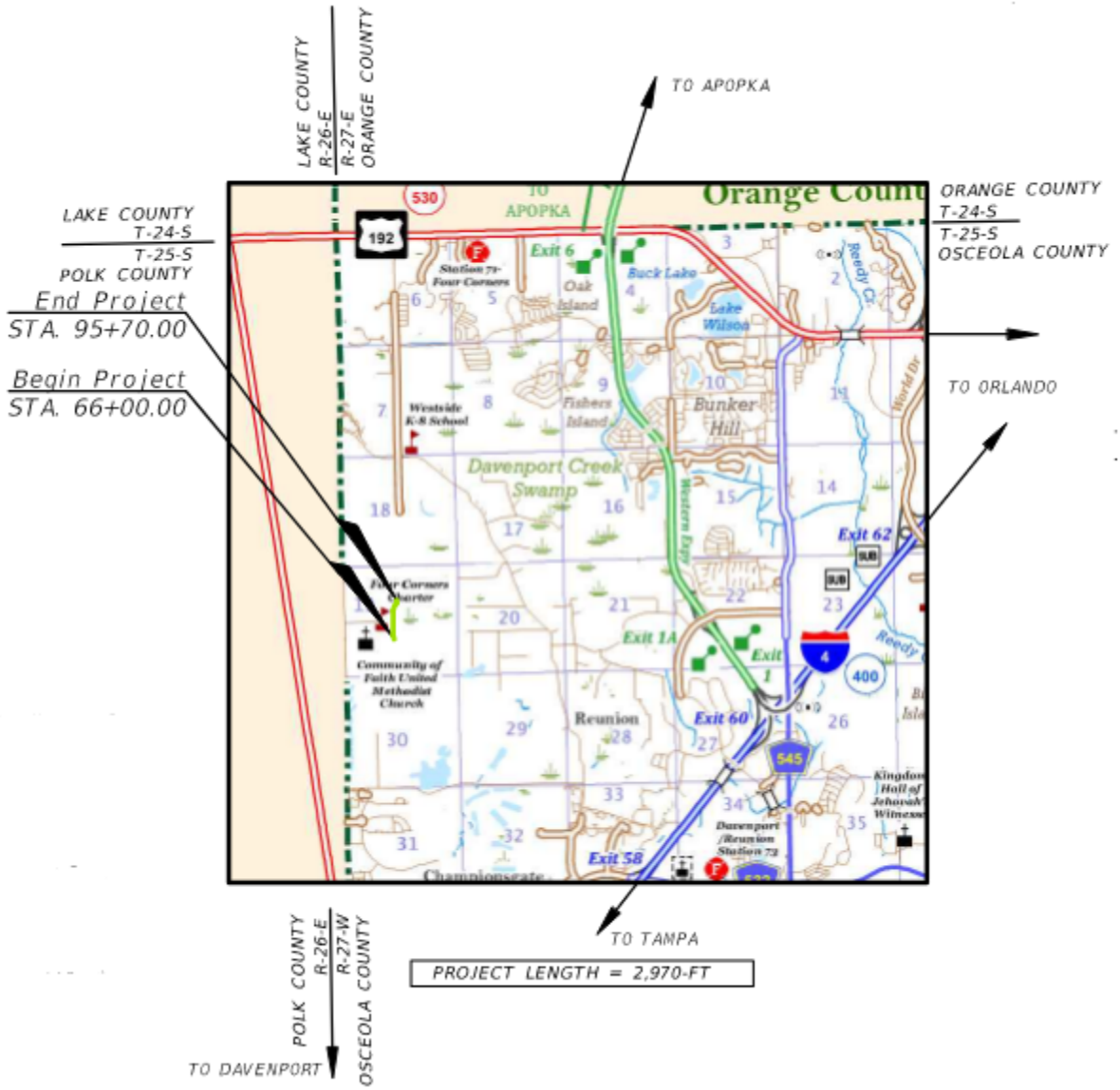
HAMILTON
ENGINEERING & SURVEYING, INC.

# STORMWATER REPORT
## FOR
# WESTSIDE BOULEVARD EXTENSION
# STA 66+00 – STA 95+70

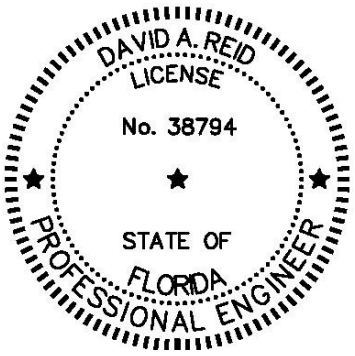
# 90% DRAINAGE DESIGN REPORT
## OSCEOLA COUNTY, FLORIDA




**FEBRUARY 28TH, 2023**
**HAMILTON PROJECT NO. 53509.0017**

## Signature Sheet for:

# STORMWATER REPORT
**FOR**
# WESTSIDE BOULEVARD EXTENSION
**OSCEOLA COUNTY, FLORIDA**

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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 and north 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 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 HNTB on January 26th, 2021. 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. 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 wetland impact is 0.13 acres and total secondary wetland impact is 0.25 acres.

### 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.

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 five (5) 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 basin 1 is located within post-development basin project limits and was utilized to calculate the pre-development discharge rate for Pond 1's control structure to Wetland 1. 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 1). 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 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 | 0.69 | 7.1% | 98 | 6.9 |
| A | Flatwoods, Depth to WT: 2 & Uncompacted (AB-2 - AB-5 & AB-7) | 3.67 | 37.8% | 80 | 30.3 |
| A | Flatwoods, Depth to WT: 4 & Uncompacted (AB-8 – AB-14) | 5.37 | 55.1% | 53 | 29.2 |
| | | 9.73 | 100% | | 66.4 |

### 2.2.7 Time of Concentration

For overland flow less than 300 feet, Manning's kinematic solution (Overtop & Meadows 1976) was used to calculate the time of concentration. The project site's ground cover is short grass condition corresponding to a roughness coefficient of 0.15.

$$t_O = \frac{0.007(nL_O)^{0.8}}{(P_2)^{0.5}(s_O)^{0.4}}$$

where $t_O$ = overland flow travel time, hours

$n$ = Manning's roughness coefficient;
$L_O$ = flow length, feet
$P_2$ = 2-year 24-hour rainfall depth, inches;
$s_O$ = overland flow slope, feet/foot.

After a maximum of 300 feet, sheet flow usually becomes a shallow concentrated flow. The following equation was used to calculate the time of concentration of shallow concentrated flow.

$$T_t = \frac{L}{3600V}$$

Where $T_t$ = travel time (hr)
L = flow length (ft)
V = average velocity (ft/s)

**PRE-BASIN 1**

| Section 1: | | | Section 2: | | | Section 3: | | |
|---|---|---|---|---|---|---|---|---|
| Watercourse: | Short Grass | | | | | | | |
| Slope (s): | 0.0265 | ft/ft | Surface Description: | Unpaved | | Surface Description: | Unpaved | |
| Length (L): | 100 | ft | Watercourse Slope (s): | 0.0105 | ft/ft | Watercourse Slope (s): | 0.0102 | ft/ft |
| Runoff (P): * | 5 | in | Flow Length (L): | 156 | ft | Flow Length (L): | 120 | ft |
| Mannings (n): ** | 0.15 | | Avg. Velocity | 1.65 | ft/s | Avg. Velocity | 1.63 | ft/s |
| | | | V = 16.1345 x S^0.5 | | | V = 16.1345 x S^0.5 | | |
| Time of Conc = | $\frac{.007(Ln)^{.8}}{P^{.5}s^{.4}}$ | | Time of Conc = | $\frac{L}{3600V}$ | | Time of Conc = | $\frac{L}{3600V}$ | |
| Time of Conc = | 0.12 | hrs | | | | | | |
| Time of Conc = | 7.00 | mins | Time of Conc = | 0.03 | hrs | Time of Conc = | 0.02 | hrs |
| | | | Time of Conc = | 1.57 | mins | Time of Conc = | 1.23 | mins |

| Total Time of Concentration = | 9.80 | mins |
|---|---|---|

### 2.2.8 Peak Runoff Rate Determination

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

### 2.2.9 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 10-year, 72-hour storm are as follows:

Pre-Basin 1: 23.30 cfs

The normal water elevation used in analysis for Pond 1 will be 117.25 (NAVD88, feet). See attached Geotechnical and Environmental Consultants, Inc. geotechnical report (dated February 26) and Royal Consulting Services' RIBs exhibit.

# 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 10-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 |
| 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.

| 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: | 0.56 | ac | 6% |
| Wetland Preservation Area: | 0.00 | ac | 0% |
| Green/Open Area: | 4.24 | ac | 45% |
| Pervious Area: | 4.24 | ac | 45% |
| Impervious Area: | 4.93 | ac | 49% |

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 (NWL):*** | 0.56 | 5.8% | 100 | 5.76 |
| **Pervious Area:** | | | | | |
| A | Flatwoods, Depth to WT=4.0, Compacted | 4.24 | 43.5% | 60 | 26.15 |
| | | 9.73 | 100% | | **81.60** |

### 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: | | | Section 2: | | |
|---|---|---|---|---|---|
| Watercourse: | Smooth Surface | | Surface Description: | Concrete Pipe | |
| Slope (s): | 0.0200 | ft/ft | Watercourse Slope (s): | 0.0020 | ft/ft |
| Length (L): | 102 | ft | Flow Length (L): | 2239 | ft |
| Runoff (P): * | 5 | in | Avg. Velocity | 2.00 | ft/s |
| Mannings (n): ** | 0.011 | | | | |
| Time of Conc = | $\frac{.007(Ln)^{.8}}{P^{.5s.4}}$ | | Time of Conc = | $\frac{L}{3600V}$ | |
| Time of Conc = | 0.02 | hrs | Time of Conc = | 0.31 | hrs |
| Time of Conc = | 0.98 | mins | 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***

Basin 1 PAV Required (Appendix C): **1.54** 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 and reduce the height of the runoff to a shallow film.

### 3.4.9 Tailwater

For Pond 1, the tailwater condition is set at an elevation of 116.15' NAVD88. The tailwater conditions were determined by on the water table shown in Royal Consulting Services/TWA's model for the RIBs, as previously mentioned. The figure below shows the Pond 1 outfall location on TWA's RIBs exhibit. Please note that the exhibit provided in Appendix B and the figure below is in NGVD29. (Conversion for the vertical datums: NGVD29 = NAVD88 +0.863).


***Figure 2: Snippet of Royal Consulting Services, Inc./Toho Water Authority's Model Predicted Groundwater Elevation at the end of the wet season with the outfall location denoted.***

### 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 312 of the 10-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 | |
| | | | | | | $V=\frac{1.49(r^{2/3})(s^{1/2})}{n}$ | 1.72 | ft/s |
| Time of Conc = | $\frac{.007(Ln)^{.8}}{P^{.5s.4}}$ | | Time of Conc = | $\frac{L}{3600V}$ | | 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**

**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 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | $V=\frac{1.49(r^{2/3})(s^{1/2})}{n}$ | 1.12 | ft/s |
| Time of Conc = | $\frac{.007(Ln)^{.8}}{P^{.5}s^{.4}}$ | | Time of Conc = | $\frac{L}{3600V}$ | | 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 | |
| | | | | | | $V=\frac{1.49(r^{2/3})(s^{1/2})}{n}$ | 0.82 | ft/s |
| Time of Conc = | $\frac{.007(Ln)^{.8}}{P^{.5}s^{.4}}$ | | Time of Conc = | $\frac{L}{3600V}$ | | 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 | |
| | | | | | | $V=\frac{1.49(r^{2/3})(s^{1/2})}{n}$ | 1.33 | ft/s |
| Time of Conc = | $\frac{.007(Ln)^{.8}}{P^{.5}s^{.4}}$ | | Time of Conc = | $\frac{L}{3600V}$ | | 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 outlet velocity below 6 feet per second to meet the requirements of LDC 4.5.3.F.4. The 10-year 72-hour maximum flow of 19.08 cfs was taken from SFWMD Permit No. 49-101036-P.

### 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

| 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 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) | 122.44 |
| Minimum Final Floor Elevations Proposed (ft) | N/A |
| | |
| Total Peak Discharge Rate Allowed (10-yr/72-hr, cfs) | 23.30 |
| Total Peak Discharge Rate Provided (10-yr/72-hr, cfs) | 11.11 |
| | |
| Drawdown Elevation Required after 336 hrs of 10-yr/72-hr (ft) | 117.25 |
| Drawdown Elevation After 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

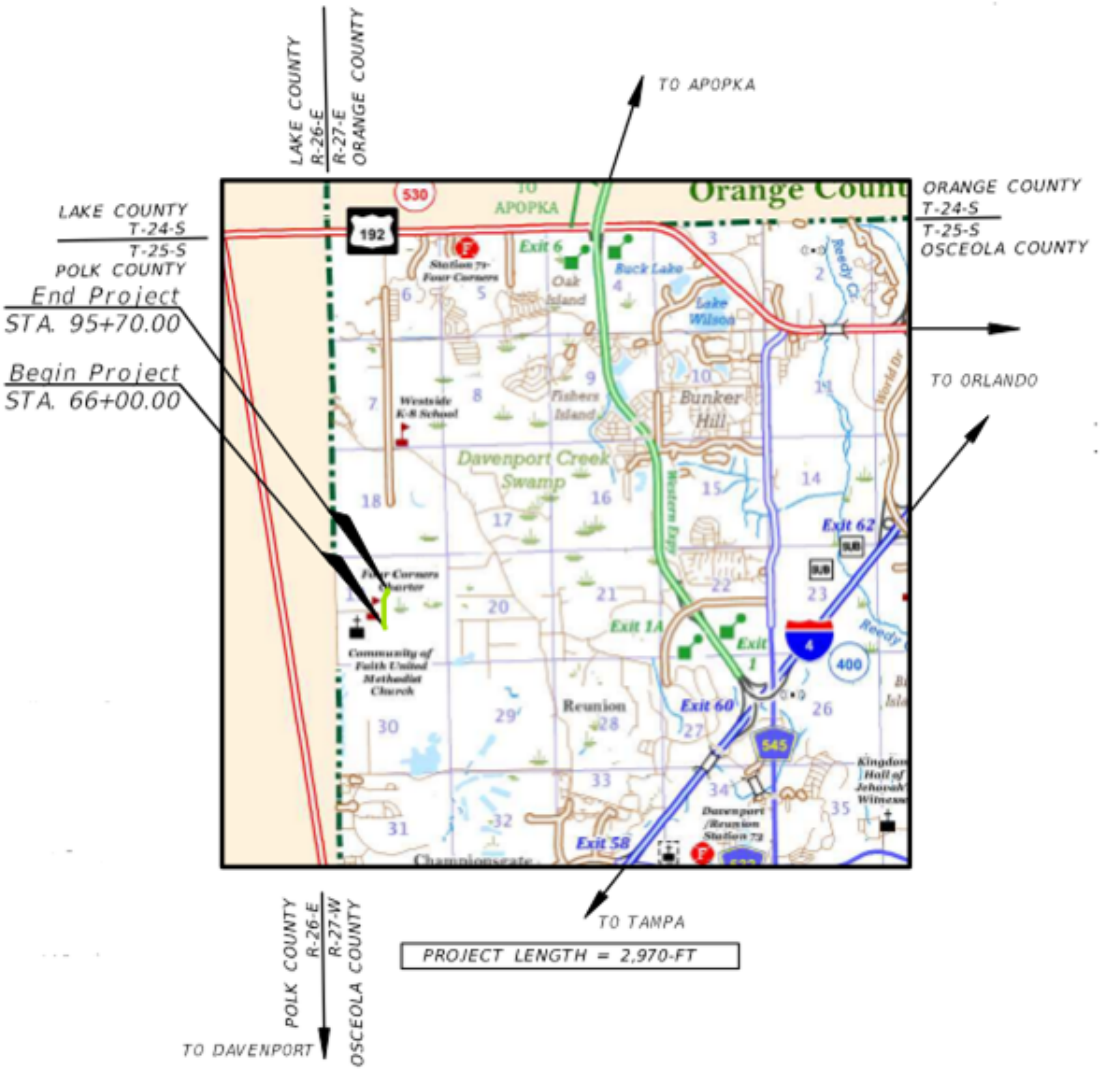
Osceola County will be responsible for the operation and maintenance of the stormwater management system.

# Appendix A

# Exhibits

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

# LOCATION MAP
## WESTSIDE BLVD EXTENSION




FEBRUARY 2023

OSCEOLA COUNTY, FLORIDA

**Westside Boulevard Extension**
Osceola County, Florida

Description:

The easterly 540 feet of Parcel 19-25-27-0000-0030-0000, said parcel being more particularly described as:

S3/4 OF E1/2 OF NE1/4 OF SW1/4 LESS FOUR CORNERS SCHOOL PB 12 PG 92-93 & LESS COM AT SE COR OF LOT 3 BLK C, FLA FRUIT & TRUCK LAND CO PB B PG 68, S89-42-12W 144.36 FT TO POB; CONT S89-42-12W 356.91 FT, N00-01-30E 365.01 FT, N89-42-12E 274.96 FT, S00-18-06E 98.99 FT TO POC, CONC E, RAD 349.41 FT, CENT ANG 23 DEG, (CH BEARING S11-47-33E 139.22 FT), SLY ALONG CURVE 140.15 FT, S21-19-09E 101.77 FT TO POC, CONC NE, RAD 328.78 FT, CENT ANG 07 DEG, (CH BEARING S24-37-44E 37.96 FT), SELY ALONG CURVE 37.99 FT TO POB & LESS BEG AT SW COR OF LOT 5 BLK C, FLA FRUIT & TRUCK LAND CO PB B PG 68, N00-01-30E 365.01 FT, N89-42-12E 477.38 FT, S00-01-30W 365.01 FT, S89-42-12W 477.38 FT TO POB.

Together with the easterly 300 feet of Parcel 19-25-27-3160-000C-0040, said parcel being more particularly described as:

FLA FRUIT & TRUCK LAND CO SUB BLK C N 1/2 OF LOT 4 & N 1/4 OF LOTS 5 & 6 LESS THAT PORTION OF FOLLOWING LYING IN LOTS 4, 5 & 6: BEG NW COR LOT 6 BLK C FLA FRUIT & TRUCKLAND CO, S 609.75 FT, N 89 DEG E 338.07 FT, N 125.05 FT, N 53 DEG E 205.12 FT, N 30 DEG E 134.36 FT, N 50 DEG E 44.83 FT, E 30.80 FT TO POC CONCAVE NWLY WITH RADIUS OF 283.75 FT, CENT ANG 34 DEG 27 MIN 37 SEC FOR 170.66 FT, S 55 DEG E 74.39 FT, N 27 DEG E 298.35 FT, N 600 FT, S 89 DEG 350 FT TO POC CONCAVE SELY WITH RADIUS OF 1,298.93 FT, CENT ANG 38 DEG 15 MIN 55 SEC FOR 867.50 FT, S 100 FT TO POB LESS FOUR CORNERS SCHOOL PB 12 PG 92-93.

Together with the easterly 300 feet of Parcel 19-25-27-3160-000B-0010, said parcel being more particularly described as:

FLA FRUIT & TRUCK LAND CO SUB BLK B LOT 1 & 12 & S1/2 LOTS 13 TO 16 LESS W 25 FT LOT 12 FOR RD R/W LESS THAT PORTION OF FOLLOWING LYING IN LOTS 1-12 BLK B: BEG NW COR LOT 6 BLK C FLA FRUIT & TRUCKLAND CO, S 609.75 FT, N 89 DEG E 338.07 FT, N 125.05 FT, N 53 DEG E 205.12 FT, N 30 DEG E 134.36 FT, N 50 DEG E 44.83 FT, E 30.80 FT TO POC CONCAVE NWLY WITH RADIUS OF 283.75 FT, CENT ANG 34 DEG 27 MIN 37 SEC FOR 170.66 FT, S 55 DEG E 74.39 FT, N 27 DEG E 298.35 FT, N 600 FT, S 89 DEG W 350 FT TO POC CONCAVE SELY, RADIUS 1298.93 FT, CENT ANG 38 DEG 15 MIN 55 SEC FOR 867.50 FT, S 100 FT TO POB.

Together with the easterly 250 feet of Parcel 19-25-27-3160-000B-0020, said parcel being more particularly described as:

FLA FRUIT & TRUCK LAND CO SUB BLK B LOTS 2, 11, N 1/2 LOTS 13 & 14, 15 & 16 LESS W 25 FT LOT 11 FOR RD R/W.

Together with the easterly 150 feet of Parcel 19-25-27-3160-000B-0030, said parcel being more particularly described as:

FLA FRUIT & TRUCK LAND CO SUB BLK B LOTS 3 TO 6.

Final right-of-way description to be determined upon completion of the roadway design and preparation of a right-of-way map.

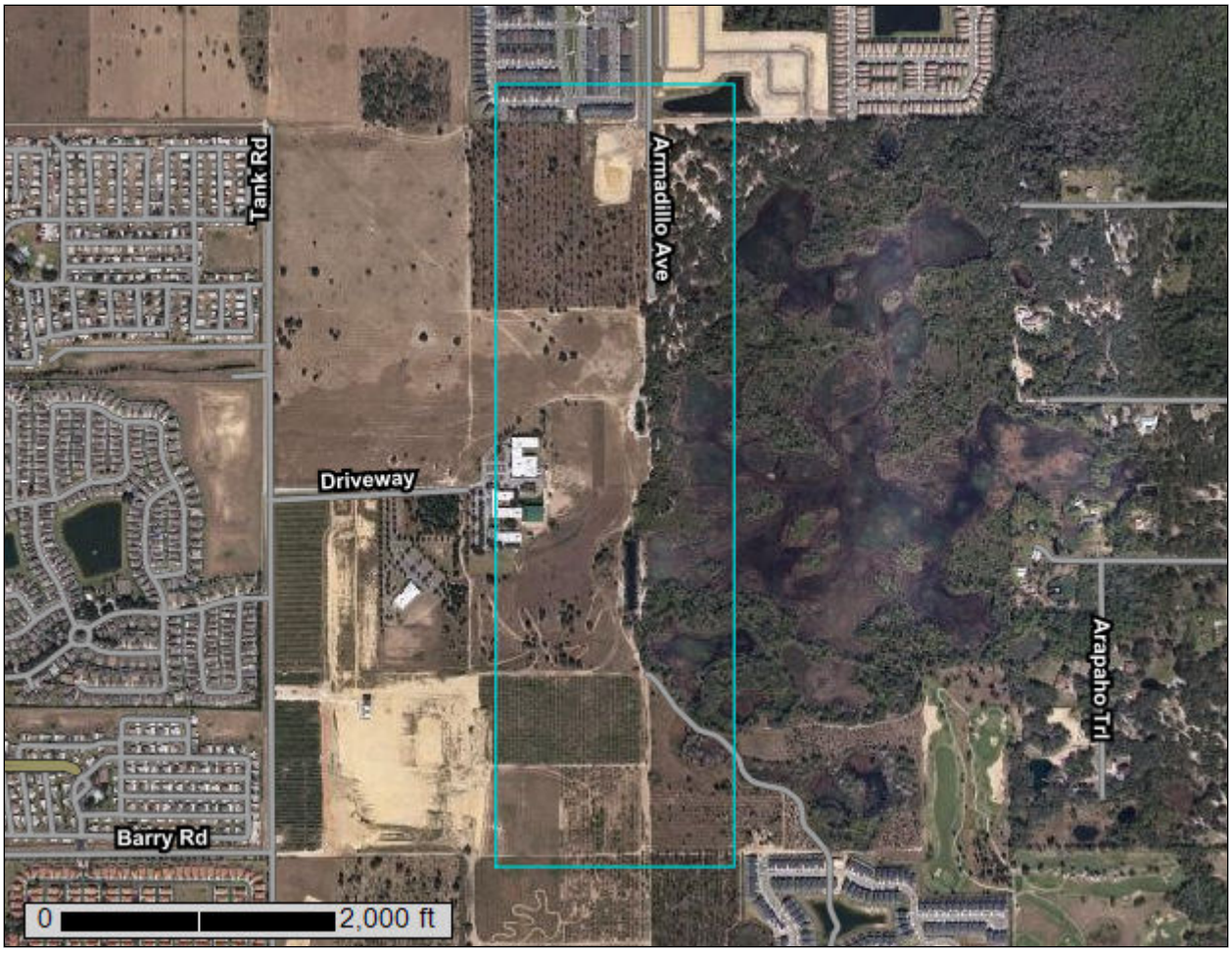
United States Department of Agriculture

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




August 7, 2020

# 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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# Contents

# 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

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.

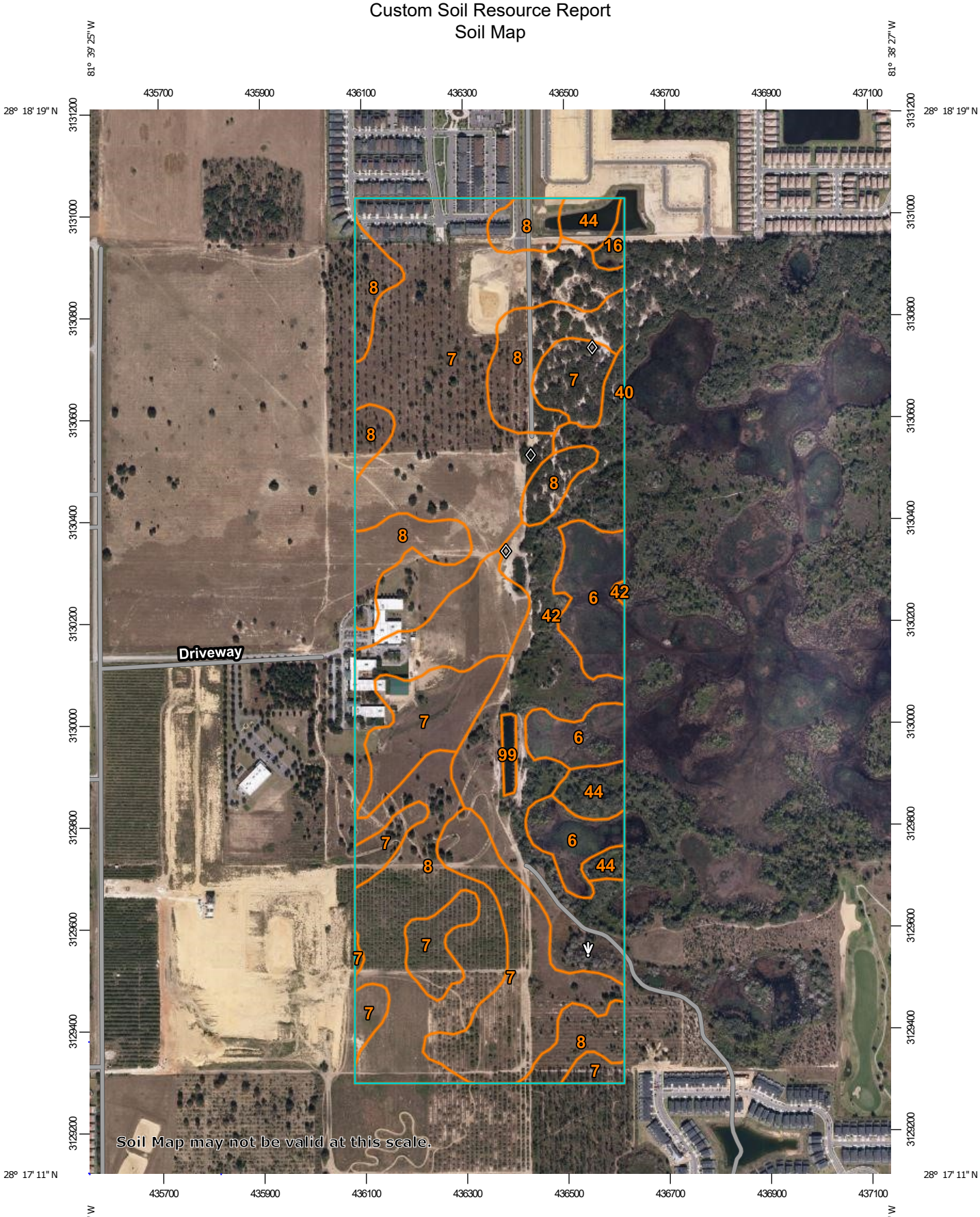
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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




Map Scale: 1:10,200 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## 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

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)

*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

*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

*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

*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)

**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

*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

*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

**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

*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

*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, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

## NOTES TO USERS

ap is for use in administering the National Flood Insurance Program. It does ecessarily identify all areas subject to flooding, particularly from local drainage s of small size. The **community map repository** should be consulted for e updated or additional flood hazard information.

in more detailed information in areas where **Base Flood Elevations** (BFEs) **floodways** have been determined, users are encouraged to consult the Flood and Floodway Data and/or Summary of Stillwater Elevations tables ed within the Flood Insurance Study (FIS) report that accompanies this FIRM. should be aware that BFEs shown on the FIRM represent rounded whole-foot ons. These BFEs are intended for flood insurance rating purposes only and not be used as the sole source of flood elevation information. Accordingly, levation data presented in the FIS report should be utilized in conjunction with IM for purposes of construction and/or floodplain management.

**l Base Flood Elevations (BFEs)** shown on this map apply only landward of rth American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should re that coastal flood elevations are also provided in the Summary of Stillwater ons table in the Flood Insurance Study report for this jurisdiction. Elevations in the Summary of Stillwater Elevations table should be used for construction floodplain management purposes when they are higher than the elevations on this FIRM.

aries of the **floodways** were computed at cross sections and interpolated n cross sections. The floodways were based on hydraulic considerations with to requirements of the National Flood Insurance Program. Floodway widths her pertinent floodway data are provided in the Flood Insurance Study report jurisdiction.

areas not in Special Flood Hazard Areas may be protected by **flood control ures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood ce Study report for information on flood control structures for this jurisdiction.

