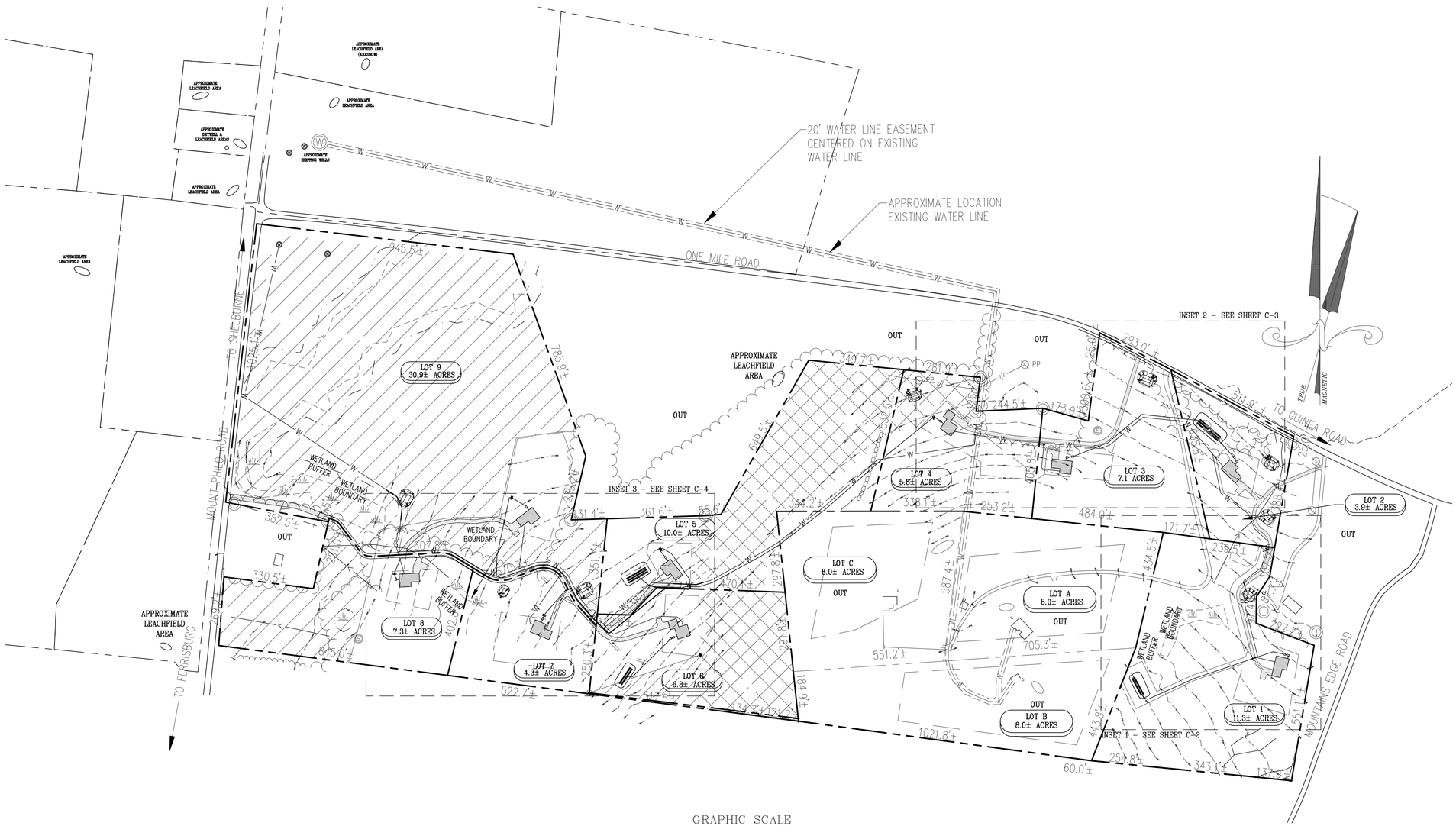
Setbacks:

The following are general setback distances that must be met unless otherwise authorized by the permitting authority and/or the consultant. This list does not necessarily include all required setback distances and the listed setback distances may not apply to all sites:

ITEM	LEACHFIELD	SEPTIC TANK	SEWER
DRILLED WELL	SEE PLAN	50	50
SPRING	SEE PLAN	75	75
LAKES, PONDS, IMPOUNDMENTS	50	25	25
RIVERS, STREAMS	50	25	10
PROPERTY LINE	25	10	10
ROADWAY, DRIVEWAY, PARKING LOTS	10	5	SEE PLAN
TREES	10	10	10
SERVICE WATER LINE	25	25	SEE PLAN

Lot	Building Env. (Acres)	Total Lot (Acres)
1	1.0	11.3
2	0.5	3.9
3	0.5	7.1
4	1.1	5.8
5	0.5	10.0
6	0.6	6.8
7	0.9	4.3
8	0.5	7.3
9	1.6	30.6
A	4.4	8.0
B	4.0	8.0
C	3.0	8.0

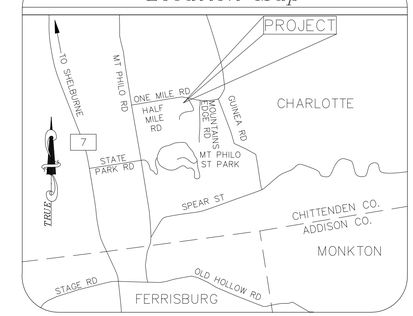
C-1 OVERVIEW
C-2 SITE PLAN - LOT 1
C-3 SITE PLAN - LOTS 2,3,& 4
C-4 SITE PLAN - LOTS 5,6,7,8,&9
C-5 DETAILS - LOT 1
C-6 DETAILS - LOTS 2 & 3
C-7 DETAILS - LOTS 4,5,7,8,&9
C-8 DETAILS - LOT 6
C-9 PROFILES
C-10 SECTIONS
S-1 PRELIMINARY SURVEY WITH EASEMENTS
S-2 PRELIMINARY SURVEY WITH EASEMENTS
SW-1 SW & EPSC OVERVIEW & SW DETAILS
SW-2 SW & EPSC SITE PLAN - PONDS 1, 2, & 3
SW-3 SW & EPSC SITE PLAN - PONDS 4 & 5
SW-4 SW & EPSC SITE PLAN - PONDS 6, 7, & 8
SW-5 EPSC DETAILS
H-1 HABITAT OVERVIEW
W-1 WELL REPORT PLAN



LEGEND

- IPF — Iron pipe found
- IRF — Iron rod found
- Proposed well
- Existing spring
- W — Water line
- 100 — 10' contours
- Property line existing
- Tree line
- Water line easement
- Wetland boundary
- Wetland buffer
- Stone wall
- Open space
- Nature corridor

Location Map



GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

Topography by Total Station
Contour Interval 10'
Approximate USGS Datum
Based on Hand Held GPS Unit

THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

THIS IS NOT A SURVEY. THIS PLAN DOES NOT MEET THE REQUIREMENTS OF 27 VSA SEC. 1403 FOR THE FILING OF SURVEY PLATS.

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PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

OVERVIEW

KR PROPERTIES, LLC

9 LOT SUBDIVISION

ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : 1" = 200'
DESIGNED BY: GNM PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 SHEET C-1

LEGEND

TP-1	Traverse point
SB-1	Test pit
IPF	Iron pipe found
	Wetland flag
	Water shut off valve
W	Water line
100	10' contours
	2' contours
	Property line
	Wetland boundary
	Wetland buffer
	Building envelope
	Right of way line
	Ditch/drainage swale
	Tree line

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Topography by Total Station
Contour Interval 2'
Approximate USGS Datum
Based on Hand Held GPS Unit

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PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

SITE PLAN - LOT 1

KR PROPERTIES, LLC

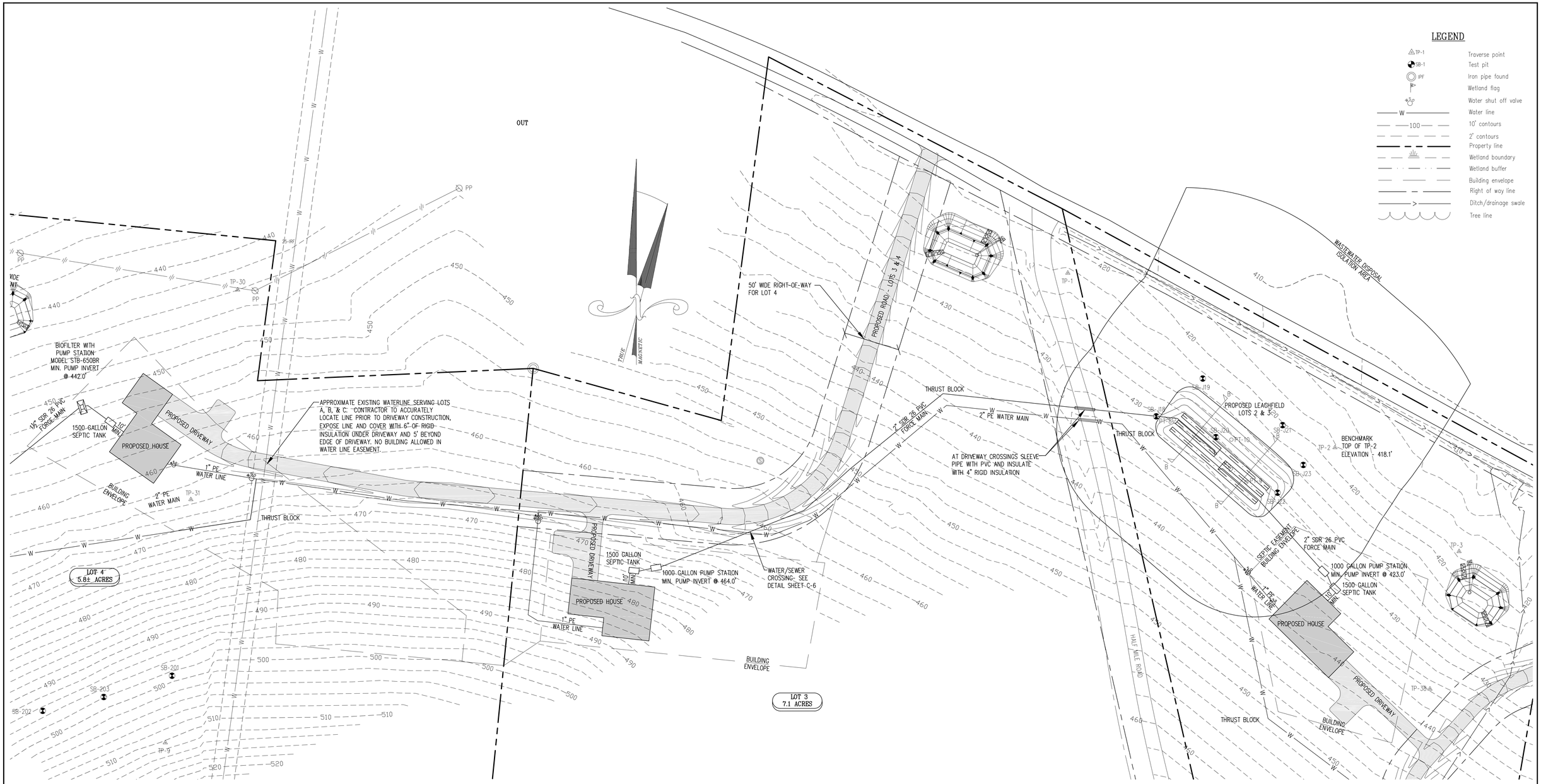
9 LOT SUBDIVISION

ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : 1" = 40'
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET C-2



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Topography by Total Station
Contour Interval 2'
Approximate USGS Datum
Based on Hand Held GPS Unit

THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

THIS IS NOT A SURVEY. THIS PLAN DOES NOT MEET THE REQUIREMENTS OF 27 VSA SEC. 1403 FOR THE FILING OF SURVEY PLATS.

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PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

SITE PLAN - LOTS 2, 3, 4

KR PROPERTIES, LLC

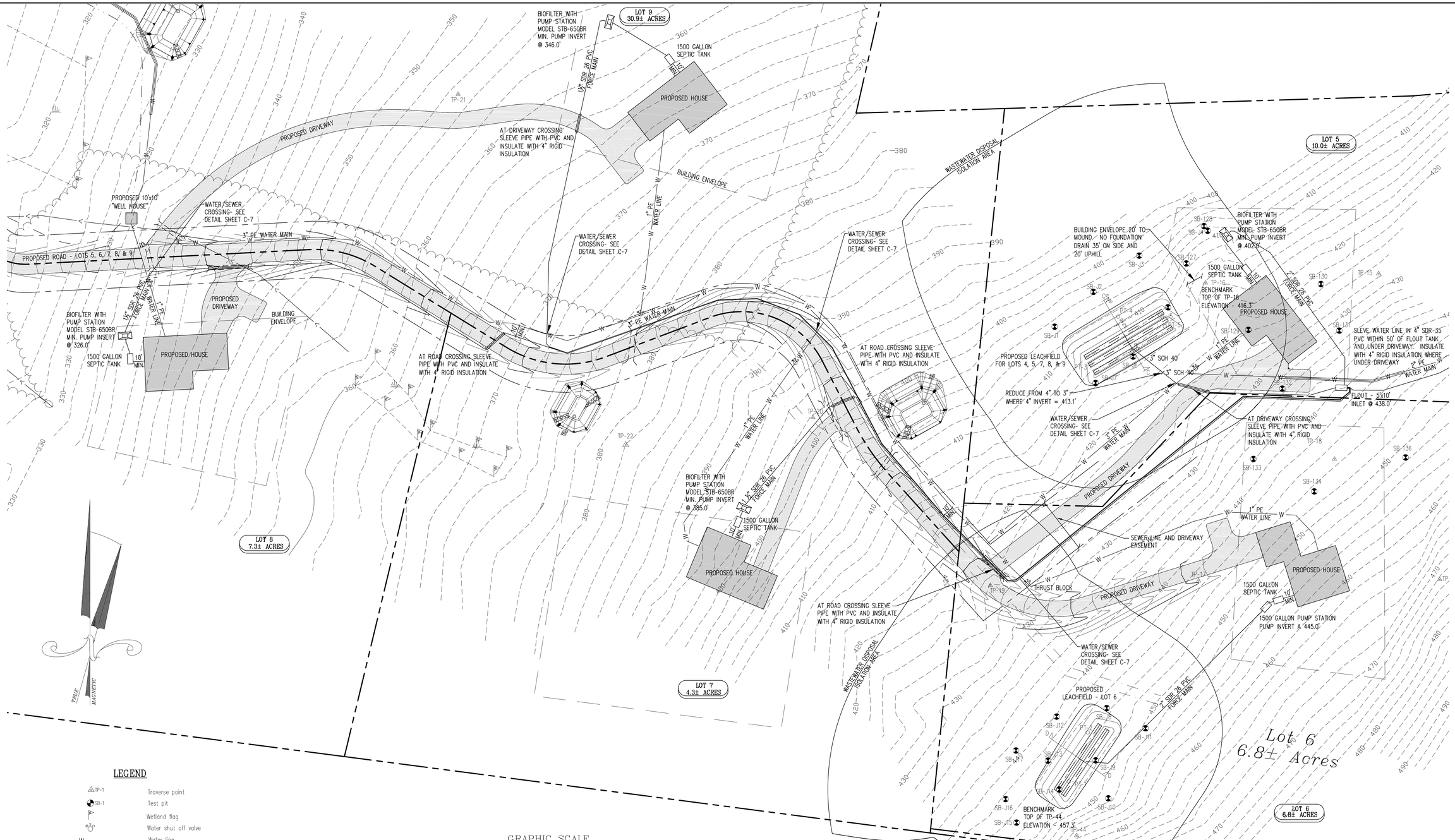
9 LOT SUBDIVISION

ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : 1" = 40'
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET C-3



LEGEND

TP-1	Traverse point
SB-1	Test pit
	Wetland flag
WSO	Water shut off valve
W	Water line
100	10' contours
	2' contours
	Property line
	Wetland boundary
	Wetland buffer
	Building envelope
	Right of way line
>	Ditch/drainage swale
	Tree line
W	Water line
	Nature corridor

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Topography by Total Station
Contour Interval 2'
Approximate USGS Datum & LIDAR
Based on Hand Held GPS Unit

PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

SITE PLAN - LOTS 5, 6, 7, 8, 9

KR PROPERTIES, LLC

9 LOT SUBDIVISION

ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : 1" = 40'
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET C-4

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NOTES - Lot:

Septic Tank and Building Sewer:

1) Use a 1500 gallon concrete septic tank with an access riser to grade, and an effluent filter.
2) Place tank a minimum of 10' from the building.
3) Use 4" cast iron or SCH 40 PVC from building to tank with one pipe joint placed on undisturbed soil to absorb settling.
4) Slope pipe from building to tank at ¼" per foot.

Pump Station:

1) Test pump on and off levels to verify dose volumes.
2) Test alarm level.
3) Test pump to verify minimum 28" discharge height at leachfield orifices.

