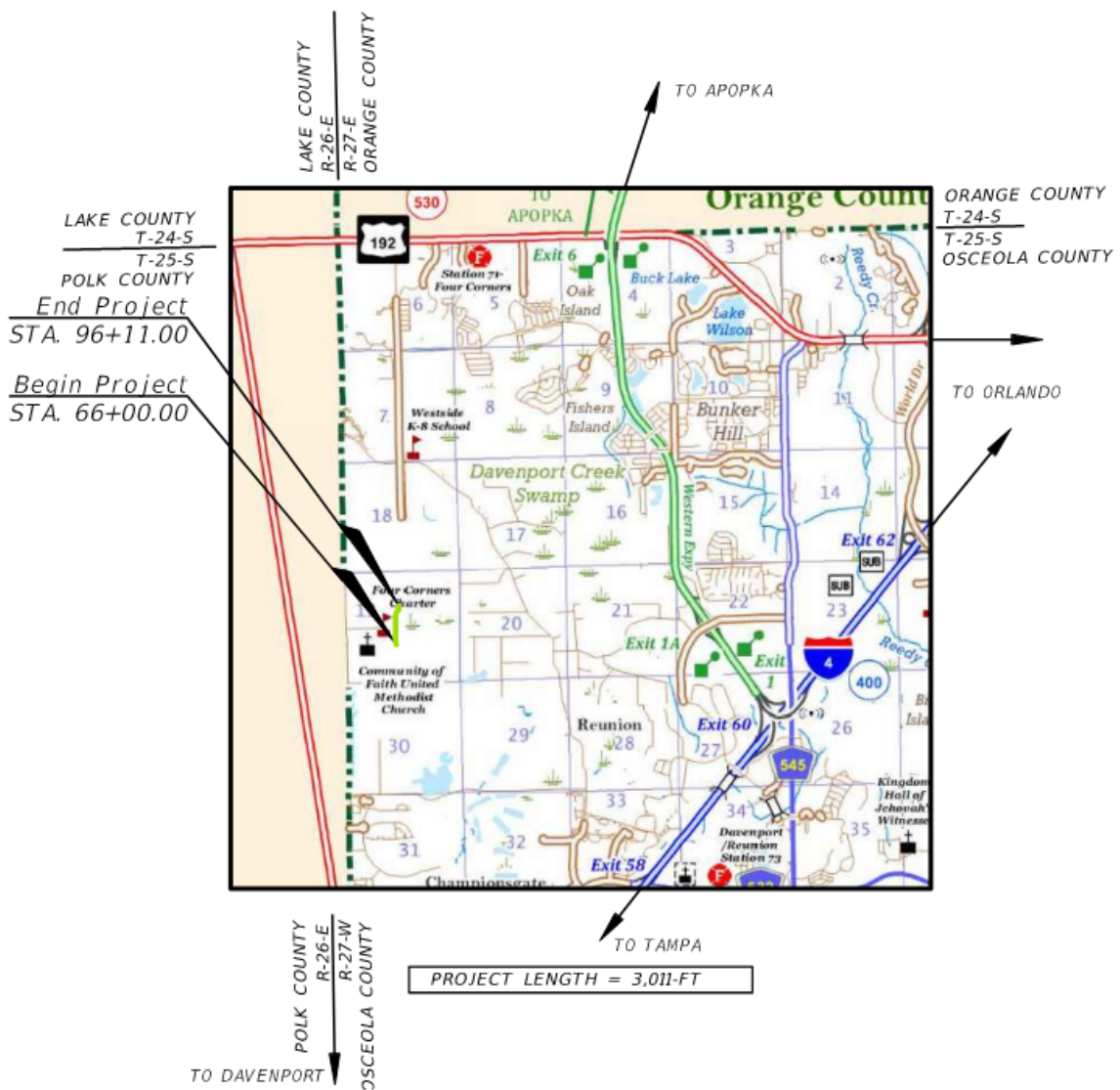


**STORMWATER REPORT
FOR
WESTSIDE BOULEVARD EXTENSION
STA 66+00 – STA 96+11**

**DRAINAGE DESIGN REPORT
OSCEOLA COUNTY, FLORIDA**

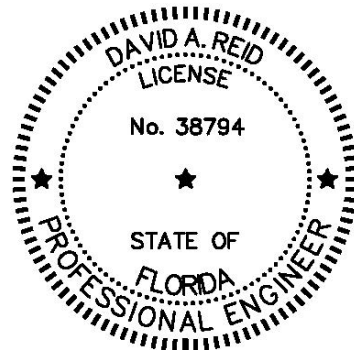


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STORMWATER REPORT
FOR
WESTSIDE BOULEVARD EXTENSION
OSCEOLA COUNTY, FLORIDA

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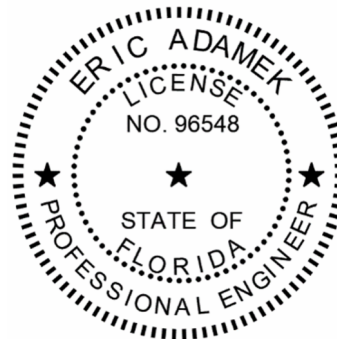
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1.0 Introduction

The purpose of this report is to present the engineering details and calculations for the site stormwater management system for a roadway project located in northwestern Osceola County, Florida. This report is in support of a request to construct a stormwater treatment system to serve a portion of a new four (4) lane divided urban road called Westside Boulevard.

The project will have one wet pond (Pond 1) to serve the portion of the Westside Boulevard road extension. All treatment volume shall be provided by the one detention wet pond.

1.1 Location

This site is located in a portion of Section 19, Township 25 South, Range 27 East in Osceola County, Florida. The proposed improvements begin at the end of the southeast development called Tract X owned by Lennar LLC and the end of the southwest development called Eden Gardens owned by EGR East LLC and ends at the beginning of the northwest residential development called Soleil at Westside owned by Mattamy Homes. The south developments that our proposed road is tying into are currently being designed and modified therefore coordination with the property owners is still ongoing. The location map is included in Appendix A. The project's horizontal datum is the Florida State Plane East zone (NAD 1983) and the vertical datum is NAVD88.

2.0 Pre-Development Overview

A pre-development analysis was performed to verify offsite impacts to the property, drainage patterns, and existing runoff rates to the adjacent properties. Most of the project is within a Toho Water Authority parcel and is located within the Reedy Creek Drainage Basin. The existing drainage pattern consists of runoff draining towards the east to adjacent wetlands (Wetland 1) that will ultimately outfall into Davenport Creek (WBID 3170K) which is an impaired water body (fecal coliform). A field review was conducted by Hamilton on March 1st, 2023. Based on what was observed in the field and other information included in previously permitted projects in the area, it was determined that the existing land uses are primarily wetlands and open space.

2.1 Pre-Development Analysis Goals

The pre-development analysis for the project was performed to determine existing offsite peak runoff discharge rates (cfs).

2.2 Existing Conditions

2.2.1 Soils

The project location has been delineated on the soils map provided in a soils maps provided in a geotechnical study performed by Geotechnical and Environmental Consultants, Inc. dated February 26, 2021 and revised May 17, 2023. The soils within this project area consist of Basinger fine sand (depressional, 0 to 1 % slopes), Candler sand (0 to 12 % slopes), and Smyrna fine sand (0 to 2 % slopes). Soil types are A and A/D. The Type A soil area shall be evaluated as Type A soils in both the existing and proposed conditions. The soil areas classified as Type A/D will be evaluated as Type A soil in the existing and developed condition. Soils within Group A have a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well-drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

2.2.2 Control Elevations

Royal Consulting Services is providing Osceola County and Toho Water Authority with plans for Rapid Infiltration Basin's (RIBs) to help treat and disperse municipal wastewater in the area. The RIBs system is planned to be in place prior to the construction of Westside Boulevard and the plans show Westside Boulevard within the influence of this development. Royal Consulting provided an exhibit that shows groundwater levels in the wet season higher than what is observed in the geotechnical report. The water table in the model varies and gets lower with increased distance from the RIBs. The water table shown in Royal Consulting Services' model is used as the estimated seasonal high water table with a value of 118.00 ft NGVD29 or 117.25 NAVD88 used for the pond design. These elevations were converted from NGVD29 to NAVD88 using a conversion factor, acquired from NOAA's online Vertical Datum Transformation tool, of NAVD88 = NGVD29 - 0.86, provided in Appendix B. The exhibit, extracted from Royal Consulting's model, can be found in Appendix B.

2.2.3 Wetlands

The proposed Westside Boulevard roadway extension is adjacent to offsite wetlands to the east (Wetland 1), that will be impacted. The total primary and primary secondary wetland impacts can be seen on the Wetland Impact Map located in the construction plans.

2.2.4 Flood Plain Area

The following Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (Map Number 12097C0020G) for Osceola County, Florida was used to identify potential floodplains associated with the project. The FEMA Map used for the floodplain analysis is shown in Appendix A.

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As shown in the FEMA map, there are locations that our proposed development impacts Zone A floodplain locations. Since there is no existing permitted information on what the existing floodplain elevation is and FEMA does not provide Zone A floodplain elevations, a vertices method was used to estimate the floodplain elevation. This method overlaps the floodplain shape with the surveyed contours along the project. Where the proposed project impacts the floodplain, multiple points were plotted to estimate the floodplain elevation using surveyed elevations. After calculations were completed, the estimated floodplain elevation is 117.15 ft (NAVD88).

The RIBs exhibit provided by Royal Consulting, found in Appendix B, shows the wetlands having a wet seasonal high water table (SHWT) of approximately 117.15-118.25 ft (NAVD88). Since the SHWT elevation of 117-15-117.85 ft at the wetlands is higher than the calculated floodplain elevation of 117.15 ft, there are no anticipated floodplain impacts.

2.2.5 Drainage Basins, Flow Patterns and Cross Drains

It was determined that the project site has ten (10) distinct pre-development drainage basins. A pre-development drainage basin map showing the basins and discharge points is shown in Appendix B. Pre-development drainage basins 1-6 are located within post-development basin project limits and were utilized to calculate the pre-development discharge rate for Pond 1’s control structure to Wetland 1. SFWMD requires that all onsite depressional storage be modeled in the pre-development conditions, therefore existing depressions 1-3 have been modeled in the pre-development condition.

Pre-development basins CD-1, CD-2, CD-3, and CD-4 are offsite existing drainage patterns that will require proposed cross drains. In the existing condition, the ground sheet flows naturally to the east towards the existing Wetland 1. When Westside Boulevard is constructed, cross drains in junction with roadside ditches will be used to convey runoff from the west towards the east into Wetland 1. The roadside ditches were added to the west side of Westside Boulevard to avoid runoff encroaching past the right of way during large storm events. Further design of the proposed cross drains can be found in the post development conditions section of this report.

The proposed pond (Pond 1) is located in the southwest section of the Westside Boulevard extension (around station 73+00 – 75+00) and will discharge in one location to Wetland 1, a historical runoff point (Pre-Basin 2). Since basins CD-1 to CD-4 existing runoff will not be conveyed into Pond 1, only pre-development basin 1 was analyzed to determine the existing offsite discharge rates. A full-size copy of this map is included in the pre-condition analysis located in Appendix B.

2.2.6 Pre-Development Basin Areas

The pre-development basin areas are listed below:

PRE-BASIN 1			
TOTAL AREA:	1.28	ac	100%
WET DETENTION AREA:	0.00	ac	0%
WETLAND AREA:	0.07	ac	6%
GREEN/OPEN AREA:	1.21	ac	94%
PERVIOUS AREA:	1.28	ac	100%
IMPERVIOUS AREA:	0.00	ac	0%

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PRE-BASIN 2			
TOTAL AREA:	3.15	ac	100%
WET DETENTION AREA:	0.68	ac	22%
WETLAND AREA:	0.00	ac	0%
GREEN/OPEN AREA:	2.47	ac	78%
PERVIOUS AREA:	2.47	ac	78%
IMPERVIOUS AREA:	0.68	ac	22%

PRE-BASIN 3			
TOTAL AREA:	1.13	ac	100%
WET DETENTION AREA:	0.00	ac	0%
WETLAND AREA:	0.00	ac	0%
GREEN/OPEN AREA:	1.13	ac	100%
PERVIOUS AREA:	1.13	ac	100%
IMPERVIOUS AREA:	0.00	ac	0%

PRE-BASIN 4			
TOTAL AREA:	2.03	ac	100%
WET DETENTION AREA:	0.00	ac	0%
WETLAND AREA:	0.00	ac	0%
GREEN/OPEN AREA:	2.03	ac	100%
PERVIOUS AREA:	2.03	ac	100%
IMPERVIOUS AREA:	0.00	ac	0%

PRE-BASIN 5			
TOTAL AREA:	1.23	ac	100%
WET DETENTION AREA:	0.00	ac	0%
WETLAND AREA:	0.00	ac	0%
GREEN/OPEN AREA:	1.23	ac	100%
PERVIOUS AREA:	1.23	ac	100%
IMPERVIOUS AREA:	0.00	ac	0%

PRE-BASIN 6			
TOTAL AREA:	0.91	ac	100%
WET DETENTION AREA:	0.00	ac	0%
WETLAND AREA:	0.00	ac	0%
GREEN/OPEN AREA:	0.91	ac	100%
PERVIOUS AREA:	0.91	ac	100%
IMPERVIOUS AREA:	0.00	ac	0%

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2.2.7 Curve Number Calculations

All existing ground curve numbers have been determined using SFWMD’s Soil Profile Storage Table.

PRE-BASIN 1

	Land Use	Area, ac.	% Area	CN No.	Comp. CN
----	Open Water/Wetland	0.07	5.5%	100	5.5
A	Flatwoods, Depth to WT: 2 & Uncompacted (AB-2, WB-1 - WB-3)	0.90	70.3%	80	56.3
A	Flatwoods, Depth to WT: 4 & Uncompacted (AB-1)	0.31	24.2%	53	12.8
		1.28	100%		74.6

PRE-BASIN 2

	Land Use	Area, ac.	% Area	CN No.	Comp. CN
----	Open Water/Wetland	0.68	21.6%	100	21.6
A	Flatwoods, Depth to WT: 2 & Uncompacted (AB-3 - AB-5)	1.37	43.5%	80	34.8
A	Flatwoods, Depth to WT: 4 & Uncompacted (PB-1 & PB-2)	1.10	34.9%	53	18.5
		3.15	100%		74.9

PRE-BASIN 3

	Land Use	Area, ac.	% Area	CN No.	Comp. CN
A	Flatwoods, Depth to WT: 2 & Uncompacted (AB-7)	1.13	100.0%	80	80.0
		1.13	100%		80.0

PRE-BASIN 4

	Land Use	Area, ac.	% Area	CN No.	Comp. CN
A	Flatwoods, Depth to WT: 4 & Uncompacted (AB-8 - AB-11)	2.03	100.0%	53	53.0
		2.03	100%		53.0

PRE-BASIN 5

	Land Use	Area, ac.	% Area	CN No.	Comp. CN
A	Flatwoods, Depth to WT: 4 & Uncompacted (AB-12 - AB-13)	1.23	100.0%	53	53.0
		1.23	100%		53.0

PRE-BASIN 6

	Land Use	Area, ac.	% Area	CN No.	Comp. CN
A	Flatwoods, Depth to WT: 4 & Uncompacted (AB-14 - AB-15)	0.91	100.0%	53	53.0
		0.91	100%		53.0

2.2.8 Time of Concentration

All pre-development basin time of concentrations were calculated to be less than 10 minutes. Therefore, 10 minutes was used for the time of concentration for all pre-development basins.

2.2.9 Existing Depressions Stage/Storage

Exist. Depression 1

ELEV	DEPTH ft	AREA ft	AREA ac	VOL. cf	VOL. ac-ft
112.80	0.00	40771	0.94	0	0.00
113.00	0.20	41389	0.95	8247	0.19
113.50	0.70	42932	0.99	29404	0.68
114.00	1.20	44476	1.02	51334	1.18
114.50	1.70	46020	1.06	74035	1.70

Exist. Depression 2

ELEV	DEPTH ft	AREA ft	AREA ac	VOL. cf	VOL. ac-ft
112.60	0.00	13336	0.31	0	0.00
113.00	0.40	13774	0.32	5466	0.13
114.00	1.40	14868	0.34	19896	0.46
115.00	2.40	15963	0.37	35422	0.81

Exist. Depression 3

ELEV	DEPTH ft	AREA ft	AREA ac	VOL. cf	VOL. ac-ft
115.00	0.00	29	0.00	0	0.00
116.00	1.00	1921	0.04	1921	0.04
117.00	2.00	3812	0.09	5733	0.13
118.00	3.00	5704	0.13	11436	0.26
119.00	4.00	7595	0.17	19031	0.44

2.2.10 Peak Runoff Rate Determination

To determine the offsite runoff, ICPR version 3, was used to create hydrographs for the existing basins of interest. The maximum runoff rates derived from the hydrograph will be used as the maximum allowable runoff in the post condition pond design.

2.2.11 Existing Conditions Summary

After performing an in-depth pre-condition analysis on the subject property, it was determined that the existing peak runoff from the basin of interest for the 25-year, 72-hour storm are as follows:

- Pre-Basin 1: 5.50 cfs
- Pre-Basin 2: 13.02 cfs
- Pre-Basin 3: 5.10 cfs
- Pre-Basin 4: 14.11 cfs
- Pre-Basin 5: 3.67 cfs
- Pre-Basin 6: 0.00 cfs
- Total : 41.40 cfs**

The existing peak runoff for the 10-year, 72-hour storm are as follows:

- Pre-Basin 1: 3.58 cfs
- Pre-Basin 2: 8.73 cfs
- Pre-Basin 3: 3.42 cfs
- Pre-Basin 4: 3.20 cfs
- Pre-Basin 5: 1.99 cfs
- Pre-Basin 6: 0.00 cfs
- Total: 20.92 cfs**

3.0 PROPOSED DEVELOPMENT

3.1 Permits Required

All necessary construction permits will be obtained before any construction activity occurring within the project limits. Permits that may be required include, but are not limited to the following:

- Osceola County Transportation approval
- SFWMD Environmental Resource Permit
- FDEP Water Permit

3.2 Post-Development Design Criteria

The objectives for this project are to provide water quality treatment of the stormwater runoff and to attenuate the peak discharge of the design storm. The pond onsite will be a wet detention pond with offsite discharge via a control structure.

The following design criteria were used for this project:

1. Wet detention (Pond 1): pond shall provide treatment volume for the first 1” of the total basin area or 2.5” of percent impervious, whichever is greater. Discharge shall be limited to existing offsite discharge rates. Pond shall recover entire volume within 14 days via natural percolation and/or bleeder device. If the pond cannot recover in the allotted time, an additional 100-year/24-hour storm event shall be detained.
2. The top of berm of the wet detention pond (Pond 1) shall be above the 25-year/72-hour design storm.
3. Per Osceola County LDC 4.5.1.D.4.C, all wet ponds shall have twelve (12) inches minimum of freeboard between the design high water and the minimum berm elevation.
4. The minimum roadway elevations shall be above the 10-year/24-hour design storm.
5. Cross drains shall convey runoff from the 50-year/24-hour design storm.

3.3 Design Storms and Rainfall Amounts

The following design storms and corresponding rainfall depths were used in the pre-development and post-development analysis. (Source: SFWMD ERP Environmental Resource Permit, A.H. II, May 2016; Osceola County Land Development Code, June 2022 & Florida Department of Transportation (FDOT) Drainage Manual, January 2021).

Frequency/Duration	Total Rainfall	Rainfall Distribution
10-year/24-hour	P = 6"	FL Modified
10-year/72-hour	P = 7.8"	SFWMD 72 hour
25-year/72-hour	P = 11"	SFWMD 72 hour
50-year/24-hour	P = 9.3"	FL Modified
100-year/72-hour	P = 12"	SFWMD 72 hour

3.4 Post Development Conditions

3.4.1 Project Areas

The Westside Boulevard project consists of one (1) post development drainage basins and four (4) cross drain post development basins. Basin 1 collects the stormwater runoff from only Westside Boulevard. The post development drainage Basin 1 is 9.73 acres. The post development drainage basin 1 areas are listed below. Post development cross drain basins areas will not be included in this report since there is no impervious area therefore no required water quality.

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POST BASIN 1			
Total Area:	9.73	ac	100%
Building Area:	0.00	ac	0%
Asphalt Area:	3.46	ac	34%
Sidewalk/Driveways Area:	1.47	ac	15%
Wet Detention Area:	0.52	ac	5%
Wetland Preservation Area:	0.00	ac	0%
Green/Open Area:	4.28	ac	44%
Pervious Area:	4.28	ac	44%
Impervious Area:	4.93	ac	51%

A full-size post condition drainage map is located in Appendix C.

3.4.2 Curve Number Calculations

All proposed curve numbers have been determined using SFWMD's Soil Profile Storage Table.

BASIN 1 (Pond 1)

	Land Use	Area, ac.	% Area	CN No.	Comp. CN
Impervious Area:					
----	Building Area	0.00	0.0%	98	0.00
----	Asphalt	3.46	35.6%	98	34.85
----	Sidewalks/Driveways	1.47	15.1%	98	14.81
----	Wetland	0.00	0.0%	95	0.00
----	Pond (Area @ NWL):	0.52	5.3%	100	5.34
Pervious Area:					
A	Flatwoods, Depth to WT=4.0, Compacted	4.28	44.0%	60	26.39
		9.73	100%		81.39

3.4.3 Time of Concentration Calculations

The time of concentration for the post development drainage basins was determined to be 19.64 mins.

POST BASIN 1

Section 1:

Watercourse: Smooth Surface
 Slope (s): 0.0200 ft/ft
 Length (L): 102 ft
 Runoff (P): * 5 in
 Mannings (n): ** 0.011
 Time of Conc = $\frac{.007(Ln)^{.6}}{P^{.5s.4}}$
 Time of Conc = 0.02 hrs
 Time of Conc = 0.98 mins

Section 2:

Surface Description: Concrete Pipe
 Watercourse Slope (s): 0.0020 ft/ft
 Flow Length (L): 2239 ft
 Avg. Velocity 2.00 ft/s
 Time of Conc = $\frac{L}{V}$
 Time of Conc = 3600V
 Time of Conc = 0.31 hrs
 Time of Conc = 18.66 mins

Total Time of Concentration = 19.64 mins

3.4.4 Control Elevation and Soil Conditions

The normal wet seasonal water elevations used for Pond 1 was determined to be 117.25 NAVD88 based on the water table shown in Royal Consulting Services’ model for the RIBs, as previously mentioned.

3.4.5 Proposed Pond Stage/Storage

Pond 1

ELEV	DEPTH ft	AREA ft	AREA ac	VOL. cf	VOL. ac-ft
117.25	0.00	22603	0.52	0	0.00
118.00	0.75	25495	0.59	18398	0.42
119.00	1.75	29350	0.67	46302	1.06
120.00	2.75	33205	0.76	78062	1.79
121.00	3.75	37061	0.85	113677	2.61
122.00	4.75	40916	0.94	153147	3.52
122.50	5.25	42844	0.98	174329	4.00

PAV Provided

3.4.6 Water Quality Required

The water quality volumes were determined using the SFWMD rules and regulations (Volume IV Permit Information Manual). The pollution abatement volume required will be greater of the first 1” of runoff from the entire site or 2.5” over the percent impervious from the entire site as calculated in Appendix C. The required pollution treatment volume will be fully satisfied by wet detention Pond 1.

This site is located in the Lake Okeechobee basin as shown in the following figure. To satisfy current TMDL requirements, an additional 50% of pollution abatement volume has been provided as shown below. The additional 50% of pollution abatement volume can be seen in the required water quality calculations located in Appendix C.

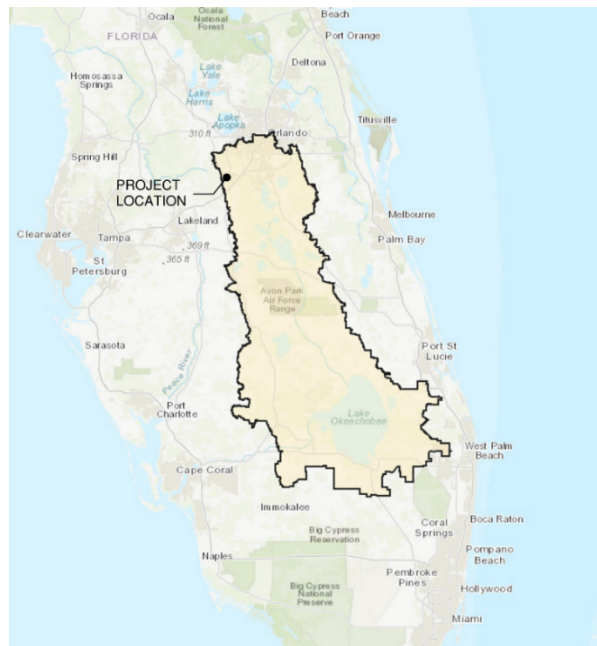


Figure 1: Lake Okeechobee Basin Map

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Basin 1 PAV Required (Appendix C): **1.55 ac-ft** Total PAV Provided: **1.79 ac-ft**

The water quality volumes provided correspond with the weir elevations for each pond:

Pond 1: **1.79 ac-ft @ 120.00'** (NAVD88)
(Pond Bottom 105.00', weir crest elevation at 120.00', bleeder invert elevation at 117.25')

3.4.7 Wet Detention Area Dimension Criteria

Total Wet Detention Area @ NWL = 0.52 ac = 22,603 SF (Minimum 0.5 acre)
Approximate Length of Pond 1 (Irregular Shape) @ NWL = 205 ft
Average Width of Pond 1 @ NWL = 22,603 SF/ 205 ft = **110 ft**

Therefore, the wet detention pond meets the required dimensional criteria as outlined in Section 5.4.2 of SFWMD's Environmental Resource Permit Applicant's Handbook Volume II, May 2016.

3.4.8 Offsite Discharge

The proposed discharge point is to the offsite wetland 1, a historical runoff area. The runoff shall be discharged via a drop structure and spreader swale. The spreader swale will limit the velocity of the water leaving the site to a final discharge velocity of less than 1 fps which will mimic natural sheet flow of water to the wetland.

3.4.9 Tailwater

On July 8th, eight (8) seasonal high-water nails were set by Bio-Tech Consulting Inc. and the SFWMD district staff during a site review for the outfall wetlands. The determined seasonal high-water elevations can be seen in the following table:

Seasonal High Water Nail No.	Elevation (ft, NAVD88)
1	114.78
2	114.82
3	114.57
4	114.49
5	114.62
6	113.28
7	112.99
8	113.09
Average	114.08

The tailwater elevation for each design storm event was not available to Hamilton at the time of writing, due to lack of drainage study for Wetland 1 or stillwater elevations. Using the seasonal high-water elevation and the previously estimated FEMA Floodzone elevation, the tailwater elevations for each design storm event was estimated to be the following:

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Design Storm	Estimated Tail Water Elevation Used (ft, NAVD88)
10-Year 24-Hour	115.15
10-Year 72-Hour	115.15
25-Year 72-Hour	116.15
50-Year 24-Hour	116.15
100-Year 24-Hour	117.15
100-Year 72-Hour	117.50

3.4.10 Pond Recovery

Pond recovery analyses were run using ICPR version 3.1 software. A separate recovery analysis was performed for the pond to demonstrate recovery of the water quality treatment volume. This was performed by running the routing time out an additional 336 hours (14 days) past the design storm event. Pond 1 is a wet detention pond that has a 3" circular bleed down device to assist with the recovery of the water quality treatment volume in Control Structure CS-1. The 3" circular bleed down orifice is set at the normal water elevation of 117.25' NAVD88. Circular bleeder calculations can be found in Appendix C. No percolation was utilized. The pond recovery flat lines at approximately 0.02 feet above the normal water level at hour 300 of the 25-year/72-hour storm event.

3.4.11 Cross Drains

There are four (4) proposed cross drains, CD-1, CD-2, CD-3, and CD-4, within the project limits that will be needed to maintain offsite existing drainage patterns. The cross drain sizes were sized based on the 50-year – 24-hour design storm per Osceola County LDC Section 4.5.1.F. To determine the total offsite runoff to each cross drain, ICPR version 3, was used to create hydrographs for the existing basin of interest. The maximum runoff rates derived from the hydrograph for the 50-year – 24-hour storm will be used to size the cross drain. All existing offsite drainage area for the cross drains is assumed to have a curve number of 53, for Flatwoods, Depth to the water table of 4ft, and uncompacted soil. Time of concentration for the offsite cross drain areas are calculated below:

CD-1

Section 1:		Section 2:		Section 3:	
Watercourse:	Short Grass	Surface Description:	Unpaved	Cross Sectional Flow Area:	4 ft ²
Slope (s):	0.0362 ft/ft	Watercourse Slope (s):	0.0519 ft/ft	Wetted Perimeter, Pw	8.25 ft
Length (L):	100 ft	Flow Length (L):	426 ft	Hydraulic Radius, r=a/Pw	0.48 ft
Runoff (P): *	5 in	Avg. Velocity	3.68 ft/s	Channel Slope, S	0.0223 ft/ft
Mannings (n): **	0.15	V = 16.1345 x S ^{0.5}		Manning's (n):**	0.08
				$V=1.49(r^{2/3})(s^{1/2})$	1.72 ft/s
Time of Conc =	$\frac{.007(Ln)^8}{p^{.5s.4}}$	Time of Conc =	$\frac{L}{3600V}$	n	
				Flow Length, L	77 ft
Time of Conc =	0.10 hrs	Time of Conc =	0.03 hrs	Time of Conc =	0.01 hrs
Time of Conc =	6.18 mins	Time of Conc =	1.93 mins	Time of Conc =	0.75 mins

Total Time of Conc.= 10.00 mins

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CD-2

Section 1:			Section 2:			Section 3:		
Watercourse:	Short Grass		Surface Description:	Unpaved		Cross Sectional Flow Area:	4	ft ²
Slope (s):	0.0312	ft/ft	Watercourse Slope (s):	0.0346	ft/ft	Wetted Perimeter, Pw	8.25	ft
Length (L):	100	ft	Flow Length (L):	1381	ft	Hydraulic Radius, r=a/Pw	0.48	ft
Runoff (P): *	5	in	Avg. Velocity	3.00	ft/s	Channel Slope, S	0.0094	ft/ft
Mannings (n): **	0.15		V = 16.1345 x S ^{0.5}			Manning's (n):**	0.08	
						$V=1.49(r^{2/3})(s^{1/2})$	1.12	ft/s
Time of Conc =	$\frac{.007(Ln)}{P^{.5s.4}}$		Time of Conc =	$\frac{L}{3600V}$		n		
						Flow Length, L	298	ft
Time of Conc =	0.11	hrs	Time of Conc =	0.13	hrs	Time of Conc =	0.07	hrs
Time of Conc =	6.56	mins	Time of Conc =	7.66	mins	Time of Conc =	4.45	mins

Total Time of Conc. = 18.67 mins

CD-3

Section 1:			Section 2:			Section 3:		
Watercourse:	Short Grass		Surface Description:	Unpaved		Cross Sectional Flow Area:	4	ft ²
Slope (s):	0.0263	ft/ft	Watercourse Slope (s):	0.0328	ft/ft	Wetted Perimeter, Pw	8.25	ft
Length (L):	100	ft	Flow Length (L):	535	ft	Hydraulic Radius, r=a/Pw	0.48	ft
Runoff (P): *	5	in	Avg. Velocity	2.92	ft/s	Channel Slope, S	0.0051	ft/ft
Mannings (n): **	0.15		V = 16.1345 x S ^{0.5}			Manning's (n):**	0.08	
						$V=1.49(r^{2/3})(s^{1/2})$	0.82	ft/s
Time of Conc =	$\frac{.007(L)}{P^{.5s.4}}$		Time of Conc =	$\frac{L}{3600V}$		n		
						Flow Length, L	500	ft
Time of Conc =	0.12	hrs	Time of Conc =	0.05	hrs	Time of Conc =	0.17	hrs
Time of Conc =	7.03	mins	Time of Conc =	3.05	mins	Time of Conc =	10.15	mins

Total Time of Conc. = 20.23 mins

CD-4

Section 1:			Section 2:			Section 3:		
Watercourse:	Short Grass		Surface Description:	Unpaved		Cross Sectional Flow Area:	4	ft ²
Slope (s):	0.0331	ft/ft	Watercourse Slope (s):	0.0378	ft/ft	Wetted Perimeter, Pw	8.25	ft
Length (L):	100	ft	Flow Length (L):	920	ft	Hydraulic Radius, r=a/Pw	0.48	ft
Runoff (P): *	5	in	Avg. Velocity	3.14	ft/s	Channel Slope, S	0.0134	ft/ft
Mannings (n): **	0.15		V = 16.1345 x S ^{0.5}			Manning's (n):**	0.08	

STORMWATER REPORT
WESTSIDE BOULEVARD EXTENSION

			$V=1.49(r^{2/3})(s^{1/2})$	1.33	ft/s
Time of Conc =	$\frac{.007(Ln)}{g}$	Time of Conc =	$\frac{L}{n}$		
	$p^{.5s.4}$		3600V	Flow Length, L	44 ft
Time of Conc =	0.11 hrs	Time of Conc =	0.08 hrs	Time of Conc =	0.01 hrs
Time of Conc =	6.41 mins	Time of Conc =	4.89 mins	Time of Conc =	0.55 mins

Total Time of Conc. = 11.85 mins

The proposed cross drains and their respective locations and sizes are summarized in the Table below.

Cross Drain ID	Station	Size (Inches)
CD-1	72+50	30"
CD-2	75+87	30"
CD-3	84+00	24"
CD-4	86+75	24"

Cross drain CD-1 was modeled with ICPR3 with the post-development conditions, as the cross drain is connected to the Pond 1 discharge structure "CS-1". Cross drains "CD-2", "CD-3" and "CD-4" were sized using Hydraflow Storm Sewer Extension for AutoCAD © Civil 3D. Drainage maps, illustrating the proposed cross drains, and cross drain tabulations are included in Appendix C.

Existing "OCS" 36" RCP/36" MES permitted with the Eden Garden Resort's Pond B (SFWMD Permit No. 49-101036-P) has been modified with the Westside Boulevard Extension to reduce the pipe velocity below 6 feet per second to meet the requirements of LDC 4.5.3.F.4 and added the spreader mechanism to discharge with non-erosive velocities. The 100-year 72-hour maximum flow of 8.61 cfs from Pond B was taken from SFWMD Permit No. 49-101036-P, since no 50-year 24-hour storm was modelled in the stormwater analysis.

3.4.12 Nutrient Loading Analysis

Nutrient Loading Analysis for Pond 1 has been submitted under a separate cover. Pond 1 was designed with a treatment volume of more than 150% the required volume, as required by the TMDL requirements for the Lake Okeechobee Basin.

3.4.13 Skimmer and Spreader Swale Calculations

The skimmer will be evaluated to determine that the opening is sufficient to not impede the flow of water entering the weir. Also, the spreader swale will be designed to limit velocity and depth of potential overflow leaving the site to ensure that there are no negative impacts to the adjacent wetlands. The skimmer calculations and spreader swale calculations are included in Appendix E.

3.4.14 Secondary Storm Tabulations

The storm sewers were designed for a design storm frequency of ten (10)-year design storm per Osceola County LDC 4.5.3C. The stormwater spread into traveled lane for an intensity of four (4.0) inches per hour must keep half of the lane clear per Osceola County LDC 4.5.3D. The hydraulic grade line shall be at or below the design elevation of the gutter. The storm system was designed using Hydraflow Storm Sewer Extension for AutoCAD © Civil 3D. The tailwater condition was set at the design high water of Pond 1. Please refer to the storm sewer tabulations included in Appendix F. The flanking inlets proposed were modelled in Hydraflow as one node for simplicity, to accommodate for the additional inlet capacity created by the flanking inlets, the inlet length was adjusted to consider all three (3) structures.

4.0 SUMMARY OF RESULTS

SFWMD:

Detention Pond	Pond 1
Pond Treatment Volume Required (ac-ft)	1.54
Pond Treatment Volume Provided (ac-ft)	1.79 @ 120.00'
Peak Stage of 25-yr/72-hr Storm Event (ft)	121.48
Top of Pond Berm (ft)	122.50
Max Stage of 100-yr/72-hr Storm Event (ft)	121.92
Minimum Final Floor Elevations Proposed (ft)	N/A
Total Peak Discharge Rate Allowed (25-yr/72-hr, cfs)	41.40
Total Peak Discharge Rate Provided (25-yr/72-hr, cfs)	23.26
Drawdown Elevation Required after 336 hrs of 25-yr/72-hr (ft)	117.25
Drawdown Elevation after 300 hrs of 25-yr/72-hr (ft)	117.27

Osceola County:

Detention Pond	Pond 1
Peak Stage of 10-yr/24-hr Storm Event (ft)	120.31
Minimum Pavement Elevations Proposed (ft)	124.11
Peak Stage of 10-yr/72-hr Storm Event (ft)	120.89
Top of Pond Berm (ft)	122.50
Required Freeboard between Peak Stage of 10-yr/72-hr and Top of Pond Berm (ft)	1.00
Provided Freeboard between Peak Stage of 10-yr/72-hr and Top of Pond Berm (ft)	1.61
Max Stage of 100-yr/72-hr Storm Event (ft)	121.92
Minimum Final Floor Elevations Proposed (ft)	N/A
Total Peak Discharge Rate Allowed (10-yr/72-hr, cfs)	20.92
Total Peak Discharge Rate Provided (10-yr/72-hr, cfs)	11.15
Drawdown Elevation Required after 336 hrs of 10-yr/72-hr (ft)	117.25
Drawdown Elevation After 300 hrs of 10-yr/72-hr (ft)	117.27

In conclusion, the site improvements proposed on this project meet the applicable stormwater management criteria per SFWMD and Osceola County.

5.0 CONSTRUCTION TECHNIQUES

The contractor shall utilize best management practices during construction to prevent erosion, turbidity and sedimentation in off-site wetlands and water bodies. Mass grading will be an interim construction phase where runoff will be graded to flow directly to the ponds or to on-site low spots for future storm drain inlets (that will be connected to ponds when constructed). Any discharges that are not connected to the pond during the interim mass grading phase will be controlled using best management practices (BMPs) prior to discharge in accordance with the Stormwater Pollution Prevention Plan developed by the contractor for compliance with NPDES stormwater permitting. The contractor shall also provide a silt fence around the site in accordance with South Florida Water Management District standards and specifications and as shown on the erosion control plans. A double-row silt fence will be installed along all wetland boundaries. After construction is complete, all disturbed areas shall be neatly graded, seeded and mulched or sodded as noted. Areas within the County R/W shall be sodded.

6.0 SYSTEM CONSTRUCTION AND MAINTENANCE

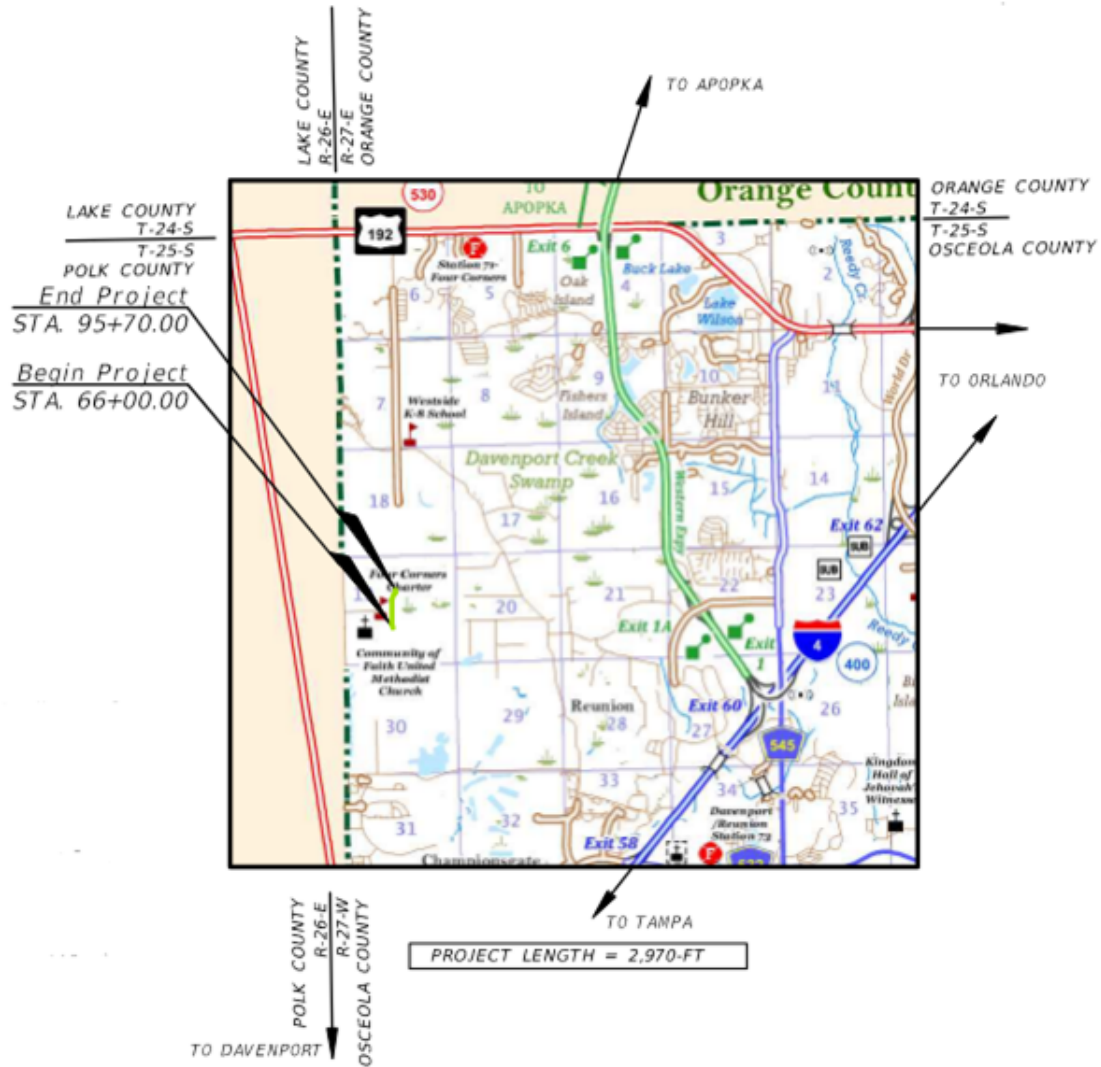
Osceola County will be responsible for the operation and maintenance of the stormwater management system.

Appendix A

Exhibits

1. **Location Map**
2. **Legal Description**
3. **Soils Map & Description**
4. **FIRM Flood Map**

LOCATION MAP WESTSIDE BLVD EXTENSION



JULY 2023

OSCEOLA COUNTY, FLORIDA

53509.0012 LENNAR – WESTSIDE BLVD EXTENSION
OVERALL RIGHT-OF-WAY BOUNDARY
April 21, 2023

DESCRIPTION:

OVERALL RIGHT-OF-WAY

THAT PART OF THE NORTHEAST 1/4 OF THE SOUTHWEST 1/4 AND THAT PART OF THE SOUTHEAST 1/4 OF THE NORTHWEST 1/4 OF SECTION 19, TOWNSHIP 25 SOUTH, RANGE 27 EAST, OSCEOLA COUNTY, FLORIDA, BEING DESCRIBED AS FOLLOWS:

COMMENCE AT A 1-1/4" PIPE WITH A 60d NAIL (NO IDENTIFICATION) FOUND AT THE SOUTHWEST CORNER OF THE SOUTHWEST 1/4 OF THE SOUTHEAST 1/4 OF SAID SECTION 19; THENCE RUN N00°13'32"E ALONG THE WEST LINE OF THE SOUTHWEST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 19 FOR A DISTANCE OF 1330.37 FEET TO THE SOUTHWEST CORNER OF THE NORTHWEST 1/4 OF THE SOUTHEAST 1/4 OF SAID SECTION 19; SAID SOUTHWEST CORNER BEING DISTANT 1330.36 FEET ON A BEARING OF S00°13'32"W FROM A 4"x4" CONCRETE MONUMENT WITH A 3/8" IRON ROD (NO IDENTIFICATION) FOUND AT THE NORTHWEST CORNER OF THE NORTHWEST 1/4 OF THE SOUTHEAST 1/4 OF SAID SECTION 19; THENCE RUN S89°47'17"W ALONG THE SOUTH LINE OF THE AFORESAID NORTHEAST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 19 FOR A DISTANCE OF 15.00 FEET TO THE SOUTHEAST CORNER OF LOT 3, BLOCK "C", PLAT OF FLORIDA FRUIT AND TRUCK COMPANY'S SUBDIVISION, RECORDED IN PLAT BOOK "B" PAGE 68 OF THE PUBLIC RECORDS OF OSCEOLA COUNTY, FLORIDA, AND TO THE POINT OF BEGINNING; THENCE CONTINUE S89°41'17"W ALONG SAID SOUTH LINE OF THE NORTHEAST 1/4 OF THE SOUTHWEST 1/4 OF SAID SECTION 19 FOR A DISTANCE OF 144.36 FEET TO THE SOUTHEAST CORNER OF LANDS DESCRIBED IN OFFICIAL RECORDS BOOK 5124, PAGE 1948 OF SAID PUBLIC RECORDS AND TO A NON-TANGENT CURVE CONCAVE NORTHEASTERLY HAVING A RADIUS OF 328.78 FEET AND A CHORD BEARING OF N24°38'39"W AND A CHORD DISTANCE OF 37.96 FEET;

THENCE RUN THE FOLLOWING FOUR (4) COURSES AND DISTANCES ALONG THE EASTERLY BOUNDARY OF SAID LANDS DESCRIBED IN OFFICIAL RECORDS BOOK 5124, PAGE 1948: 1) NORTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 06°37'08" FOR A DISTANCE OF 37.98 FEET TO THE POINT OF TANGENCY; THENCE, 2) N21°20'04"W FOR A DISTANCE OF 101.77 FEET TO A NON-TANGENT CURVE CONCAVE EASTERLY HAVING A RADIUS OF 349.41 FEET AND A CHORD BEARING OF N11°48'29"W AND A CHORD DISTANCE OF 139.22 FEET; THENCE 3) NORTHERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 22°58'59" FOR A DISTANCE OF 140.16 FEET TO THE POINT OF TANGENCY; THENCE 4) N00°19'01"W FOR A DISTANCE OF 98.99 FEET TO THE NORTHEAST CORNER OF SAID LANDS RECORDED IN OFFICIAL RECORDS BOOK 5124, PAGE 1948; THENCE RUN S89°41'17"W ALONG THE NORTH LINE OF SAID LANDS RECORDED IN OFFICIAL RECORDS BOOK 5124, PAGE 1948, FOR A DISTANCE OF 38.67 FEET;

THENCE, DEPARTING SAID NORTH LINE, RUN N08°25'49"W FOR A DISTANCE OF 155.28 FEET; THENCE RUN N77°17'45"W FOR A DISTANCE OF 26.30 FEET; THENCE RUN N60°38'40"W FOR A DISTANCE OF 231.24 FEET; THENCE RUN N00°00'32"E FOR A DISTANCE OF 55.97 FEET; THENCE RUN N43°19'04"E FOR A DISTANCE OF 293.69 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE NORTHWESTERLY HAVING A RADIUS OF 100.00 FEET AND A CHORD BEARING OF N21°27'01"E AND A CHORD DISTANCE OF 74.49 FEET; THENCE RUN NORTHEASTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 43°44'05" FOR A DISTANCE OF 76.33 FEET TO THE POINT OF TANGENCY; THENCE RUN N00°25'01"W FOR A DISTANCE OF 304.13 FEET; THENCE RUN N89°34'59"E FOR A DISTANCE OF 15.00 FEET; THENCE RUN N00°25'01"W FOR A DISTANCE OF 278.66 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE EASTERLY HAVING A RADIUS OF 1900.02 FEET AND A CHORD BEARING OF N05°57'36"E AND A CHORD DISTANCE OF 422.08 FEET; THENCE RUN NORTHERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 12°45'15" FOR A DISTANCE OF 422.95 FEET TO THE POINT OF TANGENCY; THENCE RUN N12°20'14"E FOR A DISTANCE OF 344.50 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE

WESTERLY HAVING A RADIUS OF 1573.00 FEET AND A CHORD BEARING OF N06°16'30"E AND A CHORD DISTANCE OF 332.25 FEET; THENCE RUN NORTHERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 12°07'29" FOR A DISTANCE OF 332.87 FEET TO THE POINT OF TANGENCY; THENCE RUN N00°12'45"E FOR A DISTANCE OF 15.15 FEET TO THE SOUTH LINE OF THE NORTHEAST 1/4 OF THE NORTHWEST 1/4 OF SAID SECTION 19, ALSO BEING THE SOUTH LINE OF THE PLAT OF SOLEIL AT WESTSIDE, RECORDED IN PLAT BOOK 32, PAGES 49 THROUGH 52 OF SAID PUBLIC RECORDS;

THENCE RUN S89°30'00"E ALONG SAID SOUTH LINE FOR A DISTANCE OF 132.01 FEET TO THE WEST RIGHT-OF-WAY LINE OF AN UNOPENED PLATTED 30.00 FOOT WIDE RIGHT-OF-WAY AS SHOWN ON THE AFORESAID PLAT OF FLORIDA FRUIT AND TRUCK COMPANY'S SUBDIVISION, RECORDED IN PLAT BOOK "B", PAGE 68 OF SAID PUBLIC RECORDS; THENCE RUN S00°12'45"W ALONG SAID WEST RIGHT-OF-WAY LINE, FOR A DISTANCE OF 700.15 FEET; THENCE, DEPARTING SAID WEST RIGHT-OF-WAY LINE, RUN S12°20'14"W FOR A DISTANCE OF 34.50 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE EASTERLY HAVING A RADIUS OF 1662.52 FEET AND A CHORD BEARING OF S05°57'36"W AND A CHORD DISTANCE OF 369.32 FEET; THENCE RUN SOUTHERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 12°45'15" FOR A DISTANCE OF 370.08 FEET TO THE POINT OF TANGENCY; THENCE RUN S00°25'01"E FOR A DISTANCE OF 962.68 FEET; THENCE RUN S02°50'30"E FOR A DISTANCE OF 111.04 FEET; THENCE RUN S17°42'33"W FOR A DISTANCE OF 122.38 FEET TO A NON-TANGENT CURVE CONCAVE NORTHEASTERLY HAVING A RADIUS OF 1357.00 FEET AND A CHORD BEARING OF S13°12'44"E AND A CHORD DISTANCE OF 149.83 FEET; THENCE RUN SOUTHEASTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 06°19'46" FOR A DISTANCE OF 149.91 FEET TO THE POINT OF TANGENCY; THENCE RUN S16°22'37"E FOR A DISTANCE OF 102.39 FEET TO THE AFORESAID WEST RIGHT-OF-WAY LINE OF AN UNOPENED PLATTED 30.00 FOOT WIDE RIGHT-OF-WAY; THENCE RUN S00°13'32"W ALONG SAID WEST RIGHT-OF-WAY LINE FOR A DISTANCE OF 125.67 FEET TO THE POINT OF BEGINNING.