**ojection** used in the preparation of this map was Transverse Mercator State lorida East FIPS 0901. The **horizontal datum** was NAD83 HARN, GRS1980 id. Differences in datum, spheroid, projection or State Plane zones used in oduction of FIRMs for adjacent jurisdictions may result in slight positional ces in map features across jurisdiction boundaries. These differences do not he accuracy of this FIRM.

levations on this map are referenced to the North American Vertical Datum of These flood elevations must be compared to structure and ground elevations ced to the same **vertical datum**. For information regarding conversion n the National Geodetic Vertical Datum of 1929 and the North American l Datum of 1988, visit the National Geodetic Survey website at ww.ngs.noaa.gov/ or contact the National Geodetic Survey at the following s:

formation Services
, NINGS12
al Geodetic Survey
3, #9202
ast-West Highway
Spring, Maryland 20910-3282
13-3242

in current elevation, description, and/or location information for **bench marks** on this map, please contact the Information Services Branch of the National tic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

**map** information shown on this FIRM was provided in digital format by the a County Planning Office. Orthophotography was collected in late 2007 early

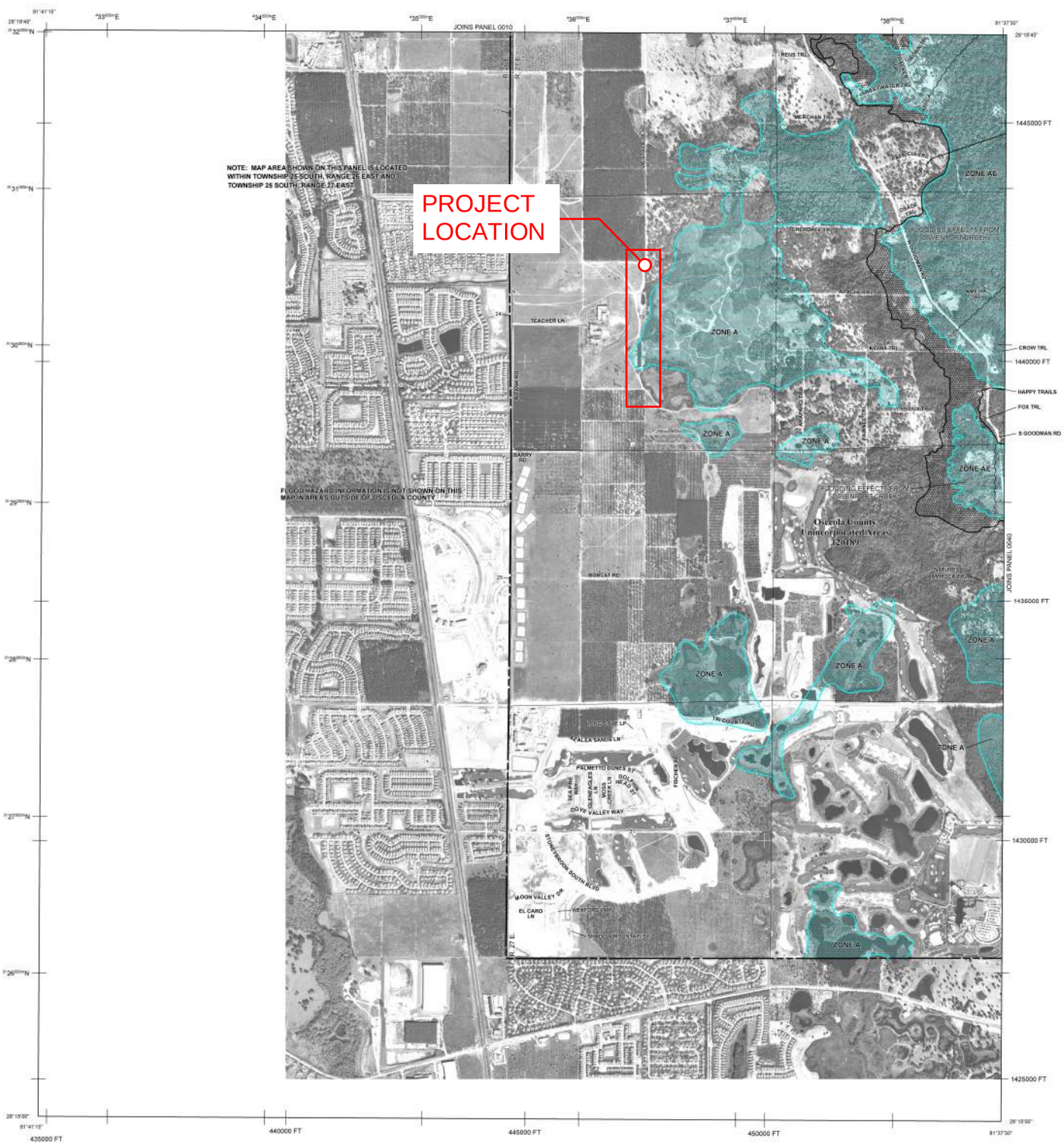
ap reflects more detailed and up-to-date **stream channel configurations** ose shown on the previous FIRM for this jurisdiction. The floodplains and ays that were transferred from the previous FIRM may have been adjusted to n to these new stream channel configurations. As a result, the Flood Profiles odway Data tables in the Flood Insurance Study report (which contains tative hydraulic data) may reflect stream channel distances that differ from shown on this map.

**rate limits** shown on this map are based on the best data available at the time location. Because changes due to annexations or de-annexations may have d after this map was published, map users should contact appropriate nity officials to verify current corporate limit locations.

refer to the separately printed **Map Index** for an overview map of the county g the layout of map panels; community map repository addresses; and a of Communities table containing National Flood Insurance Program dates for community as well as a listing of the panels on which each community is

rmation and questions about this map, available products associated with this ncluding historic versions of this FIRM, how to order products or the National nsurance Program in general, please call the **FEMA Mapping Information nge** at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service e at http://www.msc.fema.gov/. Available products may include previously Letters of Map Change, a Flood Insurance Study Report, and/or digital s of this map. Many of these products can be ordered or obtained directly e website. Users may determine the current map date for each FIRM panel by the FEMA Map Service Center website or by calling the FEMA Map dation eXchange.

**rofile base lines"** depicted on this map represent the hydraulic modeling es that match the flood profiles in the FIS report. As a result of improved aphic data, the "profile base line", in some cases, may deviate significantly e channel centerline or appear outside the SFHA.




## LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- (A) — (A) Cross section line
- (23) — (23) Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4276000mE 1000-meter Universal Transverse Mercator grid ticks, zone 14
- 6000000 FT 5000-foot grid values: Florida State Plane coordinate system, East Zone (FIPSZONE = 0901), Transverse Mercator projection
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MAY 7, 2001

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
JUNE 6, 2001 - To correct datum reference note.

JUNE 18, 2013 - To update corporate limits, change Base Flood Elevations, add Base Flood Elevations, change Special Flood Hazard Areas, change zone designations, update roads and road names, incorporate previously issued Letters of Map Revision, and reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

300 0 300 1,000 1,500 2,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0020G

# FIRM

**FLOOD INSURANCE RATE**

**OSCEOLA COUNTY, FLORIDA**
**AND INCORPORATED AR**

**PANEL 20 OF 900**

(SEE MAP INDEX FOR FIRM PANEL

CONTAINS:

| COMMUNITY | NUMBER | PANEL |
|---|---|---|
| OSCEOLA COUNTY | 120189 | 0020 |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the community.

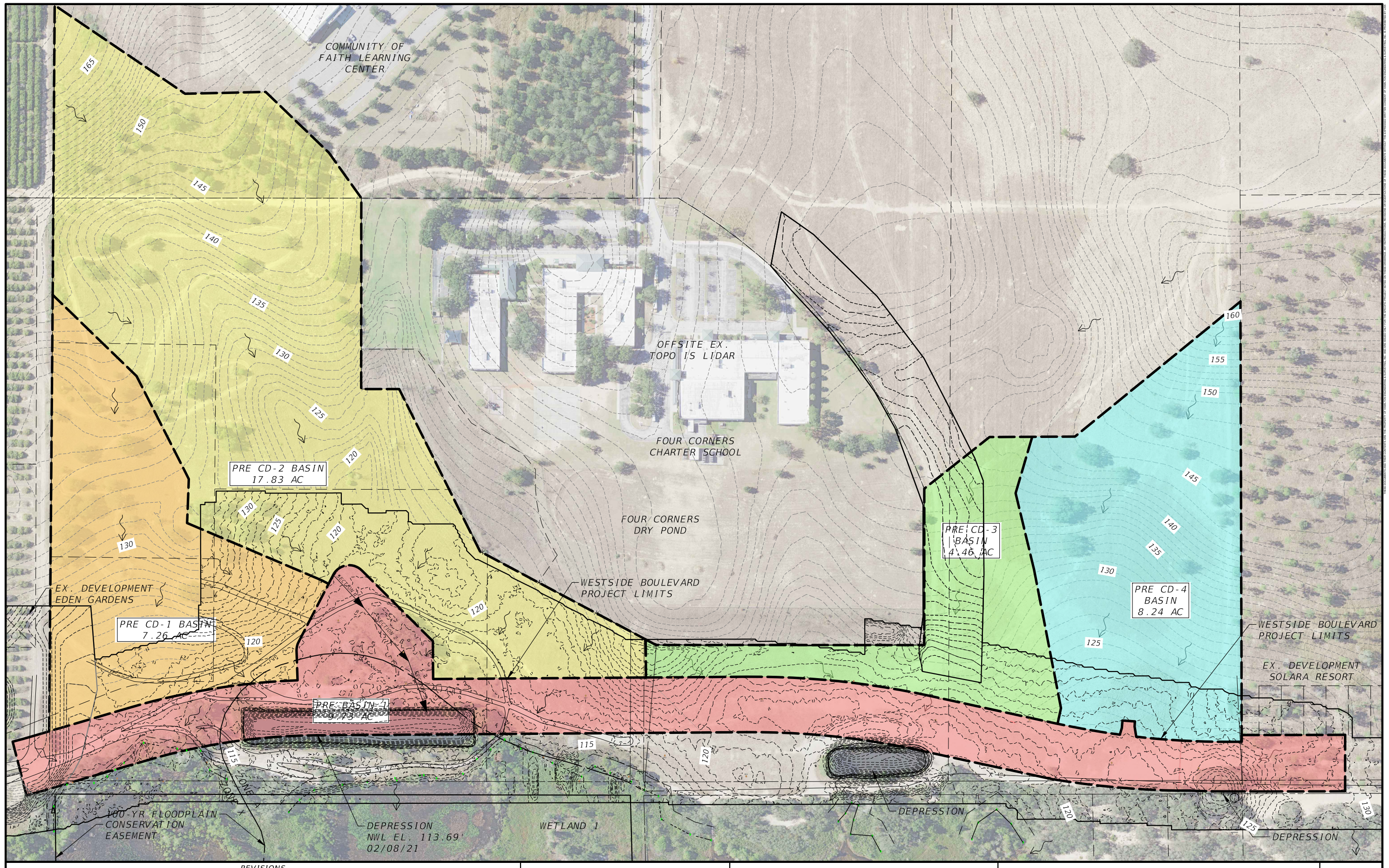
MAP NU
12097C

MAP RE
JUNE 18

Federal Emergency Management

# Appendix B

# Pre Development Analysis




| REVISIONS | | | |
|---|---|---|---|
| DATE | DESCRIPTION | DATE | DESCRIPTION |
| 02/09/2023 | REVISIONS FOR 90% SET | | |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(407) 629-8330 EXT 150


OSCEOLA COUNTY

OSCEOLA COUNTY
TRANSPORTATION AND TRANSIT DEPARTMENT

# PRE-DEVELOPMENT DRAINAGE MAP

SHEET NO.

---

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

Name: basin 1 | Node: basin 1 | 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): 9.730 | Time Shift(hrs): 0.00
Curve Number: 66.40 | 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 |
|---|---|---|
| Geometry: | Circular | Circular |
| Span(in): | 0.00 | 0.00 |
| Rise(in): | 0.00 | 0.00 |
| Invert(ft): | 0.000 | 0.000 |
| Manning's N: | 0.000000 | 0.000000 |
| 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: 0.000
Exit Loss Coef: 1.000
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
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:
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

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

Name: 10-72
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: Hydrology Sim:
Filename:

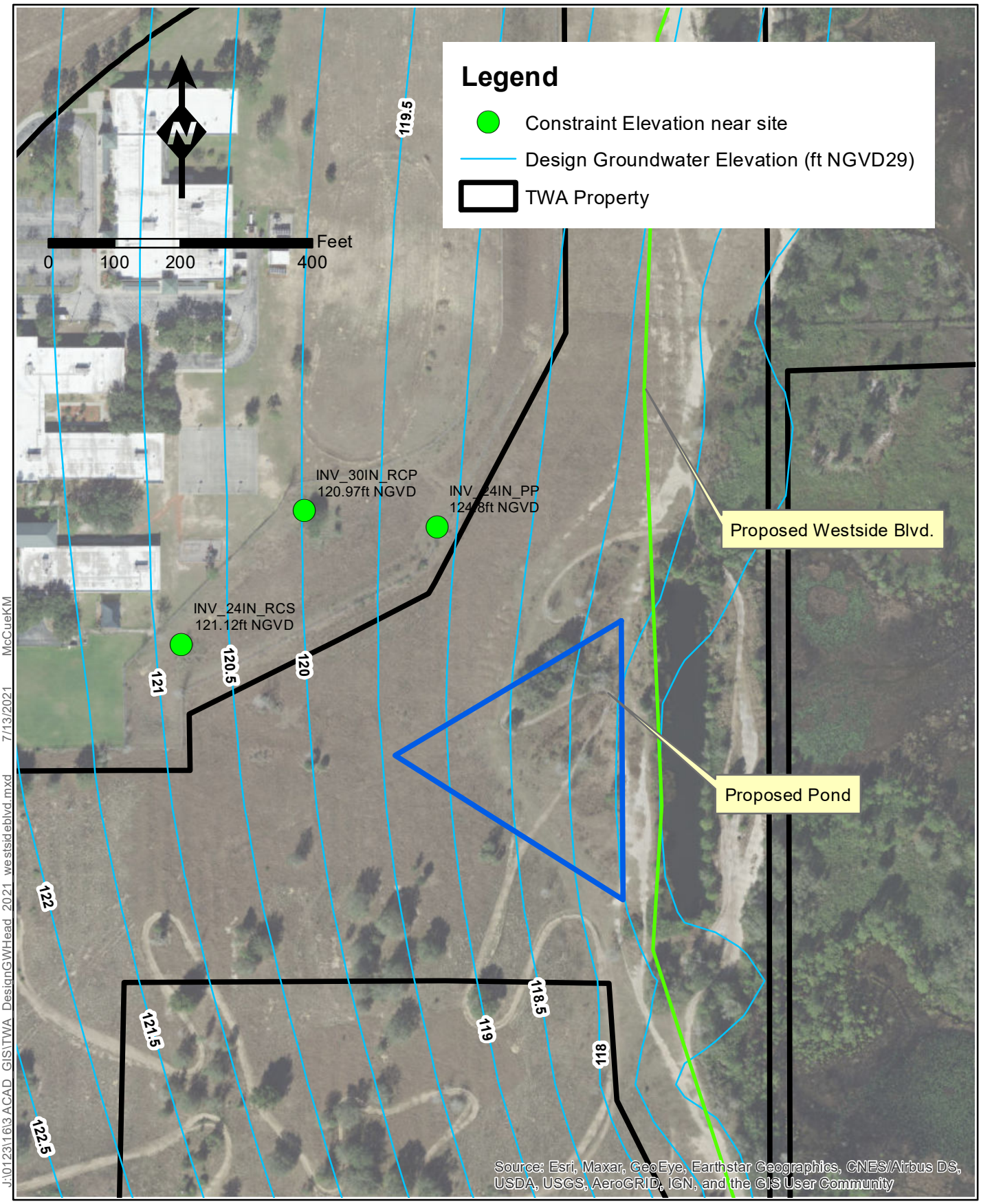
Execute: No Restart: No Patch: No
Alternative: No

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 |

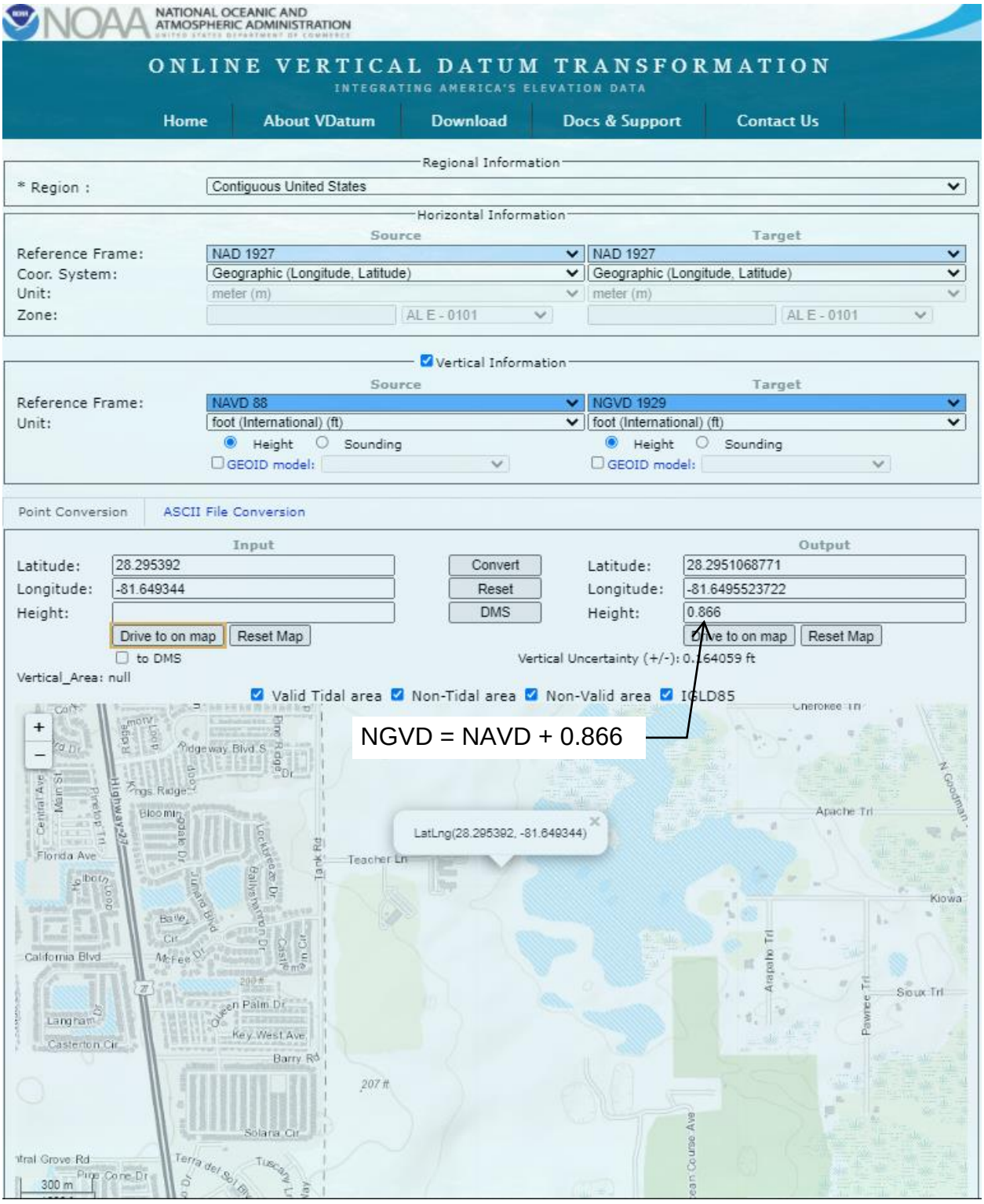
| Group | Run |
|---|---|
| BASE | Yes |

```
           Basin Name: basin 1
           Group Name: BASE
           Simulation: 10-72
            Node Name: basin 1
           Basin Type: SCS Unit Hydrograph

      Unit Hydrograph: Uh256
        Peaking Fator: 256.0
 Spec Time Inc (min): 1.33
 Comp Time Inc (min): 1.33
       Rainfall File: Sfwmd72
Rainfall Amount (in): 7.800
Storm Duration (hrs): 72.00
              Status: Onsite
  Time of Conc (min): 10.00
    Time Shift (hrs): 0.00
            Area (ac): 9.750
Vol of Unit Hyd (in): 1.000
         Curve Number: 66.400
             DCIA (%): 0.000

       Time Max (hrs): 60.02
      Flow Max (cfs): 23.301
  Runoff Volume (in): 3.888
 Runoff Volume (ft3): 137588.362
```




ROYAL CONSULTING SERVICES, INC.

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


NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
ONLINE VERTICAL DATUM TRANSFORMATION
INTEGRATING AMERICA'S ELEVATION DATA
Home
About VDatum
Download
Docs & Support
Contact Us
Regional Information
* Region :
Contiguous United States
Horizontal Information
Source
Target
Reference Frame:
NAD 1927
NAD 1927
Coor. System:
Geographic (Longitude, Latitude)
Geographic (Longitude, Latitude)
Unit:
meter (m)
meter (m)
Zone:
ALE - 0101
ALE - 0101
Vertical Information
Source
Target
Reference Frame:
NAVD 88
NGVD 1929
Unit:
foot (International) (ft)
foot (International) (ft)
Height
Sounding
Height
Sounding
GEOID model:
GEOID model:
Point Conversion
ASCII File Conversion
Input
Output
Latitude:
28.295392
Convert
Latitude:
28.2951068771
Longitude:
-81.649344
Reset
Longitude:
-81.6495523722
Height:
DMS
Height:
0.866
Drive to on map
Reset Map
Drive to on map
Reset Map
to DMS
Vertical Uncertainty (+/-): 0.164059 ft
Vertical_Area: null
Valid Tidal area
Non-Tidal area
Non-Valid area
IGLD85
NGVD = NAVD + 0.866
LatLng(28.295392, -81.649344)
Ridgeway Blvd S
Kings Ridge Loop
Florida Ave
Teacher Ln
Tank Rd
Apache Trl
Kiowa
Sioux Trl
California Blvd
Queen Palm Dr
Key West Ave
Barry Rd
Solana Cir
207 ft
300 m

# Appendix C

# Post Development Analysis

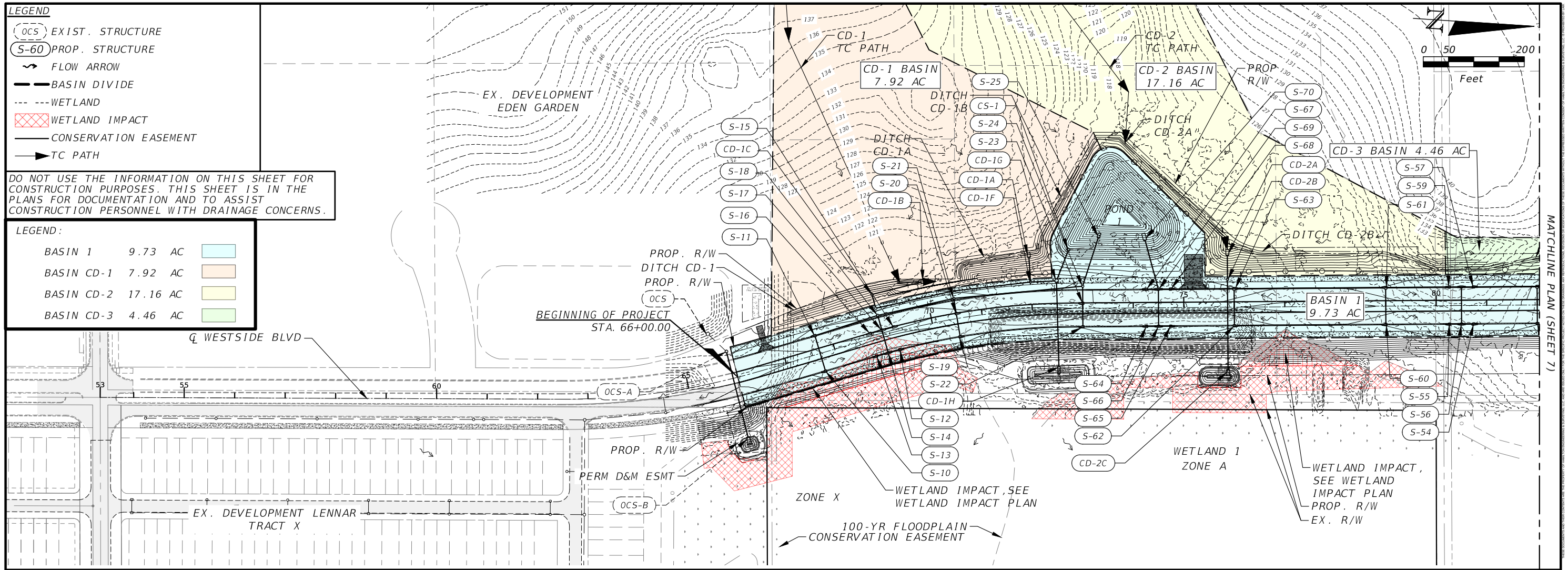
LEGEND

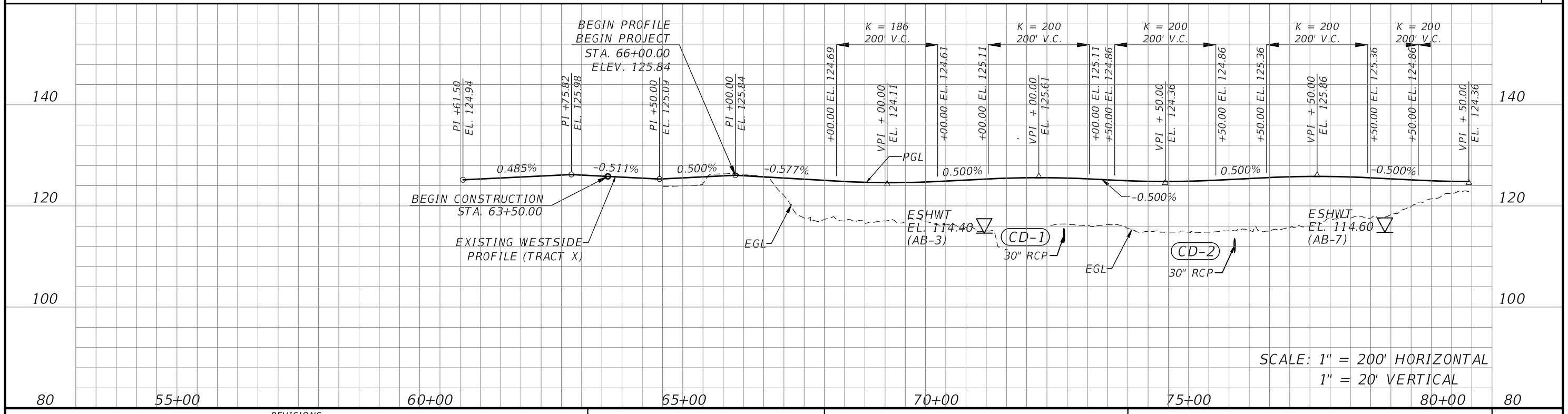
- (OCS) EXIST. STRUCTURE
- (S-60) PROP. STRUCTURE
- FLOW ARROW
- BASIN DIVIDE
- WETLAND
- WETLAND IMPACT
- CONSERVATION EASEMENT
- TC PATH

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:

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




| REVISIONS | | | |
|---|---|---|---|
| DATE | DESCRIPTION | DATE | DESCRIPTION |
| | | | |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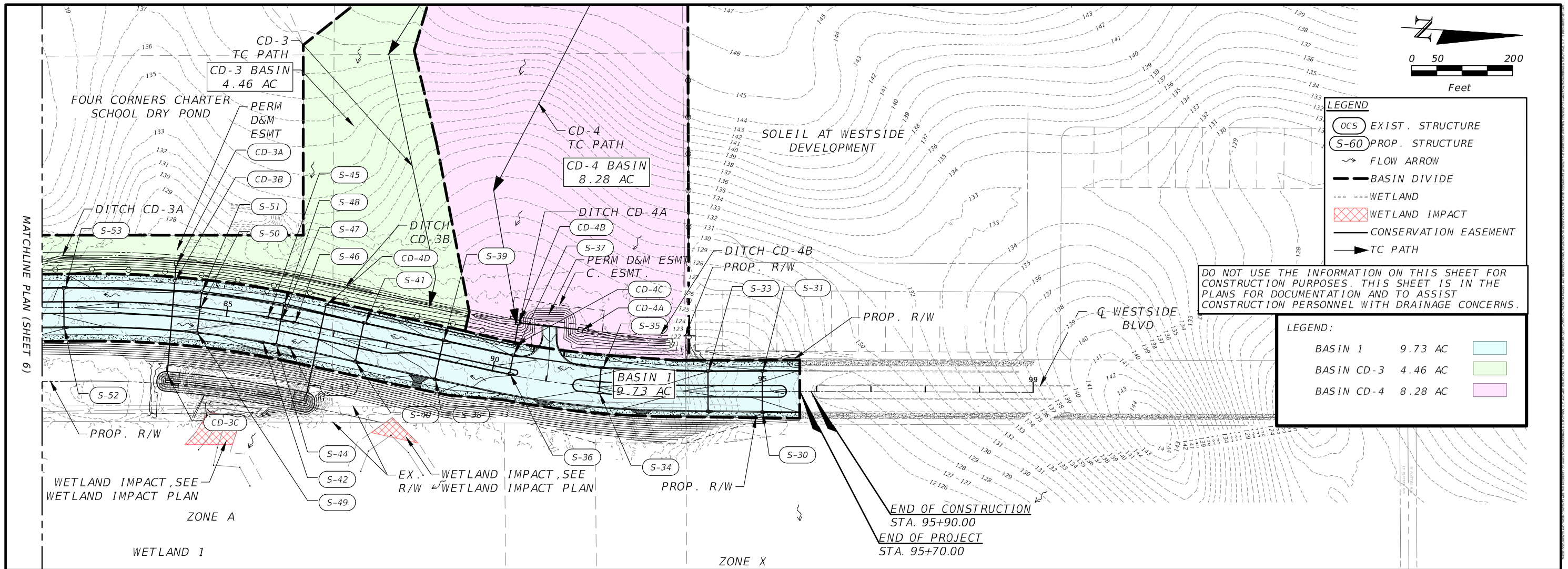
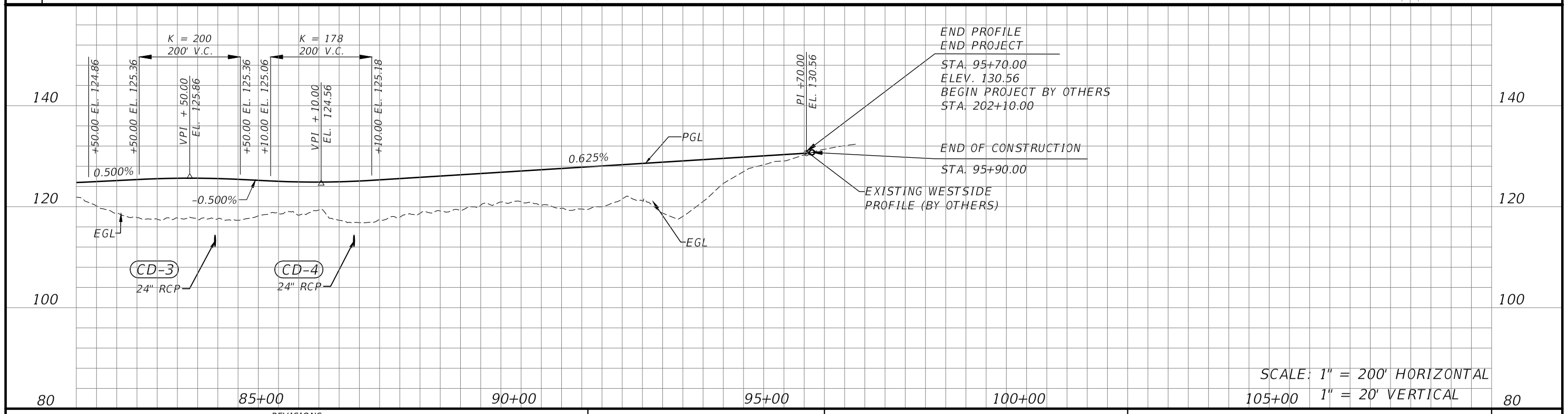
OSCEOLA COUNTY
TRANSPORTATION AND TRANSIT DEPARTMENT