Leachfield – Performance Based Approach Design Notes (Replacement not required as per §1-804(c)(3):

1) Assume a five bedroom single family residential unit. Daily Flow (DF) @ 420 gpd per bedroom for the first 3 bedrooms and 70 gpd for the remaining 2 bedrooms = 560 gpd
2) Percolation rate t = 3 minute/inch
3) Application rate (AR) = $(3/\sqrt{t}) = (3/\sqrt{3}) = 1.73$ gal/sf/day
   Maximum application rate for effluent in a mound trench = 1.0 gal/sf/day
4) Required trench area: DF/AR = 560 gpd / 1.0 g/sf/day = 560 sf
5) Actual area: 2 trenches @ 4' x 70' = 560 sf
6) Required minimum effective basal area: 560 gpd / 0.74 gpd/sf = 757 sf
7) Basal area = 2511 sf
8) Maximum Linear Loading Rate (LLR) = h x f, where
   h = (depth to limiting layer) - (required unsaturated flow depth)
   21" + 18" (mound sand) - 36" (unsaturated flow) = 3" or 0.25'.
   and f = LLR factor = 33.7 gpd/lf/ft for very sandy loam, with a 15.1-20% slope.
   Therefore, maximum LLR = 0.25 x 33.7 = 8.45 gpd/lf.
9) Actual LLR = 560 gpd/ 70 lf = 8.0 gpd/lf. which is less than the maximum allowed.
10) A Performance Based Design requires 6" naturally occurring unsaturated soil above the calculated level of the effluent plume. Based on #8 above, the Maximum Linear Loading Rate of 8.45 gpd/lf will result in 3" of mounding. As the limiting layer is at 21", 3" of mounding results in an effluent plume 18" below grade which exceeds the 6" requirement

Leachfield - Construction Notes:

1) Contact the consultant prior to any work to discuss system layout and inspection requirements.
2) Construction of the mound shall not take place if the soil moisture content is high. If questionable contractor to contact designer prior to construction.
3) Install force main, leaving 4'± above grade.
4) Plow or scarify to limits of fill. Area to be plowed to a depth of 8" with plow lines running parallel with the contours, and throwing the soil uphill. Do not plow if area is wet. Do not run machinery on plowed surface.
5) Mound sand to meet the requirements of §1-913(c), see table:

	Sieve Number	Opening (mm)	Percent Passage, by Weight
	3/8	9.500	85 - 100
	40	0.420	25 - 75
Option 1	60	0.240	0 - 30
	100	0.149	0 - 10
	200	0.074	0 - 5
	4	4.750	95 - 100
	8	2.380	80 - 100
Option 2	16	1.190	50 - 85
	30	0.590	25 - 60
	50	0.297	10 - 30
	100	0.149	2 - 10
	3/8	9.500	85 - 100
Option 3	40	0.420	30 - 50
	200	0.074	0 - 5

6) Sand is to be stockpiled on the edge of the plowed area and placed with a small track machine, keeping a minimum of 6" of sand below the tracks. Do not compact the sand.
7) Place 8" of 1"-1½" clean hard crushed stone or washed stone per the detail. Lay pressure piping and connect to force main. ¼" holes to be pointed up with orifice shields over all holes and spaced according to the detail. Ream all holes to remove burrs. System must be tested prior to covering.
8) Cover pipe with a minimum of 2" of stone and filter fabric. Topsoil, seed, and mulch the entire area. Grade to drain runoff away from system.

Inspections and Certifications:

1) It is the owner's/ contractor's responsibility to contact the consultant (McCain Consulting - 802-244-5093) for the following:

   a) For stakeout of the leachfield location - Please provide 2 weeks notice.
   b) For inspection of the scarification of the soil prior to placing stone - Please provide 72 hours notice.
   c) For inspection of the pressurization of the force main to 50 psi.
   d) To observe pump operation and to verify discharge height at the leachfield.

2) The septic system installer will provide the consultant with a signed and dated statement as follows:

   "I hereby certify that the installation-related information submitted is true and correct, and that in the exercise of my reasonable professional judgment, the wastewater system has been installed in accordance with the permitted design and all permit conditions, was inspected, was properly tested, and has successfully met those performance tests.

3) The certification of construction as required by section 1-308(a) of the Environmental Protection Rules may not be provided by the designer if the procedures outlined herein are not followed.

Maintenance:

(1) At least once a year, the depth of sludge and scum in the septic tank should be measured. The tank should be pumped if:
   (a) The sludge is closer than twelve inches to the outlet baffle,or
   (b) The scum layer is closer than three inches to the septic tank outlet baffle.
   (c) Following septic tank cleaning in units over 5,000 gallons, all interior surfaces of the tank should be inspected for leaks and cracks.

(2) At least twice a year, the outlet filter on the septic tank should be removed and cleaned by spraying it with water under normal household pressure.

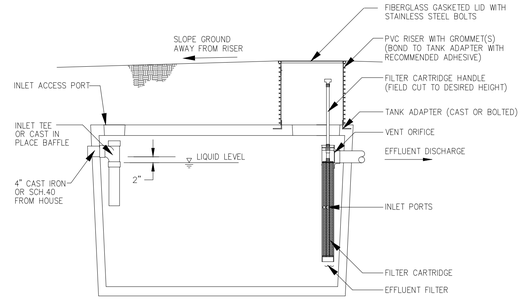
(3) At least once a year, dosing tanks and distribution boxes should be opened and settled solids removed as necessary and the dosing tank or distribution box checked for levelness.

(4) At least once a year, pump stations should be inspected:

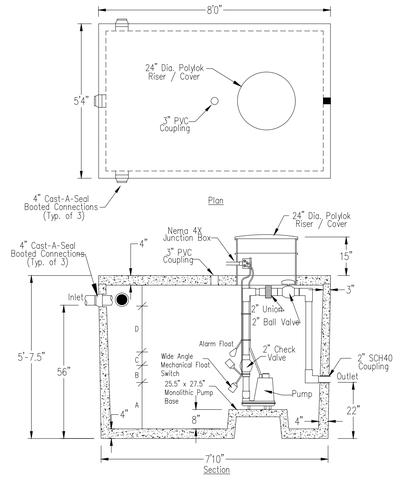
   (a) Remove settled solids as necessary. Solids and scum accumulation in the pump station may be indicative of a septic tank outlet filter malfunction, septic tank overloading, or other cause that should be investigated and remedied.
   (b) On/off and alarm floats should be tripped to ensure proper operation.
   (c) Inspect delivery of filtrate to the leachfield. Slow delivery may indicate impending pump failure.

(5) Toxic or hazardous substances should in general not be disposed of in septic systems. These substances may pass through the system in an unaltered state and contaminate groundwater or remain in the septage and subsequently contaminate the soil or corps at the site of ultimate disposal.

(6) The leachfields are not designed for the disposal of filter backwash or other byproducts of water treatment, filtration or purification systems.



TYPICAL SEPTIC TANK
(NOT TO SCALE)



TYPICAL 1000 GALLON PUMP STATION
(NOT TO SCALE)

1000 Gallon Pump Station Volumes (In Gallons) by Camp Precast			Dose Volume (Daily Flow)	Between On and Alarm	Total Gallons Used	Min. Req. Storage.	Emergency Storage Avail.
Bedrooms	Tank Capacity	Static Level (A)	(B)	(C)			(D)
2	1109	340	70	64	334	280	775
3	1109	340	105	64	509	420	600
4	1109	340	123	64	527	490	582
5	1109	340	140	64	544	560	565

PUMP PARAMETERS:

PUMP IS TO DELIVER 32 GPM AT 76 FOOT TDH.

THE PUMP IS TO BE SUPPLIED WITH STANDARD ALARM AND CONTROLS AS SUPPLIED BY THE MANUFACTURER

VOLUMES AND FLOAT SETTINGS ARE BASED ON A 1000 GALLON PUMP STATION MANUFACTURED BY CAMP PRECAST CONCRETE PRODUCTS

INSIDE DIMENSIONS VARY WITH EACH TANK SUPPLIER

Soils Information

Test Pits 03/18/13 excavated by backhoe

SB-9
0 -9" Brown topsoil loam
9" -26" Red brown loamy sand, very friable
26"-49" Gray brown slightly gravelly loamy sand, friable
Common faint mottles

SB-10
0 -10" Brown topsoil loam
10"-17" Red brown loamy sand, very friable
17"-77" Gray brown medium fine sand
ESHWT @ **47"**, stained

SB-11
0 -11" Brown topsoil loam
11"-23" Yellow brown sandy loam, very friable
23"-73" Gray brown medium coarse sand, damp
Extremely friable
Uphill side seepage @ **21"**
Many 12" cobbles in top 2'
Second seepage @ 73"

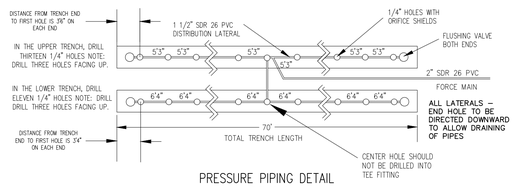
Supplemental hand auger excavated 04/?/16

A-3
0" **-30"** Nice sand

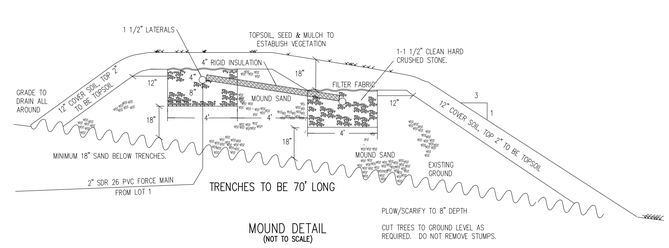
Percolation Tests

PT-6 1 Min/In @ 22"
PT-7 3 Min/In @ 20"

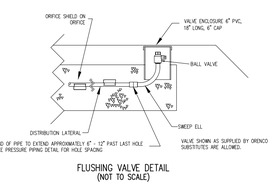
70' TRENCH
UPPER PIPE LENGTH FIRST HOLE TO LAST HOLE = 63' - 13 HOLES
LOWER PIPE LENGTH FIRST HOLE TO LAST HOLE = 63'4" - 11 HOLES
SEE FLUSHING VALVE DETAIL TO DETERMINE TOTAL PIPE LENGTH



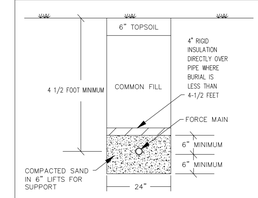
PRESSURE PIPING DETAIL
(NOT TO SCALE)



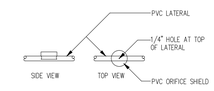
MOUND DETAIL
(NOT TO SCALE)



FLUSHING VALVE DETAIL
(NOT TO SCALE)



FORCE MAIN TRENCH DETAIL
(NOT TO SCALE)



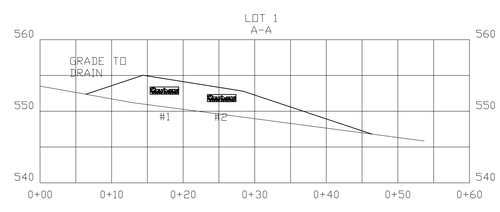
INSTALL ORIFICE SHIELD OVER EACH LATERAL HOLE AFTER THE PUMP DISCHARGE TEST IS COMPLETED AND WITNESSED BY THE DESIGNER.

ORIFICE SHIELD DETAIL
(NOT TO SCALE)

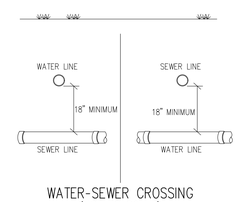
DESIGN INTENT:
THE INTENT OF THIS DESIGN IS TO HAVE A MINIMUM OF 18" OF SAND BELOW THE LEACHFIELD STONE. CONTRACTOR TO VERIFY ALL GRADES AND ELEVATIONS PRIOR TO COMMENCING CONSTRUCTION AND CONTACT DESIGNER IF DISCREPANCIES ARE FOUND.

MOUND SYSTEM INVERTS

TRENCH	BOTTOM OF STONE	DISTRIBUTION PIPE INVERT
1	552.4'	553.1'
2	551.3'	552.0'



HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'



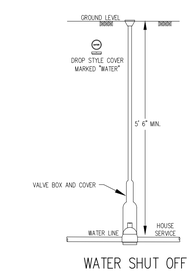
WATER-SEWER CROSSING
(NOT TO SCALE)

ARRANGE PIPES TO MAXIMIZE DISTANCE BETWEEN CROSSING AND PIPE JOINTS. SEE WATER-SEWER LINE SEPERATION NOTES

WATER-SEWER LINE SEPARATION NOTES

A. Horizontal Separation:
1. Sewers shall be laid at least ten feet horizontally from any existing or proposed water main. The distance shall be measured edge to edge.
2. Where impossible or impractical, due to ledge, boulders or other unusual conditions, to maintain the ten foot sewer-water pipe horizontal separation between sewer and water lines, the water line may be in a separate trench or on an undisturbed earth shelf in the sewer trench provided that the bottom of the water line is at least 18 inches above the top of the sewer. Wherever impossible or impractical to maintain the 18 inch vertical separation, the sewer line shall be constructed to normal water line standards and pressure tested to 50 psi for 2 hours prior to backfilling. No leakage shall be allowed for this test.

B. Crossings:
1. Sewer crossing water mains shall be laid beneath the water main with at least 18 inches vertical clearance between the outside of the sewer and the outside of the water main.
2. When it is impossible to maintain the 18 inch vertical separation, the crossing shall be arranged so that one full length of sewer pipe is centered above or below the water line with sewer joints as far as possible from water joints.
3. The sewer pipe must be constructed to the water main standards for a minimum distance of 20 feet either side of the crossing or a total of three pipe lengths, whichever is greater.
4. The section constructed to water main standards must be pressure tested to maintain 50 psi for 2 hours without leakage prior to backfilling beyond one foot above the pipe to verify water tightness.
5. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to prevent damage to the water main, and the joints of the sewer line shall be encased in concrete.



WATER SHUT OFF
(NOT TO SCALE)

THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

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PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

SEPTIC SYSTEM DETAILS – LOT 1
KR PROPERTIES, LLC
9 LOT SUBDIVISION
ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : NTS
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET C-5

NOTES - Lots 2 & 3:

Septic Tank and Building Sewer:

1) Use a 1500 gallon concrete septic tank with an access riser to grade, and an effluent filter.
2) Place tank a minimum of 10' from the building.
3) Use 4" cast iron or SCH 40 PVC from building to tank with one pipe joint placed on undisturbed soil to absorb settling.
4) Slope pipe from building to tank at ¼" per foot.

Pump Station:

1) Test pump on and off levels to verify dose volumes.
2) Test alarm level.
3) Test pump to verify minimum 28" discharge height at leachfield orifices.

Force Main:

1) Perform a hydrostatic leakage test of the force main at 50 psi and hold pressure for two hours.

Leachfield – Performance Based Approach Design Notes (Replacement not required as per §1-804(c)(3):

1) Assume 2 five bedroom single family residential units. Daily Flow (DF) @ 420 gpd per bedroom for the first 3 bedrooms and 70 gpd for the remaining bedrooms = 560 gpd per house = 1120.
2) Percolation rate t = 3 minute/inch
3) Application rate (AR) = $(3/\sqrt{t}) = (3/\sqrt{3})$ = 3.46 gal/sf/day
   Maximum application rate for effluent in a mound trench = 1.0 gal/sf/day
4) Required trench area: DF/AR = 1120 gpd / 1.0 g/sf/day = 1120 sf
5) Actual area: 2 trenches @ 4' x 100' = 800 sf and 2 trenches @ 4' x 45' = 360 sf total = 1160 sf
6) Required minimum effective basal area: 1120 gpd / 0.74 gpd/sf = 1514 sf
7) Basal area = 4709 sf
8) Maximum Linear Loading Rate (LLR) = h x f, where
   h = (depth to limiting layer) - (required unsaturated flow depth)
   = 16" + 26" (mound sand) - 36" (unsaturated flow) = 6" or 0.50'.
   and f = LLR factor = 26.2 gpd/lf/ft for fine sandy loam, with a 15.1-20% slope.
   Therefore, maximum LLR = 0.50 x 26.2 = 13.1 gpd/lf.
9) Actual LLR = 1120 gpd/ 100 lf = 11.2 gpd/lf, which is less than the maximum allowed.
10) A Performance Based Design requires 6" naturally occurring unsaturated soil above the calculated level of the effluent plume. Based on §8 above, the Maximum Linear Loading Rate of 13.1 gpd/lf will result in 6" of mounding. As the limiting layer is at 16", 6" of mounding results in an effluent plume 10" below grade which exceeds the 6" requirement.
11) Evaluated as one leachfield, design is for discreet piping network for each lot.

Leachfield - Construction Notes:

1) Contact the consultant prior to any work to discuss system layout and inspection requirements.
2) Construction of the mound shall not take place if the soil moisture content is high. If questionable contractor to contact designer prior to construction.
3) Install force main, leaving 4'± above grade.
4) Plow or scarify to limits of fill. Area to be plowed to a depth of 8" with plow lines running parallel with the contours, and throwing the soil uphill. Do not plow if area is wet. Do not run machinery on plowed surface.
5) Mound sand to meet the requirements of §1-913(c), see table:

	Sieve Number	Opening (mm)	Percent Passage, by Weight
	3/8	9.500	85 - 100
	40	0.420	25 - 75
Option 1	60	0.240	0 - 30
	100	0.149	0 - 10
	200	0.074	0 - 5
	4	4.750	95 - 100
	8	2.380	80 - 100
Option 2	16	1.190	50 - 85
	30	0.590	25 - 60
	50	0.297	10 - 30
	100	0.149	2 - 10
	3/8	9.500	85 - 100
Option 3	40	0.420	30 - 50
	200	0.074	0 - 5

6) Sand is to be stockpiled on the edge of the plowed area and placed with a small track machine, keeping a minimum of 6" of sand below the tracks. Do not compact the sand.
7) Place 8" of 1"-1½" clean hard crushed stone or washed stone per the detail. Lay pressure piping and connect to force main. ¾" holes to be pointed up with orifice shields over all holes and spaced according to the detail. Ream all holes to remove burrs. System must be tested prior to covering.
8) Cover pipe with a minimum of 2" of stone and filter fabric. Topsoil, seed, and mulch the entire area. Grade to drain runoff away from system.

Inspections and Certifications:

1) It is the owner's/ contractor's responsibility to contact the consultant (McCain Consulting - 802-244-5093) for the following:
   a) For stakeout of the leachfield location - Please provide 2 weeks notice.
   b) For inspection of the scarification of the soil prior to placing stone - Please provide 72 hours notice.
   c) For inspection of the pressurization of the force main to 50 psi.
   d) To observe pump operation and to verify discharge height at the leachfield.
2) The septic system installer will provide the consultant with a signed and dated statement as follows:

   "I hereby certify that the installation-related information submitted is true and correct, and that in the exercise of my reasonable professional judgment, the wastewater system has been installed in accordance with the permitted design and all permit conditions, was inspected, was properly tested, and has successfully met those performance tests.

3) **The certification of construction as required by section 1-308(a) of the Environmental Protection Rules may not be provided by the designer if the procedures outlined herein are not followed.**

Maintenance:

(1) At least once a year, the depth of sludge and scum in the septic tank should be measured. The tank should be pumped if:
   (a) The sludge is closer than twelve inches to the outlet baffle,or
   (b) The scum layer is closer than three inches to the septic tank outlet baffle.
   (c) Following septic tank cleaning in units over 5,000 gallons, all interior surfaces of the tank should be inspected for leaks and cracks.

