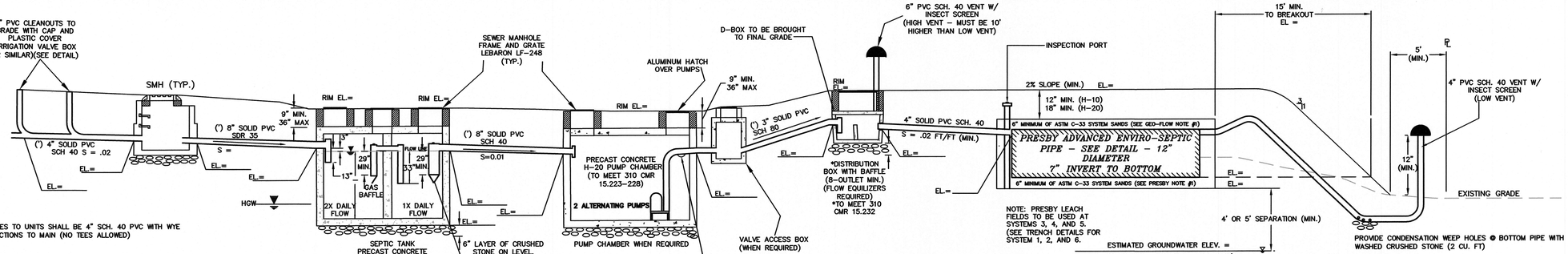
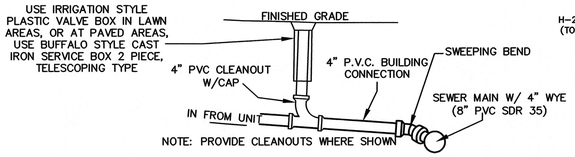


TYPICAL SEPTIC SYSTEM PROFILE

NOT TO SCALE



TYPICAL SEWER CONNECTION W/ CLEANOUT

NOT TO SCALE

SEPTIC SYSTEM INVERT SCHEDULE

SYS. #	INV @ SMH	SEPTIC TANK IN	SEPTIC TANK OUT	PUMP CHAMBER IN	PUMP CHAMBER OUT	D-BOX IN	D-BOX OUT	S.A.S. IN (INV.)	S.A.S. END (INV.)	S.A.S. BOTTOM	S.A.S. TOP S.A.S.	FINISH GRADE	BREAKOUT EL.	GW	MAX. GW HEIGHT (FT)
1	196.34	195.69	194.44	–	–	195.27	195.1	195.0	194.75	193.0	195.35	196.4	195.35	187.4 (TP 1-1)	0.45
2	–	201.76	201.51	–	–	201.33	201.16	201.09	200.80	198.8	201.44	202.5	201.44	193.8 (TP 3-2)	0.99
3	218.33 220.60	217.25 (3A) 218.14 (3B)	217.00 (3A) 218.15 (3B)	–	–	216.95	216.78	216.68	216.68	215.6	217.6	218.6	217.6	209.4 (BOT. HOLE)	0.86
4	211.4	211.3	211.05	–	–	210.9	210.73	210.60	210.60	209.51	211.5	214.5	211.5	200.6 (BOT. HOLE)	1.16
5	–	215.30	215.05	–	–	214.12	213.95	213.80	213.80	212.72	214.72	217.00	214.72	209.5 (TP 5-2)	1.30
6	–	218.98	218.73	–	–	218.57	218.4	218.3	217.85	216.3	218.65	219.7	218.6	209.3 (TP 8-1)	0.52

NOTE:
SYSTEMS #1 AND #3 REQUIRE A MINIMUM OF 5' SEPARATION TO GROUNDWATER DUE TO <2 MPI PERC RATES. ALL OTHER SYSTEMS REQUIRE A MINIMUM OF 4' SEPARATION.

DESIGN CALCULATIONS FOR UNITS #1-4:
SYSTEM #1
1.) ESTIMATED DAILY FLOW:
4 UNITS: 12 BEDROOMS X 110 GPD/BEDROOM = 1320 GPD
(4-3 BEDROOM)

3.) 2'D X 2'W TRENCHES REQUIRED: <2 MPI (CLASS I)
1320 GPD / 0.74 = 1784 S.F. / 6 S.F./L.F. = 298 L.F.
USE (6) 2'D X 2'W X 50'L TRENCHES = 300 L.F.