# DRAINAGE MAP (1)

SHEET NO. 6




| REVISIONS | | | |
|---|---|---|---|
| DATE | DESCRIPTION | DATE | DESCRIPTION |
| | | | |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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 = | 0.56 | acres | 6% |
| 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

= 1 inch x 9.73 acres x (1ft/12in)

= **0.81** **ac-ft** for the first inch of runoff

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

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

= Total project - (Wet Detention Area + Building Area)

= 9.73 - 0.56 acres + 0 acres

= **9.17** **acres** of site area for water quality pervious/impervious

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

= (Site Area for water quality pervious/impervious) - pervious area

= 9.17 acres - 4.24 acres

= **4.93** **acres**

c. Percentage of impervious for water quality:

= (Impervious area for water quality/Site area for water quality) x 100 %

=( 4.93 / 9.17 )x 100%

= **54%**

d. For 2.5 inches times the percentage impervious:

= 2.5 inches x 0.54

= **1.34** **inches** to be treated

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

= 1.34 inches x ( 9.73 acres - 0.56 acres ) x (1ft/12in)

= **1.03** **acre-ft** required for WET detention

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

= Max. required water quality volume x 1.5

= **1.03** x 1.50

= **1.54** acre-ft required for WET detention storage

= **67110** CF required for WET detention storage

==========
==== 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): 9.710 Time Shift(hrs): 0.00
Curve Number: 81.60 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

---

Name: CD-1 Node: CD-1E 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-1E 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): 116.150
Group: BASE Warn Stage(ft): 116.150
Type: Time/Stage

| Time(hrs) | Stage(ft) |
|---|---|
| 0.00 | 116.150 |
| 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-1E              Length(ft): 160.00
        Group: BASE                  To Node: offsite1               Count: 1
                                                            Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 24.00          24.00                         Exit Loss Coef: 1.00
   Invert(ft): 111.230        110.910                       Bend Loss Coef: 0.00
  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                    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): 66.00
        Group: BASE                  To Node: CD-1E                  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): 116.950        116.820                       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 ***
                                                                          TABLE
                Count: 1                      Bottom Clip(in): 0.000
                 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 ***
                                                                          TABLE
                Count: 1                      Bottom Clip(in): 0.000
                 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 ***
                                                                          TABLE
                Count: 1                      Bottom Clip(in): 0.000
                 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\erica\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

--------------------------------------------------------------------------------------------------------------
         Name: 10YR-24HR
     Filename: C:\Users\erica\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

--------------------------------------------------------------------------------------------------------------
         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          60.00

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

         Name: 100Y-72HR          Hydrology Sim: 100YR-72HR
     Filename: C:\Users\erica\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: 10YR-24HR Hydrology Sim: 10YR-24HR
Filename: C:\Users\erica\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: 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): 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 |

| Simulation | Node | Group | Time | Stage | Warning Stage | Surface Area | Total Inflow | Total Outflow | Total Vol In | Total Vol Out | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | hrs | ft | ft | ft2 | cfs | cfs | af | 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 | 120.22 | 122.60 | 34640 | 21.87 | 1.75 | 11.5 | 1.1 | |
| 10YR-72HR | pond1 | BASE | 72.00 | 120.08 | 122.60 | 34075 | 0.00 | 0.68 | 22.4 | 2.3 | RECOVERY START |
| 10YR-72HR | pond1 | BASE | 84.00 | 119.58 | 122.60 | 32118 | 0.00 | 0.35 | 22.4 | 2.9 | |
| 10YR-72HR | pond1 | BASE | 96.00 | 119.12 | 122.60 | 30318 | 0.00 | 0.31 | 22.4 | 3.2 | |
| 10YR-72HR | pond1 | BASE | 108.00 | 118.69 | 122.60 | 28709 | 0.00 | 0.27 | 22.4 | 3.5 | |
| 10YR-72HR | pond1 | BASE | 120.00 | 118.31 | 122.60 | 27280 | 0.00 | 0.23 | 22.4 | 3.7 | |
| 10YR-72HR | pond1 | BASE | 132.00 | 117.98 | 122.60 | 26022 | 0.00 | 0.18 | 22.4 | 3.9 | |
| 10YR-72HR | pond1 | BASE | 144.00 | 117.70 | 122.60 | 24761 | 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 | 23148 | 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 | RECOVERY END |
| 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 | |

| Simulation | Node | Group | Time | Stage | Warning Stage | Surface Area | Total Inflow | Total Outflow | Total Vol In | Total Vol Out |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | hrs | ft | ft | ft2 | cfs | cfs | af | af |
| 10YR-72HR | pond1 | BASE | 386.00 | 117.27 | 122.60 | 22729 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 386.25 | 117.27 | 122.60 | 22729 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 386.50 | 117.27 | 122.60 | 22729 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 386.75 | 117.27 | 122.60 | 22729 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 387.00 | 117.27 | 122.60 | 22729 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 387.25 | 117.27 | 122.60 | 22729 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 387.50 | 117.27 | 122.60 | 22729 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 387.75 | 117.27 | 122.60 | 22729 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 388.00 | 117.27 | 122.60 | 22729 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 388.25 | 117.27 | 122.60 | 22729 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 388.50 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 388.75 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 389.00 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 389.25 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 389.50 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 389.75 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 390.00 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 390.25 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 390.50 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 390.75 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 391.00 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 391.25 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 391.50 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 391.75 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 392.00 | 117.27 | 122.60 | 22728 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 392.25 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 392.50 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 392.75 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 393.00 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 393.25 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 393.50 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 393.75 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 394.00 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 394.25 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 394.50 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 394.75 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 395.00 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 395.25 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 395.50 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 395.75 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 396.00 | 117.27 | 122.60 | 22727 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 396.25 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 396.50 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 396.75 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 397.00 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 397.25 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 397.50 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 397.75 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 398.00 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 398.25 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 398.50 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 398.75 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 399.00 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 399.25 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 399.50 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 399.75 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 400.00 | 117.27 | 122.60 | 22726 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 400.25 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 400.50 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 400.75 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 401.00 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 401.25 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 401.50 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 401.75 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 402.00 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 402.25 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 402.50 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 402.75 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 403.00 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 403.25 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 403.50 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 403.75 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 404.00 | 117.27 | 122.60 | 22725 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 404.25 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 404.50 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 404.75 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 405.00 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 405.25 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 405.50 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 405.75 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 406.00 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 406.25 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 406.50 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 406.75 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 407.00 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 407.25 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |
| 10YR-72HR | pond1 | BASE | 407.50 | 117.27 | 122.60 | 22724 | 0.00 | 0.00 | 22.4 | 4.3 |

| Simulation | Node | Group | Time | Stage | Warning Stage | Surface Area | Total Inflow | Total Outflow | Total Vol In | Total Vol Out |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | hrs | ft | ft | ft2 | cfs | cfs | af | 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 |

| 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 | 100Y-72HR | 60.65 | 122.44 | 122.60 | 0.0030 | 42638 | 60.00 | 35.89 | 61.00 |
| pond1 | BASE | 10YR-24HR | 14.09 | 120.31 | 122.60 | 0.0050 | 34984 | 12.17 | 19.83 | 14.09 |
| pond1 | BASE | 10YR-72HR | 60.78 | 120.89 | 122.60 | 0.0050 | 37253 | 60.00 | 21.87 | 60.78 |

| Name | Group | Simulation | Max Time Flow hrs | Max Flow cfs | Max Delta Q cfs | Max Time US Stage hrs | Max US Stage ft | Max Time DS Stage hrs | Max DS Stage ft |
|---|---|---|---|---|---|---|---|---|---|
| CS-1 | BASE | 10YR-72HR | 60.78 | 11.11 | 0.046 | 60.78 | 120.89 | 60.49 | 117.84 |

**Project No.:** 53509.0017

**Project Name:** Westside Boulevard Extension - Osceola County

**Calculations by:** EA

***WET POND RECOVERY ANALYSIS***

**WET DETENTION "POND 1"**

**CONTRIBUTING BASINS: BASIN 1**

Size the control structure detention discharge weir:

1. Volume to be discharged in the first 24 hours is 0.5 inch of the required detention:

= 0.5 inches x (Total Site - Lakes)

= 0.5 inches x ( 9.73 acres - 0.56 acres) x ( 1 foot /12 inches)

= **0.38** **ac-ft**

2. Design head

= Weir Crest Elevation - Control Elevation

= 120.5 feet (NGVD 29) - 118 feet (NGVD29)

= **2.50** **feet (NGVD 29)**

3. Average Discharge Rate

The average flow rate (Q) required to drawdown one-half treatment volume is as follows:

Q = TV/ (2 x t x CF)

Where:

| | | |
|---|---|---|
| Treatment Volume, TV = | 76457 | ft^3 |
| Recovery time, t = | 24 | hours |
| Converstion Factor, CF= | 3600 | sec/hour |
| **Q =** | **0.44** | **cfs** |

4. Orifice Area

Rate of Discharge, Q (cfs) = C x A x Sqrt(2 x g x h)

A = Q / C x sqrt (2 x g x h)

Where:

| | | |
|---|---|---|
| Average flow rate, Q = | 0.44 | cfs |
| Orifice coeffient (assumed) = | 0.6 | |
| Average depth, h = | 2.50 | ft |
| Grav. Constant, g (ft/sec^2) = | 32.2 | |
| **Orifice Area, A =** | **0.06** | **ft^2** |

5. Orifice Diameter (unadjusted)

D = sqrt(4 x A / pi)

| | | |
|---|---|---|
| **Orifice Diameter, D =** | 0.27 | ft^2 |
| | 3.26 | inches |
| **Use:** | **3.0** | **inches** |

(Min. required per Applicant's Handbook Vol. II. IV, 5.2 (a)) 3 inches)

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

Name: CD1 | Node: CD1 | 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): 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: | 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 | | |
|---|---|---|---|---|
| Geometry: | Circular | Circular | Friction Equation: | Automatic |
| Span(in): | 0.00 | 0.00 | Solution Algorithm: | Most Restrictive |
| Rise(in): | 0.00 | 0.00 | Flow: | Both |
| Invert(ft): | 0.000 | 0.000 | Entrance Loss Coef: | 0.000 |
| Manning's N: | 0.000000 | 0.000000 | Exit Loss Coef: | 1.000 |
| 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 |
| | | | 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:
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

==========
==== 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 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 | | |
|---|---|---|---|---|
| Geometry: | Circular | Circular | Friction Equation: | Automatic |
| Span(in): | 0.00 | 0.00 | Solution Algorithm: | Most Restrictive |
| Rise(in): | 0.00 | 0.00 | Flow: | Both |
| Invert(ft): | 0.000 | 0.000 | Entrance Loss Coef: | 0.000 |
| Manning's N: | 0.000000 | 0.000000 | Exit Loss Coef: | 1.000 |
| 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 |
| | | | 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:
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

==========
==== 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:
       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



================================================================================
==== 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 | | |
|---|---|---|---|---|
| Geometry: | Circular | Circular | Friction Equation: | Automatic |
| Span(in): | 0.00 | 0.00 | Solution Algorithm: | Most Restrictive |
| Rise(in): | 0.00 | 0.00 | Flow: | Both |
| Invert(ft): | 0.000 | 0.000 | Entrance Loss Coef: | 0.000 |
| Manning's N: | 0.000000 | 0.000000 | Exit Loss Coef: | 1.000 |
| 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 |
| | | | 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:
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