CONTAINING 635,601 SQUARE FEET OR 14.5914 ACRES MORE OR LESS.



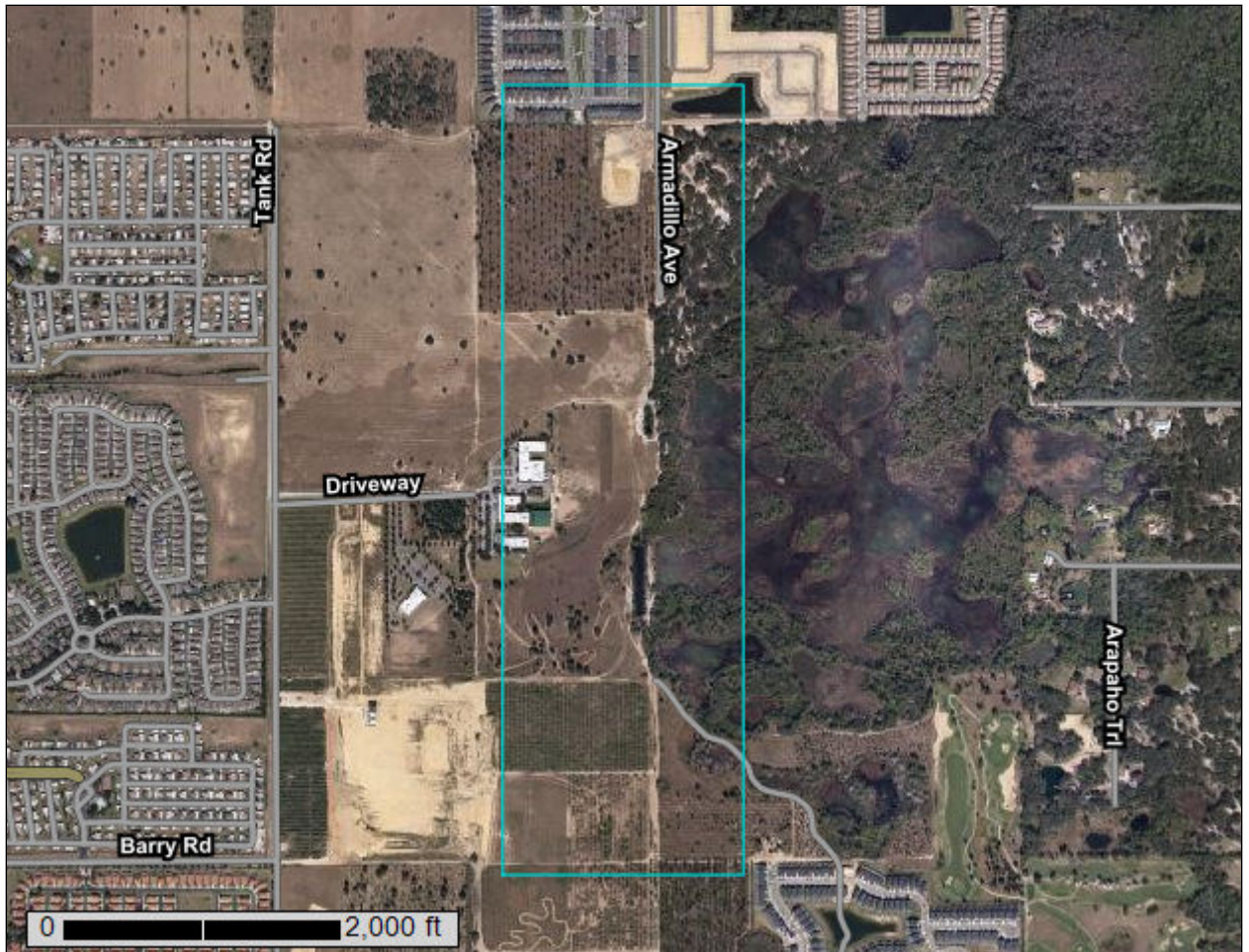
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Osceola County, Florida**



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

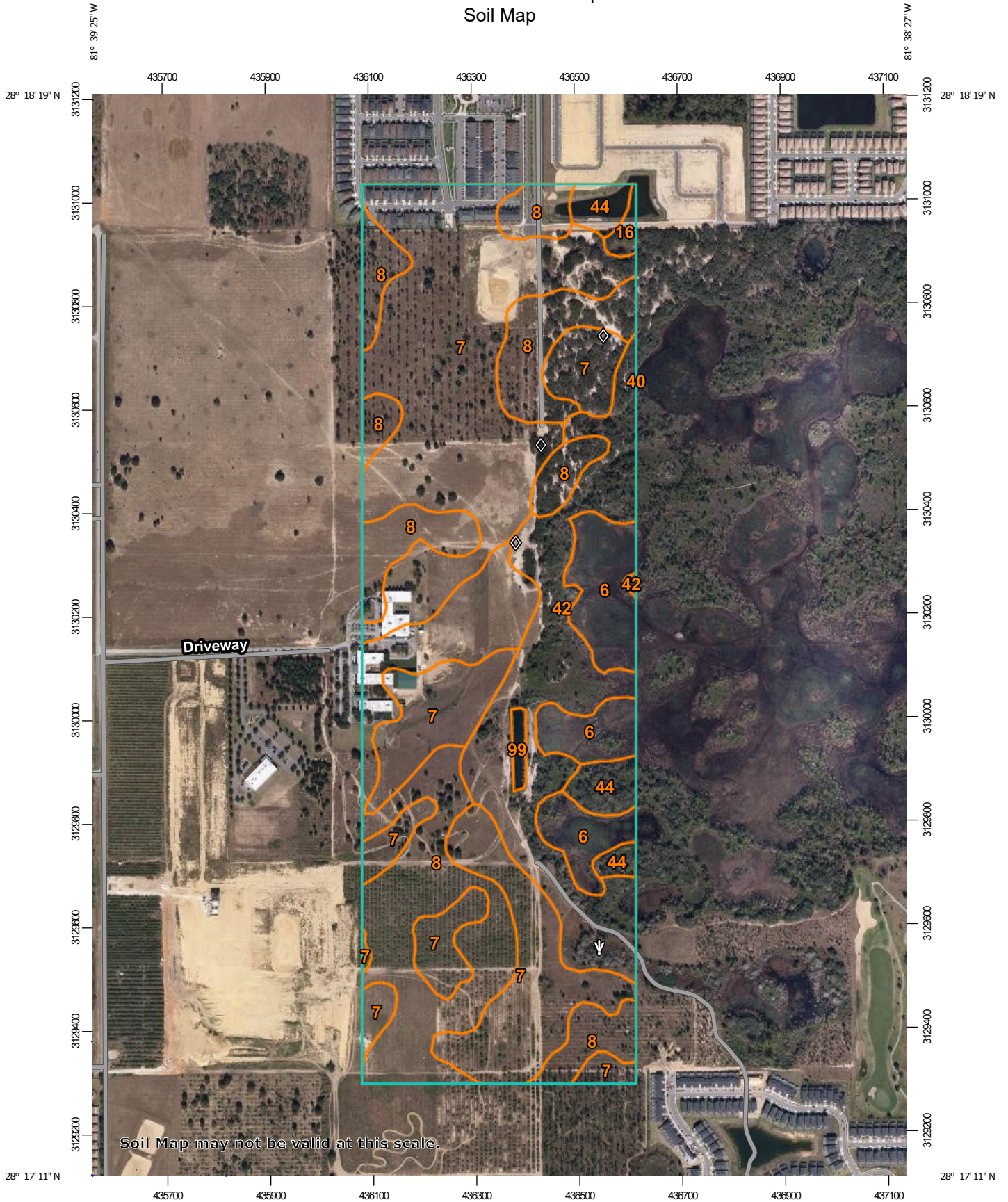
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

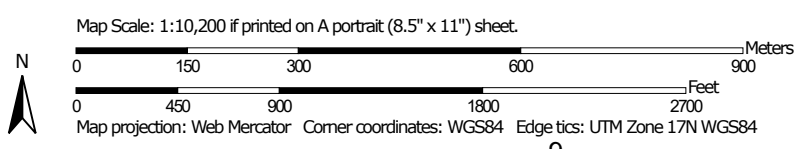
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.















Custom Soil Resource Report Soil Map



Soil Map may not be valid at this scale.



MAP LEGEND

	Area of Interest (AOI)		Spoil Area
	Area of Interest (AOI)		Stony Spot
Soils			Very Stony Spot
	Soil Map Unit Polygons		Wet Spot
	Soil Map Unit Lines		Other
	Soil Map Unit Points		Special Line Features
Special Point Features		Water Features	
	Blowout		Streams and Canals
	Borrow Pit	Transportation	
	Clay Spot		Rails
	Closed Depression		Interstate Highways
	Gravel Pit		US Routes
	Gravelly Spot		Major Roads
	Landfill		Local Roads
	Lava Flow		Background
	Marsh or swamp		Aerial Photography
	Mine or Quarry		
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Osceola County, Florida
 Survey Area Data: Version 18, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 28, 2020—Feb 4, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6	Basinger fine sand, depressional, 0 to 1 percent slopes	18.0	7.9%
7	Candler sand, 0 to 5 percent slopes	98.2	42.8%
8	Candler sand, 5 to 12 percent slopes	68.6	29.9%
16	Immokalee fine sand, 0 to 2 percent slopes	1.1	0.5%
40	Samsula muck, frequently ponded, 0 to 1 percent slopes	0.0	0.0%
42	Smyrna fine sand, 0 to 2 percent slopes	35.8	15.6%
44	Tavares fine sand, 0 to 5 percent slopes	6.5	2.9%
99	Water	1.0	0.4%
Totals for Area of Interest		229.3	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas

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are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Osceola County, Florida

6—Basinger fine sand, depressional, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2v16t
Elevation: 0 to 150 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 287 to 317 days
Farmland classification: Not prime farmland

Map Unit Composition

Basinger, depressional, and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Basinger, Depressional

Setting

Landform: Depressions on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 3 inches: fine sand
E - 3 to 8 inches: fine sand
E/Bh - 8 to 24 inches: fine sand
C - 24 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 50.02 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G154XB145FL)

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Other vegetative classification: Freshwater Marshes and Ponds (R154XY010FL),
Sandy soils on stream terraces, flood plains, or in depressions
(G154XB145FL)
Hydric soil rating: Yes

Minor Components

Smyrna

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R155XY003FL - South Florida Flatwoods
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G155XB141FL)
Hydric soil rating: No

Immokalee, hydric

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R154XY003FL - South Florida Flatwoods
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G154XB141FL)
Hydric soil rating: Yes

Floridana, hydric

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy over loamy soils on stream terraces, flood
plains, or in depressions (G154XB245FL)
Hydric soil rating: Yes

7—Candler sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2t3z1
Elevation: 10 to 260 feet
Mean annual precipitation: 47 to 56 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 280 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Candler and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Candler

Setting

Landform: Knolls on marine terraces, ridges on marine terraces

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope, interfluve, tread

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Eolian deposits and/or sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: sand

E - 6 to 63 inches: sand

E and Bt - 63 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water capacity: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: A

Forage suitability group: Sandy soils on ridges and dunes of xeric uplands

(G155XB111FL), Sandy soils on ridges and dunes of xeric uplands

(G154XB111FL)

Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL),

Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sandy soils on ridges and

dunes of xeric uplands (G155XB111FL), Sandy soils on ridges and dunes of

xeric uplands (G154XB111FL)

Hydric soil rating: No

Minor Components

Millhopper

Percent of map unit: 5 percent

Landform: Ridges on marine terraces

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

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Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL),
Sandy soils on rises, knolls, and ridges of mesic uplands (G154XB121FL)
Hydric soil rating: No

Tavares

Percent of map unit: 5 percent
Landform: Ridges on marine terraces
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, concave
Across-slope shape: Linear
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL),
Sandy soils on rises, knolls, and ridges of mesic uplands (G154XB121FL)
Hydric soil rating: No

8—Candler sand, 5 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2w0q4
Elevation: 30 to 160 feet
Mean annual precipitation: 44 to 56 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 290 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Candler and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Candler

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve, side slope, tread
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Eolian deposits and/or sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sand
E - 5 to 67 inches: sand
E and Bt - 67 to 80 inches: sand

Properties and qualities

Slope: 5 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low

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Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water capacity: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Forage suitability group: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL)

Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Sand Pine Scrub (R154XY001FL), Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL)

Hydric soil rating: No

Minor Components

Apopka

Percent of map unit: 6 percent

Landform: Ridges on marine terraces, knolls on marine terraces

Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Linear, convex

Across-slope shape: Convex, linear

Other vegetative classification: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL)

Hydric soil rating: No

Kendrick

Percent of map unit: 5 percent

Landform: Ridges on marine terraces

Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Sandy over loamy soils on knolls and ridges of mesic uplands (G154XB211FL)

Hydric soil rating: No

Adamsville

Percent of map unit: 3 percent

Landform: Rises on marine terraces, knolls on marine terraces

Landform position (three-dimensional): Interfluve, talf

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G154XB131FL)

Hydric soil rating: No

Pompano

Percent of map unit: 1 percent

Landform: Flats on marine terraces

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread, talf

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Down-slope shape: Linear
Across-slope shape: Linear, convex
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G154XB141FL)
Hydric soil rating: Yes

16—Immokalee fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2s3lk
Elevation: 0 to 130 feet
Mean annual precipitation: 44 to 56 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Immokalee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Immokalee

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 35 inches: fine sand
Bh - 35 to 54 inches: fine sand
BC - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 5.9 inches)

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Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Minor Components

Basinger

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Pomello

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, interfluve, riser
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R155XY001FL - Sand Pine Scrub
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

Wabasso

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Margate

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Placid

Percent of map unit: 1 percent

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Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL),
Sandy soils on stream terraces, flood plains, or in depressions
(G155XB145FL)
Hydric soil rating: Yes

40—Samsula muck, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzw9
Elevation: 0 to 250 feet
Mean annual precipitation: 44 to 63 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 335 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Samsula and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Samsula

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy marine deposits

Typical profile

Oa1 - 0 to 24 inches: muck
Oa2 - 24 to 32 inches: muck
Cg1 - 32 to 35 inches: sand
Cg2 - 35 to 44 inches: sand
Cg3 - 44 to 80 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent

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Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Very high (about 13.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Forage suitability group: Organic soils in depressions and on flood plains (G155XB645FL)
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL),
Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Minor Components

Basinger

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Myakka

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL),
Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Kaliga

Percent of map unit: 3 percent
Landform: Depressions on flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL),
Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Floridana

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL),
Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Hydric soil rating: Yes

Sanibel

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Anclote

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

42—Smyrna fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svzh
Elevation: 0 to 130 feet
Mean annual precipitation: 38 to 63 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Smyrna and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Smyrna

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 13 inches: fine sand
Bh - 13 to 18 inches: fine sand
C/Bw - 18 to 49 inches: fine sand
C - 49 to 80 inches: fine sand

Custom Soil Resource Report

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Minor Components

Eaugallie

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Basinger

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Immokalee

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Placid

Percent of map unit: 2 percent
Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL),
Sandy soils on stream terraces, flood plains, or in depressions
(G155XB145FL)
Hydric soil rating: Yes

Pomello

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, interfluve, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on
rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

44—Tavares fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2sw00
Elevation: 0 to 130 feet
Mean annual precipitation: 42 to 63 inches
Mean annual air temperature: 66 to 77 degrees F
Frost-free period: 340 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Tavares and similar soils: 83 percent
Minor components: 17 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tavares

Setting

Landform: Flats on marine terraces, hills on marine terraces, ridges on marine
terraces, knolls on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, side slope, tread, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand

Custom Soil Resource Report

C - 6 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: About 18 to 42 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water capacity: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)

Other vegetative classification: Sand Pine Scrub (R155XY001FL), Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)

Hydric soil rating: No

Minor Components

Cassia

Percent of map unit: 5 percent

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (three-dimensional): Tread, talf

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)

Hydric soil rating: No

Pomello

Percent of map unit: 4 percent

Landform: Ridges on marine terraces, knolls on marine terraces

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Side slope, interfluve, riser

Down-slope shape: Linear, convex

Across-slope shape: Linear

Ecological site: R155XY001FL - Sand Pine Scrub

Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)

Hydric soil rating: No

Apopka

Percent of map unit: 3 percent

Landform: Hills on marine terraces, ridges on marine terraces

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Side slope, interfluve, riser

Down-slope shape: Convex

Custom Soil Resource Report

Across-slope shape: Linear

Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R155XY002FL),
Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)

Hydric soil rating: No

Astatula

Percent of map unit: 3 percent

Landform: Hills on marine terraces, ridges on marine terraces, knolls on marine terraces

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Interfluve, side slope, riser, rise

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands
(G155XB111FL)

Hydric soil rating: No

Adamsville

Percent of map unit: 2 percent

Landform: Rises on marine terraces, knolls on marine terraces

Landform position (three-dimensional): Tread, rise

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Upland Hardwood Hammock (R155XY008FL),
Sandy soils on rises and knolls of mesic uplands (G155XB131FL)

Hydric soil rating: No

99—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified

Forage suitability group: Forage suitability group not assigned (G155XB999FL)

Other vegetative classification: Forage suitability group not assigned
(G155XB999FL)

Hydric soil rating: Unranked

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- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

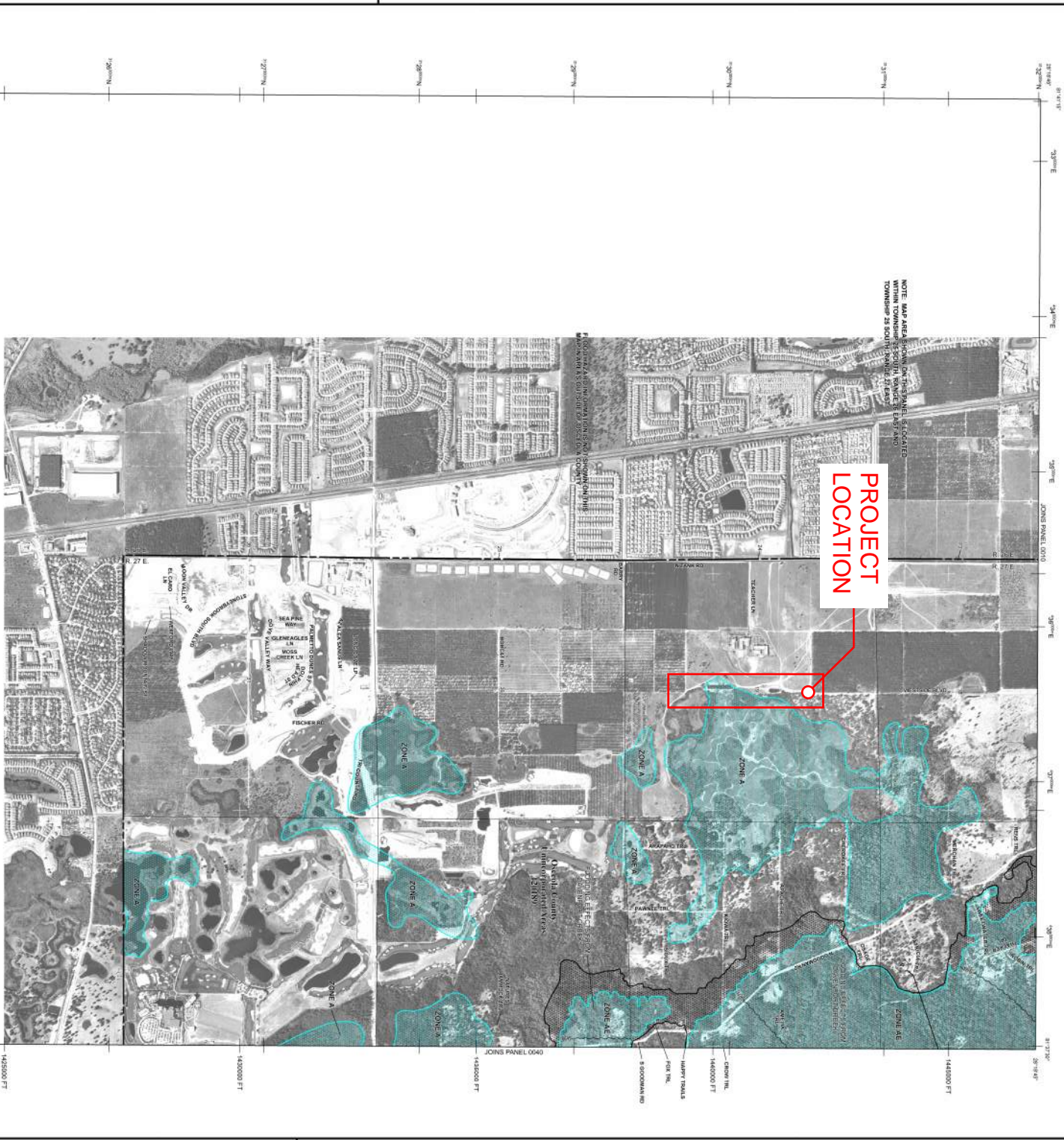
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NOTES TO USERS

The user is responsible for the National Flood Insurance Program (NFIP) and the Flood Insurance Study (FIS) that covers the project area. The Flood Insurance Study (FIS) is a periodic study of water subject to flooding, specifically for flood damage prevention and repair. The Flood Insurance Study (FIS) is a periodic study of water subject to flooding, specifically for flood damage prevention and repair. The Flood Insurance Study (FIS) is a periodic study of water subject to flooding, specifically for flood damage prevention and repair.

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NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 30 SOUTH, RANGE 16 EAST AND RANGE 16 WEST, SECTION 35 SOUTH, RANGE 16 EAST AND RANGE 16 WEST.

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO MAINTENANCE OF ANNUAL CHANCE FLOOD

ZONE A
Special Flood Hazard Area subject to maintenance of annual chance flood.

ZONE A.1
Special Flood Hazard Area subject to maintenance of annual chance flood, 1 to 1.67 feet (labeled area of protection) above flood elevation.

ZONE A.2
Special Flood Hazard Area subject to maintenance of annual chance flood, 1.67 to 2.33 feet (labeled area of protection) above flood elevation.

ZONE A.3
Special Flood Hazard Area subject to maintenance of annual chance flood, 2.33 to 3.00 feet (labeled area of protection) above flood elevation.

ZONE A.4
Special Flood Hazard Area subject to maintenance of annual chance flood, 3.00 to 3.67 feet (labeled area of protection) above flood elevation.

ZONE A.5
Special Flood Hazard Area subject to maintenance of annual chance flood, 3.67 to 4.33 feet (labeled area of protection) above flood elevation.

OTHER AREAS

ZONE X
Area determined to be subject to the special flood hazard.

UNDEVELOPED AREAS

UNDEVELOPED AREAS
Areas that are not developed and are not subject to the special flood hazard.

OTHER AREAS
Areas that are not subject to the special flood hazard.

CONVENTIONAL RESOURCES SYSTEM (CRS) AREAS

OTHER AREAS
Areas that are not subject to the special flood hazard.

OTHER AREAS
Areas that are not subject to the special flood hazard.

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE

OSCEOLA COUNTY, FLORIDA

AND INCORPORATED AREAS

PANEL 20 OF 900

DATE: 06/20/2018

MAP SCALE: 1" = 1000'

PROJECT: FIRM PANEL 20 OF 900

DATE: 06/20/2018

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NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE

OSCEOLA COUNTY, FLORIDA

AND INCORPORATED AREAS

PANEL 20 OF 900

DATE: 06/20/2018

MAP SCALE: 1" = 1000'

PROJECT: FIRM PANEL 20 OF 900

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PROJECT: FIRM PANEL 20 OF 900

DATE: 06/20/2018

PROJECT: FIRM PANEL 20 OF 900

DATE: 06/20/2018

PROJECT: FIRM PANEL 20 OF 900

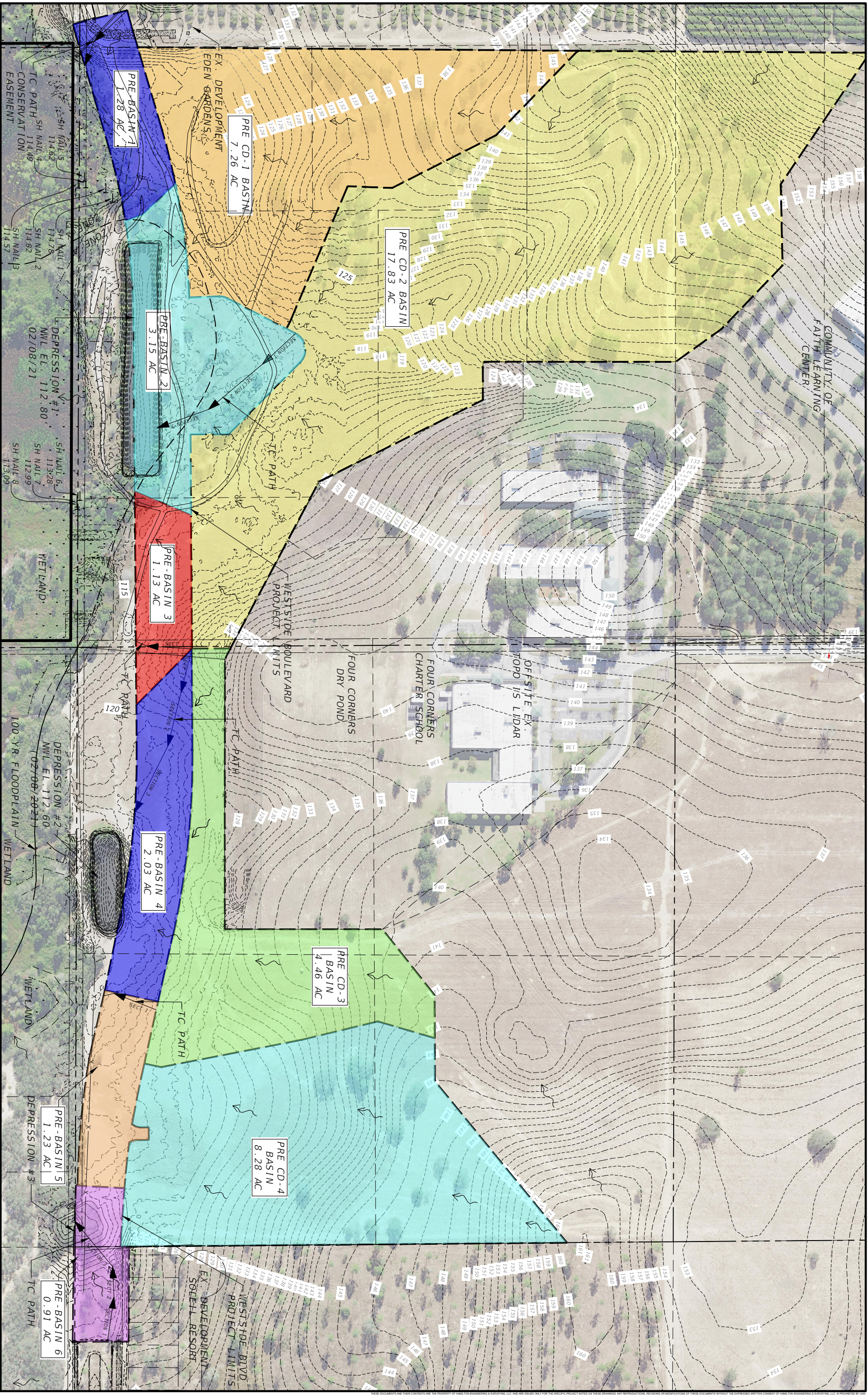
DATE: 06/20/2018

PROJECT: FIRM PANEL 20 OF 900

DATE: 06/20/2018

Appendix B

Pre Development Analysis



DATE	DESCRIPTION	DATE	DESCRIPTION	SHEET NO.
02/09/2023	REVISIONS FOR 90% SET			---
07/20/2023	REVISIONS FOR 100% SET/SF/WD RAI 1 COMMENTS			---

DATE	DESCRIPTION
JUL 25, 2023	DAVID A REID, P.E. P.E. LICENSE NUMBER 38794 HAMILTON ENGINEERING & SURVEYING, LLC 431 E. HORATIO AVE., SUITE 200 MAITLAND, FL 32751 (407) 629-8330 EXT 150

<p>OSCEOLA COUNTY TRANSPORTATION AND TRANSIT DEPARTMENT</p>	<p>PRE-DEVELOPMENT DRAINAGE MAP</p>
--	--

L:\35309\Learnar\Homes, LLC\0017 Westside Blvd EX\ENGR\02 MasterDesign\Ca\ca\Stormwater\100% Drainage Report\PRE-DEVEL-MAP.dwg (11x17)

Pre-Basin 1 10-72

```
=====
Basins
=====
Name: basin1          Node: offsite1      Status: Onsite
Group: BASE          Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256          Peaking Factor: 256.0
Rainfall File: Sfwmd72         Storm Duration(hrs): 72.00
Rainfall Amount(in): 7.800     Time of Conc(min): 10.00
Area(ac): 1.280               Time Shift(hrs): 0.00
Curve Number: 74.60           Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
```

```
=====
Nodes
=====
Name: offsite1      Base Flow(cfs): 0.000      Init Stage(ft): 114.080
Group: BASE         Type: Time/Stage          Warn Stage(ft): 116.150

Time(hrs)          Stage(ft)
-----
0.00               114.080
60.00              115.150
72.00              115.150
```

```
=====
Operating Tables
=====
Name:                Group: BASE
Type: Bottom Clip
Function: Time vs. Depth of Clip

Time(hrs)  Clip Depth(in)
-----

```

```
=====
Percolation Links
=====
Name:                Group: BASE
From Node:           To Node:
Flow: Both
Count: 1

Surface Area Option: Use 1st Point in Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev(ft): 0.000      Perimeter 1(ft): 0.000
Water Table Elev(ft): 0.000      Perimeter 2(ft): 0.000
*****0.000                      Perimeter 3(ft): 0.000
Horiz Conductivity(ft/day): 0.000 Distance 1 to 2(ft): 0.000
Vert Conductivity(ft/day): 0.000 Distance 2 to 3(ft): 0.000
Effective Porosity(dec): 0.000   Num Cells 1 to 2: 0
Suction Head(in): 0.000         Num Cells 2 to 3: 0
Layer Thickness(ft): 0.000
```

```
=====
Hydrology Simulations
=====
Name: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10YR-72HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 7.80

Time(hrs)          Print Inc(min)
-----
72.000             5.00
```

```
=====
Routing Simulations
=====
Name: 10YR-72HR          Hydrology Sim: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10YR-72HR.I32

Execute: Yes          Restart: No          Patch: No
Alternative: No

Max Delta Z(ft): 1.00          Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000        End Time(hrs): 72.00
Min Calc Time(sec): 0.50000   Max Calc Time(sec): 60.00000
Boundary Stages:              Boundary Flows:

Time(hrs)          Print Inc(min)
-----
999.000            15.000

Group              Run
```

BASE Yes

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
10YR-72HR	basin1	BASE	60.02	3.58	4.814	22368

Pre-Basin 2 10-72

==== Basins =====

```

Name: basin2                Node: DEP1                Status: Onsite
Group: BASE                 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256          Peaking Factor: 256.0
Rainfall File: Sfwmd72         Storm Duration(hrs): 72.00
Rainfall Amount(in): 7.800     Time of Conc(min): 10.00
Area(ac): 3.150               Time Shift(hrs): 0.00
Curve Number: 74.90           Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
  
```

==== Nodes =====

```

Name: DEP1                 Base Flow(cfs): 0.000     Init Stage(ft): 112.800
Group: BASE                Type: Stage/Volume        Warn Stage(ft): 114.500
  
```

Stage (ft)	Volume (af)
112.800	0.0000
113.000	0.1900
113.500	0.6800
114.000	1.1800
114.500	1.7000

```

Name: offsite1           Base Flow(cfs): 0.000     Init Stage(ft): 114.080
Group: BASE              Type: Time/Stage         Warn Stage(ft): 115.160
  
```

Time (hrs)	Stage (ft)
0.00	114.080
60.00	115.150
72.00	115.150

==== Operating Tables =====

```

Name:                    Group: BASE
Type: Bottom Clip
Function: Time vs. Depth of Clip
  
```

Time (hrs)	Clip Depth (in)
0.00	0.00
60.00	0.00
72.00	0.00

==== Weirs =====

```

Name: WEIR                From Node: DEP1
Group: BASE               To Node: offsite1
Flow: Both                Count: 1
Type: Vertical: Mavis     Geometry: Rectangular

Span(in): 1368.00
Rise(in): 99999.00
Invert(ft): 114.000
Control Elevation(ft): 112.800

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600
  
```

==== Percolation Links =====

```

Name:                    From Node:      Flow: Both
Group: BASE              To Node:      Count: 1
  
```

```

Surface Area Option: Use 1st Point in Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev(ft): 0.000           Perimeter 1(ft): 0.000
Water Table Elev(ft): 0.000           Perimeter 2(ft): 0.000
*****0.000                           Perimeter 3(ft): 0.000
Horiz Conductivity(ft/day): 0.000     Distance 1 to 2(ft): 0.000
Vert Conductivity(ft/day): 0.000     Distance 2 to 3(ft): 0.000
Effective Porosity(dec): 0.000       Num Cells 1 to 2: 0
Suction Head(in): 0.000              Num Cells 2 to 3: 0
Layer Thickness(ft): 0.000
  
```

==== Hydrology Simulations =====

Name: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10Y-72H.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 7.80

Time(hrs)	Print Inc(min)
72.000	5.00

==== Routing Simulations =====

Name: 10YR-72HR Hydrology Sim: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10Y-72H.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00	Delta Z Factor: 0.00500
Time Step Optimizer: 10.000	
Start Time(hrs): 0.000	End Time(hrs): 72.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

Time(hrs)	Print Inc(min)
999.000	15.000

Group	Run
BASE	Yes

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
DEP1	BASE	10YR-72HR	60.01	115.15	114.50	0.0050	48451	59.99	8.76	60.01	8.73
offsite1	BASE	10YR-72HR	60.01	115.15	115.16	0.0003	0	60.01	8.73	0.00	0.00

Pre-Basin 3 10-72

Basins
Name: basin3
Group: BASE
Node: offsite1
Type: SCS Unit Hydrograph CN
Status: Onsite
Unit Hydrograph: Uh256
Rainfall File: Sfwmd72
Rainfall Amount (in): 7.800
Area (ac): 1.130
Curve Number: 80.00
DCIA (%): 0.00
Peaking Factor: 256.0
Storm Duration (hrs): 72.00
Time of Conc (min): 10.00
Time Shift (hrs): 0.00
Max Allowable Q (cfs): 999999.000

Nodes
Name: offsite1
Group: BASE
Type: Time/Stage
Base Flow (cfs): 0.000
Init Stage (ft): 114.080
Warn Stage (ft): 116.150
Time (hrs) Stage (ft)
0.00 114.080
60.00 115.150
72.00 115.150

Operating Tables
Name:
Type: Bottom Clip
Function: Time vs. Depth of Clip
Group: BASE
Time (hrs) Clip Depth (in)

Percolation Links
Name:
Group: BASE
From Node:
To Node:
Flow: Both
Count: 1
Surface Area Option: Use 1st Point in Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev (ft): 0.000
Water Table Elev (ft): 0.000
*****0.000
Horiz Conductivity (ft/day): 0.000
Vert Conductivity (ft/day): 0.000
Effective Porosity (dec): 0.000
Suction Head (in): 0.000
Layer Thickness (ft): 0.000
Perimeter 1 (ft): 0.000
Perimeter 2 (ft): 0.000
Perimeter 3 (ft): 0.000
Distance 1 to 2 (ft): 0.000
Distance 2 to 3 (ft): 0.000
Num Cells 1 to 2: 0
Num Cells 2 to 3: 0

Hydrology Simulations
Name: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10YR-72HR.R32
Override Defaults: Yes
Storm Duration (hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount (in): 7.80
Time (hrs) Print Inc (min)
72.000 5.00

Routing Simulations
Name:
Filename:
Hydrology Sim:
Execute: No
Alternative: No
Restart: No
Patch: No
Max Delta Z (ft): 1.00
Time Step Optimizer: 10.000
Start Time (hrs): 0.000
Min Calc Time (sec): 0.5000
Boundary Stages:
Delta Z Factor: 0.00500
End Time (hrs): 0.00
Max Calc Time (sec): 60.0000
Boundary Flows:
Time (hrs) Print Inc (min)
999.000 15.000
Group Run

BASE Yes

Name: 10YR-72HR Hydrology Sim: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10YR-72HR.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 72.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
999.000	15.000

Group Run

BASE Yes

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
10YR-72HR	basin3	BASE	60.02	3.42	5.436	22297

Pre-Basin 4 10-72

==== Basins =====

Name: basin4 Node: DEP2 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 7.800 Time of Conc(min): 10.00
Area(ac): 2.030 Time Shift(hrs): 0.00
Curve Number: 53.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

==== Nodes =====

Name: DEP2 Base Flow(cfs): 0.000 Init Stage(ft): 112.600
Group: BASE Warn Stage(ft): 115.500
Type: Stage/Volume

Stage (ft)	Volume (af)
112.600	0.0000
113.000	0.1300
114.000	0.4600
115.000	0.8100

Name: offsite1 Base Flow(cfs): 0.000 Init Stage(ft): 114.080
Group: BASE Warn Stage(ft): 115.160
Type: Time/Stage

Time (hrs)	Stage (ft)
0.00	114.080
60.00	115.150
72.00	115.150

==== Operating Tables =====

Name: Group: BASE
Type: Bottom Clip
Function: Time vs. Depth of Clip

Time (hrs)	Clip Depth (in)
------------	-----------------

==== Weirs =====

Name: WEIR From Node: DEP2
Group: BASE To Node: offsite1
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Rectangular

Span(in): 1320.00
Rise(in): 99999.00
Invert(ft): 115.000
Control Elevation(ft): 112.600

TABLE
Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

==== Percolation Links =====

Name: From Node: Flow: Both
Group: BASE To Node: Count: 1

Surface Area Option: Use 1st Point in Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev(ft): 0.000 Perimeter 1(ft): 0.000
Water Table Elev(ft): 0.000 Perimeter 2(ft): 0.000
*****0.000 Perimeter 3(ft): 0.000
Horiz Conductivity(ft/day): 0.000 Distance 1 to 2(ft): 0.000
Vert Conductivity(ft/day): 0.000 Distance 2 to 3(ft): 0.000
Effective Porosity(dec): 0.000 Num Cells 1 to 2: 0
Suction Head(in): 0.000 Num Cells 2 to 3: 0
Layer Thickness(ft): 0.000

==== Hydrology Simulations =====

Name: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10Y-72H.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 7.80

Time(hrs)	Print Inc(min)
72.000	60.00

=====
==== Routing Simulations =====
=====

Name: 10YR-72HR Hydrology Sim: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10Y-72H.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00	Delta Z Factor: 0.00500
Time Step Optimizer: 10.000	
Start Time(hrs): 0.000	End Time(hrs): 72.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

Time(hrs)	Print Inc(min)
999.000	15.000

Group	Run
BASE	Yes

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
DEP2	BASE	10YR-72HR	60.02	115.15	115.50	0.0050	15816	60.00	3.24	60.02	3.20
offsite1	BASE	10YR-72HR	60.02	115.15	115.16	0.0003	0	60.02	3.20	0.00	0.00

Pre-Basin 5 10-72

==== Basins =====

```

Name: basin5                Node: offsite1            Status: Onsite
Group: BASE                 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256                Peaking Factor: 256.0
Rainfall File: Sfwmd72                Storm Duration(hrs): 72.00
Rainfall Amount(in): 7.800            Time of Conc(min): 10.00
Area(ac): 1.230                      Time Shift(hrs): 0.00
Curve Number: 53.00                 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
  
```

==== Nodes =====

```

Name: offsite1              Base Flow(cfs): 0.000      Init Stage(ft): 115.150
Group: BASE                 Type: Time/Stage           Warn Stage(ft): 115.160
  
```

Time(hrs)	Stage(ft)
0.00	114.080
60.00	115.150
72.00	115.150

==== Operating Tables =====

```

Name:                        Group: BASE
Type: Bottom Clip
Function: Time vs. Depth of Clip
  
```

Time(hrs)	Clip Depth(in)

==== Percolation Links =====

```

Name:                        From Node:                Flow: Both
Group: BASE                 To Node:                  Count: 1

Surface Area Option: Use 1st Point in Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev(ft): 0.000      Perimeter 1(ft): 0.000
Water Table Elev(ft): 0.000      Perimeter 2(ft): 0.000
*****0.000                      Perimeter 3(ft): 0.000
Horiz Conductivity(ft/day): 0.000 Distance 1 to 2(ft): 0.000
Vert Conductivity(ft/day): 0.000 Distance 2 to 3(ft): 0.000
Effective Porosity(dec): 0.000    Num Cells 1 to 2: 0
Suction Head(in): 0.000          Num Cells 2 to 3: 0
Layer Thickness(ft): 0.000
  
```

==== Hydrology Simulations =====

```

Name: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10Y-72H.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 7.80
  
```

Time(hrs)	Print Inc(min)
72.000	60.00

==== Routing Simulations =====

```

Name: 10YR-72HR              Hydrology Sim: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10Y-72H.I32

Execute: Yes                 Restart: No                Patch: No
Alternative: No

Max Delta Z(ft): 1.00        Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000      End Time(hrs): 72.00
Min Calc Time(sec): 0.50000 Max Calc Time(sec): 60.00000
Boundary Stages:            Boundary Flows:
  
```

Time(hrs)	Print Inc(min)
999.000	15.000

Group Run

BASE Yes

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
10YR-72HR	basin5	BASE	60.02	1.99	2.437	10883

Pre-Basin 6 10-72

==== Basins =====

```

Name: basin6                Node: DEP3                Status: Onsite
Group: BASE                 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256                Peaking Factor: 256.0
Rainfall File: Sfwmd72                Storm Duration(hrs): 72.00
Rainfall Amount(in): 7.800            Time of Conc(min): 10.00
Area(ac): 0.910                    Time Shift(hrs): 0.00
Curve Number: 53.00                Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
  
```

==== Nodes =====

```

Name: DEP3                Base Flow(cfs): 0.000            Init Stage(ft): 115.000
Group: BASE                Type: Stage/Volume                Warn Stage(ft): 119.000
  
```

Stage (ft)	Volume (af)
115.000	0.0000
116.000	0.0400
117.000	0.1300
118.000	0.2600
119.000	0.4400

```

Name: offsite1            Base Flow(cfs): 0.000            Init Stage(ft): 114.080
Group: BASE                Type: Time/Stage                Warn Stage(ft): 115.160
  
```

Time (hrs)	Stage (ft)
0.00	114.080
60.00	115.150
72.00	115.150

==== Operating Tables =====

```

Name:                    Group: BASE
Type: Bottom Clip
Function: Time vs. Depth of Clip
  
```

Time (hrs)	Clip Depth (in)

==== Weirs =====

```

Name: WEIR                From Node: DEP3
Group: BASE                To Node: offsite1
Flow: Both                Count: 1
Type: Vertical: Mavis      Geometry: Rectangular

Span(in): 960.00
Rise(in): 99999.00
Invert(ft): 119.000
Control Elevation(ft): 115.000

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600
  
```

==== Percolation Links =====

```

Name:                    From Node:                Flow: Both
Group: BASE                To Node:                    Count: 1
  
```

```

Surface Area Option: Use 1st Point in Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev(ft): 0.000                Perimeter 1(ft): 0.000
Water Table Elev(ft): 0.000                Perimeter 2(ft): 0.000
*****0.000                                Perimeter 3(ft): 0.000
Horiz Conductivity(ft/day): 0.000          Distance 1 to 2(ft): 0.000
Vert Conductivity(ft/day): 0.000          Distance 2 to 3(ft): 0.000
Effective Porosity(dec): 0.000            Num Cells 1 to 2: 0
Suction Head(in): 0.000                  Num Cells 2 to 3: 0
Layer Thickness(ft): 0.000
  
```

==== Hydrology Simulations =====

Name: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10Y-72H.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 7.80

Time(hrs)	Print Inc(min)
72.000	60.00

==== Routing Simulations =====

Name: 10YR-72HR Hydrology Sim: 10YR-72HR
Filename: C:\Users\erica\Desktop\ICPR3 Storms\10Y-72H.I32

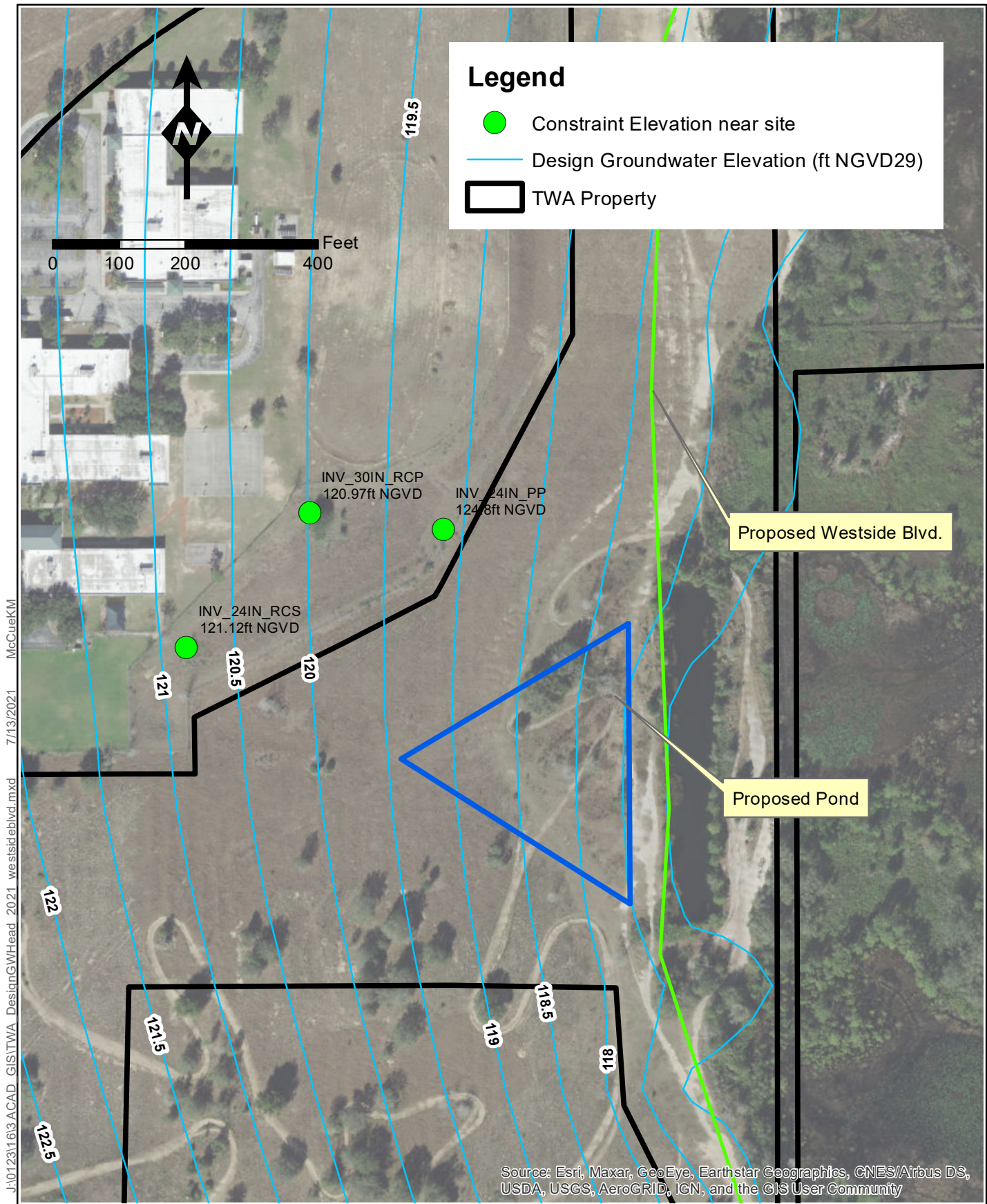
Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00	Delta Z Factor: 0.00500
Time Step Optimizer: 10.000	
Start Time(hrs): 0.000	End Time(hrs): 72.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

Time(hrs)	Print Inc(min)
999.000	15.000

Group	Run
BASE	Yes

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
DEP3	BASE	10YR-72HR	72.00	117.77	119.00	0.0050	6307	60.00	1.45	0.00	0.00
offsite1	BASE	10YR-72HR	60.00	115.15	115.16	0.0003	0	0.00	0.00	0.00	0.00



ROYAL CONSULTING SERVICES, INC.

