paved area and the furthest driveway – a distance of 420 feet. At a design width of 24 feet, a length of 420 feet and costs developed by Public Works for paving gravel roads (updated since 2007 using ENR) of \$1,508,274/mile, the traffic impact fee should be $.11 \times .075 \text{ miles} \times \$1,508,274$ or \$12,443. It should be noted that this cost per mile includes rebuilding the road as a paved road including drainage, removal of gravel surface, placement and compaction of new road gravel suitable for pavement and a 3.5 inch asphalt surface overlay.
2. The \$12,443 impact fee will go into a dedicated account and used for paving on this road. This fee could be collected in five payments as each of the five new units obtains a building permit. The Town's cost to match this paving would be \$89,603 – not an insignificant amount.

Water and Sewer:

1. As stated in previous review memos, the applicant has received approval from the Selectboard to increase the original sewer allocation for the site from 200 GPD to a total of 1,200 GPD, with conditions. The applicant has sufficient sewer and water allocation for a total of six single family homes.
2. The Town of Essex has raised the water and sewer connection fees. As of April 25, 2016, the Town's water and sewer fees are calculated as follows. A fixed flat amount per water or sewer connection, and an assigned allocation based on a per GPD fee. The

applicant will require water and sewer applications to connect for each building lot. The calculation below is based on one individual single family home.

- a. Water: $(200\text{gpd} \times \$5.73/\text{gal}) + \$1000 = \$2,146.00$
- b. Sewer: $(200\text{gpd} \times \$10.30/\text{gal}) + \$1000 = \underline{\$3,060.00}$
- c. Total = **\$5,206.00 per single family home**

3. A representative of the Town of Essex Public Works Department shall witness all connections and work performed on existing water and sewer infrastructure.
4. Recent hydrant flow testing confirms that there is low static water pressure in this area of the Town's distribution system. Public Works recommends that fire demand calculations be submitted before final approval of the project. It appears that the fire demand will be satisfied but approval will not be given without the fire flow documentation.
5. The applicant's engineer has provided peak domestic water demand calculations. The applicants engineer has used data supplied by Public Works for reference only. The flow data provided to the applicants engineer is for internal use only and was provided as courtesy to give an idea of pressure and flow in the area around Old Stage Road and Lost Nation Road. In no way does the Town of Essex certify this data is accurate. The Town of Essex recommends that the consultant perform their own hydrant flow testing to verify the flow data provided. This can be scheduled with the Public Works department. To further reiterate, the Town of Essex will not size the meter based on line pressure in the building or size of incoming service line. All single family residential homes shall receive a 5/8" water meter.
6. Again, all proposed sewer services and associated infrastructure proposed for this project shall be private. All sewer infrastructure shall be installed in accordance with the Town Specifications for Construction and Chapter 10.16, Town Sewer Use Ordinance.
7. To ensure the private sewer system will be maintained properly after construction and stay in conformance with 10.16.090 of the Town of Essex Sewer Use Ordinance, Public Works will require a written operation and maintenance plan for system, and review of the association documents describing ownership and maintenance responsibilities of the sewer system.

Storm water:

1. In the Preliminary review memo dated March 25, 2016, Public Works required a storm drainage ditch along the frontage of Lots 5 and 6. A note to the drawings must be added requiring the ditch to be stone lined. An additional standard detail must be provided for review and approval by Public Works.
2. The Town should also be granted an easement along the western boundary of Lot 6 to insure that this drainage flow can be protected over time. This can be a condition of approval.

Design Drawings:

The final review comments of the project plans have been provided in red below.

Sheet DWG 1 of 4 (Plan)

1. At Final plan submittal, the applicant must provide association language regarding the ownership and maintenance of the private sanitary sewer collection system proposed for this project.
As stated in item #7 under the Water and Sewer section of this memo, the applicant must submit an operation and maintenance plan and association language addressing the future maintenance and ownership of the private sewer system. Public Works requires this documentation in order to ensure the infrastructure constructed will be maintained and will not violate the Town Sewer Use Ordinance.
2. The applicants engineer shall provide calculations to Public Works for review to ensure the proposed private pump station and size of force main is properly sized and meets State design criteria.
Comment Addressed
3. A note on each of the four drawings notifying the contractor to contact dig safe and the Town of Essex to locate all existing underground utilities before any excavation shall be required.
Comment Addressed

Sheet DWG 2 of 4 (Utility Plan and Profile)

1. As per Chapter 21 of the Vermont Water Supply rule, no Construction Permit for Public water system will be required for the waterline extension as proposed. All work shall be constructed in accordance with the Vermont Standards for Water System Design, Construction and Protection and with the Town of Essex Standard Specifications for Construction.
Comment Addressed
2. The extension of the existing water main on Lost Nation Road can be constructed by conventional means. A note on the plans shall be provided directing the Contractor to coordinate with Green Mountain Power to hold the existing utility poles during the excavation for the new water main extension.
Comment Addressed
3. The symbol legend on the plan indicates that the individual water services to the proposed homes are 1-inch copper lines. The lines to #5 and #6 are noted to be 1.5-Inch and lots #2 through #4 are 1.25-inch. Due to the lower pressures in this area, the Town agrees that a standard $\frac{3}{4}$ inch service will not be adequate to supply proper pressure to individual homes. The Town will require pressure and head-loss calculations to verify the proper size for each new water service.
The applicants engineer has supplied the calculations requested. As stated above, the applicants engineer has used hydrant flow data supplied by Public Works for reference only. The flow data provided is for internal use only and was provided as courtesy to give an idea of pressure and flow in the area around Old Stage Road and Lost Nation Road. In no way does the Town of Essex certify this data is accurate. The Town of Essex requires that the

consultant perform their own hydrant flow testing to verify the flow data provided. This can be scheduled with the Public Works department prior to construction.

4. The Town will not allow Old Stage Road or Craftsbury Court to be open cut for any reason other than the connection to the existing manhole on Craftsbury Court. The applicants engineer has indicated on the plans that the method of construction for the sanitary sewer force main shown on the plans will be by directional bore.

Comment Addressed

5. The current location of the sewer force main along the east side of Old Stage Road between Lost Nation Road and Craftsbury Court is within 10-feet of the Towns existing water main. The sewer force main and water main must have a minimum of 10-feet of separation. Notes must be added to the plan sheet directing the contractor to pothole the existing water main to verify the exact location of the existing water main, so the new sewer force main can have the required separation.

Comment Addressed

Sheet DWG 3 of 4 (Sewer Details)

1. Although all sanitary sewer infrastructure to be constructed shall remain private, all shall be constructed in accordance with the Town of Essex Standard Specifications for Construction.
2. For convenience, Staff has attached copies of the Town's standard sewer construction details for review and use by the applicant's engineer. Any deviation from these details will not be accepted by Public Works.

The applicants engineer must address the comments below. The proposed construction documents must be in conformance with the Town of Essex Standard Specifications for Construction. As stated in the previous review memo, any deviation from these details will not be permitted.

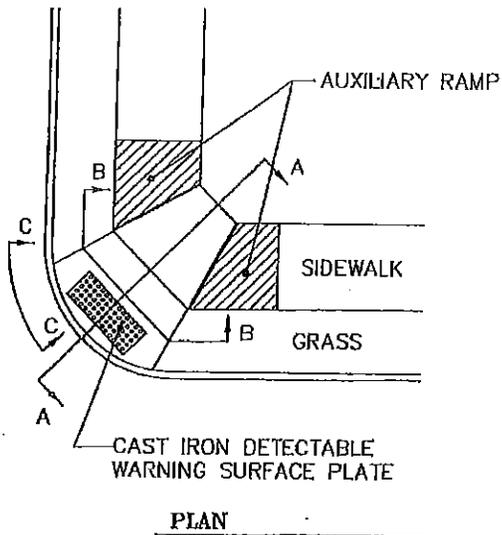
- **Fire Hydrant Detail:** Add note #11 from attached Public Works Detail A-20.
- **Forcemain Sewer Detail:** Add note #2 from attached Public Works Detail A-24.
- **Forcemain Connection Notes:** The backfill procedures are not acceptable. Refer to attached Detail A-11. Public Works will accept nothing less that what is provided within this detail.

Sheet DWG 4 of 4 (Water and General Details)

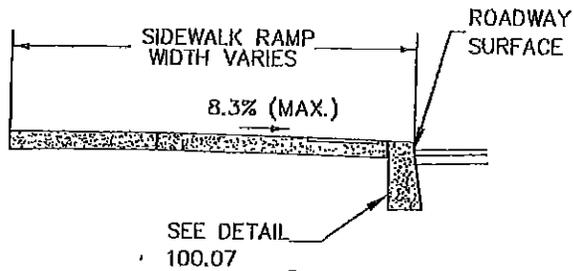
1. For convenience, Staff has attached copies of the Town's standard water construction details for review and use by the applicant's engineer. Any deviation from these details will not be accepted by Public Works.
The applicants engineer must address the comments below. The proposed construction documents must be in conformance with the Town of Essex Standard Specifications for Construction. As stated in the previous review memo, any deviation from these details will not be permitted.