==========
==== 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 |

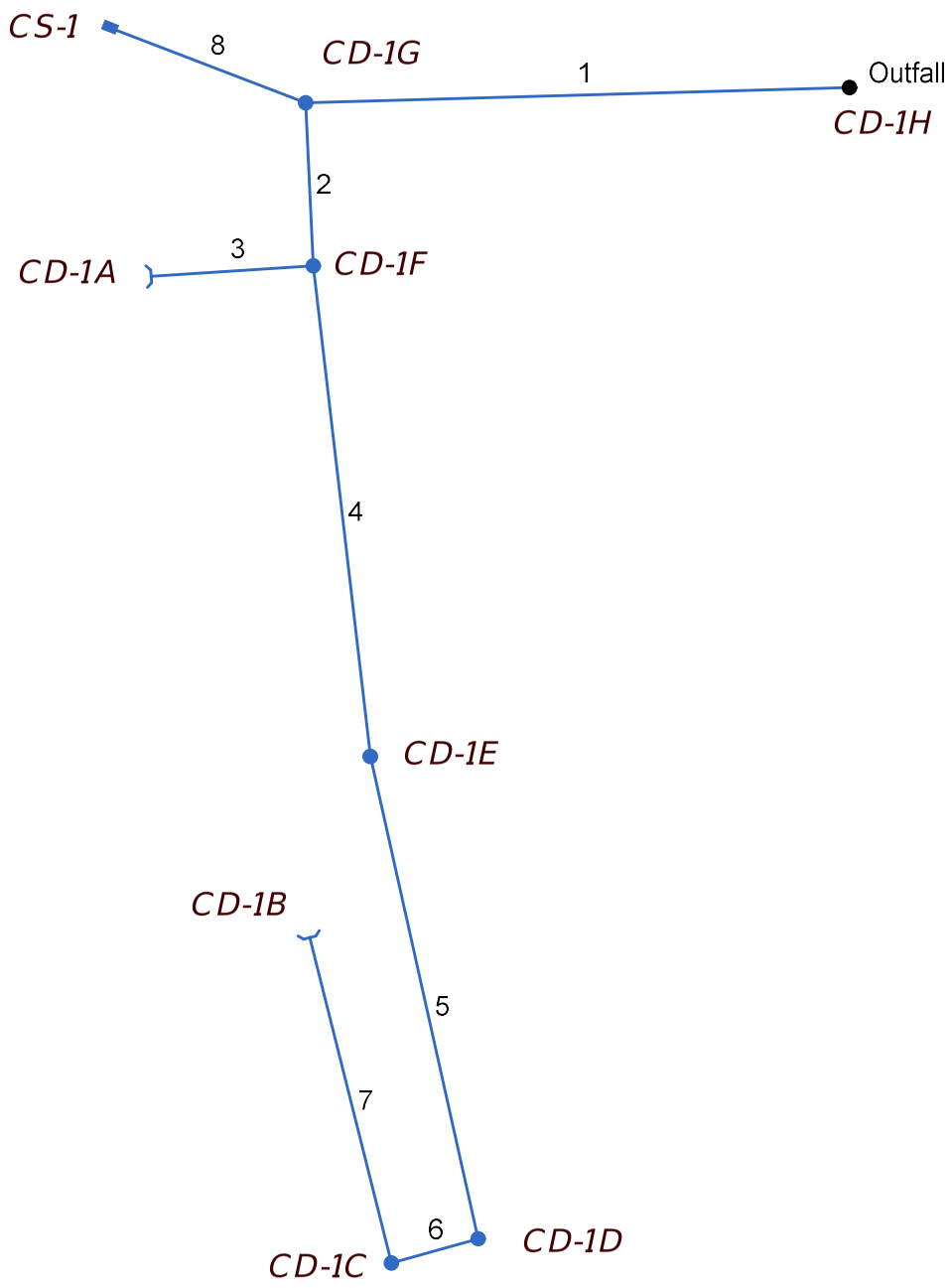
```
           Basin Name: CD4
           Group Name: BASE
           Simulation: 50-24
            Node Name: CD4
           Basin Type: SCS Unit Hydrograph

      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 | Incr. Area | Sub Total Area | C1 = C2 = C3 = | Sub Total CxA | Time of Conc. | Line Flow Time | Rnfall Inten. (I) | Total CxA | Add. Q Total Runoff | Inlet Elev. | HGL Crown Invert Up | HGL Crown Invert Dn | HGL Crown Invert Fall | Line Size | HGL Pipe Slope | Actual Design Vel | Actual Design Capac. | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (ft) | (ac) | (ac) | | | (min) | (min) | (in/hr) | | (cfs) | (ft) | (ft) | (ft) | (ft) | (in) | (%) | (ft/s) | (cfs) | |
| 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 | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |

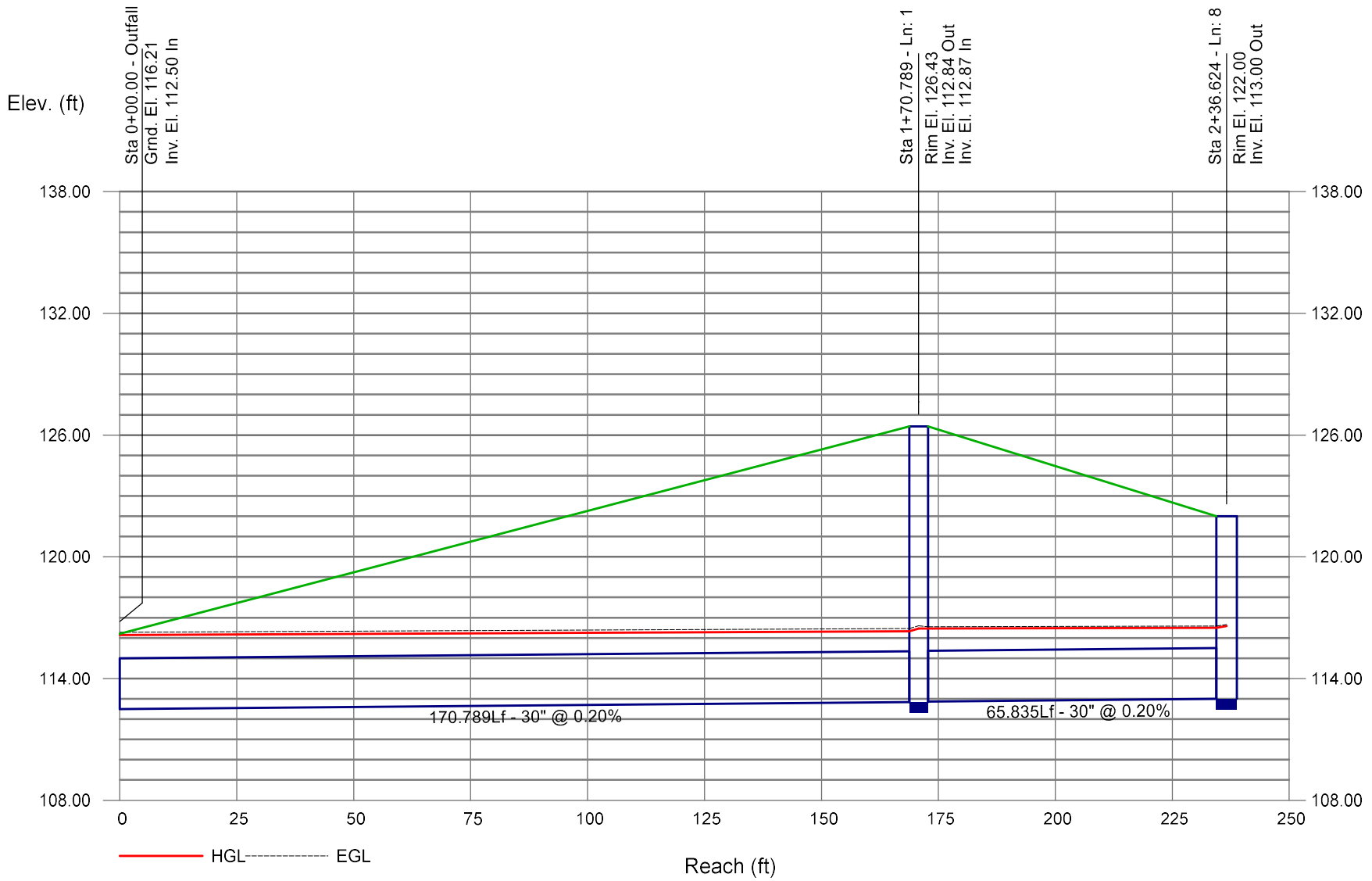
# Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan




| Project File: New.stm | Number of lines: 8 | Date: 2/28/2023 |
|---|---|---|

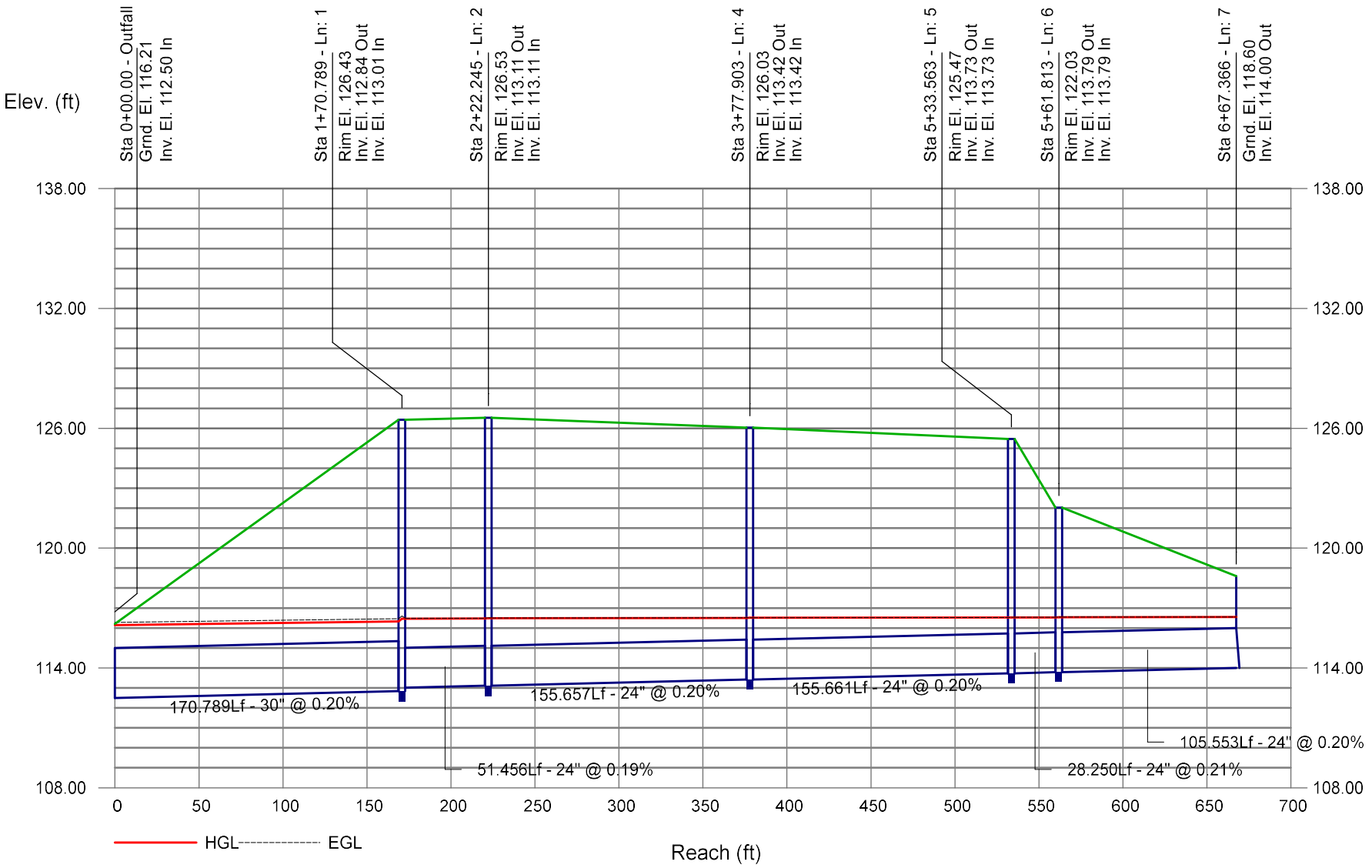
# Storm Sewer Profile

Proj. file: New.stm



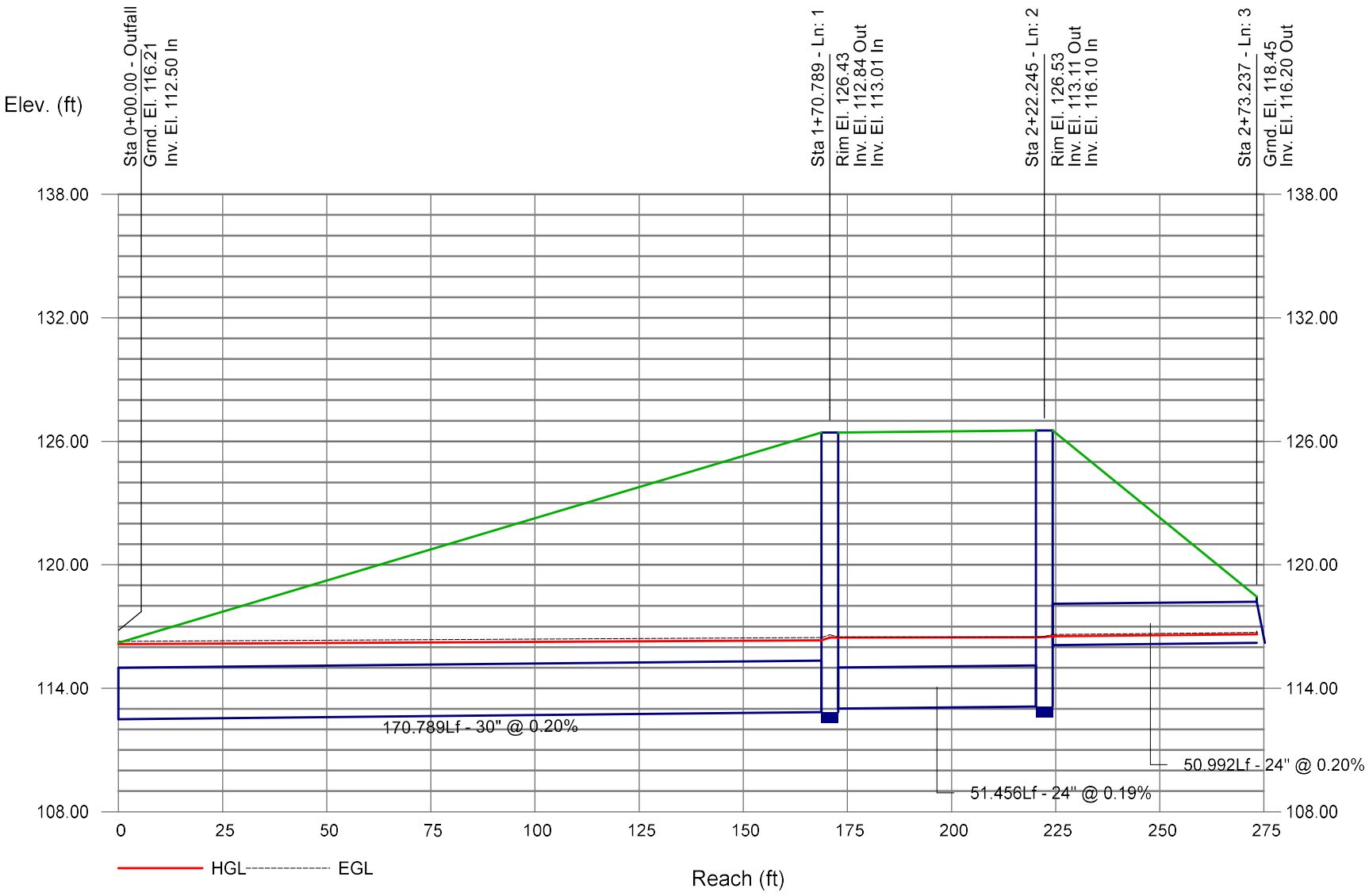
# Storm Sewer Profile

Proj. file: New.stm



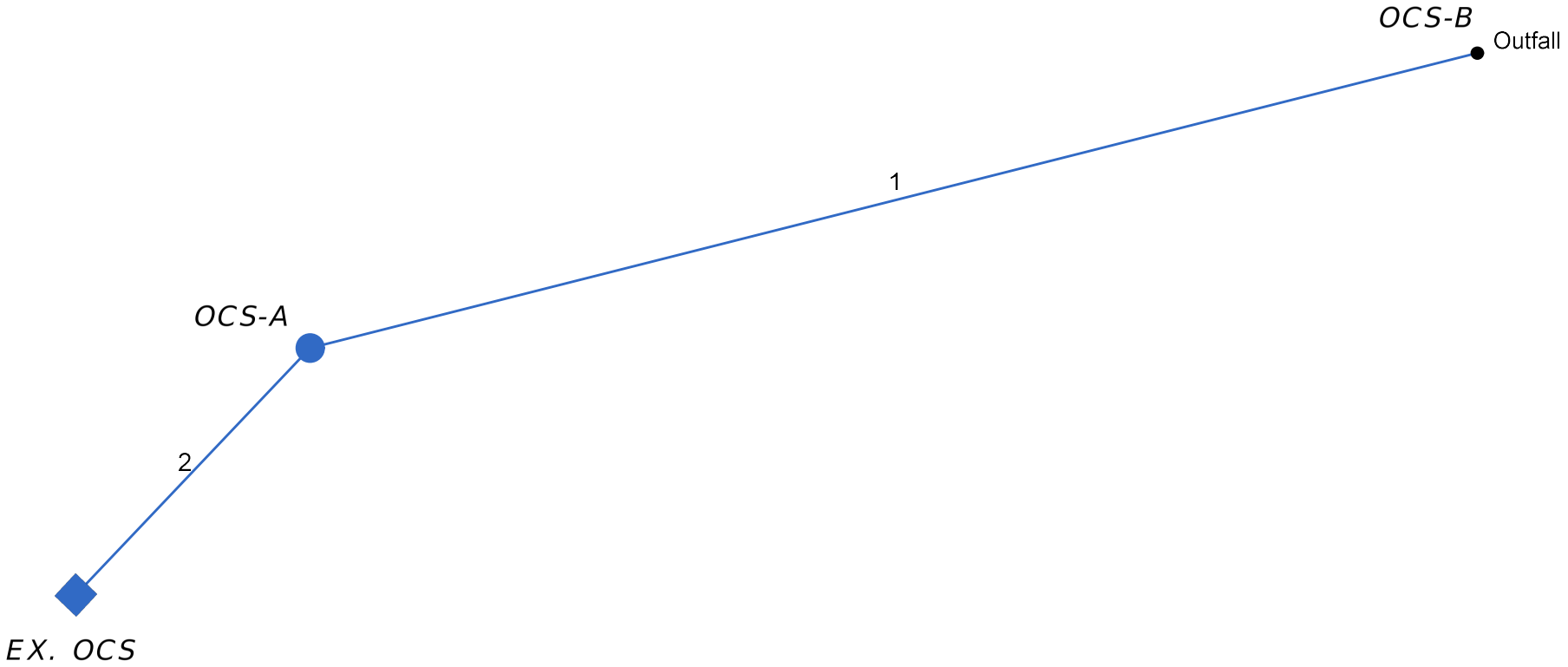
# Storm Sewer Profile

Proj. file: New.stm



| 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 | Rnfall Inten. (I) | Total CxA | Add. Q Total Runoff | Inlet Elev. | HGL Crown Invert Up | HGL Crown Invert Dn | HGL Crown Invert Fall | Line Size | HGL Pipe Slope | Actual Design Vel | Actual Design Capac. | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (ft) | (ac) | (ac) | | | (min) | (min) | (in/hr) | | (cfs) | (ft) | (ft) | (ft) | (ft) | (in) | (%) | (ft/s) | (cfs) | |
| 2 | 1 | Hdwall | 0.012 | 50.392 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | 0.58 | 0.00 | 0.00 | 7.14 | 117.79 | 116.24 | 116.20 | 0.04 | 30 | 0.07 | 2.86 | 7.14 | P-26 |
| | | | | | 0.00 | 0.00 | 0.50 | 0.00 | | | | | 7.14 | | 117.50 | 117.40 | | | 0.20 | 4.03 | 19.79 | |
| | | | | | 0.00 | 0.00 | 0.90 | 0.00 | | | | | | | 115.00 | 114.90 | 0.10 | | | | | |
| 1 | Outfall | MH | 0.012 | 181.293 | 0.00 | 0.00 | 0.20 | 0.00 | 0.58 | 2.08 | 0.00 | 0.00 | 0.00 | 125.25 | 116.20 | 116.15 | 0.05 | 30 | 0.03 | 1.45 | 7.14 | P-26 (1) |
| | | | | | 0.00 | 0.00 | 0.50 | 0.00 | | | | | 7.14 | | 113.36 | 113.00 | | | 0.20 | 4.03 | 19.80 | |
| | | | | | 0.00 | 0.00 | 0.90 | 0.00 | | | | | | | 110.86 | 110.50 | 0.36 | | | | | |

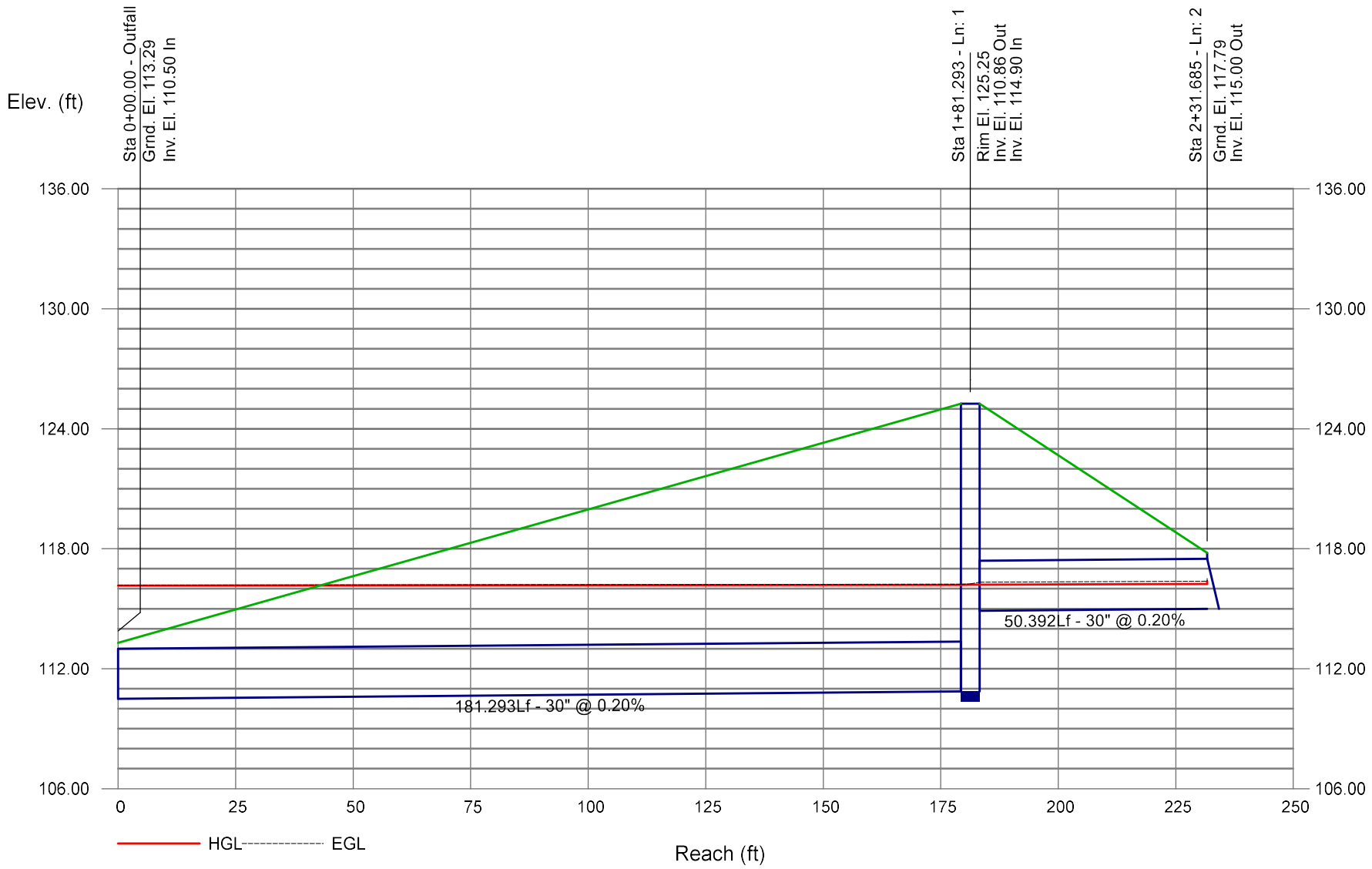
# Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan




| | | |
|---|---|---|
| Project File: STORM03.stm | Number of lines: 2 | Date: 2/28/2023 |

# Storm Sewer Profile

Proj. file: New.stm



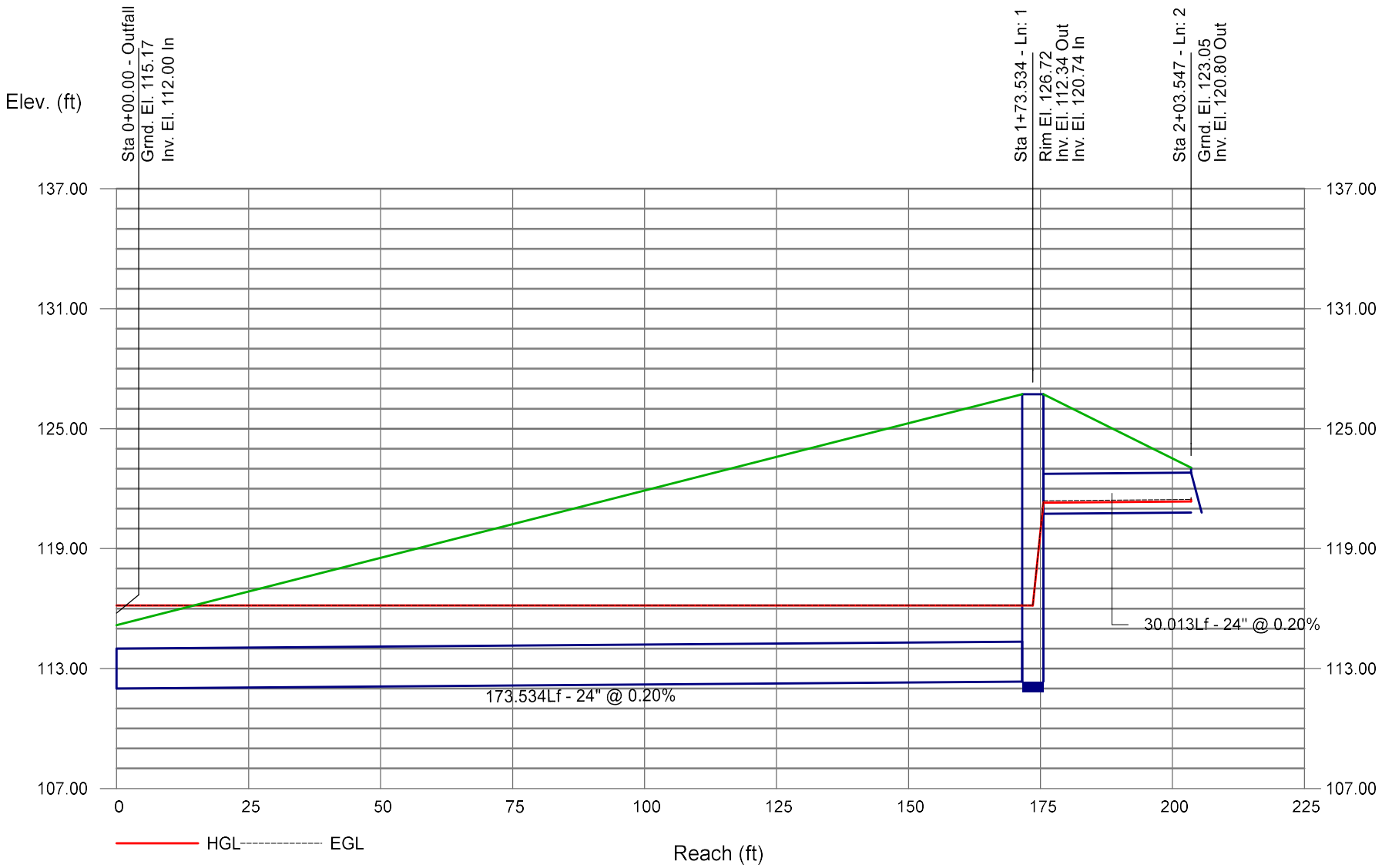
| Line | To Line | Type of Struct. | N Value | Line Len | Incr. Area | Sub Total Area | C1 = C2 = C3 = | Sub Total CxA | Time of Conc. | Line Flow Time | Rnfall Inten. (I) | Total CxA | Add. Q Total Runoff | Inlet Elev. | HGL Crown Invert Up | HGL Crown Invert Dn | HGL Crown Invert Fall | Line Size | HGL Pipe Slope | Actual Design Vel | Actual Design Capac. | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (ft) | (ac) | (ac) | | | (min) | (min) | (in/hr) | | (cfs) | (ft) | (ft) | (ft) | (ft) | (in) | (%) | (ft/s) | (cfs) | |
| 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 |
|---|---|---|

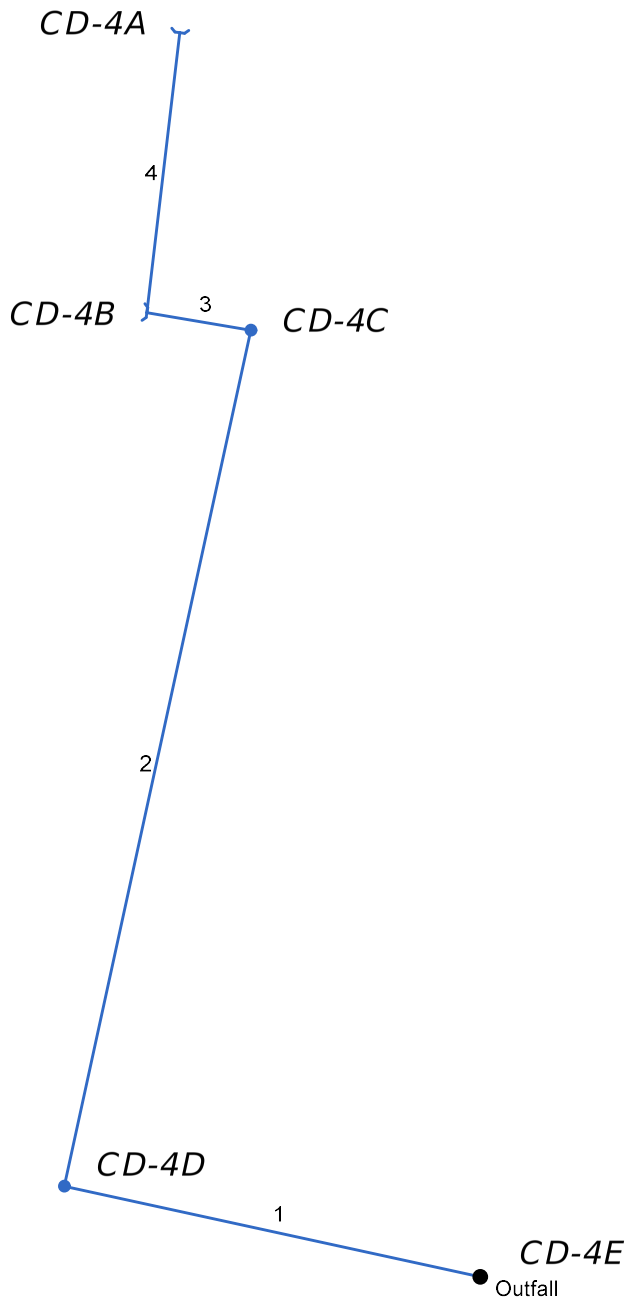
# Storm Sewer Profile

Proj. file: STORM06.stm