Figure 1
Model Predicted Groundwater Elevation
at the End of the Wet Season

ONLINE VERTICAL DATUM TRANSFORMATION

INTEGRATING AMERICA'S ELEVATION DATA

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- Docs & Support
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Regional Information

* Region :

Horizontal Information

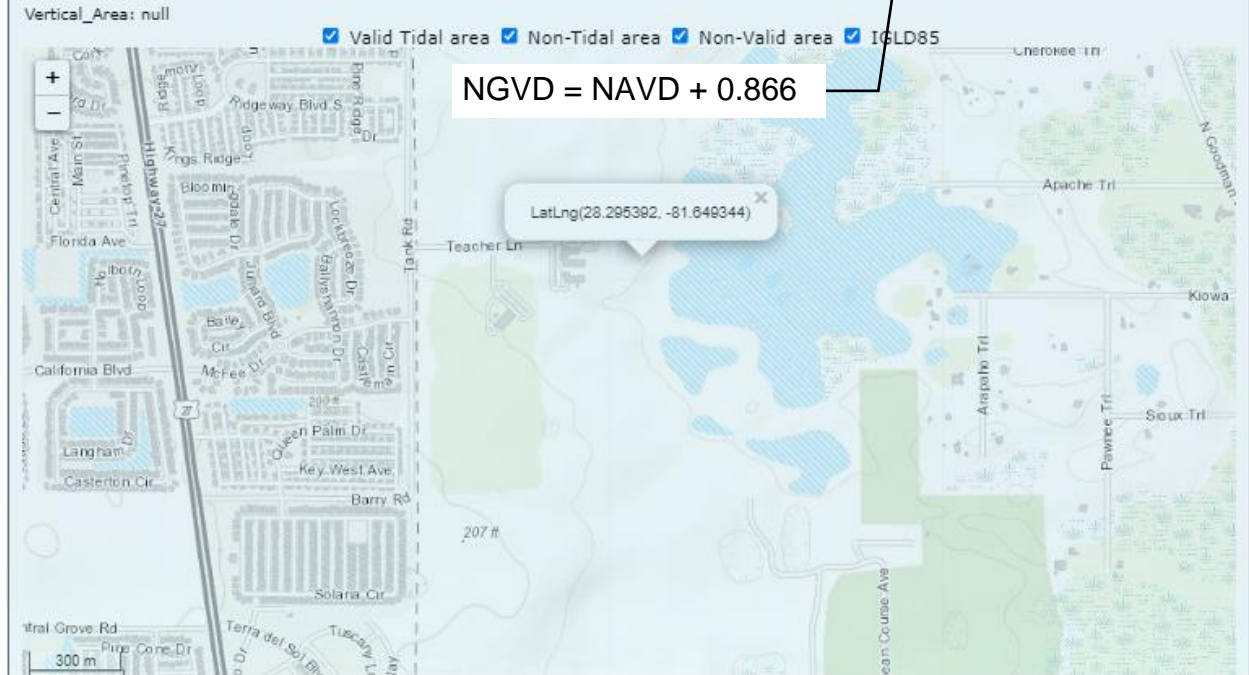
	Source	Target
Reference Frame:	<input type="text" value="NAD 1927"/>	<input type="text" value="NAD 1927"/>
Coor. System:	<input type="text" value="Geographic (Longitude, Latitude)"/>	<input type="text" value="Geographic (Longitude, Latitude)"/>
Unit:	<input type="text" value="meter (m)"/>	<input type="text" value="meter (m)"/>
Zone:	<input type="text" value="ALE - 0101"/>	<input type="text" value="ALE - 0101"/>

Vertical Information

	Source	Target
Reference Frame:	<input type="text" value="NAVD 88"/>	<input type="text" value="NGVD 1929"/>
Unit:	<input type="text" value="foot (International) (ft)"/>	<input type="text" value="foot (International) (ft)"/>
	<input checked="" type="radio"/> Height <input type="radio"/> Sounding	<input checked="" type="radio"/> Height <input type="radio"/> Sounding
	<input type="checkbox"/> GEOID model: <input type="text"/>	<input type="checkbox"/> GEOID model: <input type="text"/>

Point Conversion ASCII File Conversion

Input		Output	
Latitude:	<input type="text" value="28.295392"/>	Latitude:	<input type="text" value="28.2951068771"/>
Longitude:	<input type="text" value="-81.649344"/>	Longitude:	<input type="text" value="-81.6495523722"/>
Height:	<input type="text"/>	Height:	<input type="text" value="0.866"/>
<input type="button" value="Drive to on map"/> <input type="button" value="Reset Map"/>		<input type="button" value="Drive to on map"/> <input type="button" value="Reset Map"/>	
<input type="checkbox"/> to DMS		Vertical Uncertainty (+/-): 0.164059 ft	



Appendix C

Post Development Analysis

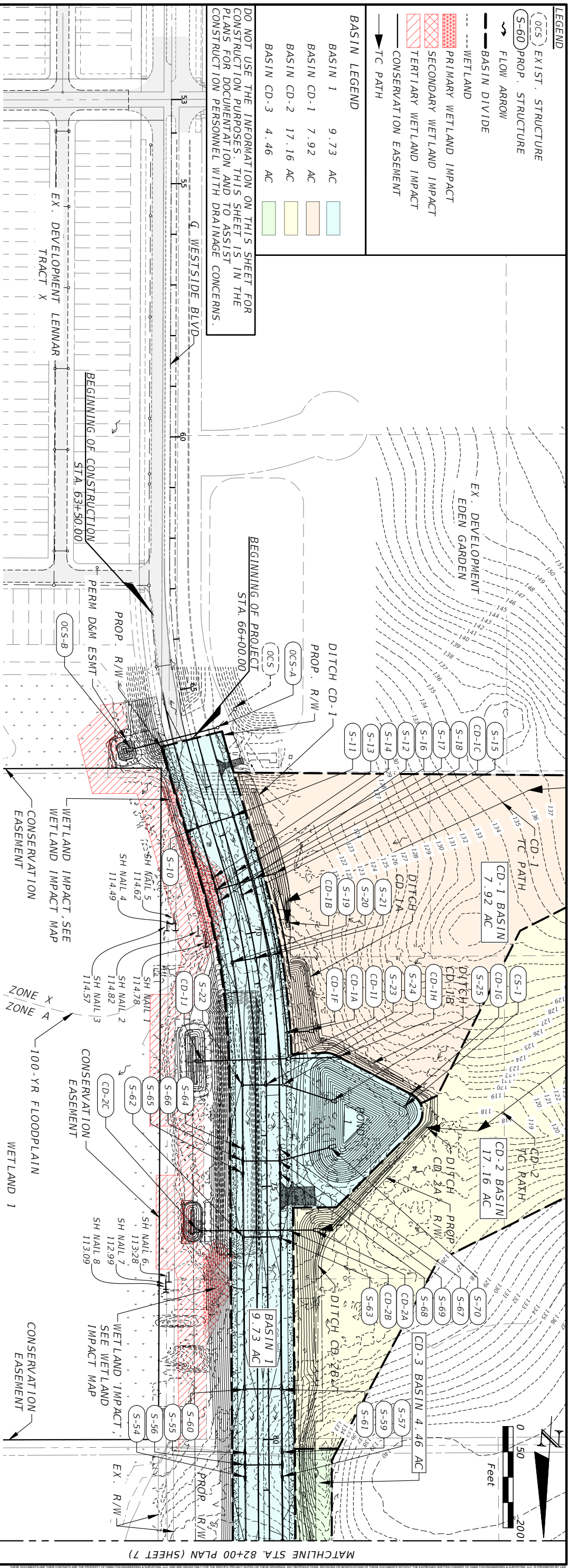
LEGEND

- (OCS) EXIST. STRUCTURE
- (S-60) PROP. STRUCTURE
- FLOW ARROW
- BASIN DIVIDE
- - - WETLAND
- ▨ PRIMARY WETLAND IMPACT
- ▨ SECONDARY WETLAND IMPACT
- ▨ TERTIARY WETLAND IMPACT
- CONSERVATION EASEMENT
- TC PATH

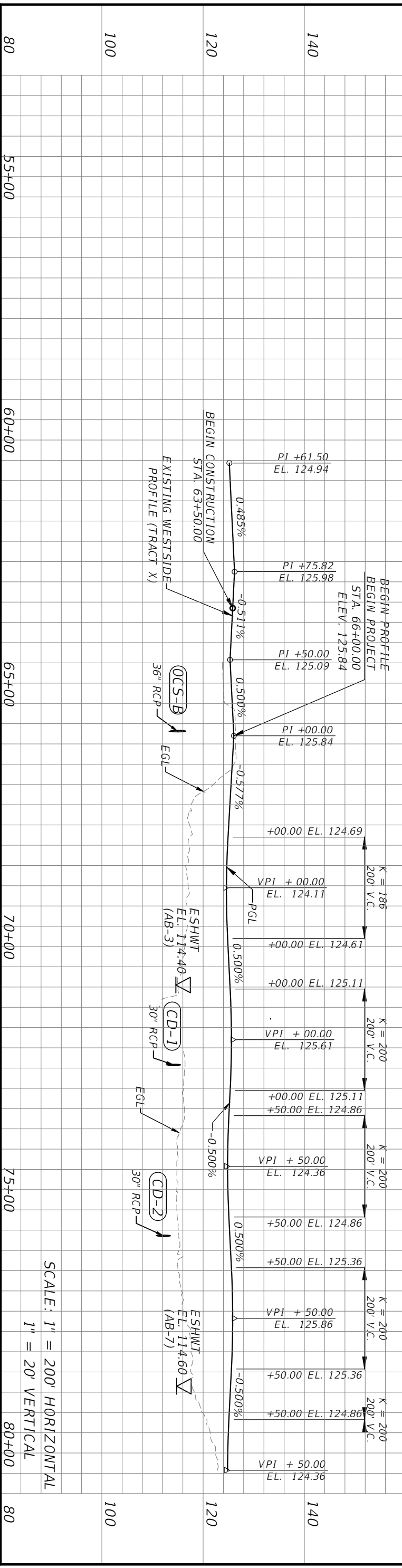
BASIN LEGEND

BASIN 1	9.73 AC	
BASIN CD-1	7.92 AC	
BASIN CD-2	17.16 AC	
BASIN CD-3	4.46 AC	

DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES. THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND TO ASSIST CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS.



MATCHLINE STA. 82+00 PLAN (SHEET 7)



SCALE: 1" = 200' HORIZONTAL
1" = 20' VERTICAL

DATE	DESCRIPTION	DATE	DESCRIPTION

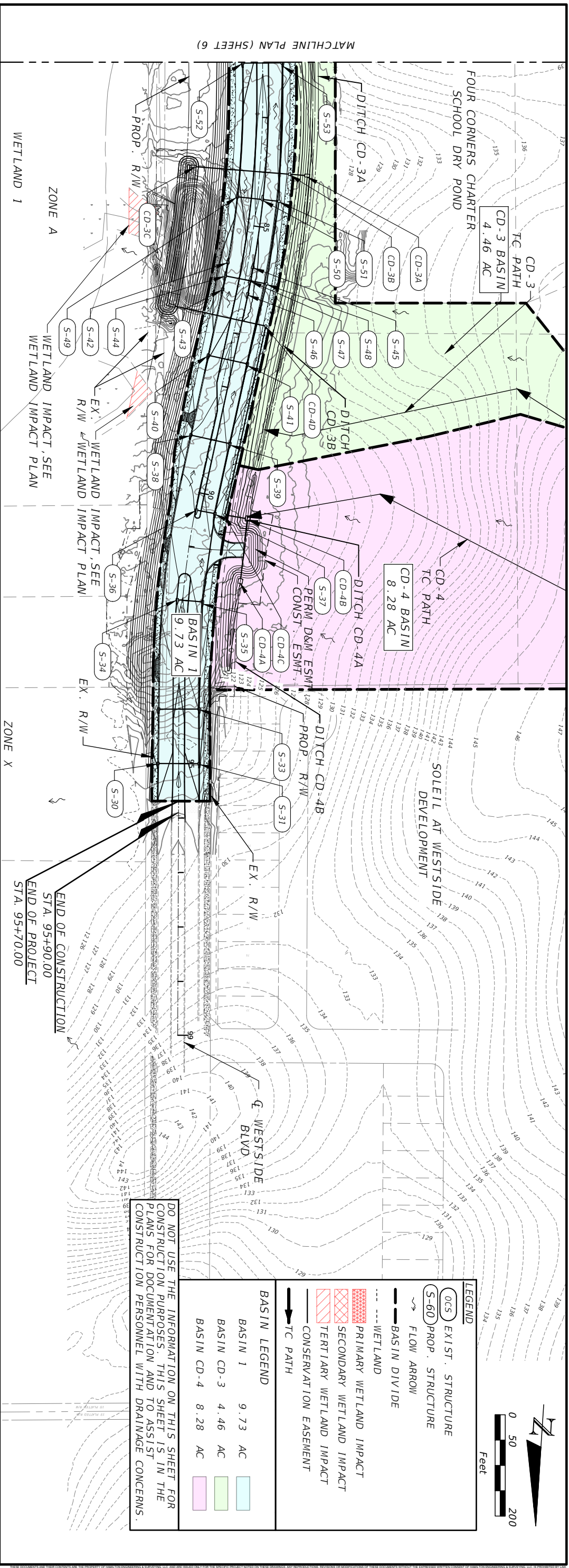
DATE	DESCRIPTION	DATE	DESCRIPTION

DAVID A. REID, P.E.
P.E. LICENSE NUMBER 38794
HAMILTON ENGINEERING & SURVEYING, LLC
431 E. HORATIO AVE., SUITE 200
MAITLAND, FL 32751
(407) 629-8330 EXT 150

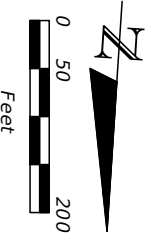


DRAINAGE MAP (1)

SHEET NO.	6
-----------	---

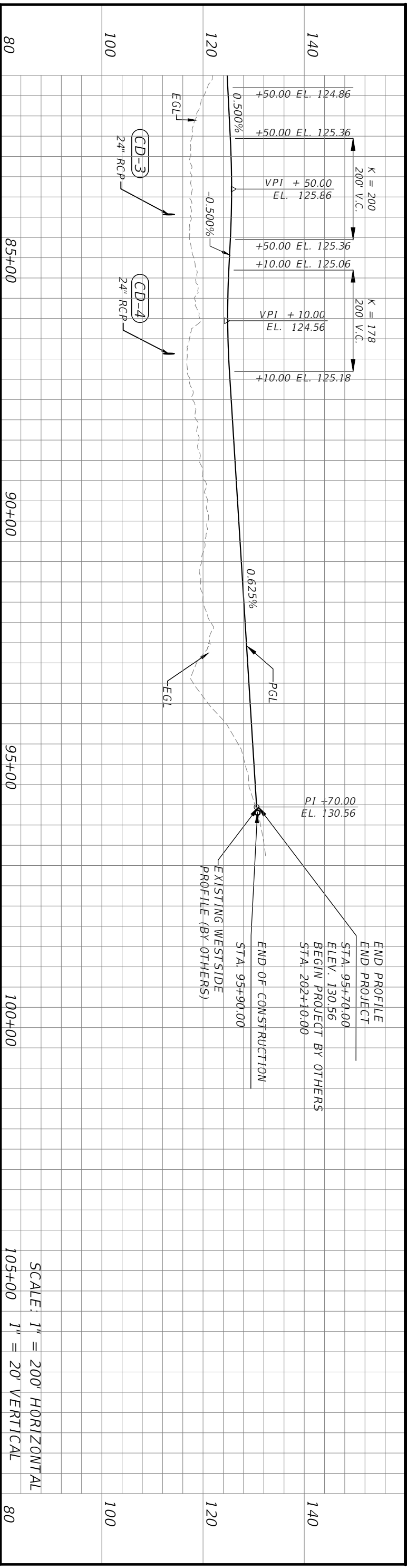


MATCHLINE PLAN (SHEET 6)



DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES. THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND TO ASSIST CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS.

LEGEND	
	EXIST. STRUCTURE
	PROP. STRUCTURE
	FLOW ARROW
	BASIN DIVIDE
	WETLAND
	PRIMARY WETLAND IMPACT
	SECONDARY WETLAND IMPACT
	TERTIARY WETLAND IMPACT
	CONSERVATION EASEMENT
	TC PATH
BASIN LEGEND	
	BASIN 1 9.73 AC
	BASIN CD-3 4.46 AC
	BASIN CD-4 8.28 AC



SCALE: 1" = 200' HORIZONTAL
1" = 20' VERTICAL

DATE	DESCRIPTION	DATE	DESCRIPTION

DAVID A. REID, P.E. P.E. LICENSE NUMBER 38794 HAMILTON ENGINEERING & SURVEYING, LLC 431 E. HORATIO AVE., SUITE 200 MAITLAND, FL 32751 (407) 629-8330 EXT 150	 OSCEOLA COUNTY TRANSPORTATION AND TRANSIT DEPARTMENT	DRAINAGE MAP (2)	SHEET NO. 7
---	---	-------------------------	-------------

Project No.: 53509.0017
Project Name: Westside Boulevard Extension - Osceola County 66+00
Calculations by: EA

SFWMD - WATER QUALITY CRITERIA

WET DETENTION "POND 1"

CONTRIBUTING BASINS: BASIN 1

Basin Area =	9.73	acres	100%
Pervious Area =	4.24	acres	44%
Wet Detention Area =	0.52	acres	5%
Building Area =	0	acres	0%
Impervious Area =	4.93	acres	51%

(excluding pond & building area)

1. Compute the first 1-inch of runoff from the developed project

$$\begin{aligned}
 &= 1 \text{ inch} \times 9.73 \text{ acres} \times (1\text{ft}/12\text{in}) \\
 &= \mathbf{0.81} \text{ ac-ft} \text{ for the first inch of runoff}
 \end{aligned}$$

2. Compute 2.5-inches times the percentage of imperviousness:

a. Site area for water quality pervious/impervious calculations only:

$$\begin{aligned}
 &= \text{Total project} - (\text{Wet Detention Area} + \text{Building Area}) \\
 &= 9.73 \text{ acres} - 0.52 \text{ acres} + 0 \text{ acres} \\
 &= \mathbf{9.21} \text{ acres of site area for water quality pervious/impervious}
 \end{aligned}$$

b. Impervious area for water quality pervious/impervious calculations only:

$$\begin{aligned}
 &= (\text{Site Area for water quality pervious/impervious}) - \text{pervious area} \\
 &= 9.21 \text{ acres} - 4.24 \text{ acres} \\
 &= \mathbf{4.97} \text{ acres}
 \end{aligned}$$

c. Percentage of impervious for water quality:

$$\begin{aligned}
 &= (\text{Impervious area for water quality} / \text{Site area for water quality}) \times 100 \% \\
 &= (4.97 / 9.21) \times 100\% \\
 &= \mathbf{54\%}
 \end{aligned}$$

d. For 2.5 inches times the percentage impervious:

$$\begin{aligned}
 &= 2.5 \text{ inches} \times 0.54 \\
 &= \mathbf{1.35} \text{ inches to be treated}
 \end{aligned}$$

e. Compute the volume required for water quality WET detention:

$$\begin{aligned}
 &= 1.35 \text{ inches} \times (9.73 \text{ acres} - 0.52 \text{ acres}) \times (1\text{ft}/12\text{in}) \\
 &= \mathbf{1.04} \text{ acre-ft required for WET detention}
 \end{aligned}$$

3. Additional 50% water quality to prevent further degradation to the receiving water body:

$$\begin{aligned}
 &= \text{Max. required water quality volume} \times 1.5 \\
 &= \mathbf{1.04} \times 1.50 \\
 &= \mathbf{1.55} \text{ acre-ft required for WET detention storage} \\
 &= \mathbf{67654} \text{ CF required for WET detention storage}
 \end{aligned}$$

==== Basins =====

```

Name: basin1           Node: pond1           Status: Onsite
Group: BASE           Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256           Peaking Factor: 256.0
Rainfall File: Sfwmd72         Storm Duration(hrs): 72.00
Rainfall Amount (in): 6.000    Time of Conc(min): 19.64
Area(ac): 9.730               Time Shift(hrs): 0.00
Curve Number: 81.39           Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
    
```

```

Name: CD-1           Node: CD-1I           Status: Onsite
Group: BASE           Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256           Peaking Factor: 256.0
Rainfall File: Sfwmd72         Storm Duration(hrs): 72.00
Rainfall Amount (in): 7.800    Time of Conc(min): 10.00
Area(ac): 7.920               Time Shift(hrs): 0.00
Curve Number: 53.00           Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
    
```

==== Nodes =====

```

Name: CD-1I           Base Flow(cfs): 0.000   Init Stage(ft): 111.150
Group: BASE           Plunge Factor: 1.00    Warn Stage(ft): 126.430
Type: Manhole, Flat Floor
    
```

6' DIA MH (DUMMY NODE)

Stage (ft)	Area (ac)
111.150	0.0006
126.430	0.0006

```

Name: offsite1       Base Flow(cfs): 0.000   Init Stage(ft): 114.080
Group: BASE           Warn Stage(ft): 115.160
Type: Time/Stage
    
```

Time (hrs)	Stage (ft)
0.00	114.080
60.00	115.150
72.00	115.150

```

Name: pond1           Base Flow(cfs): 0.000   Init Stage(ft): 117.250
Group: BASE           Warn Stage(ft): 122.600
Type: Stage/Volume
    
```

Stage (ft)	Volume (af)
117.250	0.0000
118.000	0.4200
119.000	1.0600
120.000	1.7900
121.000	2.6100
122.000	3.5200
122.500	4.0000

==== Operating Tables =====

```

Name:                 Group: BASE
Type: Bottom Clip
Function: Time vs. Depth of Clip
    
```

Time (hrs)	Clip Depth (in)

==== Pipes =====

```

Name: CD-1           From Node: CD-1I       Length(ft): 160.00
Group: BASE           To Node: offsite1     Count: 1

UPSTREAM              DOWNSTREAM              Friction Equation: Automatic
Geometry: Circular    Circular                Solution Algorithm: Most Restrictive
Span (in): 30.00      30.00                  Flow: Both
Rise (in): 30.00     30.00                  Entrance Loss Coef: 0.00
Invert (ft): 112.840  112.500                Exit Loss Coef: 1.00
Manning's N: 0.013000 0.013000              Bend Loss Coef: 0.00
Top Clip (in): 0.000  0.000                  Outlet Ctrl Spec: Use dc or tw
Bot Clip (in): 0.000  0.000                  Inlet Ctrl Spec: Use dc
Stabilizer Option: None
    
```

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==== Drop Structures =====

Name: CS-1	From Node: pond1	Length(ft): 288.00
Group: BASE	To Node: CD-1I	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 0.000
Invert(ft): 113.440	112.870	Exit Loss Coef: 1.000
Manning's N: 0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Circular	Orifice Disc Coef: 0.600	
Span(in): 3.00	Invert(ft): 117.250	
Rise(in): 3.00	Control Elev(ft): 117.250	

*** Weir 2 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 48.00	Invert(ft): 120.000	
Rise(in): 99999.00	Control Elev(ft): 117.250	

*** Weir 3 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 168.00	Invert(ft): 122.000	
Rise(in): 999999.00	Control Elev(ft): 117.250	

==== Weirs =====

Name:	From Node:
Group: BASE	To Node:
Flow: Both	Count: 1
Type: Horizontal	Geometry: Circular

Span(in): 0.00	TABLE
Rise(in): 0.00	
Invert(ft): 0.000	
Control Elevation(ft): 0.000	
Bottom Clip(in): 0.000	
Top Clip(in): 0.000	
Weir Discharge Coef: 3.200	
Orifice Discharge Coef: 0.600	

==== Percolation Links =====

Name:	From Node:	Flow: Both
Group: BASE	To Node:	Count: 1

Surface Area Option: Use 1st Point in Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm

Aquifer Base Elev(ft): 0.000	Perimeter 1(ft): 0.000
Water Table Elev(ft): 0.000	Perimeter 2(ft): 0.000
*****0.000	Perimeter 3(ft): 0.000
Horiz Conductivity(ft/day): 0.000	Distance 1 to 2(ft): 0.000
Vert Conductivity(ft/day): 0.000	Distance 2 to 3(ft): 0.000
Effective Porosity(dec): 0.000	Num Cells 1 to 2: 0
Suction Head(in): 0.000	Num Cells 2 to 3: 0
Layer Thickness(ft): 0.000	

==== Hydrology Simulations =====

Name: 10YR-24HR
Filename: C:\Users\verica\Desktop\ICPR3 Storms\10Y-24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount (in): 6.00

Time(hrs)	Print Inc(min)
24.000	5.00

==== Routing Simulations =====

Name: 10YR-24HR Hydrology Sim: 10YR-24HR
Filename: C:\Users\verica\Desktop\ICPR3 Storms\10Y-24H.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	15.000

Group	Run
BASE	Yes

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs
pond1	BASE	10YR-24HR	14.09	120.31	122.60	0.0050	34979	12.17	19.83	14.09

POST DEV. 10-72

==== Basins =====

```

Name: basin1          Node: pond1          Status: Onsite
Group: BASE          Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256          Peaking Factor: 256.0
Rainfall File: Sfwmd72        Storm Duration(hrs): 72.00
Rainfall Amount (in): 7.800    Time of Conc(min): 19.64
Area(ac): 9.730              Time Shift(hrs): 0.00
Curve Number: 81.39          Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
    
```

```

Name: CD-1           Node: CD-1I          Status: Onsite
Group: BASE          Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256          Peaking Factor: 256.0
Rainfall File: Sfwmd72        Storm Duration(hrs): 72.00
Rainfall Amount (in): 7.800    Time of Conc(min): 10.00
Area(ac): 7.920              Time Shift(hrs): 0.00
Curve Number: 53.00          Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
    
```

==== Nodes =====

```

Name: CD-1I          Base Flow(cfs): 0.000    Init Stage(ft): 111.150
Group: BASE          Plunge Factor: 1.00      Warn Stage(ft): 126.430
Type: Manhole, Flat Floor
    
```

6' DIA MH (DUMMY NODE)

Stage (ft)	Area (ac)
111.150	0.0006
126.430	0.0006

```

Name: offsite1       Base Flow(cfs): 0.000    Init Stage(ft): 114.080
Group: BASE          Warn Stage(ft): 115.160
Type: Time/Stage
    
```

Time (hrs)	Stage (ft)
0.00	114.080
60.00	115.150
72.00	115.150

```

Name: pond1          Base Flow(cfs): 0.000    Init Stage(ft): 117.250
Group: BASE          Warn Stage(ft): 122.600
Type: Stage/Volume
    
```

Stage (ft)	Volume (af)
117.250	0.0000
118.000	0.4200
119.000	1.0600
120.000	1.7900
121.000	2.6100
122.000	3.5200
122.500	4.0000

==== Operating Tables =====

```

Name:                Group: BASE
Type: Bottom Clip
Function: Time vs. Depth of Clip
    
```

Time (hrs)	Clip Depth (in)

==== Pipes =====

```

Name: CD-1           From Node: CD-1I       Length(ft): 160.00
Group: BASE          To Node: offsite1     Count: 1

UPSTREAM              DOWNSTREAM              Friction Equation: Automatic
Geometry: Circular    Circular                Solution Algorithm: Most Restrictive
Span (in): 30.00      30.00                  Flow: Both
Rise (in): 30.00      30.00                  Entrance Loss Coef: 0.00
Invert (ft): 112.840  112.500                Exit Loss Coef: 1.00
Manning's N: 0.013000 0.013000              Bend Loss Coef: 0.00
Top Clip (in): 0.000  0.000                  Outlet Ctrl Spec: Use dc or tw
Bot Clip (in): 0.000  0.000                  Inlet Ctrl Spec: Use dc
Stabilizer Option: None
    
```

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==== Drop Structures =====

Name: CS-1 From Node: pond1 Length(ft): 288.00
Group: BASE To Node: CD-1I Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 0.000
Invert(ft): 113.440	112.870	Exit Loss Coef: 1.000
Manning's N: 0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Circular	Orifice Disc Coef: 0.600	
Span(in): 3.00	Invert(ft): 117.250	
Rise(in): 3.00	Control Elev(ft): 117.250	

*** Weir 2 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 48.00	Invert(ft): 120.000	
Rise(in): 99999.00	Control Elev(ft): 117.250	

*** Weir 3 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 168.00	Invert(ft): 122.000	
Rise(in): 999999.00	Control Elev(ft): 117.250	

==== Weirs =====

Name: From Node:
Group: BASE To Node:
Flow: Both Count: 1
Type: Horizontal Geometry: Circular

Span(in): 0.00	
Rise(in): 0.00	
Invert(ft): 0.000	
Control Elevation(ft): 0.000	
	TABLE
Bottom Clip(in): 0.000	
Top Clip(in): 0.000	
Weir Discharge Coef: 3.200	
Orifice Discharge Coef: 0.600	

==== Percolation Links =====

Name: From Node: Flow: Both
Group: BASE To Node: Count: 1

Surface Area Option: Use 1st Point in Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm

Aquifer Base Elev(ft): 0.000	Perimeter 1(ft): 0.000
Water Table Elev(ft): 0.000	Perimeter 2(ft): 0.000
*****0.000	Perimeter 3(ft): 0.000
Horiz Conductivity(ft/day): 0.000	Distance 1 to 2(ft): 0.000
Vert Conductivity(ft/day): 0.000	Distance 2 to 3(ft): 0.000
Effective Porosity(dec): 0.000	Num Cells 1 to 2: 0
Suction Head(in): 0.000	Num Cells 2 to 3: 0
Layer Thickness(ft): 0.000	

==== Hydrology Simulations =====

Name: 10YR-72HR
Filename: C:\Users\verica\Desktop\ICPR3 Storms\10YR-72HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount (in): 7.80

Time(hrs)	Print Inc(min)
72.000	60.00

==== Routing Simulations =====

Name: 10YR-72HR Hydrology Sim: 10YR-72HR
Filename: C:\Users\verica\Desktop\ICPR3 Storms\10Y-72H.I32

Execute: Yes	Restart: No	Patch: No
Alternative: No		
Max Delta Z(ft): 1.00		Delta Z Factor: 0.00500
Time Step Optimizer: 10.000		
Start Time(hrs): 0.000		End Time(hrs): 408.00
Min Calc Time(sec): 0.5000		Max Calc Time(sec): 60.0000
Boundary Stages:		Boundary Flows:

Time(hrs)	Print Inc(min)
360.000	720.000

Group	Run
BASE	Yes

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
pond1	BASE	10YR-72HR	60.78	120.89	122.60	0.0050	37240	60.00	21.87	60.78	11.15

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10YR-72HR	pond1	BASE	0.00	117.25	122.60	22651	0.00	0.00	0.0	0.0
10YR-72HR	pond1	BASE	12.00	117.25	122.60	22651	0.00	0.00	0.0	0.0
10YR-72HR	pond1	BASE	24.00	117.33	122.60	23007	0.09	0.01	0.0	0.0
10YR-72HR	pond1	BASE	36.00	117.58	122.60	24187	0.25	0.11	0.2	0.1
10YR-72HR	pond1	BASE	48.00	117.86	122.60	25464	0.33	0.16	0.5	0.2
10YR-72HR	pond1	BASE	60.00	120.23	122.60	34643	21.87	1.77	11.5	1.2
10YR-72HR	pond1	BASE	72.00	120.08	122.60	34072	0.00	0.68	22.4	2.4
10YR-72HR	pond1	BASE	84.00	119.58	122.60	32116	0.00	0.35	22.4	2.9
10YR-72HR	pond1	BASE	96.00	119.12	122.60	30316	0.00	0.31	22.4	3.2
10YR-72HR	pond1	BASE	108.00	118.69	122.60	28707	0.00	0.27	22.4	3.5
10YR-72HR	pond1	BASE	120.00	118.31	122.60	27279	0.00	0.23	22.4	3.7
10YR-72HR	pond1	BASE	132.00	117.98	122.60	26021	0.00	0.18	22.4	3.9
10YR-72HR	pond1	BASE	144.00	117.70	122.60	24760	0.00	0.14	22.4	4.1
10YR-72HR	pond1	BASE	156.00	117.51	122.60	23854	0.00	0.08	22.4	4.2
10YR-72HR	pond1	BASE	168.00	117.41	122.60	23376	0.00	0.04	22.4	4.3
10YR-72HR	pond1	BASE	180.00	117.36	122.60	23147	0.00	0.02	22.4	4.3
10YR-72HR	pond1	BASE	192.00	117.33	122.60	23024	0.00	0.01	22.4	4.3
10YR-72HR	pond1	BASE	204.00	117.31	122.60	22949	0.00	0.01	22.4	4.3
10YR-72HR	pond1	BASE	216.00	117.30	122.60	22899	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	228.00	117.30	122.60	22863	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	240.00	117.29	122.60	22837	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	252.00	117.29	122.60	22816	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	264.00	117.28	122.60	22800	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	276.00	117.28	122.60	22787	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	288.00	117.28	122.60	22776	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	300.00	117.27	122.60	22767	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	312.00	117.27	122.60	22759	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	324.00	117.27	122.60	22752	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	336.00	117.27	122.60	22747	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	348.00	117.27	122.60	22742	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	360.00	117.27	122.60	22737	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	372.00	117.27	122.60	22733	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	372.25	117.27	122.60	22733	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	372.50	117.27	122.60	22733	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	372.75	117.27	122.60	22733	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	373.00	117.27	122.60	22733	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	373.25	117.27	122.60	22733	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	373.50	117.27	122.60	22733	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	373.75	117.27	122.60	22733	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	374.00	117.27	122.60	22733	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	374.25	117.27	122.60	22733	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	374.50	117.27	122.60	22733	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	374.75	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	375.00	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	375.25	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	375.50	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	375.75	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	376.00	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	376.25	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	376.50	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	376.75	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	377.00	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	377.25	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	377.50	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	377.75	117.27	122.60	22732	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	378.00	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	378.25	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	378.50	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	378.75	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	379.00	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	379.25	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	379.50	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	379.75	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	380.00	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	380.25	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	380.50	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	380.75	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	381.00	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	381.25	117.27	122.60	22731	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	381.50	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	381.75	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	382.00	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	382.25	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	382.50	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	382.75	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	383.00	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	383.25	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	383.50	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	383.75	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	384.00	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	384.25	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	384.50	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	384.75	117.27	122.60	22730	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	385.00	117.27	122.60	22729	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	385.25	117.27	122.60	22729	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	385.50	117.27	122.60	22729	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	385.75	117.27	122.60	22729	0.00	0.00	22.4	4.3

recovery
start

recovery
end

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10YR-72HR	pond1	BASE	407.75	117.27	122.60	22724	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	408.00	117.27	122.60	22724	0.00	0.00	22.4	4.3
10YR-72HR	pond1	BASE	408.00	117.27	122.60	22724	0.00	0.00	22.4	4.3

==== Basins =====

```

Name: basin1           Node: pond1           Status: Onsite
Group: BASE           Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256           Peaking Factor: 256.0
Rainfall File: Sfwmd72         Storm Duration(hrs): 72.00
Rainfall Amount (in): 11.000   Time of Conc(min): 19.64
Area(ac): 9.730              Time Shift(hrs): 0.00
Curve Number: 81.39          Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
    
```

```

Name: CD-1           Node: CD-1I          Status: Onsite
Group: BASE          Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256           Peaking Factor: 256.0
Rainfall File: Sfwmd72         Storm Duration(hrs): 72.00
Rainfall Amount (in): 11.000   Time of Conc(min): 10.00
Area(ac): 7.920              Time Shift(hrs): 0.00
Curve Number: 53.00          Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
    
```

==== Nodes =====

```

Name: CD-1I          Base Flow(cfs): 0.000   Init Stage(ft): 111.150
Group: BASE          Plunge Factor: 1.00    Warn Stage(ft): 126.430
Type: Manhole, Flat Floor
    
```

6' DIA MH (DUMMY NODE)

Stage (ft)	Area (ac)
111.150	0.0006
126.430	0.0006

```

Name: offsite1      Base Flow(cfs): 0.000   Init Stage(ft): 114.080
Group: BASE          Warn Stage(ft): 116.160
Type: Time/Stage
    
```

Time (hrs)	Stage (ft)
0.00	114.080
60.00	116.150
72.00	116.150

```

Name: pond1          Base Flow(cfs): 0.000   Init Stage(ft): 117.250
Group: BASE          Warn Stage(ft): 122.600
Type: Stage/Volume
    
```

Stage (ft)	Volume (af)
117.250	0.0000
118.000	0.4200
119.000	1.0600
120.000	1.7900
121.000	2.6100
122.000	3.5200
122.500	4.0000

==== Operating Tables =====

```

Name:                Group: BASE
Type: Bottom Clip
Function: Time vs. Depth of Clip
    
```

Time (hrs)	Clip Depth (in)

==== Pipes =====

```

Name: CD-1           From Node: CD-1I      Length(ft): 160.00
Group: BASE          To Node: offsite1    Count: 1

UPSTREAM              DOWNSTREAM
Geometry: Circular   Circular
Span (in): 30.00     30.00
Rise (in): 30.00     30.00
Invert (ft): 112.840 112.500
Manning's N: 0.013000 0.013000
Top Clip (in): 0.000 0.000
Bot Clip (in): 0.000 0.000

Friction Equation: Automatic
Solution Algorithm: Most Restrictive
Flow: Both
Entrance Loss Coef: 0.00
Exit Loss Coef: 1.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None
    
```

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==== Drop Structures =====

Name: CS-1 From Node: pond1 Length(ft): 288.00
Group: BASE To Node: CD-1I Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 0.000
Invert(ft): 113.440	112.870	Exit Loss Coef: 1.000
Manning's N: 0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Circular	Orifice Disc Coef: 0.600	
Span(in): 3.00	Invert(ft): 117.250	
Rise(in): 3.00	Control Elev(ft): 117.250	

*** Weir 2 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 48.00	Invert(ft): 120.000	
Rise(in): 99999.00	Control Elev(ft): 117.250	

*** Weir 3 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 168.00	Invert(ft): 122.000	
Rise(in): 999999.00	Control Elev(ft): 117.250	

==== Weirs =====

Name: From Node:
Group: BASE To Node:
Flow: Both Count: 1
Type: Horizontal Geometry: Circular

Span(in): 0.00	TABLE
Rise(in): 0.00	
Invert(ft): 0.000	
Control Elevation(ft): 0.000	
Bottom Clip(in): 0.000	
Top Clip(in): 0.000	
Weir Discharge Coef: 3.200	
Orifice Discharge Coef: 0.600	

==== Percolation Links =====

Name: From Node: Flow: Both
Group: BASE To Node: Count: 1

Surface Area Option: Use 1st Point in Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm

Aquifer Base Elev(ft): 0.000	Perimeter 1(ft): 0.000
Water Table Elev(ft): 0.000	Perimeter 2(ft): 0.000
*****0.000	Perimeter 3(ft): 0.000
Horiz Conductivity(ft/day): 0.000	Distance 1 to 2(ft): 0.000
Vert Conductivity(ft/day): 0.000	Distance 2 to 3(ft): 0.000
Effective Porosity(dec): 0.000	Num Cells 1 to 2: 0
Suction Head(in): 0.000	Num Cells 2 to 3: 0
Layer Thickness(ft): 0.000	

==== Hydrology Simulations =====

Name: 25YR-72HR
Filename: C:\Users\verica\Desktop\ICPR3 Storms\25Y-72H.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount (in): 11.00

Time(hrs)	Print Inc(min)
72.000	60.00

==== Routing Simulations =====

Name: 25YR-72HR Hydrology Sim: 25YR-72HR
Filename: C:\Users\verica\Desktop\ICPR3 Storms\25Y-72H.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 408.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
360.000	720.000

Group	Run
BASE	Yes

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
pond1	BASE	25YR-72HR	60.46	121.48	122.60	0.0032	39148	60.00	32.57	60.50	23.26

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25YR-72HR	pond1	BASE	0.00	117.25	122.60	22651	0.00	0.00	0.0	0.0
25YR-72HR	pond1	BASE	12.00	117.26	122.60	22693	0.05	0.00	0.0	0.0
25YR-72HR	pond1	BASE	24.00	117.47	122.60	23660	0.20	0.06	0.1	0.0
25YR-72HR	pond1	BASE	36.00	117.91	122.60	25711	0.45	0.17	0.5	0.1
25YR-72HR	pond1	BASE	48.00	118.39	122.60	27581	0.54	0.24	1.0	0.4
25YR-72HR	pond1	BASE	60.00	121.19	122.60	38250	32.57	16.84	17.4	8.8
25YR-72HR	pond1	BASE	72.00	120.12	122.60	34249	0.00	0.96	33.5	17.6
25YR-72HR	pond1	BASE	84.00	119.60	122.60	32198	0.00	0.35	33.5	18.3
25YR-72HR	pond1	BASE	96.00	119.14	122.60	30394	0.00	0.31	33.5	18.6
25YR-72HR	pond1	BASE	108.00	118.71	122.60	28774	0.00	0.27	33.5	18.9
25YR-72HR	pond1	BASE	120.00	118.32	122.60	27338	0.00	0.23	33.5	19.2
25YR-72HR	pond1	BASE	132.00	117.99	122.60	26083	0.00	0.19	33.5	19.4
25YR-72HR	pond1	BASE	144.00	117.71	122.60	24809	0.00	0.14	33.5	19.5
25YR-72HR	pond1	BASE	156.00	117.52	122.60	23884	0.00	0.08	33.5	19.6
25YR-72HR	pond1	BASE	168.00	117.41	122.60	23390	0.00	0.04	33.5	19.7
25YR-72HR	pond1	BASE	180.00	117.36	122.60	23155	0.00	0.02	33.5	19.7
25YR-72HR	pond1	BASE	192.00	117.33	122.60	23028	0.00	0.01	33.5	19.7
25YR-72HR	pond1	BASE	204.00	117.31	122.60	22952	0.00	0.01	33.5	19.8
25YR-72HR	pond1	BASE	216.00	117.30	122.60	22901	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	228.00	117.30	122.60	22864	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	240.00	117.29	122.60	22838	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	252.00	117.29	122.60	22817	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	264.00	117.28	122.60	22801	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	276.00	117.28	122.60	22787	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	288.00	117.28	122.60	22776	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	300.00	117.27	122.60	22767	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	312.00	117.27	122.60	22759	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	324.00	117.27	122.60	22753	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	336.00	117.27	122.60	22747	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	348.00	117.27	122.60	22742	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	360.00	117.27	122.60	22737	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	372.00	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	372.25	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	372.50	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	372.75	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	373.00	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	373.25	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	373.50	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	373.75	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	374.00	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	374.25	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	374.50	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	374.75	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	375.00	117.27	122.60	22733	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	375.25	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	375.50	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	375.75	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	376.00	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	376.25	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	376.50	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	376.75	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	377.00	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	377.25	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	377.50	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	377.75	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	378.00	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	378.25	117.27	122.60	22732	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	378.50	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	378.75	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	379.00	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	379.25	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	379.50	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	379.75	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	380.00	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	380.25	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	380.50	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	380.75	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	381.00	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	381.25	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	381.50	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	381.75	117.27	122.60	22731	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	382.00	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	382.25	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	382.50	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	382.75	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	383.00	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	383.25	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	383.50	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	383.75	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	384.00	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	384.25	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	384.50	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	384.75	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	385.00	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	385.25	117.27	122.60	22730	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	385.50	117.27	122.60	22729	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	385.75	117.27	122.60	22729	0.00	0.00	33.5	19.8

recovery
start

recovery
end

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25YR-72HR	pond1	BASE	407.75	117.27	122.60	22724	0.00	0.00	33.5	19.8
25YR-72HR	pond1	BASE	408.00	117.27	122.60	22724	0.00	0.00	33.5	19.8

==== Basins =====

```

Name: basin1           Node: pond1           Status: Onsite
Group: BASE           Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256           Peaking Factor: 256.0
Rainfall File: Sfwmd72         Storm Duration(hrs): 72.00
Rainfall Amount (in): 12.000   Time of Conc(min): 19.64
Area(ac): 9.730              Time Shift(hrs): 0.00
Curve Number: 81.39          Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
    
```

```

Name: CD-1           Node: CD-1I          Status: Onsite
Group: BASE           Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256           Peaking Factor: 256.0
Rainfall File: Sfwmd72         Storm Duration(hrs): 72.00
Rainfall Amount (in): 12.000   Time of Conc(min): 10.00
Area(ac): 7.920              Time Shift(hrs): 0.00
Curve Number: 53.00          Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
    
```

==== Nodes =====

```

Name: CD-1I          Base Flow(cfs): 0.000   Init Stage(ft): 111.150
Group: BASE          Plunge Factor: 1.00    Warn Stage(ft): 126.430
Type: Manhole, Flat Floor
    
```

6' DIA MH (DUMMY NODE)

Stage (ft)	Area (ac)
111.150	0.0006
126.430	0.0006

```

Name: offsite1      Base Flow(cfs): 0.000   Init Stage(ft): 114.080
Group: BASE          Warn Stage(ft): 117.510
Type: Time/Stage
    
```

Time (hrs)	Stage (ft)
0.00	114.080
60.00	117.500
72.00	117.150

```

Name: pond1          Base Flow(cfs): 0.000   Init Stage(ft): 117.250
Group: BASE          Warn Stage(ft): 122.600
Type: Stage/Volume
    
```

Stage (ft)	Volume (af)
117.250	0.0000
118.000	0.4200
119.000	1.0600
120.000	1.7900
121.000	2.6100
122.000	3.5200
122.500	4.0000

==== Operating Tables =====

```

Name:                Group: BASE
Type: Bottom Clip
Function: Time vs. Depth of Clip
    
```

Time (hrs)	Clip Depth (in)

==== Pipes =====

```

Name: CD-1           From Node: CD-1I      Length(ft): 160.00
Group: BASE          To Node: offsite1    Count: 1

UPSTREAM              DOWNSTREAM              Friction Equation: Automatic
Geometry: Circular    Circular                Solution Algorithm: Most Restrictive
Span (in): 30.00      30.00                  Flow: Both
Rise (in): 30.00      30.00                  Entrance Loss Coef: 0.00
Invert (ft): 112.840  112.500                Exit Loss Coef: 1.00
Manning's N: 0.013000 0.013000              Bend Loss Coef: 0.00
Top Clip (in): 0.000  0.000                  Outlet Ctrl Spec: Use dc or tw
Bot Clip (in): 0.000  0.000                  Inlet Ctrl Spec: Use dc
Stabilizer Option: None
    
```

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==== Drop Structures =====

Name: CS-1 From Node: pond1 Length(ft): 288.00
Group: BASE To Node: CD-1I Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 0.000
Invert(ft): 113.440	112.870	Exit Loss Coef: 1.000
Manning's N: 0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Circular	Orifice Disc Coef: 0.600	
Span(in): 3.00	Invert(ft): 117.250	
Rise(in): 3.00	Control Elev(ft): 117.250	

*** Weir 2 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 48.00	Invert(ft): 120.000	
Rise(in): 99999.00	Control Elev(ft): 117.250	

*** Weir 3 of 3 for Drop Structure CS-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 168.00	Invert(ft): 122.000	
Rise(in): 999999.00	Control Elev(ft): 117.250	

==== Weirs =====

Name: From Node:
Group: BASE To Node:
Flow: Both Count: 1
Type: Horizontal Geometry: Circular

Span(in): 0.00	
Rise(in): 0.00	
Invert(ft): 0.000	
Control Elevation(ft): 0.000	

TABLE

Bottom Clip(in): 0.000	
Top Clip(in): 0.000	
Weir Discharge Coef: 3.200	
Orifice Discharge Coef: 0.600	

==== Percolation Links =====

Name: From Node: Flow: Both
Group: BASE To Node: Count: 1

Surface Area Option: Use 1st Point in Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm

Aquifer Base Elev(ft): 0.000	Perimeter 1(ft): 0.000
Water Table Elev(ft): 0.000	Perimeter 2(ft): 0.000
*****0.000	Perimeter 3(ft): 0.000
Horiz Conductivity(ft/day): 0.000	Distance 1 to 2(ft): 0.000
Vert Conductivity(ft/day): 0.000	Distance 2 to 3(ft): 0.000
Effective Porosity(dec): 0.000	Num Cells 1 to 2: 0
Suction Head(in): 0.000	Num Cells 2 to 3: 0
Layer Thickness(ft): 0.000	

==== Hydrology Simulations =====

Name: 100YR-72HR
Filename: C:\Users\verica\Desktop\ICPR3 Storms\100Y-72.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount (in): 12.00

Time(hrs)	Print Inc(min)
72.000	60.00

==== Routing Simulations =====

Name: 100Y-72HR Hydrology Sim: 100YR-72HR
Filename: C:\Users\verica\Desktop\ICPR3 Storms\100Y-72.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 72.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
72.000	15.000

Group	Run
BASE	Yes

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
pond1	BASE	100Y-72HR	60.55	121.92	122.60	0.0030	40491	60.00	35.90	60.91	25.14

24.000 5.00

=====
=== Routing Simulations ===
=====

Name: Hydrology Sim:
Filename:

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 0.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time (hrs)	Print Inc (min)
999.000	15.000
Group	Run
-----	-----
BASE	Yes

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
50-24	CD1	BASE	12.00	3.359	3.451	99204.612

```

=====
==== Basins =====
=====
Name: CD2                               Node: CD2                               Status: Onsite
Group: BASE                             Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh484                   Peaking Factor: 484.0
Rainfall File: Fdot-24                   Storm Duration(hrs): 24.00
Rainfall Amount(in): 9.300                Time of Conc(min): 18.67
Area(ac): 17.160                          Time Shift(hrs): 0.00
Curve Number: 53.00                       Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

```

```

=====
==== Nodes =====
=====
Name:                                     Base Flow(cfs): 0.000                 Init Stage(ft): 0.000
Group: BASE                               Warn Stage(ft): 0.000
Type: Stage/Area

Stage(ft)      Area(ac)
-----

```

```

=====
==== Drop Structures =====
=====
Name:                                     From Node:                               Length(ft): 0.00
Group: BASE                               To Node:                                  Count: 1

UPSTREAM      DOWNSTREAM      Friction Equation: Automatic
Geometry: Circular      Circular      Solution Algorithm: Most Restrictive
Span(in): 0.00          0.00          Flow: Both
Rise(in): 0.00         0.00          Entrance Loss Coef: 0.000
Invert(ft): 0.000      0.000         Exit Loss Coef: 1.000
Manning's N: 0.000000  0.000000     Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000    0.000         Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000    0.000         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

```

```

=====
==== Weirs =====
=====
Name:                                     From Node:                               To Node:
Group: BASE                               To Node:                                  Count: 1
Flow: Both                                Count: 1
Type: Horizontal                           Geometry: Circular

Span(in): 0.00
Rise(in): 0.00
Invert(ft): 0.000
Control Elevation(ft): 0.000

TABLE

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

```

```

=====
==== Hydrology Simulations =====
=====
Name: 50-24
Filename: C:\Users\erica\Desktop\ICPR3 Storms\50Y-24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Fdot-24
Rainfall Amount(in): 9.30

Time(hrs)      Print Inc(min)
-----

```

24.000 60.00

=====
=== Routing Simulations ===
=====

 Name: Hydrology Sim:
 Filename:

 Execute: No Restart: No Patch: No
 Alternative: No

 Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
 Time Step Optimizer: 10.000
 Start Time(hrs): 0.000 End Time(hrs): 0.00
 Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
 Boundary Stages: Boundary Flows:

Time (hrs)	Print Inc (min)
999.000	15.000
Group	Run
-----	-----
BASE	Yes

Basin Name: CD2
Group Name: BASE
Simulation: 50-24
Node Name: CD2
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484
Peaking Fator: 484.0
Spec Time Inc (min): 2.49
Comp Time Inc (min): 2.49
Rainfall File: Fdot-24
Rainfall Amount (in): 9.300
Storm Duration (hrs): 24.00
Status: Onsite
Time of Conc (min): 18.67
Time Shift (hrs): 0.00
Area (ac): 17.160
Vol of Unit Hyd (in): 1.001
Curve Number: 53.000
DCIA (%): 0.000

