

MOUND WASTEWATER DISPOSAL SYSTEM BASIS OF DESIGN

Nancy J. Faulkner
Replacement Wastewater Disposal System
283 Higbee Road, Charlotte, Vermont
8/18/2015 (Revised on September 8, 2015)
Prepared By: Jason Barnard Licensed Designer #430-B

"Best Fix" Replacement Mound Wastewater Disposal System

I. WASTEWATER FLOWS AND MOUND SYSTEM SIZING

A. WASTEWATER FLOWS (Q)

3	Bedrooms	140	gpd/bedroom=	$\frac{420}{3}$	gpd
			Total Flows =	420	gpd

B. REQUIRED SEPTIC TANK

Required Septic Tank Capacity = **1,000 gallons** for a **3-bedroom** single-family residence.
The existing tank shall be pumped out, inspected and if in good condition the tank shall be retrofitted with a Polylok PI-122 effluent filter or equal. If the existing septic tank is in poor condition or does not appear to be water-tight, it shall be replaced with a new 1,000-gallon water-proof concrete septic tank with an approved effluent filter.

C. PERCOLATION RATE (PR)

Percolation tests were all less than 60 min/inch. Therefore, a basal area application rate of 0.74 gallons per day (gpd) per square foot (sf) is used.

D. MOUND SYSTEM APPLICATION RATE (AR)

AR = Application rate for sizing the mound system leachfield area (LA)
Ra maximum = 1.0 gpd/sf for Mounds
Selected Ra = **1.0** gpd/sf

E. REQUIRED LEACHFIELD AREA (RLA)

RLA = Q / AR
RLA = $\frac{420}{1.0}$ / **1.0**
RLA = **420** sf

F. PROPOSED LEACHFIELD AREA (PLA)

PLA = LENGTH (L) x WIDTH (W) x NUMBER OF TRENCHES or BEDS (N)
L = 55 ft
W = 8 ft
N = 1 Absorption Bed
PLA = **440** sf
PLA > RLA therefore PLA is acceptable

G. MOUND SYSTEM BASAL AREA (BA)

G1. BASAL AREA APPLICATION RATE (BAAR)

BAAR = Application rate for sizing basal area (BA)
BAAR = 0.74 gpd/sf for PR < 60 min/inch
BAAR = 0.24 gpd/sf for 60 min/inch < PR < 120 min/inch
Selected BAAR = **0.74** gpd/sf

G2. REQUIRED BASAL AREA (RBA)

RBA = Q / BAAR
RBA = $\frac{420}{0.74}$ / **0.74**
RBA = **568** sf

G3. PROPOSED BASAL AREA (PBA)

PBA = Trench or Seepage Bed Length (L) x Distance from uphill side of the bed to downhill mound toe (MT).
L = 55 ft
MT = 16 ft
PBA = **880**
PBA > RBA, therefore the PBA is acceptable

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II. MOUND SYSTEM PRESSURE DISTRIBUTION DETAILS

A. PROPOSED MOUND SYSTEM DISTRIBUTION SYSTEM

SEE THE ATTACHED ORENCO SYSTEMS, INC. PUMP SELECT SPREAD SHEET FOR THE PROPOSED MOUND SYSTEM PRESSURE DISTRIBUTION DETAILS.

B. TOTAL NUMBER OF ORIFICES IN THE DISTRIBUTION SYSTEM

Number of Orifices = **22** orifices

C. LEACHFIELD AREA (LA) PER ORIFICE

LA/Orifice = LA / Total Number of Orifices

LA/Orifice = **20.0** sf

LA/Orifice is less than 25 sf per Orifice, therefore the proposed number of orifices is in accordance with the current State of Vermont, EPRs.

III. PROPOSED PUMP STATION DESIGN

A. REQUIRED PUMP STATION

Required Pump Station Capacity = **800 gallons** for a **3-bedroom** single-family residence.

B. REQUIRED MOUND SYSTEM DOSE

Required Dose Volume = **105** Gallons

Pump Station Dimensions: On-Site Septic Solutions 800 Gallon Pump Station = 4.83 ft x 7.5 ft

Area of Pump Station = **36.2** sf

Volume per Inch of depth = **22.6** gallons / vertical inch

Pump on/off switch difference setting required for dose: **5** inches

C. REQUIRED PUMP STATION STORAGE

Storage Required = **420** gallons (1 day's flow)

D. PUMP STATION STORAGE

Pump alarm to overflow point height difference = **19.0** inches

Storage Provided = **429** gallons

Storage provided is greater than 1 day's flow, therefore the proposed pump station is adequately sized.

E. PROPOSED EFFLUENT PUMP

Champion Model Number CPE4A-12 4/10 hp 115 volt 1 phase

F. PROPOSED PUMP STATION EFFLUENT PUMP

See Attached Effluent Pump Curve