- **House Connection Detail:** Add notes #3 and #6 from attached Public Works Detail A-33.
 - **Fire Hydrant Detail:** Add the following notes to the detail. Refer to attached Public Works Detail A-30 for further direction.
 - A measurement from finish grade to top of pipe noting the minimum cover of 6'-0".
 - The thrust block at the 8X8X6 Tee must have a 16 SF thrust block.
 - A note clearly showing the drain plug and noting the plug to remain.
 - **Water Main Installation Notes:** The testing procedures stated in Note #5 are not AWWA compliant. Please update. Also, Note #6 allows for less than 6' of cover. The waterline will be installed with a minimum of 6' of cover. Public Works will not accept any new waterlines with less than 6' of Cover.
 - **Sidewalk Detail:** This detail requires some modification. Refer to attached Public Works Detail A-6 for further direction. The Cast Iron Detectable warning plate must be installed in concrete. Also, the detail only shows 6" of cover over the top of the pipe. Not acceptable. Public Works would accept this amount of cover if the material for the 18" culvert is switched to SDR 35 PVC.
 - **Water System Notes:** Note #3 states the water main shall be Class 52 ductile iron. This must be changed to C900 PVC, (Blue Brute).
2. A note on the detail sheet shall be added requiring the contractor to coordinate all water infrastructure testing and inspection with the applicants engineer and a representative from the Town.

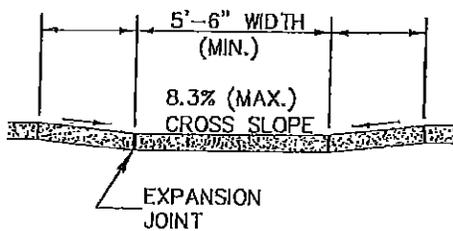
Comment Addressed



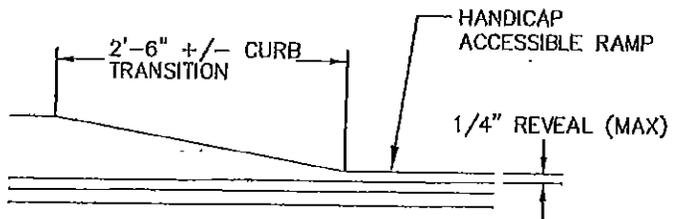
PLAN



SECTION A - A



SECTION B - B



SECTION C - C

NOTES:

1. SIDEWALK RAMPS SHALL BE INSTALLED AT ALL STREET INTERSECTIONS AND WHEREVER NEW SIDEWALKS AND CURBING INTERSECT.
2. THE MAXIMUM SLOPE ON A HANDICAP ACCESSIBLE RAMP IS 1" PER 12" OR 8.3%.
3. DETECTABLE WARNING SURFACE PLATES SHALL BE INSTALLED AT THE END OF EACH HANDICAP ACCESSIBLE RAMP.
4. APRON SUBBASE SHALL BE 12" THICK MINIMUM.
5. A BROOM FINISH SHALL BE APPLIED TO ALL CONCRETE ADJACENT TO THE DETECTABLE WARNING SURFACES.
6. ALL SIDEWALK RAMPS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT VERSION OF THE MUTCD.



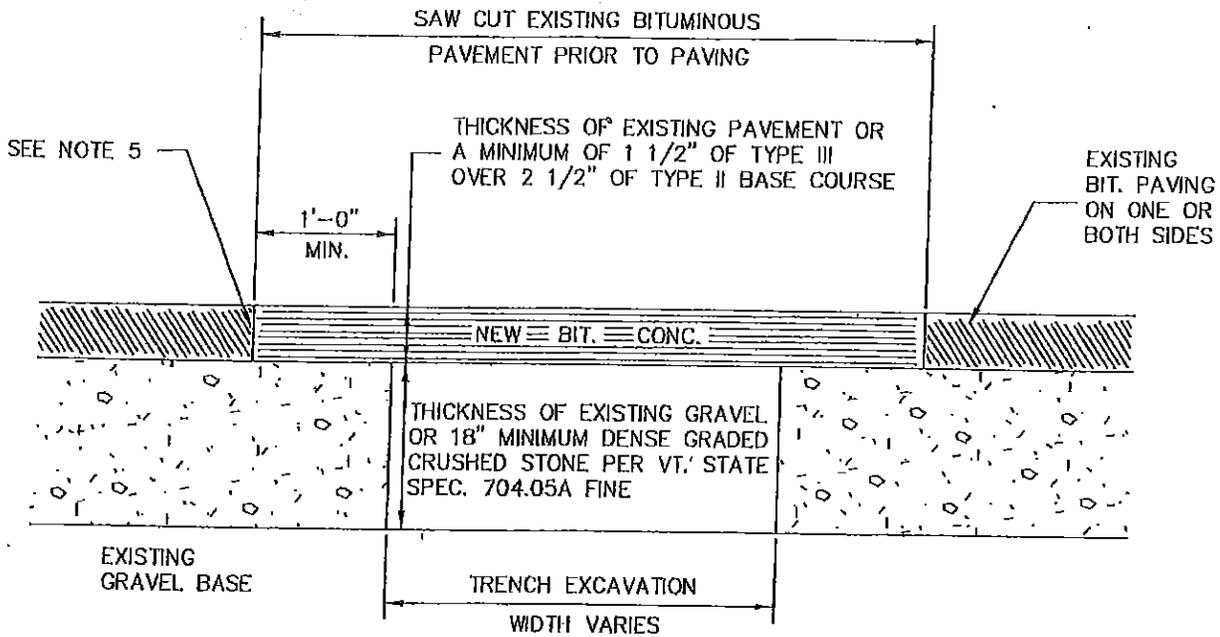
TOWN OF ESSEX
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ESSEX JDT., VT
05452
P: 802 878-1344
F: 802 878-1355
E: www.essex.org

TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

CONCRETE SIDEWALK RAMPS

Detail No: 100.06
Scale: NOT TO SCALE
Date: NOV. 2015

A-6



NOTES :

1. SETUP AND MAINTAIN SIGNS AND OTHER SAFETY CONTROL DEVICES.
2. RESHAPE HOLE AND PATCH AREA BY CUTTING WITH CONCRETE SAW INTO A SQUARE OR RECTANGULAR SHAPE. CUT SIDE FACES VERTICALLY. RESHAPE DOWNWARD TO SOLID MATERIAL AND AROUND HOLE TO SOLID PAVEMENT.
3. BACKFILL TRENCH IN 6" LIFTS AND COMPACT EACH LIFT TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698 STANDARD PROCTOR.
4. REMOVE ALL LOOSE MATERIAL AND THOROUGHLY SWEEP THE HOLE AREA CLEAN OF MUD AND STANDING WATER.
5. APPLY LIQUID EMULSION (RS-1) TO VERTICAL FACES IN A UNIFORM MANNER. DO NOT PUDDLE EMULSION ON BOTTOM OF THE HOLE.
6. PLACE TYPE II BASE COURSE PAVEMENT A MINIMUM OF 2 1/2" THICK.
7. FILL TOP OF HOLE WITH TYPE III BITUMINOUS CONCRETE AND COMPACT IN LIFTS OF NO MORE THAN 2". FINAL LIFT SHOULD BE 1/2" TO 1" ABOVE ADJOINING PAVEMENT BEFORE COMPACTION SO THAT AFTER COMPACTION THE PATCH IS LEVEL WITH THE EXISTING PAVEMENT. EACH LIFT SHOULD BE THOROUGHLY COMPACTED WITH A VIBRATORY PLATE COMPACTOR OR A VIBRATORY PORTABLE ROLLER. EXPERIENCE HAS SHOWN THAT 15 TO 20 PASSES ARE REQUIRED WITH A VIBRATORY ROLLER AND A MIX TEMPERATURE ABOVE 250 DEGREES F ARE NECESSARY TO ENSURE GOOD COMPACTION. HAND TAMPING SHOULD ONLY BE USES FOR SMALL AREAS (LESS THAN 1 S.F.).
8. CLEAN UP AREA. DO NOT LEAVE EXCESS FILL OR EXCAVATED MATERIAL ON THE PAVEMENT. REMOVE SAFETY SIGNS AND DEVICES.