Time Max (hrs): 12.03
Flow Max (cfs): 7.137
Runoff Volume (in): 3.449
Runoff Volume (ft3): 214863.907

```

=====
==== Basins =====
=====
Name: CD3                      Node: CD3                      Status: Onsite
Group: BASE                    Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh484        Peaking Factor: 484.0
Rainfall File: Fdot-24       Storm Duration(hrs): 24.00
Rainfall Amount(in): 9.300   Time of Conc(min): 20.22
Area(ac): 4.460              Time Shift(hrs): 0.00
Curve Number: 53.00          Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

```

```

=====
==== Nodes =====
=====
Name:                          Base Flow(cfs): 0.000        Init Stage(ft): 0.000
Group: BASE                    Warn Stage(ft): 0.000
Type: Stage/Area

Stage(ft)      Area(ac)
-----

```

```

=====
==== Drop Structures =====
=====
Name:                          From Node:                    Length(ft): 0.00
Group: BASE                    To Node:                      Count: 1

UPSTREAM          DOWNSTREAM                    Friction Equation: Automatic
Geometry: Circular Circular                      Solution Algorithm: Most Restrictive
Span(in): 0.00    0.00                          Flow: Both
Rise(in): 0.00    0.00                          Entrance Loss Coef: 0.000
Invert(ft): 0.000 0.000                          Exit Loss Coef: 1.000
Manning's N: 0.000000 0.000000                      Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000 0.000                          Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000 0.000                          Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

```

```

=====
==== Weirs =====
=====
Name:                          From Node:                    Geometry: Circular
Group: BASE                    To Node:                      Count: 1
Flow: Both                    Type: Horizontal

Span(in): 0.00
Rise(in): 0.00
Invert(ft): 0.000
Control Elevation(ft): 0.000

TABLE

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

```

```

=====
==== Hydrology Simulations =====
=====
Name: 50-24
Filename: L:\53509 Lennar Homes, LLC\0017 Westside Blvd Ext\ENGR\02 Master\Design\Calcs\Stormwater\ICPR3\ICPR3 Storms\10YR-

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Fdot-24
Rainfall Amount(in): 9.30

Time(hrs)      Print Inc(min)
-----

```

24.000 60.00

=====
=== Routing Simulations ===
=====

Name: Hydrology Sim:
Filename:

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 0.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time (hrs)	Print Inc (min)
999.000	15.000
Group	Run
-----	-----
BASE	Yes

Basin Name: CD3
Group Name: BASE
Simulation: 50-24
Node Name: CD3
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484
Peaking Fator: 484.0
Spec Time Inc (min): 2.70
Comp Time Inc (min): 2.70
Rainfall File: Fdot-24
Rainfall Amount (in): 9.300
Storm Duration (hrs): 24.00
Status: Onsite
Time of Conc (min): 20.22
Time Shift (hrs): 0.00
Area (ac): 4.460
Vol of Unit Hyd (in): 1.001
Curve Number: 53.000
DCIA (%): 0.000

Time Max (hrs): 12.04
Flow Max (cfs): 1.850
Runoff Volume (in): 3.450
Runoff Volume (ft3): 55859.271

=====
 Basins =====
 =====

Name: CD4 Node: CD4 Status: Onsite
 Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh484 Peaking Factor: 484.0
 Rainfall File: Fdot-24 Storm Duration(hrs): 24.00
 Rainfall Amount(in): 9.300 Time of Conc(min): 11.84
 Area(ac): 8.280 Time Shift(hrs): 0.00
 Curve Number: 53.00 Max Allowable Q(cfs): 999999.000
 DCIA(%): 0.00

=====
 Nodes =====
 =====

Name: Base Flow(cfs): 0.000 Init Stage(ft): 0.000
 Group: BASE Warn Stage(ft): 0.000
 Type: Stage/Area

 Stage(ft) Area(ac)

=====
 Drop Structures =====
 =====

Name: From Node: Length(ft): 0.00
 Group: BASE To Node: Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 0.00	0.00	Flow: Both
Rise(in): 0.00	0.00	Entrance Loss Coef: 0.000
Invert(ft): 0.000	0.000	Exit Loss Coef: 1.000
Manning's N: 0.000000	0.000000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:
 Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
 Circular Concrete: Square edge w/ headwall

=====
 Weirs =====
 =====

Name: From Node: To Node:
 Group: BASE Count: 1
 Flow: Both Geometry: Circular
 Type: Horizontal

Span(in): 0.00
 Rise(in): 0.00
 Invert(ft): 0.000
 Control Elevation(ft): 0.000

TABLE

Bottom Clip(in): 0.000
 Top Clip(in): 0.000
 Weir Discharge Coef: 3.200
 Orifice Discharge Coef: 0.600

=====
 Hydrology Simulations =====
 =====

Name: 50-24
 Filename: L:\ICPR\icpr\50Y-24H.R32

Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Fdot-24
 Rainfall Amount(in): 9.30

Time(hrs) Print Inc(min)

24.000 60.00

=====
=== Routing Simulations ===
=====

 Name: Hydrology Sim:
 Filename:

 Execute: No Restart: No Patch: No
 Alternative: No

 Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
 Time Step Optimizer: 10.000
 Start Time(hrs): 0.000 End Time(hrs): 0.00
 Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
 Boundary Stages: Boundary Flows:

Time (hrs)	Print Inc (min)
999.000	15.000
Group	Run
-----	-----
BASE	Yes

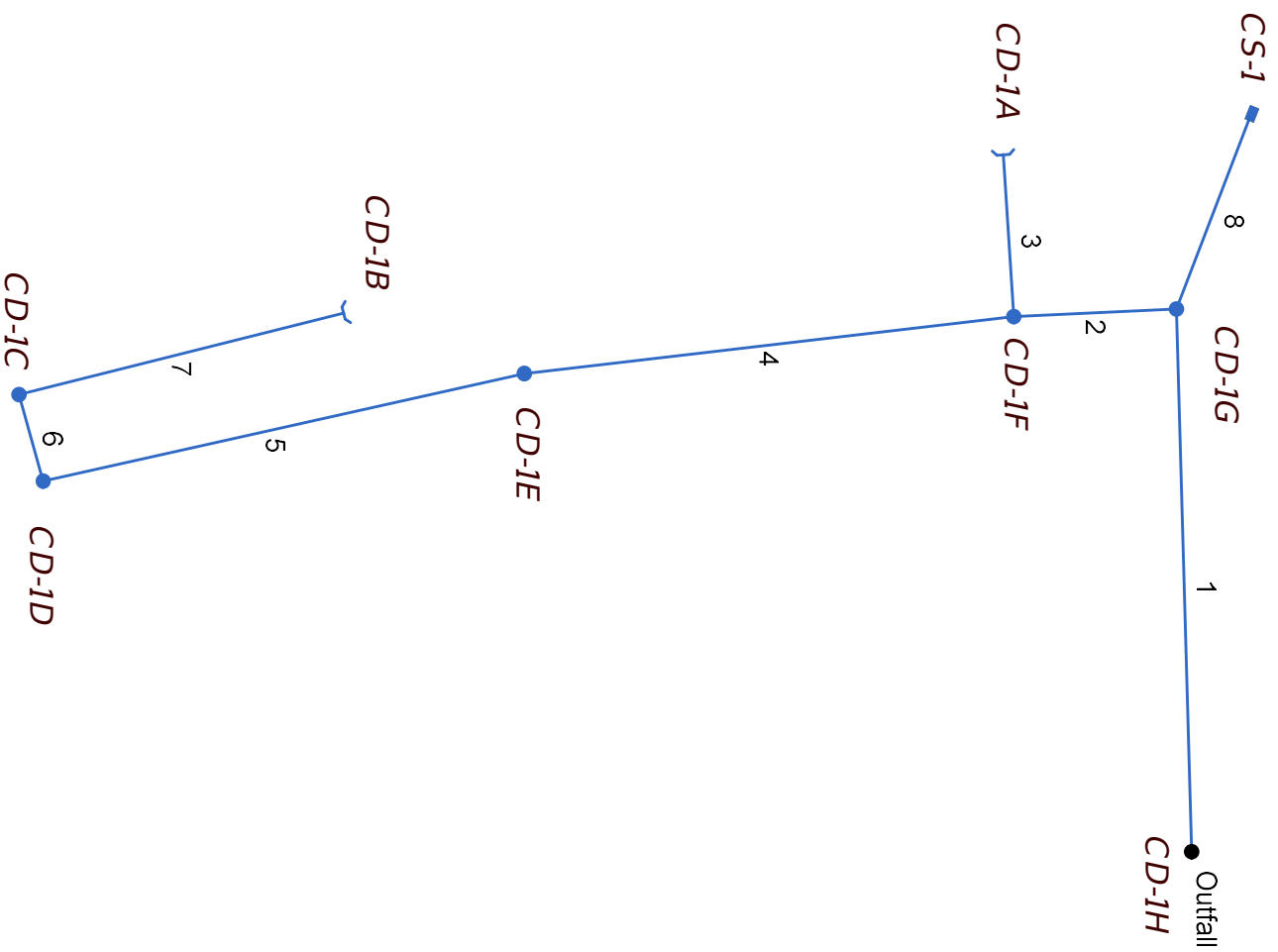
Basin Name: CD4
Group Name: BASE
Simulation: 50-24
Node Name: CD4
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484
Peaking Fator: 484.0
Spec Time Inc (min): 1.58
Comp Time Inc (min): 1.58
Rainfall File: Fdot-24
Rainfall Amount (in): 9.300
Storm Duration (hrs): 24.00
Status: Onsite
Time of Conc (min): 11.84
Time Shift (hrs): 0.00
Area (ac): 8.280
Vol of Unit Hyd (in): 1.001
Curve Number: 53.000
DCIA (%): 0.000

Time Max (hrs): 12.02
Flow Max (cfs): 3.497
Runoff Volume (in): 3.450
Runoff Volume (ft3): 103705.493

Line	To Line	Type of Struct.	N Value	Line Len (ft)	Incr. Area (ac)	Sub Total Area (ac)	C1 = C2 = C3 =	Sub Total CxA	Time of Conc. (min)	Line Flow Time (min)	Rtfall Inten. (l)	Total CxA	Add. Q Total Runoff (cfs)	Inlet Elev. (ft)	HGL Crown Invert Up (ft)	HGL Crown Invert Dn (ft)	HGL Crown Invert Fall (ft)	Line Size (in)	HGL Pipe Slope (%)	Actual Design Vel (ft/s)	Actual Design Capac. (cfs)	Line ID
8	1	MH	0.012	65.835	0.00	0.00	0.20	0.00	0.00	0.48	0.00	0.00	11.11	122.00	116.51	116.47	0.04	30	0.06	2.26	11.11	P-23
					0.00	0.00	0.50	0.00					11.11		115.50	115.37			0.20	4.02	19.74	
					0.00	0.00	0.90	0.00							113.00	112.87	0.13					
7	6	Hdwall	0.012	105.553	0.00	0.00	0.20	0.00	0.00	2.46	0.00	0.00	2.25	118.60	116.55	116.54	0.01	24	0.01	0.72	2.25	P-33
					0.00	0.00	0.50	0.00					2.25		116.00	115.79			0.20	3.48	10.93	
					0.00	0.00	0.90	0.00							114.00	113.79	0.21					
6	5	MH	0.012	28.250	0.00	0.00	0.20	0.00	2.46	0.66	0.00	0.00	0.00	122.03	116.53	116.53	0.00	24	0.01	0.72	2.25	P-35
					0.00	0.00	0.50	0.00					2.25		115.79	115.73			0.21	3.59	11.29	
					0.00	0.00	0.90	0.00							113.79	113.73	0.06					
5	4	MH	0.012	155.661	0.00	0.00	0.20	0.00	3.11	3.62	0.00	0.00	0.00	125.47	116.52	116.51	0.01	24	0.01	0.72	2.25	P-36
					0.00	0.00	0.50	0.00					2.25		115.73	115.42			0.20	3.48	10.93	
					0.00	0.00	0.90	0.00							113.73	113.42	0.31					
4	2	MH	0.012	155.657	0.00	0.00	0.20	0.00	6.74	3.62	0.00	0.00	0.00	126.03	116.51	116.49	0.01	24	0.01	0.72	2.25	P-34
					0.00	0.00	0.50	0.00					2.25		115.42	115.11			0.20	3.48	10.93	
					0.00	0.00	0.90	0.00							113.42	113.11	0.31					
3	2	Hdwall	0.012	50.992	0.00	0.00	0.20	0.00	0.00	2.41	0.00	0.00	1.11	118.45	116.63	116.53	0.10	24	0.19	2.23	1.11	0.20
					0.00	0.00	0.50	0.00					1.11		118.20	118.10			0.20	3.45	10.85	
					0.00	0.00	0.90	0.00							116.20	116.10	0.10					
2	1	MH	0.012	51.456	0.00	0.00	0.20	0.00	10.36	0.80	0.00	0.00	0.00	126.53	116.48	116.47	0.01	24	0.02	1.07	3.36	P-32
					0.00	0.00	0.50	0.00					3.36		115.11	115.01			0.19	3.44	10.80	
					0.00	0.00	0.90	0.00							113.11	113.01	0.10					
1	Outfall	MH	0.012	170.789	0.00	0.00	0.20	0.00	11.16	0.97	0.00	0.00	0.00	126.43	116.33	116.15	0.18	30	0.11	2.95	14.47	P-25
					0.00	0.00	0.50	0.00					14.47		115.34	115.00			0.20	4.04	19.82	
					0.00	0.00	0.90	0.00							112.84	112.50	0.34					

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



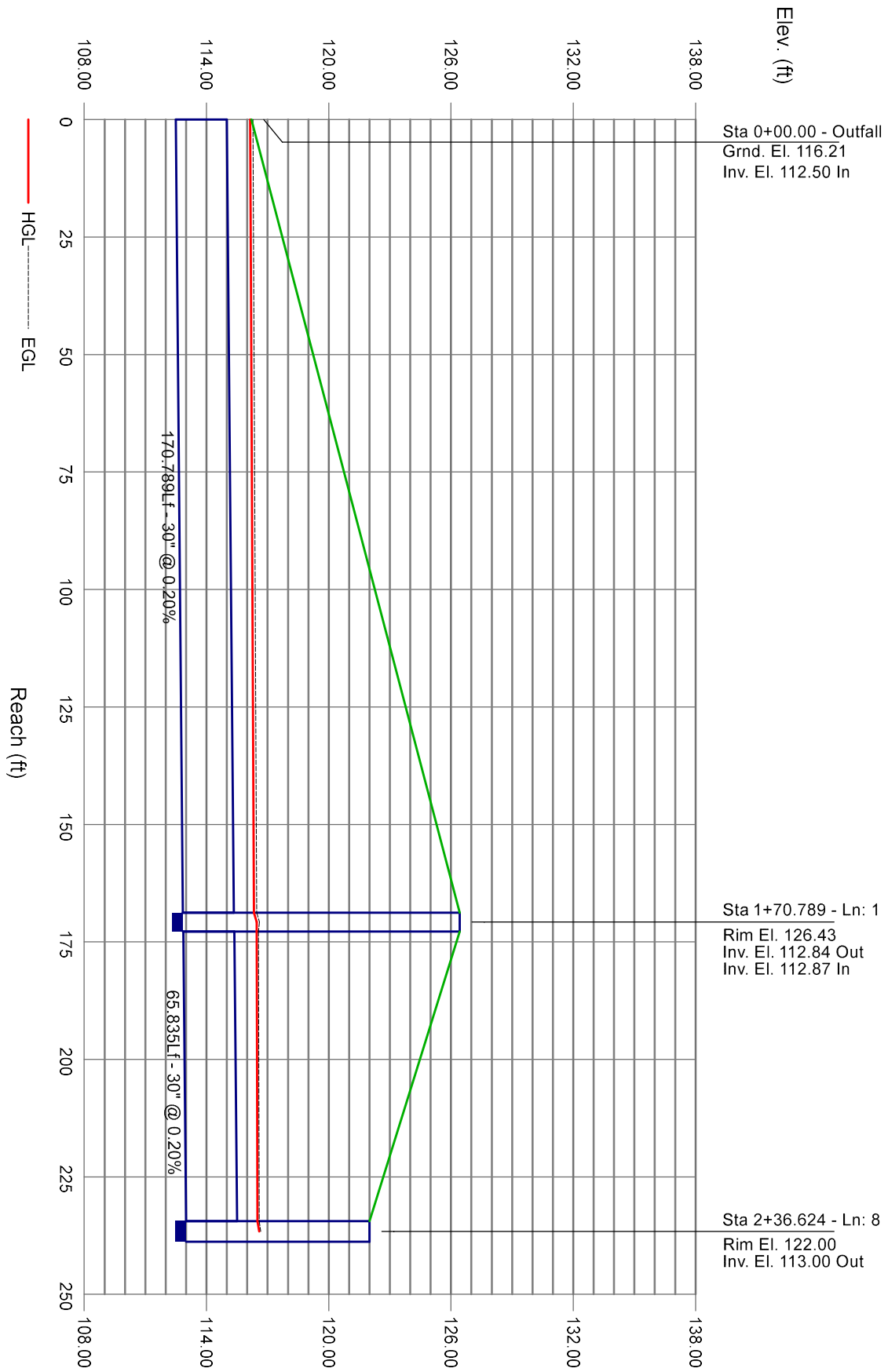
Project File: New.stm

Number of lines: 8

Date: 2/28/2023

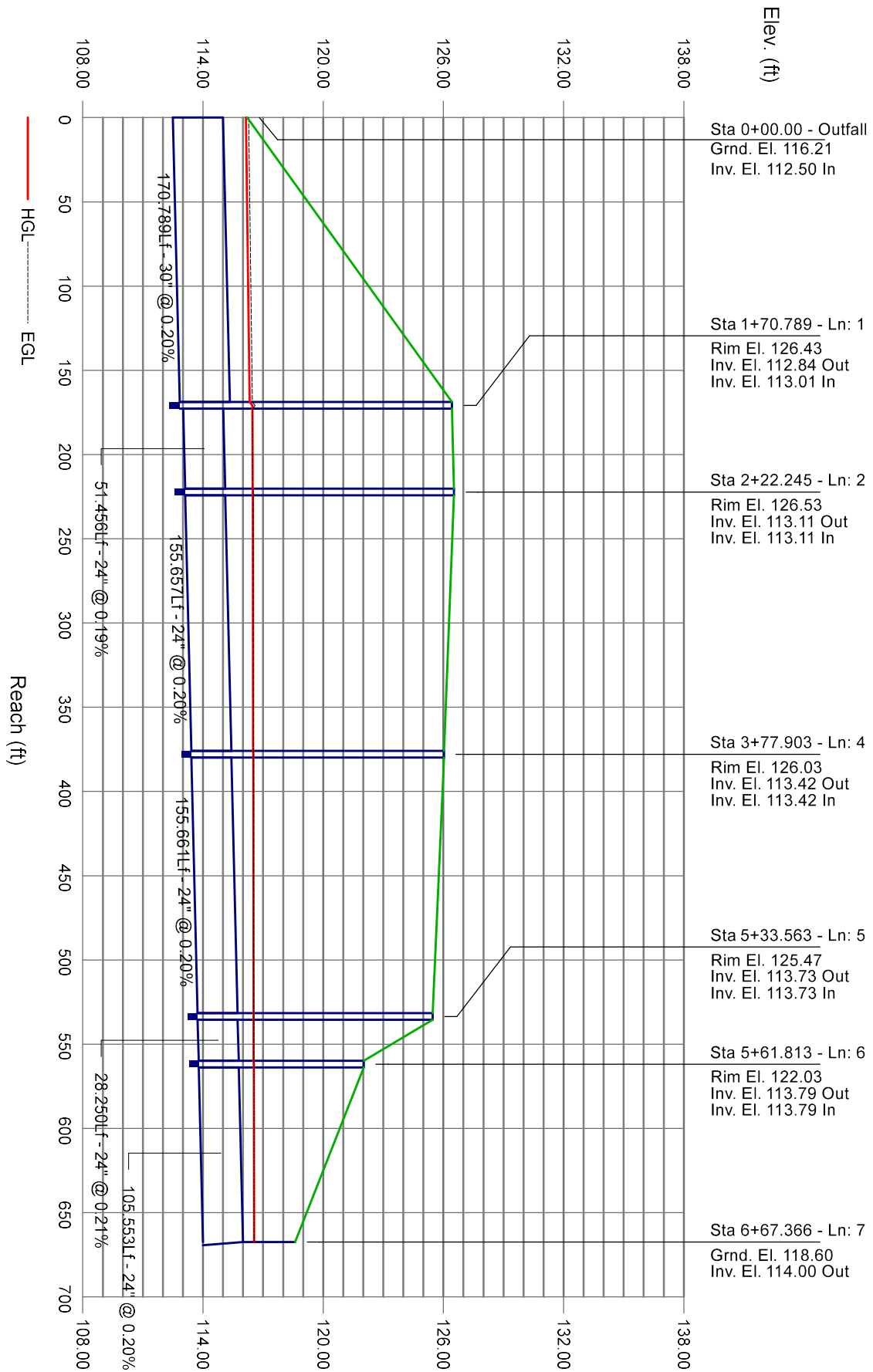
Storm Sewer Profile

Proj. file: New.stm



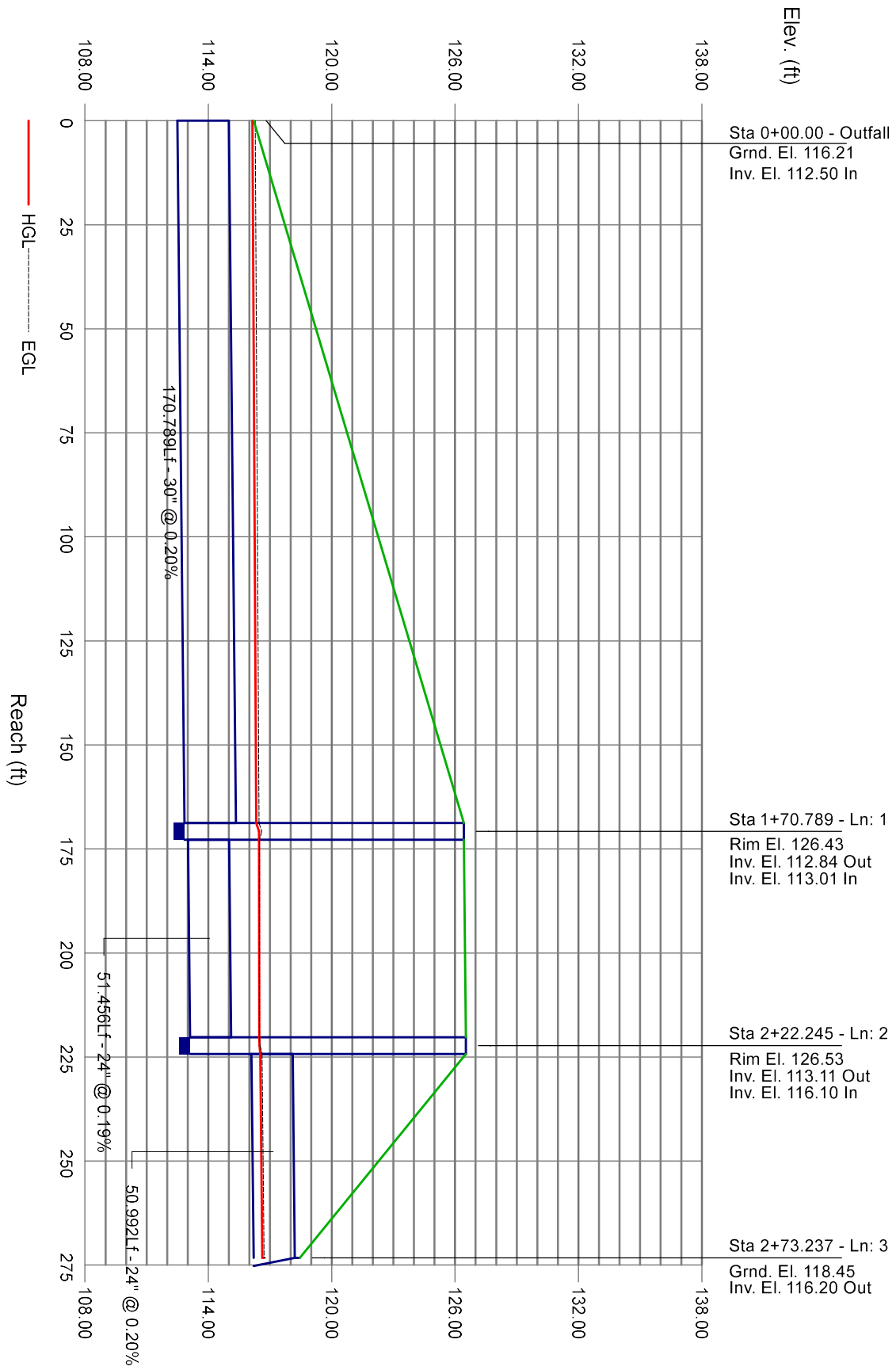
Storm Sewer Profile

Proj. file: New.stm

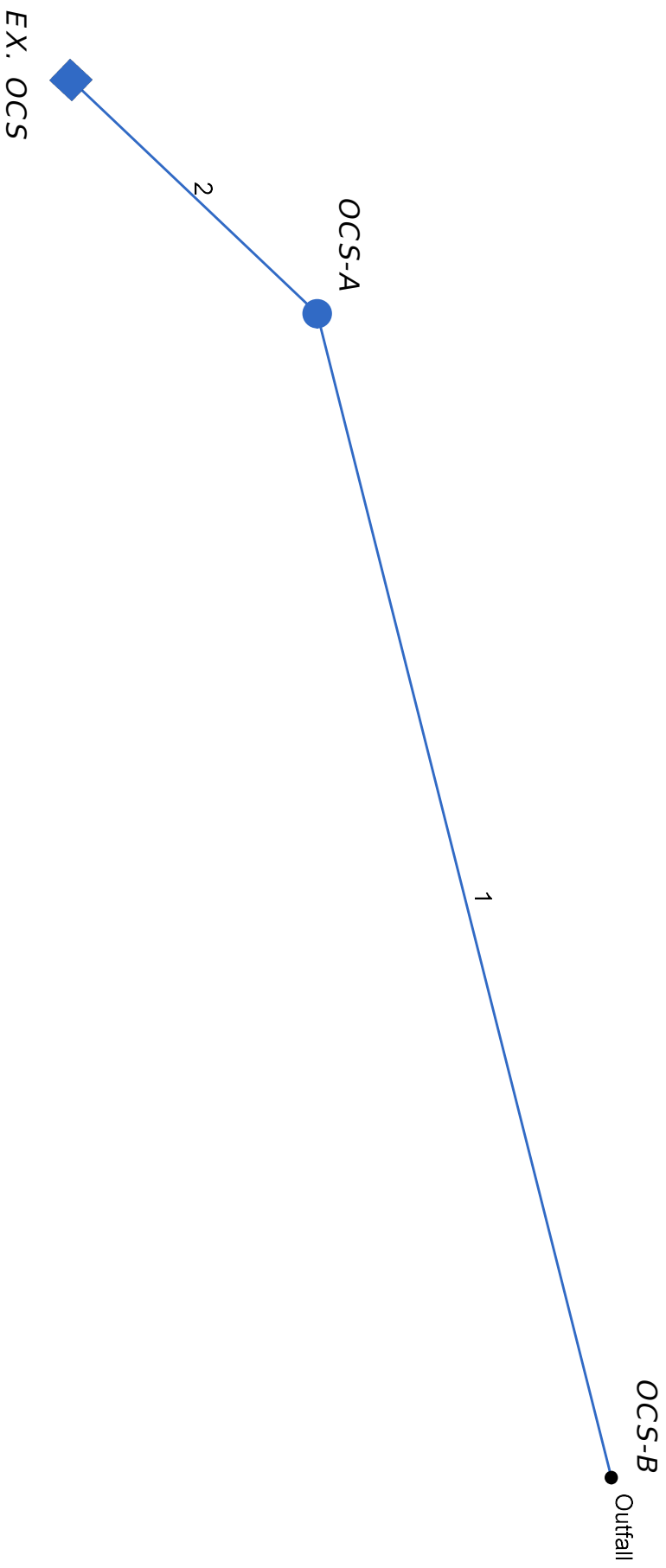


Storm Sewer Profile

Proj. file: New.stm



Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



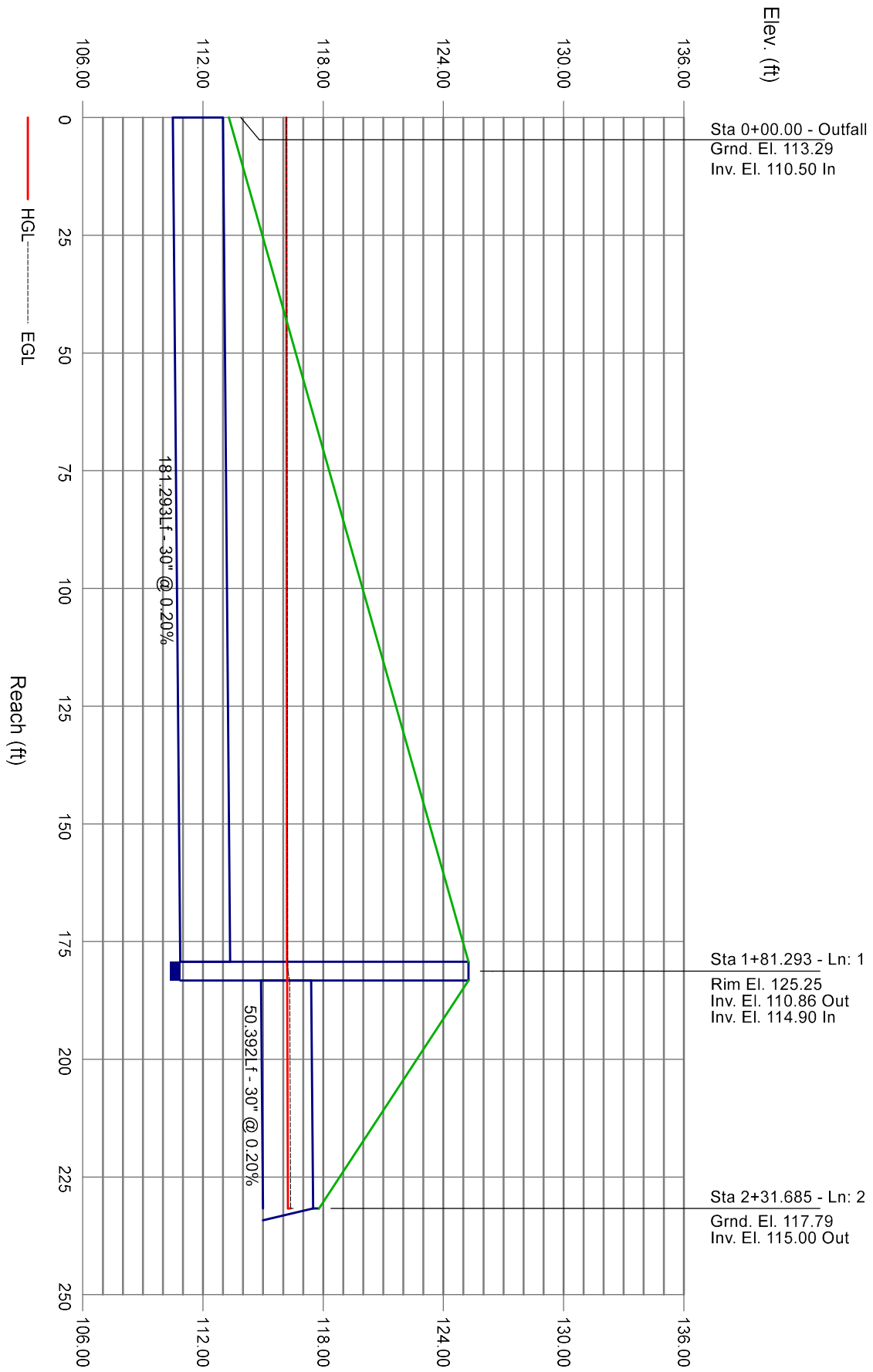
Project File: STORMM03.stm

Number of lines: 2

Date: 2/28/2023

Storm Sewer Profile

Proj. file: New.stm



Line	To Line	Type of Struct.	N Value	Line Len (ft)	Incr. Area (ac)	Sub Total Area (ac)	C1 = C2 = C3 =	Sub Total CxA	Time of Conc. (min)	Line Flow Time (min)	Rtfall Inten. (l)	Total CxA	Add. Q Total Runoff (cfs)	Inlet Elev. (ft)	HGL Crown Invert Up (ft)	HGL Crown Invert Dn (ft)	HGL Crown Invert Fall (ft)	Line Size (in)	HGL Pipe Slope (%)	Actual Design Vel (ft/s)	Actual Design Capac. (cfs)	Line ID
2	1	Hdwall	0.012	30.013	0.00	0.00	0.20	0.00	0.00	0.85	0.00	0.00	1.85	123.05	121.35	121.30	0.06	24	0.19	2.60	1.85	P-27
					0.00	0.00	0.50	0.00					1.85		122.80	122.74			0.20	3.49	10.96	
					0.00	0.00	0.90	0.00							120.80	120.74	0.06					
1	Outfall	MH	0.012	173.534	0.00	0.00	0.20	0.00	0.85	4.91	0.00	0.00	0.00	126.72	116.16	116.15	0.01	24	0.01	0.59	1.85	P-27 (1)
					0.00	0.00	0.50	0.00					1.85		114.34	114.00			0.20	3.45	10.85	
					0.00	0.00	0.90	0.00							112.34	112.00	0.34					

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan

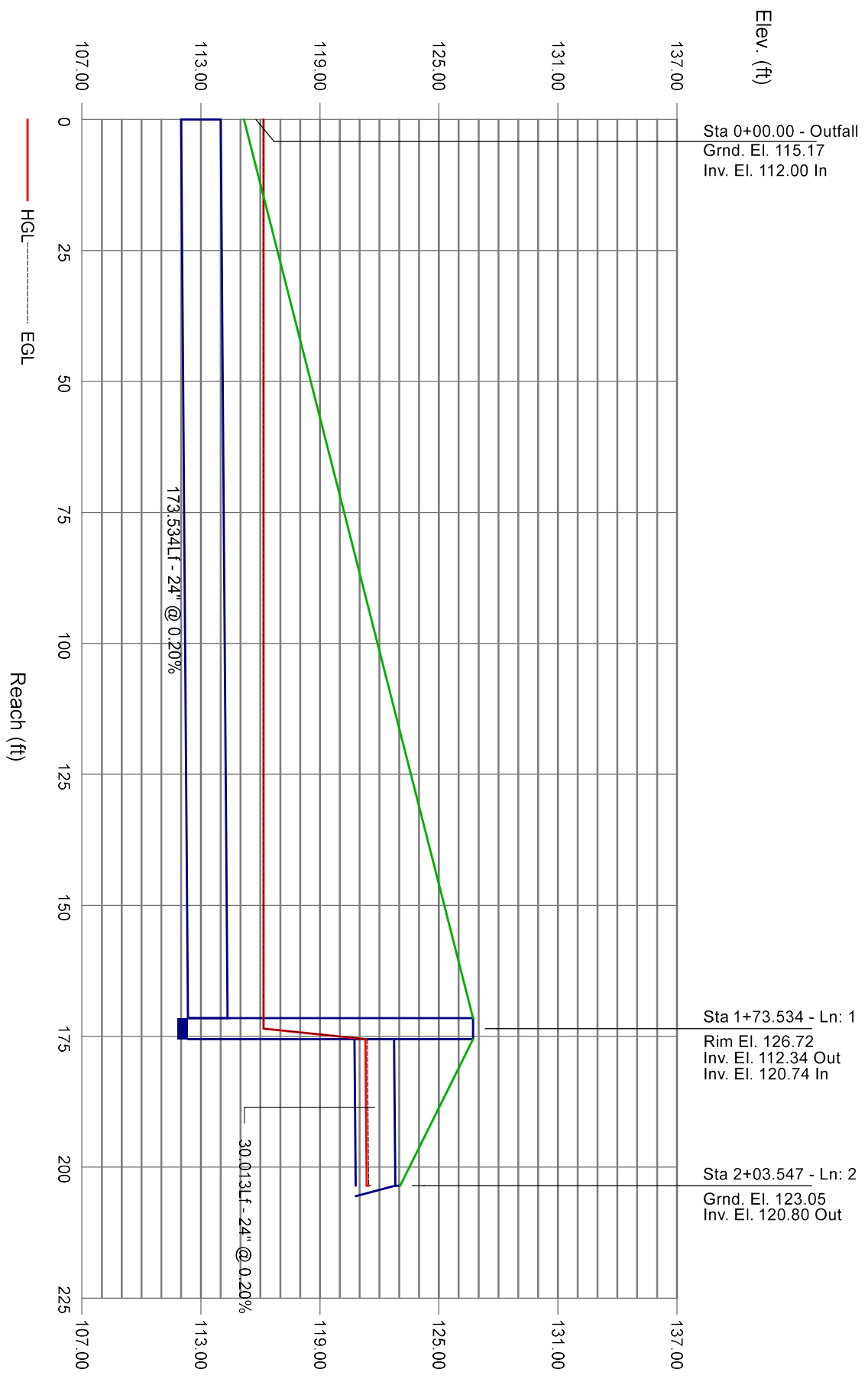


Project File: STORM05.stm

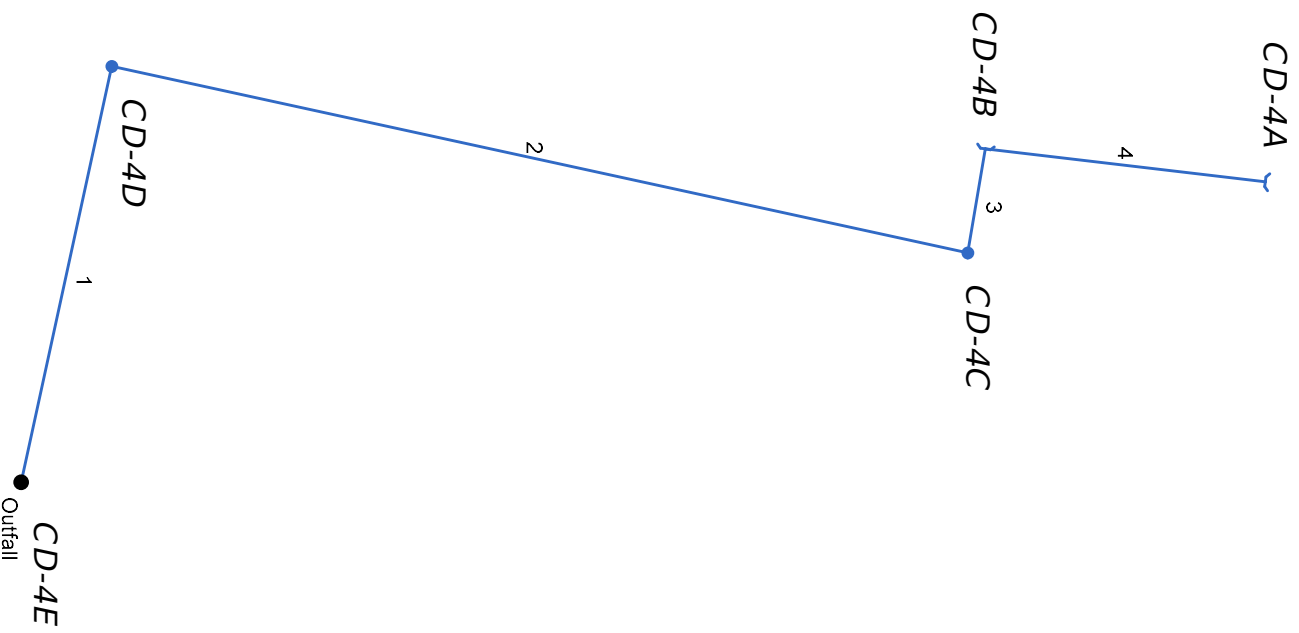
Number of lines: 2

Date: 2/28/2023

Storm Sewer Profile



Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



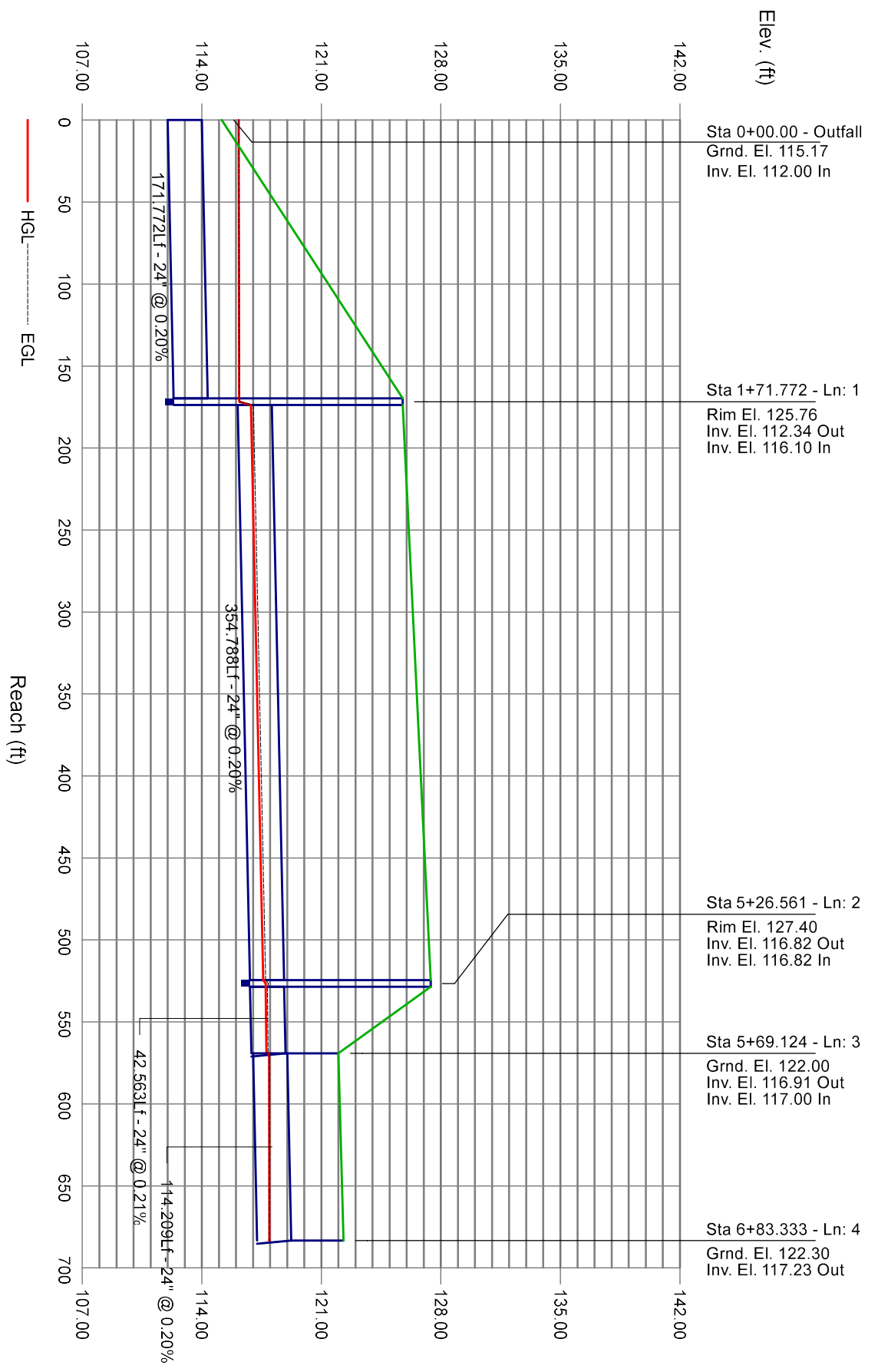
Project File: STORM07.slm

Number of lines: 4

Date: 2/28/2023

Storm Sewer Profile

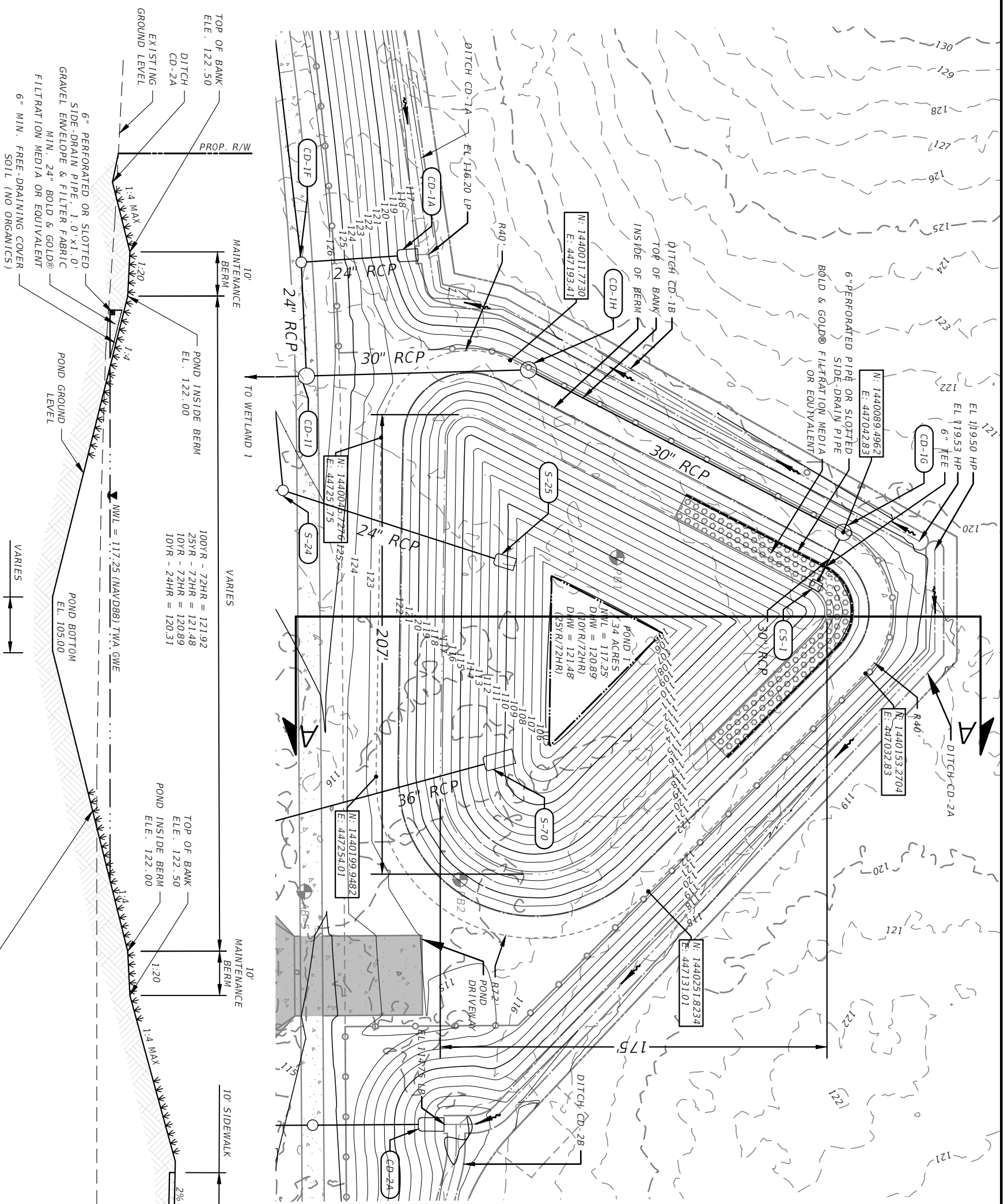
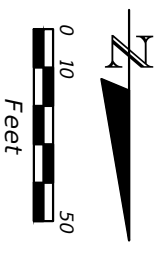
Proj. file: New.stm



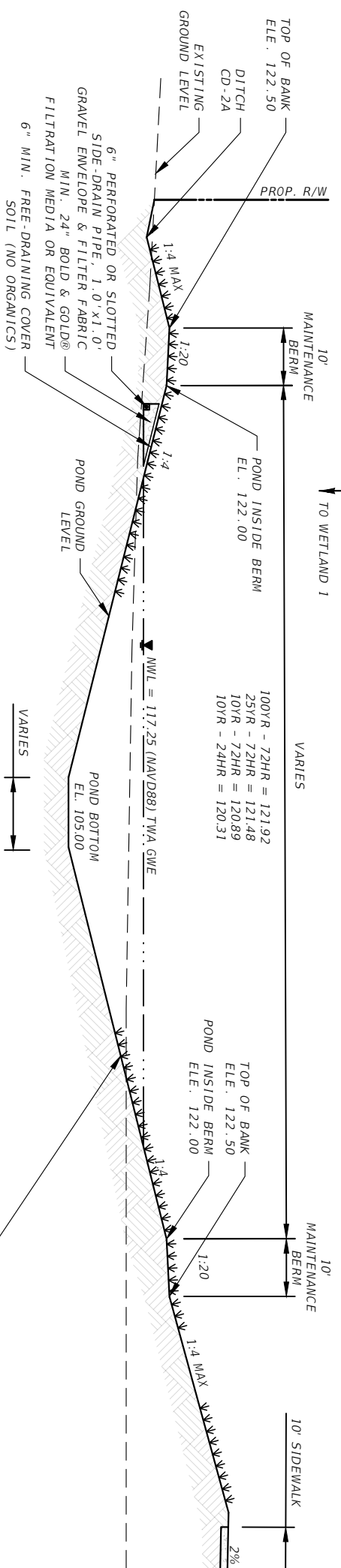
Line	To Line	Type of Struct.	N Value	Line Len (ft)	Incr. Area (ac)	Sub Total Area (ac)	C1 = C2 = C3 =	Sub Total CxA	Time of Conc. (min)	Line Flow Time (min)	Rnfall Inten. (l)	Total CxA	Add. Total Runoff (cfs)	Inlet Elev. (ft)	HGL Crown Invert Up (ft)	HGL Crown Invert Dn (ft)	HGL Crown Invert Fall (ft)	Line Size (in)	HGL Pipe Slope (%)	Actual Design Vel (ft/s)	Actual Design Capac. (cfs)	Line ID
2	1	MH	0.012	50.268	0.00	0.00	0.20	0.00	0.00	0.31	0.00	0.00	19.08	124.98	121.39	119.65	1.74	36	3.45	8.81	19.08	P-16
					0.00	0.00	0.50	0.00					19.08		122.99	121.81			2.35	15.66	110.70	
					0.00	0.00	0.90	0.00							119.99	118.81	1.18					
1	Outfall	MH	0.012	177.279	0.00	0.00	0.20	0.00	0.31	1.09	0.00	0.00	0.00	126.15	116.26	116.15	0.11	36	0.06	2.72	19.08	P-15
					0.00	0.00	0.50	0.00					19.08		116.40	116.05			0.20	4.54	32.10	
					0.00	0.00	0.90	0.00							113.40	113.05	0.35					

Appendix D

Pond, Overflow Structure, and Spreader Swale Details



CROSS SECTION A-A
N.T.S.

