County of Los Angeles

Tentative Tract Map No. 053653 Sewer Area Study

Prepared By: Diamond West Engineering, Inc

Signature:_____ Date: March 1, 2006

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Introduction

This Sewer Area Study is prepared for Tract 053653. The proposed site is located in the Unincorporated areas of Los Angeles County, South of Sagecrest Circle, North of Calgrove Blvd and adjacent to The Old Road. The project site is outside the service boundaries of the County Sanitation District and will need to be annexed into District No. 32 before service can be provided for development. The study is based on the development proposal of single family residential lots and a senior Housing complex encompassing a total of 186 units.

Due to the location of the development site, the flow from the project would have to be transported to the district's facilities by local sewer lines. The nearest sewer line north of the site is the District's Valencia Trunk Sewer, a 24 inch diameter trunk sewer with the capacity of 8.2 cfs and located at the southeast intersection of Orchard Village and Wiley Canyon Road. To the east, the District No. 32 Main Trunk Sewer, an 18-inch diameter trunk with a capacity of 5.1 cfs, is located to the east of the intersection of Orchard Village and Wiley Canyon Road.

The proposed development would generate approximately 120,215 gallons (16,070 cubic feet) of wastewater on a daily basis, which would be treated at both the Valencia Water Reclamation Plant and Saugus Water Reclamation Plant.

The purpose of this study is to verify that the existing sewer system in the City of Santa Clarita can or cannot accept the additional flow from the proposed project without creating an overload to the existing pipes. Since the study is dealing with existing pipes, the maximum capacity per reach is allowed up to the pipe flowing ¾ full for 15 inch diameter pipes or bigger, and ½ full pipes smaller than 15 inches in diameter.

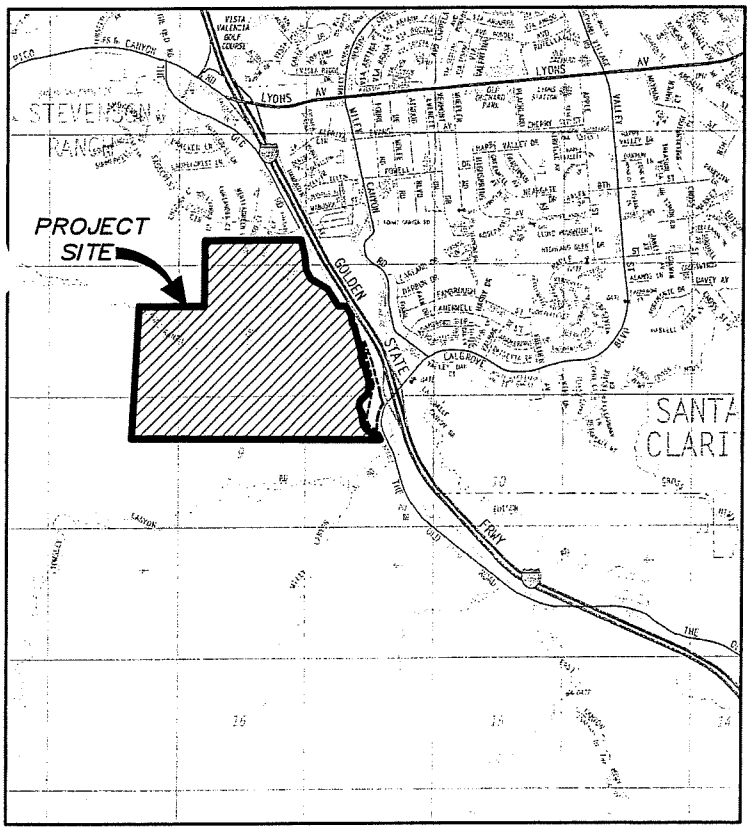
Methodology

Kutter's coefficients and equations is used in the analysis based on steady uniform flow in open channels.

SEWER AREA STUDY

FOR

LYONS CANYON RANCH



Vicinity Map

NOT TO SCALE

Source: TB Guide P. 4640

TENTATIVE TRACT No. 53653

DEVELOPER:

WESTERN PACIFIC HOUSING, LYONS CANYON, LLC.
6701 Center Drive West, Suite 900
Los Angeles, CA 90045
(310) 665-3743

ENGINEER:

DIAMOND WEST ENGINEERING, INC.
4764 Park Granada, Suite 202
Calabasas, CA 991302
(818) 222-3453

SEWER AREA STUDY

CALCULATIONS:

Proposed Area:

Total No. of Units = 186

Q Per Unit = 0.001 cfs

Q_B= (0.001)(186) = 0.186 cfs

Capacity: 8" half full @ 0.40% = 0.387 cfs
0.387 cfs > 0.186 cfs …OK

➔ 8" V.C.P. @ 0.40% OK
Use 8" Through Tract 053653

Reach 1-Reach 4

M.H. # 119- M.H.# 85

Total No. of Existing Units = 49

Q Per Unit = 0.001 cfs

Q_{Total}= (0.001)(49) = 0.049 cfs

Min. Capacity:
Reach No. 1 (M.H. # 119-M.H. # 117):

12" 1/2 full @ 0.40% = 1.070 cfs
0.049 cfs < 1.070 cfs …OK

➔ Existing Line Reach 1 through reach 4 is OK.

Reach 5-Reach 12

M.H. # 85- M.H.# 42

Total No. of Existing Units = 333

$Q_{\text{Per Unit}} = 0.001$ cfs

$Q_{Total} = (0.001)(333) = 0.333$ cfs

Min. Capacity:
Reach No. 5 (M.H. # 85-M.H. # 60):

10" 1/2 full @ 0.80% = 0.920 cfs
0.333 cfs < 0.920 cfs …OK

➔ **Existing Line Reach 5 through reach 12 is OK.**

Reach 13

M.H. # 42- M.H.# 36

Total No. of Existing Units = 350

$Q_{\text{Per Unit}} = 0.001$ cfs

$Q_{Total} = (0.001)(350) = 0.350$ cfs

Capacity:

12" 1/2 full @ 0.40% = 1.070 cfs
0.350 cfs < 1.070 cfs …OK

➔ **Existing Line Reach 13 is OK**

Reach 14-Reach 15

M.H. # 36- M.H.# 427

Total No. of Existing Units = 429

$Q_{\text{Per Unit}} = 0.001$ cfs

$Q_{Total} = (0.001)(429) = 0.429$cfs

Min. Capacity:
Reach No. 15 (M.H. # 428-M.H. # 427):

12" 1/2 full @ 2.56% = 2.730 cfs
0.429 cfs < 2.730 cfs …OK

➔ **Existing Line Reach 14 through reach 15 is OK**

Reach 16

M.H. # 427- M.H.# 413

Total No. of Existing Units = 144

$Q_{\text{Per Unit}} = 0.001$ cfs

$Q_{Existing} = (0.001)(144) = 0.144$cfs

$Q_{\text{Proposed}} = 0.186$ cfs

$Q_{total} = 0.144+0.186 = 0.330$ cfs

Capacity:

8" 1/2 full @ 0.60% = 0.430 cfs
0.330 cfs < 0.430 cfs …OK

➔ **Existing Line Reach 16 is OK**

Reach 17

M.H. # 13- M.H.# 14

Total No. of Existing + Proposed Units = 337

$Q_{\text{Per Unit}} = 0.001$ cfs

$Q_{Total} = (0.001)(337) = 0.337$cfs

Capacity:

8" 1/2 full @ 0.83% = 0.500 cfs
0.337 cfs < 0.500 cfs …OK

➔ **Existing Line Reach 17 is OK**

Reach 18

M.H. # 14- M.H.# 15

Total No. of Existing + Proposed Units = 445

$Q_{\text{Per Unit}} = 0.001$ cfs

$Q_{Total} = (0.001)(445) = 0.445$cfs

Capacity:

12" 1/2 full @ 2.71% = 2.810 cfs
0.445 cfs < 2.810 cfs …OK

➔ **Existing Line Reach 18 is OK**

Reach 19-Reach 23

M.H. # 15- M.H.# 453

Total No. of Existing + Proposed Units = 517

$Q_{\text{Per Unit}} = 0.001$ cfs

$Q_{Total} = (0.001)(517) = 0.517$cfs

Min. Capacity:
Reach No. 22 (M.H. # 451-M.H. # 452):

10" 1/2 full @ 0.38% = 0.630 cfs
0.517 cfs < 0.630 cfs …OK

➔ **Existing Line Reach 19 through reach 23 is OK**

Reach 24

M.H. # 453- M.H.# 433

Total No. of Existing + Proposed Units = 531

$Q_{\text{Per Unit}} = 0.001$ cfs

$Q_{Total} = (0.001)(531) = 0.531$cfs

Capacity:

10" 1/2 full @ 1.24% = 1.150 cfs
0.531 cfs < 1.150 cfs …OK

➔ **Existing Line Reach 24 is OK**

Reach 25

M.H. # 433- M.H.# 427

Total No. of Existing + Proposed Units = 921

$Q_{Per\ Unit} = 0.001$ cfs

$Q_{Total} = (0.001)(921) = 0.921$cfs

Capacity:

12" 1/2 full @ 0.60% = 1.32 cfs
0.921 cfs < 1.32 cfs …OK

➔ **Existing Line Reach 25 is OK**

Reach 26-Reach 29

M.H. # 427- M.H.# 423

Total No. of Existing + Proposed Units = 1350

$Q_{Per\ Unit} = 0.001$ cfs

$Q_{Total} = (0.001)(1350) = 1.350$ cfs

Min. Capacity:
Reach No. 28 (M.H. # 451-M.H. # 452):

15" 3/4 full @ 0.56% = 4.350 cfs
1.350 cfs < 4.350 cfs …OK

➔ **Existing Line Reach 26 through reach 29 is OK**

Reach 30

M.H. # 423- M.H.# 362

Total No. of Existing + Proposed Units = 1517

$Q_{Per\ Unit} = 0.001$ cfs

$Q_{Total} = (0.001)(1517) = 1.517$ cfs

Capacity:

18" 3/4 full @ 0.60% = 7.410 cfs
1.517 cfs < 7.410 cfs …OK

➔ **Existing Line Reach 30 is OK**

Reach 31-Reach 32

M.H. # 362- M.H.# 393

Total No. of Existing + Proposed Units = 1670

$Q_{Per\ Unit} = 0.001$ cfs

$Q_{Total} = (0.001)(1670) = 1.670$ cfs

Min. Capacity:
Reach No. 32 (M.H. # 392-M.H. # 393):

12" 1/2 full @ 2.0% = 2.410 cfs
1.670 cfs < 2.410 cfs …OK

➔ **Existing Line Reach 31 through reach 32 is OK**

Reach 33-Reach 37

M.H. # 393- M.H.# 349

Total No. of Existing + Proposed Units = 2644

$Q_{\text{Per Unit}} = 0.001$ cfs

$Q_{Total} = (0.001)(2644) = 2.644$ cfs

Min. Capacity:
Reach No. 33 (M.H. # 393-M.H. # 372):

18" 3/4 full @ 0.24% = 4.670 cfs
2.644 cfs < 4.670 cfs …OK

➔ **Existing Line Reach 33 through reach 37 is OK**

Reach 38

M.H. # 349- M.H.# 311

Total No. of Existing + Proposed Units = 2834

$Q_{\text{Per Unit}} = 0.001$ cfs

$Q_{Total} = (0.001)(2834) = 2.834$ cfs

Capacity:

18" 3/4 full @ 0.64% = 7.650 cfs
2.834 cfs < 7.650 cfs …OK

➔ **Existing Line Reach 38 is OK**

Reach 39-Reach 42

M.H. # 311- M.H.# 328

Total No. of Existing + Proposed Units = 2935

$Q_{Per\ Unit} = 0.001$ cfs

$Q_{Total} = (0.001)(2935) = 2.935$ cfs

Min. Capacity:
Reach No. 42 (M.H. # 320-M.H. # 328):

18" 3/4 full @ 0.40% = 6.040 cfs
2.644 cfs < 6.040 cfs …OK

➔ **Existing Line Reach 39 through reach 42 is OK**

Reach 43-Reach 44

M.H. # 328- M.H.# 782

Total No. of Existing + Proposed Units = 3012

$Q_{Per\ Unit} = 0.001$ cfs

$Q_{Total} = (0.001)(3012) = 3.012$ cfs

Min. Capacity:
Reach No. 44 (M.H. # 784-M.H. # 782):

18" 3/4 full @ 0.60% = 7.410 cfs
3.012 cfs < 7.410 cfs …OK

➔ **Existing Line Reach 43 through reach 44 is OK**

Reach 45

M.H. # 782- M.H.# 781

Total No. of Existing + Proposed Units = 3012

$Q_{Per\ Unit} = 0.001$ cfs

Q_{Total}= (0.001)(3012) = 3.012 cfs

Capacity:

18" 3/4 full @ 1.84% = 13.000 cfs

3.012 cfs < 13.000 cfs …OK

➔ **Existing Line Reach 45 is OK**

Reach 46

M.H. # 781- Trunk

Total No. of Existing + Proposed Units = 3012

Q Per Unit = 0.001 cfs

Q_{Total}= (0.001)(3012) = 3.012 cfs

Capacity:

18" 3/4 full @ 0.48% = 6.636 cfs

3.012 cfs < 6.636 cfs …OK

➔ **Existing Line Reach 46 is OK**

Sewer Trunk

Total No. of Existing + Proposed Units = 3012

Q Per Unit = 0.001 cfs

Q_{Total}= (0.001)(3012) = 3.012 cfs

Capacity:

18" 3/4 full @ 0.28% = 5.1 cfs

3.012 cfs < 5.1 cfs …OK

➔ **Sewer Trunk Capacity is OK**

Conclusion

Based on the sewer area study prepared for the project, the existing sewer line was analyzed to determine the minimum line capacity before and after the development of Tract 053653. The existing line was divided into 46 reaches each one is based on the size of the pipe and the minimum slope of this pipe.
The existing lines capacity with is more than adequate to accommodate the new development of this tract. No upgrade in the existing line is required after the development of this tract. All pipes of the existing system are adequate. All on-site sewer facilities will be owned, operated and maintained by the sewer district.