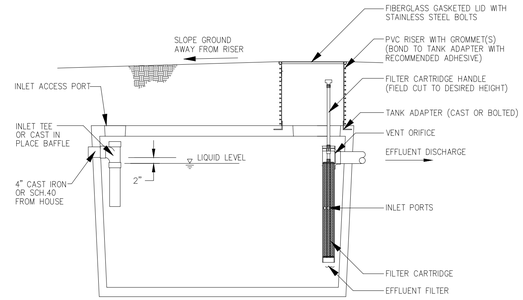
(2) At least twice a year, the outlet filter on the septic tank should be removed and cleaned by spraying it with water under normal household pressure.

(3) At least once a year, dosing tanks and distribution boxes should be opened and settled solids removed as necessary and the dosing tank or distribution box checked for levelness.

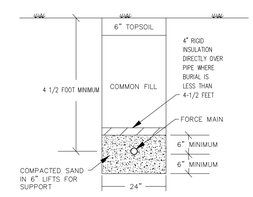
(4) At least once a year, pump stations should be inspected:
   (a) Remove settled solids as necessary. Solids and scum accumulation in the pump station may be indicative of a septic tank outlet filter malfunction, septic tank overloading, or other cause that should be investigated and remedied.
   (b) On/off and alarm floats should be tripped to ensure proper operation.
   (c) Inspect delivery of filtrate to the leachfield. Slow delivery may indicate impending pump failure.

(5) Toxic or hazardous substances should in general not be disposed of in septic systems. These substances may pass through the system in an unaltered state and contaminate groundwater or remain in the septage and subsequently contaminate the soil or corps at the site of ultimate disposal.

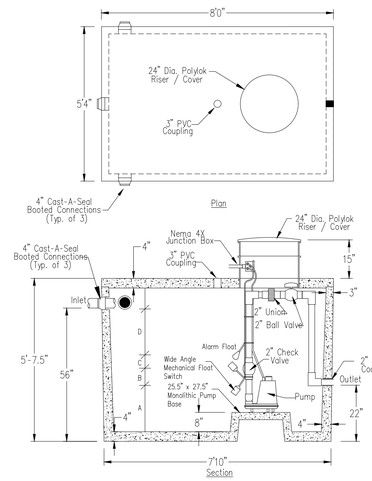
(6) **The leachfields are not designed for the disposal of filter backwash or other byproducts of water treatment, filtration or purification systems.**



TYPICAL SEPTIC TANK
(NOT TO SCALE)



FORCE MAIN TRENCH DETAIL
(NOT TO SCALE)



TYPICAL 1000 GALLON PUMP STATION
(NOT TO SCALE)

1000 Gallon Pump Station Volumes (In Gallons) by Camp Precast		Static Level	Dose Volume (Daily Flow)	Between On and Alarm	Total Gallons Used	Min. Req. Storage.	Emergency Storage Avail.
Bedrooms:	Tank Capacity	(A)	(B)	(C)			(D)
2	1109	340	70	64	334	280	775
3	1109	340	105	64	509	420	600
4	1109	340	123	64	527	490	582
5	1109	340	140	64	544	560	565

PUMP PARAMETERS:

LOT 2 - PUMP IS TO DELIVER 35 GPM AT 19 FEET TDH.
LOT 3 - PUMP IS TO DELIVER 35 GPM AT 5 FEET TDH.

THE PUMP IS TO BE SUPPLIED WITH STANDARD ALARM AND CONTROLS AS SUPPLIED BY THE MANUFACTURER

VOLUMES AND FLOAT SETTINGS ARE BASED ON A 1000 GALLON PUMP STATION MANUFACTURED BY CAMP PRECAST CONCRETE PRODUCTS

INSIDE DIMENSIONS VARY WITH EACH TANK SUPPLIER

Soils Information

Test Pits 01/18/16 excavated by backhoe
Steve Rebillard present to observe

SB-18J
0 -9" Brown topsoil loam
9" -28" Yellow brown fine sandy loam, friable
Common faint mottles @ 20"
28"-40" Gray brown very fine sandy loam, friable
Common distinct mottles

SB-19J
0 -9" Brown topsoil loam
9" -28" Yellow brown fine sandy loam, friable
Common faint mottles @ 20"
28"-40" Gray brown very fine sandy loam, friable
Seepage @ 32"

SB-20J
0 -9" Brown topsoil loam
9" -28" Yellow brown fine sandy loam, friable
Common faint mottles @ 20"
28"-40" Gray brown very fine sandy loam, friable
Seepage @ 31"

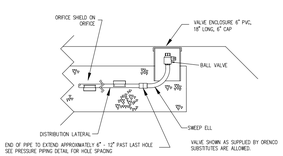
SB-21J
0 -9" Brown topsoil loam
9" -28" Yellow brown fine sandy loam, friable
Common faint mottles @ 16"
28"-40" Gray brown very fine sandy loam, friable
Seepage @ 25"

SB-22J
0 -9" Brown topsoil loam
9" -28" Yellow brown fine sandy loam, friable
Common faint mottles @ 20"
28"-40" Gray brown very fine sandy loam, friable
Seepage @ 26"

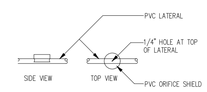
SB-23J
0 -12" Brown topsoil loam
12"-21" Yellow brown loamy sand, very friable
21"-37" Gray brown slightly gravelly sandy loam, wet

Percolation Tests

PT-8 8 Min/In @ 18"
PT-9 14 Min/In @ 21"
PT-10 26 Min/In @ 21"



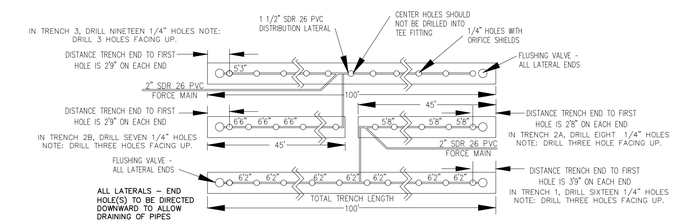
FLUSHING VALVE DETAIL
(NOT TO SCALE)



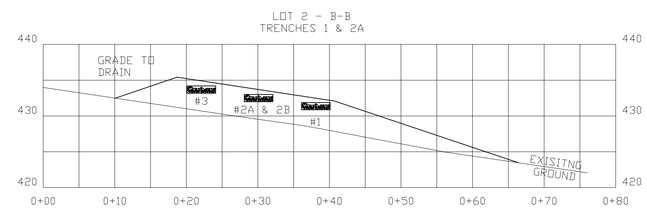
INSTALL ORIFICE SHIELD OVER EACH LATERAL HOLE AFTER THE PUMP DISCHARGE TEST IS COMPLETED AND WITNESSED BY THE DESIGNER.

ORIFICE SHIELD DETAIL
(NOT TO SCALE)

100' TRENCH
TRENCH 3 - PIPE LENGTH FIRST HOLE TO LAST HOLE = 94'6" - 19 HOLES
TRENCH 2B - PIPE LENGTH FIRST HOLE TO LAST HOLE = 39' - 7 HOLES
TRENCH 2A - PIPE LENGTH FIRST HOLE TO LAST HOLE = 39'8" - 8 HOLES
TRENCH 1 - PIPE LENGTH FIRST HOLE TO LAST HOLE = 92'6" - 16 HOLES
SEE FLUSHING VALVE DETAIL TO DETERMINE TOTAL PIPE LENGTH



PRESSURE PIPING DETAIL
(NOT TO SCALE)
(ALL LOTS)

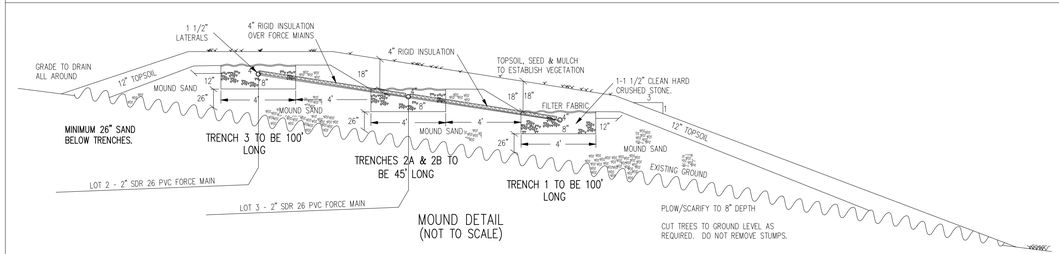


HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

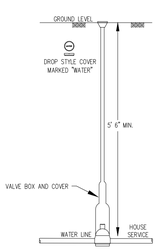
DESIGN INTENT:
THE INTENT OF THIS DESIGN IS TO HAVE A MINIMUM OF 26" OF SAND BELOW THE LEACHFIELD STONE. CONTRACTOR TO VERIFY ALL GRADES AND ELEVATIONS PRIOR TO COMMENCING CONSTRUCTION AND CONTACT DESIGNER IF DISCREPANCIES ARE FOUND.

MOUND SYSTEM INVERTS

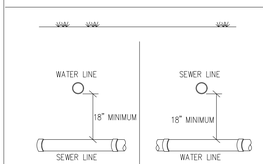
TRENCH	BOTTOM OF STONE	DISTRIBUTION PIPE INVERT
1	430.8'	431.5'
2A & 2B	432.0'	432.7'
3	433.2'	433.9'



MOUND DETAIL
(NOT TO SCALE)



WATER SHUT OFF
(NOT TO SCALE)



WATER-SEWER CROSSING
(NOT TO SCALE)

ARRANGE PIPES TO MAXIMIZE DISTANCE BETWEEN CROSSING AND PIPE JOINTS. SEE WATER-SEWER LINE SEPERATION NOTES

WATER-SEWER LINE SEPARATION NOTES

A. Horizontal Separation:
1. Sewers shall be laid at least ten feet horizontally from any existing or proposed water main. The distance shall be measured edge to edge.
2. Where impossible or impractical, due to ledge, boulders or other unusual conditions, to maintain the ten foot sewer-water pipe horizontal separation between sewer and water lines, the water line may be in a separate trench or on an undisturbed earth shelf in the sewer trench provided that the bottom of the water line is at least 18 inches above the top of the sewer. Wherever impossible or impractical to maintain the 18 inch vertical separation, the sewer line shall be constructed to normal water line standards and pressure tested to 50 psi for 2 hours prior to backfilling. No leakage shall be allowed for this test.

B. Crossings:
1. Sewer crossing water mains shall be laid beneath the water main with at least 18 inches vertical clearance between the outside of the sewer and the outside of the water main.
2. When it is impossible to maintain the 18 inch vertical separation, the crossing shall be arranged so that one full length of sewer pipe is centered above or below the water line with sewer joints as far as possible from water joints.
3. The sewer pipe must be constructed to the water main standards for a minimum distance of 20 feet either side of the crossing or a total of three pipe lengths, whichever is greater.
4. The section constructed to water main standards must be pressure tested to maintain 50 psi for 2 hours without leakage prior to backfilling beyond one foot above the pipe to verify water tightness.
5. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to prevent damage to the water main, and the joints of the sewer line shall be encased in concrete.

THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

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PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

SEPTIC SYSTEM DETAILS – LOTS 2 & 3
KR PROPERTIES, LLC
9 LOT SUBDIVISION
ONE MILE ROAD & HALF MILE ROAD CHARLOTTE

SCALE : NTS
DESIGNED BY: GNM PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 SHEET C-6

NOTES - Lots 4, 5, 7, 8, & 9:

Septic Tank and Building Sewer:

1) Use a 1500 gallon concrete septic tank with an access riser to grade, and an effluent filter at each house.
2) Place tank a minimum of 10' from the building.
3) Use 4" cast iron or SCH 40 PVC from building to tank with one pipe joint placed on undisturbed soil to absorb settling.
4) Slope pipe from building to tank at ¼" per foot.

Bio-filter STB-650BR Peat Filter with Pump:

1) Use Premier Tech Ecoflo STB-650BR concrete peat filter-pump station.
2) Contact local distributor, Camp Precast at 802-893-2401 for purchase and installation information.
3) Peat filter shall be installed downslope of septic tank with ¼" per foot minimum grade on connecting pipe.
4) Peat filter shall be placed on 6" of stone.
5) Peat filter cover shall remain above grade and accessible.
6) Heavy objects shall not be placed on or near the peat filter.
7) Test pump on and off levels to verify dose volumes.
8) Test alarm level.
9) Test pump to verify minimum discharge to flout.
10) Size pump to deliver,
    Lot 4: 15 GPM at 45 feet TDH
    Lot 5: 25 GPM at 48 feet TDH
    Lot 7: 15 GPM at 75 feet TDH
    Lot 8: 15 GPM at 145 feet TDH
    Lot 9: 15 GPM at 125 feet TDH

Flout:

1) Use a Camp 1000 gallon low profile tank with modified outlet for flout. I.D. 5' 7" x 9' 9" = 407 gal/vf. Use 13" drawdown flout = 441 gal/dose
2) Test discharge flout on and off levels to verify dose volumes.
3) Test flout to verify minimum 28" discharge height to the leachfield.

Leachfield – Performance Based Approach Design Notes (Replacement not required as per §1-804(c)(3):

1) Assume 5 single family residential units. Daily Flow (DF) @ 1575 gpd.
2) Percolation rate t = 3 minute/inch
3) Application rate (AR) = $(3/\sqrt{t}) \times 2 = (3/\sqrt{3}) \times 2 = 3.46$ gal/sf/day
   Maximum application rate for filtrate in a mound trench = 2.0 gal/sf/day
4) Required trench area: DF/AR = 1575 gpd / 2.0 g/sf/day = 787.5 sf
5) Actual area: 3 trenches @ 4' x 80' = 960 sf
6) Required minimum effective basal area: 787.5 gpd / 0.74 gpd/sf = 1064 sf
7) Basal area 3426 sf
8) Maximum Linear Loading Rate (LLR) = h x f, where
   h = (depth to limiting layer) - (required unsaturated flow depth)
   19" + 12" (mound sand) - 18" (unsaturated flow) = 13" or 1.08'.
   and f = LLR factor = 26.2 gpd/lf/ft for very fine sandy loam, with a 15.1-20% slope.
   Therefore, maximum LLR = 1.08 x 26.2 = 28.3 gpd/lf.
9) Actual LLR = 1575 gpd/ 80 lf = 19.7 gpd/lf. which is less than the maximum allowed.
10) A Performance Based Design requires 6" naturally occurring unsaturated soil above the calculated level of the effluent plume. Based on #8 above, the Maximum Linear Loading Rate of 28.3 gpd/lf will result in 13" of mounding. As the limiting layer is at 19", 13" of mounding results in an effluent plume 6" below grade which meets the 6" requirement

Leachfield - Construction Notes:

1) Contact the consultant prior to any work to discuss system layout and inspection requirements.
2) Construction of the mound shall not take place if the soil moisture content is high. If questionable contractor to contact designer prior to construction.
3) Install force main, leaving 4'± above grade.
4) Plow or scarify to limits of fill. Area to be plowed to a depth of 8" with plow lines running parallel with the contours, and throwing the soil uphill. Do not plow if area is wet. Do not run machinery on plowed surface.
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7) Place 8" of 1"-1½" clean hard crushed stone or washed stone per the detail. Lay pressure piping and connect to force main. ¼" holes to be pointed up with orifice shields over all holes and spaced according to the detail. Ream all holes to remove burrs. System must be tested prior to covering.
8) Cover pipe with a minimum of 2" of stone and filter fabric. Topsoil, seed, and mulch the entire area. Grade to drain runoff away from system.

Inspections and Certifications:

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   b) For inspection of the scarification of the soil prior to placing stone - Please provide 72 hours notice.
   c) For inspection of the pressurization of the force main to 50 psi.
   d) To observe pump operation and to verify discharge height at the leachfield.

2) The septic system installer will provide the consultant with a signed and dated statement as follows:

   "I hereby certify that the installation-related information submitted is true and correct, and that in the exercise of my reasonable professional judgment, the wastewater system has been installed in accordance with the permitted design and all permit conditions, was inspected, was properly tested, and has successfully met those performance tests.

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   (b) The scum layer is closer than three inches to the septic tank outlet baffle.
   (c) Following septic tank cleaning in units over 5,000 gallons, all interior surfaces of the tank should be inspected for leaks and cracks.

(2) At least twice a year, the outlet filter on the septic tank should be removed and cleaned by spraying it with water under normal household pressure.

(3) At least once a year, dosing tanks and distribution boxes should be opened and settled solids removed as necessary and the dosing tank or distribution box checked for levelness.

(4) At least once a year, pump stations should be inspected:

   (a) Remove settled solids as necessary. Solids and scum accumulation in the pump station may be indicative of a septic tank outlet filter malfunction, septic tank overloading, or other cause that should be investigated and remedied.
   (b) On/off and alarm floats should be tripped to ensure proper operation.
   (c) Inspect delivery of filtrate to the leachfield. Slow delivery may indicate impending pump failure.

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(6) **The leachfields are not designed for the disposal of filter backwash or other byproducts of water treatment, filtration or purification systems.**

Premier Tech Ecoflo STB-650BR Peat Filter

1) The owner shall have a valid maintenance contract in force at all times. The minimum length of any contract shall be for a period of two years. A copy of the initial and each succeeding contract shall be submitted to the appropriate Regional Environmental Office of the Agency. Maintenance shall be performed by, or shall be supervised by, a Vermont Registered Professional Engineer or a Certified Class B Site Technician, approved by the vendor, who shall provide written inspection reports detailing the maintenance performed on the specific system, any problems that have occured since the previous inspection, any modifications made to the system, the date of the inspection, and any work required to ensure the system operates in compliance with Innovative/Alternative System Approval #2002-02-R2 (2010 Renewal).

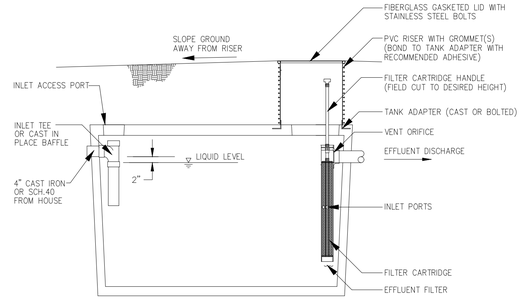
2) The inspection shall be performed in accord with the manufacturers Operation and Maintenance Manual submitted as part of the Innovative/Alternative System application package. If at any inspection the effluent is cloudy or pungent smelling, a sample shall be collected and tested for BOD and TSS. The results of any testing shall be submitted with the annual inspection report.