| 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 | Rnfall Inten. (I) | Total CxA | Add. Q Total Runoff | Inlet Elev. | HGL Crown Invert Up | HGL Crown Invert Dn | HGL Crown Invert Fall | Line Size | HGL Pipe Slope | Actual Design Vel | Actual Design Capac. | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (ft) | (ac) | (ac) | | | (min) | (min) | (in/hr) | | (cfs) | (ft) | (ft) | (ft) | (ft) | (in) | (%) | (ft/s) | (cfs) | |
| 4 | 3 | Hdwall | 0.012 | 114.209 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | 7.12 | 0.00 | 0.00 | 0.84 | 122.30 | 117.95 | 117.94 | 0.00 | 24 | 0.00 | 0.70 | 0.84 | P-28 |
| | | | | | 0.00 | 0.00 | 0.50 | 0.00 | | | | | 0.84 | | 119.23 | 119.00 | | | 0.20 | 3.50 | 11.00 | |
| | | | | | 0.00 | 0.00 | 0.90 | 0.00 | | | | | | | 117.23 | 117.00 | 0.23 | | | | | |
| 3 | 2 | Hdwall | 0.012 | 42.563 | 0.00 | 0.00 | 0.20 | 0.00 | 7.12 | 0.64 | 0.00 | 0.00 | 2.66 | 122.00 | 117.78 | 117.75 | 0.03 | 24 | 0.08 | 2.57 | 3.50 | P-29 |
| | | | | | 0.00 | 0.00 | 0.50 | 0.00 | | | | | 3.50 | | 118.91 | 118.82 | | | 0.21 | 3.59 | 11.27 | |
| | | | | | 0.00 | 0.00 | 0.90 | 0.00 | | | | | | | 116.91 | 116.82 | 0.09 | | | | | |
| 2 | 1 | MH | 0.012 | 354.788 | 0.00 | 0.00 | 0.20 | 0.00 | 7.76 | 5.31 | 0.00 | 0.00 | 0.00 | 127.40 | 117.59 | 116.87 | 0.72 | 24 | 0.20 | 3.12 | 3.50 | P-30 |
| | | | | | 0.00 | 0.00 | 0.50 | 0.00 | | | | | 3.50 | | 118.82 | 118.10 | | | 0.20 | 3.51 | 11.04 | |
| | | | | | 0.00 | 0.00 | 0.90 | 0.00 | | | | | | | 116.82 | 116.10 | 0.72 | | | | | |
| 1 | Outfall | MH | 0.012 | 171.772 | 0.00 | 0.00 | 0.20 | 0.00 | 13.06 | 2.57 | 0.00 | 0.00 | 0.00 | 125.76 | 116.19 | 116.15 | 0.04 | 24 | 0.02 | 1.11 | 3.50 | P-31 |
| | | | | | 0.00 | 0.00 | 0.50 | 0.00 | | | | | 3.50 | | 114.34 | 114.00 | | | 0.20 | 3.47 | 10.90 | |
| | | | | | 0.00 | 0.00 | 0.90 | 0.00 | | | | | | | 112.34 | 112.00 | 0.34 | | | | | |

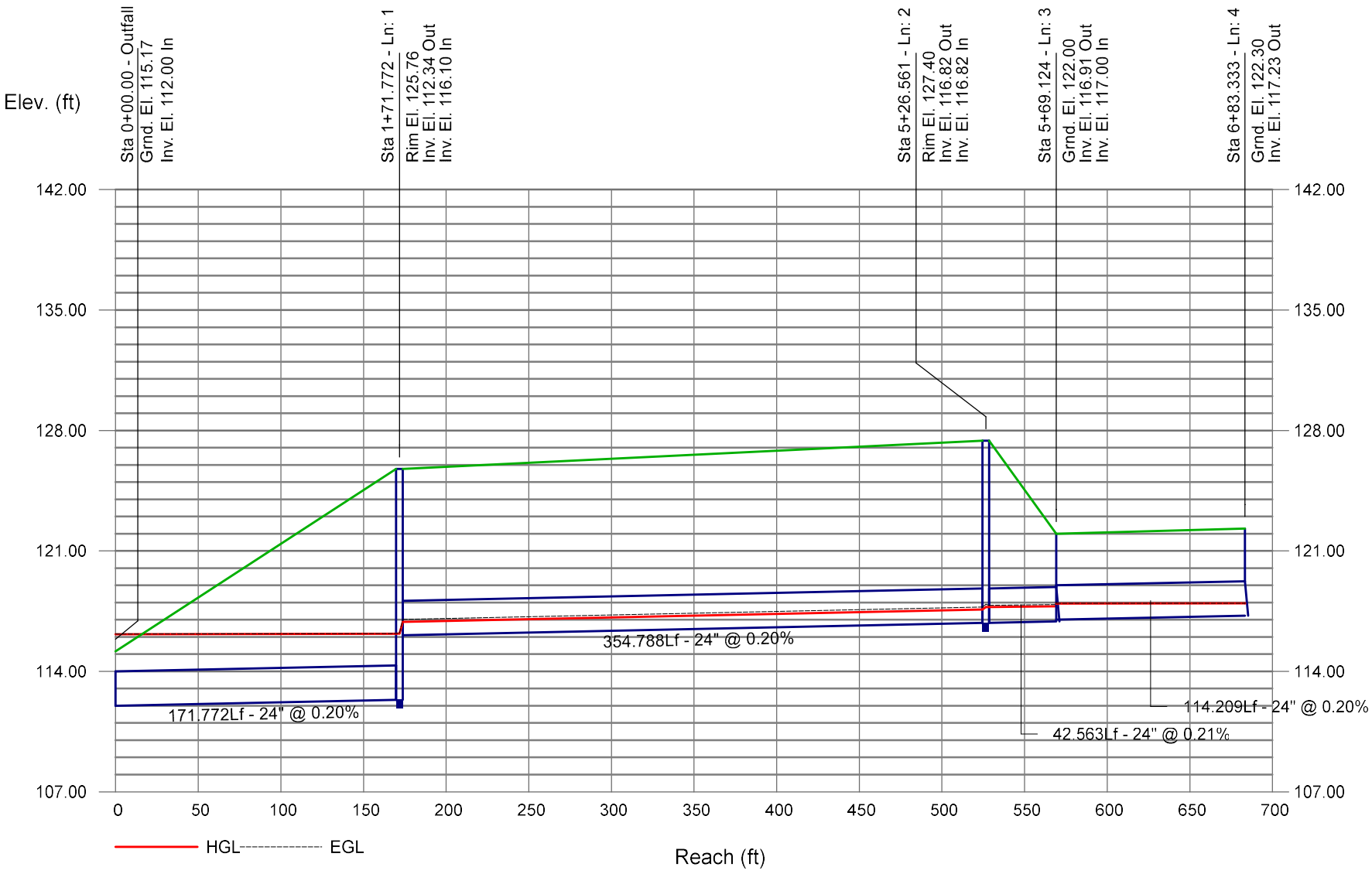
# Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan




| | | |
|---|---|---|
| Project File: STORM07.stm | Number of lines: 4 | Date: 2/28/2023 |

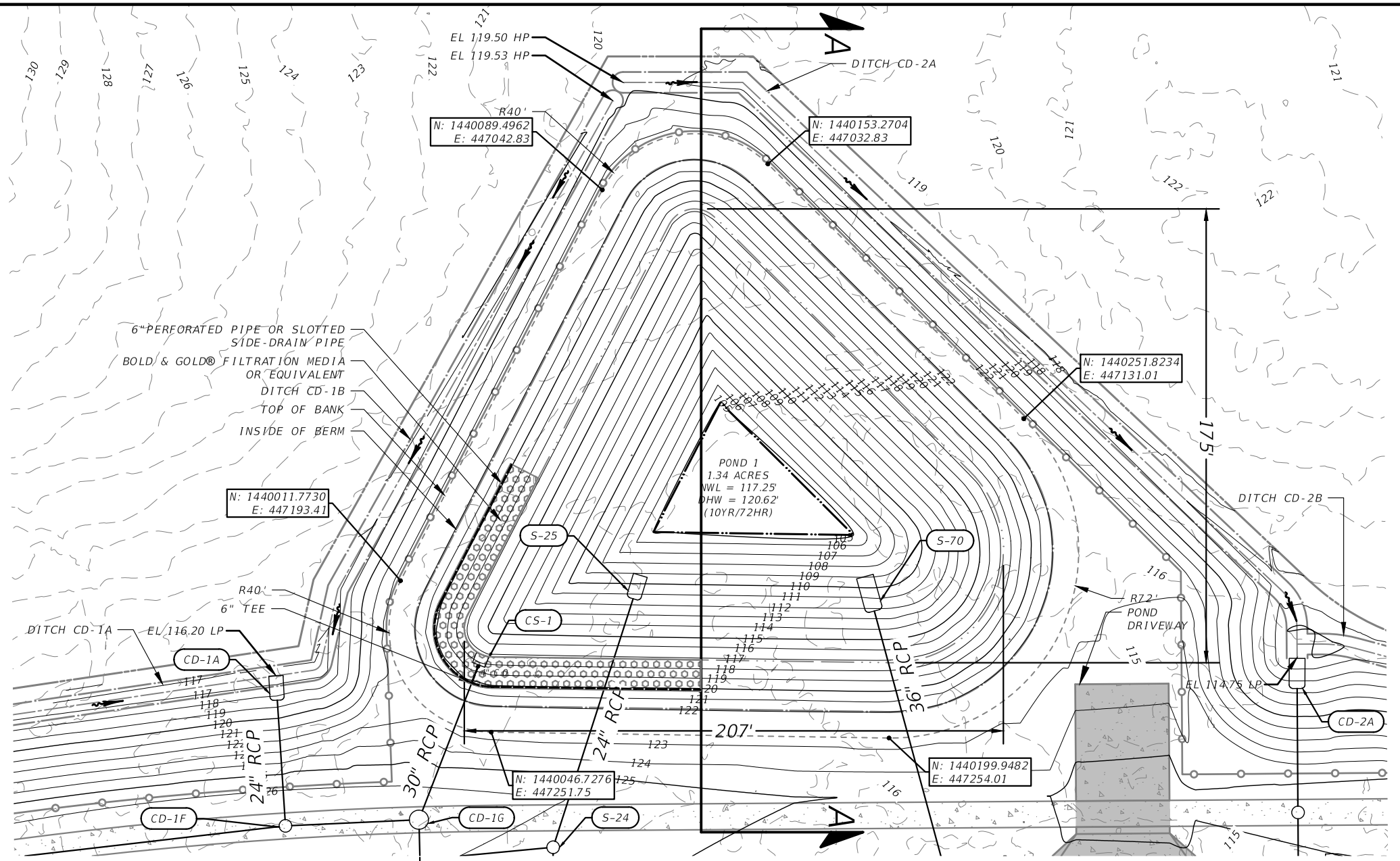
# Storm Sewer Profile

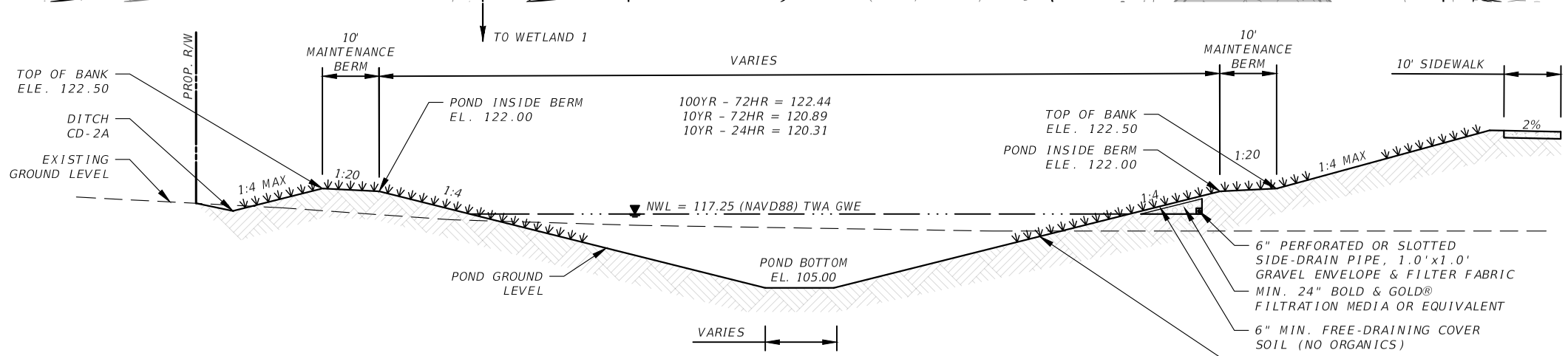
Proj. file: New.stm



# Appendix D

# Pond, Overflow Structure, and Spreader Swale Details




CROSS SECTION A-A
N.T.S.

0 10 50
Feet

| REVISIONS | | | |
|---|---|---|---|
| DATE | DESCRIPTION | DATE | DESCRIPTION |
| | | | |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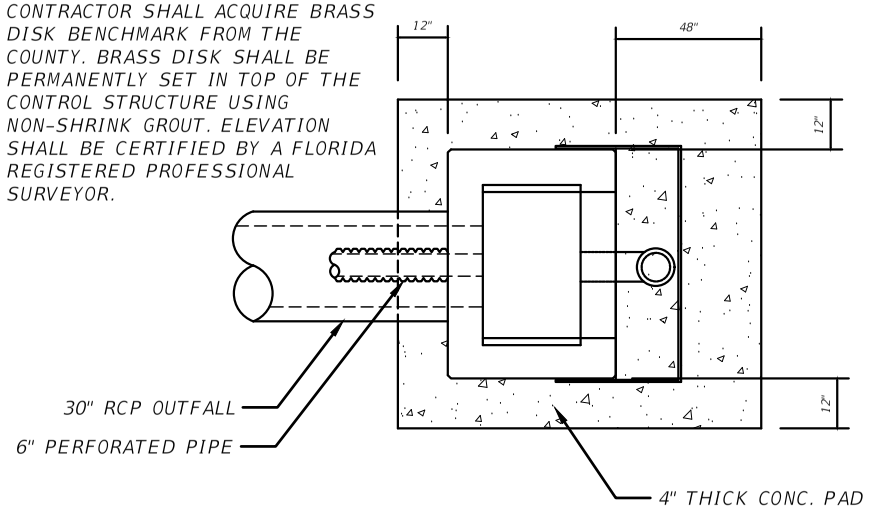
(407) 629-8330 EXT 150


OSCEOLA COUNTY
TRANSPORTATION AND TRANSIT DEPARTMENT

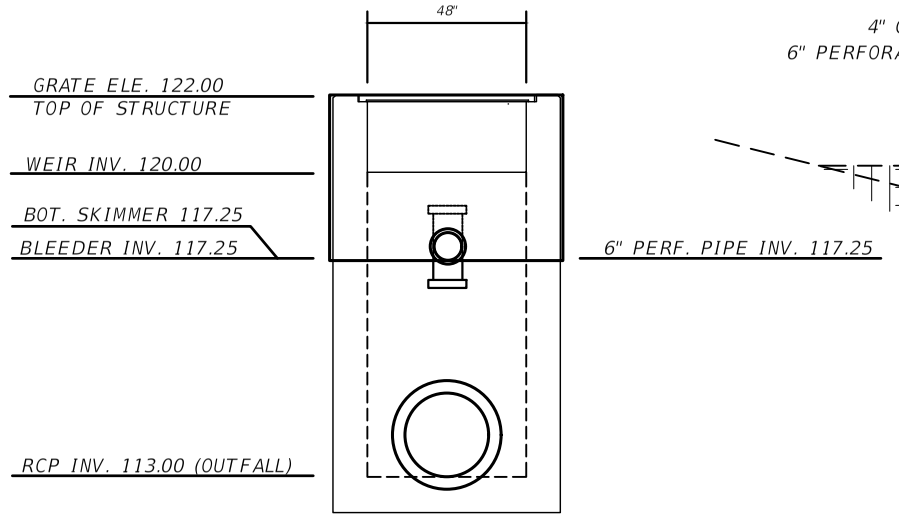
# POND DETAILS (1)

SHEET NO. 63

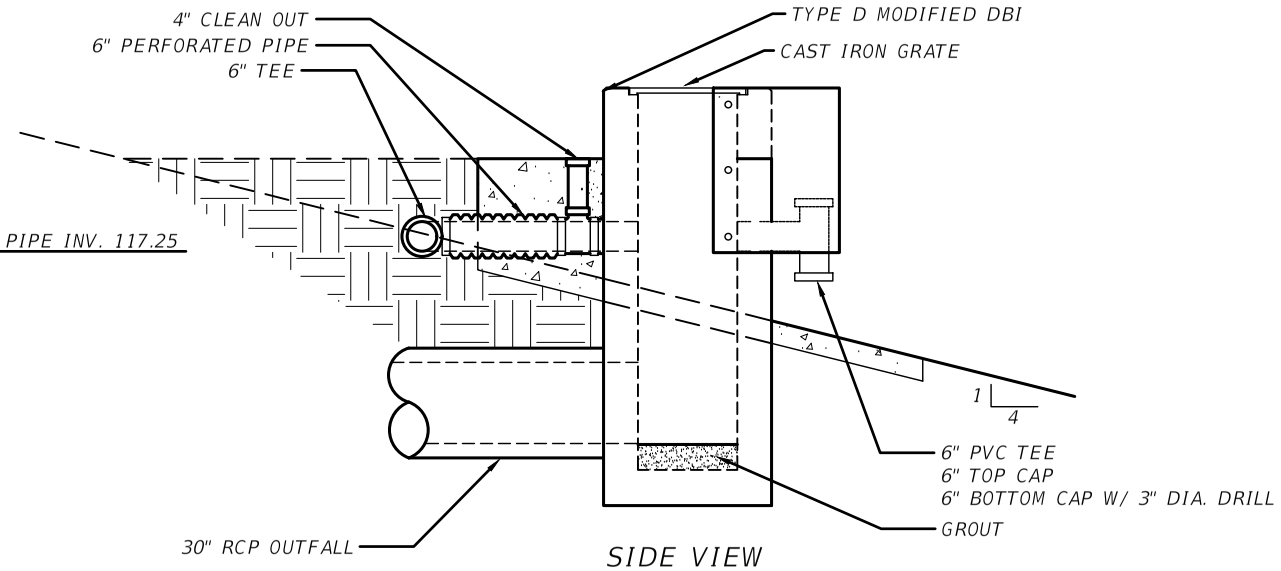
CONTRACTOR SHALL ACQUIRE BRASS DISK BENCHMARK FROM THE COUNTY. BRASS DISK SHALL BE PERMANENTLY SET IN TOP OF THE CONTROL STRUCTURE USING NON-SHRINK GROUT. ELEVATION SHALL BE CERTIFIED BY A FLORIDA REGISTERED PROFESSIONAL SURVEYOR.




PLAN VIEW
N.T.S.

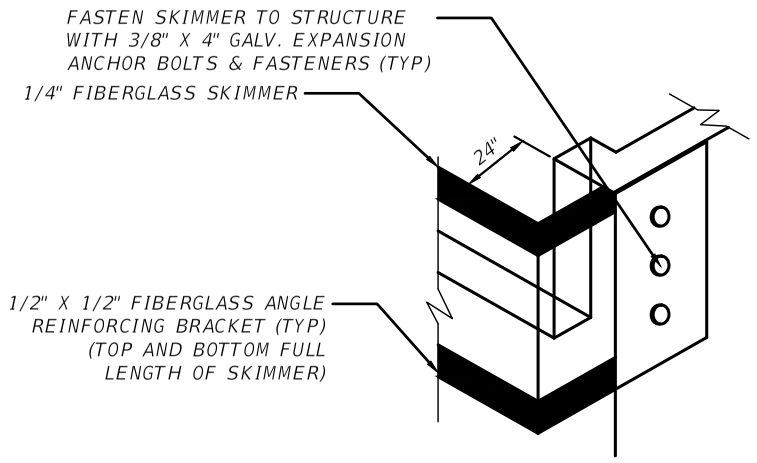



FRONT VIEW
N.T.S.




SIDE VIEW
N.T.S.

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




SKIMMER DETAIL
N.T.S.

| REVISIONS | | | |
|---|---|---|---|
| DATE | DESCRIPTION | DATE | DESCRIPTION |
| | | | |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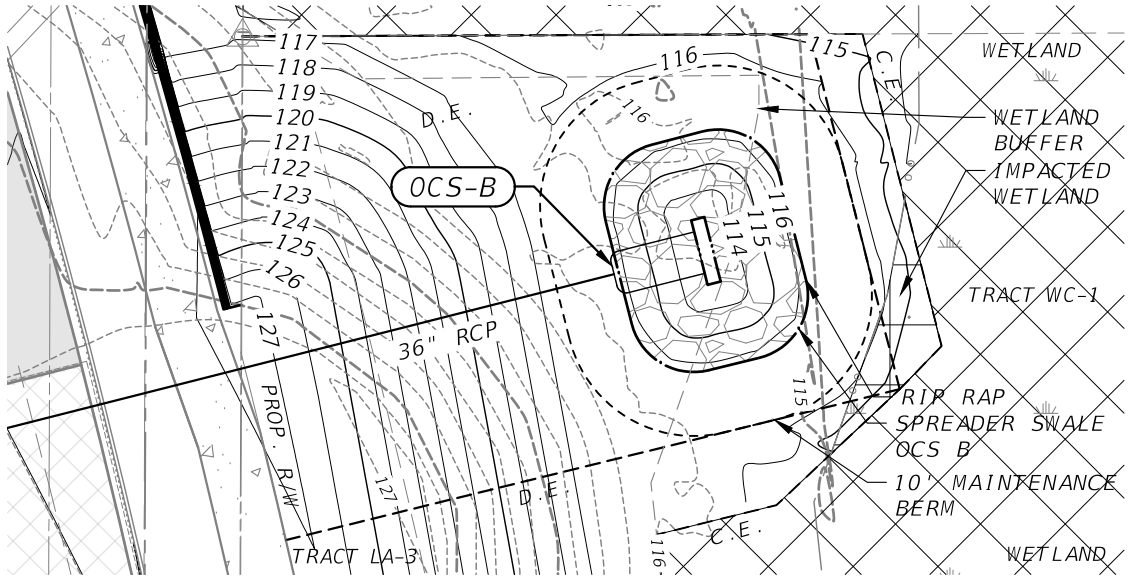
OSCEOLA COUNTY
TRANSPORTATION AND TRANSIT DEPARTMENT

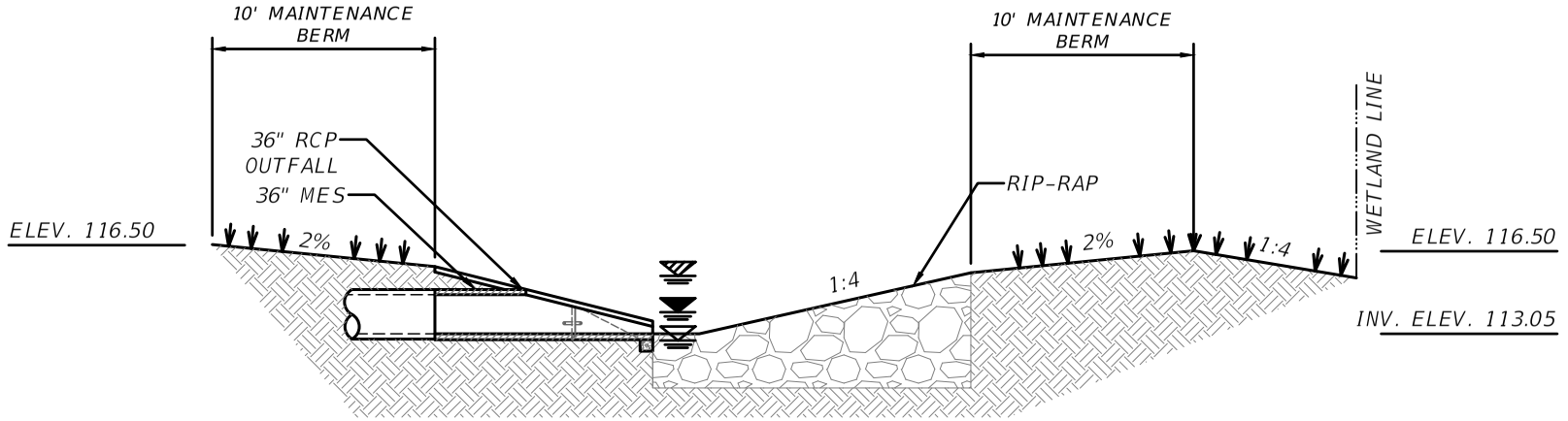
POND DETAILS (2)

SHEET NO. 64




## OCS-B SPREADER SWALE - PLAN VIEW

SCALE 1" = 30'




TWA RIBS GWT= 116.15