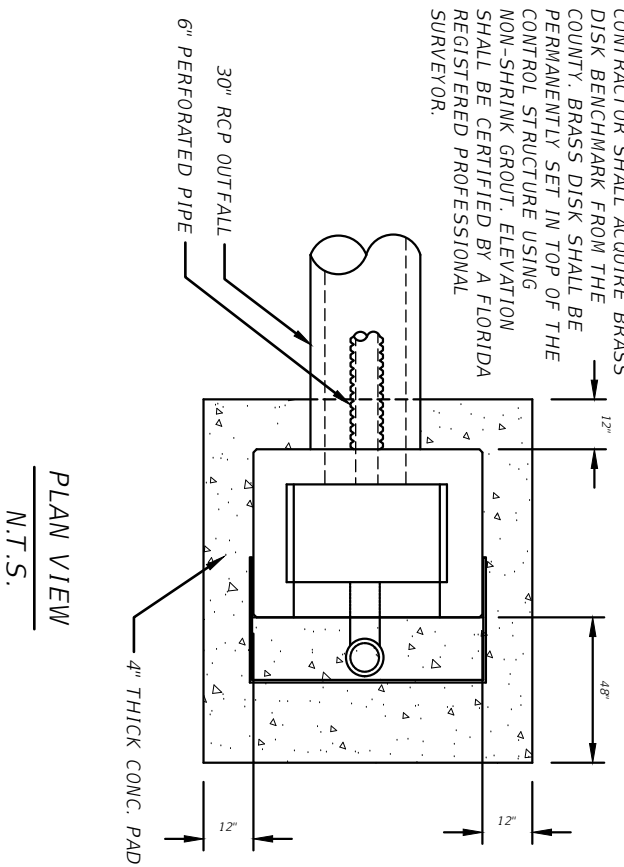


VARIES
100YR - 72HR = 121.92
25YR - 72HR = 121.48
10YR - 72HR = 120.89
10YR - 24HR = 120.31

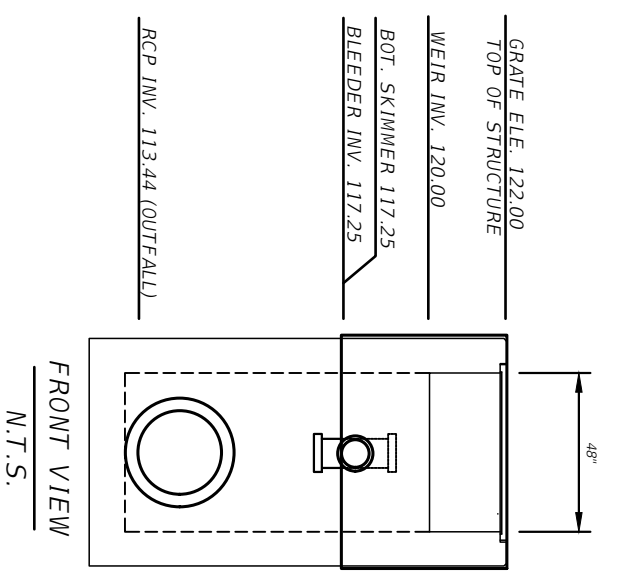
DATE	DESCRIPTION	DATE	DESCRIPTION

DAVID A. REID, P.E. P.E. LICENSE NUMBER 38794 HAMILTON ENGINEERING & SURVEYING, LLC 431 E. HORATIO AVE., SUITE 200 ORLANDO, FL 32751 (407) 629-8330 EXT 150	 OSCEOLA COUNTY TRANSPORTATION AND TRANSIT DEPARTMENT	POND DETAILS (1)	SHEET NO. 67
--	---	-------------------------	------------------------

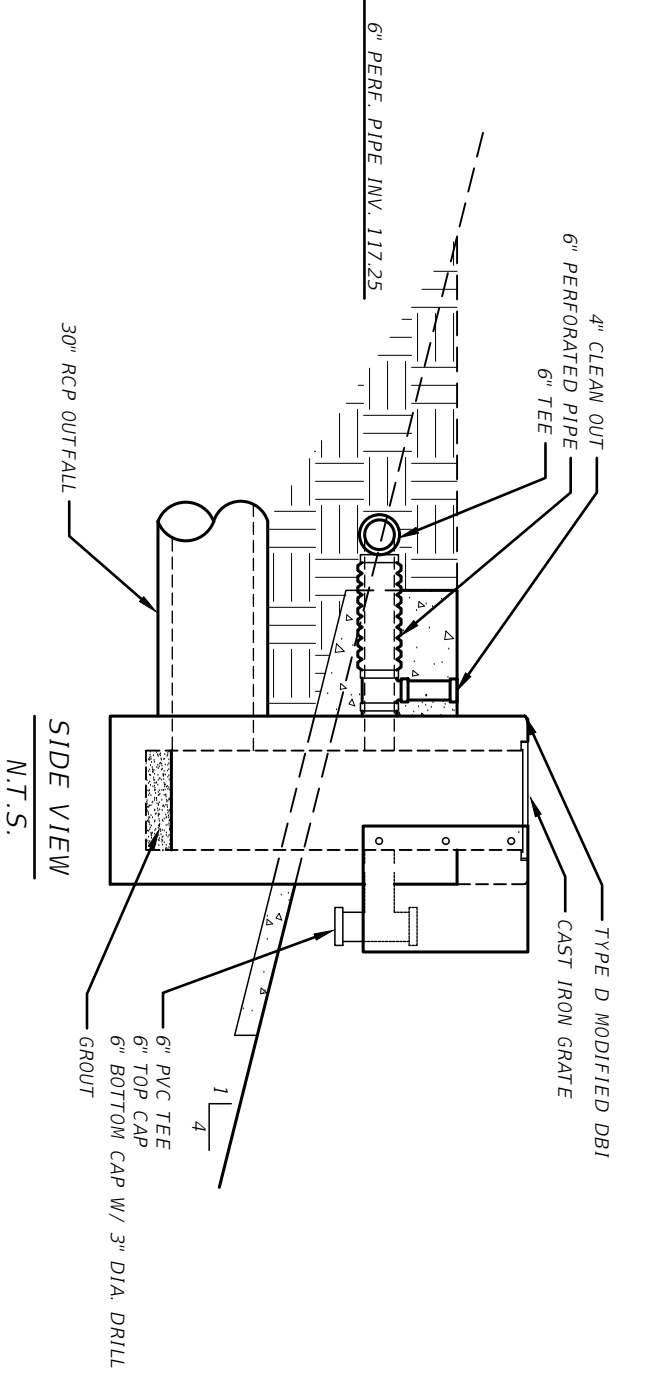
CONTRACTOR SHALL ACQUIRE BRASS DISK BENCHMARK FROM THE COUNTY. BRASS DISK SHALL BE PERMANENTLY SET IN TOP OF THE CONTROL STRUCTURE USING NON-SHRINK GROUT. ELEVATION SHALL BE CERTIFIED BY A FLORIDA REGISTERED PROFESSIONAL SURVEYOR.



PLAN VIEW
N.T.S.



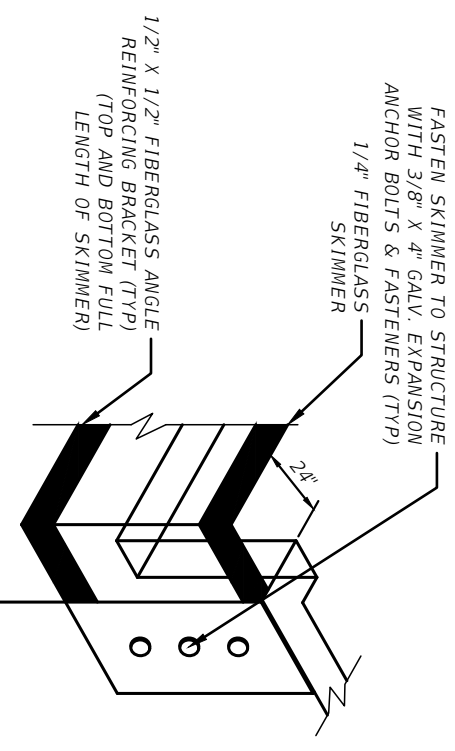
FRONT VIEW
N.T.S.



SIDE VIEW
N.T.S.

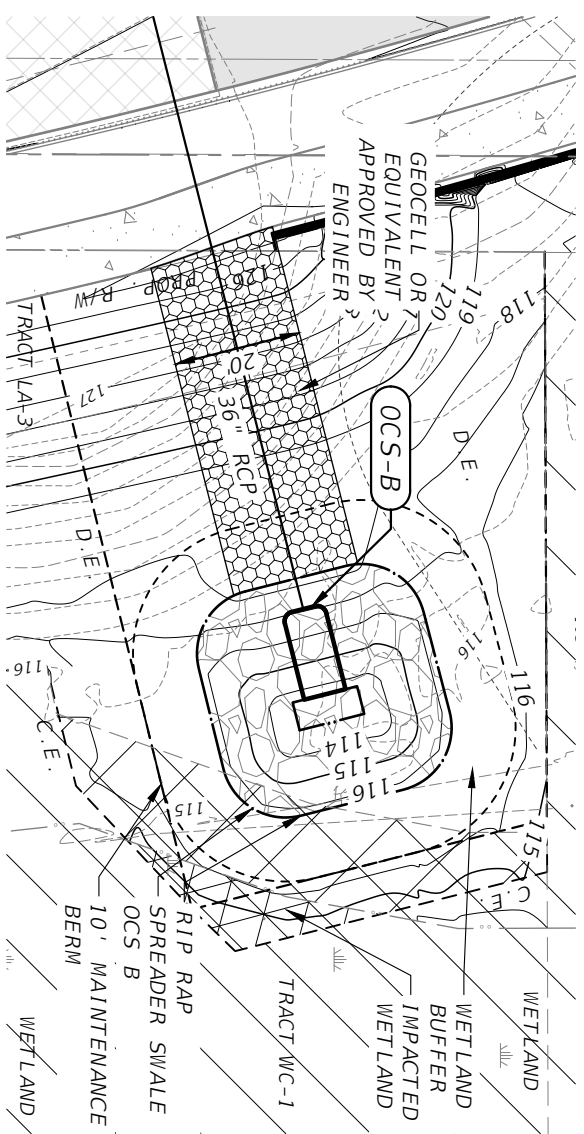
CONTROL STRUCTURE CS-1 FDOT TYPE D MODIFIED DBI
N.T.S.

SKIMMER DETAIL
N.T.S.



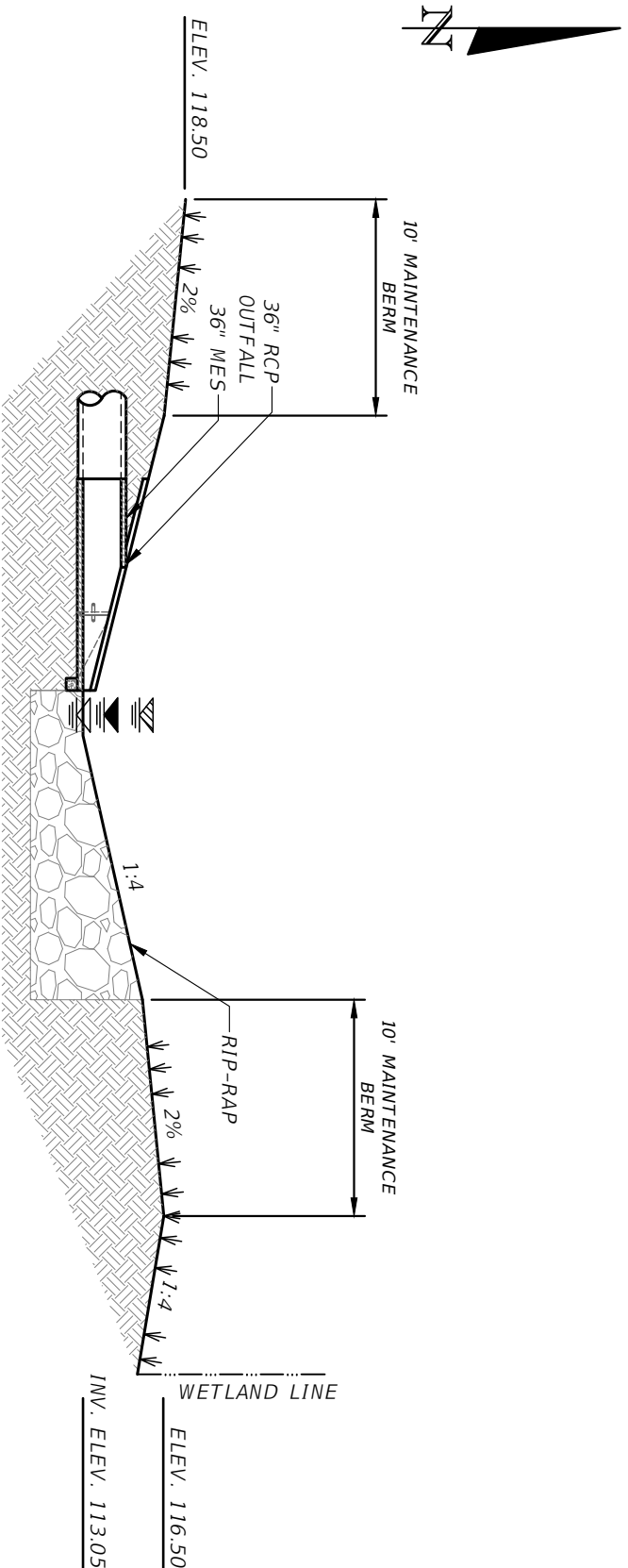
DATE	DESCRIPTION	REVISIONS	DATE	DESCRIPTION

<p>DAVID A. REID, P.E. P.E. LICENSE NUMBER 38794 HAMILTON ENGINEERING & SURVEYING, LLC 431 E. HORATIO AVE., SUITE 200 MAITLAND, FL 32751 (407) 629-8330 EXT 150</p>		<p>OSCEOLA COUNTY TRANSPORTATION AND TRANSIT DEPARTMENT</p>	<p>POND DETAILS (2)</p>	<p>SHEET NO. 68</p>
---	--	---	-------------------------	---------------------



OCS-B SPREADER SWALE - PLAN VIEW

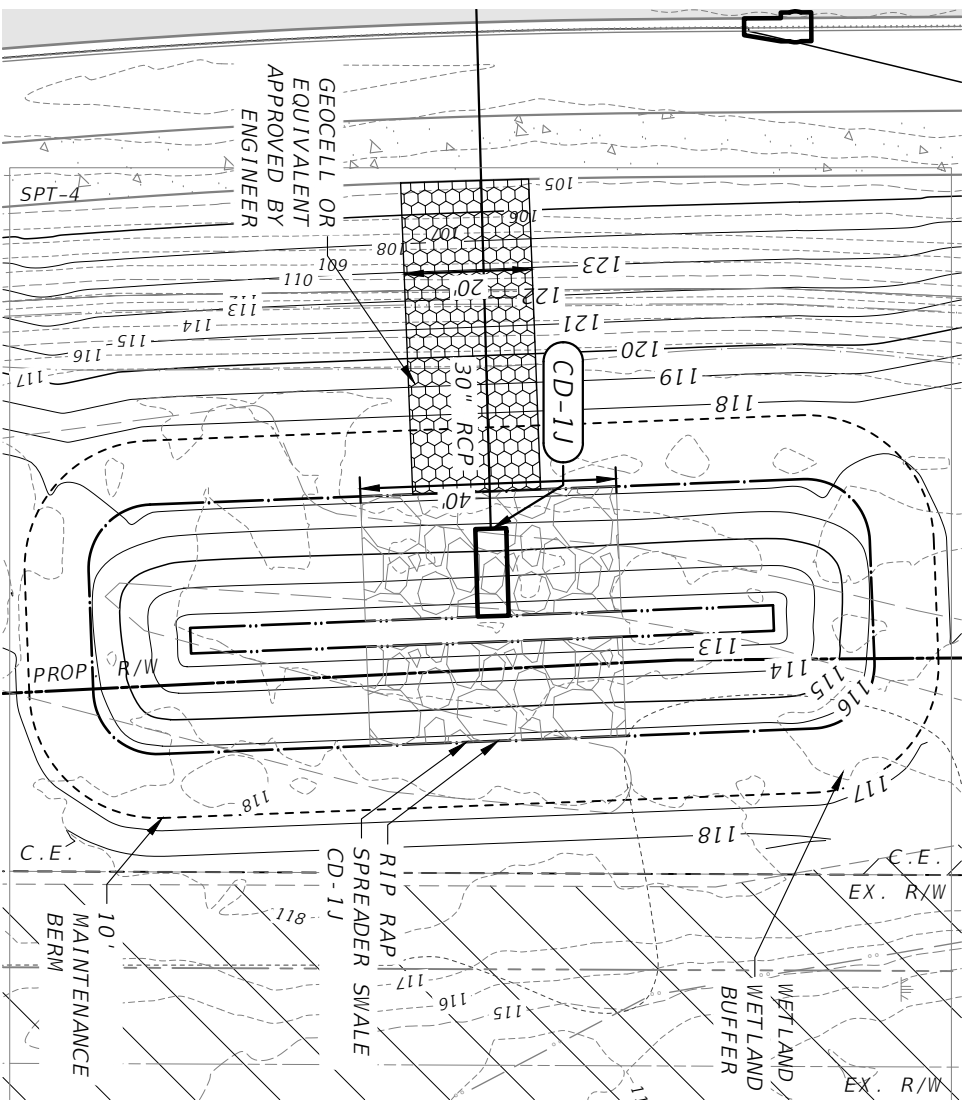
SCALE 1" = 30'



OCS-B SPREADER SWALE - DETAIL

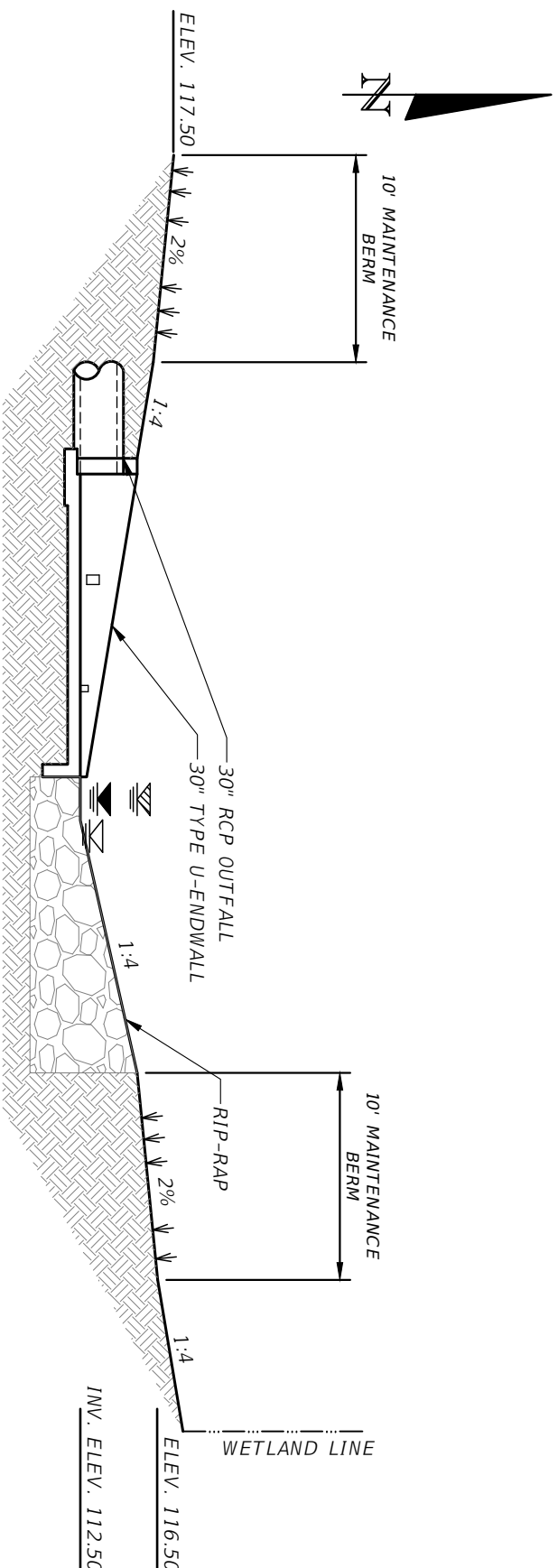
NTS

TWA RIBS GWT = 116.15
SHGWT = 114.08 (AVG. SHW NAILS 1-8)*
NWL = 112.7 (SPT-1)



CD-1J SPREADER SWALE - PLAN VIEW

SCALE 1" = 30'



CD-1J SPREADER SWALE - DETAIL

NTS

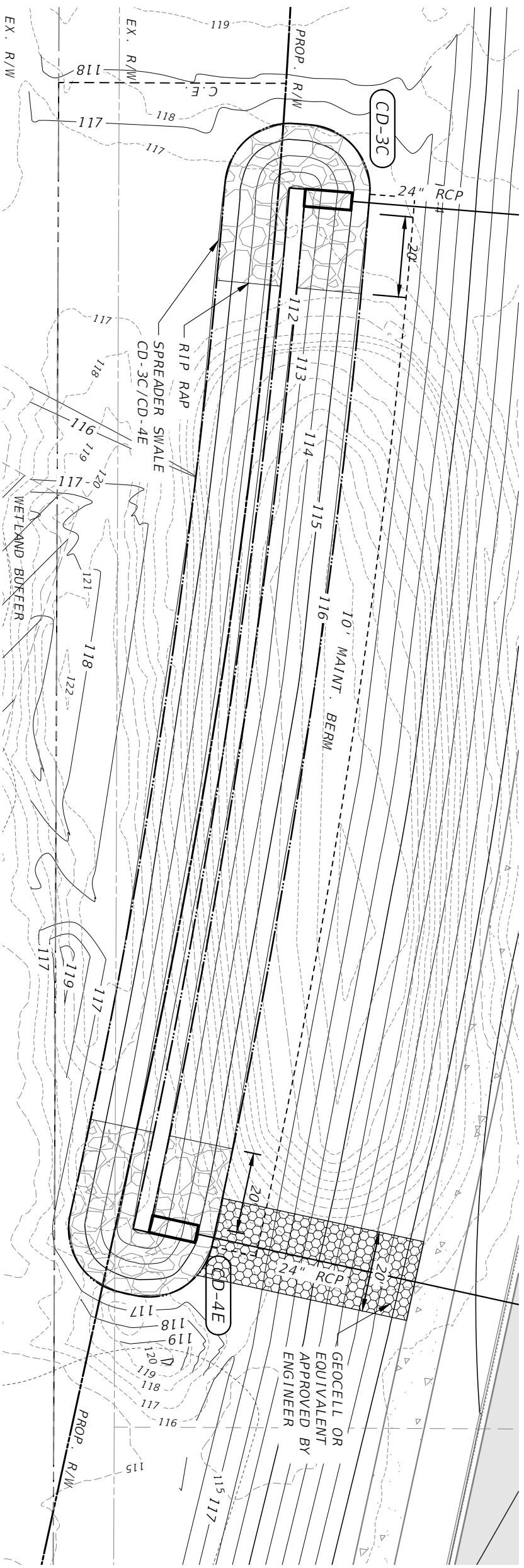
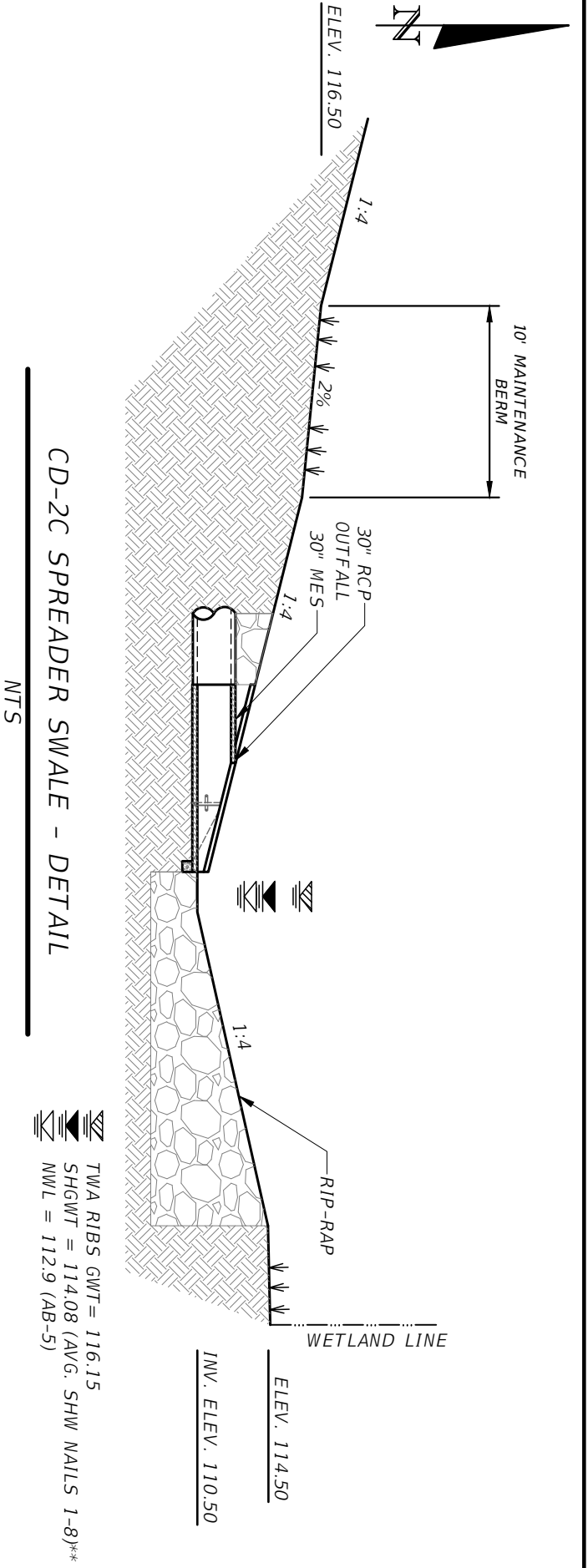
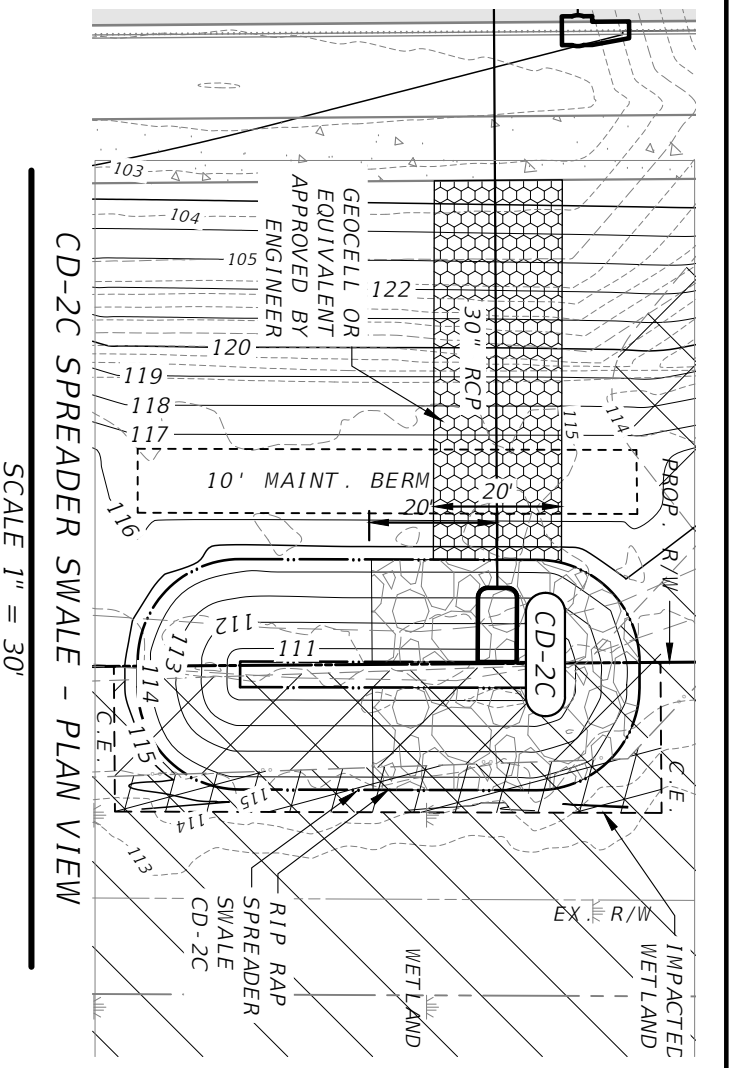
TWA RIBS GWT = 116.15
SHGWT = 114.08 (AVG. SHW NAILS 1-8)*
NWL = 113.1 (SPT-4)

* SEE SHEET 11 FOR SHW NAIL LOCATIONS

DATE	DESCRIPTION	REVISIONS	DATE	DESCRIPTION

DAVID A. REID, P.E. P.E. LICENSE NUMBER 38794 HAMILTON ENGINEERING & SURVEYING, LLC 431 E. HORATIO AVE., SUITE 200 MAITLAND, FL 32751 (407) 629-8330 EXT 150	 OSCEOLA COUNTY TRANSPORTATION AND TRANSIT DEPARTMENT	DRAINAGE DETAILS SHEET NO. 58
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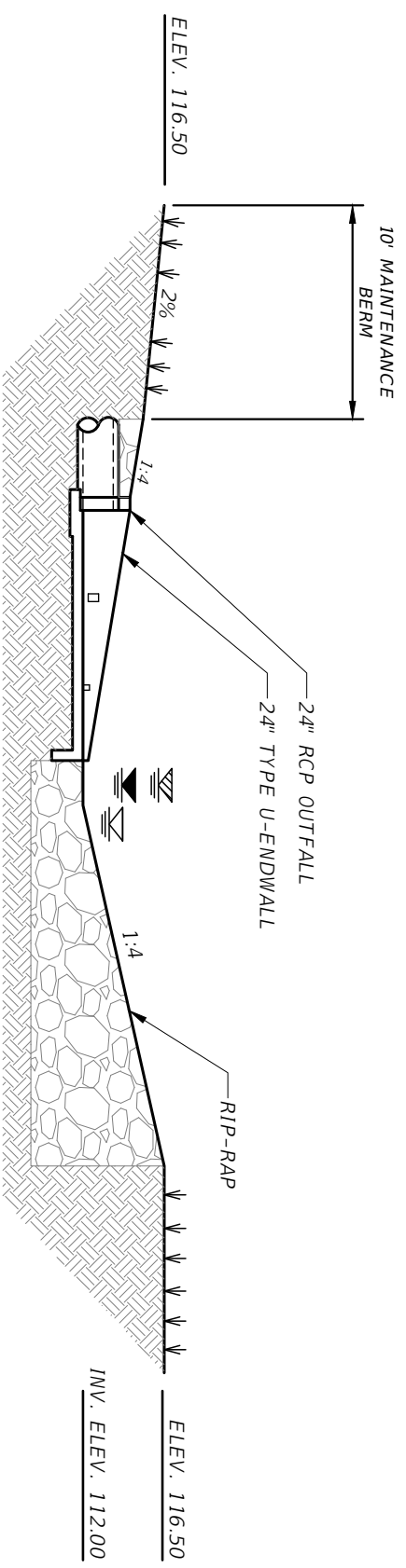
ENR4 Jul 26, 2023 - 6:25:05pm L:\53509 Lemna Homes, LLC\0017 Westside Blvd\ENGR\02 Master\1 DWG\51100% SET\58 DRAINAGE DETAILS.dwg (58 DRAINAGE DETAILS)



CD-3C/CD-4E SPREADER SWALE DETAILS LOCATED ON THE FOLLOWING SHEET
**SEE SHEET 11 FOR SHW NAIL LOCATIONS

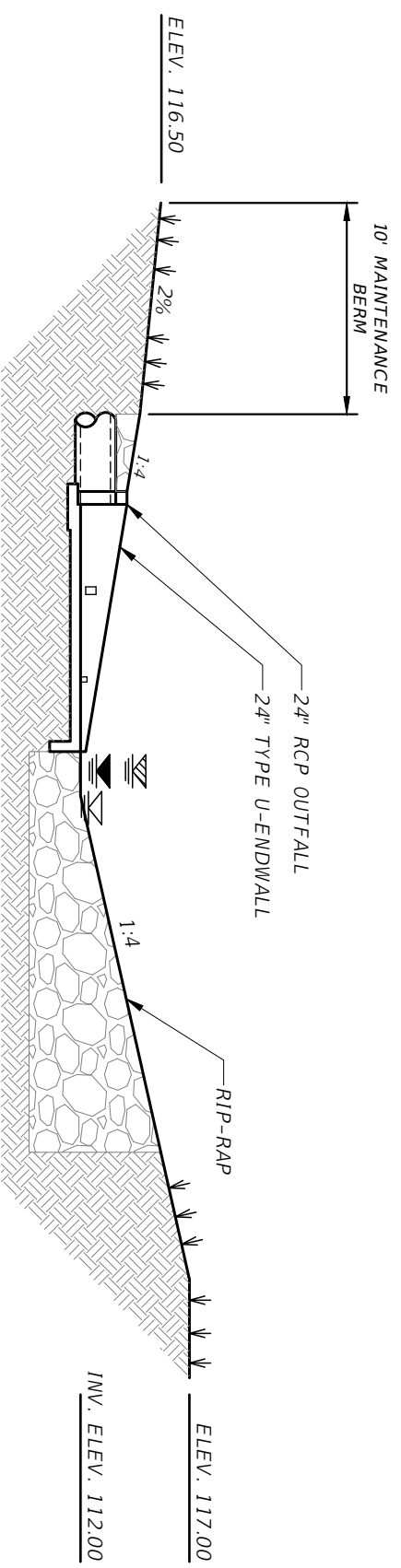
DATE	DESCRIPTION	REVISIONS	DATE	DESCRIPTION

DAVID A. REID, P.E. P.E. LICENSE NUMBER 38794 HAMILTON ENGINEERING & SURVEYING, LLC 431 E. HORATIO AVE., SUITE 200 MAITLAND, FL 32751 (407) 629-8330 EXT 150		OSCEOLA COUNTY TRANSPORTATION AND TRANSIT DEPARTMENT	DRAINAGE DETAILS SHEET NO. 59
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CD-3C SPREADER SWALE - DETAIL
NTS

TWA RIBS GWT = 116.15
SHGWT = 114.08 (AVG. SHW NAILS 1-8)*
NWL = 113.3 (PB-4)




CD-4E SPREADER SWALE - DETAIL
NTS

TWA RIBS GWT = 116.15
SHGWT = 114.08 (AVG. SHW NAILS 1-8)*
NWL = 112.7 (AB-11)

* SEE SHEET 11 FOR SHW NAIL LOCATIONS

DATE	DESCRIPTION	REVISIONS	DATE	DESCRIPTION

DAVID A. REID, P.E. P.E. LICENSE NUMBER 38794 HAMILTON ENGINEERING & SURVEYING, LLC 431 E. HORATIO AVE., SUITE 200 MAITLAND, FL 32751 (407) 629-8330 EXT 150	 OSCEOLA COUNTY TRANSPORTATION AND TRANSIT DEPARTMENT	DRAINAGE DETAILS	SHEET NO. 60
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Appendix E

Spreader Swale and Skimmer Opening Calculations

Spreader Swale Calculations

Job Number:

Project Name: Westside Boulevard Extension
Pond 1 & CD-1

Spreader Calculations are based on the following Equation:

$$\text{Continuity Equation} \quad Q = VA$$

Q = Weir Discharge rate (cfs)
C = Runoff Coefficient (3.2)
H = Height of Water (ft)
L = Length of Spreader Swale Required (ft)
V = Velocity over spreader Swale (fps)

$$\begin{aligned} Q &= 14.47 \text{ cfs} && \text{(from ICPR routing data)} \\ C &= 3.2 && \text{(weir coefficient)} \\ V &= 2 \text{ fps} && \text{(maximum allowed)} \\ H &= 0.1 \text{ ft} && \text{(maximum allowed)} \end{aligned}$$

$$\begin{aligned} Q &= VA \text{ cfs} \\ A &= Q / V \text{ sf} \end{aligned}$$

$$\begin{aligned} A &= 7.235 \text{ sf} \\ A &= LH \text{ sf} && \text{(area = length x height)} \end{aligned}$$

$$\begin{aligned} L &= A / H \text{ ft} \\ L &= 72 \text{ ft @ 2 fps} \text{ minimum required} \end{aligned}$$

To consist of 90' sodded swale/rip rap on each side

Actual discharge over spreader swale:

$$\begin{aligned} H &= A/L \text{ ft} \\ A &= 0.08 \text{ sf} \end{aligned}$$

$$\begin{aligned} Q &= VA \text{ cfs} \\ \mathbf{Q} &= \mathbf{0.161 \text{ cfs}} \end{aligned}$$

Spreader Swale Calculations

Job Number:

Project Name: Westside Boulevard Extension
CD-2

Spreader Calculations are based on the following Equation:

$$\text{Continuity Equation} \quad Q = VA$$

Q = Weir Discharge rate (cfs)

C = Runoff Coefficient (3.2)

H = Height of Water (ft)

L = Length of Spreader Swale Required (ft)

V = Velocity over spreader Swale (fps)

$$Q = 7.14 \text{ cfs} \quad (\text{from ICPR routing data})$$

$$C = 3.2 \quad (\text{weir coefficient})$$

$$V = 6 \text{ fps} \quad (\text{maximum allowed})$$

$$H = 0.1 \text{ ft} \quad (\text{maximum allowed})$$

$$Q = VA \text{ cfs}$$

$$A = Q / V \text{ sf}$$

$$A = 1.19 \text{ sf}$$

$$A = LH \text{ sf} \quad (\text{area} = \text{length} \times \text{height})$$

$$L = A / H \text{ ft}$$

$$L = 12 \text{ ft @ } 2 \text{ fps} \quad \text{minimum required}$$

To consist of 45' of sodded swale/rip rap on both sides

Actual discharge over spreader swale:

$$H = A/L \text{ ft}$$

$$A = 0.026 \text{ sf}$$

$$Q = VA \text{ cfs}$$

$$Q = 0.159 \text{ cfs}$$

Spreader Swale Calculations

Job Number:

Project Name: Westside Boulevard Extension
CD-3/CD-4

Spreader Calculations are based on the following Equation:

$$\text{Continuity Equation} \quad Q = VA$$

Q = Weir Discharge rate (cfs)

C = Runoff Coefficient (3.2)

H = Height of Water (ft)

L = Length of Spreader Swale Required (ft)

V = Velocity over spreader Swale (fps)

$$Q = 5.35 \text{ cfs} \quad (\text{from ICPR routing data})$$

$$C = 3.2 \quad (\text{weir coefficient})$$

$$V = 6 \text{ fps} \quad (\text{maximum allowed})$$

$$H = 0.1 \text{ ft} \quad (\text{maximum allowed})$$

$$Q = VA \text{ cfs}$$

$$A = Q / V \text{ sf}$$

$$A = 0.892 \text{ sf}$$

$$A = LH \text{ sf} \quad (\text{area} = \text{length} \times \text{height})$$

$$L = A / H \text{ ft}$$

$$L = 9 \text{ ft @ } 2 \text{ fps} \text{ minimum required}$$

To consist of 260' of sodded swale/rip rap on both sides

Actual discharge over spreader swale:

$$H = A/L \text{ ft}$$

$$A = 0.031 \text{ sf}$$

$$Q = VA \text{ cfs}$$

$$Q = 0.184 \text{ cfs}$$

Spreader Swale Calculations

Job Number:

Project Name: Westside Boulevard Extension
OCS-B

Spreader Calculations are based on the following Equation:

$$\text{Continuity Equation} \quad Q = VA$$

Q = Weir Discharge rate (cfs)

C = Runoff Coefficient (3.2)

H = Height of Water (ft)

L = Length of Spreader Swale Required (ft)

V = Velocity over spreader Swale (fps)

$$Q = 8.61 \text{ cfs} \quad (\text{from Permit \# 49-101036-P})$$

$$C = 3.2 \quad (\text{weir coefficient})$$

$$V = 2 \text{ fps} \quad (\text{maximum allowed})$$

$$H = 0.1 \text{ ft} \quad (\text{maximum allowed})$$

$$Q = VA \text{ cfs}$$

$$A = Q / V \text{ sf}$$

$$A = 4.305 \text{ sf}$$

$$A = LH \text{ sf} \quad (\text{area} = \text{length} \times \text{height})$$

$$L = A / H \text{ ft}$$

$$L = 43 \text{ ft @ 2 fps} \quad \text{minimum required}$$

To consist of 56' sodded swale/rip rap on each side

Actual discharge over spreader swale:

$$H = A/L \text{ ft}$$

$$A = 0.077 \text{ sf}$$

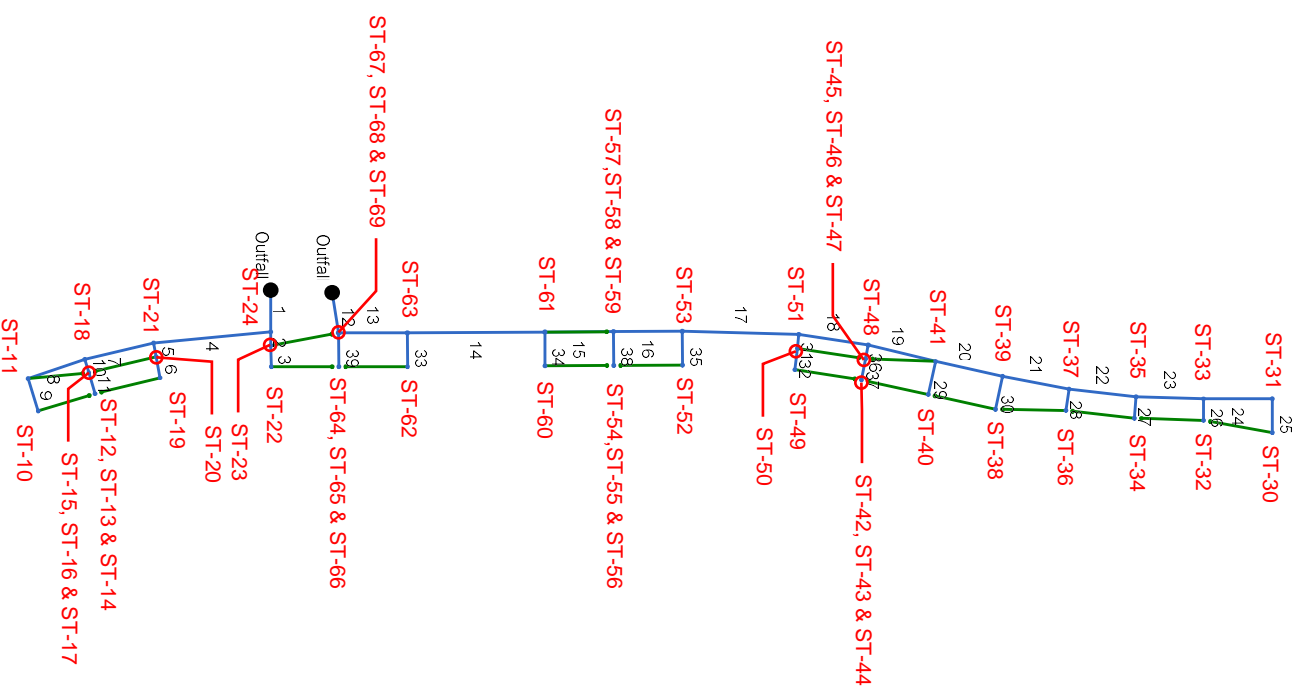
$$Q = VA \text{ cfs}$$

$$Q = 0.154 \text{ cfs}$$

Appendix F

Hydraflow Input, Results & Profiles

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: STORMM0102.stm

Number of lines: 39

Date: 6/2/2022

Line	To Line	Type of Struct.	N Value	Line Len (ft)	Incr. Area (ac)	Sub Total Area (ac)	C1 = C2 = C3 =	Sub Total CXA	Time of Conc. (min)	Line Flow Time (min)	Rainfall Inten. (l)	Total CXA (in/hr)	Add. Q Total Runoff (cfs)	Inlet Elev. (ft)	HGL Crown Invert (ft)	HGL Crown Invert (ft)	HGL Crown Invert (ft)	Line Size (in)	HGL Pipe Size (%)	Actual Design (ft/s)	Actual Design (cfs)	Line ID	
39	12	Curb	0.012	73.410	0.00	0.00	0.20	0.00	10.00	1.11	7.21	0.27	0.00	124.50	121.20	121.17	0.03	18	0.04	1.65	1.95	66-69	
					0.00	0.00	0.50	0.00					1.95		121.80	121.65			0.20	0.00	0.00		
					0.00	0.00	0.90	0.00							120.30	120.15	0.15						
38	15	Curb	0.012	73.410	0.00	0.00	0.20	0.00	10.00	1.11	7.21	0.27	0.00	124.53	122.52	122.50	0.02	18	0.03	1.10	1.95	56-59	
					0.00	0.00	0.50	0.00					1.95		121.90	121.75			0.20	0.00	0.00		
					0.00	0.00	0.90	0.00							120.40	120.25	0.15						
37	36	Curb	0.012	46.660	0.00	0.00	0.20	0.00	10.00	0.70	7.21	0.27	0.00	124.70	123.65	123.64	0.01	18	0.03	1.10	1.95	44-45	
					0.00	0.00	0.50	0.00					1.95		122.00	121.91			0.19	0.00	0.00		
					0.00	0.00	0.90	0.00							120.50	120.41	0.09						
36	18	Curb	0.012	30.375	0.00	0.00	0.20	0.00	10.70	0.23	7.11	0.55	0.00	125.32	123.60	123.57	0.04	18	0.12	2.20	3.90	47-48	
					0.00	0.00	0.50	0.00					3.90		121.91	121.85			0.20	0.00	0.00		
					0.00	0.00	0.90	0.00							120.41	120.35	0.06						
35	16	Curb	0.012	73.410	0.00	0.00	0.20	0.00	10.00	2.27	7.21	0.13	0.00	125.03	122.95	122.94	0.01	18	0.01	0.54	0.95	52-53	
					0.00	0.00	0.50	0.00					0.95		122.40	122.25			0.20	0.00	0.00		
					0.00	0.00	0.90	0.00							120.90	120.75	0.15						
34	14	Curb	0.012	73.410	0.00	0.00	0.20	0.00	10.00	2.16	7.21	0.14	0.00	125.03	121.90	121.90	0.00	18	0.01	0.74	1.00	60-61	
					0.00	0.00	0.50	0.00					1.00		122.40	122.25			0.20	0.00	0.00		
					0.00	0.00	0.90	0.00							120.90	120.75	0.15						
33	13	Curb	0.012	73.410	0.00	0.00	0.20	0.00	10.00	2.16	7.21	0.14	0.00	125.03	121.51	121.49	0.02	18	0.03	1.31	1.00	62-63	
					0.00	0.00	0.50	0.00					1.00		122.40	122.25			0.20	0.00	0.00		
					0.00	0.00	0.90	0.00							120.90	120.75	0.15						
32	31	Curb	0.012	46.662	0.00	0.00	0.20	0.00	10.00	0.70	7.21	0.27	0.00	125.20	123.45	123.44	0.01	18	0.03	1.10	1.95	49-50	
					0.00	0.00	0.50	0.00					1.95		122.50	122.41			0.19	0.00	0.00		
					0.00	0.00	0.90	0.00							121.00	120.91	0.09						
31	17	Curb	0.012	30.366	0.00	0.00	0.20	0.00	10.70	0.23	7.11	0.55	0.00	125.75	123.40	123.36	0.04	18	0.12	2.20	3.90	47-48	
					0.00	0.00	0.50	0.00					3.90		122.41	122.35			0.20	0.00	0.00		
					0.00	0.00	0.90	0.00							120.91	120.85	0.06						