3) The first inspection shall be completed no later than 6 months after placing the system in service.

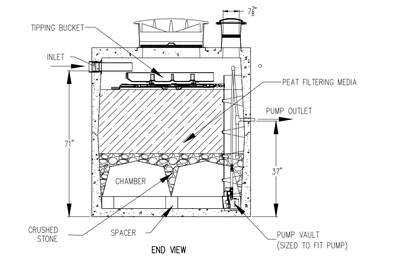
4) The second inspection shall be completed no later than 12 months after placing the system in service.

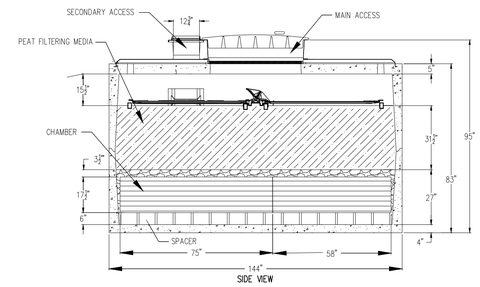
5) Subsequent inspections shall be completed at least once per year based on the date when the system was first placed in service.

6) All inspection reports shall be filed with the appropriate Regional Environmental Office of the Agency and the landowner no later than 30 days after the date of inspection.



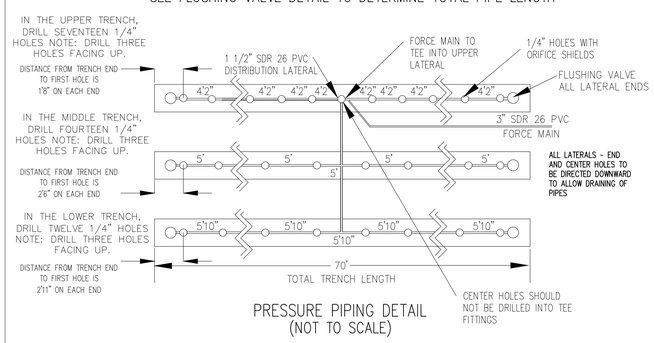
TYPICAL SEPTIC TANK
(NOT TO SCALE)
(LOTS 4, 5, 7, 8, & 9)



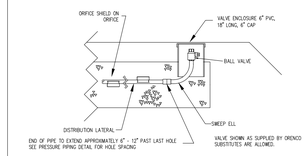


BIO-FILTER STB-650BR
(NOT TO SCALE)
(LOTS 4, 5, 7, 8, & 9)

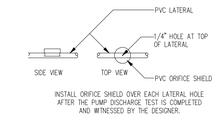
70' TRENCH
UPPER PIPE LENGTH FIRST HOLE TO LAST HOLE = 66'8" - 17 HOLES
MIDDLE PIPE LENGTH FIRST HOLE TO LAST HOLE = 65' - 14 HOLES
LOWER PIPE LENGTH FIRST HOLE TO LAST HOLE = 64'2" - 12 HOLES
SEE FLUSHING VALVE DETAIL TO DETERMINE TOTAL PIPE LENGTH



PRESSURE PIPING DETAIL
(NOT TO SCALE)



FLUSHING VALVE DETAIL
(NOT TO SCALE)



INSTALL ORIFICE SHIELD OVER EACH LATERAL HOLE AFTER THE PUMP DISCHARGE TEST IS COMPLETED AND WITNESSED BY THE DESIGNER.

ORIFICE SHIELD DETAIL
(NOT TO SCALE)
(LOTS 4, 5, 7, 8, & 9)

Soils Information

Test Pits 01/18/16 excavated by backhoe
Brian Trembeck present to observe

SB-1J
0 -10" Dark brown topsoil loam
10"-27" Yellow brown fine sandy loam, very friable
Small seepage @ 23"
27"-48" Gray brown loamy sand, common faint mottles, wet
Seepage @ **22"**, on downslope face

SB-2J
0 -10" Brown topsoil loam
10"-27" Yellow brown very fine sandy loam, very friable
27"-51" Gray brown slightly gravelly loamy sand
Common faint mottles @ **24"**

SB-3J
0 -8" Brown topsoil loam
8" -22" Yellow brown very fine sandy loam, very friable
Few faint mottles @ **19"**
22"-48" Gray brown slightly gravelly sandy loam
Common distinct mottles

SB-4J
0 -6" Brown topsoil loam
6" -18" Orange brown slightly loamy fine sand
18"-39" Gray brown sand, few faint mottles @ **33"**
39"-59" Gray brown slightly gravelly loamy sand
Common faint mottles
Seepage @ 43"

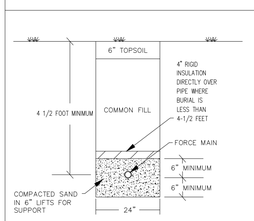
SB-5J
0 -9" Brown topsoil loam
9" -27" Yellow brown loamy fine sand, very friable
Few faint mottles **20"**
27"-47" Gray brown sandy loam, common distinct mottles
Seepage @ 25"

SB-6J
0 -9" Brown topsoil loam
9" -27" Yellow brown loamy fine sand, very friable
Few faint mottles **19"**
27"-47" Gray brown sandy loam, common distinct mottles
Seepage @ 23"

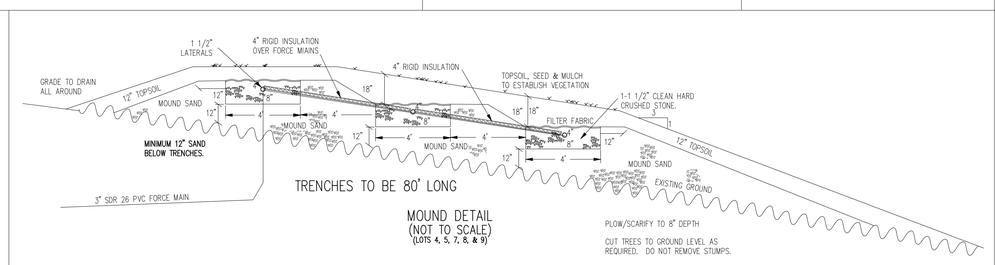
SB-7J
0 -9" Brown topsoil loam
9" -27" Yellow brown loamy fine sand, very friable
Common faint mottles **21"**
27"-47" Gray brown sandy loam, common distinct mottles
Seepage @ 27"

Percolation Tests

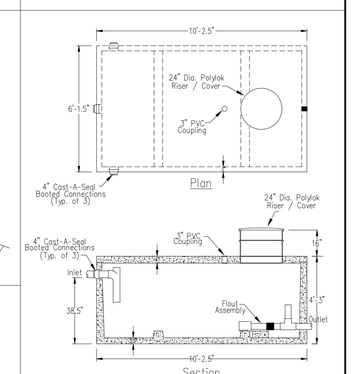
PT-3	12 Min/In	@	20"
PT-4	48 Min/In	@	20"
PT-5	33 Min/In	@	24"



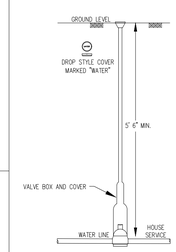
FORCE MAIN TRENCH DETAIL
(NOT TO SCALE)
(LOTS 4, 5, 7, 8, & 9)



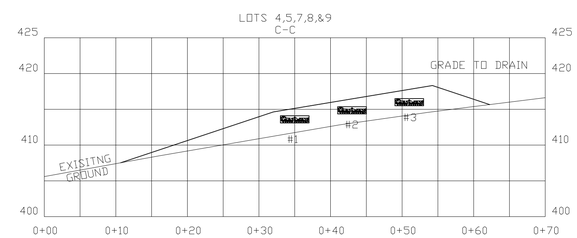
MOUND DETAIL
(NOT TO SCALE)
(LOTS 4, 5, 7, 8, & 9)



LOW PROFILE TANK DETAIL
WITH MODIFIED OUTLET FOR FLOUT
(NOT TO SCALE)



WATER SHUT OFF
(NOT TO SCALE)

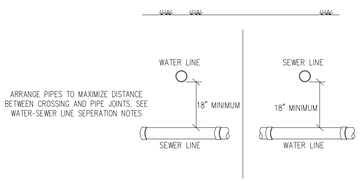


HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

MOUND SYSTEM INVERTS

TRENCH	BOTTOM OF STONE	DISTRIBUTION PIPE INVERT
1	413.1'	413.8'
2	414.3'	415.0'
3	415.5'	416.2'

DESIGN INTENT:
THE INTENT OF THIS DESIGN IS TO HAVE A MINIMUM OF 12" OF SAND BELOW THE LEACHFIELD STONE. CONTRACTOR TO VERIFY ALL GRADES AND ELEVATIONS PRIOR TO COMMENCING CONSTRUCTION AND CONTACT DESIGNER IF DISCREPANCIES ARE FOUND.



WATER-SEWER CROSSING
(NOT TO SCALE)

WATER-SEWER LINE SEPARATION NOTES

A. Horizontal Separation:
1. Sewers shall be laid at least ten feet horizontally from any existing or proposed water main. The distance shall be measured edge to edge.
2. Where impossible or impractical, due to ledge, boulders or other unusual conditions, to maintain the ten foot sewer-water pipe horizontal separation between sewer and water lines, the water line may be in a separate trench or on an undisturbed earth shelf in the sewer trench provided that the bottom of the water line is at least 18 inches above the top of the sewer. Wherever impossible or impractical to maintain the 18 inch vertical separation, the sewer line shall be constructed to normal water line standards and pressure tested to 50 psi for 2 hours prior to backfilling. No leakage shall be allowed for this test.

B. Crossings:
1. Sewer crossing water mains shall be laid beneath the water main with at least 18 inches vertical clearance between the outside of the sewer and the outside of the water main.
2. When it is impossible to maintain the 18 inch vertical separation, the crossing shall be arranged so that one full length of sewer pipe is centered above or below the water line with sewer joints as far as possible from water joints.
3. The sewer pipe must be constructed to the water main standards for a minimum distance of 20 feet either side of the crossing or a total of three pipe lengths, whichever is greater.
4. The section constructed to water main standards must be pressure tested to maintain 50 psi for 2 hours without leakage prior to backfilling beyond one foot above the pipe to verify water tightness.
5. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to prevent damage to the water main, and the joints of the sewer line shall be encased in concrete.

THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

Y:\Cadd\98000's\98027\dwg\98027_09-14-16.dwg

PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

SEPTIC SYSTEM DETAILS – LOTS 4, 5, 7, 8, 9

KR PROPERTIES, LLC

9 LOT SUBDIVISION

ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : NTS
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET C-7

NOTES - Lots 4, 5, 7, 8, & 9:

Septic Tank and Building Sewer:

1) Use a 1500 gallon concrete septic tank with an access riser to grade, and an effluent filter.
2) Place tank a minimum of 10' from the building.
3) Use 4" cast iron or SCH 40 PVC from building to tank with one pipe joint placed on undisturbed soil to absorb settling.
4) Slope pipe from building to tank at ¼" per foot.

Pump Station:

1) Test pump on and off levels to verify dose volumes.
2) Test alarm level.
3) Test pump to verify minimum 28" discharge height at leachfield orifices.

Leachfield – Performance Based Approach Design Notes (Replacement not required as per §1-804(c)(3):

1) Assume a 5 bedroom single family residential unit. Daily Flow (DF) @ 420 gpd per bedroom for the first 3 bedrooms and 70 gpd for the remaining bedroom = 560 gpd
2) Percolation rate t = 3 minute/inch
3) Application rate (AR) = $(3/\sqrt{t}) = (3/\sqrt{3}) = 1.73$ gal/sf/day
   Maximum application rate for effluent in a mound trench = 1.0 gal/sf/day
4) Required trench area: DF/AR = 560 gpd / 1.0 g/sf/day = 560 sf
5) Actual area: 2 trenches @ 4' x 70' = 560 sf
6) Required minimum effective basal area: 560 gpd / 0.74 gpd/sf = 758 sf
7) Basal area = 2153 sf
8) Maximum Linear Loading Rate (LLR) = h x f, where
   h = (depth to limiting layer) - (required unsaturated flow depth) = 20" + 20" (mound sand) - 36" (unsaturated flow) = 4" or 0.33'.
   and f = LLR factor = 26.2 gpd/lf/ft for very fine sandy loam, with a 15.1-20% slope.
   Therefore, maximum LLR = 0.33 x 26.2 = 8.6. gpd/lf.
9) Actual LLR = 560 gpd/ 70 lf = 8.0 gpd/lf. which is less than the maximum allowed.
10) A Performance Based Design requires 6" naturally occurring unsaturated soil above the calculated level of the effluent plume. Based on #8 above, the Maximum Linear Loading Rate of 8.6 gpd/lf will result in 4" of mounding. As the limiting layer is at 20", 4" of mounding results in an effluent plume 16" below grade which exceeds the 6" requirement

Leachfield - Construction Notes:

1) Contact the consultant prior to any work to discuss system layout and inspection requirements.
2) Construction of the mound shall not take place if the soil moisture content is high. If questionable contractor to contact designer prior to construction.
3) Install force main, leaving 4'± above grade.
4) Plow or scarify to limits of fill. Area to be plowed to a depth of 8" with plow lines running parallel with the contours, and throwing the soil uphill. Do not plow if area is wet. Do not run machinery on plowed surface.
5) Mound sand to meet the requirements of §1-913(c), see table:

	Sieve Number	Opening (mm)	Percent Passage, by Weight
Option 1	3/8	9.500	85 - 100
	40	0.420	25 - 75
	60	0.240	0 - 30
	100	0.149	0 - 10
	200	0.074	0 - 5
Option 2	4	4.750	95 - 100
	8	2.380	80 - 100
	16	1.190	50 - 85
	30	0.590	25 - 60
	50	0.297	10 - 30
	100	0.149	2 - 10
Option 3	3/8	9.500	85 - 100
	40	0.420	30 - 50
	200	0.074	0 - 5

6) Sand is to be stockpiled on the edge of the plowed area and placed with a small track machine, keeping a minimum of 6" of sand below the tracks. Do not compact the sand.
7) Place 8" of 1"-1½" clean hard crushed stone or washed stone per the detail. Lay pressure piping and connect to force main. ¼" holes to be pointed up with orifice shields over all holes and spaced according to the detail. Ream all holes to remove burrs. System must be tested prior to covering.
8) Cover pipe with a minimum of 2" of stone and filter fabric. Topsoil, seed, and mulch the entire area. Grade to drain runoff away from system.

Inspections and Certifications:

1) It is the owner's/ contractor's responsibility to contact the consultant (McCain Consulting - 802-244-5093) for the following:
   a) For stakeout of the leachfield location - Please provide 2 weeks notice.
   b) For inspection of the scarification of the soil prior to placing stone - Please provide 72 hours notice.
   c) For inspection of the pressurization of the force main to 50 psi.
   d) To observe pump operation and to verify discharge height at the leachfield.
2) The septic system installer will provide the consultant with a signed and dated statement as follows:

   "I hereby certify that the installation-related information submitted is true and correct, and that in the exercise of my reasonable professional judgment, the wastewater system has been installed in accordance with the permitted design and all permit conditions, was inspected, was properly tested, and has successfully met those performance tests.

Inspections and Certifications - Continued:

3) The certification of construction as required by section 1-308(a) of the Environmental Protection Rules may not be provided by the designer if the procedures outlined herein are not followed.

Maintenance:

(1) At least once a year, the depth of sludge and scum in the septic tank should be measured. The tank should be pumped if:
   (a) The sludge is closer than twelve inches to the outlet baffle,or
   (b) The scum layer is closer than three inches to the septic tank outlet baffle.
   (c) Following septic tank cleaning in units over 5,000 gallons, all interior surfaces of the tank should be inspected for leaks and cracks.

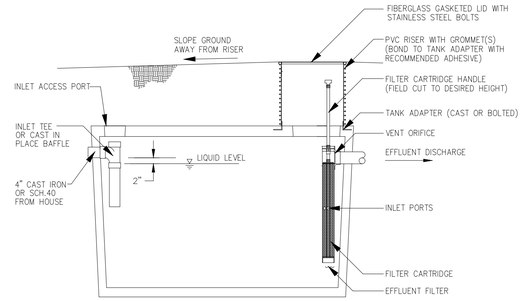
(2) At least twice a year, the outlet filter on the septic tank should be removed and cleaned by spraying it with water under normal household pressure.

(3) At least once a year, dosing tanks and distribution boxes should be opened and settled solids removed as necessary and the dosing tank or distribution box checked for leveliness.

(4) At least once a year, pump stations should be inspected:
   (a) Remove settled solids as necessary. Solids and scum accumulation in the pump station may be indicative of a septic tank outlet filter malfunction, septic tank overloading, or other cause that should be investigated and remedied.
   (b) On/off and alarm floats should be tripped to ensure proper operation.
   (c) Inspect delivery of filtrate to the leachfield. Slow delivery may indicate impending pump failure.

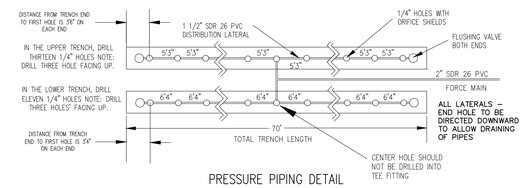
(5) Toxic or hazardous substances should in general not be disposed of in septic systems. These substances may pass through the system in an unaltered state and contaminate groundwater or remain in the septage and subsequently contaminate the soil or corps at the site of ultimate disposal.

(6) The leachfields are not designed for the disposal of filter backwash or other byproducts of water treatment, filtration or purification systems.