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION

AREA STUDY

An area study must be made for all private contract sewer projects. See attached sample. The area study must include the following items:

1. Area being served -- In Acres
2. Determined Tributary area to main line being designed (incl. areas of future devel.)- In Acres
3. Existing and Land Use Zoning
4. Anticipated Sewer Discharge in cfs of total area based on zoning, and/or heavy water users
5. Existing or proposed utilities if in conflict
6. Existing and proposed sewers showing pipe size and grade leading up to the trunk line in order for you to evaluate the impact of your proposed development on the existing system
7. Direction of sewer flow
8. Contour lines
9. Scale not to be less than 1"=600'
10. North arrow pointing up or to the left

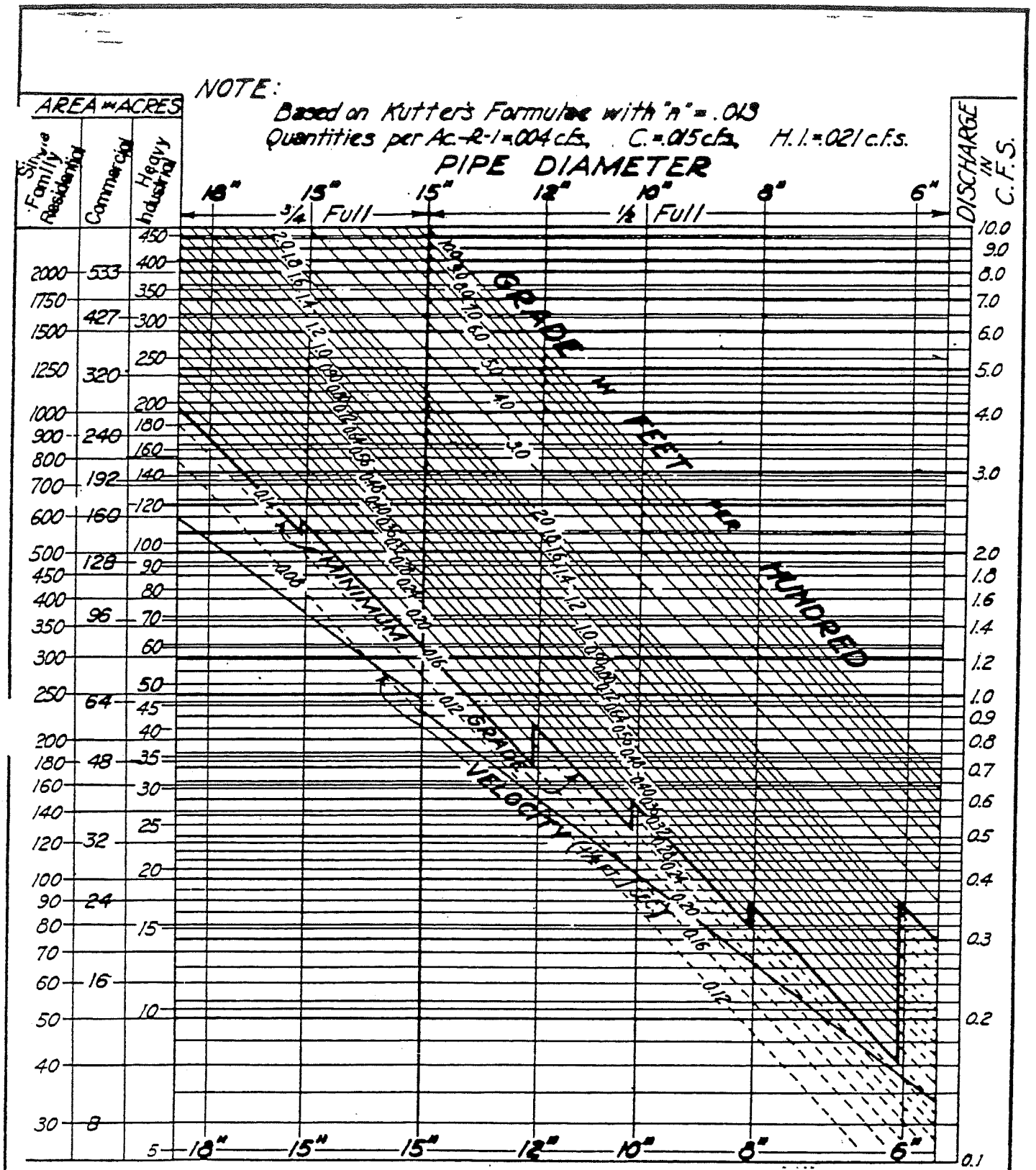
ZONING COEFFICIENTS

ZONE	COEFFICIENT (cfs/Acre)
Agriculture	0.001
Residential	
R-1	0.004
R-2	0.008
R-3	0.012
R-4	0.016 *
Commerical	
C-1 through C-4	0.015 *
Heavy Industrial	
M-1 through M-4	0.021 *

* Individual building, commercial or industrial plant capacities shall be the determining factor when they exceed the coefficients shown.

The coefficient to be used for any zoned areas not listed will be determined by the County based upon the intended development and use.

The County shall determine which of the coefficients or combination of coefficients shall be used for design as determined by the established or proposed zoning in the study area. Any modifications to these coefficients due to topography, development, or hazard areas, shall be approved by the Department of Public Works.



NOTE: USE 15"- 1/2 FULL FOR COMPUTING DESIGN CAPACITY OF A NEW SEWER SYSTEM. USE 15"- 3/4" FULL FOR CHECKING CAPACITY OF EXIST. SEWER SYSTEM.

FLOW DIAGRAM FOR THE DESIGN OF CIRCULAR SANITARY SEWERS

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

ASSISTANT DEPUTY

COUNTY ENGINEER

COUNTY ENGINEER STANDARD S-C4

DATE: 3/80

DESIGN RCE 10443

Sewer Area Study Table-1

Reach No.	Segment		Pipe		*Capacity		**Cumulative No. of Units Prop.+ Exis.	Unit Coefficient	Cumulative Calculated Flow (cfs)	PC or CI Construction Plan #	Comment	***Cum. Flow/Allowed Cap.*100
	M.H. #	M.H. #	Size (in)	Slope (%)	1/2 Full (<15")	3/4 Full (>15")						
1	119	117	12	0.40	1.07		49	0.001	0.049	P.C. 9346		0.05
2	117	88	12	0.40	1.07		49	0.001	0.049	P.C. 9346		0.05
3	88	87	10	2.44	1.61		49	0.001	0.049	P.C. 9346		0.03
4	87	85	8	4.00	1.11		49	0.001	0.049	P.C. 7578		0.04
5	85	60	10	0.80	0.92		333	0.001	0.333	P.C. 7578		0.36
6	60	59	10	0.88	0.96		333	0.001	0.333	P.C. 7578		0.35
7	59	53	12	0.40	1.07		333	0.001	0.333	P.C. 7578		0.31
8	53	50	12	0.40	1.07		333	0.001	0.333	P.C. 7599		0.31
9	50	48	10	1.80	1.38		333	0.001	0.333	P.C. 7599		0.24
10	48	47	10	6.32	2.59		333	0.001	0.333	P.C. 7599		0.13
11	47	45	10	6.04	2.53		333	0.001	0.333	P.C. 7599		0.13
12	45	42	10	1.00	1.03		333	0.001	0.333	P.C. 7599		0.32
13	42	36	12	0.40	1.07		350	0.001	0.35	P.C. 7599		0.33
14	36	428	15	0.40		3.67	429	0.001	0.429	P.C. 7599		0.12
15	428	427	12	2.56	2.73		429	0.001	0.429	P.C. 7599		0.16
16	9	13	8	0.60	0.43		330	0.001	0.33	P.C. 10428		0.77
17	13	14	8	0.83	0.50		337	0.001	0.337	P.C. 10428		0.67
18	14	15	12	2.71	2.81		445	0.001	0.445	P.C. 7521		0.16
19	15	58	10	1.40	1.22		517	0.001	0.517	P.C. 6698A		0.42
20	58	497	10	1.00	1.03		517	0.001	0.517	P.C. 6698A		0.50
21	497	451	10	0.36	1.61		517	0.001	0.517	P.C. 6698A		0.32
22	451	452	10	0.38	0.63		517	0.001	0.517	P.C. 6698A		0.82
23	452	453	10	2.00	1.46		517	0.001	0.517	P.C. 6698A		0.35
24	453	433	10	1.24	1.15		531	0.001	0.531	P.C. 6698A		0.46
25	433	427	12	0.60	1.32		921	0.001	0.921	P.C. 6698A		0.70
26	427	426	15	0.56		4.35	1350	0.001	1.35	P.C. 7549		0.31
27	426	425	15	1.24		6.48	1350	0.001	1.35	P.C. 7549		0.21
28	425	424	15	0.56		4.35	1350	0.001	1.35	P.C. 7549		0.31
29	424	423	15	0.72		4.94	1350	0.001	1.35	P.C. 7549		0.27
30	423	362	18	0.60		7.41	1517	0.001	1.517	P.C. 7549		0.20
31	362	392	15	0.60		4.50	1670	0.001	1.67	P.C. 7549		0.37
32	392	393	12	2.00	2.41		1670	0.001	1.67	P.C. 7549		0.69
33	393	372	18	0.24		4.67	2644	0.001	2.644	P.C. 7549		0.57
34	372	344	15	1.00		5.82	2644	0.001	2.644	P.C. 7549		0.45
35	344	345	18	0.76		8.34	2644	0.001	2.644	P.C. 7549		0.32
36	345	346	18	0.68		7.89	2644	0.001	2.644	P.C. 7549		0.34
37	346	349	18	0.40		6.04	2644	0.001	2.644	P.C. 7549		0.44
38	349	311	18	0.64		7.65	2834	0.001	2.834	P.C. 7549		0.37
39	311	312	15	1.04		5.94	2935	0.001	2.935	P.C. 7549		0.49
40	312	319	18	0.60		7.41	2935	0.001	2.935	P.C. 7549		0.40
41	319	320	18	0.64		7.65	2935	0.001	2.935	P.C. 7549		0.38
42	320	328	18	0.40		6.04	2935	0.001	2.935	P.C. 7549		0.49
43	328	784	18	1.12		10.13	3012	0.001	3.012	P.C. 7549		0.30
44	784	782	18	0.60		7.41	3012	0.001	3.012	P.C. 7549		0.41
45	782	781	18	1.84		13.00	3012	0.001	3.012	P.C. 7549		0.23
46	781	Trunk	18	0.48		6.63	3012	0.001	3.012	P.C. 7549		0.45
Trunk			18	0.28		5.10	3012	0.001	3.012			0.59