SHGWT = 114.4 (SPT-1)
NWL = 112.7 (SPT-1)

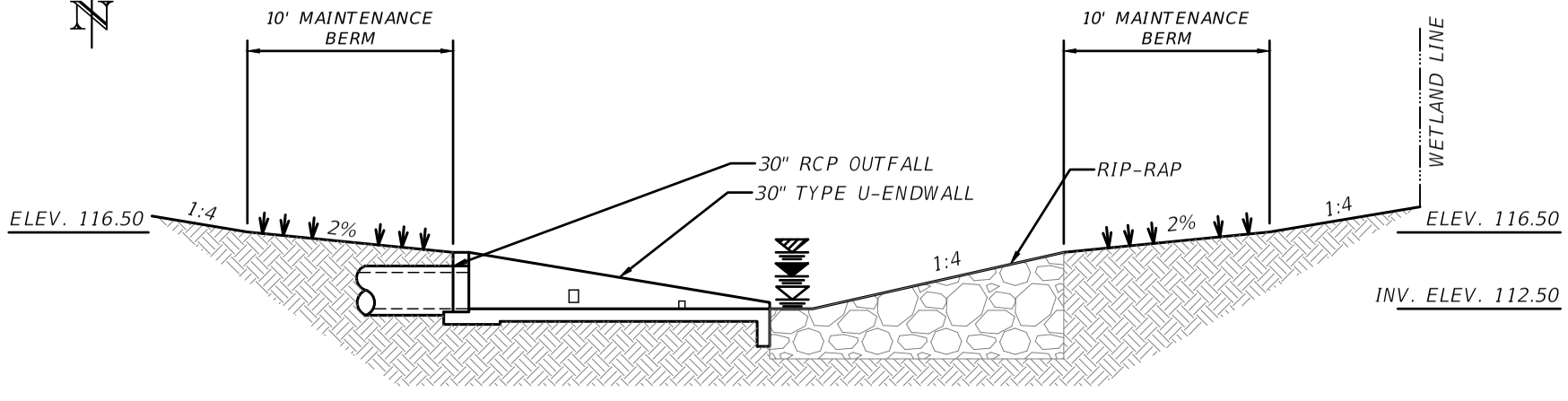
## OCS-B SPREADER SWALE - DETAIL

NTS




## CD-1H SPREADER SWALE - PLAN VIEW

SCALE 1" = 30'




## CD-1H SPREADER SWALE - DETAIL

NTS

TWA RIBS GWT= 116.15
SHGWT = AGS (SPT-4)
NWL = 113.1 (SPT-4)

| REVISIONS | | | |
|---|---|---|---|
| DATE | DESCRIPTION | DATE | DESCRIPTION |
| | | | |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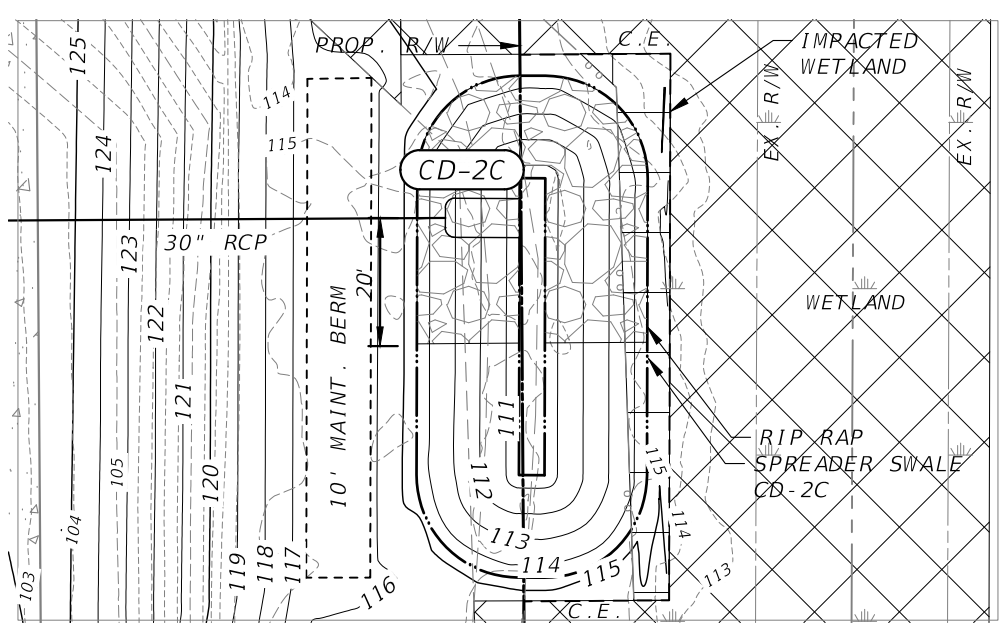
OSCEOLA COUNTY
TRANSPORTATION AND TRANSIT DEPARTMENT

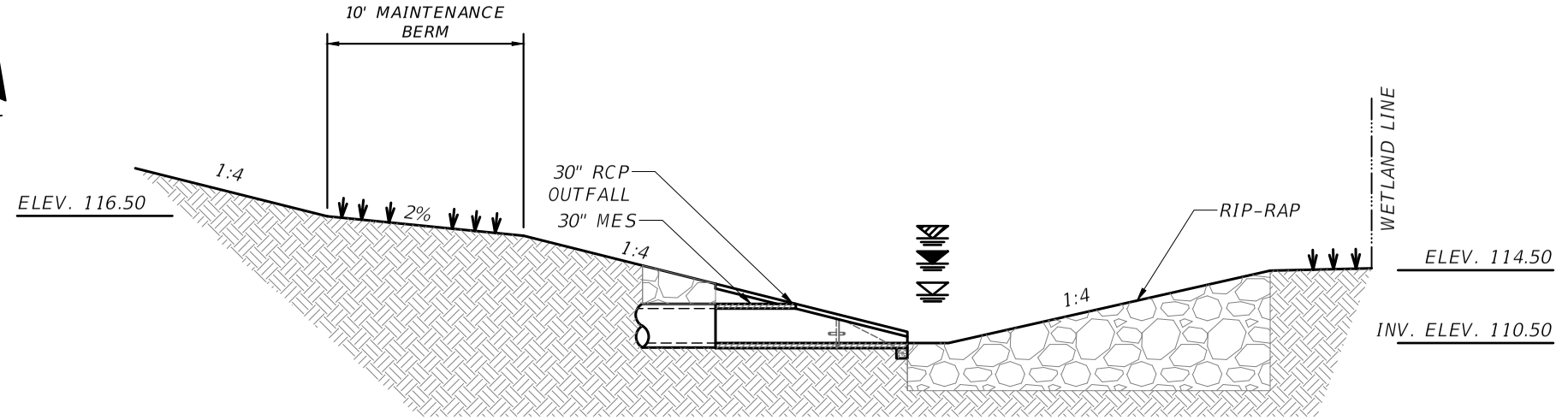
# DRAINAGE DETAILS

SHEET NO. 58



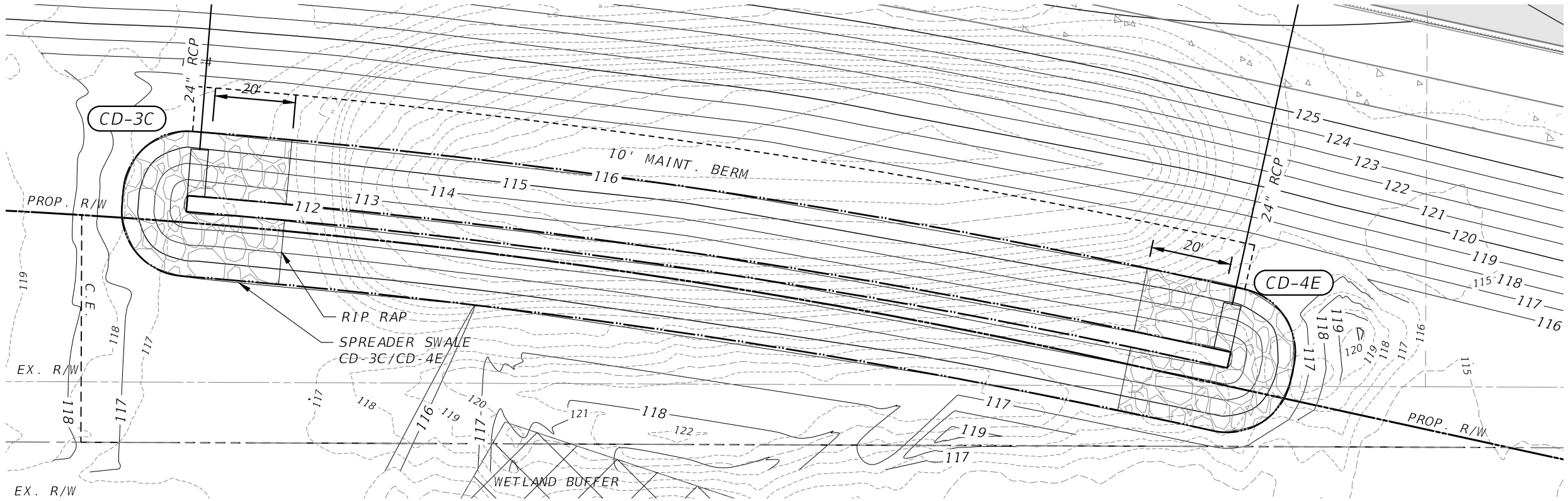

## CD-2C SPREADER SWALE - PLAN VIEW

SCALE 1" = 30'




## CD-2C SPREADER SWALE - DETAIL

NTS




## CD-3C/CD-4E SPREADER SWALE - PLAN VIEW*

SCALE 1" = 30'

*CD-3C/CD-4E SPREADER SWALE DETAILS LOCATED ON THE FOLLOWING SHEET

| REVISIONS | | | |
|---|---|---|---|
| DATE | DESCRIPTION | DATE | DESCRIPTION |
| | | | |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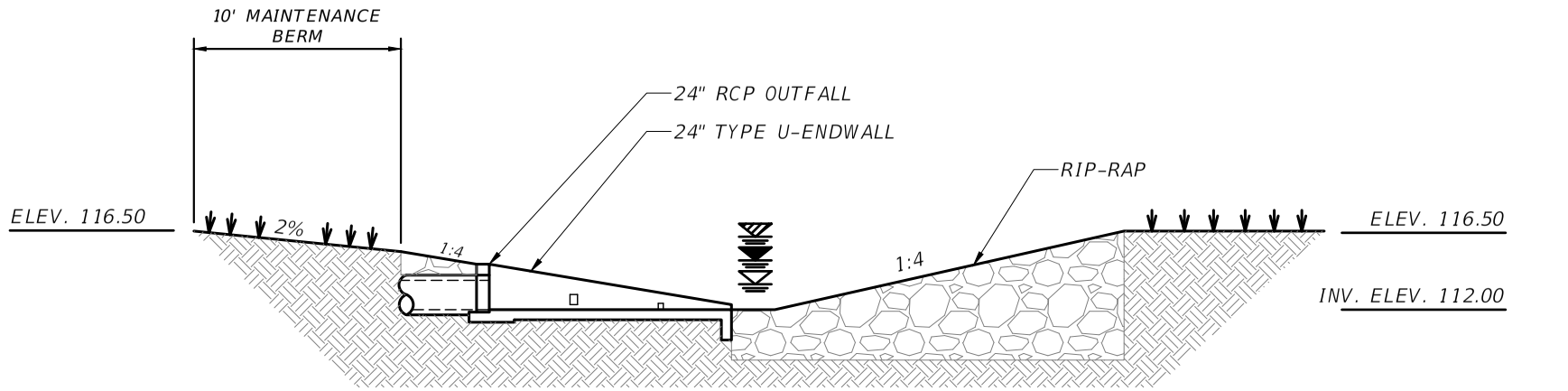
OSCEOLA COUNTY
TRANSPORTATION AND TRANSIT DEPARTMENT

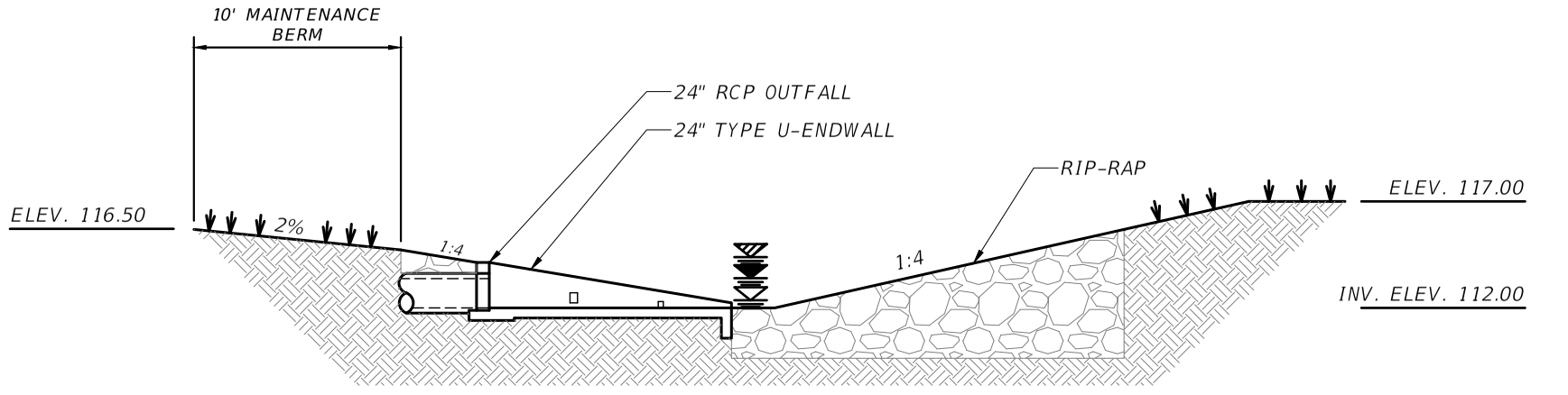
# DRAINAGE DETAILS

SHEET NO. 59




## CD-3C SPREADER SWALE - DETAIL

NTS




## CD-4E SPREADER SWALE - DETAIL

NTS

| REVISIONS | | | |
|---|---|---|---|
| DATE | DESCRIPTION | DATE | DESCRIPTION |
| | | | |

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(407) 629-8330 EXT 150

OSCEOLA COUNTY
TRANSPORTATION AND TRANSIT DEPARTMENT

# DRAINAGE DETAILS

SHEET NO. 60

# 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:

Continuity Equation 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 | = | 14.47 | cfs | (from ICPR routing data) |
| C | = | 3.2 | | (weir coefficient) |
| V | = | 2 | fps | (maximum allowed) |
| H | = | 0.1 | ft | (maximum allowed) |

| | | | |
|---|---|---|---|
| Q | = | VA | cfs |
| A | = | Q / V | sf |

| | | | |
|---|---|---|---|
| A | = | 7.235 | sf |
| A | = | LH | sf (area = length x height) |

| | | | | |
|---|---|---|---|---|
| L | = | A / H | ft | |
| L | = | 72 | ft @ 2 fps | minimum required |

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

Actual discharge over spreader swale:

| | | | |
|---|---|---|---|
| H | = | A/L | ft |
| A | = | 0.08 | sf |

| | | | |
|---|---|---|---|
| Q | = | VA | cfs |
| **Q** | **=** | **0.161** | **cfs** |

**Spreader Swale Calculations**

Job Number:
Project Name: Westside Boulevard Extension
CD-2

Spreader Calculations are based on the following Equation:

Continuity Equation 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 | cfs | (from ICPR routing data) |
| C | = | 3.2 | | (weir coefficient) |
| V | = | 6 | fps | (maximum allowed) |
| H | = | 0.1 | ft | (maximum allowed) |

| | | | |
|---|---|---|---|
| Q | = | VA | cfs |
| A | = | Q / V | sf |

| | | | |
|---|---|---|---|
| A | = | 1.19 | sf |
| A | = | LH | sf (area = length x height) |

| | | | |
|---|---|---|---|
| L | = | A / H | ft |
| L | = | 12 | ft @ 2 fps minimum required |

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

Actual discharge over spreader swale:

| | | | |
|---|---|---|---|
| H | = | A/L | ft |
| A | = | 0.026 | sf |

| | | | |
|---|---|---|---|
| Q | = | VA | cfs |
| **Q** | **=** | **0.159** | **cfs** |

**Spreader Swale Calculations**

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

Spreader Calculations are based on the following Equation:

Continuity Equation 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 | cfs | (from ICPR routing data) |