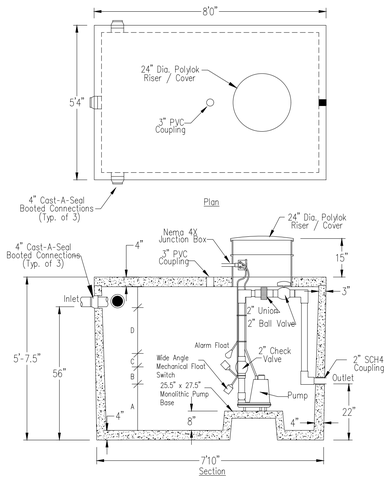


TYPICAL SEPTIC TANK
(NOT TO SCALE)

70' TRENCH
UPPER PIPE LENGTH FIRST HOLE TO LAST HOLE = 63' - 13 HOLES
LOWER PIPE LENGTH FIRST HOLE TO LAST HOLE = 63'4" - 11 HOLES
SEE FLUSHING VALVE DETAIL TO DETERMINE TOTAL PIPE LENGTH



PRESSURE PIPING DETAIL
(NOT TO SCALE)



TYPICAL 1000 GALLON PUMP STATION
(NOT TO SCALE)

1000 Gallon Pump Station Volumes (In Gallons) by Camp Precast			Dose Volume (Daily Flow)	Between On and Alarm	Total Gallons Used	Min. Req. Storage.	Emergency Storage Avail.
Bedrooms	Tank Capacity	Static Level (A)	(B)	(C)			(D)
2	1109	340	70	64	334	280	775
3	1109	340	105	64	509	420	600
4	1109	340	123	64	527	490	582
5	1109	340	140	64	544	560	565

PUMP PARAMETERS:

PUMP IS TO DELIVER 35 GPM AT 15 FEET TDH.

THE PUMP IS TO BE SUPPLIED WITH STANDARD ALARM AND CONTROLS AS SUPPLIED BY THE MANUFACTURER

VOLUMES AND FLOAT SETTINGS ARE BASED ON A 1000 GALLON PUMP STATION MANUFACTURED BY CAMP PRECAST CONCRETE PRODUCTS

INSIDE DIMENSIONS VARY WITH EACH TANK SUPPLIER

Soils Information

Test Pits 01/18/16 excavated by backhoe
Steve Rebillard present to observe

SB-8J
0 -9" Brown topsoil loam
9" -27" Yellow brown fine sandy loam, friable
Few faint mottles @ **21"**
27"-43" Gray brown slightly gravelly loamy sand
Common distinct mottles, seepage @ 25"

SB-9J
0 -8" Brown topsoil loam
8" -21" Yellow brown fine sandy loam, very friable
21"-**34"** Orange brown loamy fine sand, friable

SB-10J
0 -7" Brown topsoil loam
7" -25" Yellow brown fine sandy loam, very friable
25"-36" Orange brown loamy fine sand, friable
Few faint mottles @ **22"**

SB-11J
0 -8" Brown topsoil loam
8" -25" Orange brown very fine sandy loam
Few faint mottles @ **21"**
25"-37" Gray brown slightly gravelly very fine sandy loam
Common distinct mottles
Seepage @ 23"

SB-12J
0 -8" Brown topsoil loam
8" -14" Red brown slightly loamy sand
14"-40" Gray brown slightly gravelly sand
Few faint mottles @ **24"**

SB-13J
0 -7" Brown topsoil loam
7" -28" Red brown slightly gravelly sandy loam
28"-45" Gray brown sand
Few faint mottles

SB-14J
0 -6" Brown topsoil loam
6" -25" Orange brown loamy fine sand, friable
25"-40" Gray brown very fine sandy loam
Common faint mottes, few faint mottles @ **20"**

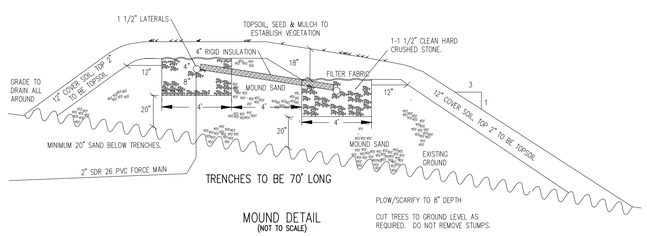
SB-15J
0 -7" Brown topsoil loam
7" -26" Red brown sandy loam, very friable
Few faint mottles @ 10"
26"-39" Gray brown slightly gravelly very fine sandy loam
Common faint mottes,

SB-16J
0 -8" Brown topsoil loam
8" -22" Orange brown loamy fine sand
22"-40" Gray brown slightly gravelly sand
Common distinct mottles

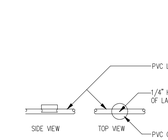
SB-17J
0 -8" Brown topsoil loam
8" -22" Orange brown slightly gravelly loamy sand
22"-45" Gray brown sand
Few faint mottles @ **22"**

Percolation Tests

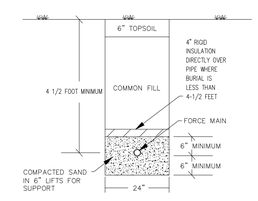
PT-1 4 Min/In @ 16"
PT-2 5 Min/In @ 16"



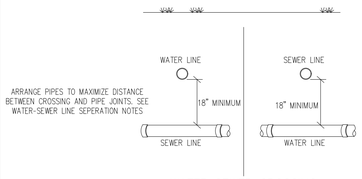
MOUND DETAIL
(NOT TO SCALE)



ORIFICE SHIELD DETAIL
(NOT TO SCALE)



FORCE MAIN TRENCH DETAIL
(NOT TO SCALE)

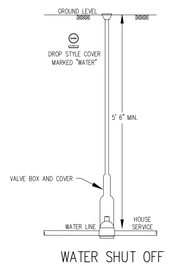


WATER-SEWER CROSSING
(NOT TO SCALE)

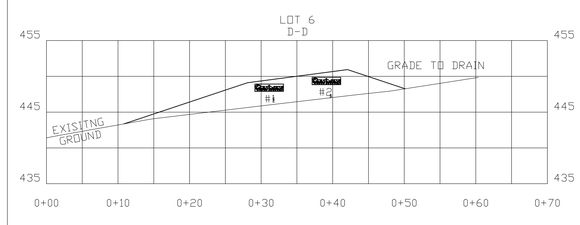
WATER-SEWER LINE SEPARATION NOTES

A. Horizontal Separation:
1. Sewers shall be laid at least ten feet horizontally from any existing or proposed water main. The distance shall be measured edge to edge.
2. Where impossible or impractical, due to ledge, boulders or other unusual conditions, to maintain the ten foot sewer-water pipe horizontal separation between sewer and water lines, the water line may be in a separate trench or on an undisturbed earth shelf in the sewer trench provided that the bottom of the water line is at least 18 inches above the top of the sewer. Wherever impossible or impractical to maintain the 18 inch vertical separation, the sewer line shall be constructed to normal water line standards and pressure tested to 50 psi for 2 hours prior to backfilling. No leakage shall be allowed for this test.

B. Crossings:
1. Sewer crossing water mains shall be laid beneath the water main with at least 18 inches vertical clearance between the outside of the sewer and the outside of the water main.
2. When it is impossible to maintain the 18 inch vertical separation, the crossing shall be arranged so that one full length of sewer pipe is centered above or below the water line with sewer joints as far as possible from water joints.
3. The sewer pipe must be constructed to the water main standards for a minimum distance of 20 feet either side of the crossing or a total of three pipe lengths, whichever is greater.
4. The section constructed to water main standards must be pressure tested to maintain 50 psi for 2 hours without leakage prior to backfilling beyond one foot above the pipe to verify water tightness.
5. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to prevent damage to the water main, and the joints of the sewer line shall be encased in concrete.



WATER SHUT OFF
(NOT TO SCALE)



HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

DESIGN INTENT:
THE INTENT OF THIS DESIGN IS TO HAVE A MINIMUM OF 20" OF SAND BELOW THE LEACHFIELD STONE. CONTRACTOR TO VERIFY ALL GRADES AND ELEVATIONS PRIOR TO COMMENCING CONSTRUCTION AND CONTACT DESIGNER IF DISCREPANCIES ARE FOUND.

MOUND SYSTEM INVERTS

TRENCH	BOTTOM OF STONE	DISTRIBUTION PIPE INVERT
1	447.9'	448.6'
2	448.8'	449.5'

THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

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PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

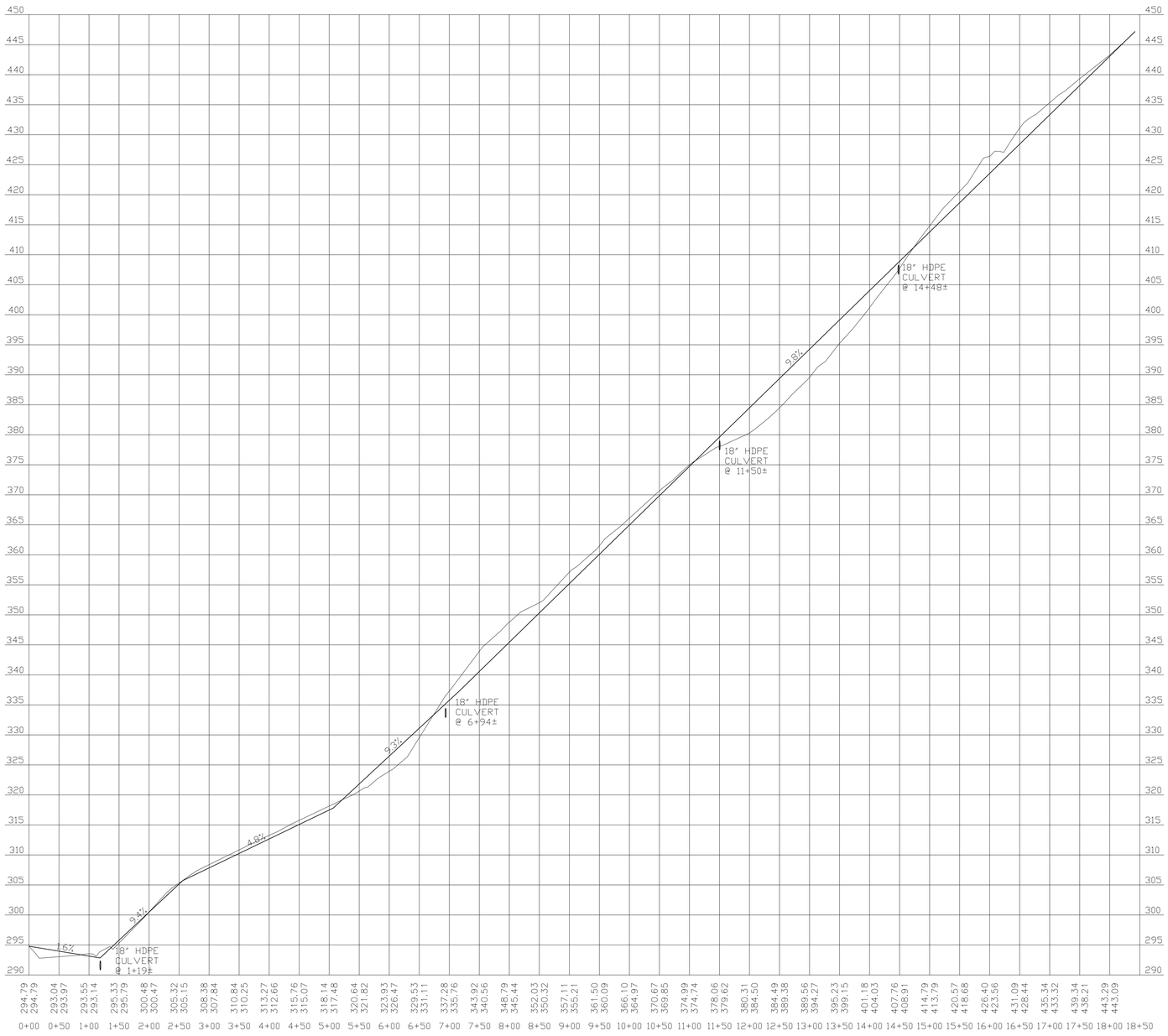
SEPTIC SYSTEM DETAILS – LOT 6
KR PROPERTIES, LLC
9 LOT SUBDIVISION
ONE MILE ROAD & HALF MILE ROAD CHARLOTTE

SCALE : NTS
DESIGNED BY: GNM PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

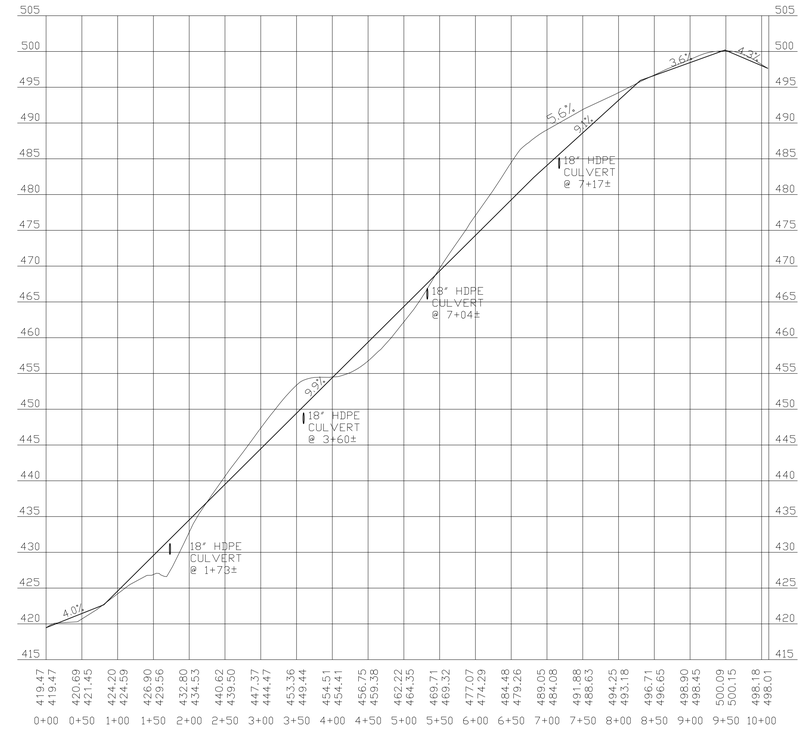
McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 SHEET C-8

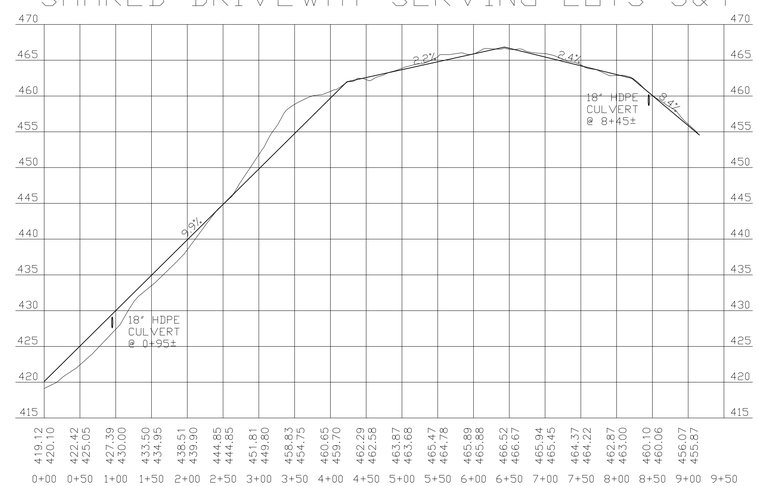
MAIN ROAD SERVING LOTS 5,6,7,8,&9



SHARED DRIVEWAY SERVING LOTS 1&2



SHARED DRIVEWAY SERVING LOTS 3&4



HORIZONTAL SCALE 1" = 100'
VERTICAL SCALE 1" = 10'
(SCALE IN FEET)

PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

PROFILES

KR PROPERTIES, LLC

9 LOT SUBDIVISION

ONE MILE ROAD & HALF ROAD — CHARLOTTE

SCALE : 1" = 40'
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET C-9

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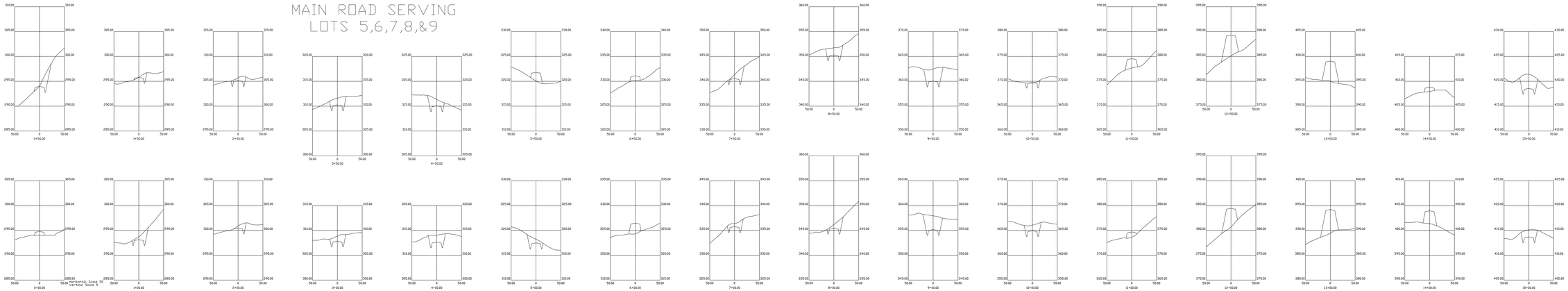
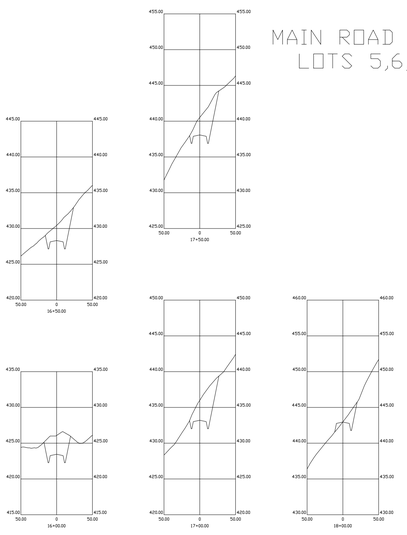
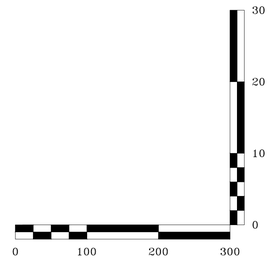
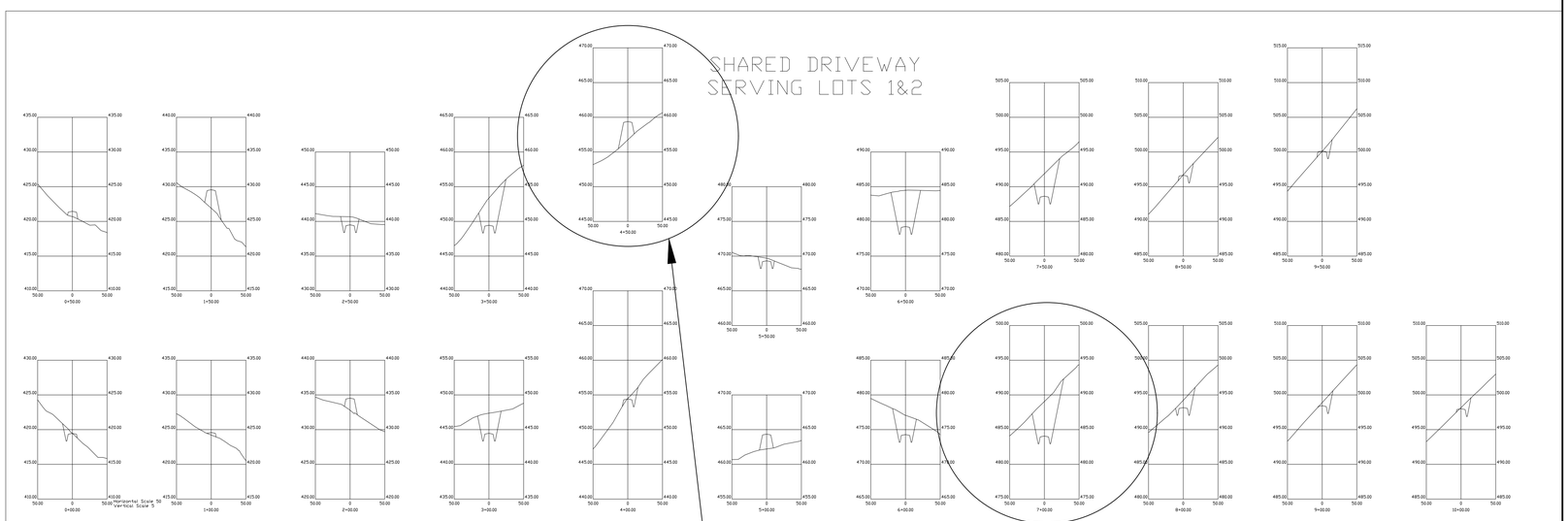