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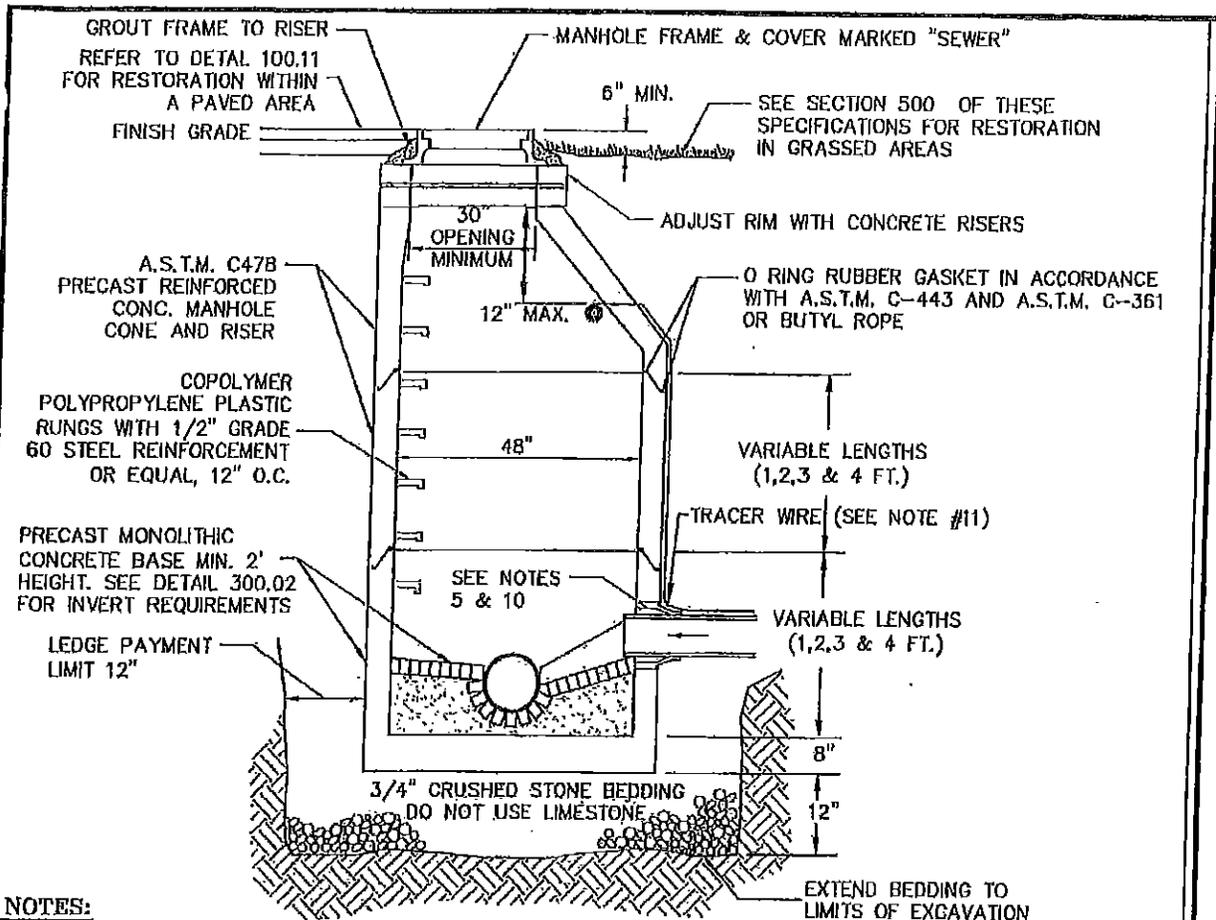
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

TRENCH REPAIR

Detail No: 100.11
Scale: NOT TO SCALE
Date: NOV. 2015

A-11



NOTES:

1. THERE SHALL BE NO PARING OF INTERIOR SURFACES WITH MORTAR. ALL JOINTS SHALL BE SEALED ON EXTERIOR SURFACES ONLY.
2. REFER TO THE WRITTEN SPECIFICATIONS FOR BACKFILL AND COMPACTION REQUIREMENTS
3. REFER TO THE WRITTEN SPECIFICATIONS FOR SANITARY SEWER STRUCTURE MATERIAL REQUIREMENTS AND TESTING REQUIREMENTS.
4. RAISE FRAME TO FINISH GRADE ONLY AFTER BASE COURSE OF PAVEMENT IS IN PLACE. RAISE FRAME TO BASE COURSE GRADE IF WEARING COURSE IS TO BE PLACED NEXT CONSTRUCTION SEASON.
5. CAST IN PLACE RUBBER BOOTS SHALL BE USED ON ALL SEWER CONNECTIONS. A CORE-N-SEAL STYLE BOOT MAY BE USED UPON TOWN APPROVAL.
6. HIGH STRENGTH NON-SHRINK GROUT SHALL BE USED TO SET FRAME AND GRADE RINGS.
7. IN GRASS AREAS, FRAME AND COVER ARE TO BE INSTALLED A MINIMUM OF 6" ABOVE GRADE.
8. BACKFILL MANHOLES WITH MATERIAL APPROVED BY TOWN.
9. IF THE INVERT IN ELEVATION IS GREATER THAN 2' ABOVE THE INVERT OUT ELEVATION, REFER TO FIGURE A-21 FOR AN INSIDE DROP MANHOLE.
10. FRAME AND COVER SHALL CONFORM TO H-20 LOADING REQUIREMENTS.
11. INSERT A SECTION OF PVC CONDUIT OR TUBING THROUGH THE SIDEWALL OF THE STRUCTURE AS SHOWN FOR THE TRACER WIRE TO ENTER THE STRUCTURE. ONCE THE TRACER WIRE IS INSTALLED, SEAL THE VOID BETWEEN THE CONDUIT OR TUBING AND THE TRACER WIRE WITH A WATERPROOF SEALANT. INSIDE THE MANHOLE, A COIL OF WIRE LONG ENOUGH TO REACH THE COVER SHALL BE ATTACHED TO THE INSIDE OF THE STRUCTURE BY MEANS OF PLASTIC "ZIP-TIES" TO A STAINLESS STEEL RING.



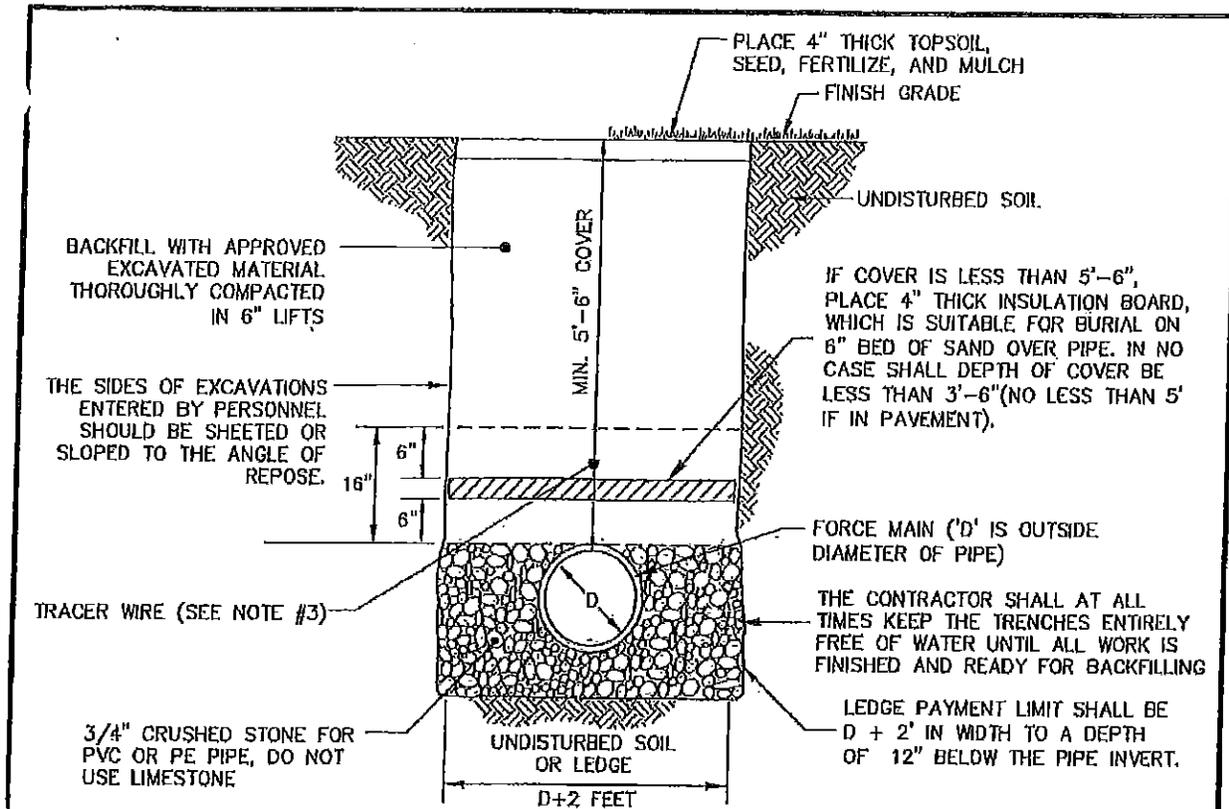
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