| C | = | 3.2 | | (weir coefficient) |
| V | = | 6 | fps | (maximum allowed) |
| H | = | 0.1 | ft | (maximum allowed) |

| | | | |
|---|---|---|---|
| Q | = | VA | cfs |
| A | = | Q / V | sf |

| | | | |
|---|---|---|---|
| A | = | 0.892 | sf |
| A | = | LH | sf (area = length x height) |

| | | | | |
|---|---|---|---|---|
| L | = | A / H | ft | |
| L | = | 9 | ft @ 2 fps | minimum required |

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

Actual discharge over spreader swale:

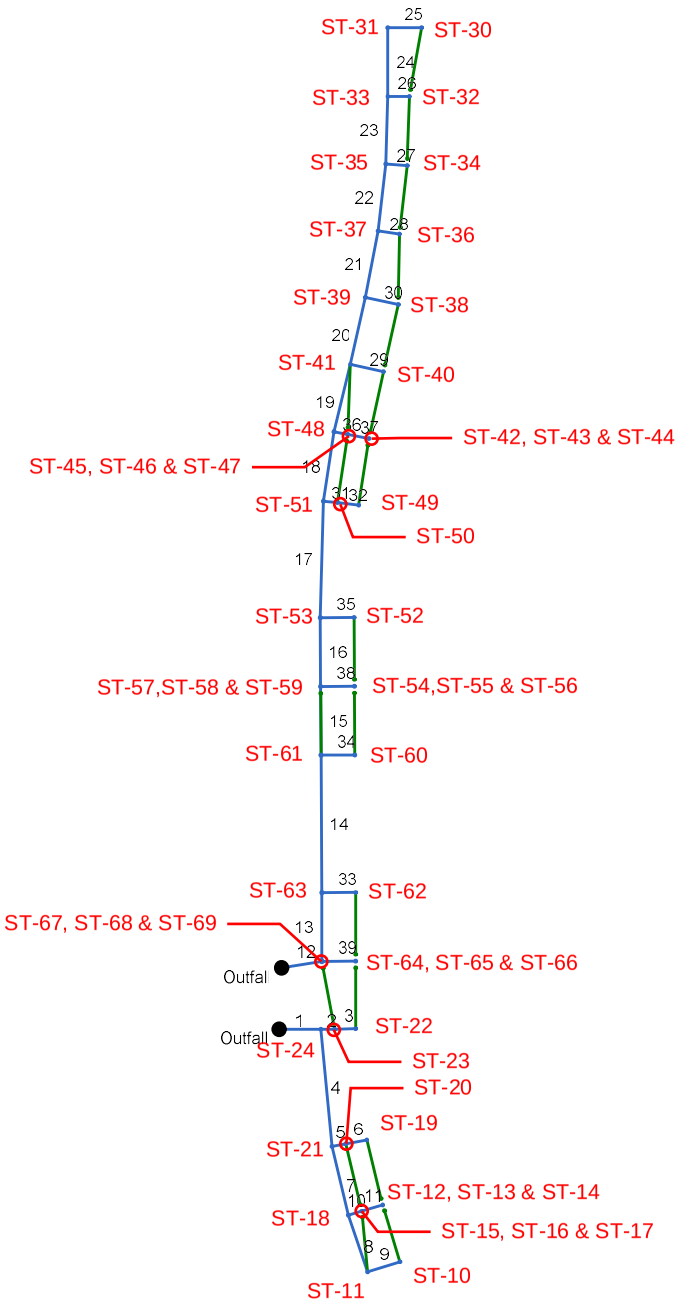
| | | | |
|---|---|---|---|
| H | = | A/L | ft |
| A | = | 0.031 | sf |

| | | | |
|---|---|---|---|
| Q | = | VA | cfs |
| **Q** | **=** | **0.184** | **cfs** |

# Appendix F

# Hydraflow Input, Results & Profiles

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




| Project File: STORM0102.stm | Number of lines: 39 | Date: 6/2/2022 |
|---|---|---|

| 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 | Rnfall Inten. (I) | Total CxA | Add. Q Total Runoff | Inlet Elev. | HGL Crown Invert | HGL Crown Invert | HGL Crown Invert | Line Size | HGL Pipe | Actual Design | Actual Design | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (ft) | (ac) | (ac) | | | (min) | (min) | (in/ hr) | | (cfs) | (ft) | (ft) | (ft) | (ft) | (in) | (%) | (ft/ s) | (cfs) | |
| 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 | Rnfall Inten. (I) | Total CxA | Add. Q Total Runoff | Inlet Elev. | HGL Crown Invert | HGL Crown Invert | HGL Crown Invert | Line Size | HGL Pipe | 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 | | | | | |

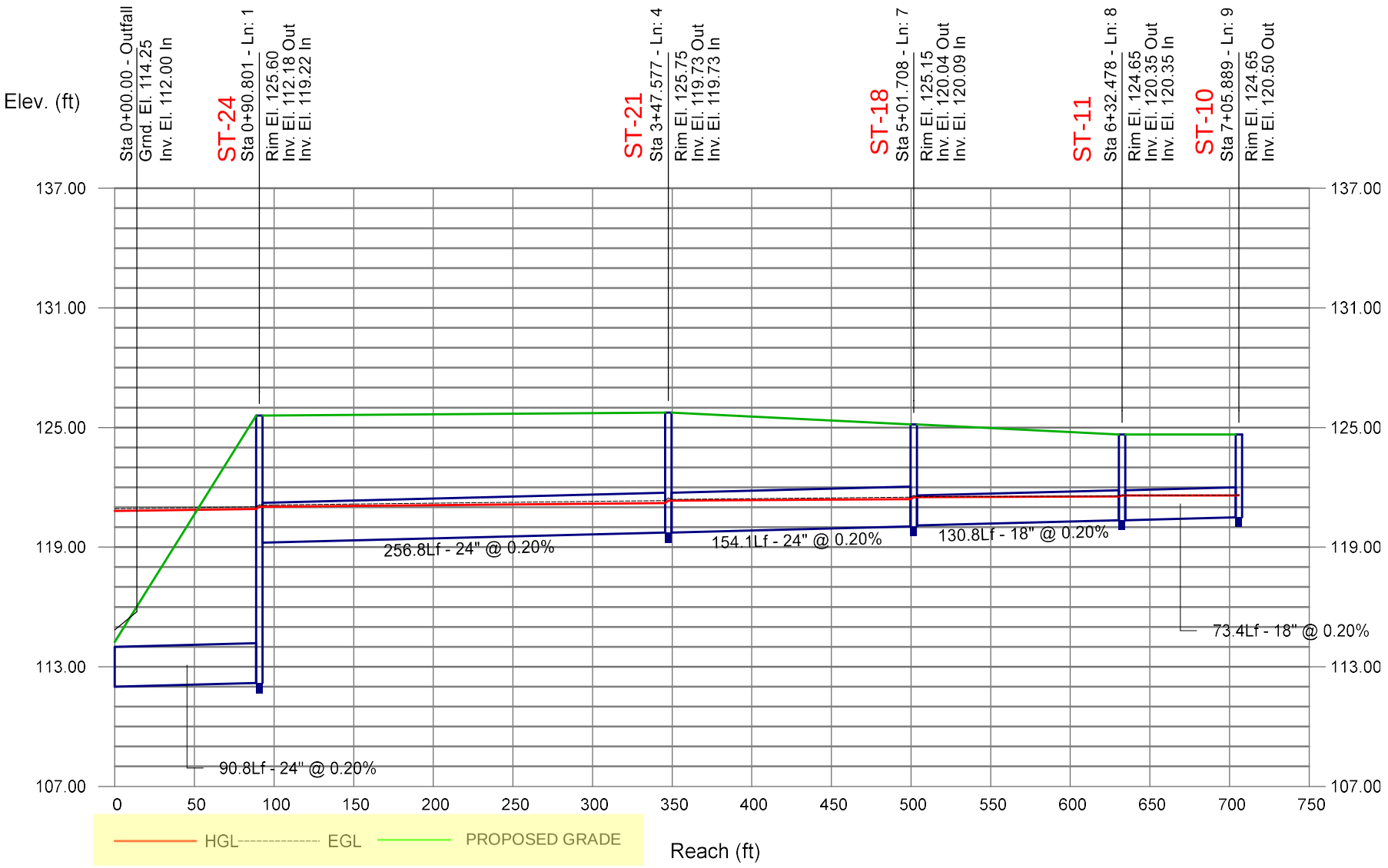
| Line | To Line | Type of Struct. | N Value | Line Len | Incr. Area | Sub Total Area | C1 = C2 = C3 = | Sub Total CxA | Time of Conc. | Line Flow Time | Rnfall Inten. (I) | Total CxA | Add. Q Total Runoff | Inlet Elev. | HGL Crown Invert | HGL Crown Invert | HGL Crown Invert | Line Size | HGL Pipe | Actual Design | Actual Design | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (ft) | (ac) | (ac) | | | (min) | (min) | (in/ hr) | | (cfs) | (ft) | (ft) | (ft) | (ft) | (in) | (%) | (ft/ s) | (cfs) | |
| 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 | )utfa | 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 | | | 0.21 | 0.00 | 0.00 | |

| 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 | Rnfall Inten. (I) | Total CxA | Add. Q Total Runoff | Inlet Elev. | HGL Crown Invert | HGL Crown Invert | HGL Crown Invert | Line Size | HGL Pipe | Actual Design | Actual Design | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (ft) | (ac) | (ac) | | | (min) | (min) | (in/ hr) | | (cfs) | (ft) | (ft) | (ft) | (ft) | (in) | (%) | (ft/ s) | (cfs) | |
| | | | | | 0.00 | 0.00 | 0.90 | 0.00 | | | | | | | 120.20 | 120.10 | 0.10 | | | | | |
| 10 | 7 | 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 | 13-14 |
| | | | | | 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 | 8 | 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 | 10-11 |
| | | | | | 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 | 7 | 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 | 11-14 |
| | | | | | 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 | 4 | 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 | 14-17 |
| | | | | | 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 | 5 | 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 | 15-16 |
| | | | | | 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 | 4 | 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 | 16-17 |
