

WARE MALCOMB

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BUILDING MEASUREMENT

May 29, 2024

Aurora Water – Utilities Division
15151 E Alameda Pkwy
Aurora, CO 80012

Re: Master Utility Study Amendment Letter
Aurora Metro Center – Parcel A (221363MU1)

To whom it may concern,

This letter is written to amend the Aurora Metro Master Utility Study due to changes made with the proposed Master Plan Amendment, requested by the owner/developer. The intent of the revision proposed is to provide an opportunity to increase dwelling units from commercial and hotels to multi-family for Planning Area A2.

The proposed revision to the Master Plan intends to combine Planning Areas PA-A2 and PA-A3. However, in the previously approved report PA-A2 was designed as a commercial area instead of multi-family. For this amendment, the combined Planning Area of A2 and A3 will be multi-family, which will add a significant number of units. For simplicity, the calculations following this letter are pulled from the Approved MUS for Aurora Metro. Planning Area A2 has been revised to contain the same number of units as A3 (300 units). The flow rate from A2 was also designed to match the flow rate from A3.

Based on the calculations provided the existing sanitary infrastructure has the capacity to convey the added sanitary demands for this revised master plan development. The existing water infrastructure is also in conformance with COA standards with the building demands.

Reference calculations following this letter for more information.

Should you have any questions or comments, please feel free to contact me at (303) 561-3333.

Sincerely,

Ware Malcomb



Chris Strawn
Principal

APPROVED AURORA
METRO MUS WITH
REVISIONS

Master Utility Report

Aurora Metro Center Aurora, Colorado

Project No. 1064-01

- Submittal:
- 1st: August 14, 2020
 - 2nd: November 18, 2020
 - 3rd: February 22, 2021
 - 4th: July 30, 2021
 - 5th: August 27, 2021
 - 6th: September 29, 2021
 - 7th: October 19, 2021
 - 8th: November 11, 2021

Approved For One Year From This Date

11/29/2021


City Engineer

11/15/2021
Date


Water Department

11/28/2021
Date


Fire and Life Safety

11-23-2021
Date

Prepared For:
Aurora Parcel A, LLC.,
Aurora Parcel B, LLC.,
& Aurora Parcel C, LLC.
631 High Street
Denver, CO 80218

Prepared By:
Innovative Land Consultants, Inc.
12071 Tejon Street, Suite 470
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(303) 421-4224

B. Sanitary Sewer Design Criteria

Design criteria for the sanitary sewer system is based upon Section 5 of the Water, Sanitary Sewer & Storm Drainage Infrastructure Standards & Specifications from Aurora Water. Per section 5.03.6 of the standards and specifications from the City of Aurora, "Depth of flow in pipes should not exceed seventy-five percent (75%) of capacity for pipes twelve inches (12") or smaller and eighty percent (80%) for pipes larger than twelve inches (12")." Per email communication with Aurora Water Engineer Casey Ballard with the City of Aurora on October 9th, 2020, prior hotel water demands have been estimated assuming an average of 98 gpd/room which approximately equates to one guest per room.

The City of Aurora requirements for the sanitary sewer system area as follows:

- i. Loading Rates
 - o Residential Population = 2.77 People/Unit
 - o Residential Demand = 68 gpcd
 - o Commercial Population Equivalence = 22 People/Acre
 - o Commercial Demand = 1,500 gpd/Acre
 - o Infiltration = 10% of the Average Loading
- ii. Peaking Factor
 - o Peaking Factor = $5 \div p^{0.167}$ where p = population in thousands
 - o Maximum Peaking Factor = 4.0
 - o Minimum Peaking Factor = 1.7
- iii. Materials and Velocities
 - o Manning's n = 0.011 for PVC & n = 0.013 for RCP or VCP
 - o Minimum Pipe Slope = 0.4%
 - o Minimum Velocity = 2 ft/s at least once per day
 - o Maximum Velocity = 10 ft/s flowing full or ½ full

C. Proposed Sanitary Sewer System

All sanitary flows from the Aurora Metro Center site outfall to the existing 21" sanitary main at the terminal design point, Design Point 20 (DP-20). Sanitary flows from PA-A1 outfall to existing 8" stub at DP-15. Sanitary flows from PA-A2 and PA-A3 outfall to the existing 8" stub provided at DP-2.

