Technical Note

TN 1.16 Arcadia™ Maximum Hydraulic Rates and Required Rim to Outlet Invert Difference

Introduction

The Arcadia is a single manhole hydrodynamic separator designed to remove total suspended solids and other contaminants from stormwater. The device employs a series of angled baffles with a vertical weir wall separating the inlet(s) and outlet pipes. This weir wall allows the unit to bypass excessive stormwater flows internally once the inletting rates exceed the designed treatment rate. This document describes the maximum hydraulic rate (MHR), or bypass capacity of the device based on unit size and rim to invert elevation difference. MHR should not be confused with Maximum Treatment Rate (MTR) which would be the flow rate at which the device meets prescribed treatment criteria.

Maximum Hydraulic Rate and Rim to Outlet Invert Difference

The maximum hydraulic rate (bypass) is governed in part by the space between the outlet invert elevation and the rim elevation of the structure, accounting for freeboard (air space). The inlet(s) and outlet invert for Arcadias are typically at the same elevation. The table below assumes a 4” (100 mm) tall frame mounted on an 8” (200 mm) thick top slab. Contact Application Engineering for applications that require rim to invert differences shallower than the minimums shown in Table 1, or for bypass rates higher than the maximums listed in Table 1.

Figure 1: Arcadia Standard Detail

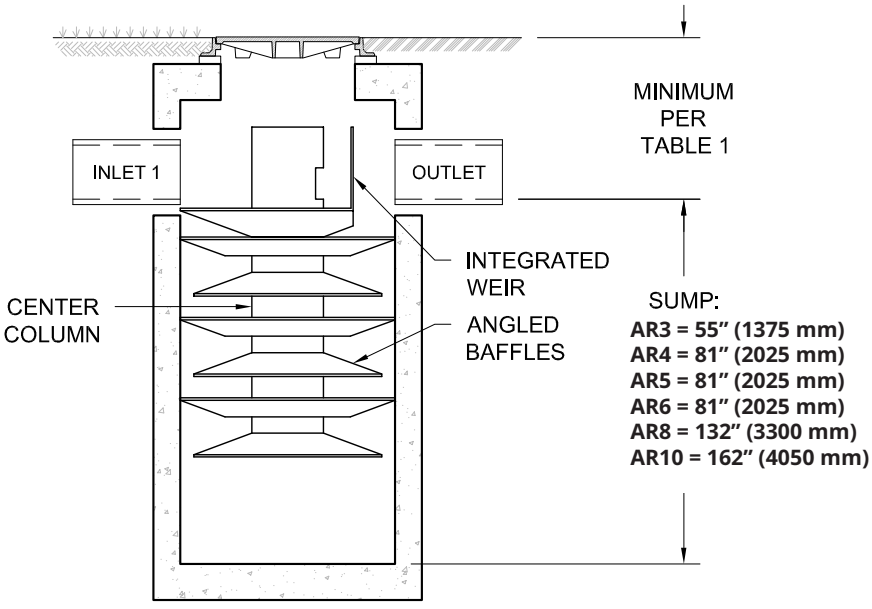

Table 1: Maximum Hydraulic Rate and Rim to Outlet Invert Difference

Arcadia AR3 (36” [900 mm] Manhole)

Maximum Hydraulic Rate (Bypass) cfs (L/s)	Required Rim to Outlet Invert Difference in (mm)
1.0 (28.3)	35 (889)
1.4 (39.6)	36 (914)
1.5 (42.4)	37 (940)
2.3 (65.1)	38 (965)
2.9 (82.1)	39 (991)
3.4 (96.2)	40 (1016)
4.2 (118.9)	42 (1067)
4.9 (138.7)	44 (1118)

Arcadia AR4 (48” [1200 mm] Manhole)

Maximum Hydraulic Rate (Bypass) cfs (L/s)	Required Rim to Outlet Invert Difference in (mm)
1.9 (53.8)	35 (889)
2.5 (70.7)	36 (914)
2.7 (76.4)	37 (940)
3.3 (93.4)	38 (965)
4.2 (118.9)	39 (991)
4.9 (138.7)	40 (1016)
6.1 (172.7)	42 (1067)
7.1 (201.0)	44 (1118)

Arcadia AR5 (60” [1500 mm] Manhole)

Maximum Hydraulic Rate (Bypass) cfs (L/s)	Required Rim to Outlet Invert Difference in (mm)
2.9 (82.1)	35 (889)
3.9 (110.4)	36 (914)
4.3 (121.7)	37 (940)
5.0 (141.5)	38 (965)
6.4 (181.2)	39 (991)
7.6 (215.2)	40 (1016)
9.5 (269.0)	42 (1067)
11.0 (311.4)	44 (1118)
12.4 (351.1)	46 (1168)

Arcadia AR6 (72” [1800 mm] Manhole)

Maximum Hydraulic Rate (Bypass) cfs (L/s)	Required Rim to Outlet Invert Difference in (mm)
4.2 (118.9)	35 (889)
5.6 (158.5)	36 (914)
6.2 (175.5)	37 (940)
7.3 (206.7)	38 (965)
9.3 (263.3)	39 (991)
10.9 (308.6)	40 (1016)
13.6 (385.1)	42 (1067)
15.9 (450.2)	44 (1118)
17.9 (506.8)	46 (1168)

Arcadia AR8 (96” [2400 mm] Manhole)

Maximum Hydraulic Rate (Bypass) cfs (L/s)	Required Rim to Outlet Invert Difference in (mm)
10.0 (283.1)	36 (914)
11.0 (311.4)	37 (940)
12.9 (365.2)	38 (965)
16.5 (467.2)	39 (991)
19.5 (552.1)	40 (1016)
24.3 (688.0)	42 (1067)
28.3 (801.3)	44 (1118)
31.8 (900.4)	46 (1168)
35.0 (991.0)	48 (1219)

Arcadia AR10 (120” [3000 mm] Manhole)

Maximum Hydraulic Rate (Bypass) cfs (L/s)	Required Rim to Outlet Invert Difference in (mm)
15.0 (424.7)	36 (914)
17.2 (487.0)	37 (940)
19.0 (538.0)	38 (965)
24.9 (705.0)	39 (991)
29.6 (838.1)	40 (1016)
37.3 (1056.2)	42 (1067)
43.7 (1237.4)	44 (1118)
49.3 (1396.0)	46 (1168)
54.3 (1537.6)	48 (1219)