* Calculated using Kutter's Formula with n=0.013 (as in SC-C4 graph in PC Procedural Manual)
** Based on current land use and coefficients per LA County
*** Allowed Capacity = (1/2 Full for pipes < 15" diameter, 3/4 full for pipes ≥15" diameter)

Reach No. 1

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.0000 ft
Depth	0.5000 ft
Slope	0.0040 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.1267 cfs
Area	0.7854 ft2
Wetted Area	0.3927 ft2
Wetted Perimeter	1.5708 ft
Perimeter	3.1416 ft
Velocity	2.8690 fps
Hydraulic Radius	0.2500 ft
Percent Full	50.0000 %
Full flow Flowrate	2.2533 cfs
Full flow velocity	2.8690 fps

Critical Information

Critical depth	0.4470 ft
Critical slope	0.0059 ft/ft
Critical velocity	3.3158 fps
Critical area	0.3398 ft2
Critical perimeter	1.4646 ft
Critical hydraulic radius	0.2320 ft
Critical top width	0.9944 ft
Specific energy	0.6279 ft
Minimum energy	0.6705 ft
Froude number	0.8071
Flow condition	Subcritical

Reach No. 2

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.0000 ft
Depth	0.5000 ft
Slope	0.0040 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.1267 cfs
Area	0.7854 ft2
Wetted Area	0.3927 ft2
Wetted Perimeter	1.5708 ft
Perimeter	3.1416 ft
Velocity	2.8690 fps
Hydraulic Radius	0.2500 ft
Percent Full	50.0000 %
Full flow Flowrate	2.2533 cfs
Full flow velocity	2.8690 fps

Critical Information

Critical depth	0.4470 ft
Critical slope	0.0059 ft/ft
Critical velocity	3.3158 fps
Critical area	0.3398 ft2
Critical perimeter	1.4646 ft
Critical hydraulic radius	0.2320 ft
Critical top width	0.9944 ft
Specific energy	0.6279 ft
Minimum energy	0.6705 ft
Froude number	0.8071
Flow condition	Subcritical

Reach No. 3

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8333 ft
Depth	0.4166 ft
Slope	0.0244 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.7107 cfs
Area	0.5454 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3088 ft
Perimeter	2.6179 ft
Velocity	6.2745 fps
Hydraulic Radius	0.2083 ft
Percent Full	49.9940 %
Full flow Flowrate	3.4221 cfs
Full flow velocity	6.2748 fps

Critical Information

Critical depth	0.5973 ft
Critical slope	0.0078 ft/ft
Critical velocity	4.0423 fps
Critical area	0.4232 ft2
Critical perimeter	1.6702 ft
Critical hydraulic radius	0.2534 ft
Critical top width	0.8333 ft
Specific energy	1.0284 ft
Minimum energy	0.8959 ft
Froude number	1.9339
Flow condition	Supercritical

Reach No. 4

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.6670 ft
Depth	0.3335 ft
Slope	0.0400 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.2100 cfs
Area	0.3494 ft2
Wetted Area	0.1747 ft2
Wetted Perimeter	1.0477 ft
Perimeter	2.0954 ft
Velocity	6.9260 fps
Hydraulic Radius	0.1668 ft
Percent Full	50.0000 %
Full flow Flowrate	2.4200 cfs
Full flow velocity	6.9260 fps

Critical Information

Critical depth	0.5392 ft
Critical slope	0.0090 ft/ft
Critical velocity	3.8790 fps
Critical area	0.3119 ft2
Critical perimeter	1.4592 ft
Critical hydraulic radius	0.2138 ft
Critical top width	0.6670 ft
Specific energy	1.0790 ft
Minimum energy	0.8089 ft
Froude number	2.3858
Flow condition	Supercritical

Reach No. 5

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8330 ft
Depth	0.4166 ft
Slope	0.0080 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	0.9792 cfs
Area	0.5450 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3087 ft
Perimeter	2.6169 ft
Velocity	3.5924 fps
Hydraulic Radius	0.2083 ft
Percent Full	50.0120 %
Full flow Flowrate	1.9576 cfs
Full flow velocity	3.5921 fps

Critical Information

Critical depth	0.4396 ft
Critical slope	0.0067 ft/ft
Critical velocity	3.3567 fps
Critical area	0.2917 ft2
Critical perimeter	1.3546 ft
Critical hydraulic radius	0.2153 ft
Critical top width	0.8330 ft
Specific energy	0.6172 ft
Minimum energy	0.6594 ft
Froude number	1.1072
Flow condition	Supercritical

Reach No. 6

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8330 ft
Depth	0.4166 ft
Slope	0.0088 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.0270 cfs
Area	0.5450 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3087 ft
Perimeter	2.6169 ft
Velocity	3.7678 fps
Hydraulic Radius	0.2083 ft
Percent Full	50.0120 %
Full flow Flowrate	2.0531 cfs
Full flow velocity	3.7674 fps

Critical Information

Critical depth	0.4509 ft
Critical slope	0.0068 ft/ft
Critical velocity	3.4104 fps
Critical area	0.3011 ft2
Critical perimeter	1.3772 ft
Critical hydraulic radius	0.2186 ft
Critical top width	0.8330 ft
Specific energy	0.6372 ft
Minimum energy	0.6763 ft
Froude number	1.1612
Flow condition	Supercritical

Reach No. 7

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.0000 ft
Depth	0.5000 ft
Slope	0.0040 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.1267 cfs
Area	0.7854 ft2
Wetted Area	0.3927 ft2
Wetted Perimeter	1.5708 ft
Perimeter	3.1416 ft
Velocity	2.8690 fps
Hydraulic Radius	0.2500 ft
Percent Full	50.0000 %
Full flow Flowrate	2.2533 cfs
Full flow velocity	2.8690 fps

