



MARTHA'S VINEYARD  
ENGINEERING & DESIGN

## Drainage Calculations for Proposed Retention Pond

April 29, 2022

Tisbury Planning Board  
Taqueria Special Permit Application

Dear Members,

The late Kent Healy developed a general stormwater concept for the old stone bank in Vineyard Haven, MA. For the purposes of these calculations, we will be using Mr. Healy's soil data. The intent of this letter is to review the previous calculations and make corrections as Martha's Vineyard Engineering & Design see fit.

The lot has been divided into two areas for the purposes of this analysis. Area 1: the immediate area around the bank, including the proposed retention pond (below the proposed deck), and the roofs of the old bank (building D) and Building F (see site plan). Area 2 is comprised of: The walkways around the back of the old bank building, sloping down from Main Street and the accompanying grass/pervious areas around them.

### Area Breakdown:

	<i>*All areas were measured using the site plan provided by Dunn*</i>
A <sub>1, impervious</sub>	= 3,390sf + 2,340sf = 5,730sf
A <sub>2, impervious</sub>	= 2,070sf
A <sub>total, impervious</sub>	= 7,800sf
A <sub>2, permeable</sub>	= 4,223sf

### Capacity of Retention Pond:

2,340sf x 8.27in/hr x 1ft/12in (per the MA Stormwater Handbook 8.27in/hr for sand)	= 1,612 cf/hr (dispersed water into soil around retention pond)
2,340sf x 2ft (assumed depth of retention pond) x 40% (% voids of ¾" stone)	= 1,872cf (storage capacity of retention pond)

### Runoff in a 25-year, 24-hr Storm:

#### **Impervious area**

5.8in/day x 1ft/12in (per Hydrology Handbook Appendix F-4 Dukes County) x 7,800sf  
= 3,770cf

#### **Permeable area**

5.8in/day x 1ft/12in (per Appendix F-4 Dukes County) x 40% (% runoff) x 4,223sf  
= 816cf

3,770cf + 816cf = 4,586cf (storage capacity for 24hr period)  
Total per hour = 191cf/hr (total flow into retention pond per hour)



From these calculations it is evident that the 25-yr 24-hr flow into the retention pond from the various runoff areas is far less than the capacity of the retention pond/area.

The system designed by Kent Healy provides fifteen (15) 5" downspouts to take runoff from roofs and awnings to the sand and gravel retention pond under the proposed deck. Grading and conduit will direct the runoff from the remain areas to the retention pond. It is recommended that the depth of the retention pond to be "bowl shaped" with a minimum of 24in of  $\frac{3}{4}$ " stone over the naturally occurring sand, to provide 1,872cf of storage between the voids of the stone. Each conduit/pipe should terminate onto a splash block under the deck to prevent erosion of the pond and the soils.

The retention pond, as designed, has far more capacity than needed to safely disperse all the expected runoff from a 25-year, 24-hr storm.

Please contact the office if you have any questions or concerns.

Sincerely,



Casey Decker, PE  
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