SANITARY SEWER MANHOLE

Detail No: 300.01
Scale: NOT TO SCALE
Date: NOV. 2015

A-20



FORCE MAIN SPECIFICATIONS

1. PLACE THRUST BLOCKS AT ALL FORCE MAIN BENDS.

2. **TESTING:** THE CONTRACTOR SHALL FURNISH ALL FACILITIES AND PERSONNEL FOR CONDUCTING THE FOLLOWING TEST. THE FORCE MAIN SHALL BE FILLED WITH WATER AND TESTED BY THE CONTRACTOR TO A MINIMUM PRESSURE OF 50 PSI AT THE HIGHEST POINT ALONG THE FORCE MAIN FOR TWO HOURS AND THE PRESSURE SHALL NOT VARY MORE THAN 5 PSI. THE NEW LINES SHALL NOT BE ACCEPTED IF THE LEAKAGE DURING THE TWO-HOUR TEST IS GREATER THAN THAT DETERMINED BY THE FOLLOWING FORMULA.

$$L = \frac{ND \sqrt{P}}{7,400}$$

WHERE L = THE ALLOWABLE LEAKAGE IN GALLONS PER HOUR

N = THE NUMBER OF JOINTS IN THE LENGTH OF PIPELINE TESTED

D = THE NOMINAL DIAMETER OF THE PIPE IN INCHES

P = THE AVERAGE TEST PRESSURE MEASURED IN LBS/SQ IN

LEAKAGE IS DEFINED AS THE QUANTITY OF WATER THAT MUST BE SUPPLIED INTO THE NEWLY LAID PIPE TO MAINTAIN THE PRESSURE OF 50 PSI. THE CONTRACTOR SHALL AT ONCE LOCATE ANY LEAKS AND ACHIEVE THE ACCEPTABLE LIMIT AT NO EXTRA CHARGE TO THE OWNER.

3. INSTALL A CONTINUOUS SHEATHED SOLID CONDUCTOR COPPER TRACER WIRE OVER PIPE. THE WIRE SHALL BEGIN INSIDE ONE MANHOLE AND RUN TO THE NEXT MANHOLE. INSIDE THE MANHOLES, A COIL OF WIRE LONG ENOUGH TO REACH THE COVER SHALL BE ATTACHED TO THE INSIDE OF THE STRUCTURE. SEE DETAILS 300.01 AND 300.03.



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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

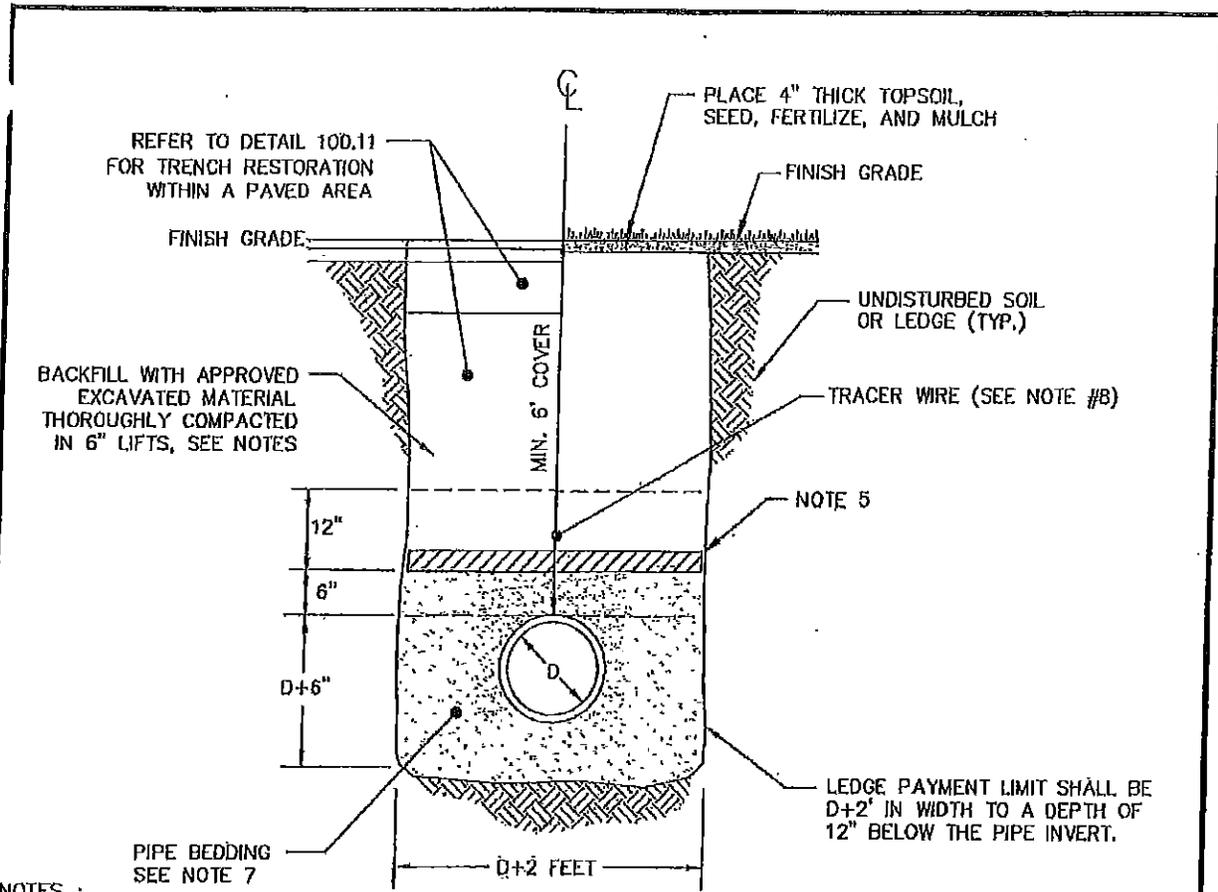
SANITARY SEWER TRENCH
(FORCEMAIN)

Detail No: 300.05

Scale: NOT TO SCALE

Date: NOV, 2015

A-24



NOTES :

1. THE CONTRACTOR SHALL KEEP THE TRENCH ENTIRELY FREE OF WATER AT ALL TIMES UNTIL THE WORK IS COMPLETE AND READY FOR BACKFILLING.
2. THE SIDES OF THE TRENCHES SHALL BE SHEETED OR SLOPED TO THE ANGLE OF REPOSE IF THE TRENCH IS 4' OR MORE IN DEPTH.
3. BACKFILL TRENCH IN 6" LIFTS AND COMPACT EACH LIFT TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698 STANDARD PROCTOR.
4. BACKFILL SHALL HAVE NO STONES LARGER THAN 1.5-INCHES IN DIAMETER.
5. SEE DETAIL 400.09 FOR PIPE INSULATION REQUIREMENTS.
6. ALL WORK SHALL CONFORM TO THESE SPECIFICATIONS AND PLANS UNLESS OTHERWISE SPECIFIED.
7. THE PIPE BEDDING FOR DUCTILE IRON PIPE SHALL BE THOROUGHLY COMPACTED SAND OR GRAVEL. 3/4" STONE BEDDING SHALL BE USED AS PIPE BEDDING FOR PVC OR PE PIPE.
8. INSTALL A CONTINUOUS SHEATHED SOLID CONDUCTOR COPPER TRACER WIRE OVER PIPE. THE WIRE SHALL BEGIN IN A TEST BOX ADJACENT TO ONE HYDRANT AND RUN TO A TEST BOX ADJACENT TO THE NEXT HYDRANT. SEE DETAIL 400.02.