DESIGN CALCULATIONS FOR UNITS #5-7:
SYSTEM #2
1.) ESTIMATED DAILY FLOW:
3 UNITS: 7 BEDROOMS X 110 GPD/BEDROOM = 770 GPD
(1-3 BEDROOM AND 2-2 BEDROOM)

2.) REQUIRED SEPTIC TANK CAPACITY: (PER TITLE 5)
TWO TANKS IN SERIES (OR TWO COMPARTMENT TANK):
FIRST COMPARTMENT = 48 HOUR DETENTION X 770 GPD = 1540 GAL. (MIN)
SECOND COMPARTMENT = 24 HOUR DETENTION X 770 GPD = 770 GAL
SEPTIC TANK SIZE PROVIDED (2-COMPARTMENT TANK) = 2,500 GAL

3.) 2'D X 2'W TRENCHES REQUIRED: 14 MPI (CLASS II)
770 GPD / 0.56 = 1375 S.F. / 6. S.F./L.F. = 229 L.F.
USE (4) 2'D X 2'W X 58'L TRENCHES =231 L.F.

DESIGN CALCULATIONS FOR UNITS #21-28:
SYSTEM #3
1.) ESTIMATED DAILY FLOW:
10 UNITS: 27 BEDROOMS X 110 GPD/BEDROOM = 2,970 GPD
(7 X 3 BEDROOM AND 3 X 2 BEDROOM)
2.) REQUIRED SEPTIC TANK CAPACITY: (PER TITLE 5)
TWO TANKS IN SERIES (OR TWO COMPARTMENT TANK):
FIRST COMPARTMENT = 48 HOUR DETENTION X 2970 GPD = 5,940 GAL
SECOND COMPARTMENT = 24 HOUR DETENTION X 2,970 GPD = 2,970 GAL
SEPTIC TANK SIZE PROVIDED (2-COMPARTMENT TANK) = 9,000 GAL

3.) PRESBY ADVANCED ENVIRO-SEPTIC SYSTEM LEACHING REQUIREMENTS:
USE <2 M.P.I. PERCOLATION RATE (CLASS I)
EFFLUENT LOADING RATE = 0.74 GPD/SF
PER TITLE V, AREA REQUIRED= 2,970 GPD/ 0.74 GPD/SF = 4013 SF
**USING PRESBY ENVIRO-SEPTIC SYSTEM, EMPLOY 40% REDUCTION TO LEACHING SYSTEM AREA: 4013 SF X 0.6 = 2,408 S.F.
(2,426 S.F. MIN. REQUIRED PER PRESBY DESIGN MANUAL)
USE (1) 103'L X 25'W LEACHING BEDS = 2,575 S.F.

RESERVE: 4013 S.F REQUIRED
USE LEACHING FIELD TRENCHES
2'D X 2'W TRENCHES = 6 S.F./L.F OF LEACHING AREA
4013 S.F./ 6 = 669 L.F OF TRENCHES REQUIRED
USE (7) 2'D X 2'W X 100'L TRENCHES = 700 L.F.

4.) PRESBY ADVANCED ENVIRO-SEPTIC PIPE REQUIREMENTS:
FOR A PERC RATE OF 1-60 MPI:
NEED 100 L.F OF PRESBY AES SEPTIC PIPE FOR EACH 2 BEDROOMS
100 L.F. PER 2 BEDROOMS X 27 BEDROOMS = 1350 LF OF AES PIPE REQ'D
USE (14) 100' LENGTHS OF PIPE SPACED @ 1.5' O.C
WITH 2.25' OF SAND ON SIDES AND 1.5' OF SAND AT ENDS

DESIGN CALCULATIONS FOR UNITS 12-17:
SYSTEM #4
1.) ESTIMATED DAILY FLOW:
6 UNITS: 14 BEDROOMS X 110 GPD/BEDROOM = 1,540 GPD
(2 X 3 BEDROOMS AND 4 X 2 BEDROOM)

2.) REQUIRED SEPTIC TANK CAPACITY: (PER TITLE 5)
TWO TANKS IN SERIES (OR TWO COMPARTMENT TANK):
FIRST COMPARTMENT = 48 HOUR DETENTION X 1,540 GPD = 3,080 GAL
SECOND COMPARTMENT = 24 HOUR DETENTION X 1,540 GPD = 1,540 GAL
SEPTIC TANK SIZE PROVIDED (2-COMPARTMENT TANK) = 5,000 GAL

3.) PRESBY ENVIRO-SEPTIC SYSTEM LEACHING REQUIREMENTS:
USE 6 M.P.I. PERCOLATION RATE (CLASS II)
EFFLUENT LOADING RATE = 0.60 GPD/SF
PER TITLE V, AREA REQUIRED= 1,540 GPD / 0.60 GPD/SF = 2,567 S.F.
**USING ADVANCED PRESBY ENVIRO-SEPTIC SYSTEM, EMPLOY 40% REDUCTION TO LEACHING SYSTEM AREA: 2,567 S.F. X 0.6 = 1,540 S.F.
USE (1) 62'L X 25'W LEACHING BEDS = 1,550 S.F.