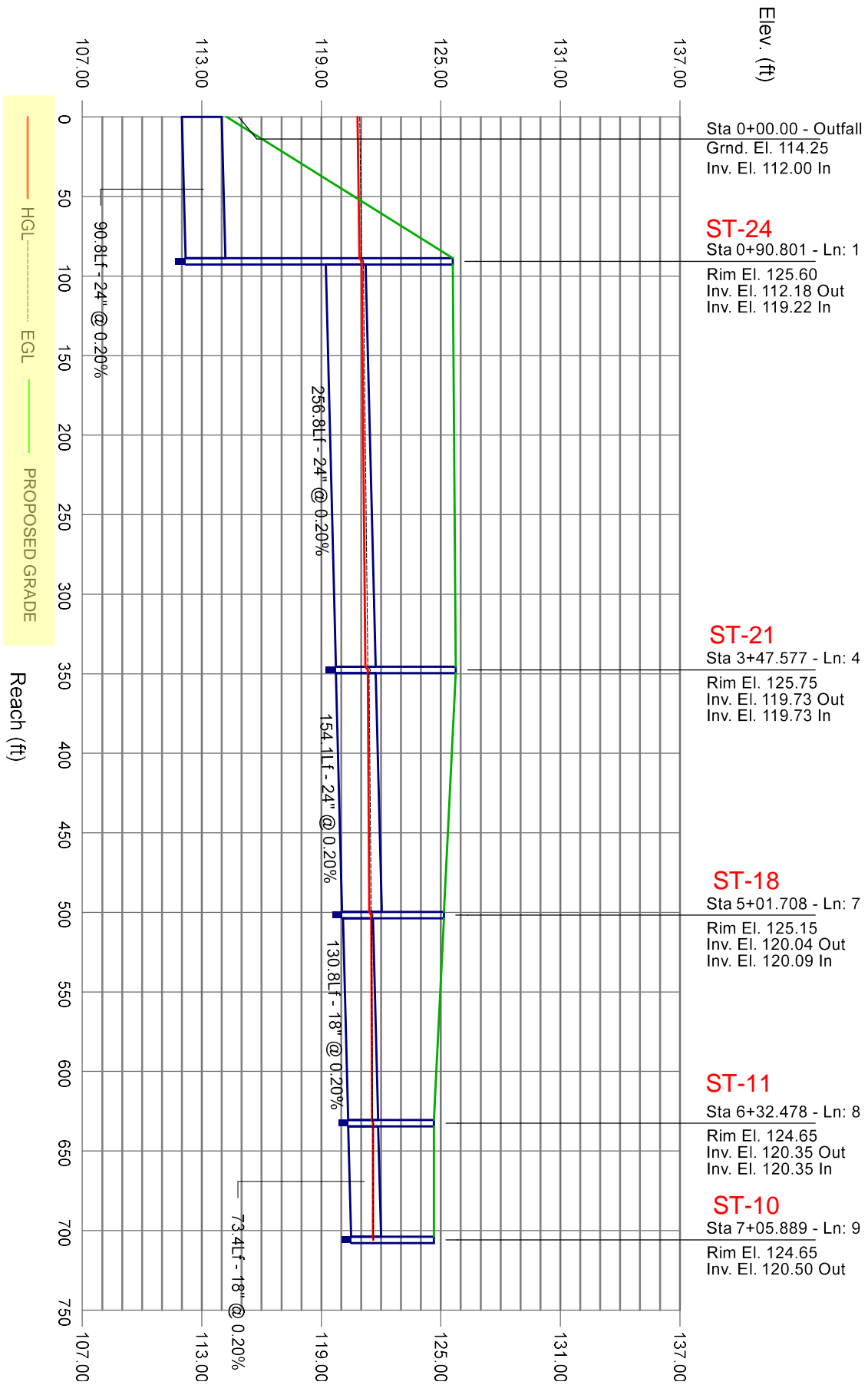
Line	To Line	Type of Struct.	N Value	Line Len	Incr. Area	Sub Total Area	C1 = C2 = C3 =	Sub Total CxA	Time of Conc.	Line Flow Time	Rainfall Inten. (l)	Total CxA	Add. Q Total Runoff	Inlet Elev.	HGL Crown Invert	HGL Crown Invert	HGL Crown Invert	Line Size	HGL Pipe Design	Actual Design	Actual Design	Line ID
				(ft)	(ac)	(ac)			(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	
30	20	Curb	0.012	73.410	0.00	0.00	0.20	0.00	10.00	1.96	7.21	0.15	0.00	126.75	124.22	124.22	0.01	18	0.01	0.63	1.11	38-39
					0.00	0.00	0.50	0.00					1.11		123.84	123.70			0.19	0.00	0.00	
					0.00	0.00	0.90	0.00							122.34	122.20	0.14					
29	19	Curb	0.012	73.410	0.00	0.00	0.20	0.00	10.00	2.07	7.21	0.14	0.00	126.83	123.96	123.95	0.00	18	0.01	0.63	1.05	40-41
					0.00	0.00	0.50	0.00					1.05		124.20	124.05			0.20	0.00	0.00	
					0.00	0.00	0.90	0.00							122.70	122.55	0.15					
28	21	Curb	0.012	46.659	0.00	0.00	0.20	0.00	10.00	1.39	7.21	0.14	0.00	127.70	124.38	124.38	0.00	18	0.01	0.59	0.99	36-37
					0.00	0.00	0.50	0.00					0.99		124.59	124.50			0.19	0.00	0.00	
					0.00	0.00	0.90	0.00							123.09	123.00	0.09					
27	22	Curb	0.012	46.667	0.00	0.00	0.20	0.00	10.00	1.47	7.21	0.13	0.00	128.60	124.73	124.72	0.01	18	0.02	1.20	0.93	34-35
					0.00	0.00	0.50	0.00					0.93		125.59	125.50			0.19	0.00	0.00	
					0.00	0.00	0.90	0.00							124.09	124.00	0.09					
26	23	Curb	0.012	46.660	0.00	0.00	0.20	0.00	10.00	1.57	7.21	0.12	0.00	129.50	125.30	125.28	0.03	18	0.06	1.56	0.88	32-33
					0.00	0.00	0.50	0.00					0.88		126.30	126.21			0.19	0.00	0.00	
					0.00	0.00	0.90	0.00							124.80	124.71	0.09					
25	24	Curb	0.012	73.410	0.00	0.00	0.20	0.00	10.00	3.59	7.21	0.08	0.00	129.93	126.15	126.00	0.15	18	0.20	1.95	0.60	30-31
					0.00	0.00	0.50	0.00					0.60		127.30	127.15			0.20	0.00	0.00	
					0.00	0.00	0.90	0.00							125.80	125.65	0.15					
24	23	Curb	0.012	150.000	0.00	0.00	0.20	0.00	13.59	3.51	6.72	0.18	0.00	129.93	125.53	125.28	0.26	18	0.17	2.27	1.18	31-33
					0.00	0.00	0.50	0.00					1.18		126.55	126.25			0.20	0.00	0.00	
					0.00	0.00	0.90	0.00							125.05	124.75	0.30					
23	22	Curb	0.012	147.346	0.00	0.00	0.20	0.00	17.09	1.41	6.28	0.44	0.00	129.48	125.08	124.79	0.29	18	0.20	2.91	2.74	33-35
					0.00	0.00	0.50	0.00					2.74		125.79	125.50			0.20	0.00	0.00	
					0.00	0.00	0.90	0.00							124.29	124.00	0.29					
22	21	Curb	0.012	146.962	0.00	0.00	0.20	0.00	18.51	0.90	6.12	0.70	0.00	128.19	124.55	124.38	0.17	18	0.12	2.60	4.27	35-37
					0.00	0.00	0.50	0.00					4.27		124.79	124.50			0.20	0.00	0.00	
					0.00	0.00	0.90	0.00							123.29	123.00	0.29					

Line	To Line	Type of Struct.	N Value	Line Len (ft)	Incr. Area (ac)	Sub Total Area (ac)	C1 = C2 = C3 =	Sub Total CVA	Time of Conc. (min)	Line Flow Time (min)	Rainfall Inten. (l)	Total CVA	Add. Q Total Runoff (cfs)	Inlet Elev. (ft)	HGL Crown Invert (ft)	HGL Crown Invert (ft)	HGL Crown Invert (ft)	Line Size (in)	HGL Pipe Design (%)	Actual Design (ft/s)	Actual Design (cfs)	Line ID	
21	20	Curb	0.012	147.606	0.00	0.00	0.20	0.00	19.40	1.17	6.02	0.97	0.00	127.23	124.30	124.22	0.08	24	0.06	1.85	5.82	37-39	
					0.00	0.00	0.50	0.00					5.82	124.00	123.70				0.20	0.00	0.00		
					0.00	0.00	0.90	0.00						122.00	121.70	0.30							
20	19	Curb	0.012	150.000	0.00	0.00	0.20	0.00	20.58	0.94	5.89	1.25	0.00	126.67	124.09	123.95	0.14	24	0.09	2.35	7.37	39-41	
					0.00	0.00	0.50	0.00					7.37	123.10	122.80				0.20	0.00	0.00		
					0.00	0.00	0.90	0.00						121.10	120.80	0.30							
19	18	Curb	0.012	151.006	0.00	0.00	0.20	0.00	21.51	0.78	5.79	1.54	0.00	126.68	123.76	123.57	0.20	24	0.13	2.83	8.89	41-48	
					0.00	0.00	0.50	0.00					8.89	122.80	122.50				0.20	0.00	0.00		
					0.00	0.00	0.90	0.00						120.80	120.50	0.30							
18	17	MH	0.012	153.320	0.00	0.00	0.20	0.00	22.29	0.93	5.71	2.08	0.00	125.70	123.47	123.36	0.11	30	0.07	2.42	11.90	48-51	
					0.00	0.00	0.50	0.00					11.90	122.85	122.54				0.20	0.00	0.00		
					0.00	0.00	0.90	0.00						120.35	120.04	0.31							
17	16	MH	0.012	254.312	0.00	0.00	0.20	0.00	23.22	1.24	5.62	2.63	0.00	126.25	123.22	122.94	0.28	30	0.11	3.01	14.78	50-53	
					0.00	0.00	0.50	0.00					14.78	122.54	122.03				0.20	0.00	0.00		
					0.00	0.00	0.90	0.00						120.04	119.53	0.51							
16	15	Curb	0.012	150.000	0.00	0.00	0.20	0.00	24.46	0.68	5.50	2.90	0.00	125.45	122.70	122.50	0.19	30	0.13	3.25	15.95	53-59	
					0.00	0.00	0.50	0.00					15.95	122.03	121.73				0.20	0.00	0.00		
					0.00	0.00	0.90	0.00						119.53	119.23	0.30							
15	14	Curb	0.012	150.000	0.00	0.00	0.20	0.00	25.14	0.58	5.43	3.44	0.00	124.50	122.16	121.90	0.27	30	0.18	3.81	18.70	59-61	
					0.00	0.00	0.50	0.00					18.70	121.73	121.43				0.20	0.00	0.00		
					0.00	0.00	0.90	0.00						119.23	118.93	0.30							
14	13	Curb	0.012	300.000	0.00	0.00	0.20	0.00	25.72	1.58	5.38	3.72	0.00	125.00	121.70	121.49	0.21	36	0.07	2.88	20.00	61-63	
					0.00	0.00	0.50	0.00					20.00	121.93	121.33				0.20	0.00	0.00		
					0.00	0.00	0.90	0.00						118.93	118.33	0.60							
13	12	Curb	0.012	150.003	0.00	0.00	0.20	0.00	27.30	0.76	5.23	4.00	0.00	125.00	121.29	121.17	0.12	36	0.08	2.96	20.92	63-69	
					0.00	0.00	0.50	0.00					20.92	121.33	121.03				0.20	0.00	0.00		
					0.00	0.00	0.90	0.00						118.33	118.03	0.30							
12	Jutta	Curb	0.012	88.580	0.00	0.00	0.20	0.00	28.05	0.40	5.17	4.54	0.00	124.50	120.91	120.82	0.09	36	0.11	3.32	23.45	69-70	
					0.00	0.00	0.50	0.00					23.45	115.18	115.00				0.20	0.00	0.00		
					0.00	0.00	0.90	0.00						112.18	112.00	0.18							
11	10	Curb	0.012	47.537	0.00	0.00	0.20	0.00	10.00	0.77	7.21	0.25	0.00	124.33	121.57	121.56	0.01	18	0.02	1.05	1.81	12-13	
					0.00	0.00	0.50	0.00					1.81	121.70	121.60								

Line ID	Line Number	Type of Line Struct.	N Value	Line Len (ft)	Incr. Area (ac)	Sub Total Area (ac)	C1 = C2 = C3 =	Sub Total CxA	Time of Conc. (min)	Line Flow Time (min)	Rainfall Inten. (l)	Total CxA (in/hr)	Add. Q Total Runoff (cfs)	Inlet Elev. (ft)	HGL Crown Invert (ft)	HGL Crown Invert (ft)	HGL Crown Invert (ft)	Line Size (in)	HGL Pipe Design (%)	Actual Design (ft/s)	Actual Design (cfs)
					0.00	0.00	0.90	0.00													
	10	Curb	0.012	30.373	0.00	0.00	0.20	0.00	10.77	0.25	7.10	0.51	0.00	124.75	121.53	121.50	0.02	18	0.08	2.07	3.61
					0.00	0.00	0.50	0.00					3.61		121.60	121.54			0.20	0.00	0.00
					0.00	0.00	0.90	0.00							120.10	120.04	0.06				
	9	Curb	0.012	73.411	0.00	0.00	0.20	0.00	10.00	1.89	7.21	0.16	0.00	124.65	121.59	121.59	0.00	18	0.01	0.78	1.14
					0.00	0.00	0.50	0.00					1.14		122.00	121.85			0.20	0.00	0.00
					0.00	0.00	0.90	0.00							120.50	120.35	0.15				
	8	Curb	0.012	130.770	0.00	0.00	0.20	0.00	11.89	1.74	6.95	0.31	0.00	124.65	121.54	121.50	0.04	18	0.03	1.34	2.15
					0.00	0.00	0.50	0.00					2.15		121.85	121.59			0.20	0.00	0.00
					0.00	0.00	0.90	0.00							120.35	120.09	0.26				
	7	MH	0.012	154.131	0.00	0.00	0.20	0.00	13.63	1.40	6.71	0.82	0.00	125.15	121.41	121.34	0.07	24	0.05	2.21	5.49
					0.00	0.00	0.50	0.00					5.49		122.04	121.73			0.20	0.00	0.00
					0.00	0.00	0.90	0.00							120.04	119.73	0.31				
	6	Curb	0.012	46.653	0.00	0.00	0.20	0.00	10.00	1.44	7.21	0.13	0.00	124.72	121.37	121.37	0.00	18	0.01	0.85	0.95
					0.00	0.00	0.50	0.00					0.95		122.00	121.91			0.19	0.00	0.00
					0.00	0.00	0.90	0.00							120.50	120.41	0.09				
	5	Curb	0.012	30.387	0.00	0.00	0.20	0.00	11.44	0.46	7.01	0.27	0.00	125.27	121.35	121.34	0.01	18	0.03	1.59	1.90
					0.00	0.00	0.50	0.00					1.90		121.91	121.85			0.20	0.00	0.00
					0.00	0.00	0.90	0.00							120.41	120.35	0.06				
	4	MH	0.012	256.776	0.00	0.00	0.20	0.00	15.03	1.78	6.54	1.09	0.00	125.75	121.21	121.02	0.19	24	0.07	2.62	7.12
					0.00	0.00	0.50	0.00					7.12		121.73	121.22			0.20	0.00	0.00
					0.00	0.00	0.90	0.00							119.73	119.22	0.51				
	3	Curb	0.012	45.785	0.00	0.00	0.20	0.00	10.00	2.02	7.21	0.09	0.00	124.97	121.18	121.17	0.01	18	0.03	1.24	0.67
					0.00	0.00	0.50	0.00					0.67		122.20	122.11			0.20	0.00	0.00
					0.00	0.00	0.90	0.00							120.70	120.61	0.09				
	2	Curb	0.012	29.697	0.00	0.00	0.20	0.00	12.02	0.66	6.93	0.18	0.00	125.50	121.12	121.06	0.06	18	0.20	2.41	1.28
					0.00	0.00	0.50	0.00					1.28		122.11	122.05			0.20	2.89	5.11
					0.00	0.00	0.90	0.00							120.61	120.55	0.06				
	1	Jutta MH	0.012	90.801	0.00	0.00	0.20	0.00	16.81	0.55	6.32	1.27	0.00	125.60	120.92	120.82	0.10	24	0.11	2.56	8.05
					0.00	0.00	0.50	0.00					8.05		114.18	114.00			0.20	3.47	10.91

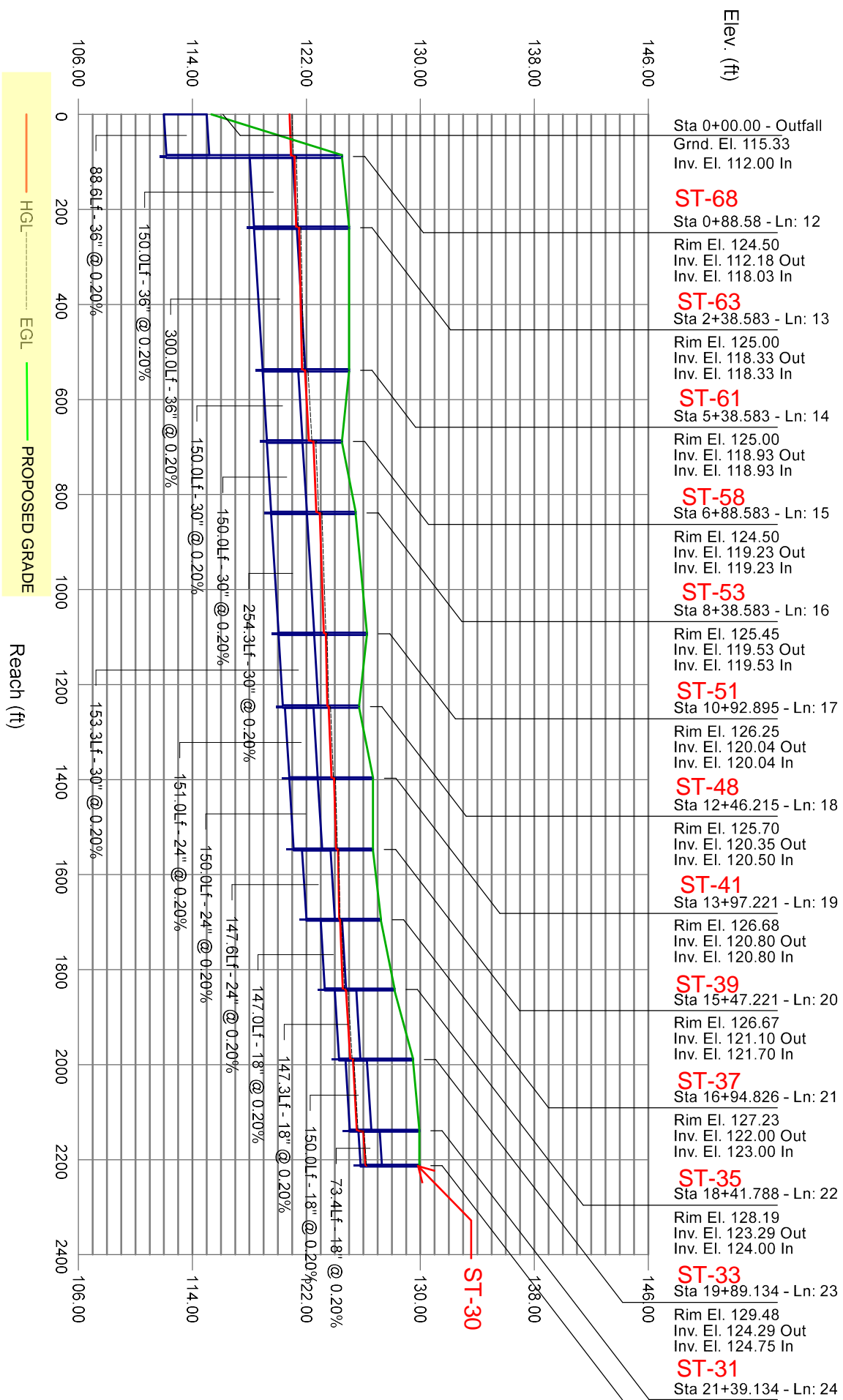
Line	To	Type	N	Line	Incr.	Sub	C1 =	Sub	Time	Line	Rnfall	Add. Q	Inlet	HGL	HGL	HGL	Line	HGL	Actual	Actual	Line ID	
Line	Line	of	Value	Len	Area	Total	=	Total	of	Flow	Inten.	Total	Elev.	Crown	Crown	Crown	Size	Pipe	Design	Design		
	Struct.	Struct.		(ft)	(ac)	Area	C2 =	Area	Conc.	Time	(l)	Runoff	(ft)	Invert	Invert	Invert	(in)	(%)	(ft/s)	(cfs)		

Storm Sewer Profile



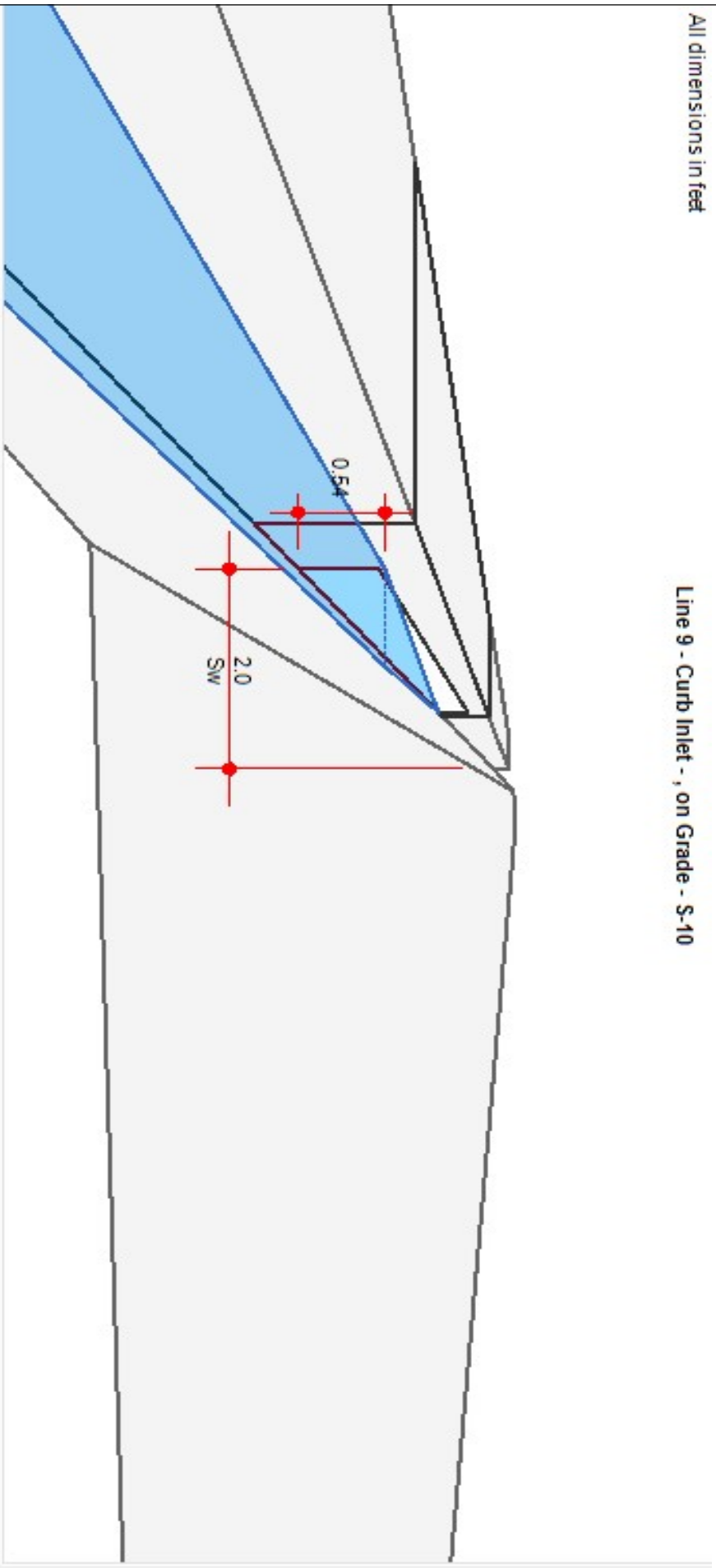
Storm Sewer Profile

Proj. file: STORM0102.stm



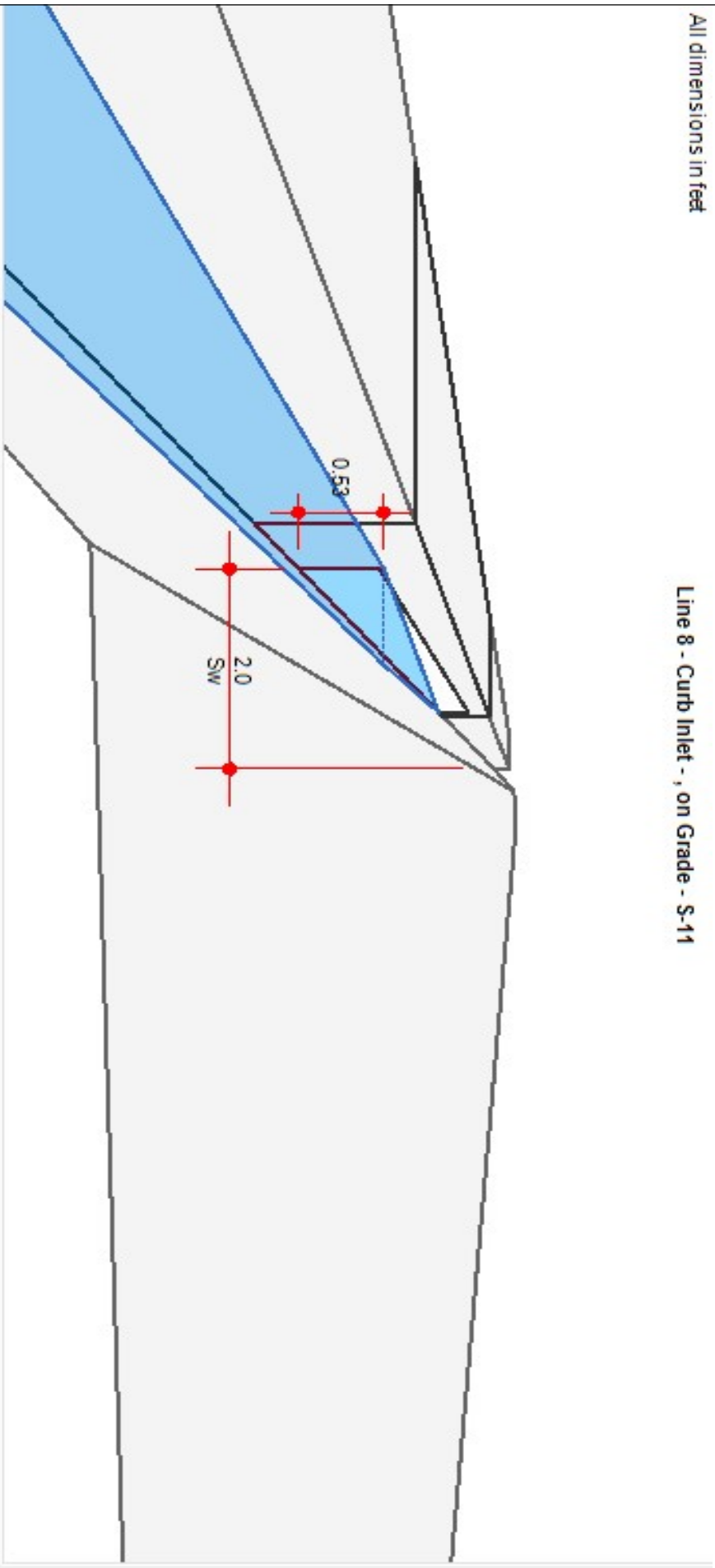
All dimensions in feet

Line 9 - Curb Inlet - , on Grade - S-10



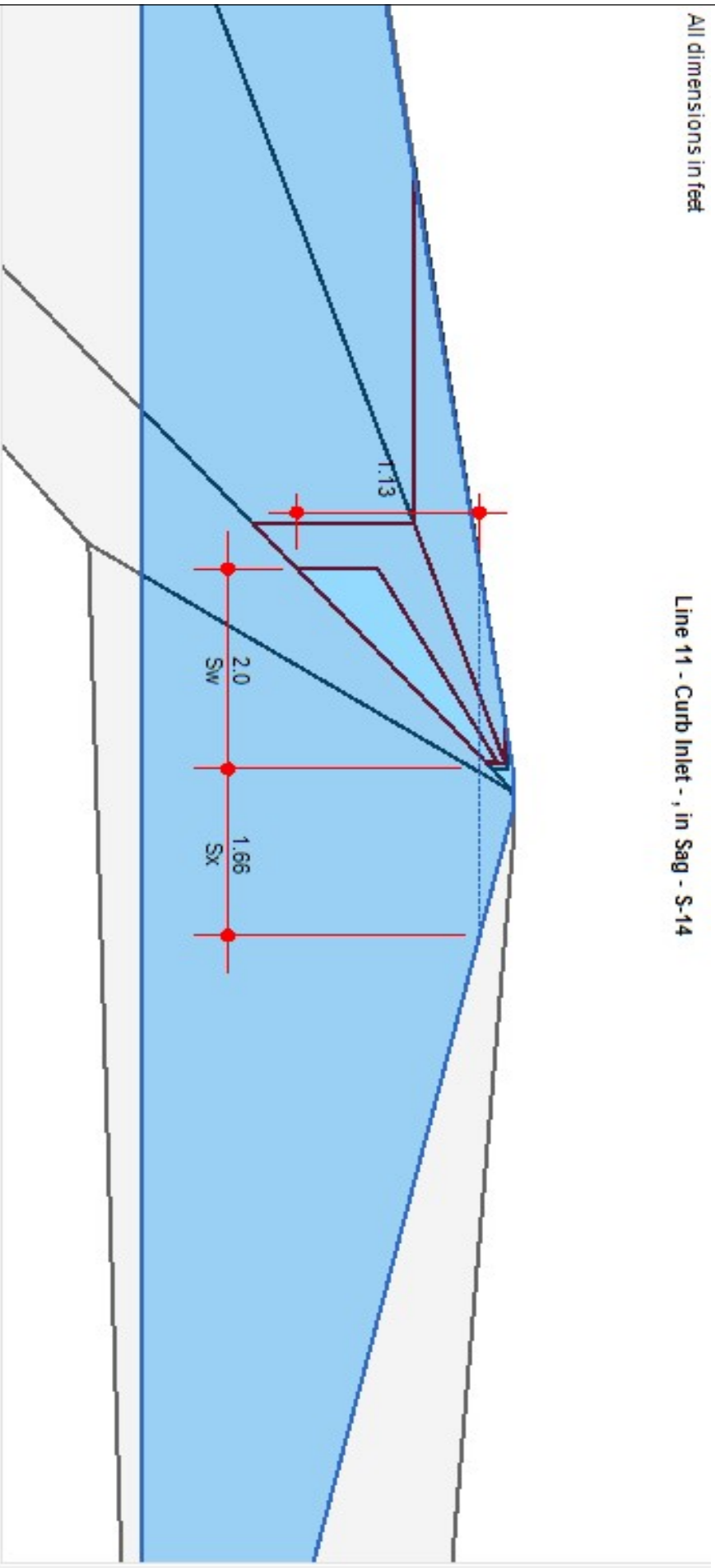
All dimensions in feet

Line 8 - Curb Inlet - , on Grade - S-11



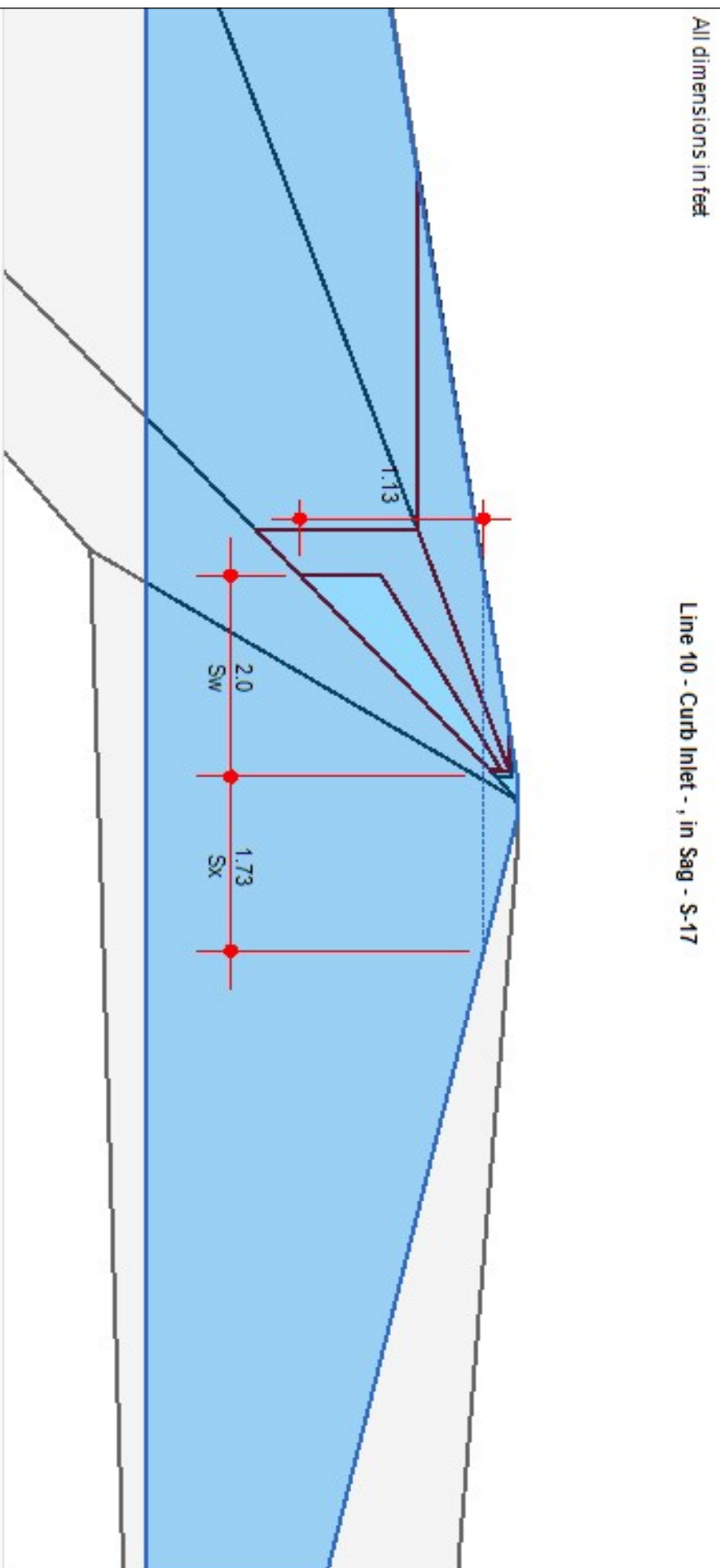
All dimensions in feet

Line 11 - Curb Inlet - , in Sag - S-14



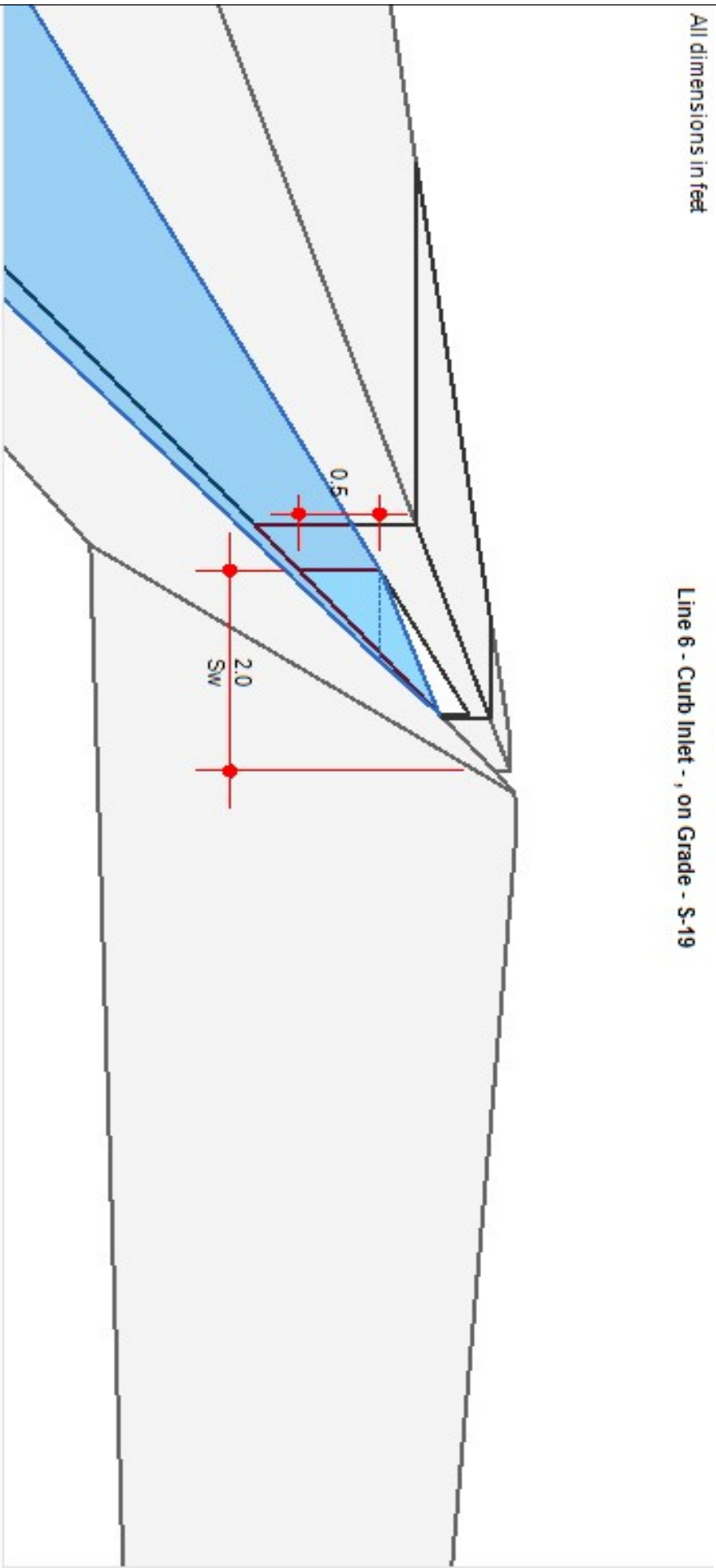
All dimensions in feet

Line 10 - Curb Inlet - , in Sag - S-17



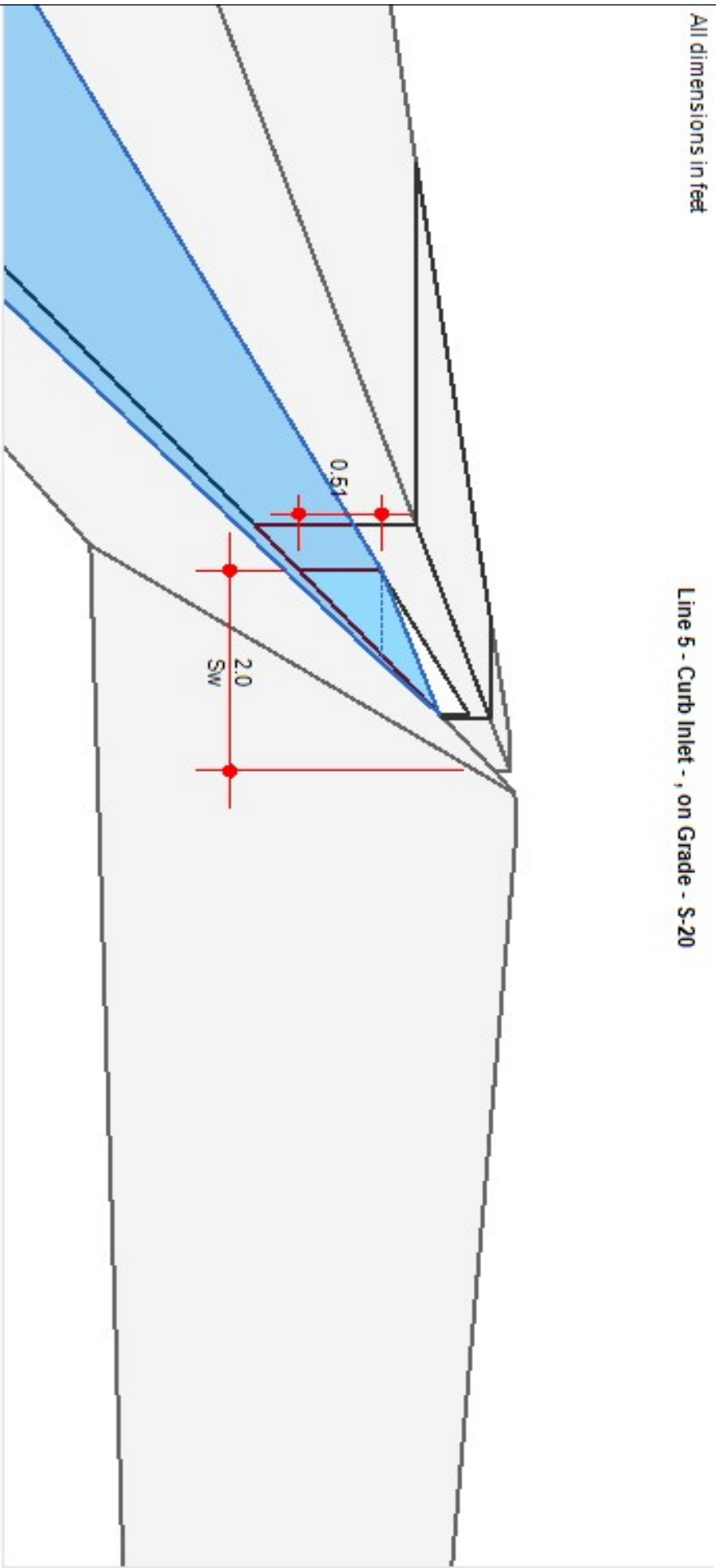
All dimensions in feet

Line 6 - Curb Inlet - , on Grade - S-19



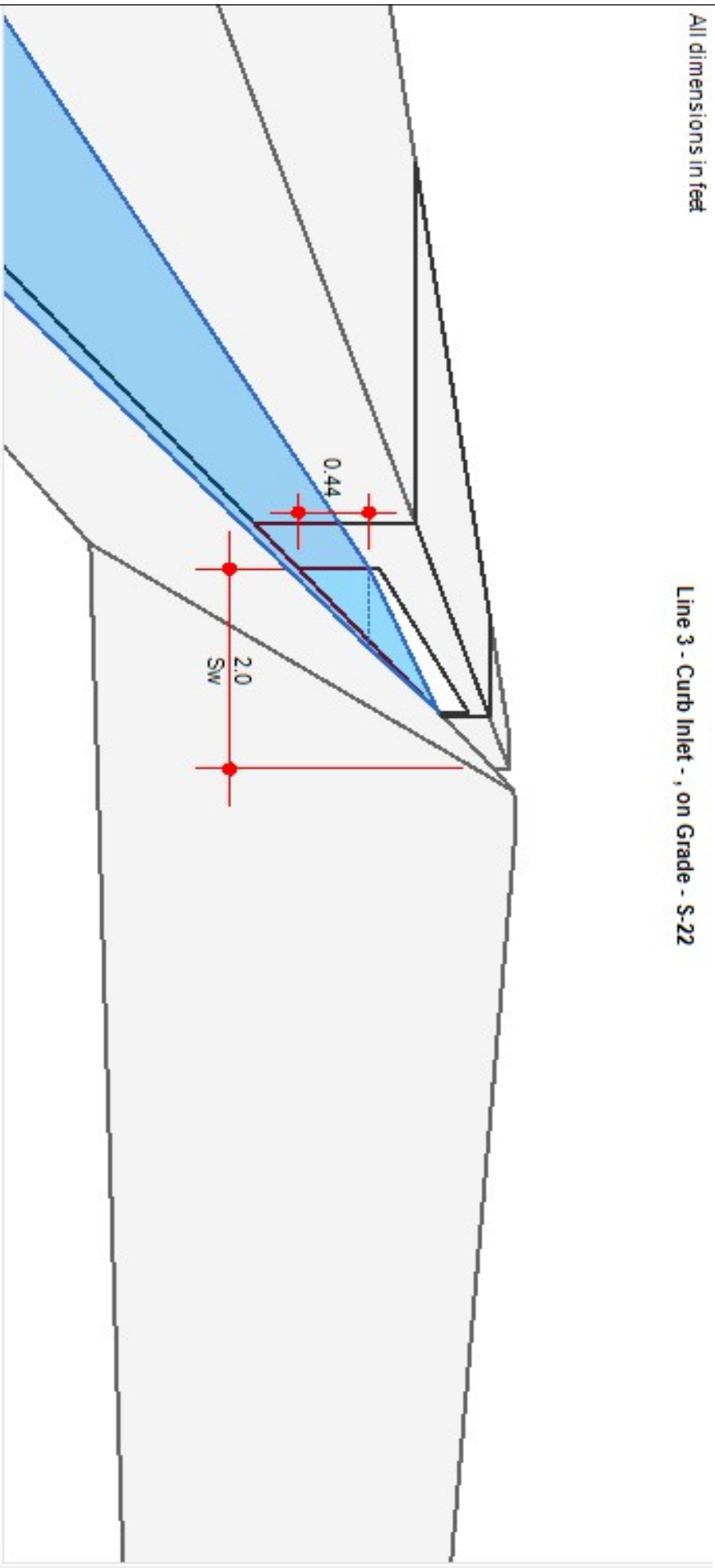
All dimensions in feet

Line 5 - Curb Inlet - , on Grade - S-20



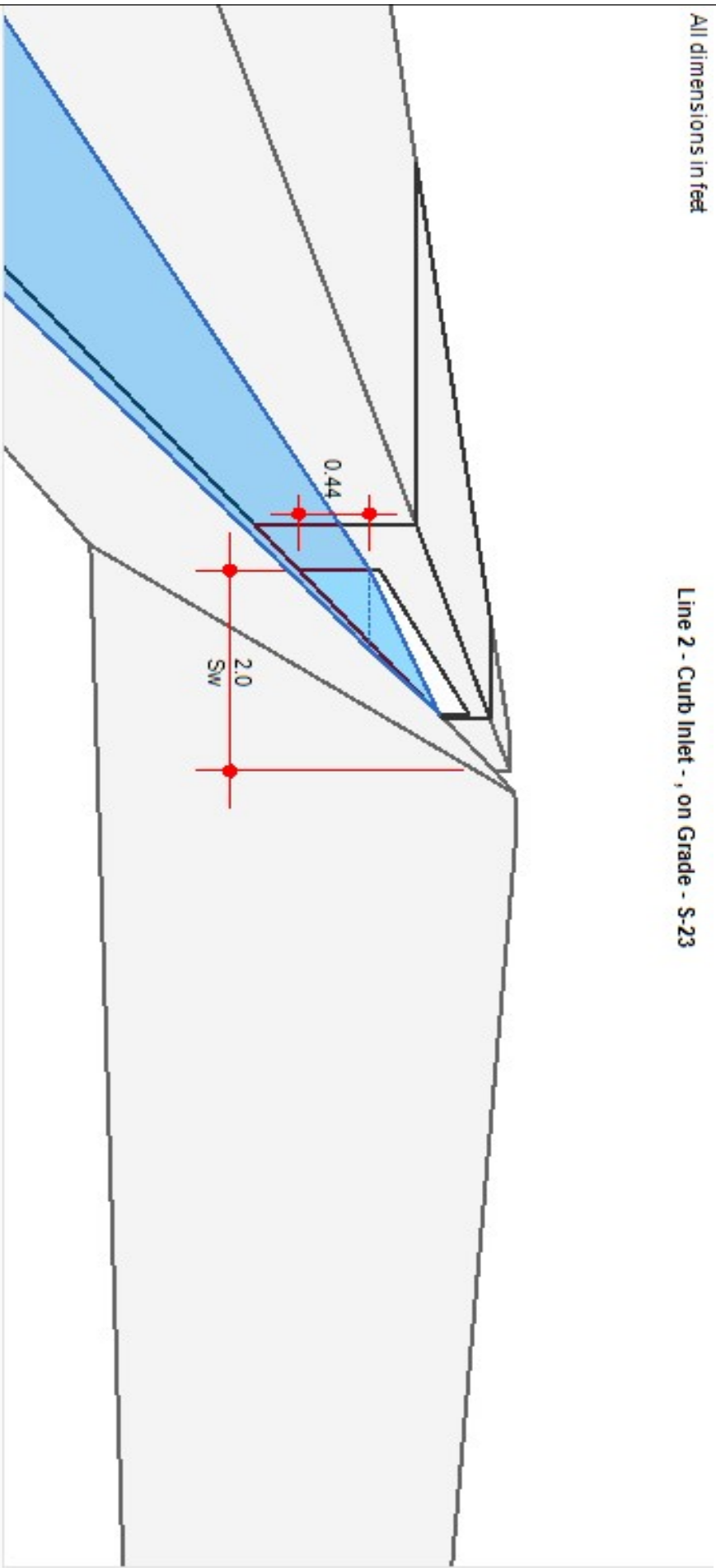
All dimensions in feet

Line 3 - Curb Inlet - , on Grade - S-22



All dimensions in feet

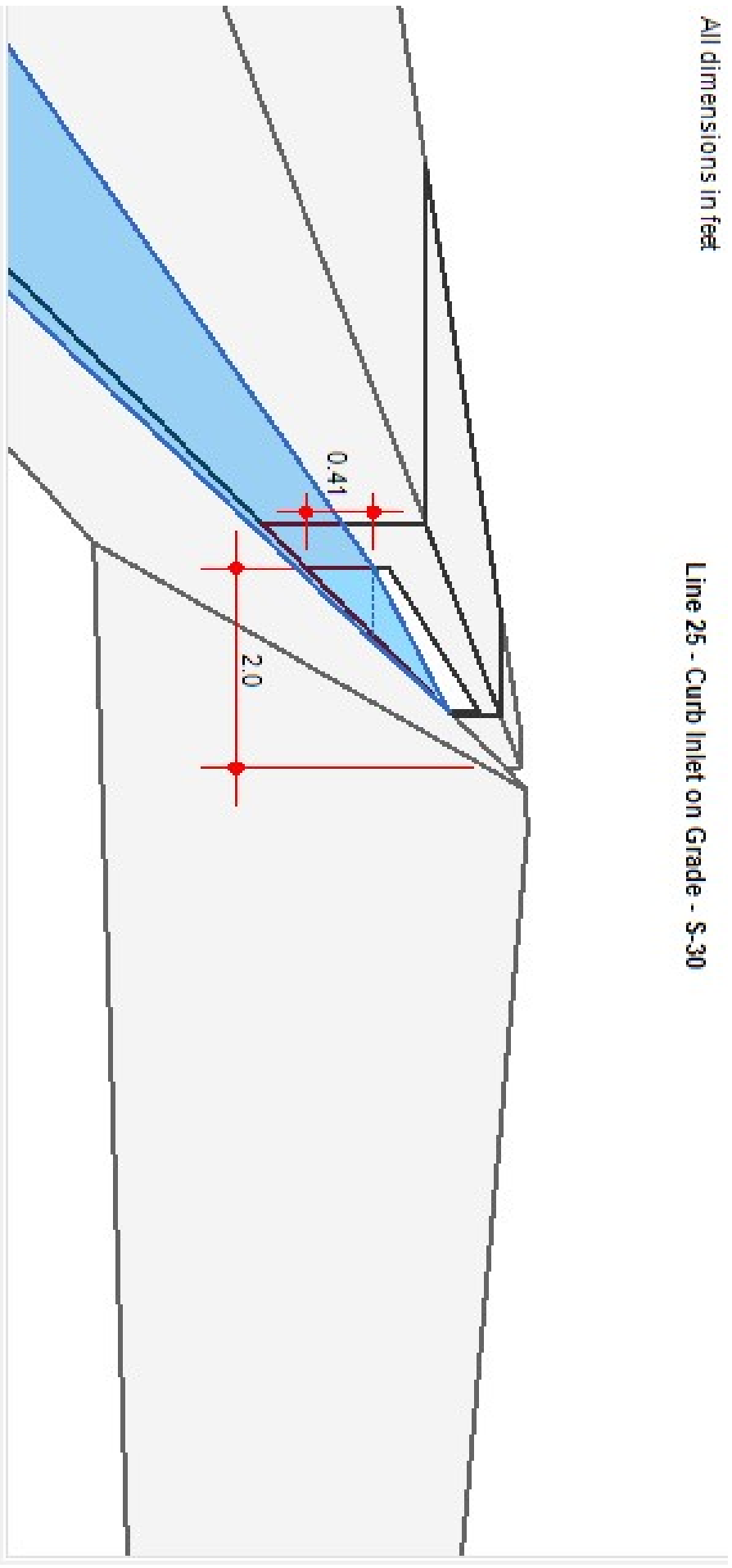
Line 2 - Curb Inlet - , on Grade - S-23



Inlet Section (Line 25 - Curb Inlet) - S-30

All dimensions in feet

Line 25 - Curb Inlet on Grade - S-30



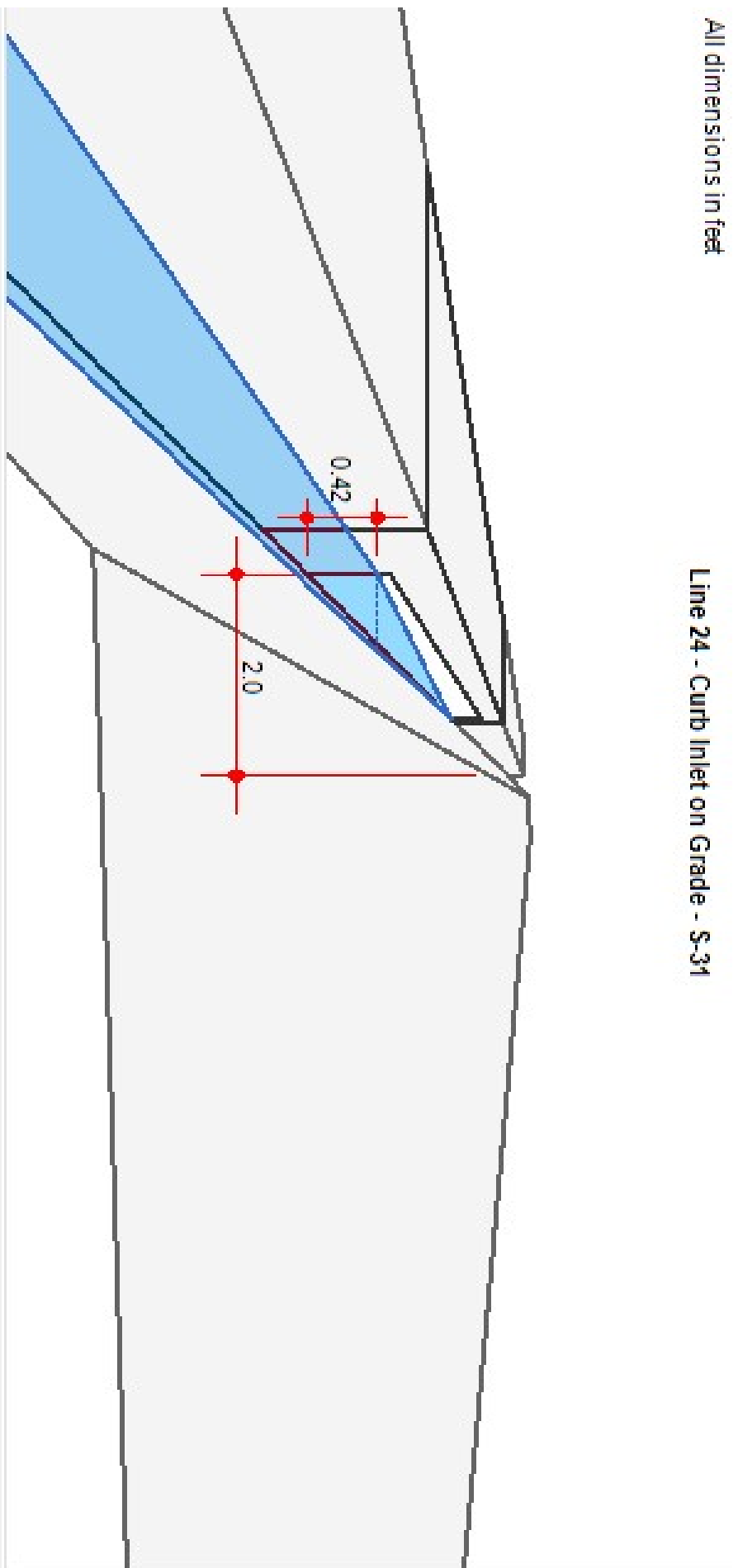
Line #	Q				Inlet			Gutter				Depth			Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
25	0.60	0.00	0.60	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.020	0.41	0.74	0.00	0.00	26	