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ESSEX JUNCTION, VT
05452

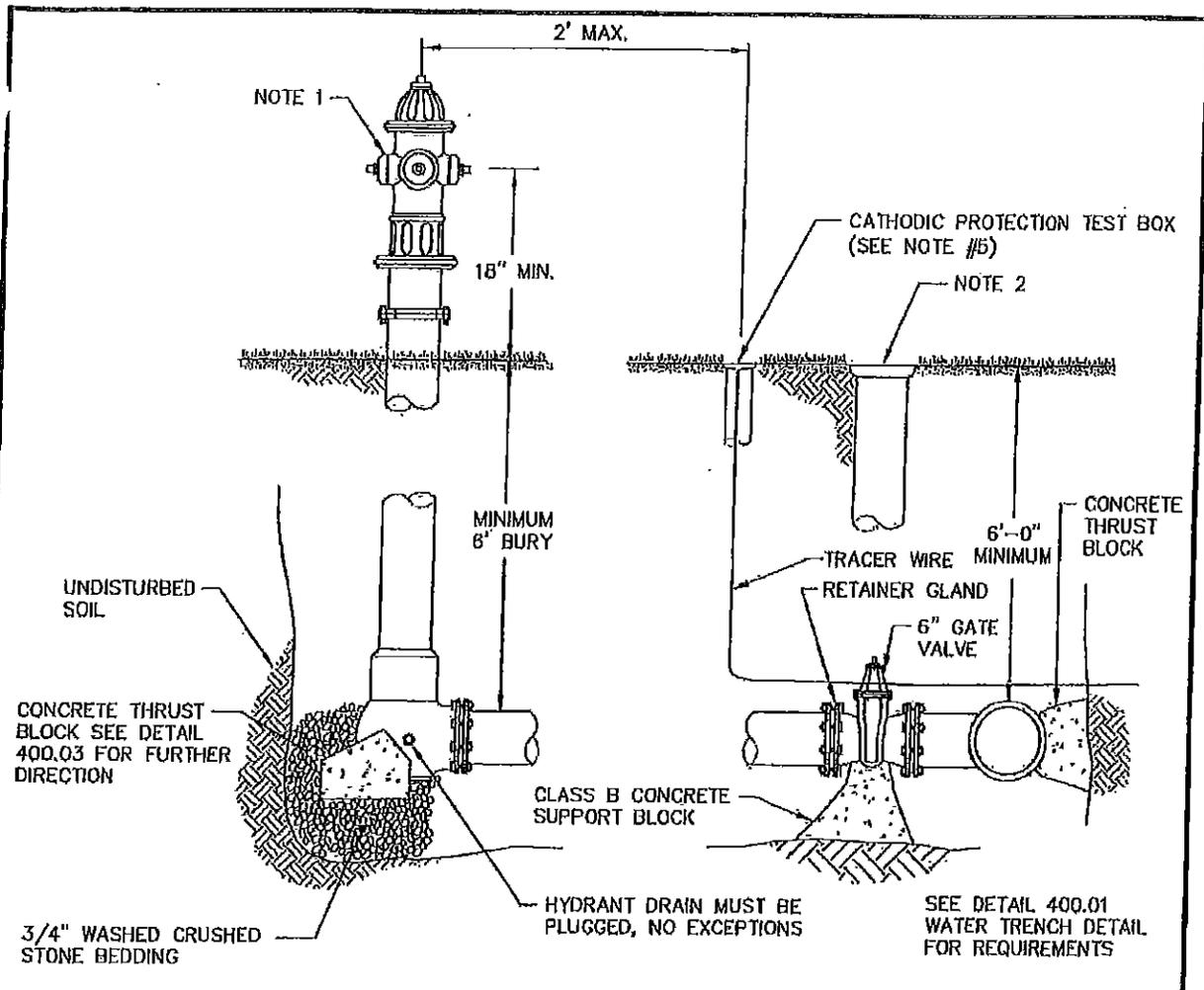
P: 802 878-1344
F: 802 878-1325
W: www.essex.org

TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

WATER TRENCH

Detail No:	400.01
Scale:	NOT TO SCALE
Date:	NOV. 2015

A-29



NOTES:

1. NEW HYDRANT SHALL BE KENNEDY GUARDIAN K-81D. NO SUBSTITUTIONS WILL BE APPROVED UNLESS NOTED.
2. VALVE BOXES SHALL BE CAST IRON TWO PIECE SLIDE TYPE WITH 5 1/4" SHAFT AND A CAST IRON COVER MARKED "WATER".
3. ALL HYDRANT PIPING OFF OF MAIN SHALL BE 6" AND MATCH THE EXISTING WATERMAIN PIPE MATERIAL EITHER CLASS 52 DUCTILE IRON OR C900 PVC. ALL MECHANICAL JOINT FITTINGS AND RETAINER GLANDS SHALL CONFORM TO CURRENT AWWA STANDARDS, SEE SPECIFICATIONS FOR REQUIREMENTS.
4. ALL WORK SHALL CONFORM TO THE WRITTEN SPECIFICATIONS AND PLANS UNLESS OTHERWISE SPECIFIED.
5. INSTALL A CATHODIC PROTECTION TEST BOX (BINGHAM & TAYLOR MODEL P200NFG OR APPROVED EQUAL) WITHIN 2' OF ALL NEW HYDRANTS FOR TERMINATING THE TRACER WIRES IN.



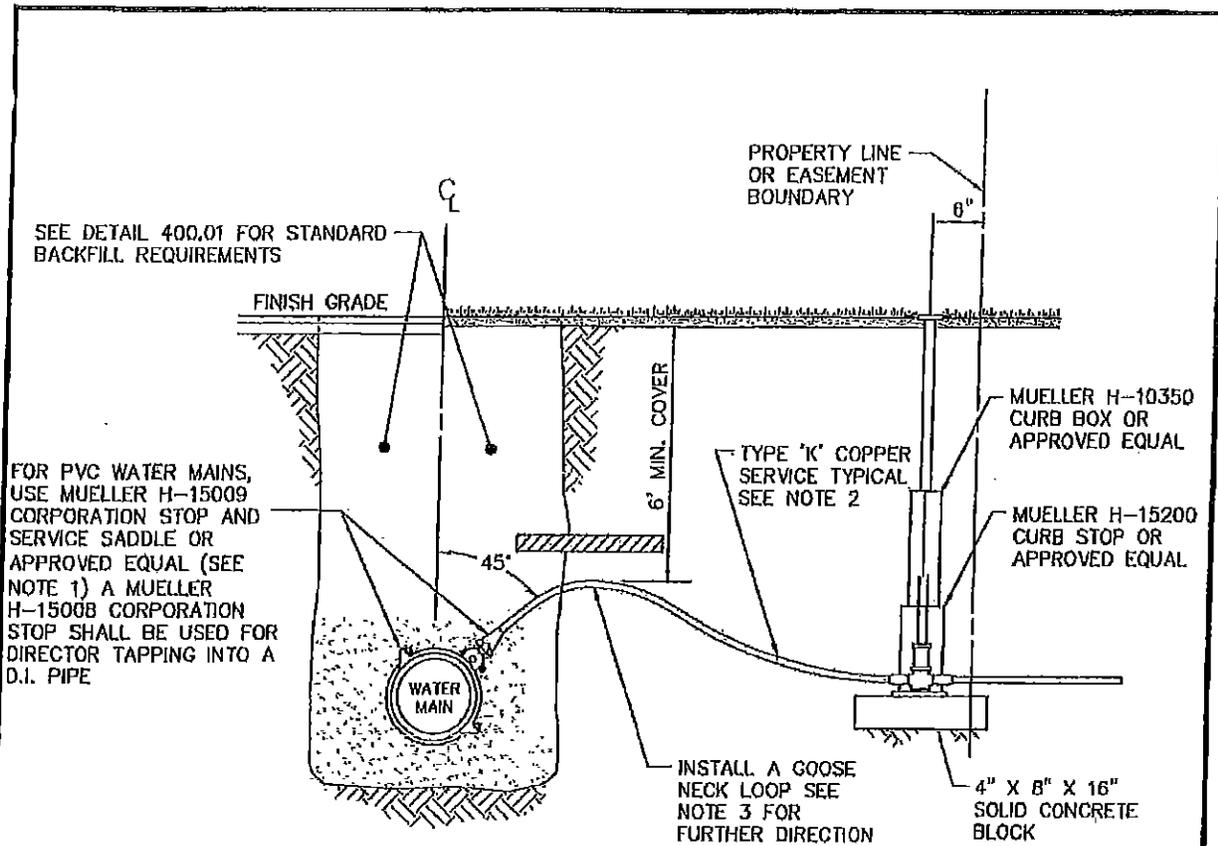
TOWN OF ESSEX
PUBLIC WORKS
67 MAIN STREET
ESSEX JCT., VT
05456
PH 802 878-1364
FX 802 878-1358
E1 WWW.ESEXV.ORG

TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

FIRE HYDRANT

Detail No: 400.02
Scale: NOT TO SCALE
Date: NOV. 2015

A-30



SEE DETAIL 400.01 FOR STANDARD BACKFILL REQUIREMENTS

FOR PVC WATER MAINS, USE MUELLER H-15009 CORPORATION STOP AND SERVICE SADDLE OR APPROVED EQUAL (SEE NOTE 1) A MUELLER H-15008 CORPORATION STOP SHALL BE USED FOR DIRECTOR TAPPING INTO A D.I. PIPE