Sanitary flows from PA-B1 outfall to the 12" sanitary main at DP-13 which conveys flows north out of PA-B1 and into the 12" sanitary main in E. Alameda Pkwy. Sanitary flows from PA-B2 outfall to the 12" sanitary main along the planning areas northern boundary at DP-12. Sanitary flows from PA-B3 are split in two directions. Seventy-five percent (75%) of sanitary flows from PA-B3 outfall to the proposed 8" sanitary main in E. Dakota Ave. where they merge with additional flows at DP-11 and twenty-five percent (25%) outfall at DP-8 to the proposed 8" sanitary main in S. Fraser Ct. Sanitary flows from PA-B4 outfall at DP-10 to the existing 12" sanitary main along the eastern boundary of the planning area. Sanitary flows from PA-B5 are split in two directions. Seventy percent (70%) of sanitary flows from PA-B5 outfall to the proposed 8" sanitary main in E. Dakota Ave where they merge with

additional flows at DP-9 and thirty percent (30%) outfall at DP-18 to the proposed 8" sanitary main in S. Fraser Ct. Sanitary flows from PA-B6 outfall to a proposed 8" sanitary main at DP-9 which conveys flows north where they connect to the existing 12" sanitary main within PA-B4.

Sanitary flows from PA-C1 outfall at DP-16 to a proposed 8" sanitary main which connects to the existing 8" stub. At DP-17, sanitary flows from PA-C2 outfall to an existing 12" sanitary main. At DP-5, sanitary flows from PA-C3 outfall to a proposed 8" sanitary main which connects to the existing 8" stub. Refer to Appendix D for the Sanitary Routing Map which provides the locations of existing and proposed infrastructure, design points, and additional design details.

Flows from OFFSITE-1 merge with flows from PA-C1 at DP-1. From DP-1, flows are conveyed north to DP-3 where they merge with flows from PA-A2 and PA-A3. Flows are conveyed northeast from DP-3 where they merge with flows from PA-A1 at DP-4 before being conveyed to the terminal design point, DP-20.

Flows from OFFSITE-3 merge with those from PA-C2 and PA-C3 at DP-6. Flows from DP-6 are conveyed north to DP-7 where they merge with flows from OFFSITE-6 before continuing north to DP-14.

Sanitary flows from OFFSITE-7 merge with thirty percent (30%) of flows from PA-B5 at DP-18. Flows are conveyed north from DP-18 until they merge with twenty-five percent (25%) of flows from PA-B3 at DP-8. From DP-8, flows are conveyed north until they reach DP-13.

Seventy percent (70%) of flows from PA-B5 merge with flows from PA-B6 at DP-9. Flows are conveyed north from DP-9 until they merge with flows from PA-B4 at DP-10. From DP-10, flows continue north until merging with flows seventy-five percent (75%) of flows from PA-B3. Flows continue north from DP-11 until reaching DP-12 where they merge with flows from PA-B2. At DP-12 flows are diverted to the west until reaching DP-13.

Flows from PA-B1, PA-B2, PA-B3, PA-B4, PA-B5, PA-B6, and OFFSITE-7 all converge at DP-13. From DP-13 flows are conveyed northwest where they merge with flows from OFFSITE-2 at DP-19 before continuing northwest to DP-14.

Flows from PA-B1, PA-B2, PA-B3, PA-B4, PA-B5, PA-B6, PA-C2, PA-C3, OFFSITE-2, OFFSITE-3, OFFSITE-5, OFFSITE-6, and OFFSITE-7 converge at DP-14 and are conveyed northwest to the terminal design point, DP-20, where they merge with those from PA-A1, PA-A2, PA-A3, PA-C1, OFFSITE-1, and OFFSITE-4. Refer to Appendix D for the Sanitary Routing Diagram.

A combination of 8", 10", and 12" sanitary pipes will be utilized to provide service throughout the site. All proposed pipes are designed with a minimum slope of 0.40%. Refer to Appendix D to see a detailed view of the sanitary sewer system with includes pipe sizes and pipe slopes utilized for analysis.