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 24 - Curb Inlet) - S-31

All dimensions in feet

Line 24 - Curb Inlet on Grade - S-31

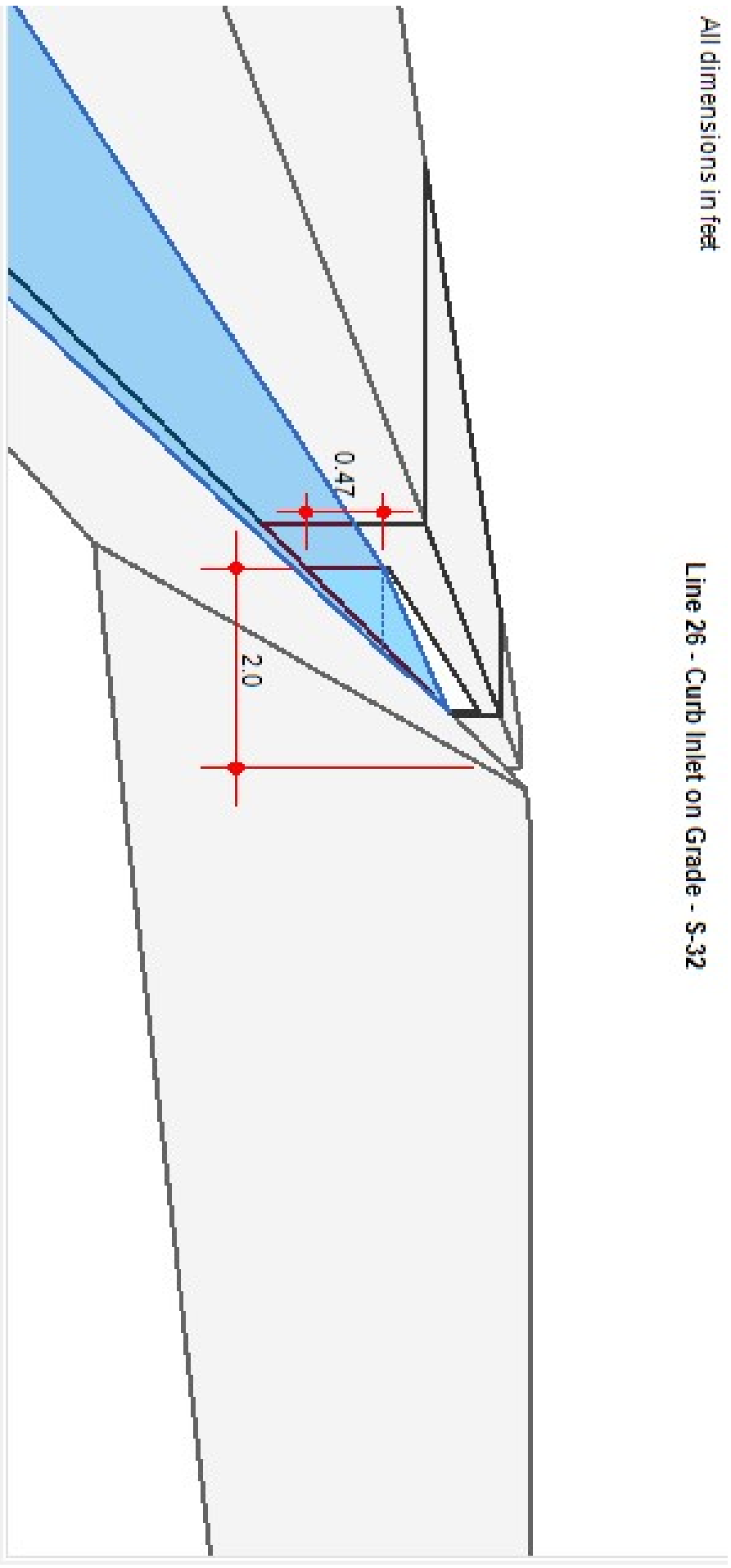


Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)	
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
24	0.67	0.00	0.67	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.020	0.42	0.77	0.00	0.00	23	
Project File:											No. Lines: 39			Run Date: 4/8/2022			

Inlet Section (Line 26 - Curb Inlet) - S-32

All dimensions in feet

Line 26 - Curb Inlet on Grade - S-32



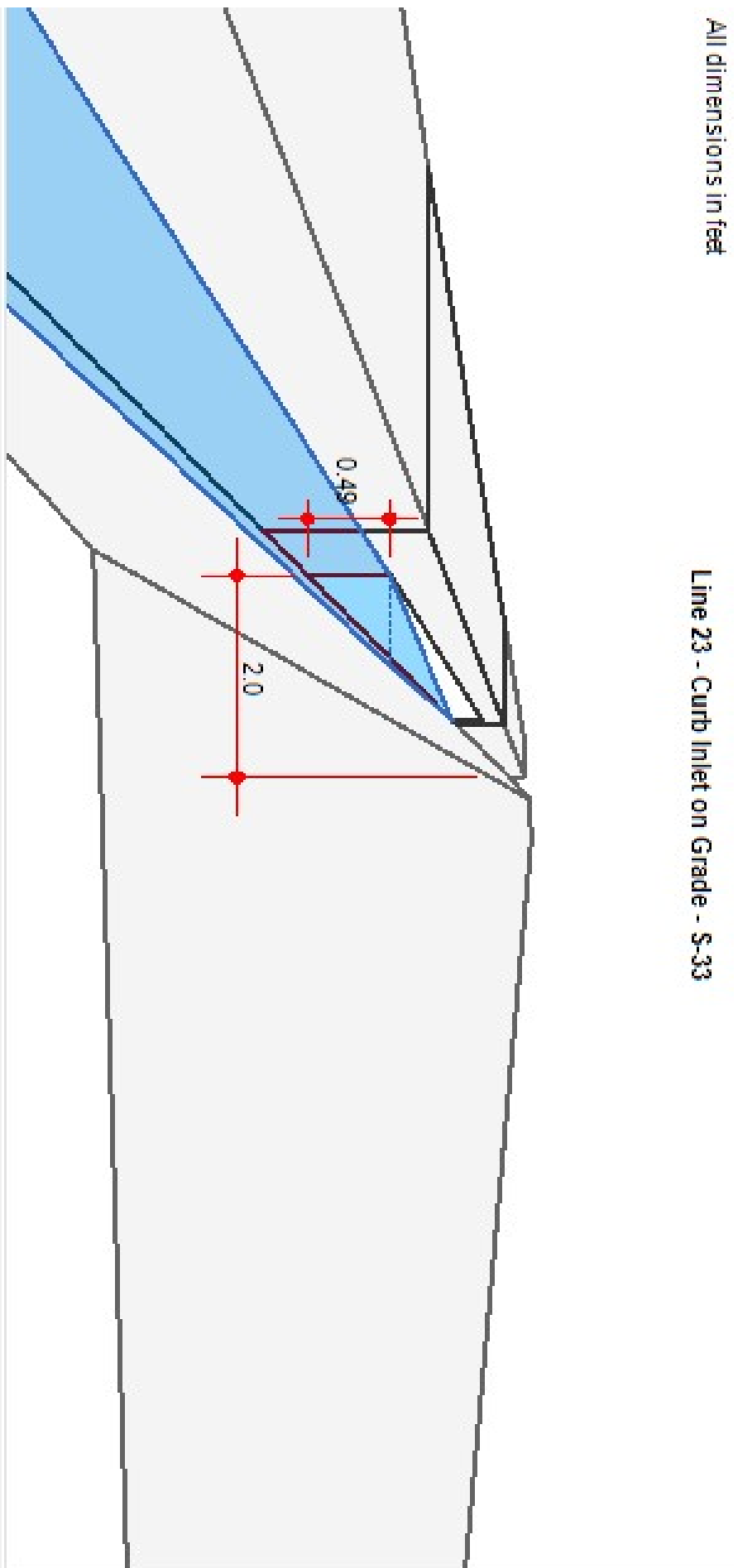
Line #	Q				Inlet			Gutter				Depth			Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
26	0.88	0.00	0.88	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.070	0.47	0.85	0.00	0.00	27	

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 23 - Curb Inlet) - S-33

All dimensions in feet

Line 23 - Curb Inlet on Grade - S-33



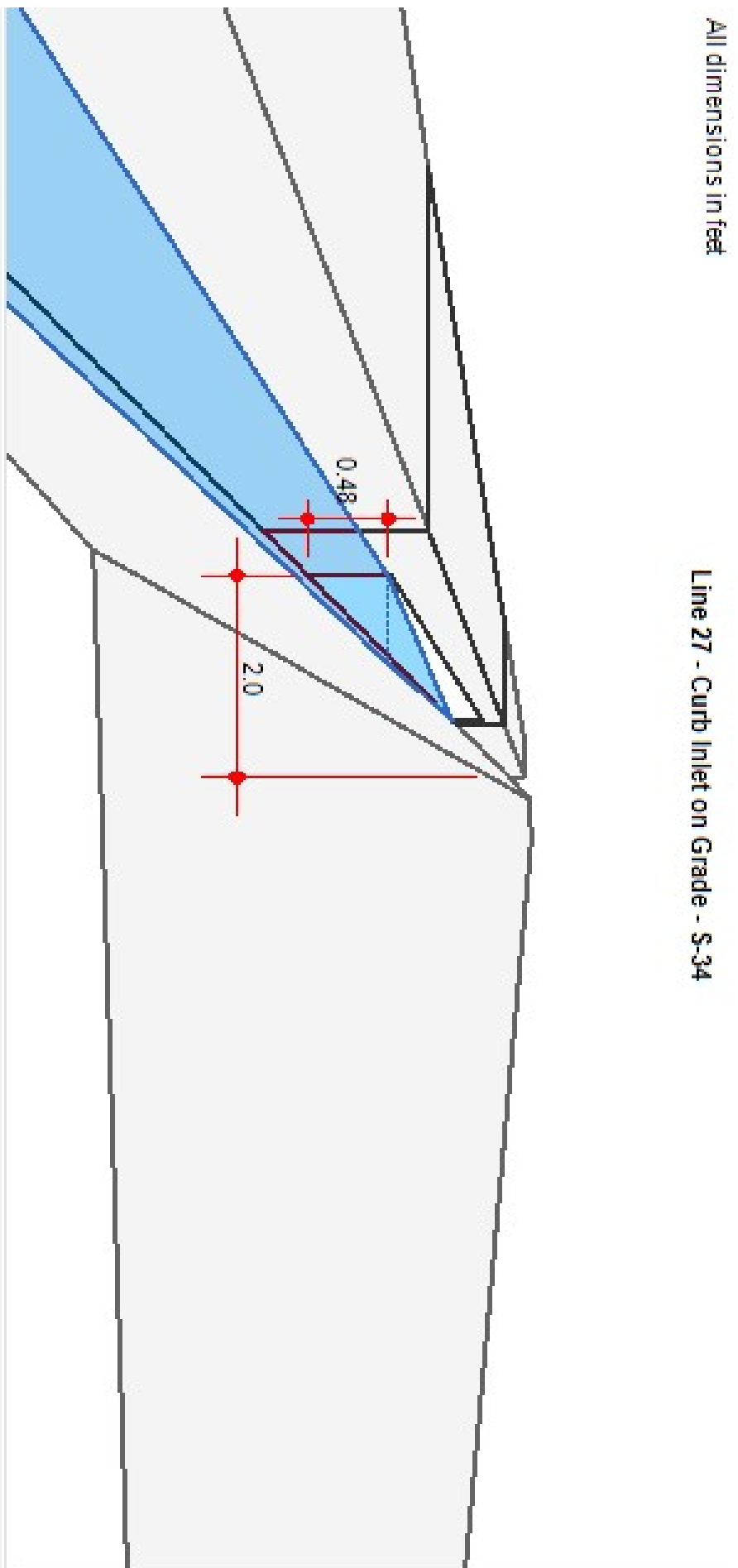
Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)	
23	1.00	0.00	1.00	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.020	0.49	0.90	0.00	0.00	22

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 27 - Curb Inlet) - S-34

All dimensions in feet

Line 27 - Curb Inlet on Grade - S-34

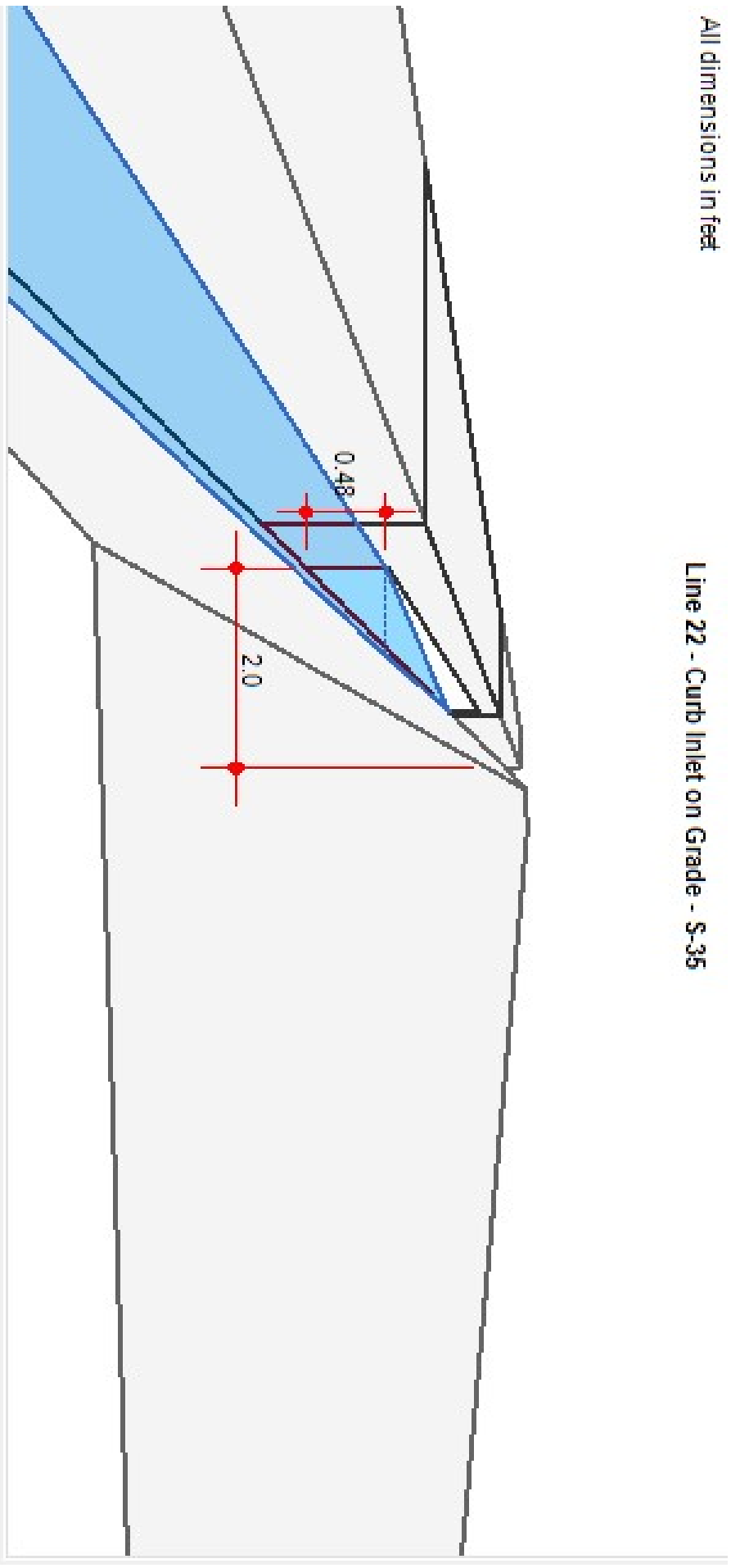


Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)	
27	0.93	0.00	0.93	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.020	0.48	0.87	0.00	0.00	28
Project File:											No. Lines: 39		Run Date: 4/8/2022			

Inlet Section (Line 22 - Curb Inlet) - S-35

All dimensions in feet

Line 22 - Curb Inlet on Grade - S-35



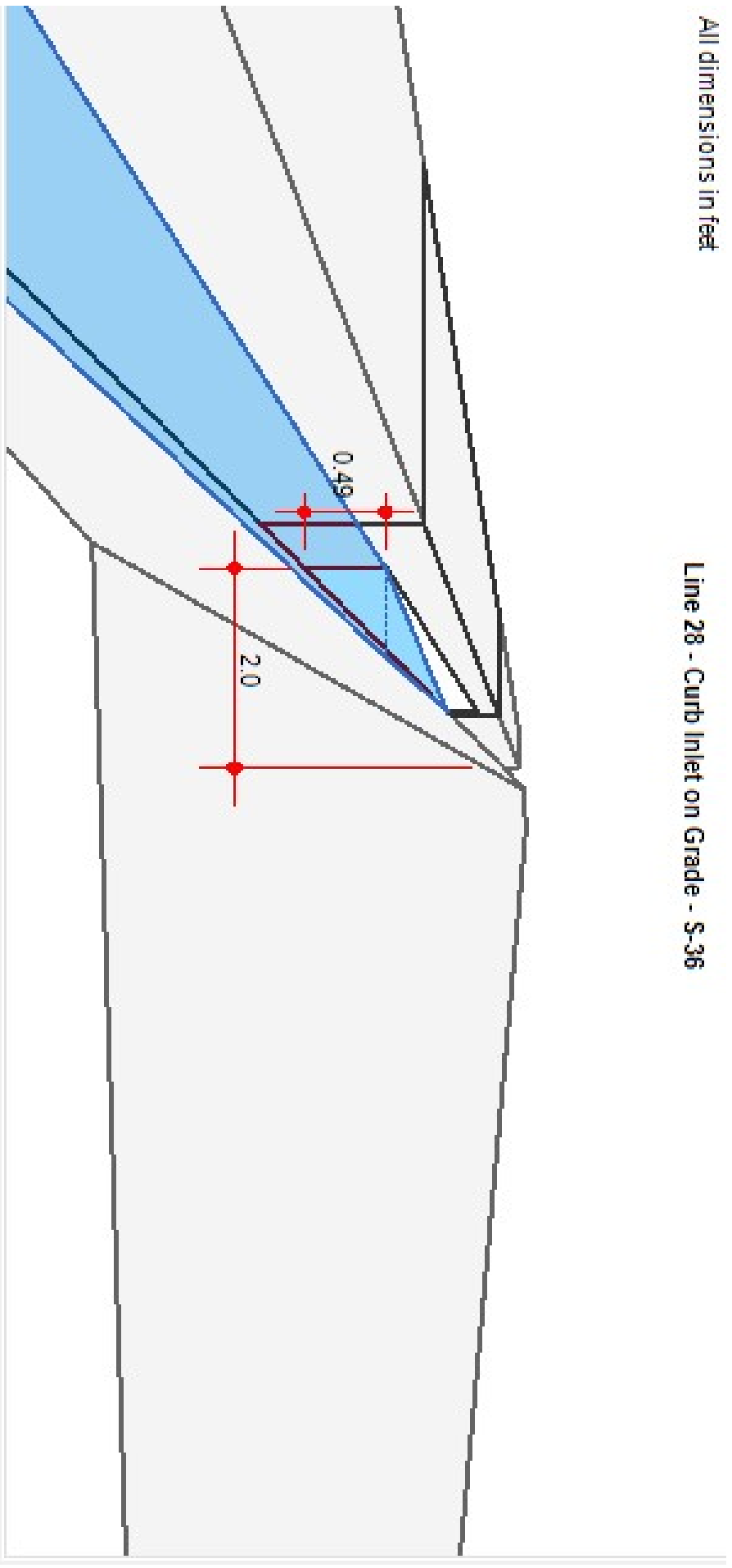
Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)	
22	0.95	0.00	0.95	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.020	0.48	0.88	0.00	0.00	21

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 28 - Curb Inlet) - S-36

All dimensions in feet

Line 28 - Curb Inlet on Grade - S-36



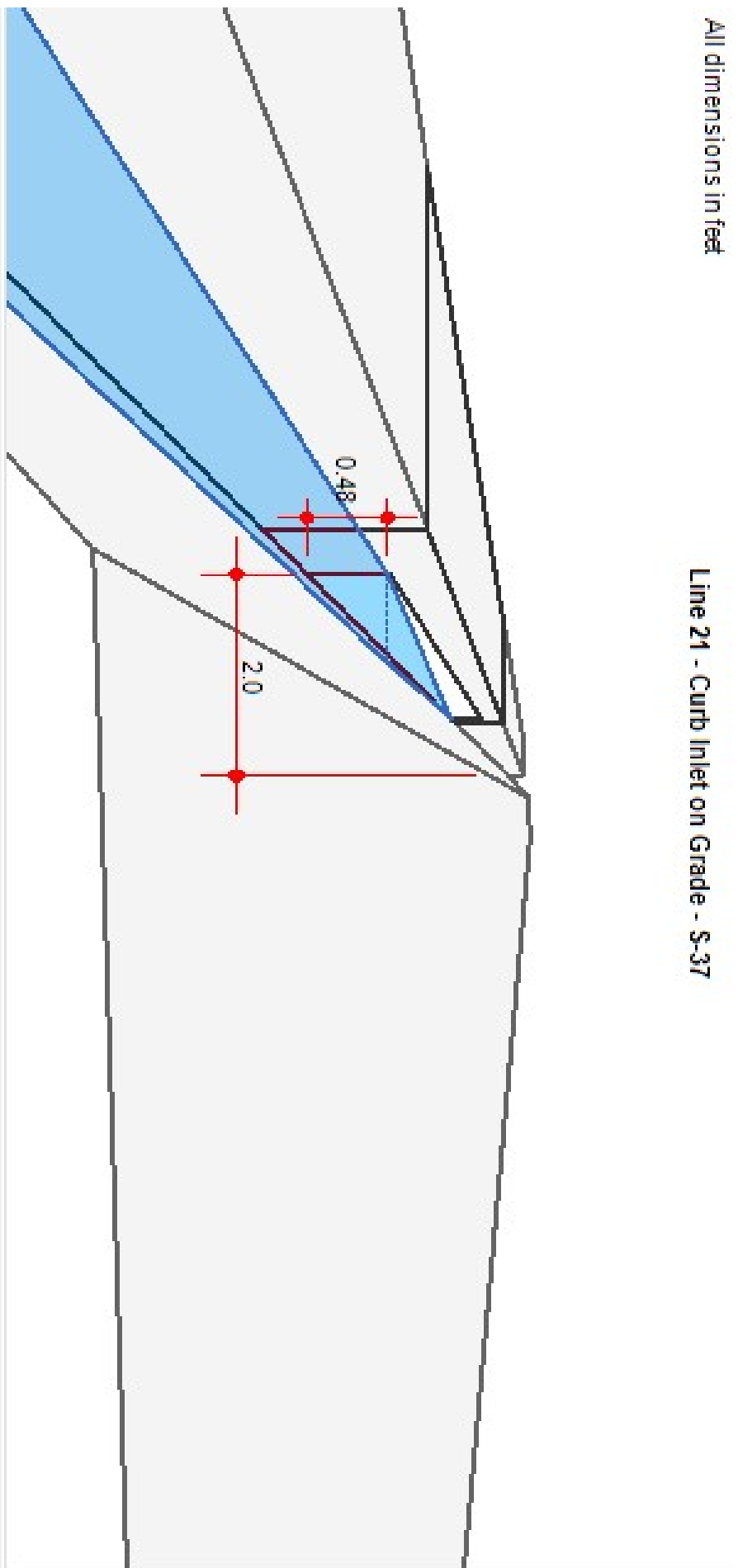
Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)	
28	0.99	0.00	0.99	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.020	0.49	0.89	0.00	0.00	30

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 21 - Curb Inlet) - S-37

All dimensions in feet

Line 21 - Curb Inlet on Grade - S-37



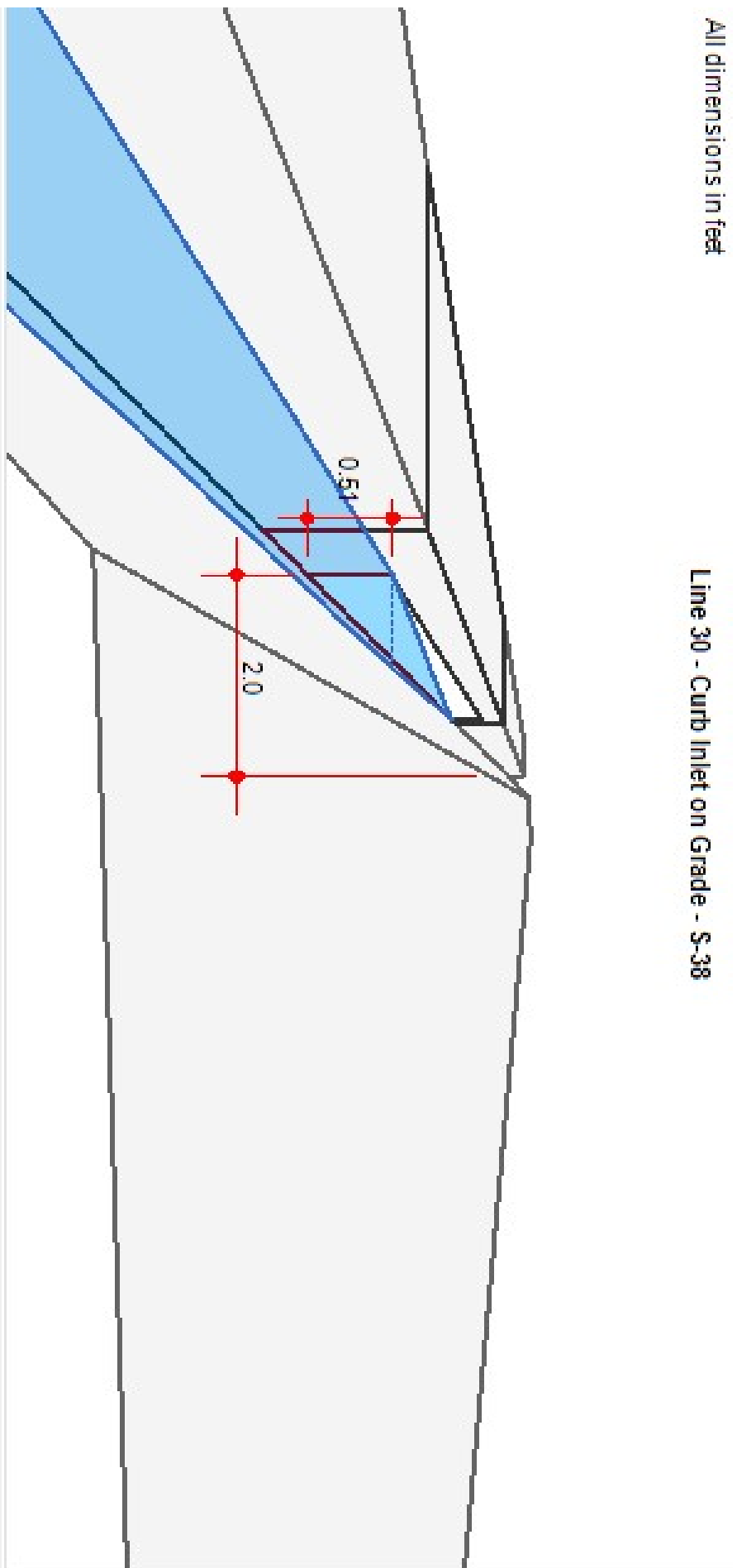
Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)	
21	0.95	0.00	0.95	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.020	0.48	0.88	0.00	0.00	20

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 30 - Curb Inlet) - S-38

All dimensions in feet

Line 30 - Curb Inlet on Grade - S-38



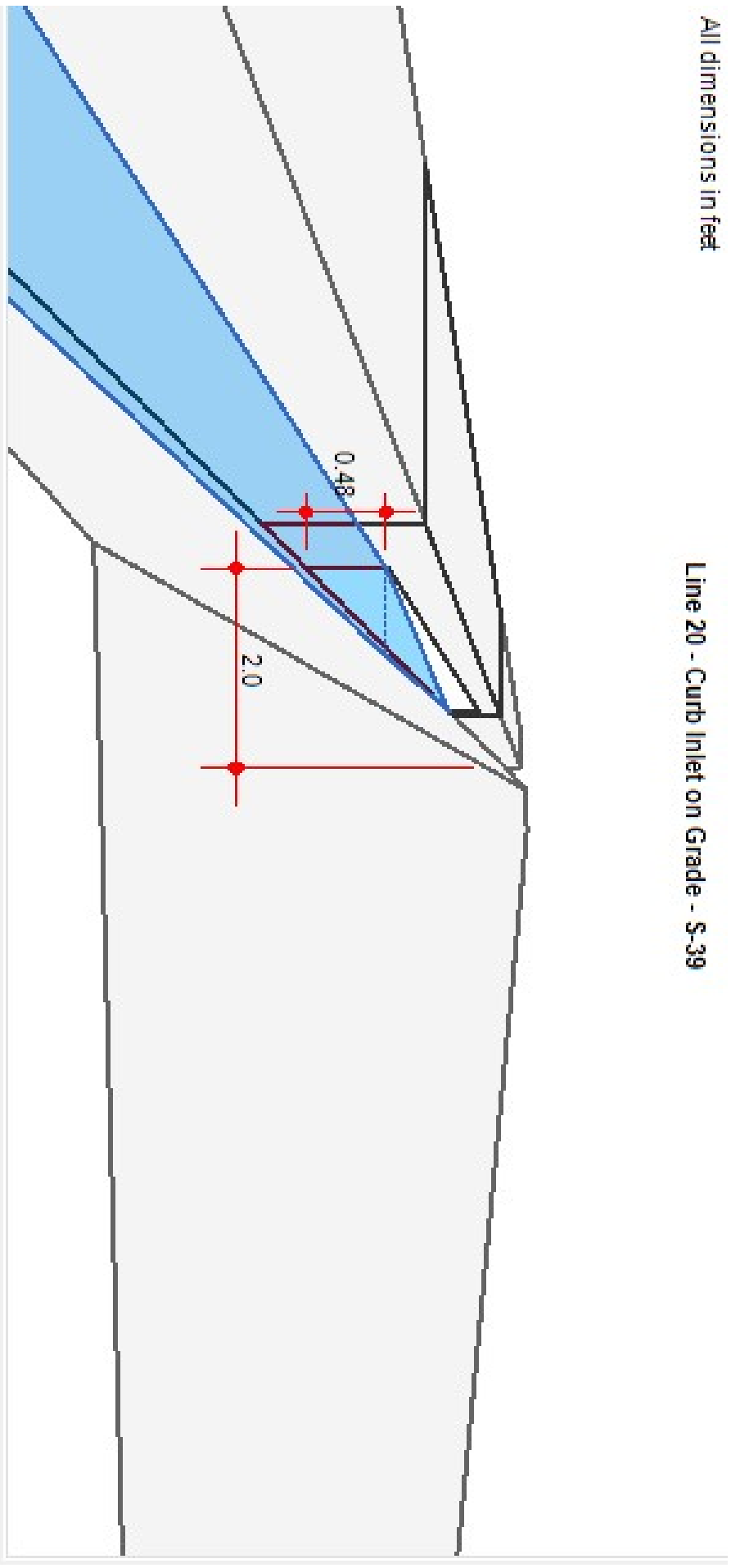
Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)	
30	1.11	0.00	1.11	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.020	0.51	0.93	0.00	0.00	29

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 20 - Curb Inlet) - S-39

All dimensions in feet

Line 20 - Curb Inlet on Grade - S-39



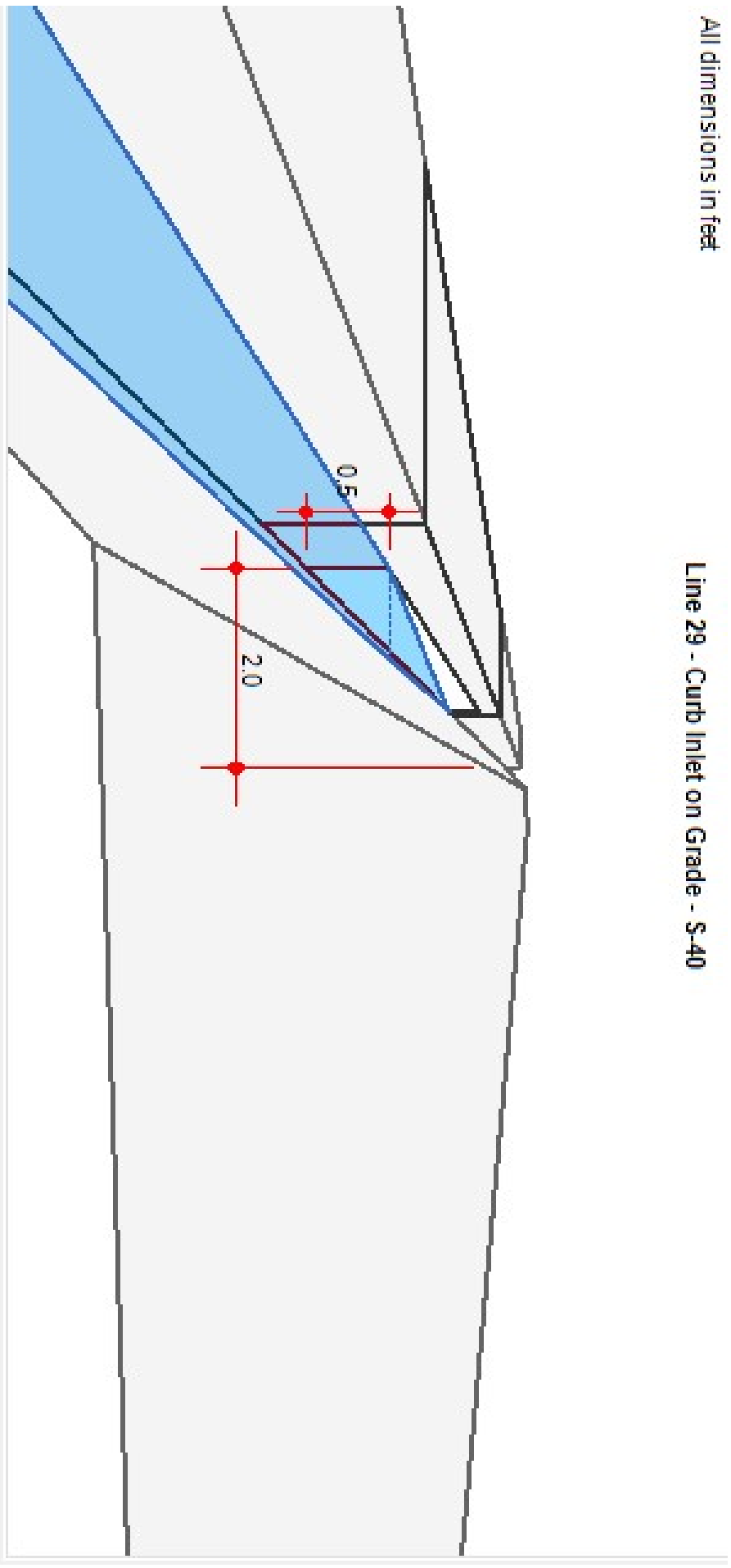
Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)	
20	0.95	0.00	0.95	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.017	0.48	0.88	0.00	0.00	19

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 29 - Curb Inlet) - S-40

All dimensions in feet

Line 29 - Curb Inlet on Grade - S-40



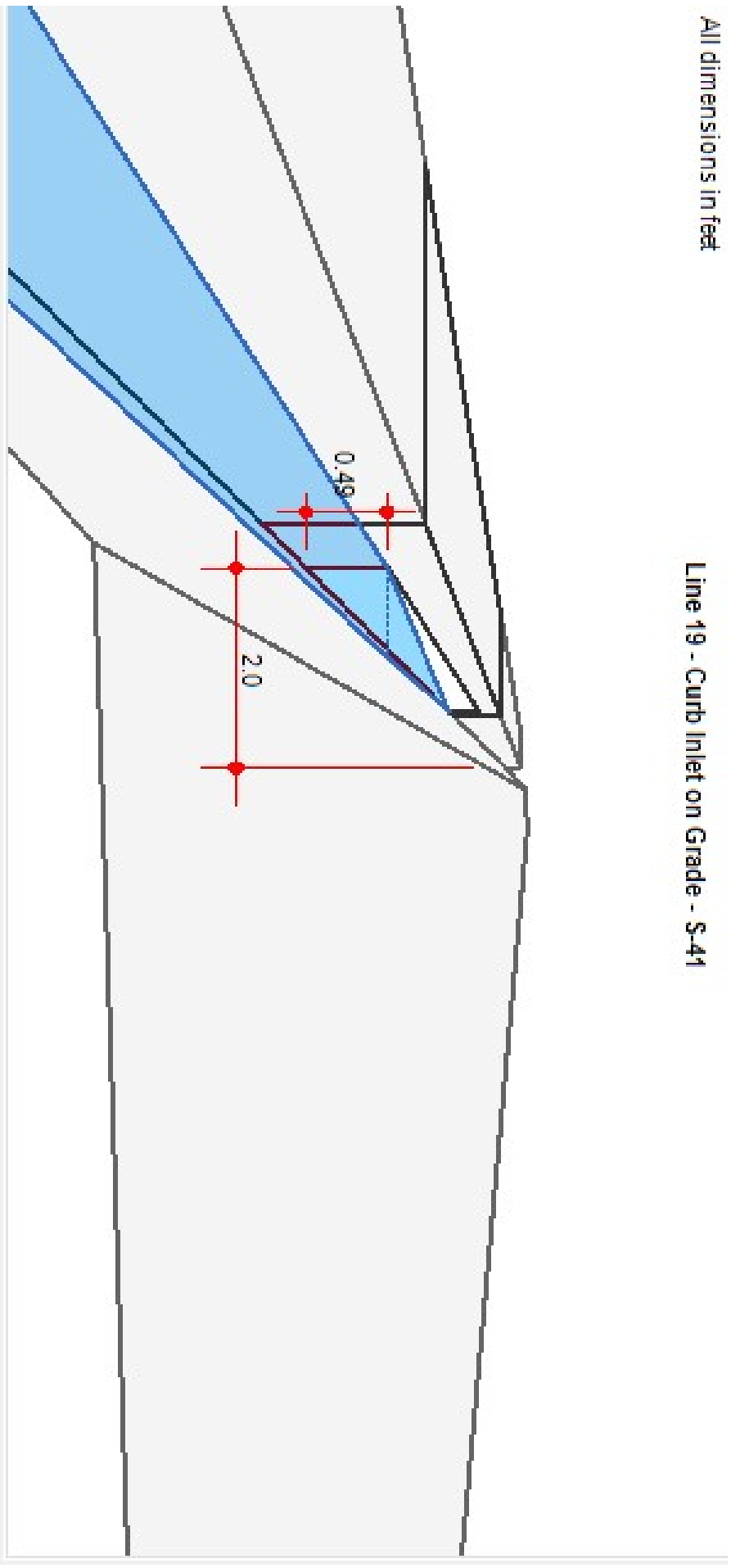
Line #	Q				Inlet			Gutter				Depth			Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
29	1.05	0.00	1.05	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.020	0.50	0.91	0.00	0.00	37	

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 19 - Curb Inlet) - S-41

All dimensions in feet

Line 19 - Curb Inlet on Grade - S-41

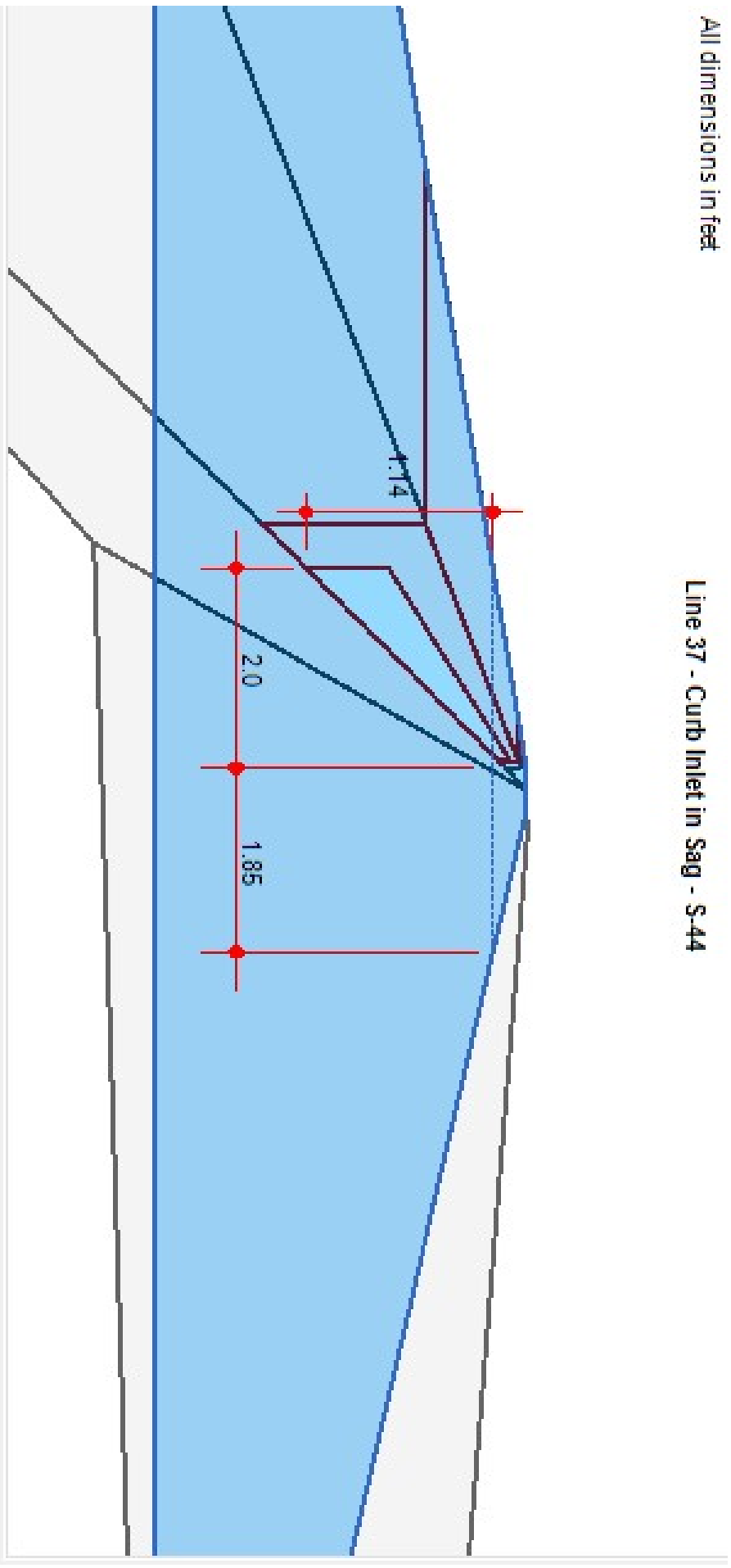


Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)	
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
19	1.00	0.00	1.00	0.00	10.50	0.0	6.0	2.00	0.006	0.550	0.020	0.49	0.90	0.00	0.00	36	
Project File:											No. Lines: 39			Run Date: 4/8/2022			

Inlet Section (Line 37 - Curb Inlet) - S-44

All dimensions in feet

Line 37 - Curb Inlet in Sag - S-44



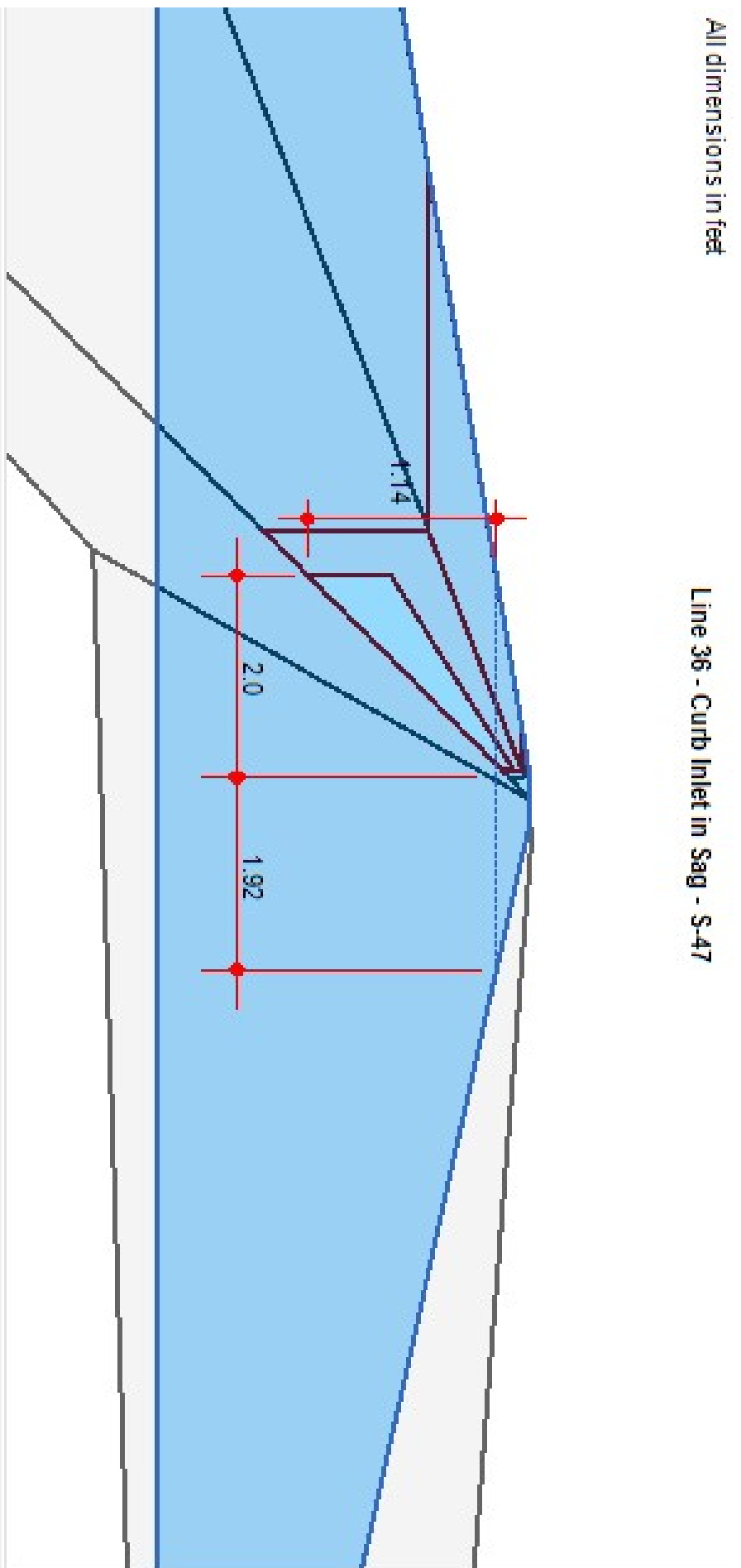
Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)	
37	1.95	0.00	1.95	0.00	36.00	0.0	6.0	2.00	Sag	0.550	0.020	1.14	3.85	n/a	n/a	Sag