PROPERTY LINE OR EASEMENT BOUNDARY

FINISH GRADE

6" MIN. COVER

TYPE 'K' COPPER SERVICE TYPICAL SEE NOTE 2

MUELLER H-10350 CURB BOX OR APPROVED EQUAL

MUELLER H-15200 CURB STOP OR APPROVED EQUAL

45°

WATER MAIN

INSTALL A GOOSE NECK LOOP SEE NOTE 3 FOR FURTHER DIRECTION

4" X 8" X 16" SOLID CONCRETE BLOCK

NOTES :

1. SERVICE SADDLES SHALL BE COATED IRON WITH STAINLESS STEEL BANDS AND HARDWARE OR APPROVED EQUAL.
2. ALL RESIDENTIAL SERVICE LINES UP TO AND INCLUDING 1.5" DIAMETER SHALL BE TYPE K COPPER, ALL SERVICE LINES GREATER THAN 1.5" MAY BE PVC OR PE AS APPROVED BY THE DEPARTMENT OF PUBLIC WORKS.
3. ALL SERVICE CONNECTIONS 1-1/2" AND UNDER SHALL HAVE A LOOP INSTALLED DIRECTLY OFF OF THE MAIN. THE HIGHEST POINT OF THIS LOOP SHALL BE INSULATED IF LESS THAN 6' OF COVER.
4. IF COVER OVER SERVICE IS BETWEEN 5'-6', PLACE 2" THICK INSULATION BOARD OVER PIPE. IF COVER IS BETWEEN 4'-5' THEN PLACE 4" THICK INSULATION BOARD OVER PIPE. IN NO CASE SHALL THERE BE LESS THAN 5' OF COVER IN PAVED AREAS OR 4' OF COVER IN GRASS AREAS.
5. ALL WORK SHALL CONFORM TO THESE SPECIFICATIONS AND PLANS UNLESS OTHERWISE SPECIFIED.
6. THE PIPE BEDDING FOR TYPE "K" COPPER PIPE SHALL BE THOROUGHLY COMPACTED SAND, 3/4" STONE BEDDING SHALL BE USED AS PIPE BEDDING FOR PVC OR PE PIPE.



TOWN OF ESSEX
PUBLIC WORKS
81 MAIN STREET
ESSEX JOY, VT
05452

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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

WATER SERVICE CONNECTION

Detail No: 400.05
Scale: NOT TO SCALE
Date: NOV, 2015

A-33

JHSTUART

CIVIL/ENVIRONMENTAL ENGINEERS

July 21, 2016

Town of Essex
Attn: Greg Duggan, Planner
81 Main Street
Essex Jct., Vermont 05452

Re: Hayward Design Build (10 Old Stage Road)

Dear Greg:

In response to your email, I am enclosing herewith the following:

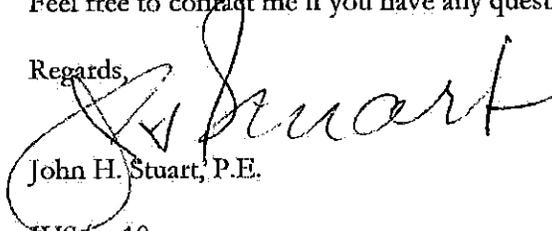
1. Response to Public Works comments.
2. Updated Dwg. 3
3. Updated Dwg. 4

Three (3) full-sized hard copies of the revised plans and seven (7) reduced copies of the plans are attached.

Public Works has included a requirement that a legal document be produced for the private wastewater system. Hayward Design would the Commission include a condition to produce the final legal agreement before a building permit could be issued.

Feel free to contact me if you have any questions or comments.

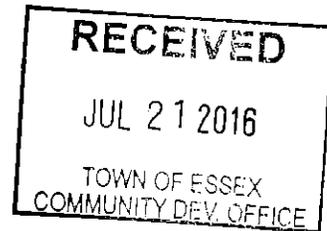
Regards,


John H. Stuart, P.E.

JHS/ov10

cc: Hayward Design Build

encl.



JHSTUART

CIVIL/ENVIRONMENTAL ENGINEERS

July 19, 2016

Town of Essex
Attn: Aaron Martin, P.E., Utilities Director/Town Engineer
81 Main Street
Essex Jct., Vermont 05452

Re: Hayward Design Build (10 Old Stage Road)

Dear Aaron:

The following additional information is provided in response to comments contained in your memo dated June 30th:

Drawing 1 of 4

1. Attached is a draft of the Operations and Maintenance manual for the sewer system.

Drawing 2 of 4

1. The Lost Nation Road hydrant was flow tested on this date and determined to produce 1,007 GPM based on hydrant conditions at Craftsbury (static: 48 psi/residual: 38 psi) and Lost Nation (static: 48 psi/residual: 36 psi).

Drawing 3 of 4

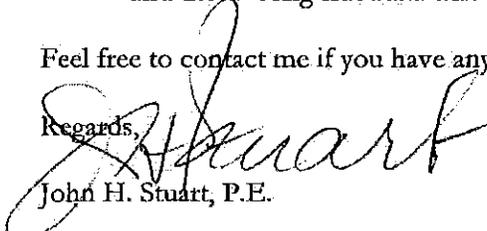
1. The manhole detail has been updated to include the Note #11 information from A-20.
2. The force main testing procedure from A-24 has been added to the detail.
3. The Craftsbury Court road cut detail has been updated to reflect detail A-11.

Drawing 4 of 4

1. The house connection detail has added Notes #3 and 6 from A-33.
2. The hydrant detail has been updated to include more information on cover depth, the thrust block size and drain plug from A-30.
3. The water main detail has been updated to provide the necessary cover and a test procedure.
4. The pipe specification has been revised to provide for C-900.
5. The sidewalk detail has been revised to provide a concrete section to connect Old Stage Road and the existing sidewalk. The culvert material has been changed to SDR 35 PVC.

Feel free to contact me if you have any questions or comments.

Regards,


John H. Stuart, P.E.

JHS/ov10

10 OLD STAGE ROAD

WASTEWATER COLLECTION AND DISPOSAL SYSTEM

OVERVIEW—The 3.15 acre tract located at the intersection of Lost Nation and Old Stage Roads has been subdivided into six (6) lots that are to be connected to municipal sewer system. The project is located in the Essex Sewer District, but is not in close proximity to existing sewer collection lines. As such, it is necessary to install a gravity collection with individual services to each lot, a pump station and a sewer force main that will connect the station to an existing sewer manhole located on Craftsbury Court. **THIS SYSTEM WILL BE PRIVATELY OWNED, MAINTAINED AND REPAIRED BY THE LOT OWNERS.** These responsibilities are further described in a legal document that will attach to the individual lot deeds and run with the land in perpetuity.

SYSTEM COMPONENTS:

1. Collection Sewer — A gravity sewer line extends from Lot 2 to Lot 6 serves all lots in the subdivision, to which are connected service lines from each lot. The collection line and services are six (6) and four (4) inches respectively and are SDR 35 PVC with bell and spigot couplings. Prior to placing in service, the lines will have been tested to assure water tightness. The collection line terminates at the pump station where it connects by means of a Kor-N-Seal watertight coupling.
2. Sewer Manholes — There are two (2) sewer manholes situated on the sewer collection line. These structures are four (4) diameter at the base, equipped with rungs for access and enclosed with a cast iron frame and grate. The main purpose for the manholes is to provide access to the collection line for inspection and maintenance. The manholes will have been tested for water tightness before placed in service.
3. Pump Station — A concrete structure is provided at the lowest end of the sewer collection line where wastewater is processed through a grinder pump and delivered through a sewer force main to the municipal system located on Craftsbury Court. The station has been provided with a metal access hatch (lockable), two grinder pumps, a riel system to facilitate removal of the pumps and a control panel for automatic operation of the pumps. The tank has been sized to provided storage in the event of a sustained power outage to the area. The station operates by a float system that turns a pump on to deliver the tank contents to the municipal line. Another float turns the pump off at a specific liquid level and simultaneously alternates the operation to the standby pump. Should the primary pump fail to activate, the liquid level will rise to another float that will activate the stand-by pump and also trigger a visual/audible alarm indicating that service is necessary. The station can operate on the stand-by mode until repairs can be effected.
4. Sewer Force Main — The pump station converts wastewater to a slurry which is then pumped through a small diameter force main from Lot 6 behind Lots 3-5; then between Lots 2 and 3; then along Lost Nation Road; then, crossing Old Stage Road; then, running north along the east side of Old Stage to Craftsbury Court; then, east to a manhole on the municipal system. The line was installed used directional boring to avoid surface damage to Old Stage Road and Craftsbury Court. The connection to the manhole was completed using the Kor-N-Seal procedure and provided a watertight connection. The force main was pressure tested to assure water-tightness before activation.