Critical Information

Critical depth	0.4470 ft
Critical slope	0.0059 ft/ft
Critical velocity	3.3158 fps
Critical area	0.3398 ft2
Critical perimeter	1.4646 ft
Critical hydraulic radius	0.2320 ft
Critical top width	0.9944 ft
Specific energy	0.6279 ft
Minimum energy	0.6705 ft
Froude number	0.8071
Flow condition	Subcritical

Reach No. 8

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.0000 ft
Depth	0.5000 ft
Slope	0.0040 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.1267 cfs
Area	0.7854 ft2
Wetted Area	0.3927 ft2
Wetted Perimeter	1.5708 ft
Perimeter	3.1416 ft
Velocity	2.8690 fps
Hydraulic Radius	0.2500 ft
Percent Full	50.0000 %
Full flow Flowrate	2.2533 cfs
Full flow velocity	2.8690 fps

Critical Information

Critical depth	0.4470 ft
Critical slope	0.0059 ft/ft
Critical velocity	3.3158 fps
Critical area	0.3398 ft2
Critical perimeter	1.4646 ft
Critical hydraulic radius	0.2320 ft
Critical top width	0.9944 ft
Specific energy	0.6279 ft
Minimum energy	0.6705 ft
Froude number	0.8071
Flow condition	Subcritical

Reach No. 9

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8333 ft
Depth	0.4166 ft
Slope	0.0180 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.4693 cfs
Area	0.5454 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3088 ft
Perimeter	2.6179 ft
Velocity	5.3891 fps
Hydraulic Radius	0.2083 ft
Percent Full	49.9940 %
Full flow Flowrate	2.9392 cfs
Full flow velocity	5.3894 fps

Critical Information

Critical depth	0.5483 ft
Critical slope	0.0074 ft/ft
Critical velocity	3.8424 fps
Critical area	0.3824 ft2
Critical perimeter	1.5722 ft
Critical hydraulic radius	0.2432 ft
Critical top width	0.8333 ft
Specific energy	0.8679 ft
Minimum energy	0.8225 ft
Froude number	1.6610
Flow condition	Supercritical

Reach No. 10

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8333 ft
Depth	0.4166 ft
Slope	0.0532 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	2.5260 cfs
Area	0.5454 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3088 ft
Perimeter	2.6179 ft
Velocity	9.2648 fps
Hydraulic Radius	0.2083 ft
Percent Full	49.9940 %
Full flow Flowrate	5.0530 cfs
Full flow velocity	9.2653 fps

Critical Information

Critical depth	0.7480 ft
Critical slope	0.0089 ft/ft
Critical velocity	4.6030 fps
Critical area	0.5488 ft2
Critical perimeter	1.9716 ft
Critical hydraulic radius	0.2783 ft
Critical top width	0.8333 ft
Specific energy	1.7505 ft
Minimum energy	1.1219 ft
Froude number	2.8555
Flow condition	Supercritical

Reach No. 11

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8333 ft
Depth	0.4166 ft
Slope	0.0604 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	2.6915 cfs
Area	0.5454 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3088 ft
Perimeter	2.6179 ft
Velocity	9.8719 fps
Hydraulic Radius	0.2083 ft
Percent Full	49.9940 %
Full flow Flowrate	5.3841 cfs
Full flow velocity	9.8724 fps

Critical Information

Critical depth	0.7764 ft
Critical slope	0.0091 ft/ft
Critical velocity	4.7015 fps
Critical area	0.5725 ft2
Critical perimeter	2.0285 ft
Critical hydraulic radius	0.2822 ft
Critical top width	0.8333 ft
Specific energy	1.9311 ft
Minimum energy	1.1646 ft
Froude number	3.0426
Flow condition	Supercritical

Reach No. 12

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8333 ft
Depth	0.4166 ft
Slope	0.0100 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.0952 cfs
Area	0.5454 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3088 ft
Perimeter	2.6179 ft
Velocity	4.0168 fps
Hydraulic Radius	0.2083 ft
Percent Full	49.9940 %
Full flow Flowrate	2.1908 cfs
Full flow velocity	4.0170 fps

Critical Information

Critical depth	0.4667 ft
Critical slope	0.0069 ft/ft
Critical velocity	3.4839 fps
Critical area	0.3144 ft2
Critical perimeter	1.4089 ft
Critical hydraulic radius	0.2231 ft
Critical top width	0.8333 ft
Specific energy	0.6673 ft
Minimum energy	0.7000 ft
Froude number	1.2380
Flow condition	Supercritical

Reach No. 13

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.0000 ft
Depth	0.5000 ft
Slope	0.0040 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.1267 cfs
Area	0.7854 ft2
Wetted Area	0.3927 ft2
Wetted Perimeter	1.5708 ft
Perimeter	3.1416 ft
Velocity	2.8690 fps
Hydraulic Radius	0.2500 ft
Percent Full	50.0000 %
Full flow Flowrate	2.2533 cfs
Full flow velocity	2.8690 fps

Critical Information

Critical depth	0.4470 ft
Critical slope	0.0059 ft/ft
Critical velocity	3.3158 fps
Critical area	0.3398 ft2
Critical perimeter	1.4646 ft
Critical hydraulic radius	0.2320 ft
Critical top width	0.9944 ft
Specific energy	0.6279 ft
Minimum energy	0.6705 ft
Froude number	0.8071
Flow condition	Subcritical

Reach No. 14

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.2500 ft
Depth	0.9375 ft
Slope	0.0040 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	3.7255 cfs
Area	1.2272 ft2
Wetted Area	0.9873 ft2
Wetted Perimeter	2.6180 ft
Perimeter	3.9270 ft
Velocity	3.7735 fps
Hydraulic Radius	0.3771 ft
Percent Full	75.0000 %
Full flow Flowrate	4.0855 cfs
Full flow velocity	3.3292 fps

Critical Information

Critical depth	0.8011 ft
Critical slope	0.0064 ft/ft
Critical velocity	4.6323 fps
Critical area	0.8337 ft2
Critical perimeter	2.3156 ft
Critical hydraulic radius	0.3600 ft
Critical top width	1.2500 ft
Specific energy	1.1673 ft
Minimum energy	1.2016 ft
Froude number	0.7564
Flow condition	Subcritical

Reach No. 15

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.0000 ft
Depth	0.5000 ft
Slope	0.0256 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	2.8502 cfs
Area	0.7854 ft2
Wetted Area	0.3927 ft2
Wetted Perimeter	1.5708 ft
Perimeter	3.1416 ft
Velocity	7.2581 fps
Hydraulic Radius	0.2500 ft
Percent Full	50.0000 %
Full flow Flowrate	5.7005 cfs
Full flow velocity	7.2581 fps

Critical Information

Critical depth	0.7394 ft
Critical slope	0.0075 ft/ft
Critical velocity	4.5095 fps
Critical area	0.6321 ft2
Critical perimeter	2.0495 ft
Critical hydraulic radius	0.3084 ft
Critical top width	1.0000 ft
Specific energy	1.3187 ft
Minimum energy	1.1090 ft
Froude number	2.0419
Flow condition	Supercritical

Reach No. 16

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.6667 ft
Depth	0.3333 ft
Slope	0.0060 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	0.4680 cfs
Area	0.3491 ft2
Wetted Area	0.1745 ft2
Wetted Perimeter	1.0471 ft
Perimeter	2.0945 ft
Velocity	2.6815 fps
Hydraulic Radius	0.1667 ft
Percent Full	49.9925 %
Full flow Flowrate	0.9362 cfs
Full flow velocity	2.6816 fps

