

# SMMA

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61 Waverly St  
 Residences at Ashland  
 SMMA Job No. 24142  
 Last Updated: 02/06/2026  
 Calc by: KIC  
 Check by: WWP

## Scour Calculations

Design values based on the 100-year design runoff event.

$$L_a = \frac{1.8Q}{D_0^{3/2}} + 7D_0, \text{ for } TW < \frac{D_0}{2}$$

$$W = 3D_0 + L_a, \text{ for } TW < \frac{D_0}{2}$$

$$D_{30} = \frac{1.95 S^{0.555} q^{2/3}}{g^{1/3}} \quad 1.25*Q/b$$

		Detention Basin Inlet	Detention Basin Weir	Subsurface Infiltration Basin 1	Subsurface Infiltration Basin 2
Discharge*	Q (cfs)	12.03	0.00	0.21	0.09
Outlet Pipe Diameter	Do (ft)	1.50	1.00	1.00	1.00
Tailwater	TW (ft)	0.00	0.00	0.00	0.00
Slope	S (ft/ft)	0.33	0.33	0.33	0.03
Bottom Width of Chute	b (ft)	9.00	9.00	9.00	9.00
Unit Discharge	q (sq ft/s)	1.67	0.00	0.03	0.01
Length of Apron	La (ft)	22.29	7.00	7.38	7.16
Width of Apron	W (ft)	26.79	10.00	10.38	10.16
Outfall Rock Size	D50 (in)	10.00	10.00	10.00	10.00
Levee Thickness	T (in)	15.00	15.00	15.00	15.00
Filter Thickness	FT (in)	6.00	6.00	6.00	6.00
Median Stone Diameter	D30 (in)	8.37	0.00	0.56	0.08

\*Discharge Values based on the 100-yr, 24-hr storm.

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Page F-32

## LEEVE CRITERIA

### Material and Structural Requirements

Rip-Rap Levees (2:1 max. side slopes)

(Ungouted)

Velocities	Rock Size (D50 Size)	Levee Thickness - T		Filter Thickne
		Straight Reach	Curved Reach	
0 - 7 f.p.s.	50 lb. (10")	15-inch	20-inch	6-inch
7 - 9 f.p.s.	100 lb. (12")	18-inch	24-inch	6-inch
10 f.p.s.	NH Type "A" 150 lb. (15")	23-inch	30-inch	9-inch
11 f.p.s.	300 lb. (18")	27-inch	36-inch	9-inch
12 f.p.s.	1/4-ton (21")	32-inch	42-inch	9-inch
13 f.p.s.	NH Type "B" = 24" 1/2-ton (27") NH Type "C" = 27"	41-inch	54-inch	12-inch
13 - 15 f.p.s.	NH Type "D" = 31" 1-ton (34")	51-inch	68-inch	12-inch
16 - 17 <sup>5</sup> f.p.s.	2-ton (43")	65-inch	86-inch	12-inch
18 - 20 f.p.s.	4-ton (54")	81-inch	108-inch	12-inch

(Gouted) Can be used only with special District approval

16 - 20 f.p.s.	1-ton (34")	51-inch	68-inch	12-inch
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Gabion Levees (2:1 side slopes)

Velocities	Levee Thickness (Straight or Curved Reach)	Rockfill	Wire Gage of Baskets	Apron Length
0 - 7 f.p.s.	12-inch Baskets	4" - 8"	12 ga.	12 feet
8 - 10 f.p.s.	18-inch Baskets	4" - 8"	11 ga.	18 feet
11 - 15 f.p.s.	18-inch Baskets	4" - 8"	11 ga.	21 feet

Gabion levees not permitted where velocities exceed 15 f.p.s.

Hyd. Man.