MAIN ROAD SERVING
LOTS 5,6,7,8,&9

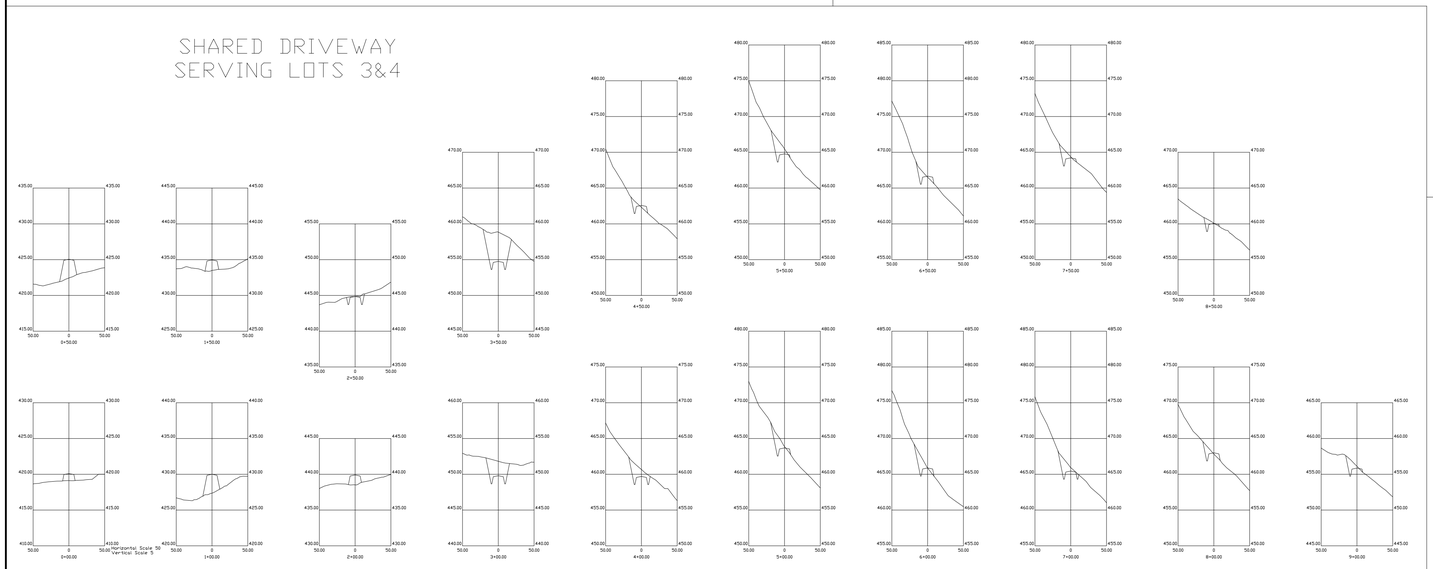


MAIN ROAD SERVING
LOTS 5,6,7,8,&9

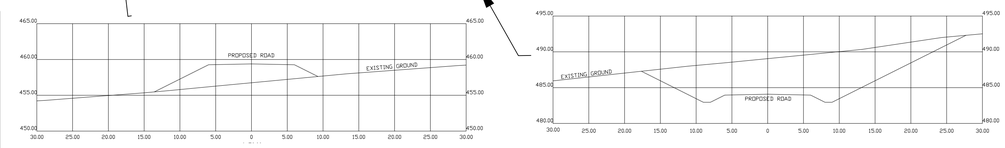




SHARED DRIVEWAY
SERVING LOTS 1&2



SHARED DRIVEWAY
SERVING LOTS 3&4



SECTIONS EXPANDED TO
EQUALIZED SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

SECTIONS

KR PROPERTIES, LLC

9 LOT SUBDIVISION

ONE MILE ROAD & HALF ROAD — CHARLOTTE

SCALE : NTS
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET C-10

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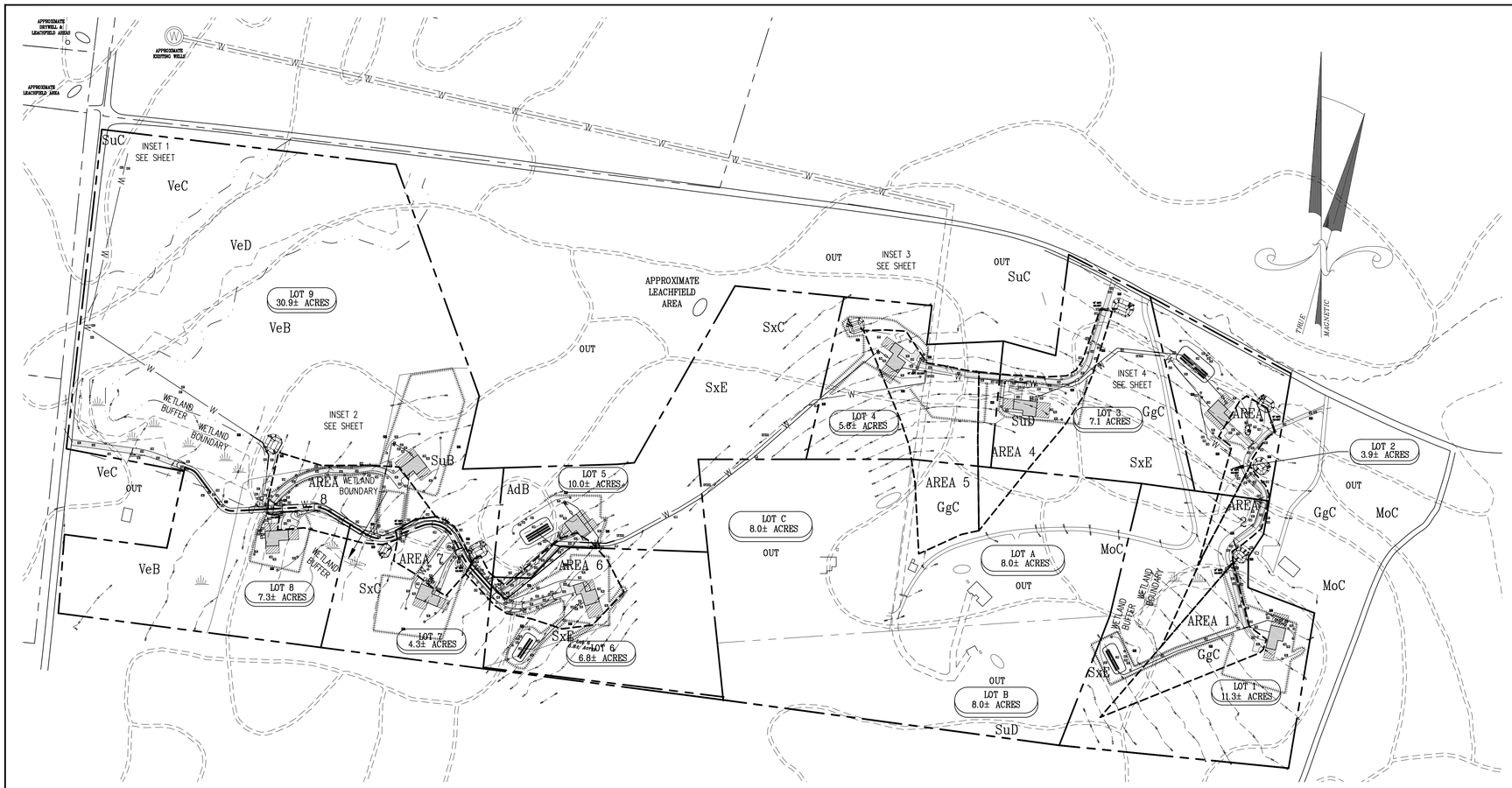
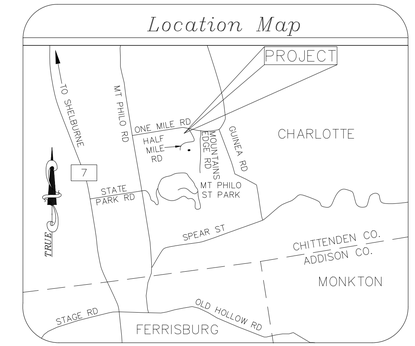


LEGEND

- Property line existing
- Property line proposed
- 10' contours
- Water line
- Water line easement
- Wetland boundary
- Wetland buffer
- AREA 1 — Drainage area
- 59A — Soil map symbol
- Soil boundary
- Drainage area
- Stone lined ditch
- Stone erosion check dam
- Culvert headwall
- Grass channel

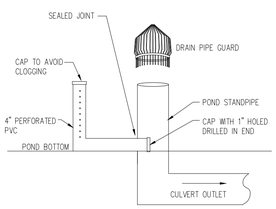


GRAPHIC SCALE

200 0 100 200 400 800

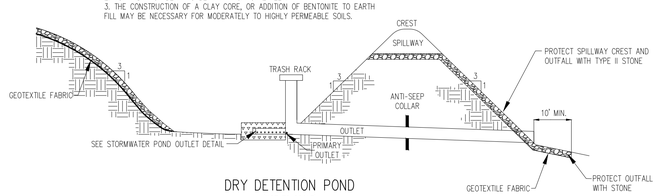
(IN FEET)
1 inch = 200 ft.

Topography by Total Station
Contour Interval 5'
Approximate USGS Datum
Based on Hand Held GPS Unit

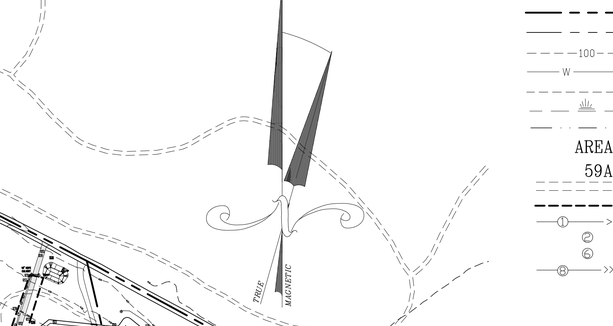


STORMWATER POND OUTLET DETAIL
(NOT TO SCALE)

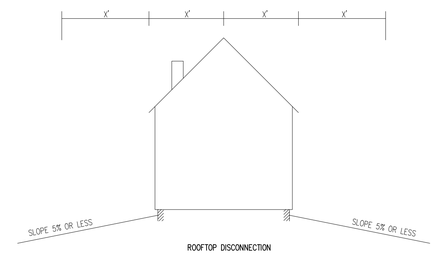
NOTES:
1. BERM IS TO BE COMPACTED TO 95% PROCTOR DENSITY IN 12 INCH LIFTS.
2. TOP WIDTH OF BERM TO BE A MINIMUM OF 2 FEET.
3. THE CONSTRUCTION OF A CLAY CORE, OR ADDITION OF BENTONITE TO EARTH FILL MAY BE NECESSARY FOR MODERATELY TO HIGHLY PERMEABLE SOILS.



DRY DETENTION POND
(NOT TO SCALE)

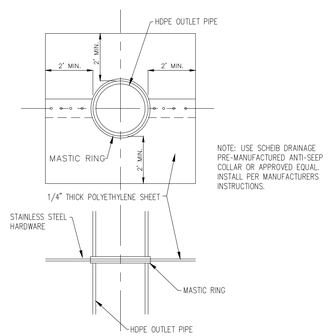


HOUSE SITE GRADING (TYP)
(NOT TO SCALE)



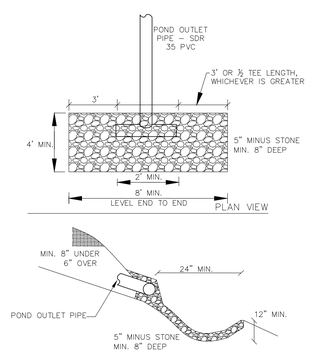
ROOFTOP DISCONNECTION

1. Slope land away from building at 5% or less.
2. Length of 5% (or less) is to be equal to or greater than the contributing rooftop length (x).
3. Gutters and downspouts are not allowed.
4. Sloped land is to be vegetated.
5. The rooftop length contributing to a given discharge location shall be 75' or less and the rooftop area contributing to any one discharge location shall not exceed 1000 s.f.
6. If these stated conditions cannot be met with final grading of individual lot, an approved water quality treatment structure may be utilized per the 2002 VSWMM. Contact design engineer for guidance.



NOTE: USE SCHEIB DRAINAGE PRE-MANUFACTURED ANTI-SEEP COLLAR OR APPROVED EQUAL. INSTALL PER MANUFACTURERS INSTRUCTIONS.

ANTI-SEEP COLLAR
(NOT TO SCALE)



THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

THIS IS NOT A SURVEY. THIS PLAN DOES NOT MEET THE REQUIREMENTS OF 27 VSA SEC. 1403 FOR THE FILING OF SURVEY PLATS.

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SW & EPSC OVERVIEW & SW DETAILS

KR PROPERTIES, LLC

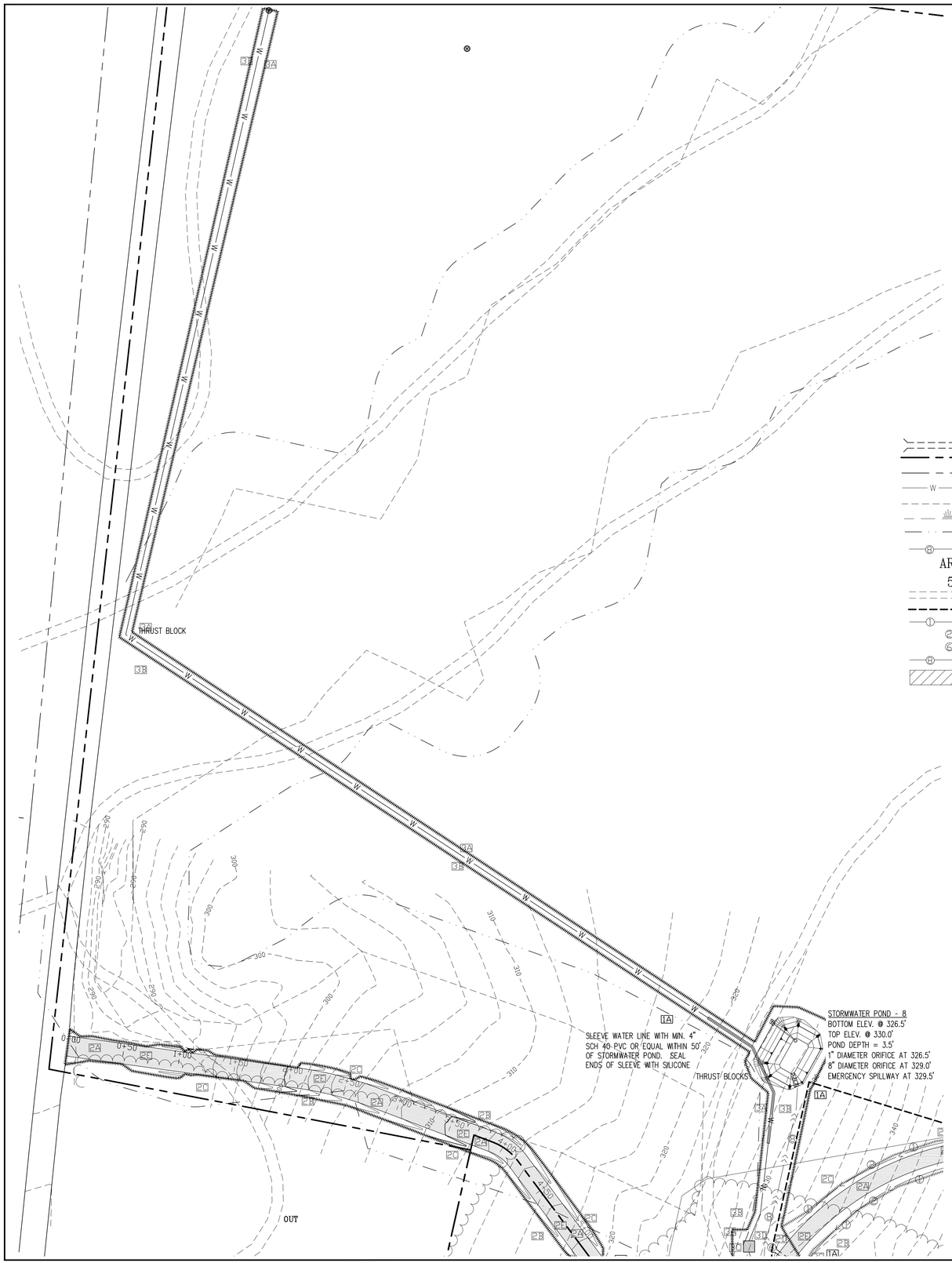
9 LOT SUBDIVISION

ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : 1" = 200'
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