Critical Information

Critical depth	0.3198 ft
Critical slope	0.0069 ft/ft
Critical velocity	2.8274 fps
Critical area	0.1655 ft2
Critical perimeter	1.0201 ft
Critical hydraulic radius	0.1622 ft
Critical top width	0.6661 ft
Specific energy	0.4450 ft
Minimum energy	0.4797 ft
Froude number	0.9240
Flow condition	Subcritical

Reach No. 17

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.6667 ft
Depth	0.3333 ft
Slope	0.0083 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	0.5504 cfs
Area	0.3491 ft2
Wetted Area	0.1745 ft2
Wetted Perimeter	1.0471 ft
Perimeter	2.0945 ft
Velocity	3.1538 fps
Hydraulic Radius	0.1667 ft
Percent Full	49.9925 %
Full flow Flowrate	1.1011 cfs
Full flow velocity	3.1540 fps

Critical Information

Critical depth	0.3482 ft
Critical slope	0.0072 ft/ft
Critical velocity	2.9837 fps
Critical area	0.1845 ft2
Critical perimeter	1.0770 ft
Critical hydraulic radius	0.1713 ft
Critical top width	0.6667 ft
Specific energy	0.4879 ft
Minimum energy	0.5223 ft
Froude number	1.0867
Flow condition	Supercritical

Reach No. 18

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.0000 ft
Depth	0.5000 ft
Slope	0.0271 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	2.9326 cfs
Area	0.7854 ft2
Wetted Area	0.3927 ft2
Wetted Perimeter	1.5708 ft
Perimeter	3.1416 ft
Velocity	7.4677 fps
Hydraulic Radius	0.2500 ft
Percent Full	50.0000 %
Full flow Flowrate	5.8651 cfs
Full flow velocity	7.4677 fps

Critical Information

Critical depth	0.7515 ft
Critical slope	0.0075 ft/ft
Critical velocity	4.5525 fps
Critical area	0.6442 ft2
Critical perimeter	2.0737 ft
Critical hydraulic radius	0.3106 ft
Critical top width	1.0000 ft
Specific energy	1.3666 ft
Minimum energy	1.1272 ft
Froude number	2.1009
Flow condition	Supercritical

Reach No. 19

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8333 ft
Depth	0.4166 ft
Slope	0.0140 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.2958 cfs
Area	0.5454 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3088 ft
Perimeter	2.6179 ft
Velocity	4.7527 fps
Hydraulic Radius	0.2083 ft
Percent Full	49.9940 %
Full flow Flowrate	2.5921 cfs
Full flow velocity	4.7530 fps

Critical Information

Critical depth	0.5114 ft
Critical slope	0.0072 ft/ft
Critical velocity	3.6848 fps
Critical area	0.3517 ft2
Critical perimeter	1.4985 ft
Critical hydraulic radius	0.2347 ft
Critical top width	0.8333 ft
Specific energy	0.7676 ft
Minimum energy	0.7671 ft
Froude number	1.4649
Flow condition	Supercritical

Reach No. 20

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8333 ft
Depth	0.4166 ft
Slope	0.0100 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.0952 cfs
Area	0.5454 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3088 ft
Perimeter	2.6179 ft
Velocity	4.0168 fps
Hydraulic Radius	0.2083 ft
Percent Full	49.9940 %
Full flow Flowrate	2.1908 cfs
Full flow velocity	4.0170 fps

Critical Information

Critical depth	0.4667 ft
Critical slope	0.0069 ft/ft
Critical velocity	3.4839 fps
Critical area	0.3144 ft2
Critical perimeter	1.4089 ft
Critical hydraulic radius	0.2231 ft
Critical top width	0.8333 ft
Specific energy	0.6673 ft
Minimum energy	0.7000 ft
Froude number	1.2380
Flow condition	Supercritical

Reach No. 21

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8333 ft
Depth	0.4166 ft
Slope	0.0036 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	0.6571 cfs
Area	0.5454 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3088 ft
Perimeter	2.6179 ft
Velocity	2.4101 fps
Hydraulic Radius	0.2083 ft
Percent Full	49.9940 %
Full flow Flowrate	1.3145 cfs
Full flow velocity	2.4102 fps

Critical Information

Critical depth	0.3566 ft
Critical slope	0.0062 ft/ft
Critical velocity	2.9487 fps
Critical area	0.2228 ft2
Critical perimeter	1.1885 ft
Critical hydraulic radius	0.1875 ft
Critical top width	0.8246 ft
Specific energy	0.5069 ft
Minimum energy	0.5349 ft
Froude number	0.7428
Flow condition	Subcritical

Reach No. 22

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8333 ft
Depth	0.4166 ft
Slope	0.0038 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	0.6751 cfs
Area	0.5454 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3088 ft
Perimeter	2.6179 ft
Velocity	2.4761 fps
Hydraulic Radius	0.2083 ft
Percent Full	49.9940 %
Full flow Flowrate	1.3505 cfs
Full flow velocity	2.4763 fps

Critical Information

Critical depth	0.3617 ft
Critical slope	0.0062 ft/ft
Critical velocity	2.9737 fps
Critical area	0.2270 ft2
Critical perimeter	1.1987 ft
Critical hydraulic radius	0.1894 ft
Critical top width	0.8260 ft
Specific energy	0.5119 ft
Minimum energy	0.5425 ft
Froude number	0.7632
Flow condition	Subcritical

Reach No. 23

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	0.8333 ft
Depth	0.4166 ft
Slope	0.0200 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.5488 cfs
Area	0.5454 ft2
Wetted Area	0.2726 ft2
Wetted Perimeter	1.3088 ft
Perimeter	2.6179 ft
Velocity	5.6806 fps
Hydraulic Radius	0.2083 ft
Percent Full	49.9940 %
Full flow Flowrate	3.0982 cfs
Full flow velocity	5.6809 fps

Critical Information

Critical depth	0.5647 ft
Critical slope	0.0076 ft/ft
Critical velocity	3.9105 fps
Critical area	0.3961 ft2
Critical perimeter	1.6051 ft
Critical hydraulic radius	0.2468 ft
Critical top width	0.8333 ft
Specific energy	0.9181 ft
Minimum energy	0.8471 ft
Froude number	1.7508
Flow condition	Supercritical

Reach No. 24

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.0000 ft
Depth	0.5000 ft
Slope	0.0124 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.9837 cfs
Area	0.7854 ft2
Wetted Area	0.3927 ft2
Wetted Perimeter	1.5708 ft
Perimeter	3.1416 ft
Velocity	5.0514 fps
Hydraulic Radius	0.2500 ft
Percent Full	50.0000 %
Full flow Flowrate	3.9674 cfs
Full flow velocity	5.0514 fps

Critical Information

Critical depth	0.6037 ft
Critical slope	0.0067 ft/ft
Critical velocity	3.9963 fps
Critical area	0.4964 ft2
Critical perimeter	1.7782 ft
Critical hydraulic radius	0.2792 ft
Critical top width	1.0000 ft
Specific energy	0.8965 ft
Minimum energy	0.9055 ft
Froude number	1.4211
Flow condition	Supercritical

Reach No. 25

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.0000 ft
Depth	0.5000 ft
Slope	0.0060 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	1.3799 cfs
Area	0.7854 ft2
Wetted Area	0.3927 ft2
Wetted Perimeter	1.5708 ft
Perimeter	3.1416 ft
Velocity	3.5138 fps
Hydraulic Radius	0.2500 ft
Percent Full	50.0000 %
Full flow Flowrate	2.7597 cfs
Full flow velocity	3.5138 fps