RESERVE: 1,540 S.F REQUIRED
USE LEACHING FIELD TRENCHES
2'D X 2'W TRENCHES = 6 S.F./L.F OF LEACHING AREA
2,567 S.F./6 = 428 L.F OF TRENCHES REQUIRED
USE (6) 2'D X 2'W X 72'L TRENCHES = 432 L.F.

4.) PRESBY ADVANCED ENVIRO-SEPTIC PIPE REQUIREMENTS:
FOR A PERC RATE OF 1-60 MPI:
NEED 100 L.F. OF PRESBY AES SEPTIC PIPE FOR EACH 2 BEDROOMS
100 L.F. PER 2 BEDROOMS X 14 BEDROOMS = 700 LF OF AES PIPE REQ'D.
USE (12) 60' LENGTHS OF PIPE SPACED @ 2.0' O.C
WITH 1.0' OF SAND ALL AROUND.

DESIGN CALCULATIONS FOR UNITS #8-11, #18-20:
SYSTEM #5
1.) ESTIMATED DAILY FLOW:
7 UNITS: 20 BEDROOMS X 110 GPD/BEDROOM = 2,200 GPD
(6 X 3 BEDROOMS AND 1 X 2 BEDROOM)

2.) REQUIRED SEPTIC TANK CAPACITY: (PER TITLE 5)
TWO TANKS IN SERIES (OR TWO COMPARTMENT TANK):
FOR UNITS #8-11 (12 BEDROOMS):
FIRST COMPARTMENT = 48 HOUR DETENTION X 1320 GPD = 2640 GAL
SECOND COMPARTMENT = 24 HOUR DETENTION X 1320 GPD = 1320 GAL
SEPTIC TANK SIZE PROVIDED (2-COMPARTMENT TANK) = 4,000 GAL
FOR UNITS #18-20 (8 BEDROOMS):
FIRST COMPARTMENT = 48 HOUR DETENTION X 880 GPD = 1,760 GAL
SECOND COMPARTMENT = 24 HOUR DETENTION X 880 GPD = 880 GAL
SEPTIC TANK SIZE PROVIDED (2-COMPARTMENT TANK) = 3,000 GAL

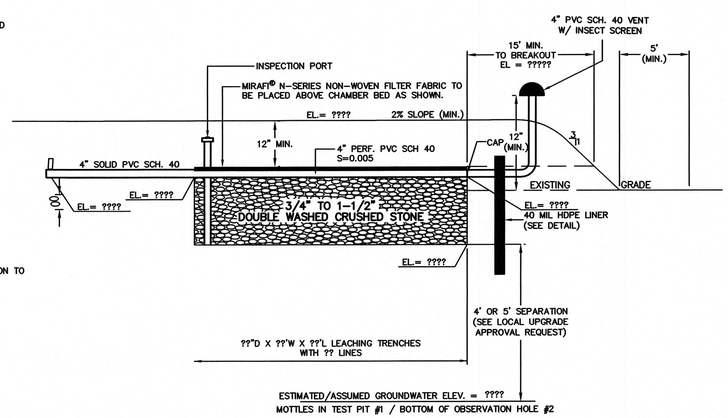
3.) PRESBY ADVANCED ENVIRO-SEPTIC SYSTEM LEACHING REQUIREMENTS:
USE 3 M.P.I. PERCOLATION RATE (CLASS II)
EFFLUENT LOADING RATE = 0.60 GPD/SF
PER TITLE V, AREA REQUIRED= 2,200 GPD / 0.60 GPD/SF = 3,667 SF
**USING PRESBY ADVANCED ENVIRO-SEPTIC SYSTEM, EMPLOY 40% REDUCTION TO LEACHING SYSTEM AREA: 3,667 SF X 0.6 = 2,200 S.F.
(2,310 S.F. MIN. REQUIRED PER PRESBY DESIGN MANUAL)
USE (1) 83' X 28.5' LEACHING BED = 2,365 S.F.

RESERVE: 3,667 S.F REQUIRED
USE LEACHING FIELD TRENCHES
2'D X 2'W TRENCHES = 6 S.F./L.F. OF LEACHING AREA
3,667 S.F./ 6 = 612 L.F OF TRENCHES REQUIRED
USE (9) 2'D X 2'W X 70'L TRENCHES = 630 L.F.