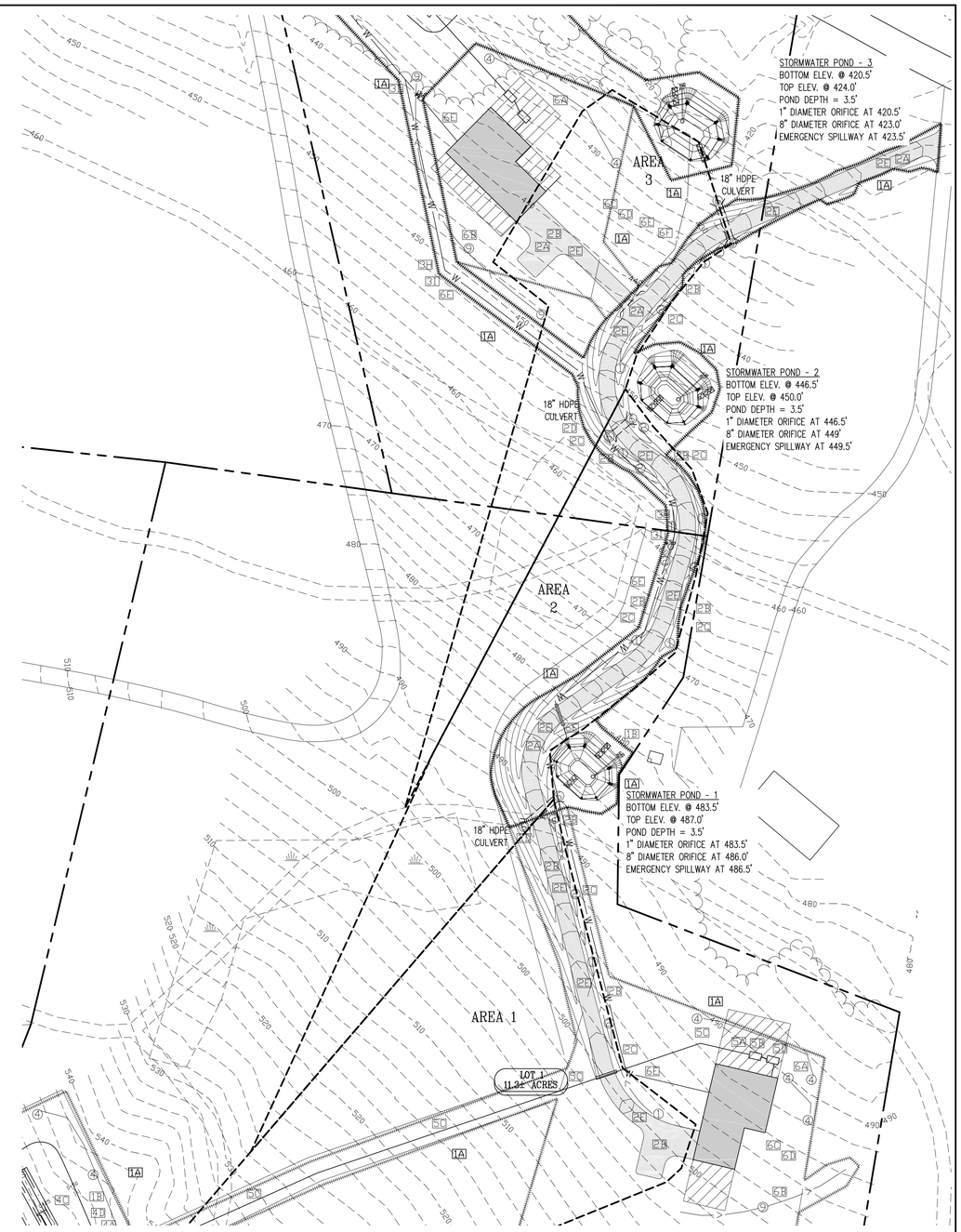
McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET SW-1



LEGEND

- Proposed culvert
- Property line existing
- Property line proposed
- Water line
- Water line easement
- Wetland boundary
- Wetland buffer
- Grass channel
- AREA 1 — Drainage area
- 59A — Soil map symbol
- Soil boundary
- Drainage area
- Stone lined ditch
- Stone erosion check dam
- Culvert headwall
- Grass channel
- Rooftop disconnect



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Topography by Total Station
Contour Interval 5'
Approximate USGS Datum
Based on Hand Held GPS Unit

THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

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SW & EPSC SITE PLAN – PONDS 1, 2, & 3

KR PROPERTIES, LLC

9 LOT SUBDIVISION

ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : 1" = 50'
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET SW-2

LEGEND

- Proposed culvert
- Property line existing
- Property line proposed
- Water line
- Water line easement
- Grass channel
- AREA 1 / 59A — Drainage area
- Soil map symbol
- Soil boundary
- Drainage area
- Stone lined ditch
- Stone erosion check dam
- Culvert headwall
- Grass channel
- Rooftop disconnect

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Topography by Total Station
Contour Interval 5'
Approximate USGS Datum
Based on Hand Held GPS Unit

THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

THIS IS NOT A SURVEY. THIS PLAN DOES NOT MEET THE REQUIREMENTS OF 27 VSA SEC. 1403 FOR THE FILING OF SURVEY PLATS.

SW & EPSC SITE PLAN – PONDS 4 & 5

KR PROPERTIES, LLC

9 LOT SUBDIVISION

ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : 1" = 50'
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

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93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET SW-3

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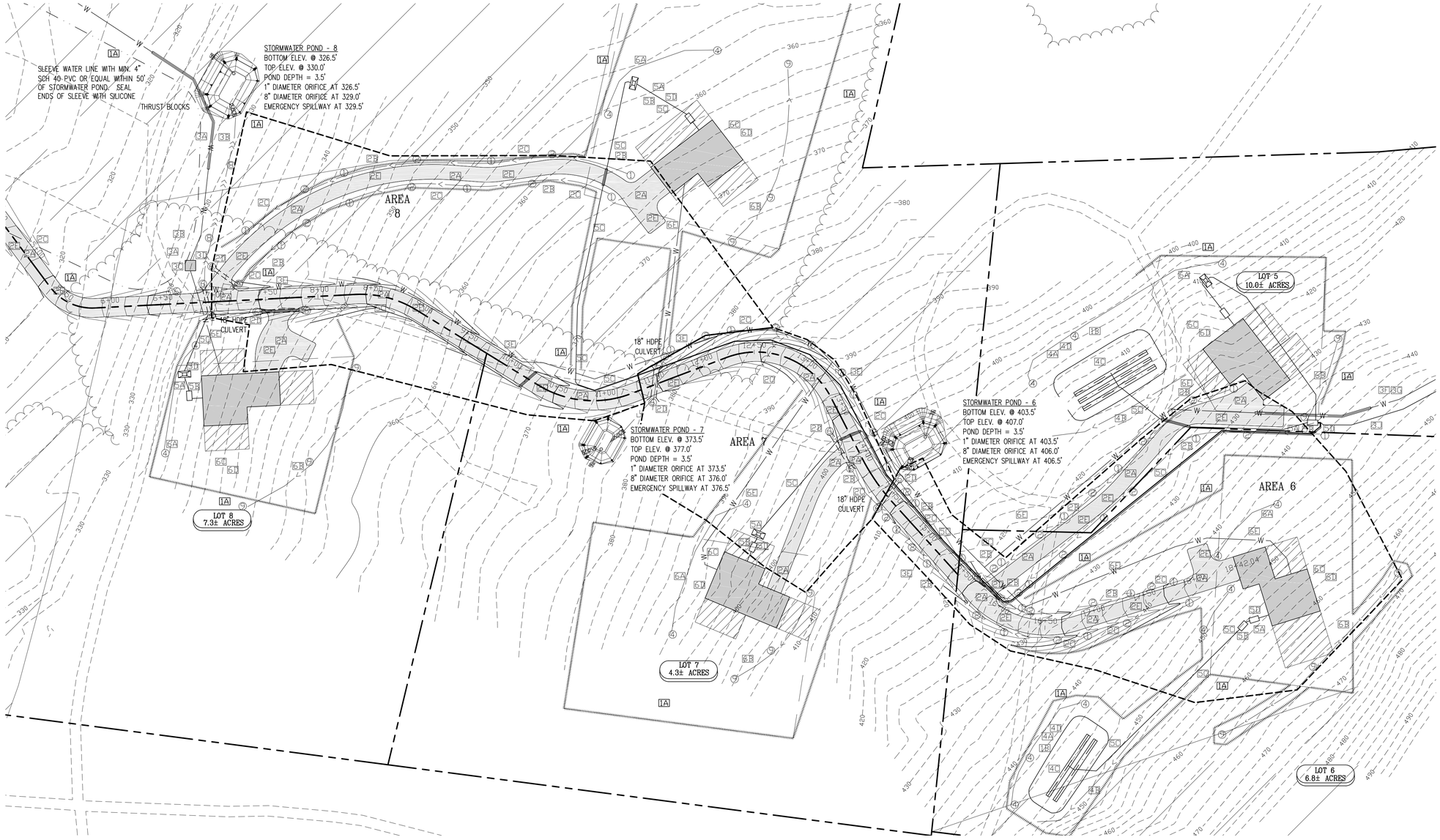

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Topography by Total Station
Contour Interval 5'
Approximate USGS Datum
Based on Hand Held GPS Unit

THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

THIS IS NOT A SURVEY. THIS PLAN DOES NOT MEET THE REQUIREMENTS OF 27 VSA SEC. 1403 FOR THE FILING OF SURVEY PLATS.

SW & EPSC SITE PLAN – PONDS 6, 7, & 8

KR PROPERTIES, LLC

9 LOT SUBDIVISION

ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : 1" = 50'
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET SW-4

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GENERAL EROSION PREVENTION AND SEDIMENT CONTROL NOTES

1. AN ON-SITE PLAN COORDINATOR SHALL BE IDENTIFIED PRIOR TO THE START OF CONSTRUCTION. THE ON-SITE COORDINATOR SHALL HAVE THE AUTHORITY TO STOP OR MODIFY CONSTRUCTION ACTIVITIES AS NECESSARY TO COMPLY WITH THE PLAN AND THE TERMS AND CONDITIONS OF THE PERMIT. THE ON-SITE COORDINATOR SHALL HAVE ADEQUATE EXPERIENCE IN EROSION CONTROL AND CONSTRUCTION TECHNIQUES. THE NAME AND CONTACT INFORMATION OF THE ON-SITE PLAN COORDINATOR MUST BE FILED IN WRITING WITH THE VERMONT AGENCY OF NATURAL RESOURCES PRIOR THE THE START OF CONSTRUCTION.

2. ALL CONSTRUCTION/STUMPING TO BE CONDUCTED DURING THE SUMMER CONSTRUCTION SEASON, BETWEEN MAY 1 AND OCTOBER 15. TREE CLEARING MAY OCCUR DURING WINER MONTHS WHEN GROUND IS FROZEN. A WINTER EROSION PREVENTION AND SEDIMENT CONTROL PLAN WILL BE PREPARED IF CONSTRUCTION IS TO EXTEND BEYOND THIS PERIOD. ALL SEEDING AND MULCHING SHALL BE DONE BY SEPTEMBER 15 TO ENSURE VEGETATIVE COVER IS ESTABLISHED BEFORE WINTER. CONTACT DESIGNER FOR OTHER STABILIZATION MEASURES TO BE APPROVED BY THE VERMONT AGENCY OF NATURAL RESOURCES IF SEEDING CANNOT BE COMPLETED BY SEPTEMBER 15TH. IF WINTER CONSTRUCTION IS PROPOSED A WINTER EPSC PLAN MUST BE PREPARED AND SUBMITTED TO ANR WATER QUALITY DIVISION PRIOR TO SEPTEMBER 15TH AND NO CONSTRUCTION SHALL CONTINUE PAST OCTOBER 15TH WITHOUT APPROVAL BY ANR.

3. THE END USER OF EACH LOT IS TO SUBMIT FOR THEIR OWN COVERAGE UNDER THE CONSTRUCTION GENERAL PERMIT FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES.

4. ALL EROSION PREVENTION AND SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED BY OR UNDER THE DIRECTION OF THE ON-SITE PLAN COORDINATOR AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND AS SOON AS POSSIBLE BUT NO LATER THAN 24 HOURS AFTER ANY STORM EVENT WHICH GENERATES A DISCHARGE OF STORMWATER RUNOFF FROM THE CONSTRUCTION SITE.

5. THE SEQUENCE OF CONSTRUCTION ACTIVITIES SHALL BE PLANNED SUCH THAT DISTURBED SOIL CAN BE PROTECTED AND STABILIZED AS SOON AS POSSIBLE (WITHIN 48 HOURS). TEMPORARY MULCH SHALL BE APPLIED TO ANY DISTURBED AREAS NOT TO BE WORKED ON FOR 7 DAYS OR MORE. SEED AND MULCH AREAS NOT TO BE WORKED ON FOR A MONTH OR MORE. THERE SHALL NEVER BE MORE THAN TWO ACRES OF DISTURBED EARTH EXPOSURE AT ANY GIVEN TIME.

6. THE PROJECT'S NOTICE OF INTENT (NOI) MUST BE CONSPICUOUSLY POSTED NEAR THE ENTRANCE OF THE PROJECT. IN ADDITION A COPY OF THIS PLAN AND ALL AMENDMENTS MUST BE KEPT ON SITE FROM THE DATE OF COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO THE DATE OF FINAL STABILIZATION.

CONSTRUCTION SEQUENCING/EROSION PREVENTION AND SEDIMENT CONTROL NOTES AND PHASING. PHASES ARE NUMBERED FOR CLARITY OF PLAN. CONSTRUCTION SEQUENCING MAY VARY FROM PHASE NUMBERING.

1A EROSION CONTROL EVENTS SHOWN ON SHEETS SW-1, SW-2, SW-3, & SW-4 CORRESPOND WITH SEQUENCING LISTED BELOW EACH PHASE.

PHASE 1 - PRE-CONSTRUCTION - DELINEATE LIMITS OF DISTURBANCE, BUILD CONSTRUCTION ENTRANCE, AND INSTALL SILT FENCE.

1A - The limits of disturbance shall be clearly delineated as shown on the plans with snow fence or nylon rope prior to the initiation of construction in any given portion of the property. As the construction progresses, the demarcation of the limits of disturbance shall always be completed prior to the onset of work in any given area.
1B - Install Silt Fence as shown on plan - see details for specifications.
1C - Build Construction Entrance as shown on plan - see details for specifications.
1D - Tree Clearing - cut trees within limits of disturbance as necessary. All logging shall be performed in accordance with the Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont. "Slash" shall be chipped on site and spread over disturbed areas to prevent erosion.

PHASE 2 - ROAD & DETENTION POND CONSTRUCTION - Construction to be divided into phases. For each phase, road construction events 2A-2D are to be completed before construction of detention ponds and individual driveways begin.

All phases of road, driveway, and detention pond construction are to be sequenced as follows:

PHASE 2.1 - Main road stations 0+0 to 8+00±.
2.1.1 - Stub driveways to lots 8 & 9.
2.1.2 - Construct stormwater pond 8
PHASE 2.2 - Main road stations 8+00± to 16+00±.
2.2.1 - Stub driveways to lots 5, 6, & 7.
2.2.2 - Construct stormwater ponds 6 & 7.
PHASE 2.3 - Lots 3 & 4 shared driveway from 0+00 to 6+80±.
2.3.1 - Stub driveway to lot 3.
2.3.2 - Construct stormwater pond 4.
PHASE 2.4 - Lots 1 & 2 shared driveway, from 0+00 to 4+90±.
2.4.1 - Stub driveway to lot 2.
2.4.2 - Stub driveway to lot 1.
2.4.3 - Construct stormwater pond 3.
2.4.4 - Construct stormwater pond 2.

2A - Grade new road and driveway stubs to subgrade elevation.
2B - Shape ditches and install stone check dams as specified on Erosion Control Detail #2. Check dams are to remain in place until side slopes are stabilized, at which point dams will be replaced with stone lined ditches where shown.
2C - Seed and mulch side slopes. Side slopes to be sloped at a maximum of 2:1. Erosion control matting is to be used on all disturbed slopes of 3:1 or steeper. All other disturbed areas are to be stabilized with seed and mulch in accordance with the Suggested Seeding Rates Table on this Sheet. A soil test shall be performed in each area to determine which seed mixture and appropriate fertilizer is required.
2D - Install culverts where specified on site plans.
2E - Apply gravel surface to traveled area of road and driveways.
2F - Stub driveway entrances 20' into lots.

PHASE 3 - WATER SYSTEM

3A - Install approximately 1425' of 2" CL200 HDPE or equal from well to pump house. Disturbance to be limited to minimum necessary for trenching.
3B - Seed and mulch disturbed area same day trench is backfilled.
3C - Install 3,000 gallon water storage tank.
3D - Construct pump house approximately (10'x10') above storage tank.
3E - Install water line along main road from storage tank to lot 5 driveway with service connections and water shutoff valves for lots 5 - 9.
3F - Clear water line path from lot 5 to Half Mile Road, approximately 2,400'.
3G - Install approximately 2,400' of various size water line with service stubs and shutoff valves at each lot. Use minimal disturbance width, seed and mulch same day as backfilling.
3H - Clear water line path from Half Mile Road to lot 1, approximately 630'.
3I - Install ±630' of water line with service stub and shutoff valves for lots 1 & 2 ending at lot 1 shutoff. Use minimal disturbance width, seed and mulch same day as backfilling.
3J - Install approximately 900' of sewer line from edge of lot 4 to common flout on lot 5 when water line is installed.