10 OLD STAGE ROAD

Wastewater Collection and Disposal System

Page 2

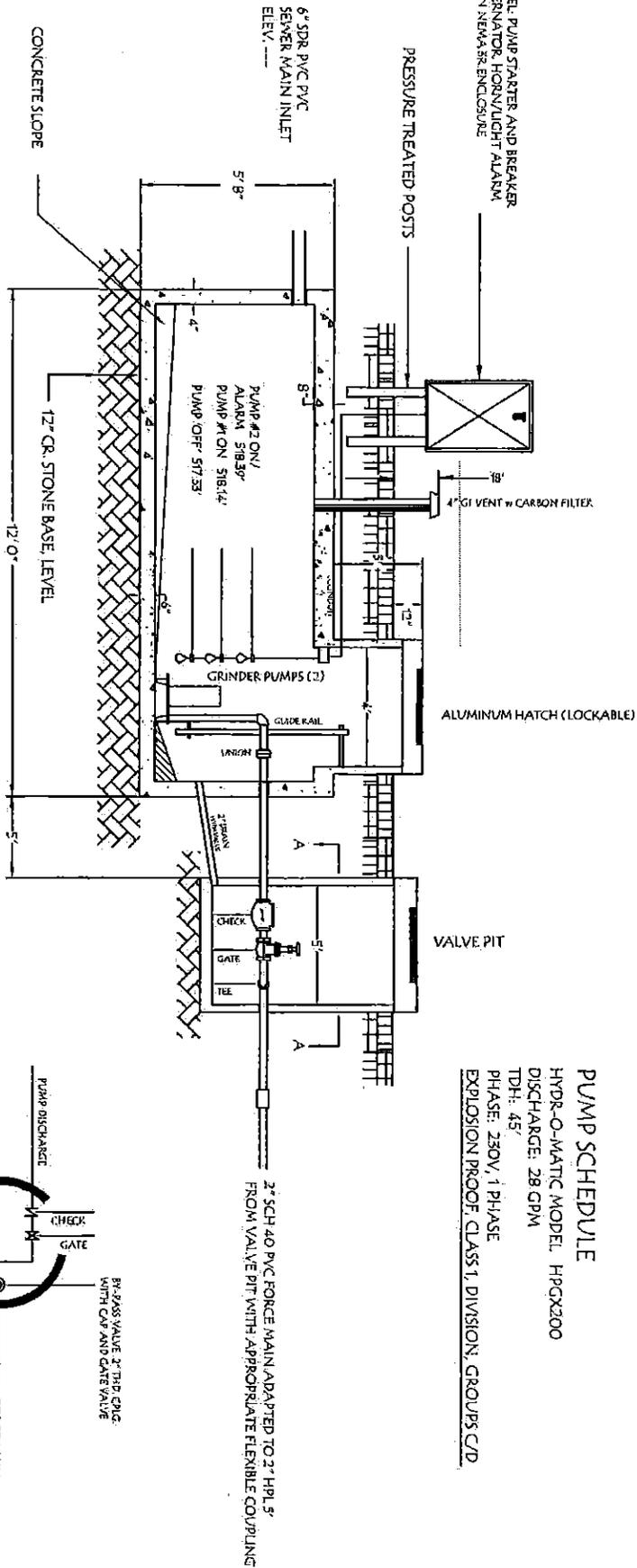
OPERATION

The collection and disposal of wastewater is accomplished by what is referred to as a passive system whereby no operator input is required. Each lot has a gravity service line that flows to a common gravity collection line which is connected to the pump station. Two grinder pumps operate by a float and pump control system that turns one pump on (lead pump), turns the pump off, and alternates to the second pump which becomes the lead pump on the following cycle. One of the floats is set to activate a light and horn alarm that will indicate a problem with the lead pump. The station can continue to operate normally if a pump fails or has to be removed for service.

MAINTENANCE

The association is responsible for operation and maintenance of the system. A contract is to be maintained with a firm specializing in the maintenance and repair of small scale wastewater systems to include periodic inspection of the components and effect any repairs that may be required. A recommended frequency for the inspections would be quarterly. The association will also retain a professional engineer to conduct an annual inspection and report to the association, the Town of Essex and the State of Vermont on the condition of the system as well as any recommendations for maintenance and repair.

CONTROL PANEL, PUMP STARTER AND BREAKER SWITCHES, ALTERNATOR, HORN/LIGHT ALARM. ALL CONTROLS IN NEMA 3R ENCLOSURE



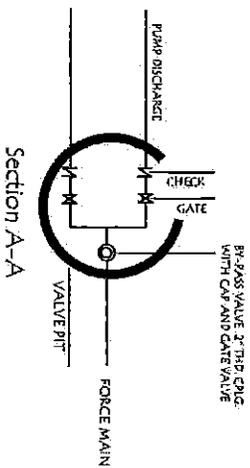
PUMP SCHEDULE
 HDR-O-MATIC MODEL HPGX200
 DISCHARGE: 28 GPM
 TDH: 45'
 PHASE: 230V, 1 PHASE
 EXPLOSION PROOF, CLASS 1, DIVISION, GROUPS C/D

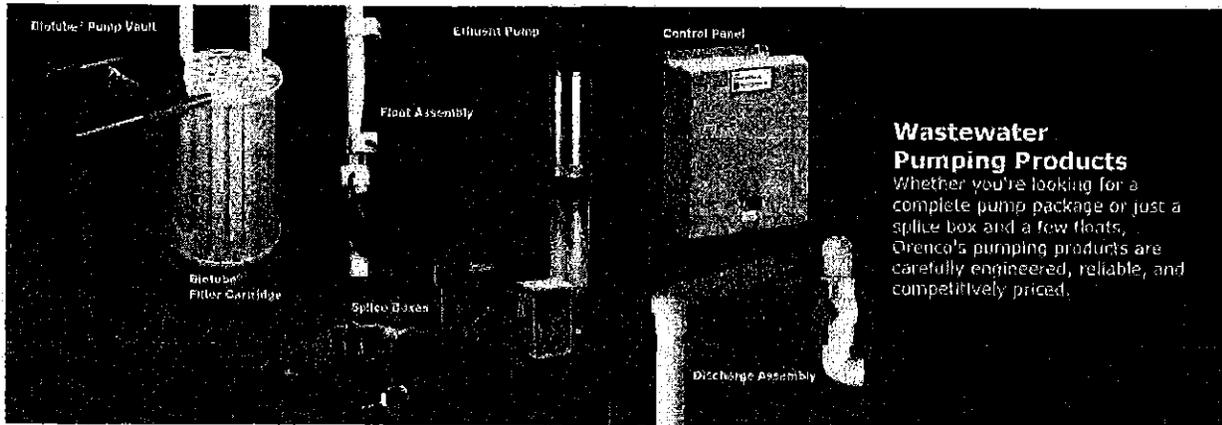
LIFT STATION ELEVATION

TANK SCHEDULE
 CAPACITY: 2000 GALS.

LIFT STATION CONSTRUCTION NOTES

1. THE LIFT STATION AND VALVE PIT SHALL BE 5000 PSI CONCRETE. THE TANK SHALL HAVE A MONOLITHIC BASE WITH RISER CAST INTO TOP. ANY JOINTS IN RISER SHALL BE SEALED WITH DOUBLE INTRUFASTIC. ALL CONCRETE SHALL BE RATED FOR H-10 LOADING.
2. ALL TANK AND PIT OPENINGS SHALL BE EQUIPPED WITH RUBBER BOOT CONNECTIONS.
3. PRIOR TO BACKFILLING, THE LIFT STATION SHALL BE FILLED WITH WATER FOR 24 HOURS WITH NO LOSS. BACKFILL AROUND STRUCTURES SHALL BE CLEAN GRANULAR MATERIAL COMPACTED IN SIX (6) INCH LAYERS.
4. ALL INTERNAL PIPING SHALL BE SCHEDULE 80 PVC WITH SOLVENT WELD OR THREADED COUPLINGS.
5. GATE VALVES WITH #350 CHECK VALVES FLOWMATIC SHALL TYPE 50 FLANGES, 125# THD OR EQUAL.
6. ALL ELECTRICAL WORK TO BE PERFORMED BY LICENSED ELECTRICIAN. POWER BETWEEN PANEL AND STATION TO HAVE GAS SEALS.





Wastewater Pumping Products

Whether you're looking for a complete pump package or just a splice box and a few floats, Orenco's pumping products are carefully engineered, reliable, and competitively priced.