D. Sanitary Sewer Analysis

Analysis of the sanitary sewer system was done by calculating the average sanitary loading generated by each planning area. Then, the average loading values generated by each planning area and each off-site basin were used to calculate the total average flow, the infiltration, and peak flow at various design points. For the peak flow, The design points represent the locations where sanitary loading conditions would be of highest concern. The following tables show the average loading generated by each planning area and the average sanitary loading values from the off-site basins as defined within the 2005 Master Utility Report. Refer to Appendix A for detailed sanitary loading calculations.

Average Sanitary Loading by Planning Area						
PLANNING AREA (PA-)	A1	A2	A3	B1	B2	B3
AVERAGE LOADING (MGD)	0.009	0.008	0.063	0.005	0.006	0.014
PLANNING AREA (PA-)	B4	B5	B6	C1	C2	C3
AVERAGE LOADING (MGD)	0.013	0.038	0.019	0.066	0.042	0.042

Average Sanitary Loading per Off-Site Basin							
BASIN (OFFSITE-)	1	2	3	4	5	6	7
AVERAGE LOADING (MGD)	0.403	0.016	0.047	0.109	0.018	0.014	0.004

Peak Flow analysis was done at twenty (20) design points throughout the sanitary system. The following tables shows the loading combinations at each of the design points. Refer to Appendix D for the Sanitary Routing Map which shows the location of each design point.

Sanitary Loading Combinations		Sanitary Loading Combinations	
Design Point	Contributing Basins	Design Point	Contributing Basins
1	C1, OFFSITE-1	12	B2, 75% OF B3, B4, 70% OF B5, B6
2	A2, A3	13	B1, B2, B3, B4, B5, B6, OFFSITE-7
3	A2, A3, C1, OFFSITE-1	14	B1, B2, B3, B4, B5, B6, C2, C3, OFFSITE-2, OFFSITE-3, OFFSITE-5
4	A1, A2, A3, C1, OFFSITE-1	15	A1
5	C3	16	C1
6	C2, C3, OFFSITE-3	17	C2
7	C2, C3, OFFSITE-3, OFFSITE-6	18	30% OF B5, OFFSITE-7
8	25% OF B3, 30% OF B5, OFFSITE-7	19	B1, B2, B3, B4, B5, B6, OFFSITE-2 OFFSITE-7
9	70% OF B5, B6	20	TOTAL SANITARY BASIN
10	B4, 70% OF B5, B6		
11	75% OF B3, B4, 70% OF B5, B6		

Analysis of the peak flow plus infiltration at each design point was completed to ensure functionality throughout the site. The following tables show the average loading, infiltration, peaking factors, and peak flows that were calculated for each design point. Refer to Appendix A for detailed sanitary loading calculations.

Proposed Sanitary Flow Calculations by Design Point					
DESIGN POINT	1	2	3	4	5
AVERAGE LOADING (MGD)	0.470	0.126	0.595	0.604	0.042
INFILTRATION (MGD)	0.047	0.010	0.060	0.060	0.004
PEAKING FACTOR USED	3.62	4.00	3.48	3.47	4.00
PEAK FLOW (MGD)	1.703	0.504	2.071	2.096	0.170
PEAK FLOW + INFILTRATION (MGD)	1.750	0.514	2.131	2.156	0.174

Proposed Sanitary Flow Calculations by Design Point					
DESIGN POINT	6	7	8	9	10
AVERAGE LOADING (MGD)	0.131	0.145	0.019	0.045	0.058
INFILTRATION (MGD)	0.013	0.015	0.002	0.005	0.006
PEAKING FACTOR USED	4.00	4.00	4.00	4.00	4.00
PEAK FLOW (MGD)	0.526	0.582	0.077	0.181	0.232
PEAK FLOW + INFILTRATION (MGD)	0.539	0.596	0.079	0.185	0.238

Proposed Sanitary Flow Calculations by Design Point					
DESIGN POINT	11	12	13	14	15
AVERAGE LOADING (MGD)	0.069	0.075	0.099	0.356	0.009
INFILTRATION (MGD)	0.007	0.007	0.009	0.036	0.001
PEAKING FACTOR USED	4.00	4.00	4.00	3.79	4.00
PEAK FLOW (MGD)	0.275	0.299	0.397	1.350	0.035
PEAK FLOW + INFILTRATION (MGD)	0.282	0.307	0.406	1.385	0.036