PHASE 4 - LEACHFIELDS. Common leachfield serving lots 4, 5, 7, 8, & 9 to be constructed by developer. Common leachfield serving lots 2 & 3 to be constructed by developer. Individual leachfields for lots 1 & 6 to be constructed by end user. All logging shall be performed in accordance with the Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont. "Slash" shall be chipped on site and spread over disturbed areas to prevent erosion.
4A - Install silt fence along downslope side of area to be disturbed.
4B - Install diversion swale or grass channel (as specified on the plan) upslope of area to divert runoff around area.
Diversion Swale - Construct diversion swale as specified on Diversion Swale Erosion Control Detail. The swale is to remain in place upon completion of construction to divert runoff around leachfield. Seed and mulch swale immediately upon completion.
Grass Channel - Shape grass channels as specified on Grass Channel Erosion Control Detail. Side slopes to be sloped at a maximum of 3:1 with bottom width of 2.' Disturbed areas are to be stabilized with seed and mulch as per 2C above.
4C - Construct leachfield as shown on plan.
4D - Remove silt fence when vegetation is established over leachfield area.

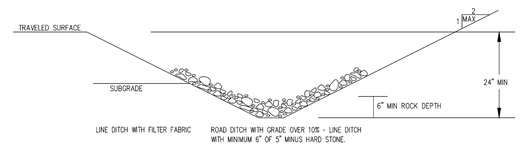
PHASE 5 - INSTALLATION OF SEPTIC PIPE LINES, SEPTIC TANKS, PRETREATMENT/PUMP STATIONS, AND FLOUT CHAMBER. - All pipes to be installed in the location and as specified on the design plans. All logging shall be performed in accordance with the Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont. "Slash" shall be chipped on site and spread over disturbed areas to prevent erosion.

Developer to install flout chamber on lot 5, service line to lot 4 (see 3J), and service stubs/lines to lots 5, 7, 8, & 9. Sewer service lines may be installed concurrent with construction of road serving lot 5-9. Developer to construct common mound on lot 5 serving lots 4, 5, 7, 8, & 9. Developer to construct common mound on lot 2 serving lots 2 & 3. Endusers to construct individual on-site septic syttem for lots 1 & 6.

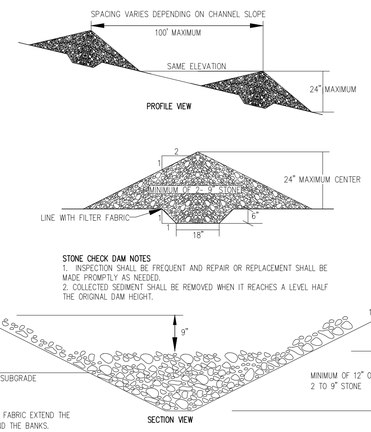
5A - Excavate pit for septic tanks (Lots 1 - 9), biofilters/pump stations (Lots 4, 5, 7, 8, & 9), and pump stations (Lots 1, 2, 3, & 6) on the same day that the units will be delivered.
5B - Install septic tank, pump stations and siphon chambers, install and seal pipes into tanks.
5C - Excavate pipe trench, place bedding, pipe and backfill to final grade. Pressure testing of pipelines will be required.
5D - Seed and mulch all disturbed areas immediately upon completion of backfilling of pipe trench. Road crossing to be graveled.

GENERAL EROSION PREVENTION AND SEDIMENT CONTROL NOTES (Continued)

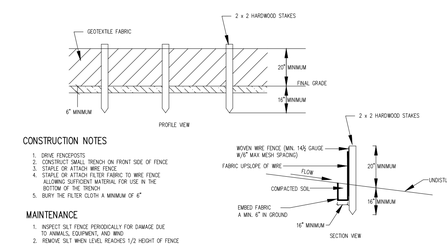
PHASE 6 - END USER - DRIVEWAY CONSTRUCTION, AND HOUSE CONSTRUCTION AND WATER LINE IMPACTS.
Driveways - Follow steps 2A - 2E listed above.
6A - Install silt fence downslope of house site prior to commencement of construction.
6B - Install diversion swale with stone splash pad at outlet upslope of house site prior to commencement of construction. Seed and mulch swale immediately upon completion.
6C - All exterior site work to be complete within 6 months of commencement of construction.
6D - Apply temporary mulch to all disturbed areas.
6E - Excavate waterline trench, place bedding, pipe and backfill to final grade. Seed and mulch all disturbed areas immediately upon completion of backfilling of pipe trench.



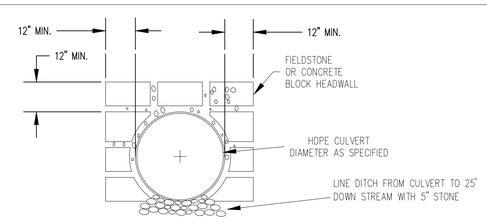
EROSION CONTROL NUMBER 1
STONE LINED DITCH
(NOT TO SCALE)



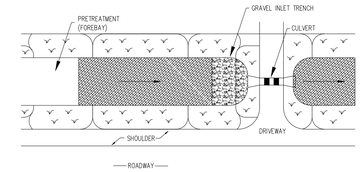
EROSION CONTROL NUMBER 2
STONE EROSION CHECK DAM
(NOT TO SCALE)



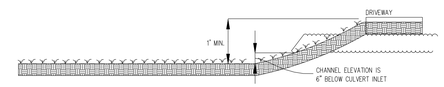
EROSION CONTROL NUMBER 4
SILT FENCE DETAIL
(NOT TO SCALE)



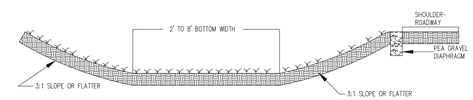
EROSION CONTROL NUMBER 6
CULVERT HEADWALL DETAIL
(NOT TO SCALE)



PLAN VIEW



LONGITUDINAL VIEW

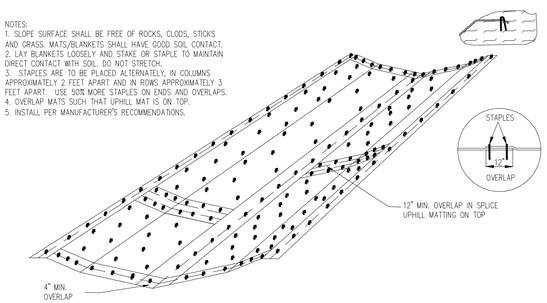


SECTION VIEW

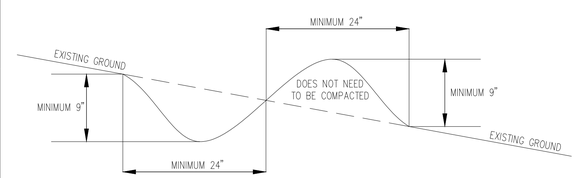
Grass lined channels with slopes greater than 5% shall utilize erosion control matting to achieve a stable vegetated channel. See Erosion Control Matting Detail for an installation detail.

GRASS CHANNEL
(NOT TO SCALE)

NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH SOIL. DO NOT STRETCH.
3. STAPLES ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2 FEET APART AND IN ROWS APPROXIMATELY 3 FEET APART. USE 50% MORE STAPLES ON ENDS AND OVERLAPS.
4. OVERLAP MATS SUCH THAT UPHILL MAT IS ON TOP.
5. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.



EROSION CONTROL MATTING DETAIL
INSTALLATION FOR GRASS LINED CHANNEL
(NOT TO SCALE)



EROSION CONTROL NUMBER 9
DRAINAGE SWALE DETAIL
(NOT TO SCALE)

EROSION CONTROL SCHEDULE

CONSTRUCTION ELEMENT	EROSION CONTROL	MAINTENANCE
GENERAL	1. ALL CONSTRUCTION WILL STRICTLY ADHERE TO THE PRACTICES OUTLINED IN THE VERMONT HANDBOOK FOR SOIL EROSION AND SEDIMENT CONTROL ON CONSTRUCTION SITES AND THE SPECIFICATIONS & DETAILS PROVIDED ON THESE PLANS 2. WATER IS TO BE APPLIED TO DISTURBED AREAS AS NECESSARY TO CONTROL DUST.	
DRIVEWAY CLEARING & GRUBBING	1. SITE VISIT BY ENGINEER AND CONTRACTOR TO FLAG WORK LIMITS. NO HEAVY EQUIPMENT ALLOWED BEYOND THESE LIMITS. 2. INSTALL SILT FENCES DOWNSLOPE OF CONSTRUCTION SITE. 3. REMOVE STUMPS FROM DRIVEWAY DITCH LINES ONLY. STUMP DISPOSAL IS TO BE OFFSITE OR IN A PRE-APPROVED DISPOSAL LOCATION OR ON-SITE IN ACCORDANCE WITH ANR REGULATIONS.	
TOPSOIL STRIPPING & ROUGH GRADING	1. INSTALL CULVERTS AND STONE CHECK DAMS AS PART OF INITIAL ROUGH GRADING. 2. INSTALL STONE HEADWALLS AT INLET AND OUTLET OF ALL CULVERTS.	ENGINEER AND CONTRACTOR TO INSPECT EFFECTIVENESS OF DIKES AND DAMS. DRAINAGE SWALES UPSLOPE OF DIKING WILL BE INSTALLED AS REQUIRED DURING CONSTRUCTION.
ROAD SLOPING & DITCHING	1. ALL SEEDING AND MULCHING TO BE APPLIED WITHIN 2 DAYS OF COMPLETION OF ROAD SLOPING AND DITCHING. 2. INSTALL STONE CHECK DAMS IN ALL DRIVEWAY DITCHES. SEE DETAIL NUMBER 2.	INSPECT MULCHED AREAS DAILY AFTER RAINS; OTHER-WISE WEEKLY. IF EROSION IS OCCURING, REPAIR AND RE-SEED AS REQUIRED AND INSTALL JUTE NETTING OVER MULCH.
FINAL GRADING	1. ROADSIDE DITCHES TO BE LINED WITH STONE AS PER DETAIL WHEREVER SLOPE EXCEEDS 5% DITCHES UNDER 5% TO BE SEEDED AND MULCHED. 2. ALL DISTURBED AREAS TO BE SEEDED IN ACCORDANCE WITH THE SEEDING RATE TABLE ON THIS SHEET. 3. APPLY HAY MULCH AT A RATE OF 2.5 TONS/ACRE. 4. APPLY A TEMPORARY SEED MIX OF ANNUAL RYE GRASS AT A RATE OF 20 LBS/ACRE IN AREAS LEFT UNPROTECTED FOR MORE THAN 14 DAYS.	INSPECT DAILY AFTER RAINS; OTHERWISE WEEKLY AND REPAIR AS REQUIRED. INSPECT DAILY AFTER RAINS; OTHERWISE WEEKLY AD REPAIR AS REQUIRED.

SUGGESTED SEEDING RATES AND OTHER INFORMATION OF VARIOUS SPECIES AND SEED MIXTURES

Seed species & mixtures	Seed variety	Rate in lbs. per acre	Per 1000 sq. ft.	When and where to use
Temporary seeding				
Ryegrass (annual or perennial) Winter rye (cereal rye)		20 120	0.5 2.0	Sow May 1 - September 15 Sow September 15 - May 1
Mix #1				
Creeping red fescue Perennial ryegrass	Ensylva, Pennlawn, Boreal Pennfine, Linn	10 10	0.25 0.25	This mix is used extensively for shadded areas.
Mix #2				
Switchgrass	Shelter, Pathfinder, Trailblazer, or Blackwell	20	0.5	This rate is in pure live seed. Good for upland edge of a wetland to filter runoff and provide wildlife benefits. In areas where erosion may be a problem, a companion seeding of sand love grass should be added to provide quick cover at a rate of 2 lbs. per acre (0.05 lbs. per 1000 sq. ft.)
Mix #3				
Switchgrass Big bluestern Little bluestern Indiangrass Coastal pinicgrass Sideoats grama Wildflower mix	Shelter, Pathfinder, Trailblazer, or Blackwell Niagra Aldous or Camper Rumsey Atlantic El Reno or Trailway	4 4 2 3 2 2 0.5	0.1 0.1 0.05 0.1 0.05 0.05 0.01	This mix has been successful on sand and gravel plantings. It is very difficult to seed without a warm season grass seeder such as a Fraux seed drill. Broadcasting this seed is very difficult due to the fluffy nature of some of the seed, such as bluestems and indiangrass.
Mix #4				
Switchgrass Coastal panicgrass	Shelter, Pathfinder, Trailblazer, or Blackwell Atlantic	10 10	0.25 0.25	This mix is salt tolerant, a good choice along the upland edge of tidal areas and roadside.
Mix #5				
Creeping red fescue Tall fescue Perennial ryegrass Birdsfoot trefoil	Ensylva, Pennlawn, Boreal KY - 31, Rebel Pennfine, Linn Empire, Pardee	20 20 5 10	0.45 0.45 0.10 0.45	General purpose erosion control mix. Not to be used for a turf planting or play grounds.

EPSC DETAILS

KR PROPERTIES, LLC

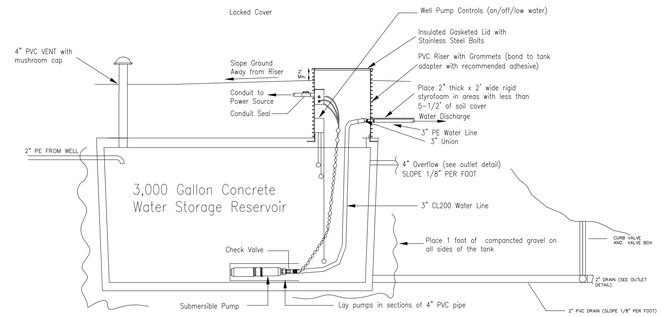
9 LOT SUBDIVISION

ONE MILE ROAD & HALF ROAD — CHARLOTTE

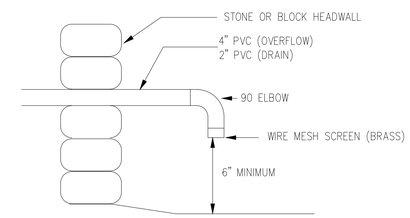
SCALE : NTS
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

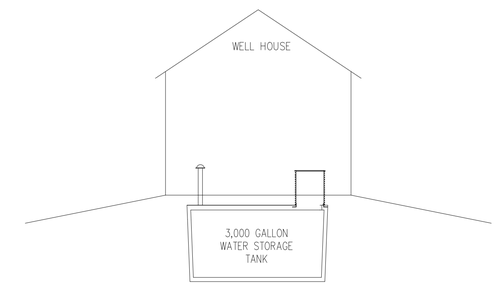
DATE: SEPTEMBER 14, 2016 — SHEET SW-5



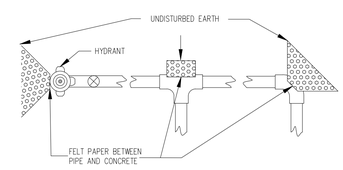
WATER RESERVOIR
(NOT TO SCALE)
(SIZE TO BE VERIFIED AFTER LONG TERM YIELD TESTING)
(ALL LOTS)



WATER RESERVOIR OUTLET DETAIL
(NOT TO SCALE)



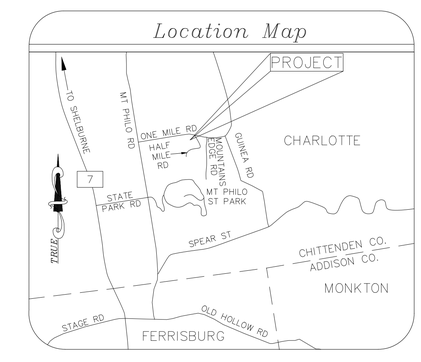
WELL HOUSE DETAIL
(NOT TO SCALE)



THRUST BLOCKS
NOT TO SCALE

MINIMUM CONTACT AREA FOR CONCRETE THRUST BLOCK ON UNDISTURBED SOIL IN SQ. FT.

PIPE SIZE	BEND 11¼	22½	45	90	TEES	WYES
4"	1	1.5	3.0	5.5	4.0	4.0
8"	3	6	12	22	15	15



LEGEND

△TP-1	Traverse point
———	Property line
— — —	2' Contour

THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

THIS IS NOT A SURVEY. THIS PLAN DOES NOT MEET THE REQUIREMENTS OF 27 VSA SEC. 1403 FOR THE FILING OF SURVEY PLATS.

PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

WELL REPORT PLAN
KR PROPERTIES, LLC
9 LOT SUBDIVISION
ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : 1" = 100'
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
CHECKED BY: GNM

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET W-1

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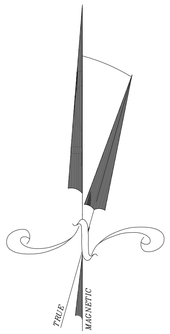

LEGEND

- Property line
- Tree line
- Aquatic habitat
- Core habitat
- Forest habitat
- Linkage habitat

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

Topography by Total Station
Contour Interval 10'
Approximate USGS Datum
Based on Hand Held GPS Unit

Lot size less Right-of-way	Open Space / Nature Corridor
Lot 1 = 10.85± Acres	0 / 0
Lot 2 = 3.28± Acres	0 / 0
Lot 3 = 5.58± Acres	0 / 0
Lot 4 = 5.82± Acres	0 / 1.11± Acres
Lot 5 = 10.00± Acres	0 / 6.37± Acres
Lot 6 = 6.45± Acres	0.88± Acres / 3.46± Acres
Lot 7 = 3.95± Acres	0 / 0
Lot 8 = 6.96± Acres	3.65± Acres / 0
Lot 9 = 28.66± Acres	25.52± Acres / 0
Total = 81.55± Acres	40.97± Acres

LEGEND

- Property line
- Building envelope
- Wetland boundary
- Wetland buffer
- Tree line
- Open space
- Nature corridor

THIS IS NOT A SURVEY. THIS PLAN DOES NOT MEET THE REQUIREMENTS OF 27 VSA SEC. 1403 FOR THE FILING OF SURVEY PLATS.

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PRELIMINARY
NOT FOR CONSTRUCTION

CONSULTANT:
GUNNER MCCAIN
LD-B #237
CPESC #2646
CESSWI #0177

HABITAT & OPEN LAND OVERVIEW

KR PROPERTIES, LLC

9 LOT SUBDIVISION

ONE MILE ROAD & HALF MILE ROAD — CHARLOTTE

SCALE : 1" = 200'
DESIGNED BY: GNM — PROJECT 98027
DRAWN BY: WDB
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McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 14, 2016 — SHEET H-1