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 36 - Curb Inlet) - S-47

All dimensions in feet

Line 36 - Curb Inlet in Sag - S-47



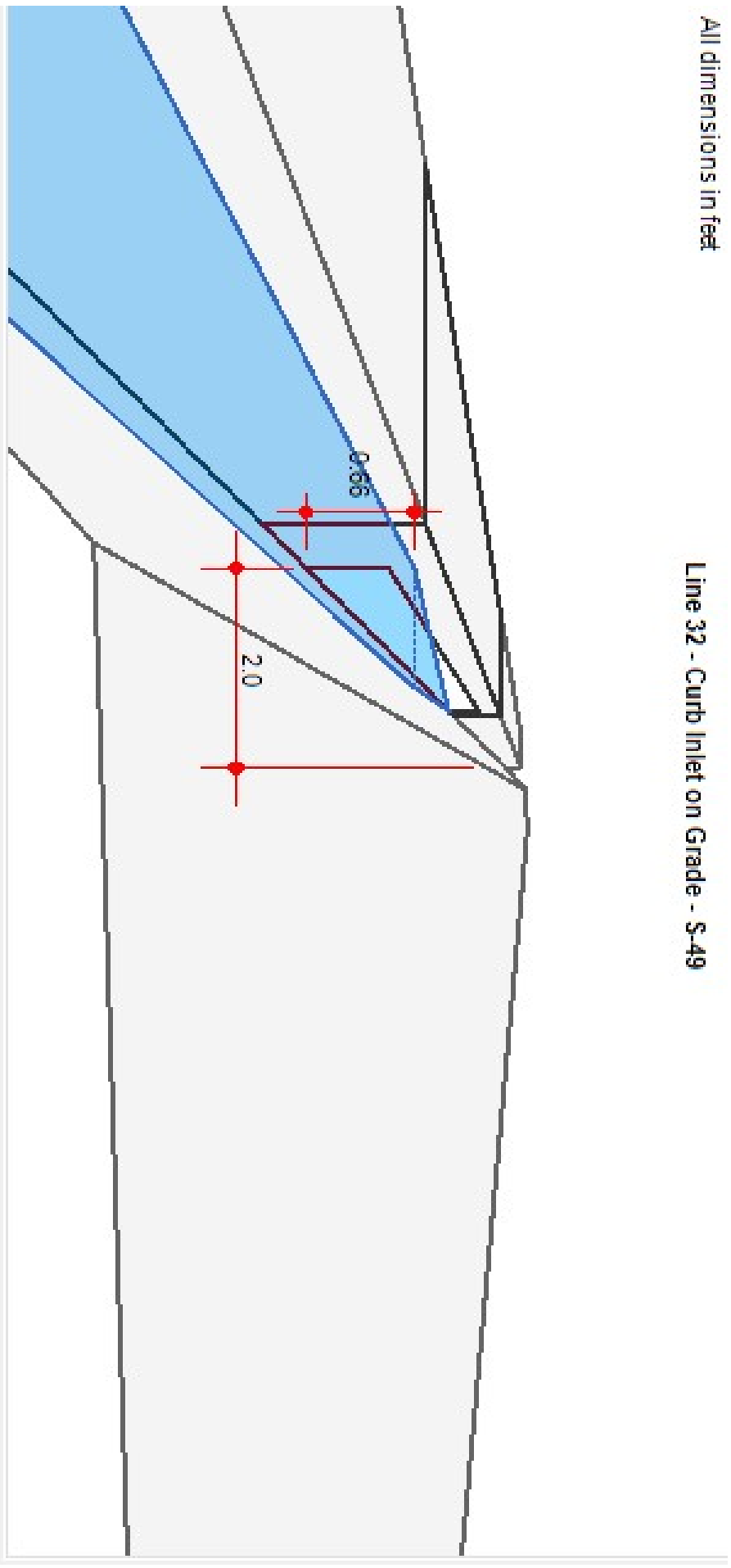
Line #	Q				Inlet			Gutter				Depth			Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
36	2.00	0.00	2.00	0.00	36.00	0.0	6.0	2.00	Sag	0.550	0.020	1.14	3.92	n/a	n/a	Sag	

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 32 - Curb Inlet) - S-49

All dimensions in feet

Line 32 - Curb Inlet on Grade - S-49

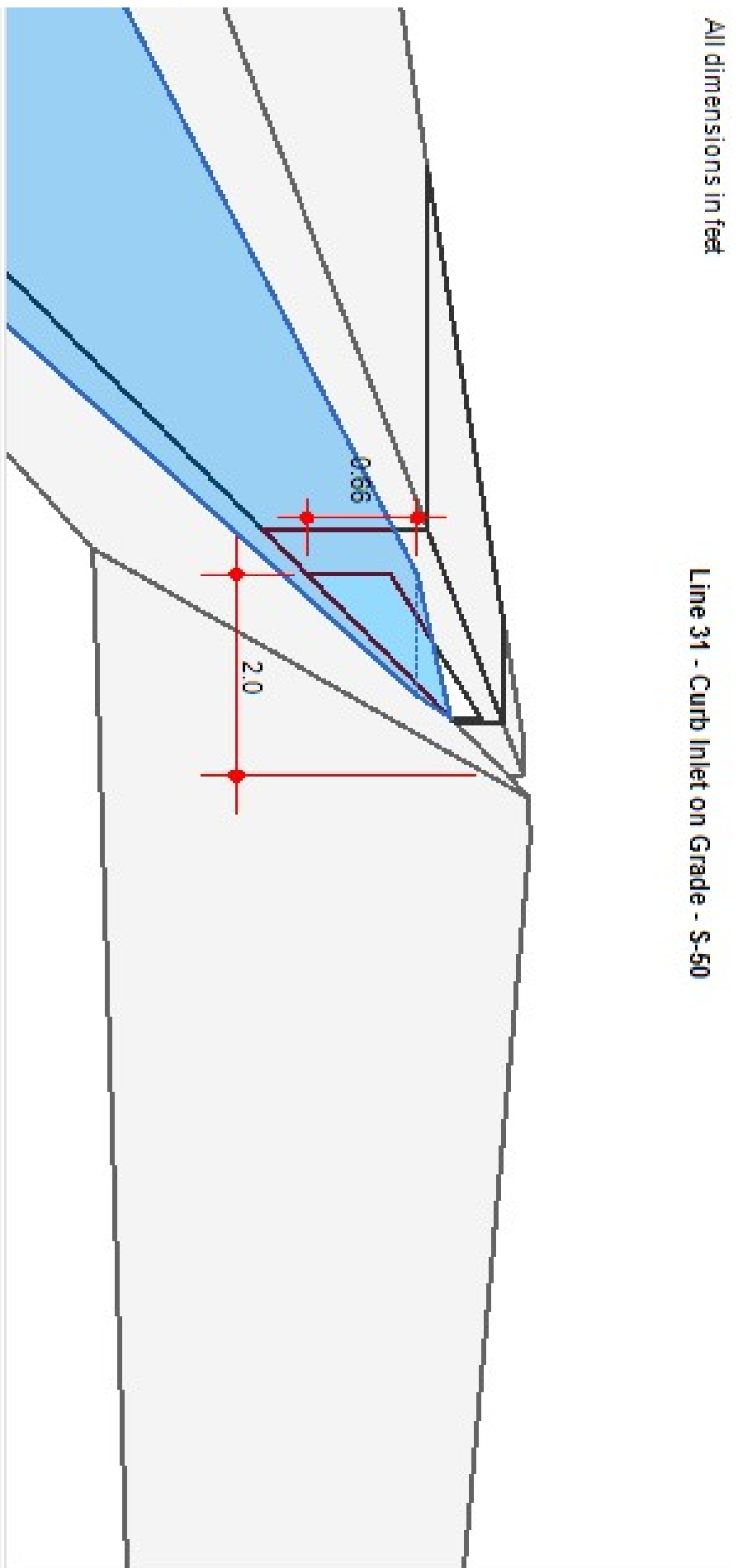


Line #	Q				Inlet			Gutter				Depth			Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
32	1.95	0.00	1.95	0.00	10.50	0.0	6.0	2.00	0.005	0.550	0.020	0.66	1.19	0.00	0.00	37	
Project File:												No. Lines: 39			Run Date: 4/8/2022		

Inlet Section (Line 31 - Curb Inlet) - S-50

All dimensions in feet

Line 31 - Curb Inlet on Grade - S-50

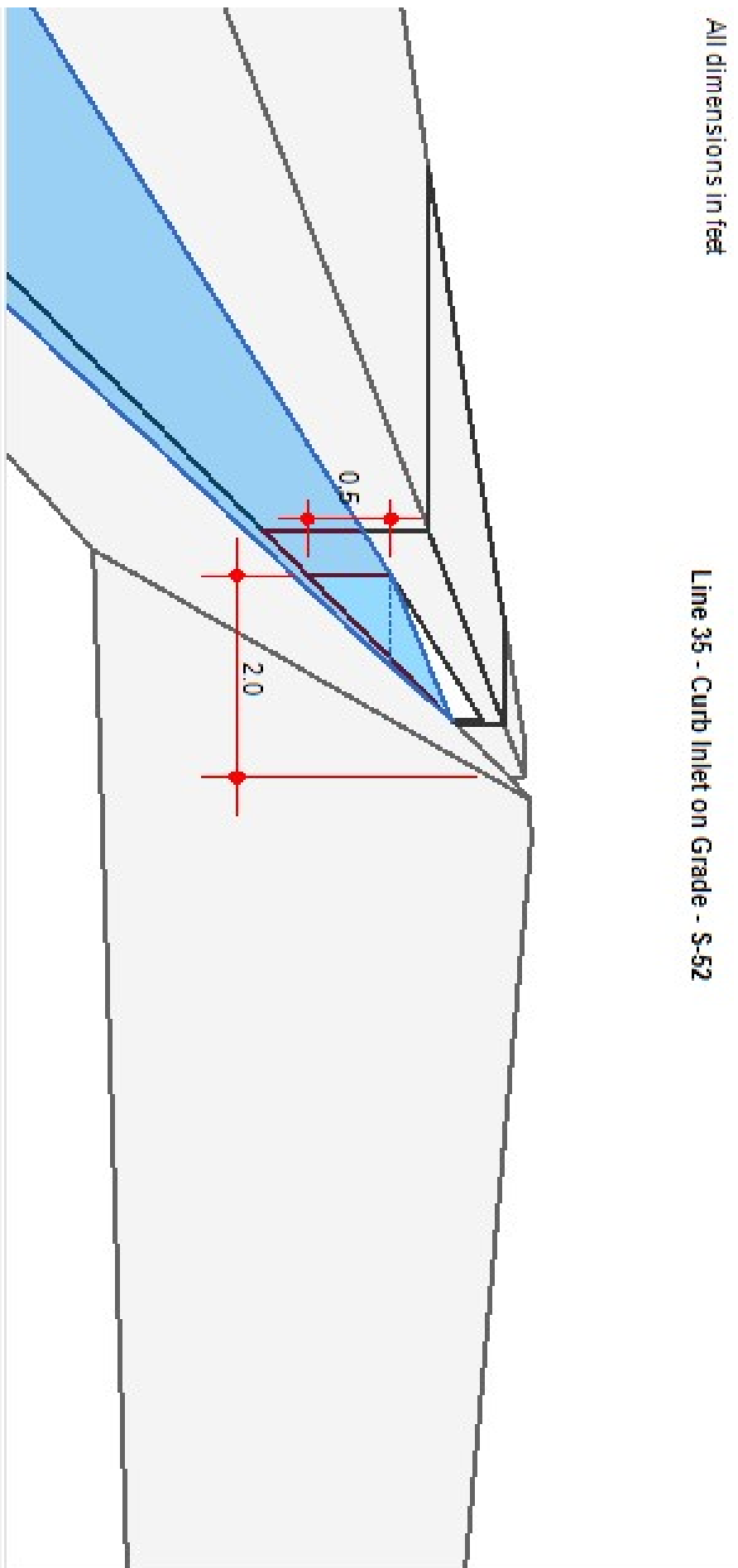


Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)	
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
31	2.00	0.00	2.00	0.00	10.50	0.0	6.0	2.00	0.005	0.550	0.020	0.66	1.20	0.00	0.00	36	
Project File:											No. Lines: 39			Run Date: 4/8/2022			

Inlet Section (Line 35 - Curb Inlet) - S-52

All dimensions in feet

Line 35 - Curb Inlet on Grade - S-52



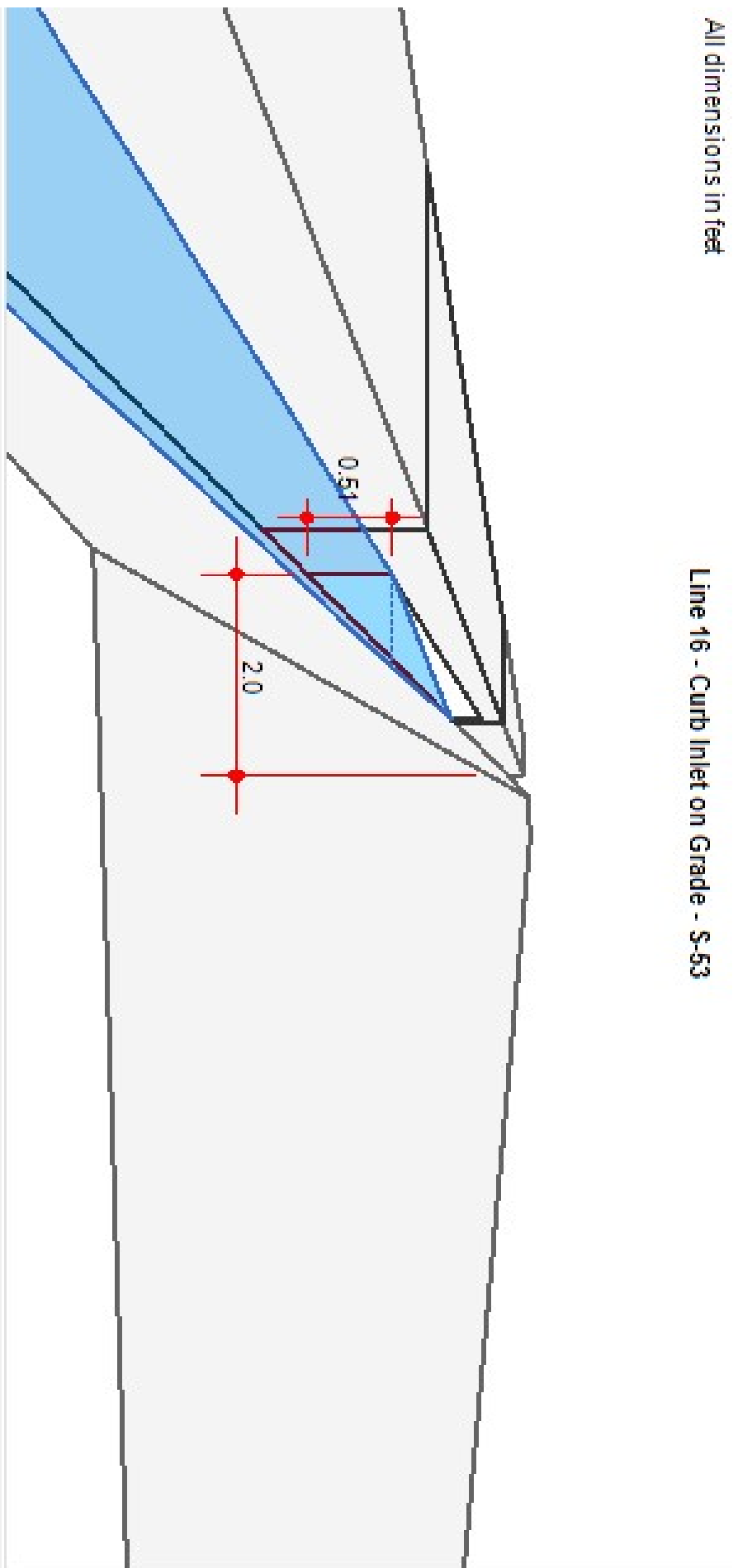
Line #	Q				Inlet			Gutter				Depth			Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
35	0.95	0.00	0.95	0.00	10.50	0.0	6.0	2.00	0.005	0.550	0.020	0.50	0.91	0.00	0.00	38	

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 16 - Curb Inlet) - S-53

All dimensions in feet

Line 16 - Curb Inlet on Grade - S-53

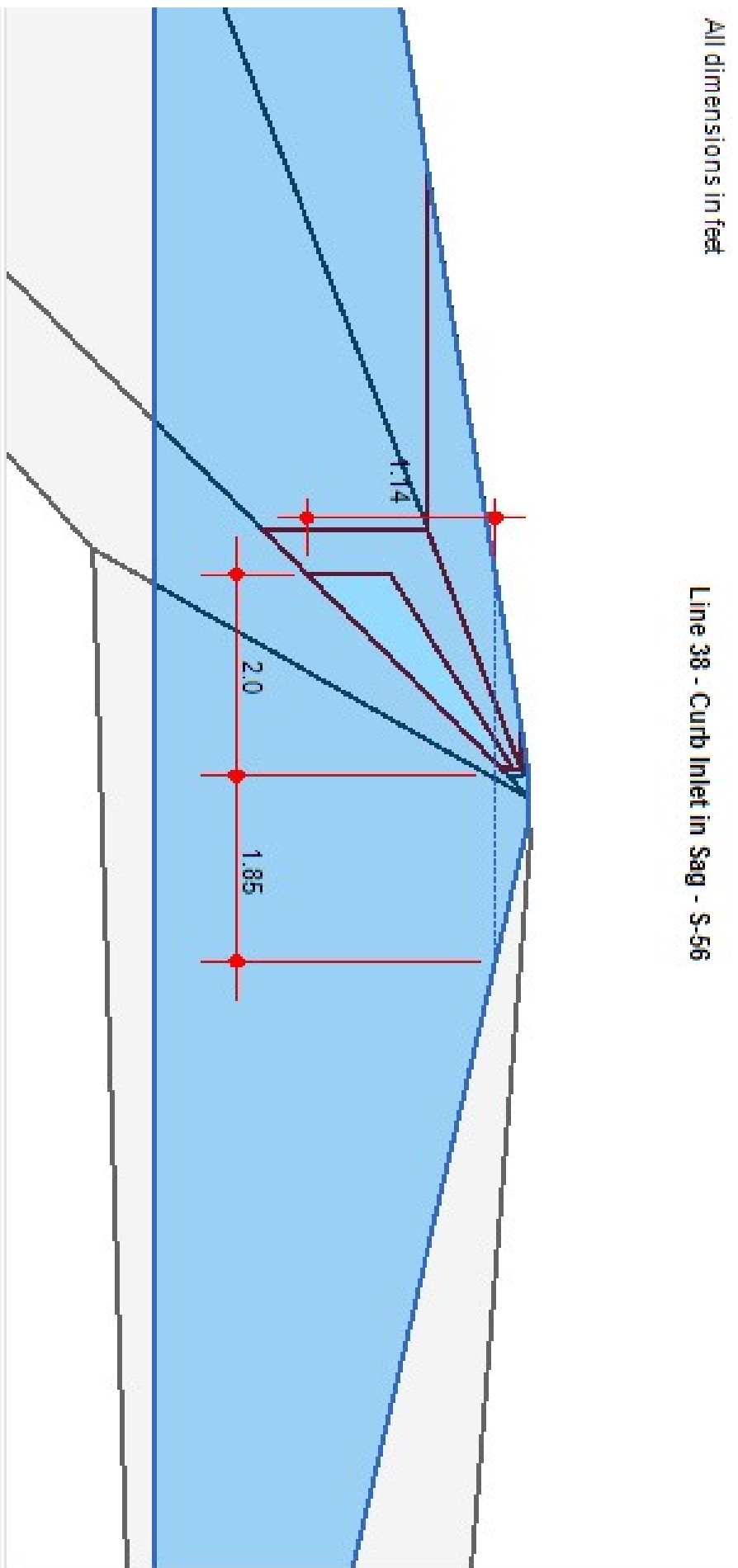


Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)	
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
16	1.00	0.00	1.00	0.00	10.50	0.0	6.0	2.00	0.005	0.550	0.020	0.51	0.93	0.00	0.00	15	
Project File:											No. Lines: 39			Run Date: 4/8/2022			

Inlet Section (Line 38 - Curb Inlet) - S-56

All dimensions in feet

Line 38 - Curb Inlet in Sag - S-56



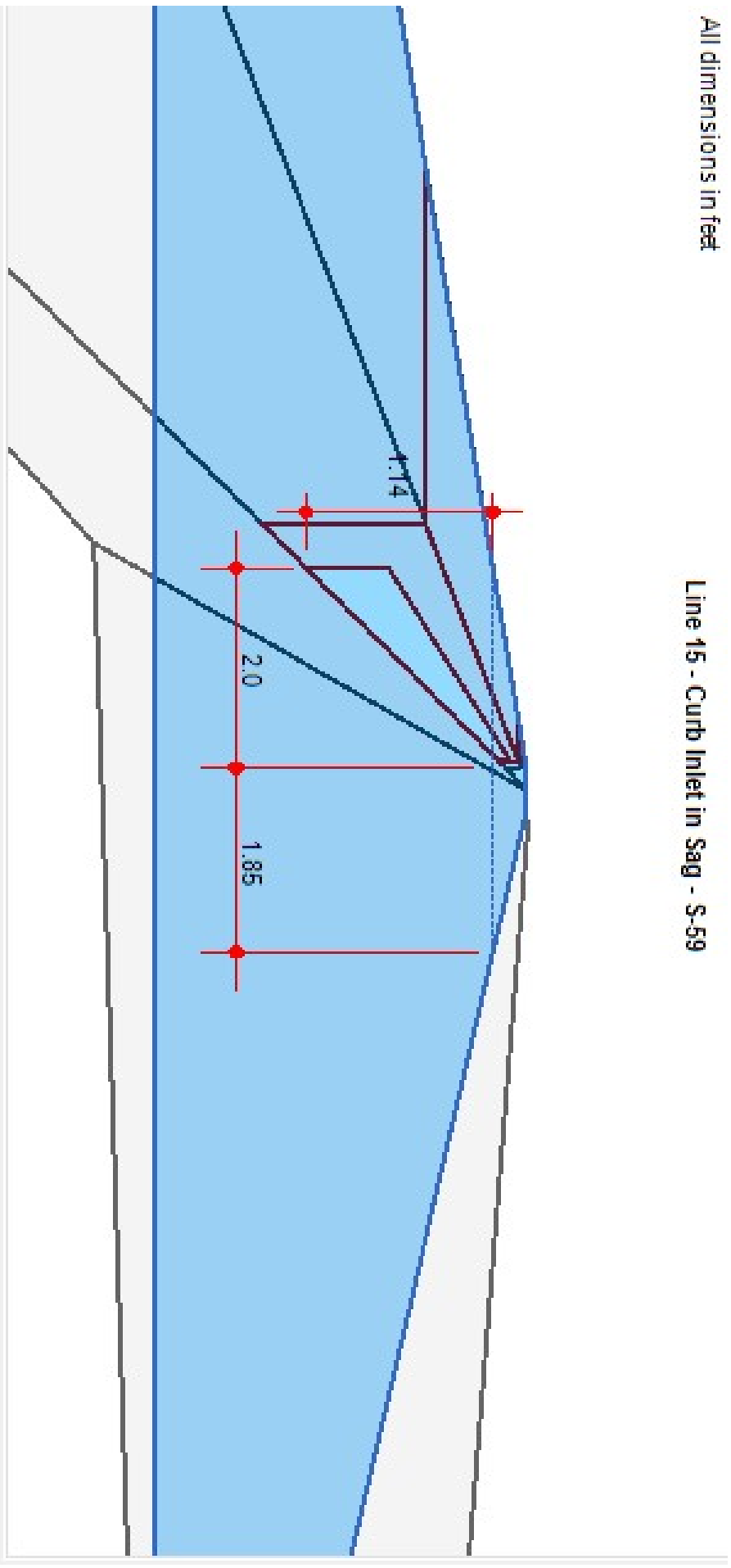
Line #	Q				Inlet			Gutter				Depth			Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
38	1.95	0.00	1.95	0.00	36.00	0.0	6.0	2.00	Sag	0.550	0.020	1.14	3.85	n/a	n/a	Sag	

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 15 - Curb Inlet) - S-59

All dimensions in feet

Line 15 - Curb Inlet in Sag - S-59



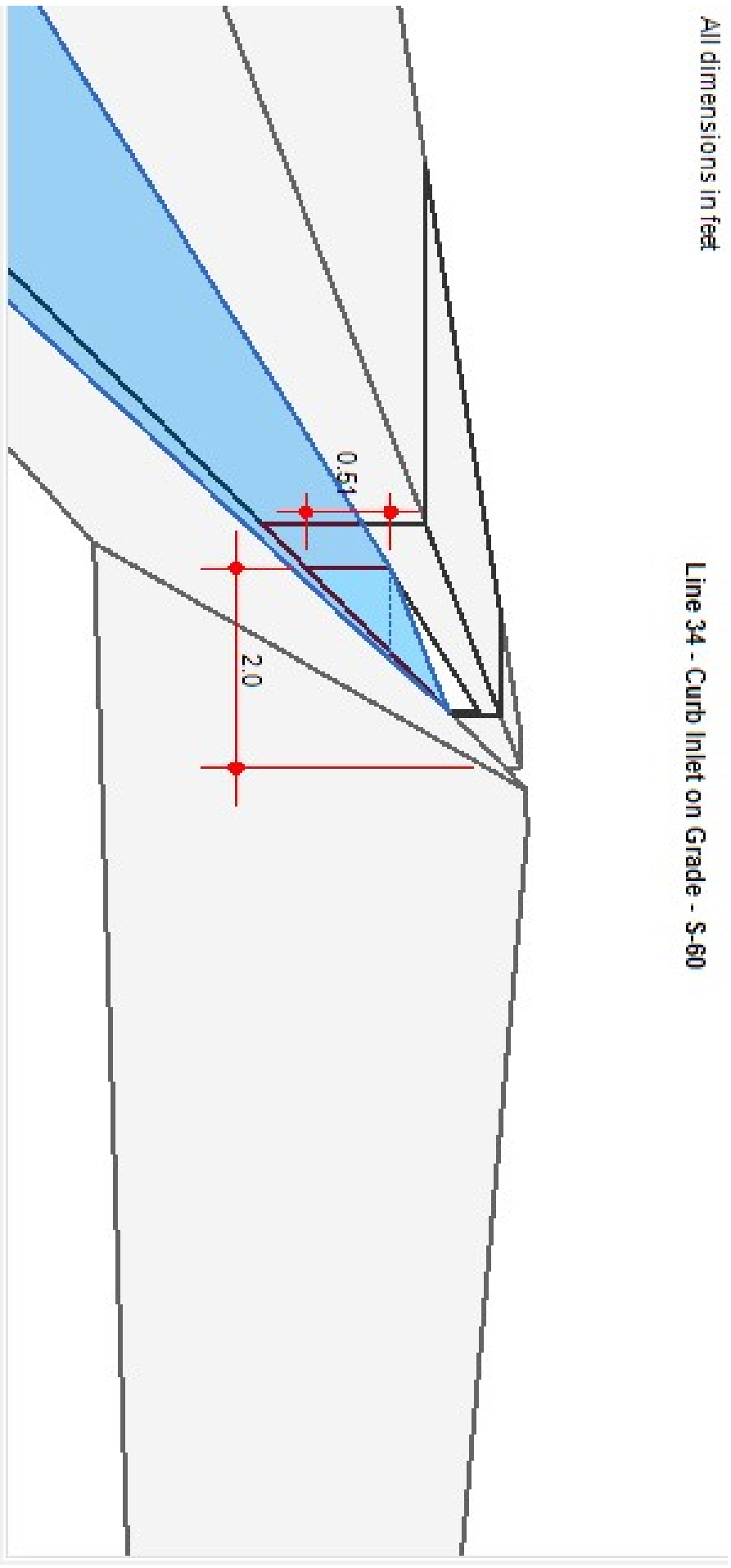
Line #	Q				Inlet			Gutter				Depth			Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
15	1.95	0.00	1.95	0.00	36.00	0.0	6.0	2.00	Sag	0.550	0.020	1.14	3.85	n/a	n/a	Sag	

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 34 - Curb Inlet) - S-60

All dimensions in feet

Line 34 - Curb Inlet on Grade - S-60



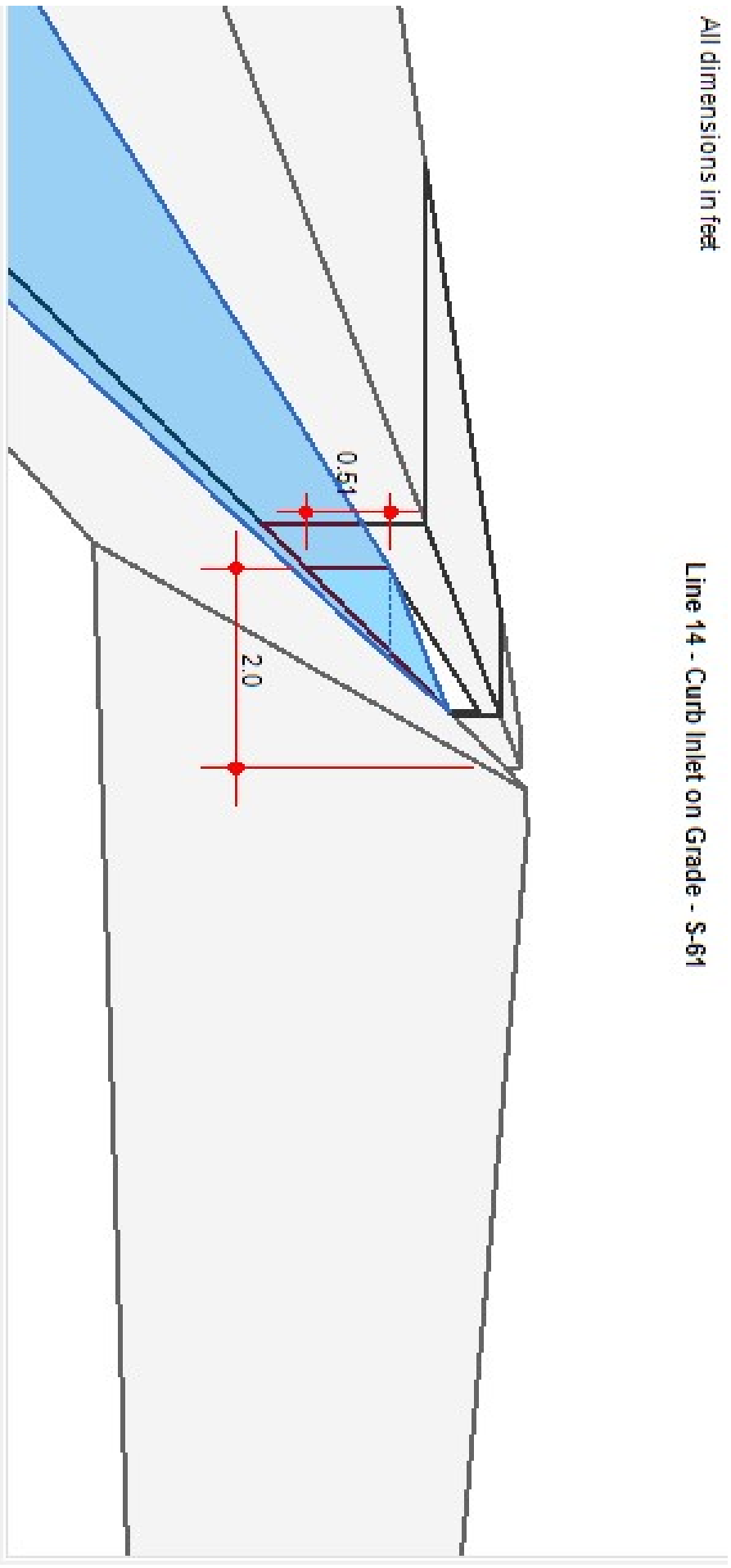
Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)	
34	1.00	0.00	1.00	0.00	10.50	0.0	6.0	2.00	0.005	0.550	0.020	0.51	0.93	0.00	0.00	38

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 14 - Curb Inlet) - S-61

All dimensions in feet

Line 14 - Curb Inlet on Grade - S-61

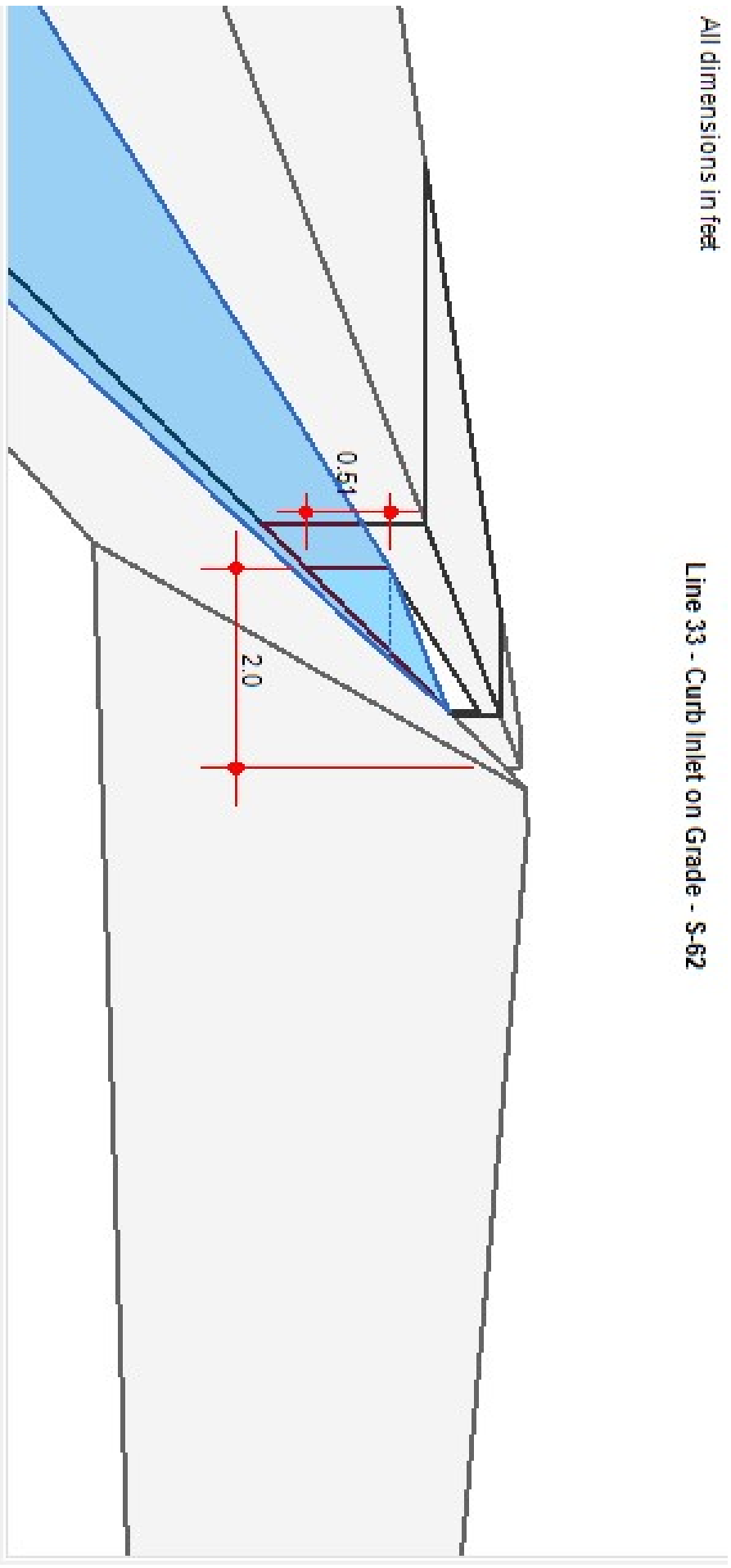


Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)	
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
14	1.00	0.00	1.00	0.00	10.50	0.0	6.0	2.00	0.005	0.550	0.020	0.51	0.93	0.00	0.00	15	
Project File:											No. Lines: 39			Run Date: 4/8/2022			

Inlet Section (Line 33 - Curb Inlet) - S-62

All dimensions in feet

Line 33 - Curb Inlet on Grade - S-62



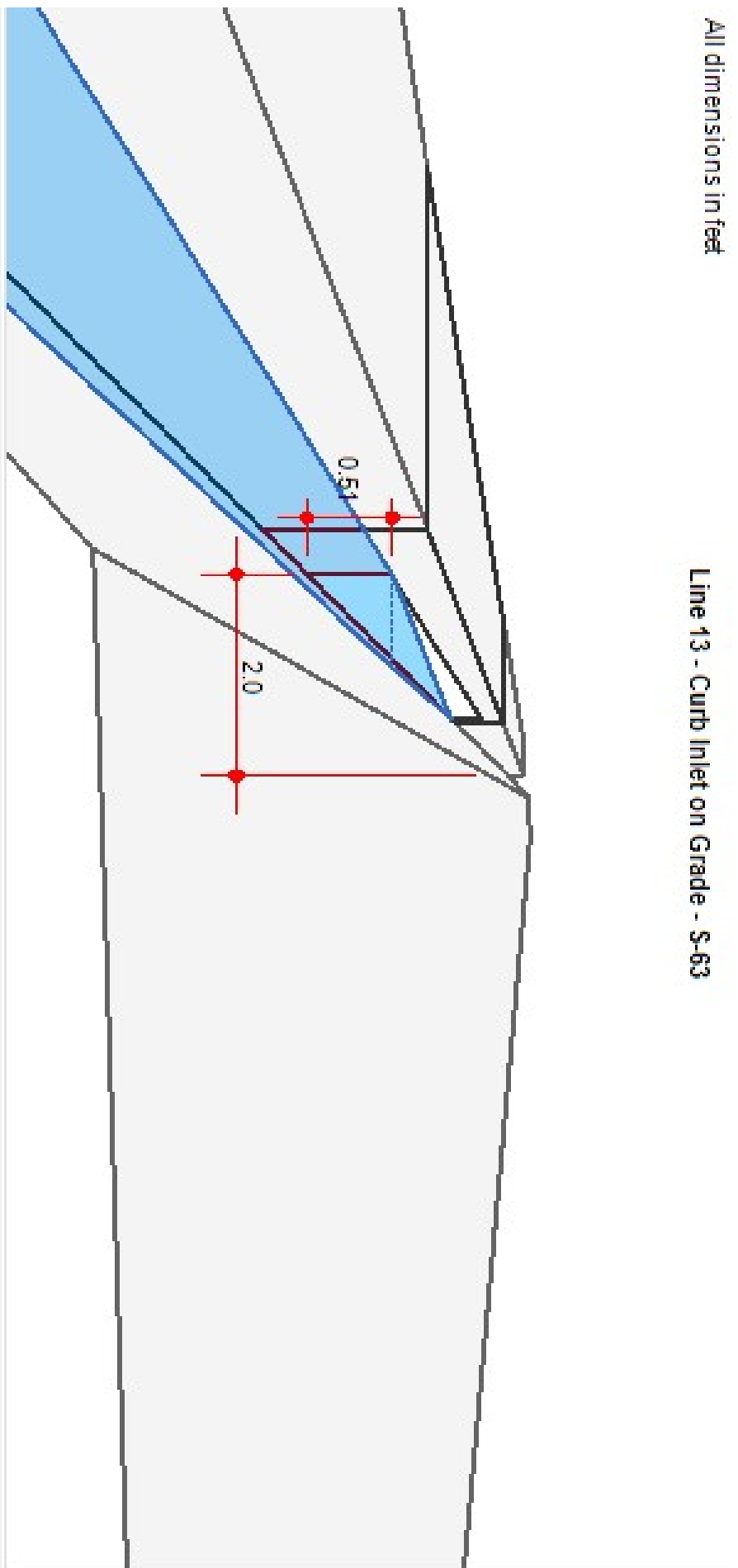
Line #	Q				Inlet			Gutter				Depth			Spread		Byp
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)	Line (ft)	
33	1.00	0.00	1.00	0.00	10.50	0.0	6.0	2.00	0.005	0.550	0.020	0.51	0.93	0.00	0.00	39	

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 13 - Curb Inlet) - S-63

All dimensions in feet

Line 13 - Curb Inlet on Grade - S-63



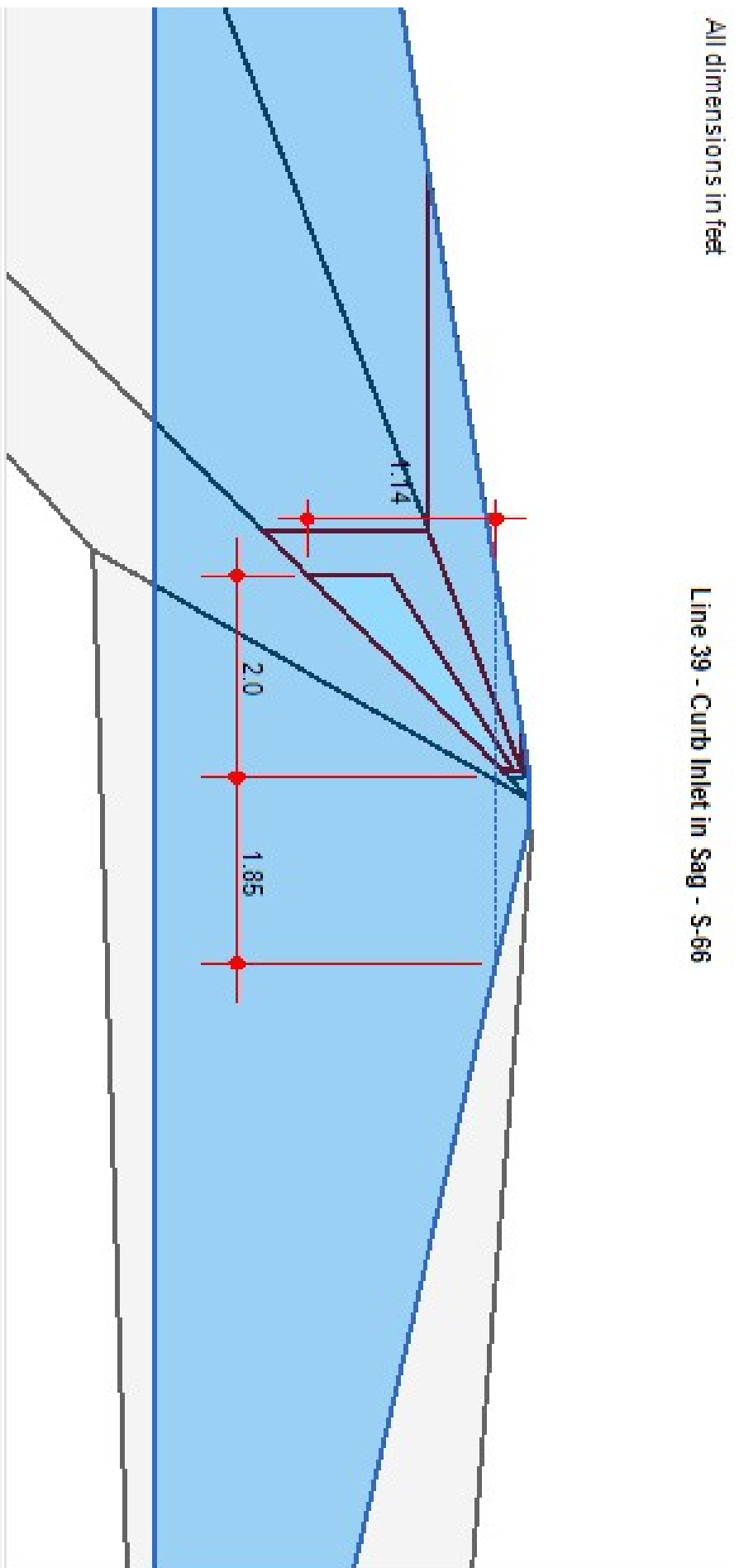
Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)	
13	1.00	0.00	1.00	0.00	10.50	0.0	6.0	2.00	0.005	0.550	0.020	0.51	0.93	0.00	0.00	12

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 39 - Curb Inlet) - S-66

All dimensions in feet

Line 39 - Curb Inlet in Sag - S-66



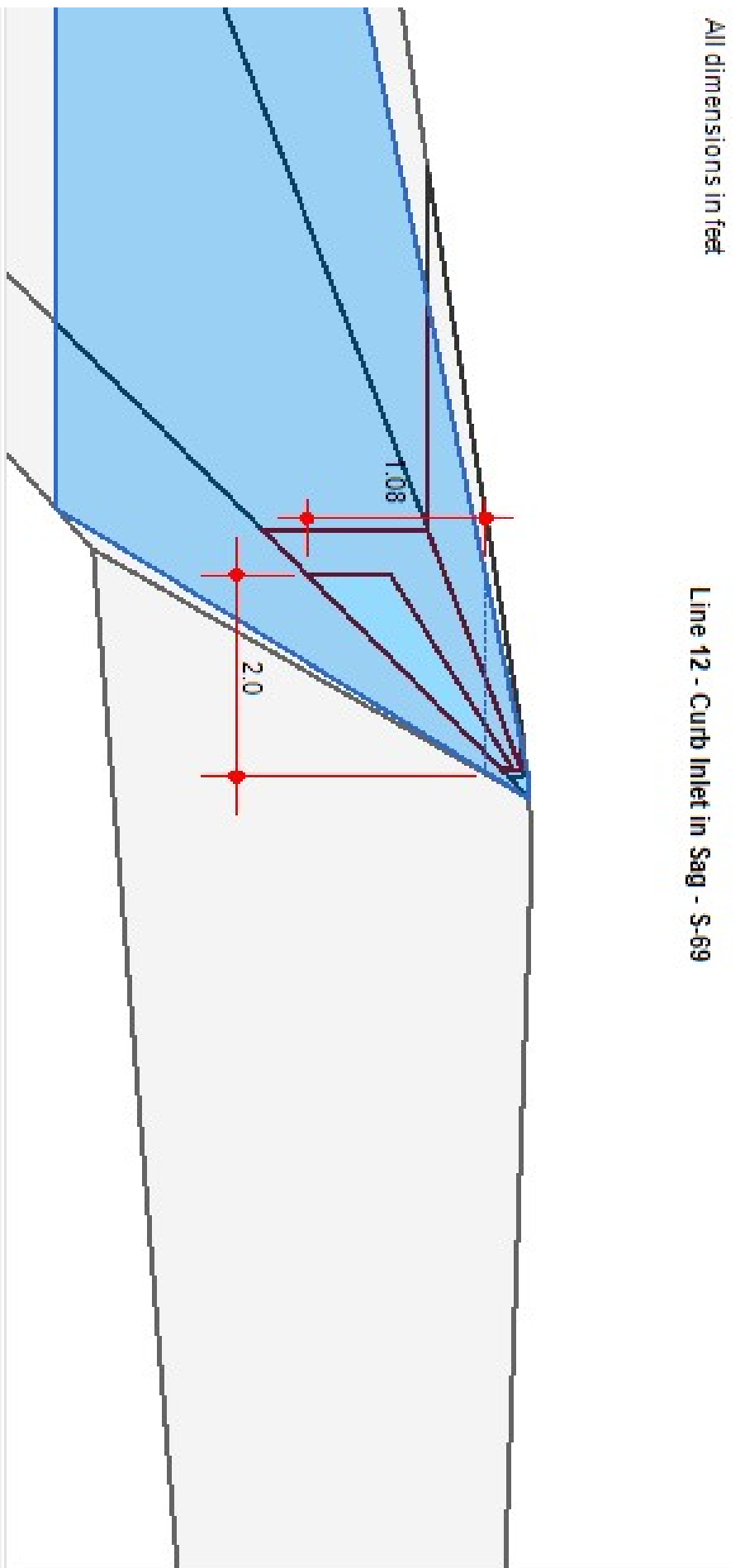
Line #	Q				Inlet			Gutter				Depth			Spread		Byp Line (ft)
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
39	1.95	0.00	1.95	0.00	36.00	0.0	6.0	2.00	Sag	0.550	0.020	1.14	3.85	n/a	n/a	Sag	

Project File: _____ No. Lines: 39 Run Date: 4/8/2022

Inlet Section (Line 12 - Curb Inlet) - S-69

All dimensions in feet

Line 12 - Curb Inlet in Sag - S-69



Line #	Q				Inlet			Gutter				Depth		Spread		Byp Line (ft)	
	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Length (ft)	Depr (in)	Throat (in)	Width (ft)	Slope (ft/ft)	Sw (ft/ft)	Sx (ft/ft)	Gutter (ft)	Inlet (ft)	Gutter (ft)	Inlet (ft)		
12	1.95	0.00	1.95	0.00	36.00	0.0	6.0	2.00	Sag	0.550	0.050	1.08	1.96	n/a	n/a	Sag	
Project File:												No. Lines: 39		Run Date: 4/8/2022			