4.) PRESBY ADVANCED ENVIRO-SEPTIC PIPE REQUIREMENTS:
FOR A PERC RATE OF 1-60 MPI:
NEED 100 LF OF PRESBY AES SEPTIC PIPE FOR EACH 2 BEDROOMS
100 L.F. PER 2 BEDROOMS X 20 BEDROOMS = 1000 LF OF AES PIPE REQ'D
USE (15) 80' LENGTHS OF PIPE SPACED @ 1.75' O.C = 1200 LF PROVIDED.
WITH 1.5' OF SAND ALL AROUND

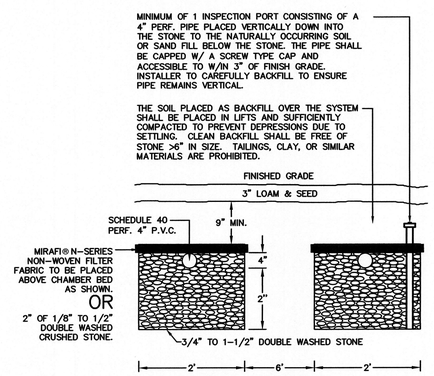
DESIGN CALCULATIONS FOR UNITS #29-32:
SYSTEM #6
1.) ESTIMATED DAILY FLOW:
3 UNITS: 7 BEDROOMS X 110 GPD/BEDROOM = 770 GPD
(1-3 BEDROOM AND 2-2 BEDROOMS)

3.) 2'D X 2'W TRENCHES REQUIRED: <5 MPI (CLASS I)
770 GPD / 0.74 = 1041 S.F. / 6 S.F./L.F. = 173 L.F.
USE (3) 2'D X 2'W X 60'L TRENCHES = 180 L.F.



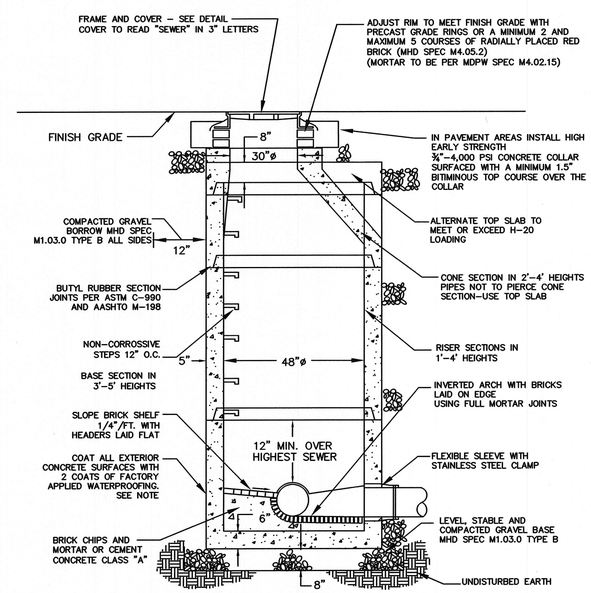
TYPICAL TRENCH PROFILE

NOT TO SCALE



TYPICAL LEACHING TRENCHES

NOT TO SCALE



4' I.D. DIAMETER PRECAST CONCRETE SEWER MANHOLE

N.T.S.

NOTES:
1. EXCAVATION TO ALLOW FOR FREE TRAVEL OF COMPACTION EQIPMENT
2. ALL COMPACTION TO A MINIMUM 95 PERCENT DRY DENSITY DETERMINED BY ASTM D1557. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS
3. ALL PRECAST TO MEET OR EXCEED ASTM C-478 AND ASSHTO M 199 SPECIFICATIONS
4. REINFORCED STEEL TO MEET OR EXCEED ASTM A185 AND H-20 LOADING REQUIREMENTS
5. ALL PRECAST CONCRETE TO BE 4,000 PSI MIMIMUM AND MEET ASTM C-478 (6.1)

COMMONWEALTH OF MASSACHUSETTS
JAMES A. PAVLIK
CIVIL
No. 30458
REGISTERED PROFESSIONAL ENGINEER

James A. Pavlik
10-5-17

REVISIONS

1	5/11/17	BETA ENG./TOWN COMMENTS
2	6/16/17	GENERAL
3	8.14.17	GENERAL
4	9.29.17	UNITS 15/16 AND GRADING

APPLICANT

THE VILLAGE AT NORFOLK, LLC
32 NORFOLK AVENUE
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NORFOLK, MA 02056
ASSESSORS MAP 14 BLOCK 49
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DETAILS SHEET FOR "THE VILLAGE AT NORFOLK"

IN NORFOLK MASSACHUSETTS

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DATE: FEBRUARY 21, 2017
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SCALE: NTS | SHEET 8 OF 10

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