

Appendix B – Hydraulic Calculations

- Full-flow Capacity Calculations

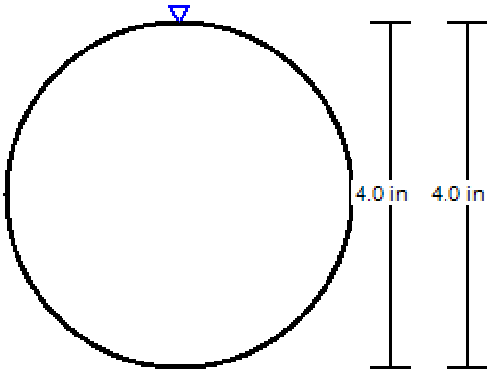
Worksheet for 4" SD

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.478 ft/ft
Normal Depth	4.0 in
Diameter	4.0 in
Discharge	1.32 cfs
Results	
Discharge	1.32 cfs
Normal Depth	4.0 in
Flow Area	0.1 ft ²
Wetted Perimeter	1.0 ft
Hydraulic Radius	1.0 in
Top Width	0.00 ft
Critical Depth	4.0 in
Percent Full	100.0 %
Critical Slope	0.478 ft/ft
Velocity	15.08 ft/s
Velocity Head	3.53 ft
Specific Energy	3.87 ft
Froude Number	(N/A)
Maximum Discharge	1.42 cfs
Discharge Full	1.32 cfs
Slope Full	0.478 ft/ft
Flow Type	Critical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	4.0 in
Critical Depth	4.0 in
Channel Slope	0.478 ft/ft
Critical Slope	0.478 ft/ft

Cross Section for 4" SD

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.478 ft/ft
Normal Depth	4.0 in
Diameter	4.0 in
Discharge	1.32 cfs



V: 1
H: 1

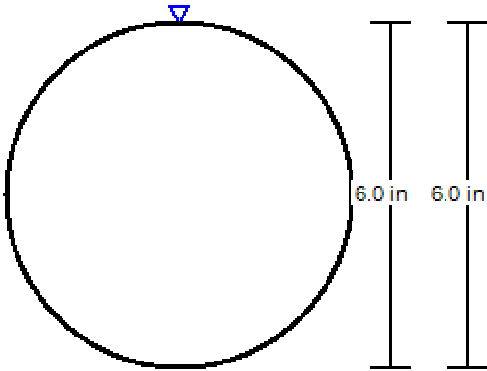
Worksheet for 6" SD

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.044 ft/ft
Normal Depth	6.0 in
Diameter	6.0 in
Discharge	1.18 cfs
Results	
Discharge	1.18 cfs
Normal Depth	6.0 in
Flow Area	0.2 ft ²
Wetted Perimeter	1.6 ft
Hydraulic Radius	1.5 in
Top Width	0.00 ft
Critical Depth	5.8 in
Percent Full	100.0 %
Critical Slope	0.039 ft/ft
Velocity	5.99 ft/s
Velocity Head	0.56 ft
Specific Energy	1.06 ft
Froude Number	(N/A)
Maximum Discharge	1.27 cfs
Discharge Full	1.18 cfs
Slope Full	0.044 ft/ft
Flow Type	Undefined
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	6.0 in
Critical Depth	5.8 in
Channel Slope	0.044 ft/ft
Critical Slope	0.039 ft/ft

Cross Section for 6" SD

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.044 ft/ft
Normal Depth	6.0 in
Diameter	6.0 in
Discharge	1.18 cfs



V: 1
H: 1

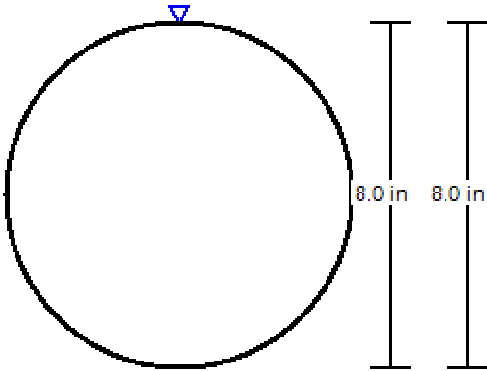
Worksheet for 8" SD

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.044 ft/ft
Normal Depth	8.0 in
Diameter	8.0 in
Discharge	2.53 cfs
Results	
Discharge	2.53 cfs
Normal Depth	8.0 in
Flow Area	0.3 ft ²
Wetted Perimeter	2.1 ft
Hydraulic Radius	2.0 in
Top Width	0.00 ft
Critical Depth	7.8 in
Percent Full	100.0 %
Critical Slope	0.039 ft/ft
Velocity	7.26 ft/s
Velocity Head	0.82 ft
Specific Energy	1.49 ft
Froude Number	(N/A)
Maximum Discharge	2.73 cfs
Discharge Full	2.53 cfs
Slope Full	0.044 ft/ft
Flow Type	Undefined
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	8.0 in
Critical Depth	7.8 in
Channel Slope	0.044 ft/ft
Critical Slope	0.039 ft/ft

Cross Section for 8" SD

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.044 ft/ft
Normal Depth	8.0 in
Diameter	8.0 in
Discharge	2.53 cfs



V: 1
H: 1