Proposed Sanitary Flow Calculations by Design Point					
DESIGN POINT	16	17	18	19	20
AVERAGE LOADING (MGD)	0.066	0.042	0.016	0.115	0.936
INFILTRATION (MGD)	0.007	0.004	0.002	0.012	0.094
PEAKING FACTOR USED	4.00	4.00	4.00	4.00	3.23
PEAK FLOW (MGD)	0.264	0.170	0.063	0.462	3.020
PEAK FLOW + INFILTRATION (MGD)	0.270	0.174	0.064	0.473	3.114

Hydraulic analysis of the sanitary sewer system for the Aurora Metro Center was performed using Flowmaster. Per the City of Aurora criteria, an analysis was performed on the proposed sanitary sewer system for the peak flow condition. Per the hydraulic analysis, all sanitary sewer mains operate within the parameters defined by City of Aurora. Existing topographical slopes across the site range from 2% to 7%; based on these existing slopes, it is not anticipated that there will be any issues with meeting proposed pipe slopes in the sanitary sewer. Refer to Appendix C for the sanitary hydraulic calculations.

APPENDIX A

Demand and Flow Calculations

Proposed Sanitary Flow Calculations by Planning Area						
PLANNING AREA (PA-)	A1	A2	A3	B1	B2	B3
NUMBER OF DWELLINGS UNITS	0	0	300	0	0	72
HOTEL ROOMS	100	0	0	0	0	0
COMMERCIAL AREA (acres)	1.23	5.44	4.60	3.48	4.01	0.57
COMMERCIAL DEMAND (gal/acre)	1500	1500	1500	1500	1500	1500
RESIDENTIAL DEMAND (gpd)	68	68	68	68	68	68
EQUIVALENT NUMBER OF RESIDENTS	128	120	932	77	88	212
AVERAGE LOADING (MGD)	0.009	0.008	0.063	0.005	0.006	0.014
INFILTRATION (MGD)	0.001	0.001	0.006	0.001	0.001	0.001

0.063

0.006

PLANNING AREA (PA-)	B4	B5	B6	C1	C2	C3
NUMBER OF DWELLINGS UNITS	63	200	100	350	225	225
COMMERCIAL AREA (acres)	0.57	0.00	0.00	0.00	0.00	0.00
COMMERCIAL DEMAND (gal/acre)	1500	1500	1500	1500	1500	1500
RESIDENTIAL DEMAND (gpd)	68	68	68	68	68	68
EQUIVALENT NUMBER OF RESIDENTS	187	554	277	970	624	624
AVERAGE LOADING (MGD)	0.013	0.038	0.019	0.066	0.042	0.042
INFILTRATION (MGD)	0.001	0.004	0.002	0.007	0.004	0.004

Off-Site Sanitary Flows from the 2005 Master Utility Report				
BASIN (OFFSITE-)	1	2	3	4
AVERAGE DAY DEMAND (MGD)	0.403	0.016	0.047	0.109
INFILTRATION (MGD)	0.040	0.002	0.005	0.011
COMMERCIAL DEMAND (gal/acre)	1500	1500	1500	1500
RESIDENTIAL DEMAND (gpcd)	68	68	68	68
ESTIMATED EQUIVALENT NUMBER OF RESIDENTS	5,904	239	684	1,594

BASIN (OFFSITE-)	5	6	7
AVERAGE DAY DEMAND (MGD)	0.018	0.014	0.004
INFILTRATION (MGD)	0.002	0.001	0.000
COMMERCIAL DEMAND (gal/acre)	1500	1500	1500
RESIDENTIAL DEMAND (gpcd)	68	68	68
ESTIMATED EQUIVALENT NUMBER OF RESIDENTS	257	206	55

Note: All Average Day Demand values for off-site basins are directly from the Master Utility Report by Martin/Martin Inc. which was approved on 6/29/2005.