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PFSWG Sewage Grinder Pumps (PFSWG)

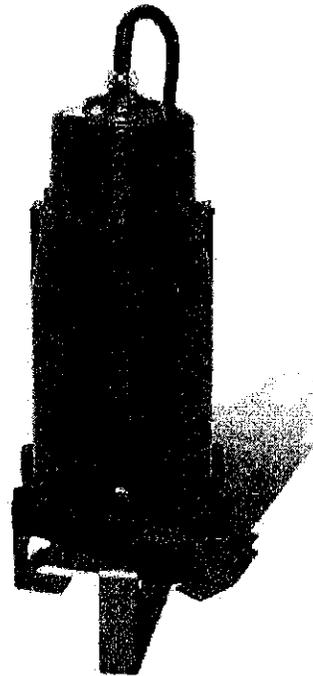
PFSWG Sewage Grinder Pumps are typically used to grind and transport sewage from a pump basin to primary tankage or to a pressure sewer line. They are also used in applications where grinder pumps are specified by regulation or code. The PFSWG's corrosion-resistant construction adds durability in wastewater applications that require grinder pumps. The PFSWG is CSA and UL listed, Manufactured by Franklin Electric.

- Cast-iron pump housing and cover
- Corrosion-resistant epoxy coating
- Built-in protection for thermal overload and over-current conditions
- Short motor shaft for reduced deflection
- Tight cutting clearances
- 414,000 cuts per minute
- CSA and UL listed
- Three-year warranty from date of manufacture

Product Code

- PFSWG — PFSWG series submersible sewage grinder pump; 2 hp (1.49 kW); 60 Hz; single phase; 230 VAC; 1½-inch NPT discharge end

Technical Data Sheet



PFSWG Sewage Grinder Pump

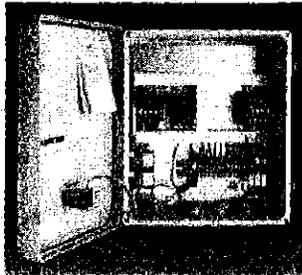




DAX Series Duplex Control Panels

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Duplex control panels can be used in systems that require two motors operating in alternation, as in pumping operations. The panel can run both motors simultaneously when demand is high.



DAX Series Duplex Control Panel

Product Nomenclature



Options (should appear in the following order):

- IR = intrinsically safe relay (S, DAX only)
- PT = programmable timer (S, DAX only)
- RO = redundant off
- CS = current sensor (S, DAX only)
- DS = disconnect switch
- RA = remote alarm (dry contact)
- TS = test switch
- HT = heater
- ETM = elapsed time meter
- CT = counter
- JRL = pump run light
- PL = power light
- SA = surge arrester

Pump voltage:^a

- 1 = 120 VAC
- 2 = 240 VAC

Panel series:

- A = simplex alarm panel
- S = simplex control panel
- DAX = duplex alternating control panel

^a All panels require 120 VAC for the controls

Specification sheets:

[DAX Series Demand-Controlled \(PDF\)](#)

[DAX Series Timer-Controlled \(PDF\)](#)

Sample documents:

[DAX1RO submital](#)

[DAX1RO document set](#)

Specifications

Orenco Duplex Control Panel



Demand-Controlled

This document is a specification sheet for the Orenco Systems Duplex Control Panel: Demand-Controlled. Specifications for alternative features are included as subpoints of each specification, and specifications for options are included in Section 6. Include only the alternatives and options that your application requires.

1. GENERAL

1.1 Panel type: Contractor shall furnish all labor, materials, equipment and incidentals required to provide a simplex motor control panel as specified herein.

1.2 Assembly and testing: The motor control panel shall be assembled and tested by a controls system manufacturer (Orenco Systems, Inc. or pre-approved equal) meeting the standards of UL 508A for industrial controls and shall be UL labeled and serialized accordingly. The panel shall be assembled and tested by the manufacturer to ensure that components and motors are suitably matched and to ensure single-source responsibility for the equipment.

1.3 Motor circuit components: The panel shall contain all components required by the motor manufacturer for starting and protecting the motor. If the motor manufacturer requires the control panel to have certain features for warranty of the motor, such as thermal overload detection or seal failure detection, these features shall be included.

1.4 Warranty: The panel shall be warranted for three years against part defects.

1.5 Approval process for substitution: No part shall be substituted for a part specified here without the approval of the designer.

2. POWER

2.1 Motor power: Incoming motor power shall be single-phase, 60 Hz, 120 VAC. **Or:**

2.1.1 Motor power: Incoming motor power shall be single-phase, 60 Hz, 240 VAC.

2.2 Control/alarm power: Incoming control/alarm power shall be single-phase, 60 Hz, 120 VAC.

3. CONSTRUCTION

3.1 Enclosure: Components shall be housed in a fiberglass enclosure meeting UL Type 4X requirements with a hinged door and neoprene gasket. The enclosure shall accommodate a padlock.

3.2 Labeling and documentation: A nameplate shall be permanently affixed to the exterior of the enclosure. A ratings label affixed to the inside of the enclosure shall include the model number, voltage, phase, frequency, ampere rating and horsepower rating. A label warning about the risk of electric shock shall be permanently affixed to the outer door. As-built schematic drawings and any other necessary instructions shall be supplied inside the enclosure.

3.3 Back plate: A removable aluminum back plate shall be provided for mounting all circuit breakers, motor starters, etc. All components mounted to the back plate shall be secured by screws. Rivets shall not be acceptable for securing any component to the backplate.

3.4 Mounting: Whenever possible, components shall be standard, off-the-shelf components that mount in sockets or directly on the DIN rail for ease of replacement.

3.5 Wiring: Wiring shall be installed in ducts for neatness and safety. All grounding conductors shall be securely connected to assure a proper ground.

3.6 Touch-safe construction: Panel construction and all components shall be touch-safe whenever possible.

4. FUNCTIONS

4.1 Inputs: The control panel shall accept inputs from contacts for off, lead motor on, lag motor on, alarm, and optional redundant off functions.

4.2 Control logic: In response to demand, the panel will control two motors, alternating the first ("lead") motor each cycle. The second ("lag") motor will come on when additional demand requires it. The operator can manually select whether the two motors will alternate or whether one will always be the lead. Electromechanical relays shall be provided for control logic.

4.3 Motor power circuit: In Auto and Hand operation modes, the motor load shall be switched through a motor contactor.

4.4 Alarm function: An alarm condition shall activate the main alarm light on the front of the enclosure and a warble-tone alarm horn. The audible alarm can be silenced. The alarm light shall remain illuminated until the problem is corrected. The audible alarm shall be controlled by a 120 VAC relay with automatic reset.

5. COMPONENTS

5.1 Control and alarm circuit breaker: Control and alarm circuits shall be protected by a separate 10-amp circuit breaker with thermal-magnetic tripping.

5.2 Motor circuit breakers: Each motor circuit shall be protected by a 20-amp circuit breaker with thermal-magnetic tripping.

5.3 Motor contactors: Each motor contactor shall be 1 hp at 120 VAC, 60 Hz, 16 full load amps (FLA), or 3 hp, 240 VAC, 60 Hz, 16 full load amps (FLA). They shall be rated for 2.5 million cycles at FLA and 10 million at 50% of FLA.

5.4 Control relays: Control relays shall be rated 8A resistive (DPDT). They shall be rated for an operational life of 200,000 cycles at full resistive load and 50 million cycles at no load.

5.5 HOA switches: The HOA switches shall allow selection of Hand, Off, or Auto operation mode.

5.6 Alarm horn: The alarm horn shall be rated 95 dB minimum.

5.7 Alarm light: The alarm light shall be a UL Type 4X listed 1-watt LED with a 7/8-in. red lens and push-to-silence functionality.

5.8 Terminal blocks: All connections shall be made in touch-safe terminal blocks rated for 600 VAC, 50 A, capable of holding wires from 26 AWG to 8 AWG and accommodating a 3/16-in. instrument screwdriver blade.

6. OPTIONAL FEATURES

6.1 Intrinsically safe components: Control relays shall be intrinsically safe, 120 VAC, listed per UL 698A, for Class 1 Div. 1, groups A, B, C, and D hazardous locations.

6.2 Redundant off relay: The system shall include a redundant off relay that will activate an alarm and disable the motor when the primary off relay fails or, in the case of a tank, when a low liquid level is detected.

6.3 Heater: The system shall include a self-adjusting heater that radiates additional wattage as the temperature drops.

6.4 Elapsed time meters: The system shall include elapsed time meters with a 7-digit non-resettable display. The meters shall record up to 99,999 hours with a resolution of 0.01 hour.

6.5 Event counters: The system shall include event counters with a 6-digit non-resettable display.

6.6 Motor run lights: The system shall include UL Type 4X listed motor run lights on the front of the enclosure with a 7/8-in. green lens having a 1-watt, 120 VAC LED.

6.7 Power light: The system shall include a UL Type 4X listed power light on the front of the enclosure with a 7/8-in. green lens having a 1-watt, 120 VAC LED.