Critical Information

Critical depth	0.4970 ft
Critical slope	0.0061 ft/ft
Critical velocity	3.5409 fps
Critical area	0.3897 ft2
Critical perimeter	1.5648 ft
Critical hydraulic radius	0.2490 ft
Critical top width	1.0000 ft
Specific energy	0.6919 ft
Minimum energy	0.7455 ft
Froude number	0.9885
Flow condition	Subcritical

Reach No. 26

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.2500 ft
Depth	0.9375 ft
Slope	0.0056 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	4.4081 cfs
Area	1.2272 ft2
Wetted Area	0.9873 ft2
Wetted Perimeter	2.6180 ft
Perimeter	3.9270 ft
Velocity	4.4649 fps
Hydraulic Radius	0.3771 ft
Percent Full	75.0000 %
Full flow Flowrate	4.8341 cfs
Full flow velocity	3.9392 fps

Critical Information

Critical depth	0.8802 ft
Critical slope	0.0067 ft/ft
Critical velocity	4.8995 fps
Critical area	0.9326 ft2
Critical perimeter	2.4739 ft
Critical hydraulic radius	0.3770 ft
Critical top width	1.2500 ft
Specific energy	1.2592 ft
Minimum energy	1.3203 ft
Froude number	0.8950
Flow condition	Subcritical

Reach No. 27

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.2500 ft
Depth	0.9375 ft
Slope	0.0124 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	6.5594 cfs
Area	1.2272 ft2
Wetted Area	0.9873 ft2
Wetted Perimeter	2.6180 ft
Perimeter	3.9270 ft
Velocity	6.6440 fps
Hydraulic Radius	0.3771 ft
Percent Full	75.0000 %
Full flow Flowrate	7.1933 cfs
Full flow velocity	5.8616 fps

Critical Information

Critical depth	1.1066 ft
Critical slope	0.0077 ft/ft
Critical velocity	5.5936 fps
Critical area	1.2156 ft2
Critical perimeter	2.9267 ft
Critical hydraulic radius	0.4153 ft
Critical top width	1.2500 ft
Specific energy	1.6499 ft
Minimum energy	1.6599 ft
Froude number	1.3318
Flow condition	Supercritical

Reach No. 28

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.2500 ft
Depth	0.9375 ft
Slope	0.0056 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	4.4081 cfs
Area	1.2272 ft2
Wetted Area	0.9873 ft2
Wetted Perimeter	2.6180 ft
Perimeter	3.9270 ft
Velocity	4.4649 fps
Hydraulic Radius	0.3771 ft
Percent Full	75.0000 %
Full flow Flowrate	4.8341 cfs
Full flow velocity	3.9392 fps

Critical Information

Critical depth	0.8802 ft
Critical slope	0.0067 ft/ft
Critical velocity	4.8995 fps
Critical area	0.9326 ft2
Critical perimeter	2.4739 ft
Critical hydraulic radius	0.3770 ft
Critical top width	1.2500 ft
Specific energy	1.2592 ft
Minimum energy	1.3203 ft
Froude number	0.8950
Flow condition	Subcritical

Reach No. 29

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.2500 ft
Depth	0.9375 ft
Slope	0.0072 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	4.9983 cfs
Area	1.2272 ft2
Wetted Area	0.9873 ft2
Wetted Perimeter	2.6180 ft
Perimeter	3.9270 ft
Velocity	5.0627 fps
Hydraulic Radius	0.3771 ft
Percent Full	75.0000 %
Full flow Flowrate	5.4813 cfs
Full flow velocity	4.4666 fps

Critical Information

Critical depth	0.9454 ft
Critical slope	0.0070 ft/ft
Critical velocity	5.1090 fps
Critical area	1.0141 ft2
Critical perimeter	2.6043 ft
Critical hydraulic radius	0.3894 ft
Critical top width	1.2500 ft
Specific energy	1.3512 ft
Minimum energy	1.4181 ft
Froude number	1.0148
Flow condition	Supercritical

Reach No. 30

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0060 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	7.4196 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	5.2189 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	8.1366 cfs
Full flow velocity	4.6044 fps

Critical Information

Critical depth	1.0958 ft
Critical slope	0.0065 ft/ft
Critical velocity	5.4844 fps
Critical area	1.4023 ft2
Critical perimeter	3.0479 ft
Critical hydraulic radius	0.4601 ft
Critical top width	1.5000 ft
Specific energy	1.5646 ft
Minimum energy	1.6438 ft
Froude number	0.9550
Flow condition	Subcritical

Reach No. 31

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.2500 ft
Depth	0.9375 ft
Slope	0.0060 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	4.5628 cfs
Area	1.2272 ft2
Wetted Area	0.9873 ft2
Wetted Perimeter	2.6180 ft
Perimeter	3.9270 ft
Velocity	4.6216 fps
Hydraulic Radius	0.3771 ft
Percent Full	75.0000 %
Full flow Flowrate	5.0037 cfs
Full flow velocity	4.0774 fps

Critical Information

Critical depth	0.8976 ft
Critical slope	0.0068 ft/ft
Critical velocity	4.9561 fps
Critical area	0.9543 ft2
Critical perimeter	2.5086 ft
Critical hydraulic radius	0.3804 ft
Critical top width	1.2500 ft
Specific energy	1.2822 ft
Minimum energy	1.3464 ft
Froude number	0.9264
Flow condition	Subcritical

Reach No. 32

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.0000 ft
Depth	0.5000 ft
Slope	0.0200 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	2.5193 cfs
Area	0.7854 ft2
Wetted Area	0.3927 ft2
Wetted Perimeter	1.5708 ft
Perimeter	3.1416 ft
Velocity	6.4153 fps
Hydraulic Radius	0.2500 ft
Percent Full	50.0000 %
Full flow Flowrate	5.0386 cfs
Full flow velocity	6.4153 fps

Critical Information

Critical depth	0.6894 ft
Critical slope	0.0072 ft/ft
Critical velocity	4.3277 fps
Critical area	0.5821 ft2
Critical perimeter	1.9496 ft
Critical hydraulic radius	0.2986 ft
Critical top width	1.0000 ft
Specific energy	1.1396 ft
Minimum energy	1.0341 ft
Froude number	1.8048
Flow condition	Supercritical

Reach No. 33

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0024 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	4.6926 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	3.3008 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	5.1461 cfs
Full flow velocity	2.9121 fps

Critical Information

Critical depth	0.8498 ft
Critical slope	0.0057 ft/ft
Critical velocity	4.7077 fps
Critical area	1.0332 ft2
Critical perimeter	2.5558 ft
Critical hydraulic radius	0.4043 ft
Critical top width	1.5000 ft
Specific energy	1.3008 ft
Minimum energy	1.2747 ft
Froude number	0.6040
Flow condition	Subcritical

Reach No. 34

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.2500 ft
Depth	0.9375 ft
Slope	0.0100 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	5.8905 cfs
Area	1.2272 ft2
Wetted Area	0.9873 ft2
Wetted Perimeter	2.6180 ft
Perimeter	3.9270 ft
Velocity	5.9665 fps
Hydraulic Radius	0.3771 ft
Percent Full	75.0000 %
Full flow Flowrate	6.4598 cfs
Full flow velocity	5.2639 fps

Critical Information

Critical depth	1.0393 ft
Critical slope	0.0074 ft/ft
Critical velocity	5.3966 fps
Critical area	1.1315 ft2
Critical perimeter	2.7921 ft
Critical hydraulic radius	0.4052 ft
Critical top width	1.2500 ft
Specific energy	1.5120 ft
Minimum energy	1.5589 ft
Froude number	1.1960
Flow condition	Supercritical