Aurora Metro Center - Sanitary Loading Combinations

Design Point	Contributing Basins	Peak Flow + Infiltration (MGD)	Outfall Pipe Diameter (in.)	Pipe Slope (%)	Normal Depth (in.)	Pipe (%) Full per the Normal Depth
1	C1, OFFSITE-1	1.750	15	1.20*	5.87	39
2	A2, A3	0.293	8	0.40*	4.01	50
3	A2, A3, C1, OFFSITE-1	1.965	15	1.70*	5.69	38
4	A1, A2, A3, C1, OFFSITE-1	1.991	15	2.00*	5.49	37
5	C3	0.174	12	0.40^	2.99	37
6	C2, C3, OFFSITE-3	0.539	12	2.40*	2.90	24
7	C2, C3, OFFSITE-3, OFFSITE-6	0.596	12	0.80*	4.05	34
8	25% OF B3, 30% OF B5, OFFSITE-7	0.079	8	0.40^	1.99	25
9	70% OF B5, B6	0.185	8	0.40^	3.10	39
10	B4, 70% OF B5, B6	0.238	12	0.30*	3.24	27
11	75% OF B3, B4, 70% OF B5, B6	0.282	12	0.29*	3.57	30
12	B2, 75% OF B3, B4, 70% OF B5, B6	0.307	12	0.25*	3.88	32
13	B1, B2, B3, B4, B5, B6, OFFSITE-7	0.406	12	0.80*	3.32	28
14	B1, B2, B3, B4, B5, B6, C2, C3, OFFSITE-2, OFFSITE-3, OFFSITE-5	1.385	12	0.40*	8.15	68
15	A1	0.036	8	4.20*	0.77	10
16	C1	0.270	8	0.40^	3.82	48
17	C2	0.174	8	0.40^	2.44	20
18	30% OF B5, OFFSITE-7	0.064	8	0.40*	1.79	22
19	B1, B2, B3, B4, B5, B6, OFFSITE-2 OFFSITE-7	0.473	12	0.80*	3.59	30
20	TOTAL SANITARY BASIN	3.114	21	0.80*	7.71	37

0.514

2.131

2.156

5.88

6.00

5.76

73%

40%

38%

Note: 1. Pipe slopes shown represent the lowest slope of any branch of sanitary sewer between the design point and the next downstream manhole where additional flows converge or there is a change in diameter, as these pipe slopes represent the sections of sanitary sewer that would be of the highest concern.
 2. Normal Depth values are directly from Flowmaster computations. Refer to Appendix C for detailed Sanitary Hydraulic Computations.
 *Pipe slopes with an asterick are existing conditions. Data from Aztec Survey dated 6/30/2020 or from City of Aurora's GIS Wastewater and Stormwater Assets Map.
 ^Pipe slopes designated with a caret are for proposed sections which are designed at the minimum allowable slope.

Proposed Sanitary Flow Calculations by Design Point					
DESIGN POINT	1	2	3	4	5
NUMBER OF DWELLINGS UNITS - ON-SITE	350	900	950	950	225
HOTEL ROOMS - ON-SITE	0	0	0	100	0
COMMERCIAL AREA - ON-SITE (acres)	1.23	10.04	10.04	11.27	0.00
RESIDENTIAL DEMAND (gpd)	68	68	68	68	68
COMMERCIAL DEMAND (gal/acre)	1,500	1,500	1,500	1,500	1,500
AVERAGE LOADING FROM ON-SITE BASINS (MGD)	0.068	0.072	0.137	0.146	0.042
ESTIMATED EQUIVALENT NUMBER OF RESIDENTS - ON-SITE	997	1,052	2,022	2,149	624
AVERAGE LOADING FROM OFF-SITE BASINS (MGD)	0.403	0.000	0.403	0.403	0.000
ESTIMATED EQUIVALENT NUMBER OF RESIDENTS - OFF-SITE	5,903	0	5,903	5,903	0
TOTAL AVERAGE LOADING (MGD)	0.470	0.126	0.595	0.604	0.042
INFILTRATION (MGD)	0.047	0.010	0.060	0.060	0.004
TOTAL ESTIMATED EQUIVALENT NUMBER OF RESIDENTS	6,900	1,864	8,728	8,866	624
PEAKING FACTOR USED	3.62	4.00	3.48	3.47	4.00
PEAK FLOW (MGD)	1.703	0.504	2.071	2.096	0.170
PEAK FLOW + INFILTRATION (MGD)	1.750	0.514	2.131	2.156	0.174
PIPE DIAMETER AT OUTFALL (in.)	15	8	15	15	8
MINIMUM PIPE SLOPE AT OUTFALL (%)	1.20	0.40	1.70	2.00	0.40
NORMAL DEPTH AT OUTFALL'S MINIMUM SLOPE (in.) - FROM FLOWMASTER	5.87	5.88	6.00	5.76	2.99
ALLOWABLE (%) NORMAL DEPTH TO PIPE CAPACITY	80	75	80	80	75
PIPE (%) FULL PER NORMAL DEPTH AT OUTFALL'S MINIMUM SLOPE	39	73	40	38	37

Proposed Sanitary Flow Calculations by Design Point					
DESIGN POINT	6	7	8	9	10
NUMBER OF DWELLINGS UNITS - ON-SITE	450	450	78	240	303
HOTEL ROOMS	0	0	0	0	0
COMMERCIAL AREA - ON-SITE (acres)	0.00	0.00	0.14	0.00	0.57
RESIDENTIAL DEMAND (gpd)	68	68	68	68	68
COMMERCIAL DEMAND (gal/acre)	1,500	1,500	1,500	1,500	1,500
AVERAGE LOADING FROM ON-SITE BASINS (MGD)	0.085	0.085	0.015	0.045	0.058
ESTIMATED EQUIVALENT NUMBER OF RESIDENTS - ON-SITE	1,247	1,247	220	665	852
AVERAGE LOADING FROM OFF-SITE BASINS (MGD)	0.047	0.061	0.004	0.000	0.000
ESTIMATED EQUIVALENT NUMBER OF RESIDENTS - OFF-SITE	684	890	55	0	0
TOTAL AVERAGE LOADING (MGD)	0.131	0.145	0.019	0.045	0.058
INFILTRATION (MGD)	0.013	0.015	0.002	0.005	0.006
TOTAL ESTIMATED EQUIVALENT NUMBER OF RESIDENTS	1,931	2,137	275	665	852
PEAKING FACTOR USED	4.00	4.00	4.00	4.00	4.00
PEAK FLOW (MGD)	0.526	0.582	0.077	0.181	0.232
PEAK FLOW + INFILTRATION (MGD)	0.539	0.596	0.079	0.185	0.238
PIPE DIAMETER AT OUTFALL (in.)	12	12	8	8	12
MINIMUM PIPE SLOPE AT OUTFALL (%)	2.40	0.80	0.40	0.40	0.30
NORMAL DEPTH AT OUTFALL'S MINIMUM SLOPE (in.) - FROM FLOWMASTER	2.90	4.05	1.99	3.10	3.24
ALLOWABLE (%) NORMAL DEPTH TO PIPE CAPACITY	75	75	75	75	75
PIPE (%) FULL PER NORMAL DEPTH AT OUTFALL'S MINIMUM SLOPE	24	34	25	39	27

SANITARY DESIGN POINT CALCULATIONS WITH REVISED FLOW RATES

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Wednesday, May 29 2024

Design Point 2 (8 inch Pipe at 0.4% Slope)