Reach No. 35

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0076 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	8.3505 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	5.8737 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	9.1575 cfs
Full flow velocity	5.1821 fps

Critical Information

Critical depth	1.1725 ft
Critical slope	0.0067 ft/ft
Critical velocity	5.7048 fps
Critical area	1.5173 ft2
Critical perimeter	3.2012 ft
Critical hydraulic radius	0.4740 ft
Critical top width	1.5000 ft
Specific energy	1.6818 ft
Minimum energy	1.7587 ft
Froude number	1.0748
Flow condition	Supercritical

Reach No. 36

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0068 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	7.8988 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	5.5560 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	8.6621 cfs
Full flow velocity	4.9017 fps

Critical Information

Critical depth	1.1357 ft
Critical slope	0.0066 ft/ft
Critical velocity	5.6000 fps
Critical area	1.4621 ft2
Critical perimeter	3.1275 ft
Critical hydraulic radius	0.4675 ft
Critical top width	1.5000 ft
Specific energy	1.6232 ft
Minimum energy	1.7035 ft
Froude number	1.0166
Flow condition	Supercritical

Reach No. 37

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0040 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	6.0581 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	4.2613 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	6.6435 cfs
Full flow velocity	3.7595 fps

Critical Information

Critical depth	0.9777 ft
Critical slope	0.0061 ft/ft
Critical velocity	5.1261 fps
Critical area	1.2250 ft2
Critical perimeter	2.8115 ft
Critical hydraulic radius	0.4357 ft
Critical top width	1.5000 ft
Specific energy	1.4181 ft
Minimum energy	1.4665 ft
Froude number	0.7797
Flow condition	Subcritical

Reach No. 38

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0064 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	7.6629 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	5.3901 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	8.4035 cfs
Full flow velocity	4.7554 fps

Critical Information

Critical depth	1.1162 ft
Critical slope	0.0065 ft/ft
Critical velocity	5.5437 fps
Critical area	1.4328 ft2
Critical perimeter	3.0885 ft
Critical hydraulic radius	0.4639 ft
Critical top width	1.5000 ft
Specific energy	1.5939 ft
Minimum energy	1.6743 ft
Froude number	0.9863
Flow condition	Subcritical

Reach No. 39

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.2500 ft
Depth	0.9375 ft
Slope	0.0104 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	6.0072 cfs
Area	1.2272 ft2
Wetted Area	0.9873 ft2
Wetted Perimeter	2.6180 ft
Perimeter	3.9270 ft
Velocity	6.0847 fps
Hydraulic Radius	0.3771 ft
Percent Full	75.0000 %
Full flow Flowrate	6.5877 cfs
Full flow velocity	5.3682 fps

Critical Information

Critical depth	1.0512 ft
Critical slope	0.0075 ft/ft
Critical velocity	5.4320 fps
Critical area	1.1463 ft2
Critical perimeter	2.8159 ft
Critical hydraulic radius	0.4071 ft
Critical top width	1.2500 ft
Specific energy	1.5350 ft
Minimum energy	1.5768 ft
Froude number	1.2196
Flow condition	Supercritical

Reach No. 40

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0060 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	7.4196 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	5.2189 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	8.1366 cfs
Full flow velocity	4.6044 fps

Critical Information

Critical depth	1.0958 ft
Critical slope	0.0065 ft/ft
Critical velocity	5.4844 fps
Critical area	1.4023 ft2
Critical perimeter	3.0479 ft
Critical hydraulic radius	0.4601 ft
Critical top width	1.5000 ft
Specific energy	1.5646 ft
Minimum energy	1.6438 ft
Froude number	0.9550
Flow condition	Subcritical

Reach No. 41

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0064 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	7.6629 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	5.3901 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	8.4035 cfs
Full flow velocity	4.7554 fps

Critical Information

Critical depth	1.1162 ft
Critical slope	0.0065 ft/ft
Critical velocity	5.5437 fps
Critical area	1.4328 ft2
Critical perimeter	3.0885 ft
Critical hydraulic radius	0.4639 ft
Critical top width	1.5000 ft
Specific energy	1.5939 ft
Minimum energy	1.6743 ft
Froude number	0.9863
Flow condition	Subcritical

Reach No. 42

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0040 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	6.0581 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	4.2613 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	6.6435 cfs
Full flow velocity	3.7595 fps

Critical Information

Critical depth	0.9777 ft
Critical slope	0.0061 ft/ft
Critical velocity	5.1261 fps
Critical area	1.2250 ft2
Critical perimeter	2.8115 ft
Critical hydraulic radius	0.4357 ft
Critical top width	1.5000 ft
Specific energy	1.4181 ft
Minimum energy	1.4665 ft
Froude number	0.7797
Flow condition	Subcritical

Reach No. 43

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0112 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	10.1371 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	7.1304 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	11.1167 cfs
Full flow velocity	6.2908 fps

Critical Information

Critical depth	1.3121 ft
Critical slope	0.0072 ft/ft
Critical velocity	6.0857 fps
Critical area	1.7267 ft2
Critical perimeter	3.4803 ft
Critical hydraulic radius	0.4961 ft
Critical top width	1.5000 ft
Specific energy	1.9456 ft
Minimum energy	1.9681 ft
Froude number	1.3047
Flow condition	Supercritical

Reach No. 44

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0060 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	7.4196 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	5.2189 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	8.1366 cfs
Full flow velocity	4.6044 fps

Critical Information

Critical depth	1.0958 ft
Critical slope	0.0065 ft/ft
Critical velocity	5.4844 fps
Critical area	1.4023 ft2
Critical perimeter	3.0479 ft
Critical hydraulic radius	0.4601 ft
Critical top width	1.5000 ft
Specific energy	1.5646 ft
Minimum energy	1.6438 ft
Froude number	0.9550
Flow condition	Subcritical

Reach NO. 45

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0184 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	12.9931 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	9.1394 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	14.2488 cfs
Full flow velocity	8.0632 fps

Reach No. 46

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0048 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	6.6363 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	4.6680 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	7.2776 cfs
Full flow velocity	4.1183 fps

Critical Information

Critical depth	1.0288 ft
Critical slope	0.0063 ft/ft
Critical velocity	5.2842 fps
Critical area	1.3018 ft2
Critical perimeter	2.9138 ft
Critical hydraulic radius	0.4468 ft
Critical top width	1.5000 ft
Specific energy	1.4767 ft
Minimum energy	1.5432 ft
Froude number	0.8542
Flow condition	Subcritical

Existing Sewer Trunk

Given Input Data:

Shape	Circular
Solving for	Flowrate
Diameter	1.5000 ft
Depth	1.1250 ft
Slope	0.0014 ft/ft
Manning's n	0.0130

Computed Results:

Flowrate	3.5840 cfs
Area	1.7671 ft2
Wetted Area	1.4217 ft2
Wetted Perimeter	3.1416 ft
Perimeter	4.7124 ft
Velocity	2.5210 fps
Hydraulic Radius	0.4525 ft
Percent Full	75.0000 %
Full flow Flowrate	3.9304 cfs
Full flow velocity	2.2241 fps

Critical Information

Critical depth	0.7365 ft
Critical slope	0.0053 ft/ft
Critical velocity	4.3035 fps
Critical area	0.8633 ft2
Critical perimeter	2.3291 ft
Critical hydraulic radius	0.3706 ft
Critical top width	1.4998 ft
Specific energy	1.2276 ft
Minimum energy	1.1047 ft
Froude number	0.4613
Flow condition	Subcritical

MAPS

LYONS CANYON RANCH

TENTATIVE TRACT 53653

SEWER INDEX MAP