Circular

Diameter (ft) = 0.67

Invert Elev (ft) = 1.00

Slope (%) = 0.40

N-Value = 0.011

Calculations

Compute by: Known Q

Known Q (cfs) = 0.80

↖ 0.514 MGD

Highlighted

Depth (ft) = 0.49

Q (cfs) = 0.800

Area (sqft) = 0.28

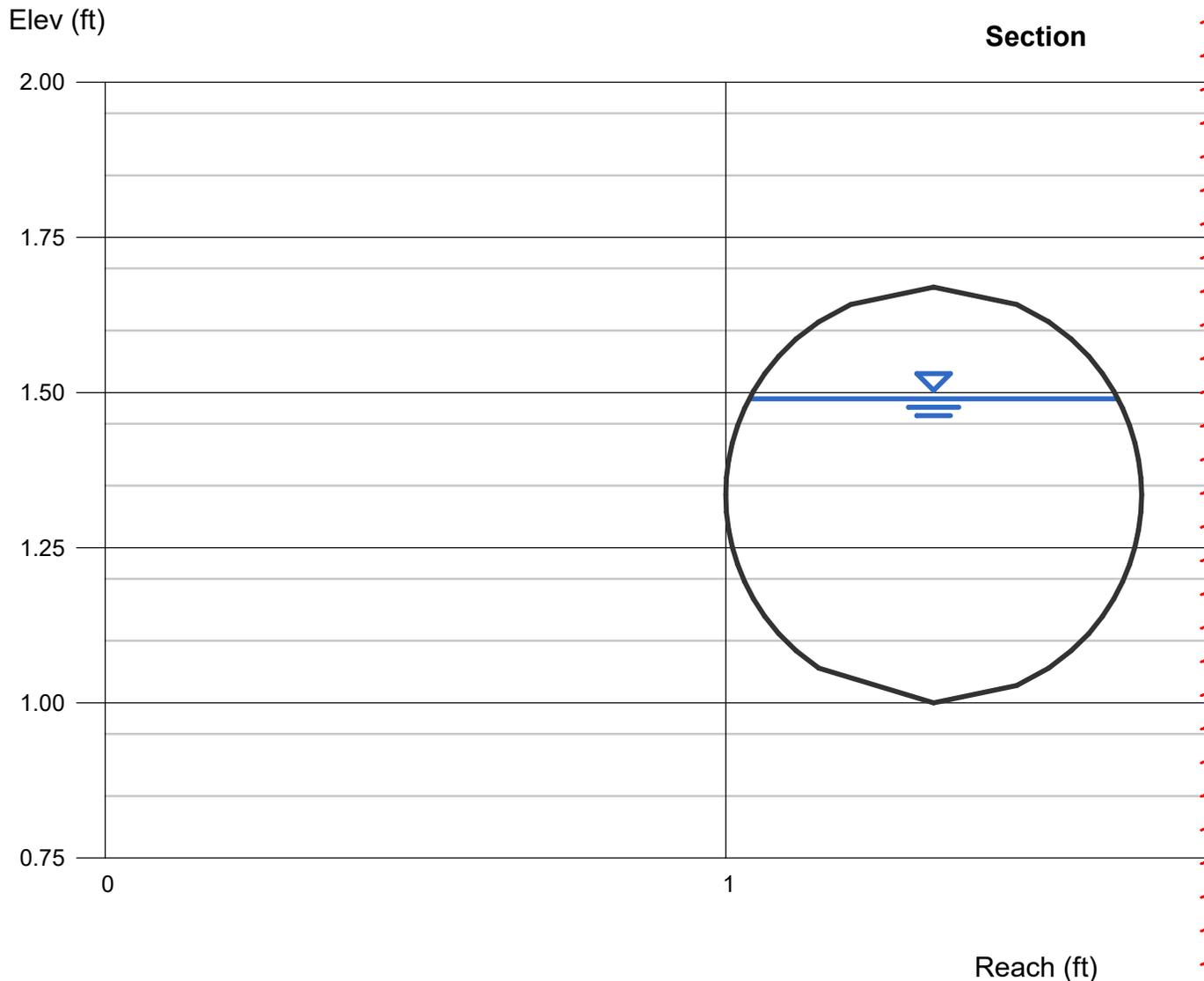
Velocity (ft/s) = 2.89

Wetted Perim (ft) = 1.38

Crit Depth, Yc (ft) = 0.43

Top Width (ft) = 0.59

EGL (ft) = 0.62



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Wednesday, May 29 2024

Design Point 3 (15 inch Pipe at 1.70% Slope)

Circular

Diameter (ft) = 1.25

Invert Elev (ft) = 1.00

Slope (%) = 1.70

N-Value = 0.011

Calculations

Compute by: Known Q

Known Q (cfs) = 3.30

↖ 2.131 MGD

Highlighted

Depth (ft) = 0.50

Q (cfs) = 3.300

Area (sqft) = 0.46

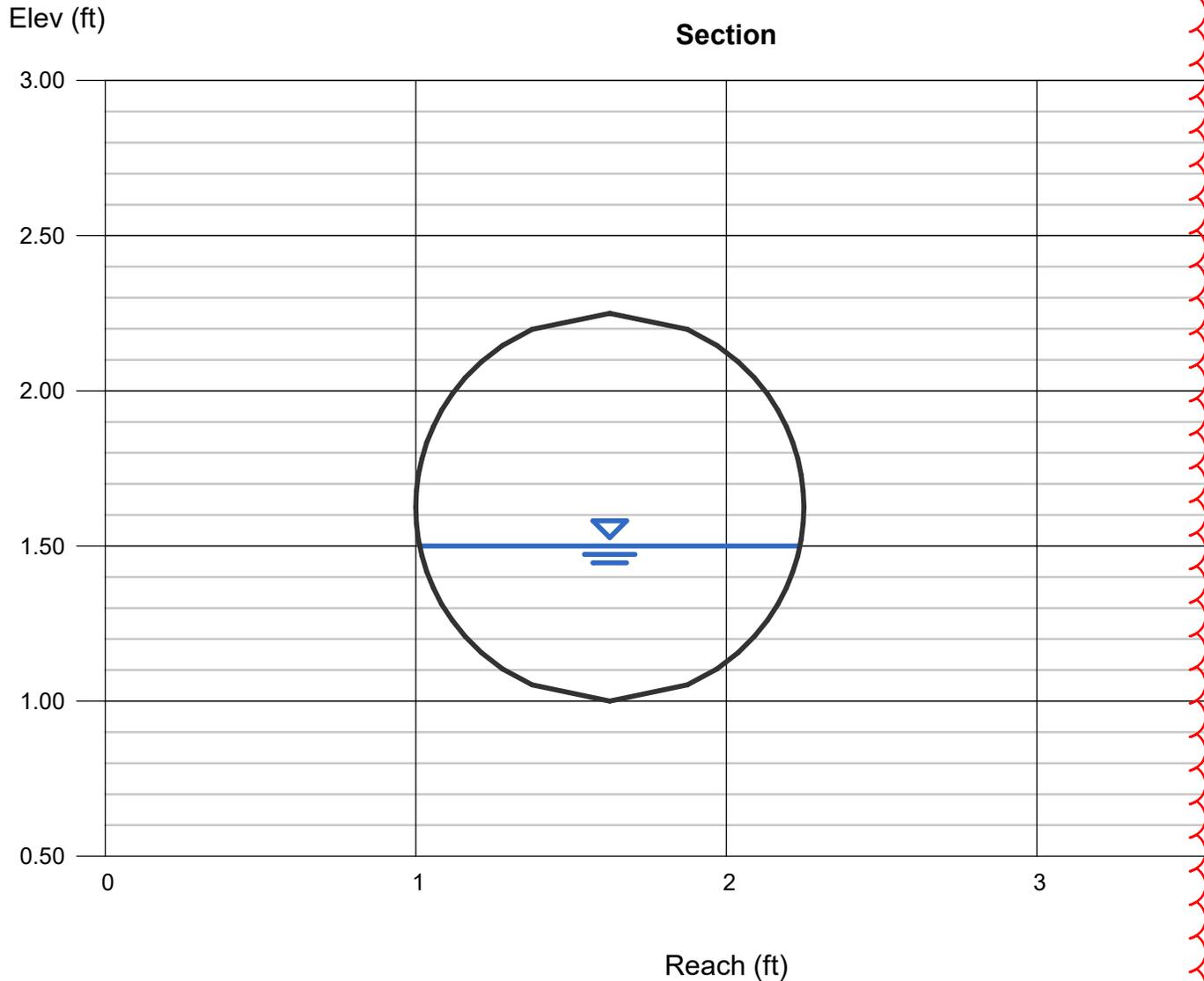
Velocity (ft/s) = 7.19

Wetted Perim (ft) = 1.71

Crit Depth, Yc (ft) = 0.74

Top Width (ft) = 1.22

EGL (ft) = 1.30



Channel Report

Design Point 4 (15 inch Pipe at 2.0% Slope)

Circular

Diameter (ft) = 1.25

Invert Elev (ft) = 1.00

Slope (%) = 2.00

N-Value = 0.011

Calculations

Compute by: Known Q

Known Q (cfs) = 3.34

↗ 2.156 MGD

Highlighted

Depth (ft) = 0.48

Q (cfs) = 3.340

Area (sqft) = 0.44

Velocity (ft/s) = 7.65

Wetted Perim (ft) = 1.67

Crit Depth, Yc (ft) = 0.74

Top Width (ft) = 1.22

EGL (ft) = 1.39