| | | | | | 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 | 1 | 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 | 17-20 |
| | | | | | 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 | 2 | 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 | 18-19 |
| | | | | | 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 | 1 | 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 | 19-20 |
| | | | | | 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 | )utfa | 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 | 20-21 |
| | | | | | 0.00 | 0.00 | 0.50 | 0.00 | | | | | 8.05 | | 114.18 | 114.00 | | | 0.20 | 3.47 | 10.91 | |

| 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 | Rnfall Inten. (I) | Total CxA | Add. Q Total Runoff | Inlet Elev. | HGL Crown Invert | HGL Crown Invert | HGL Crown Invert | Line Size | HGL Pipe | Actual Design | Actual Design | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (ft) | (ac) | (ac) | | | (min) | (min) | (in/ hr) | | (cfs) | (ft) | (ft) | (ft) | (ft) | (in) | (%) | (ft/ s) | (cfs) | |
| | | | | | 0.00 | 0.00 | 0.90 | 0.00 | | | | | | | 112.18 | 112.00 | 0.18 | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |

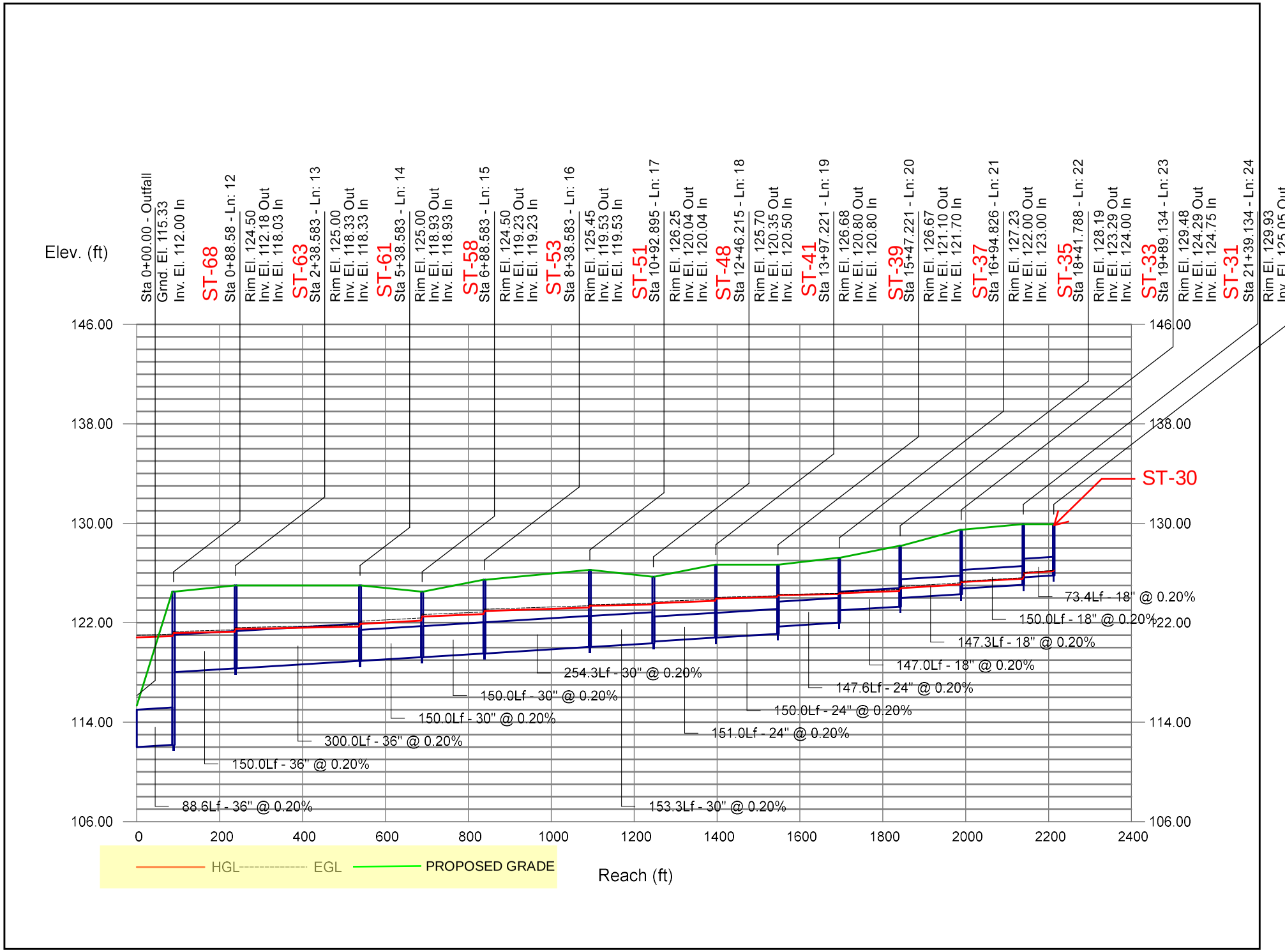
# Storm Sewer Profile

Proj. file: STORM0102.stm



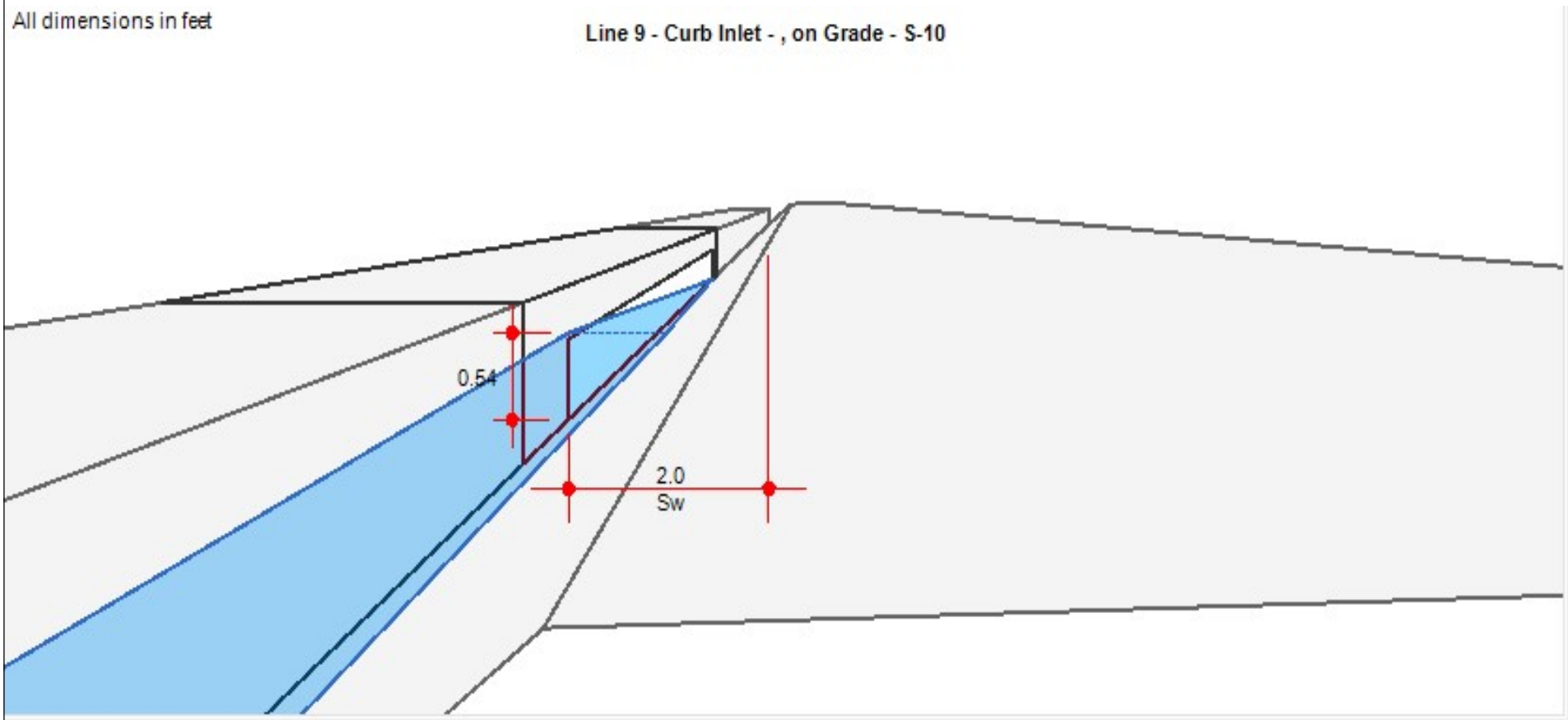
# Storm Sewer Profile

Proj. file: STORM0102.stm

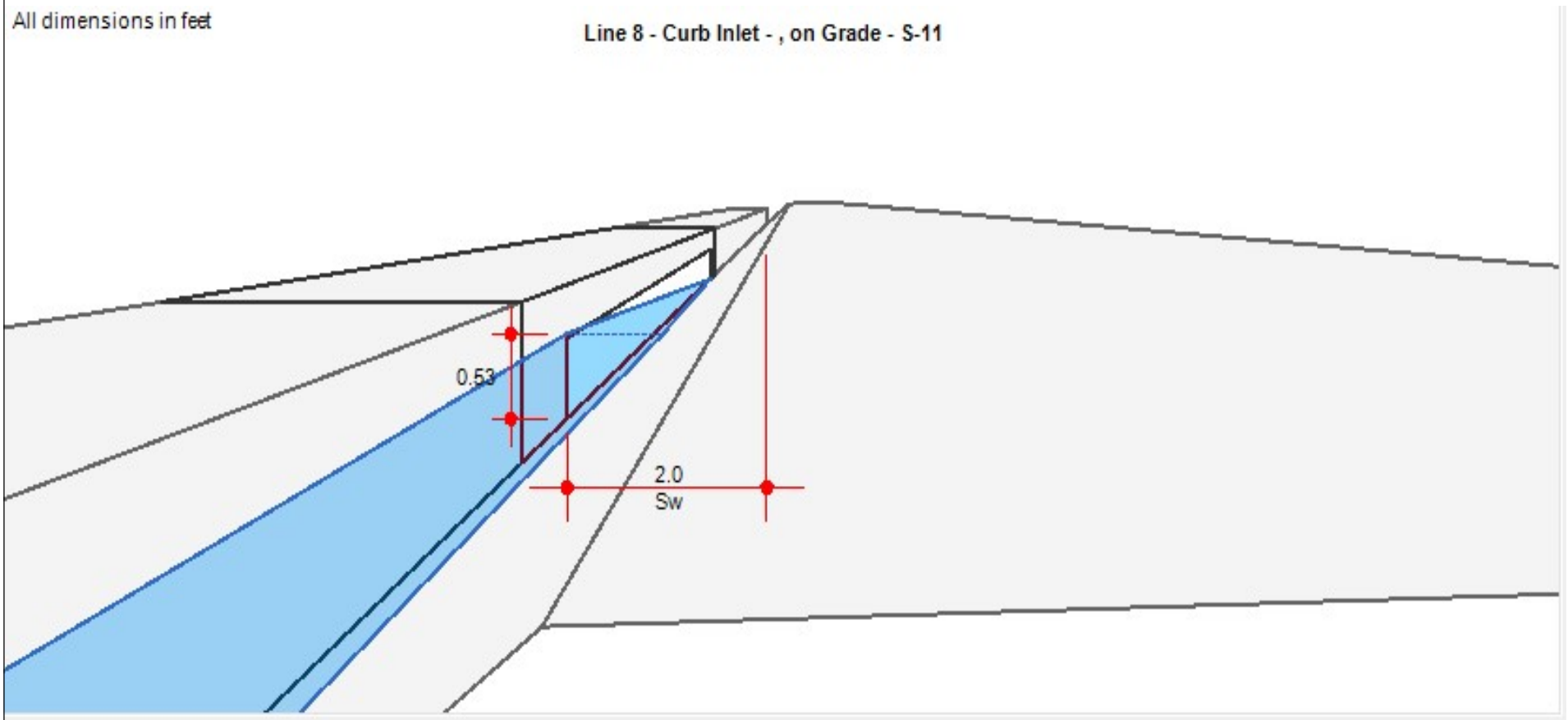


All dimensions in feet

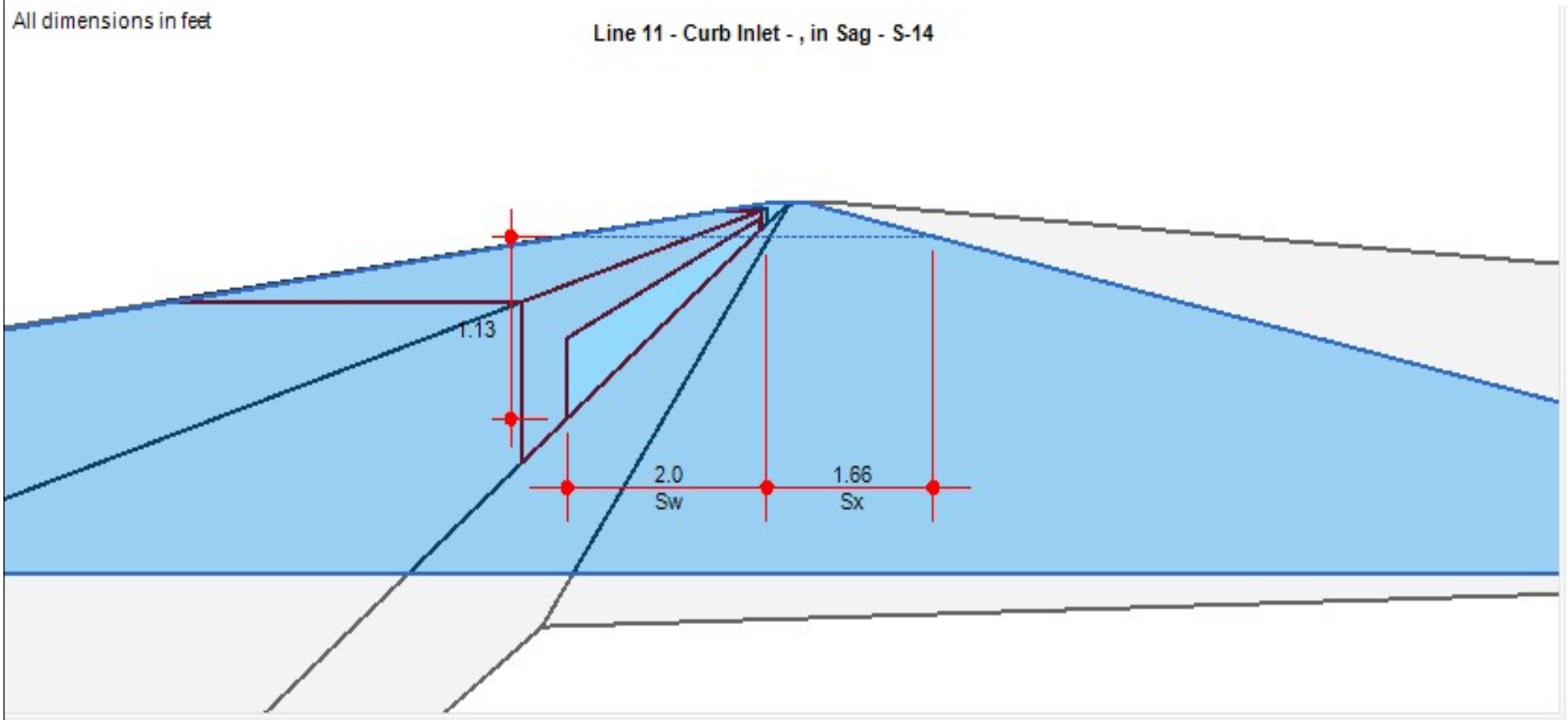
Line 9 - Curb Inlet - , on Grade - S-10



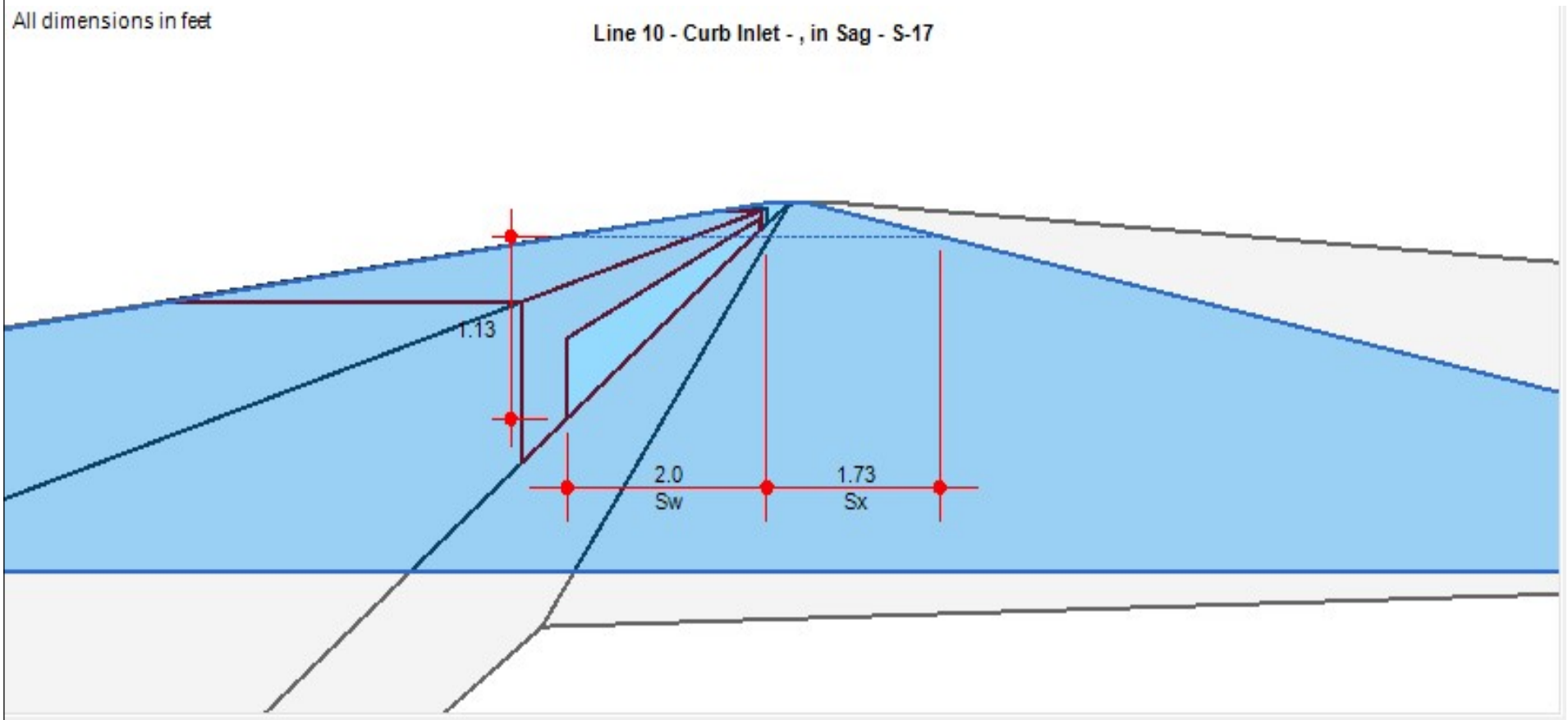
All dimensions in feet



All dimensions in feet

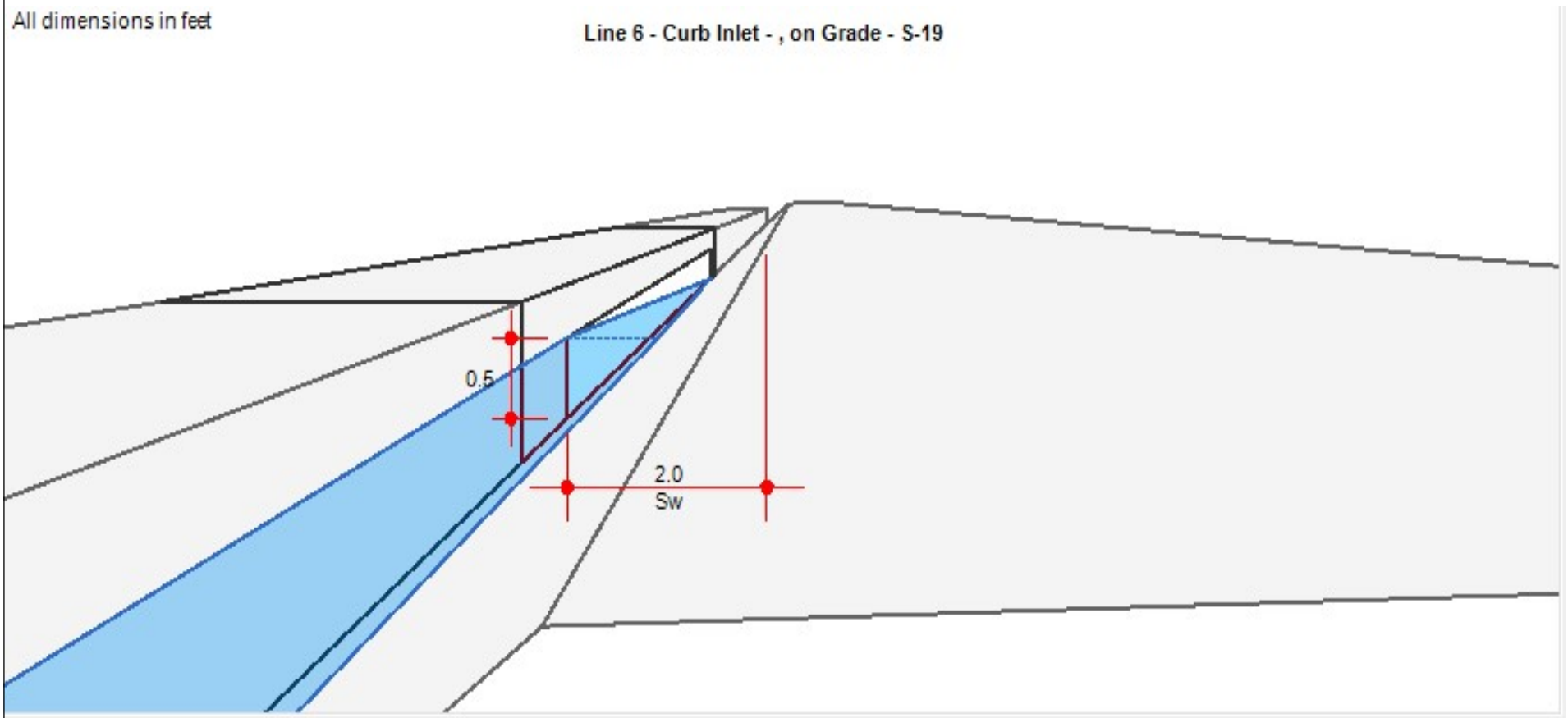


All dimensions in feet



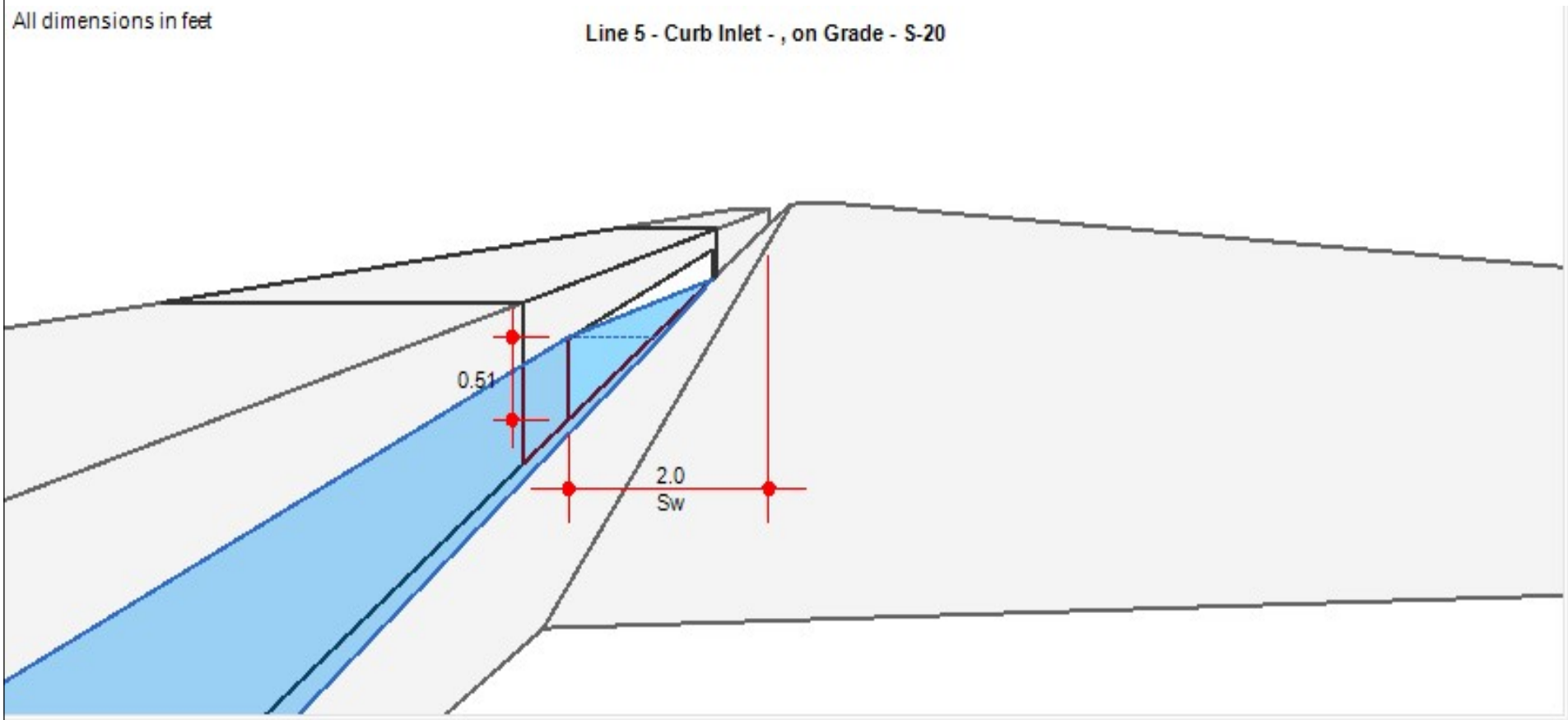
All dimensions in feet

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



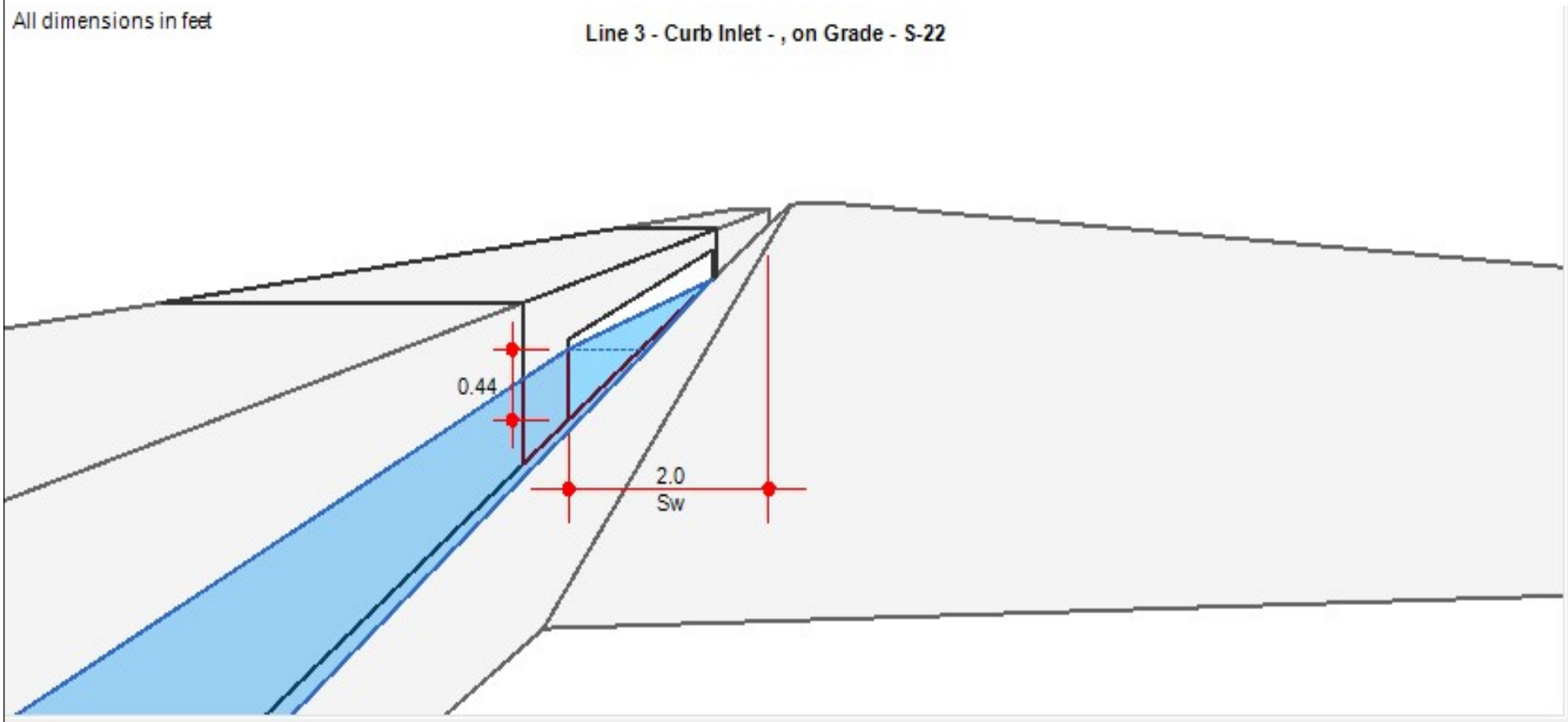
All dimensions in feet

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

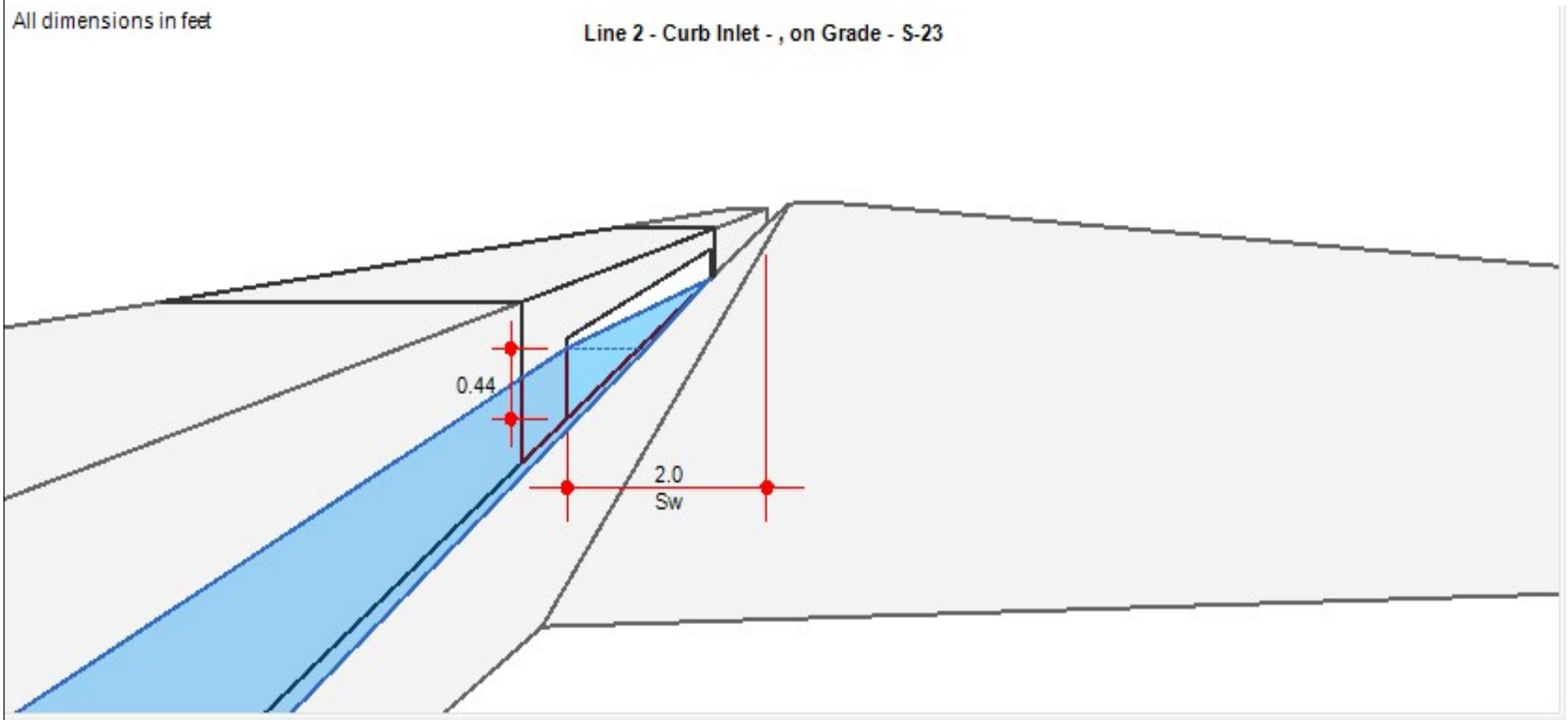


All dimensions in feet

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

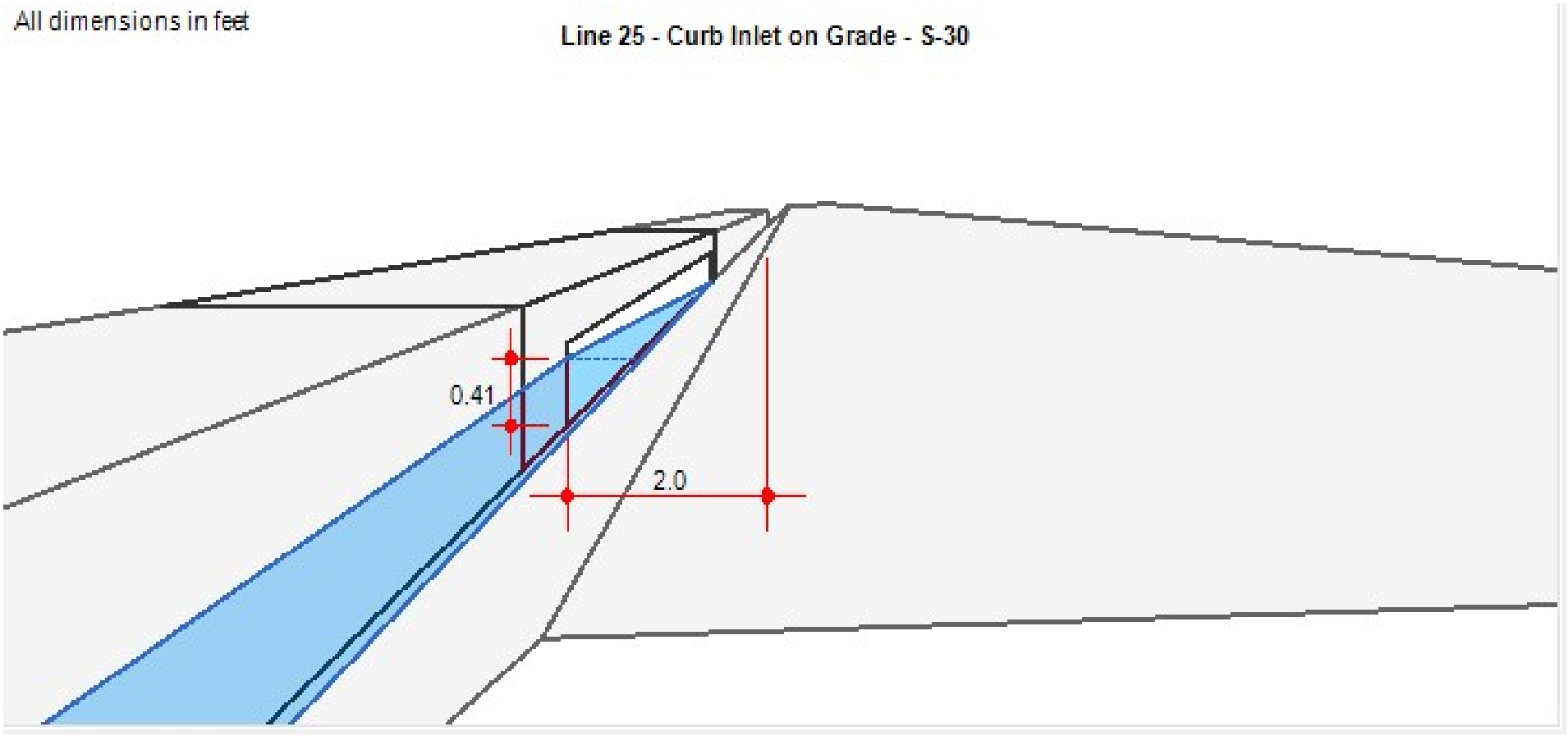


All dimensions in feet



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



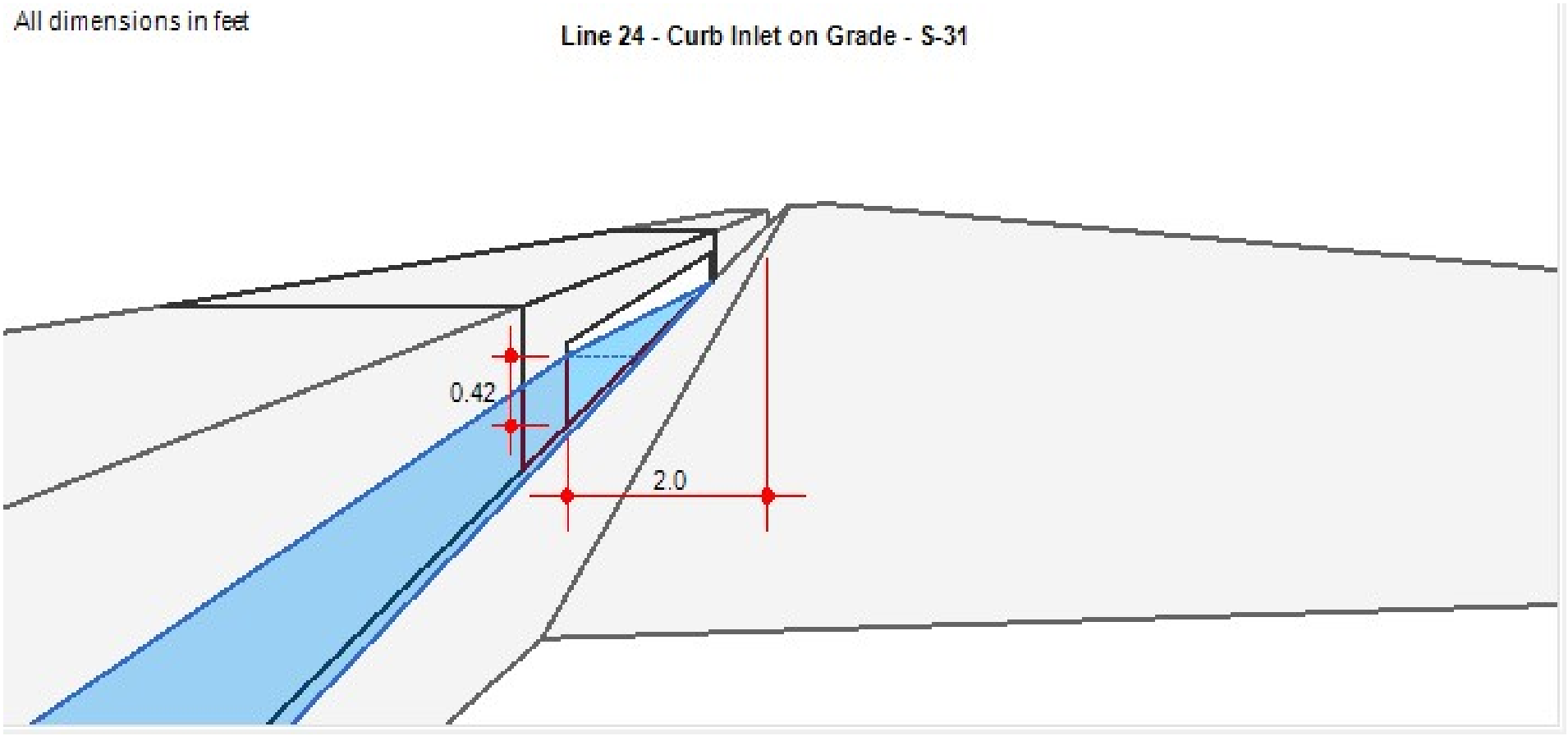



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



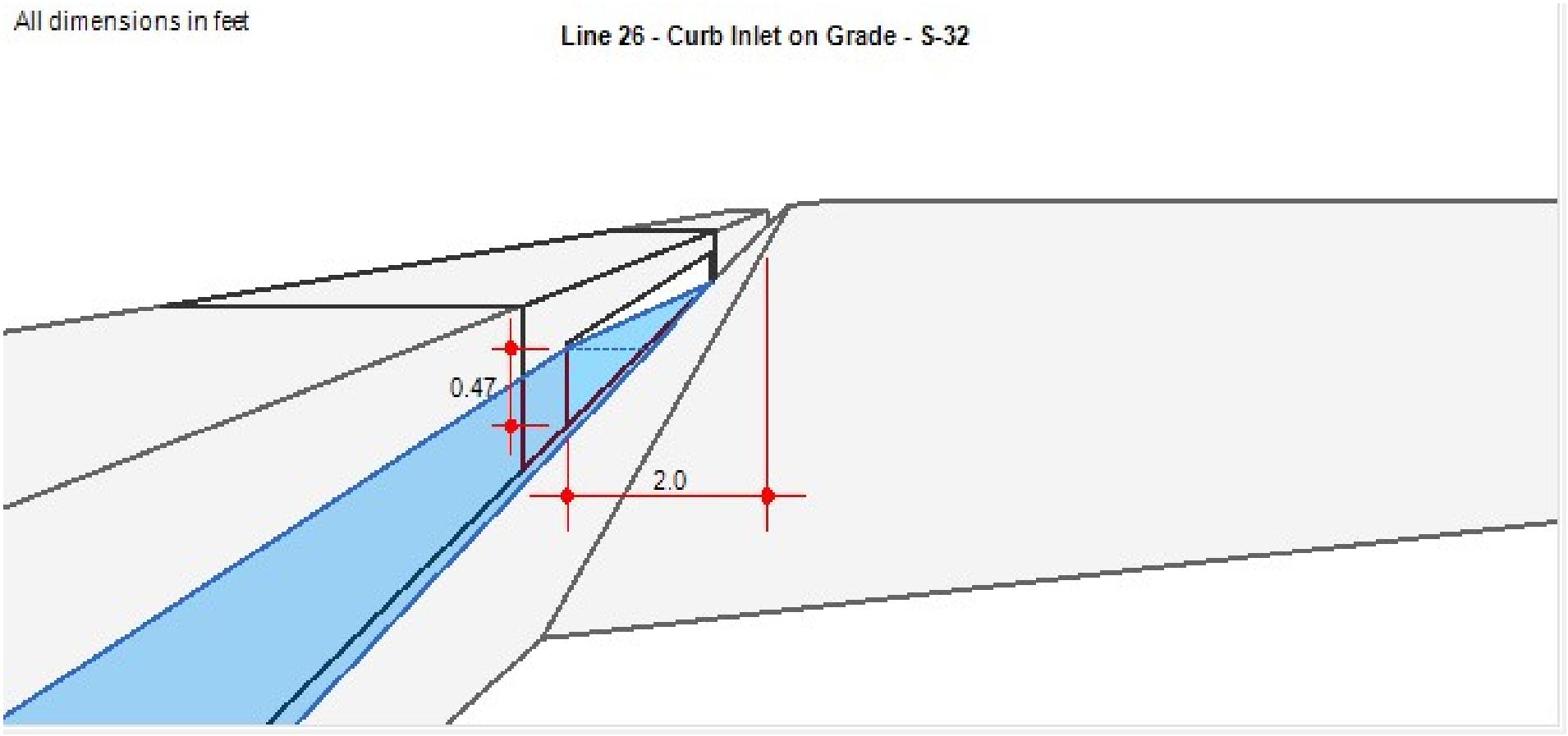



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



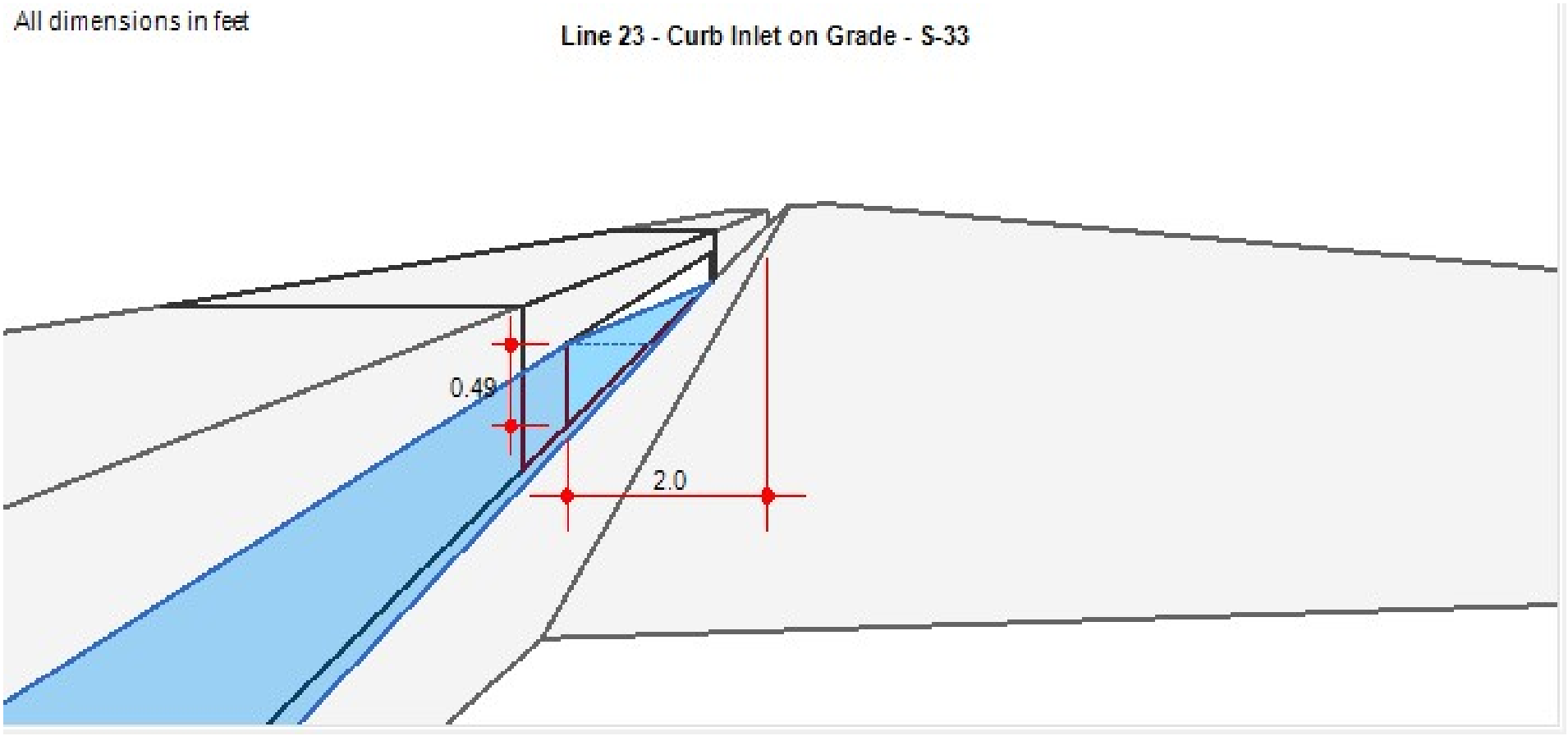



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



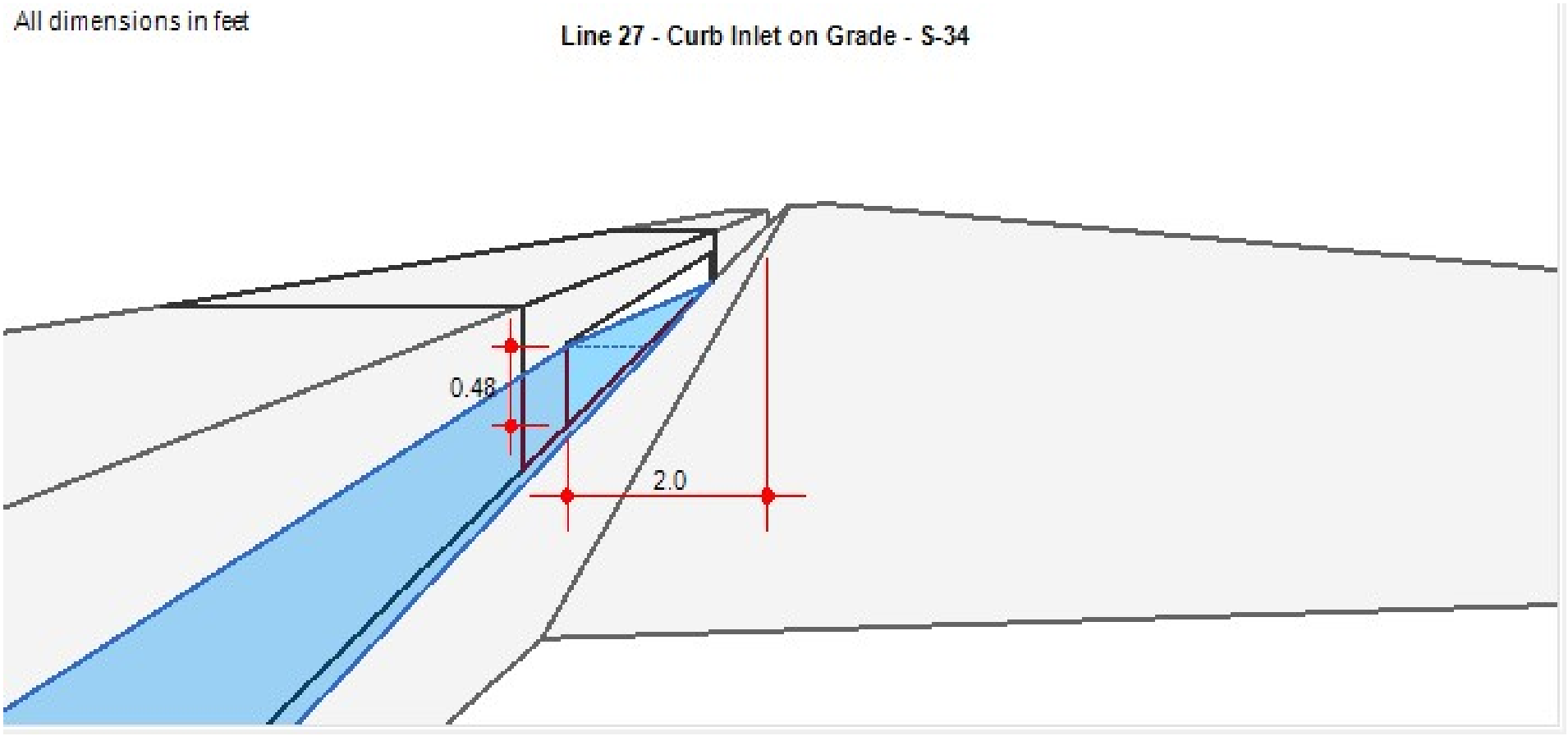



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



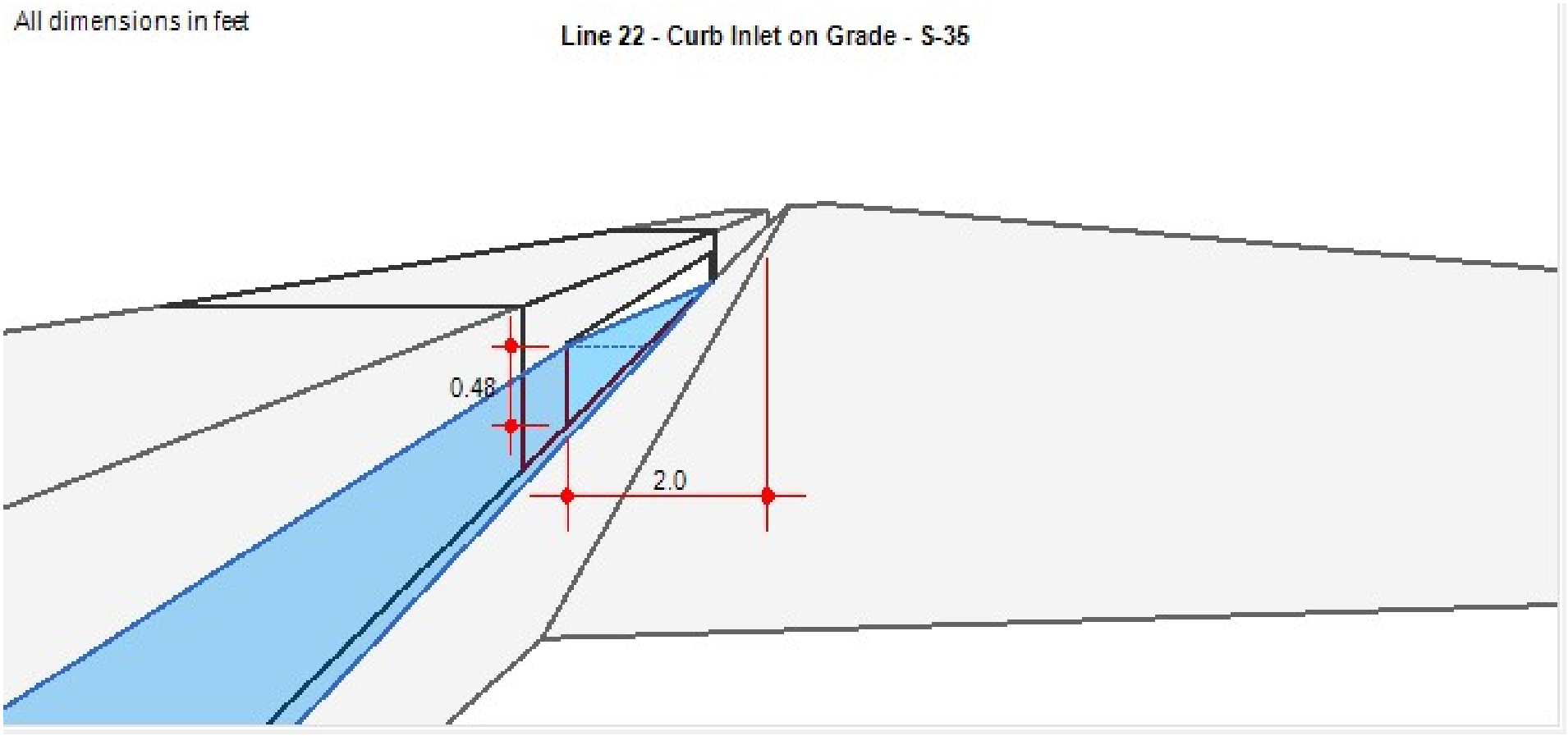



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



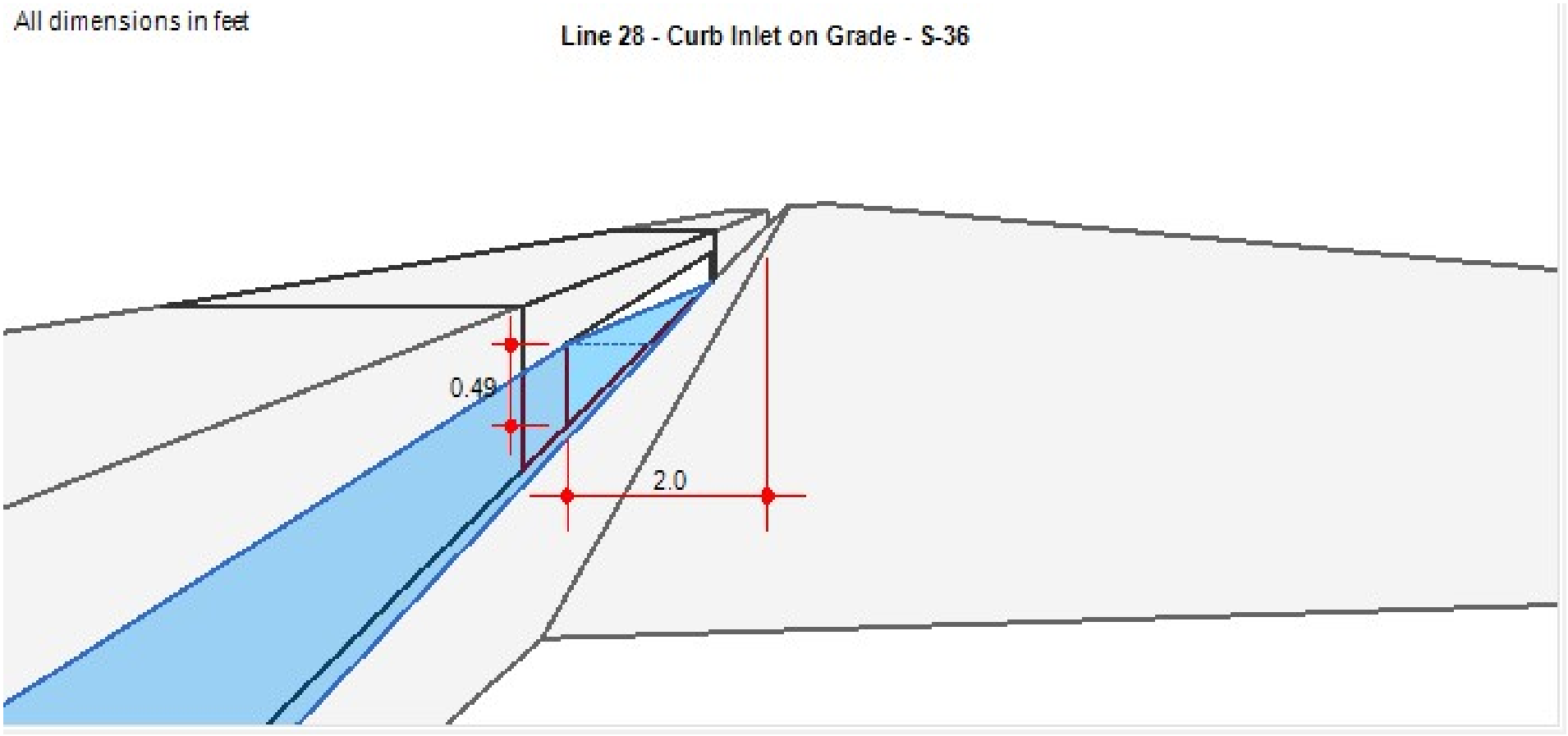



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



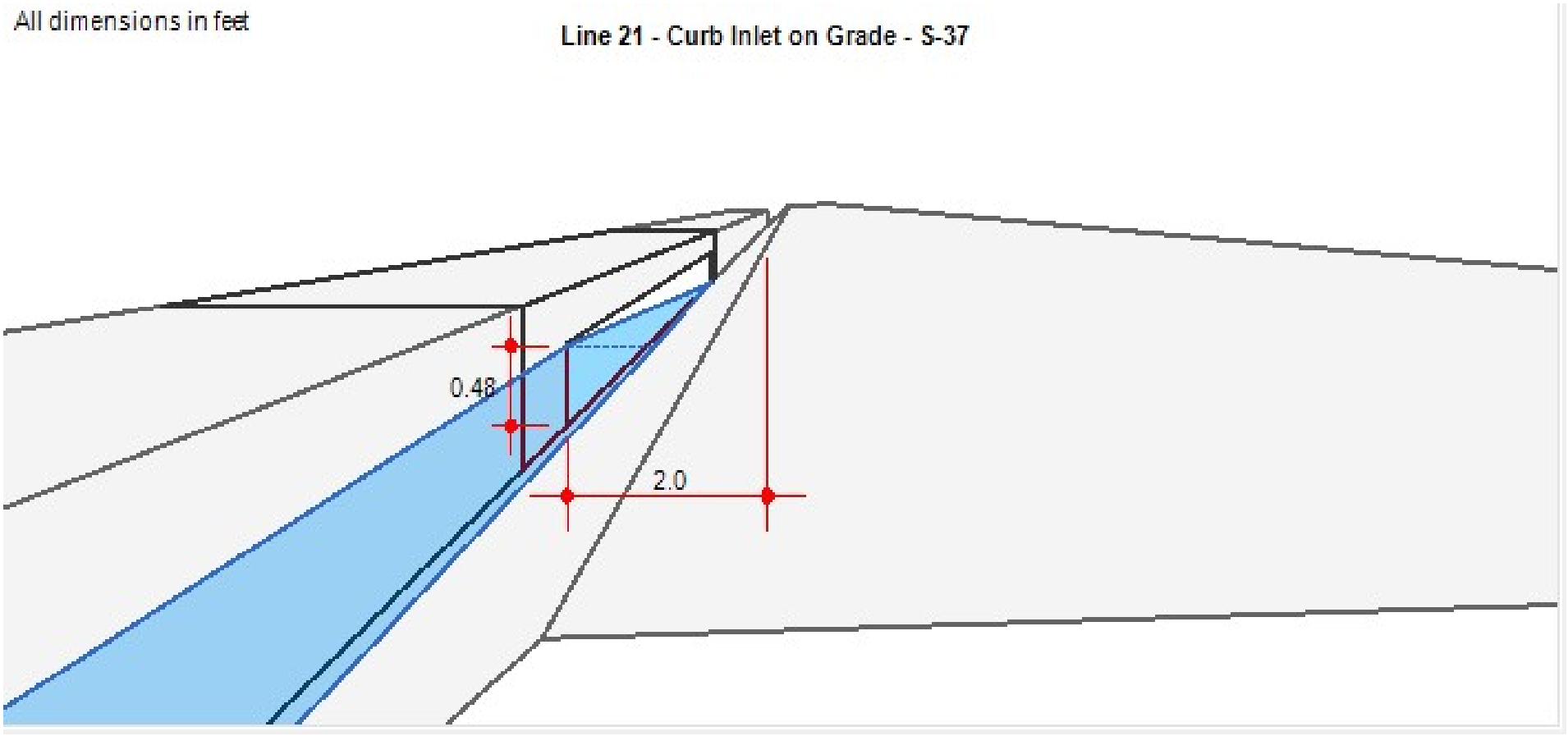



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



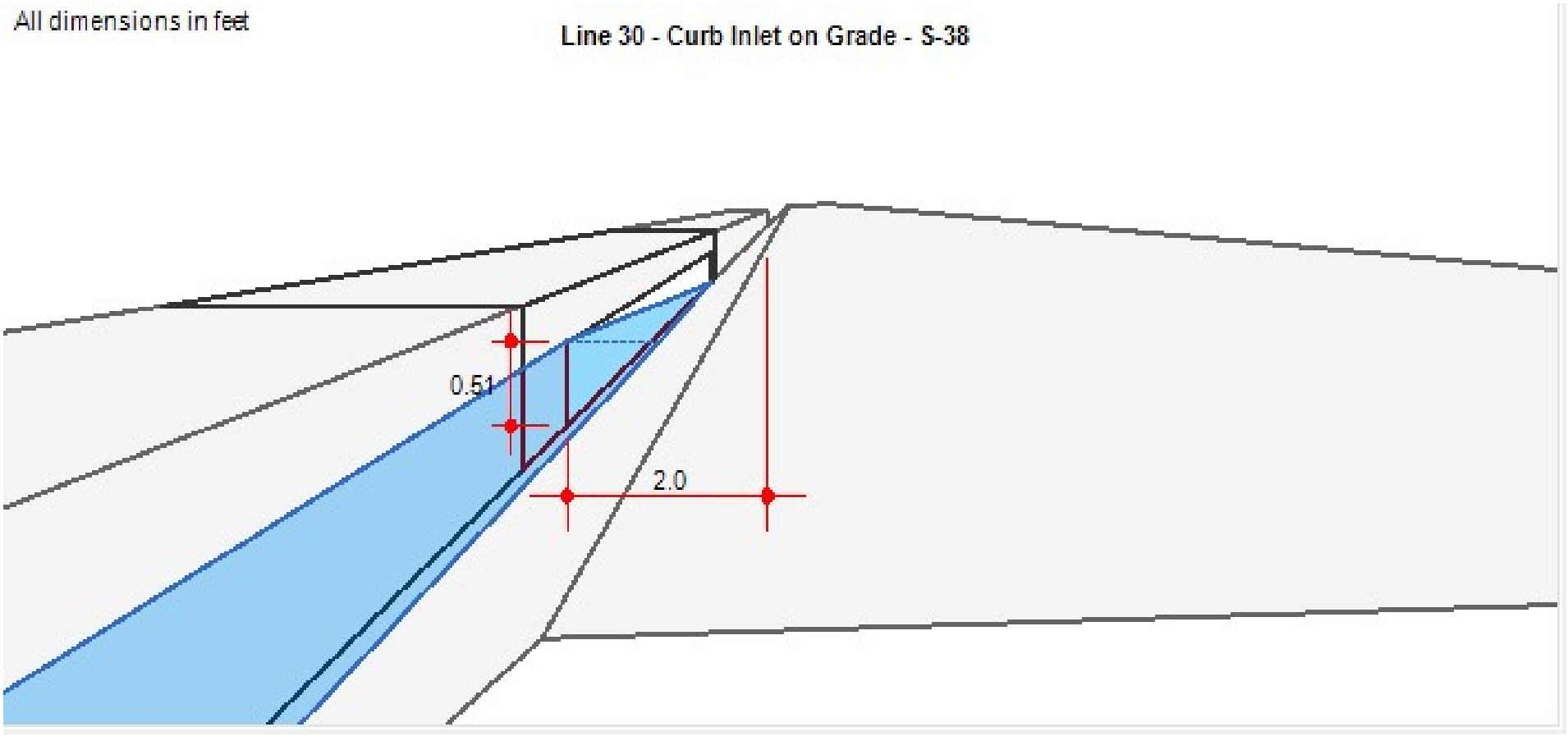



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



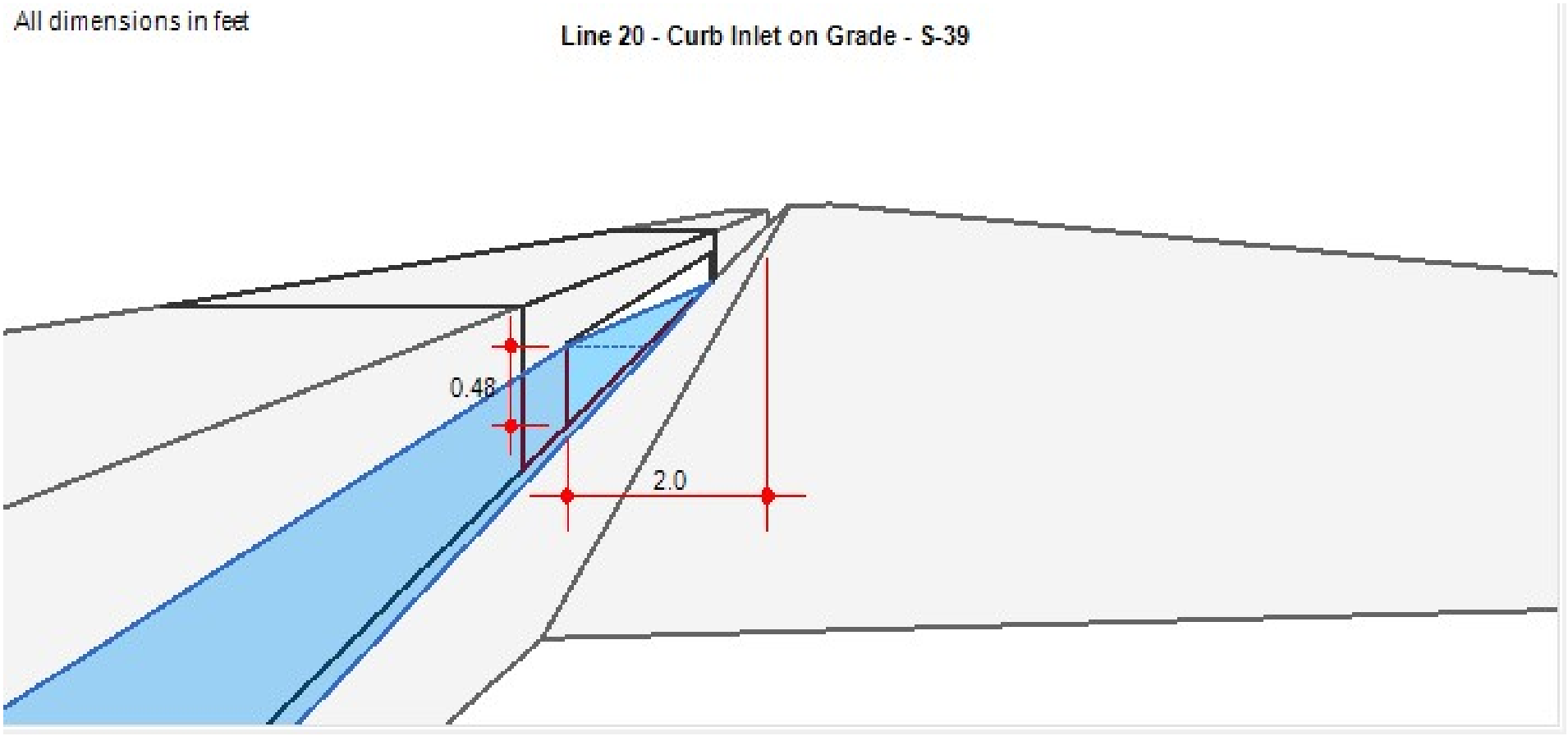



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



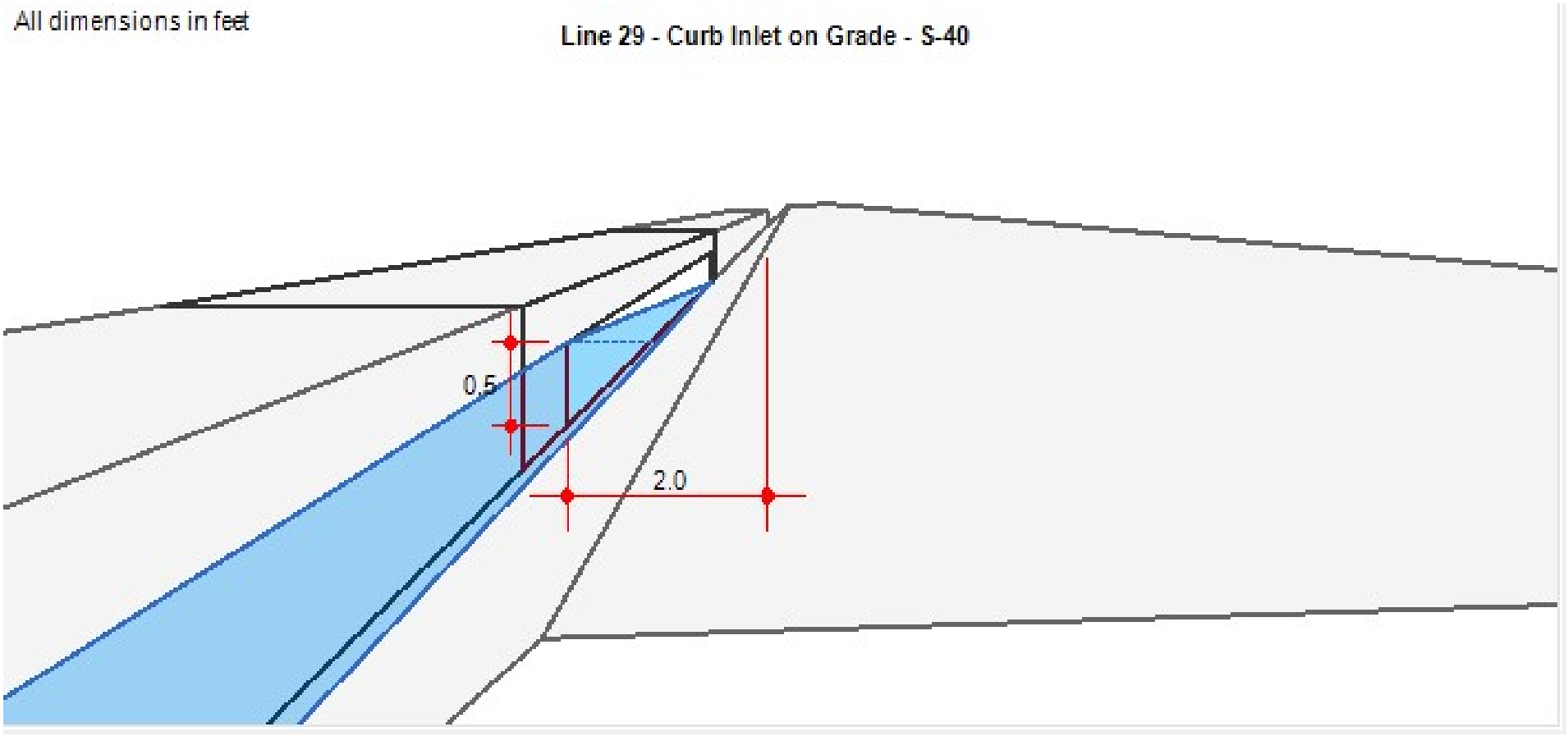



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



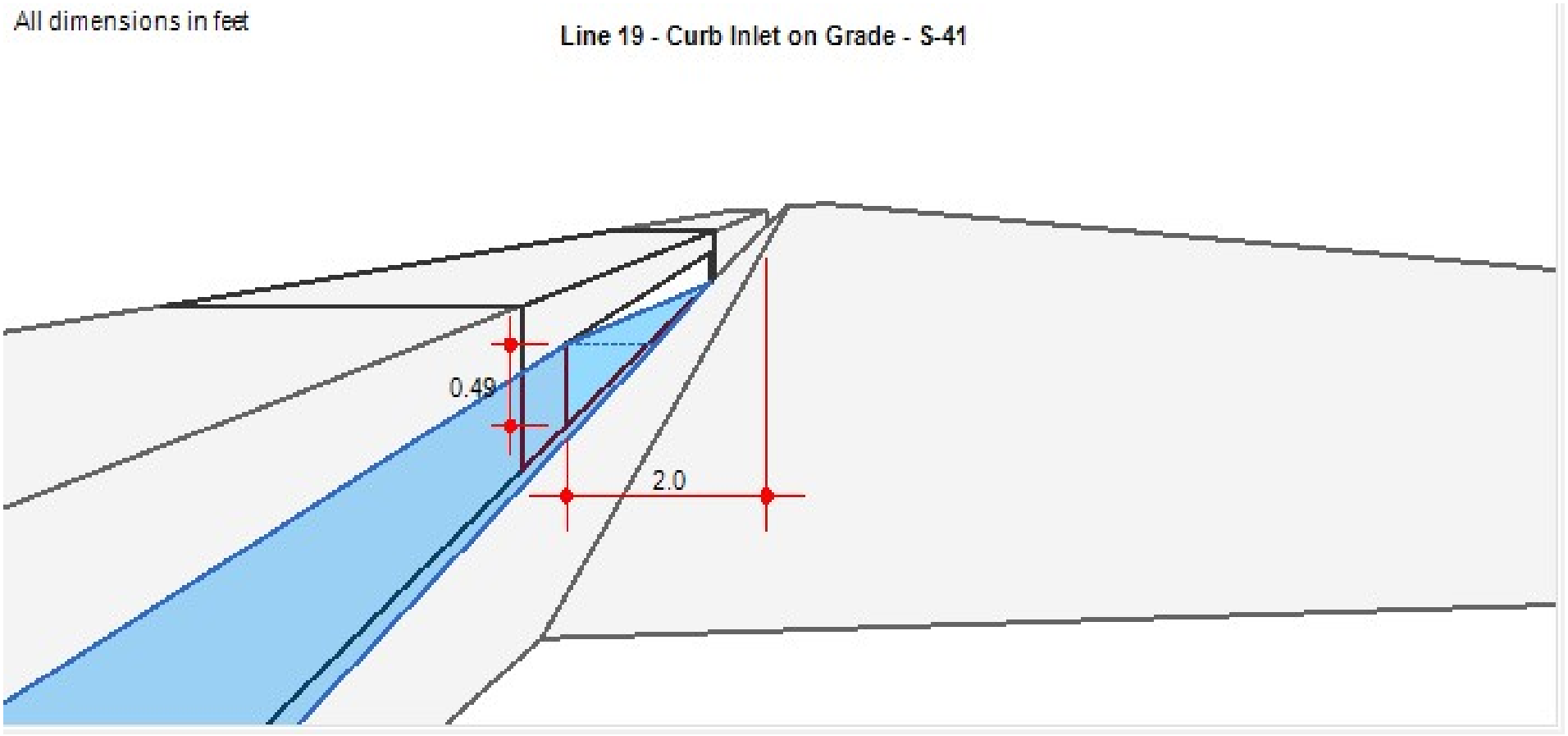



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



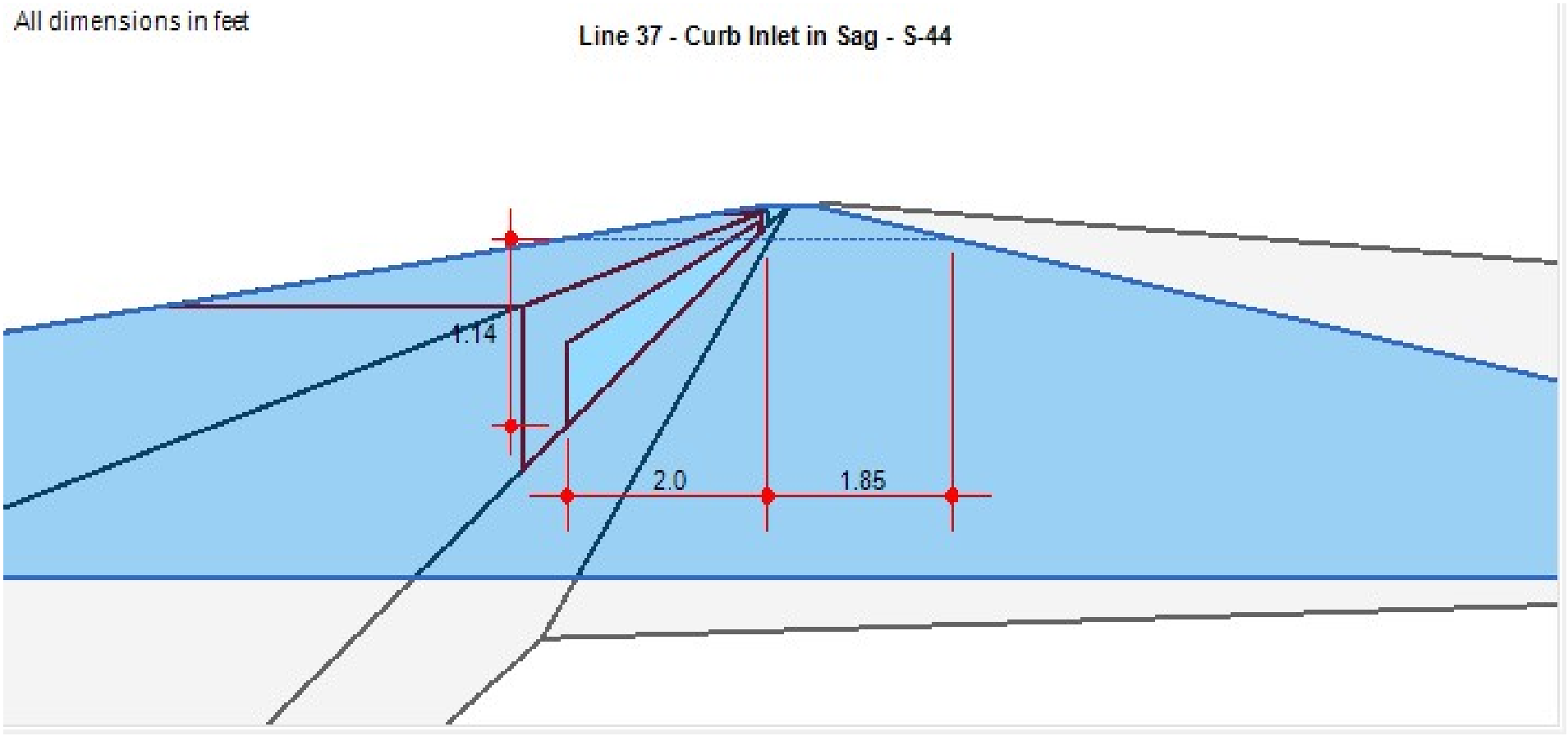



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



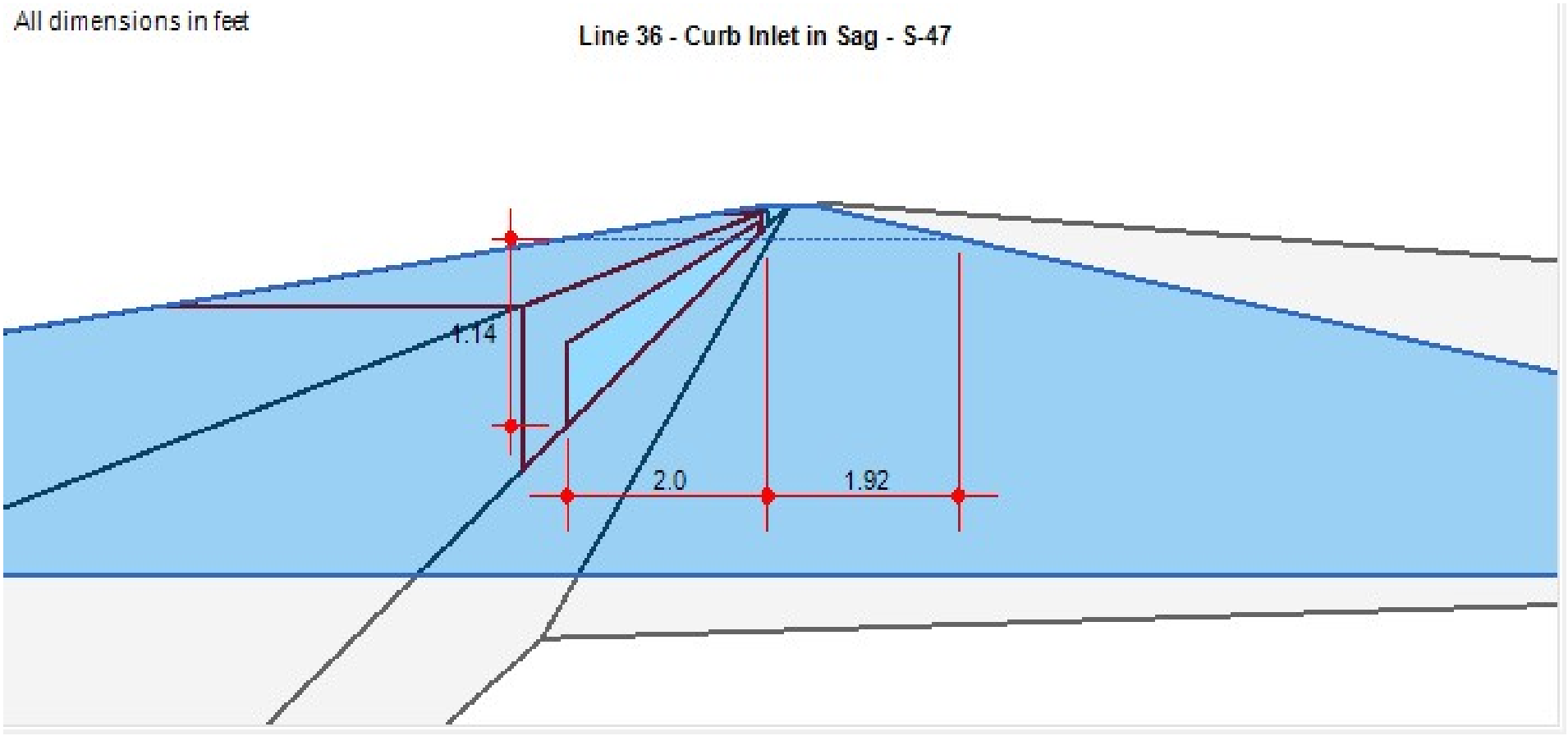



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



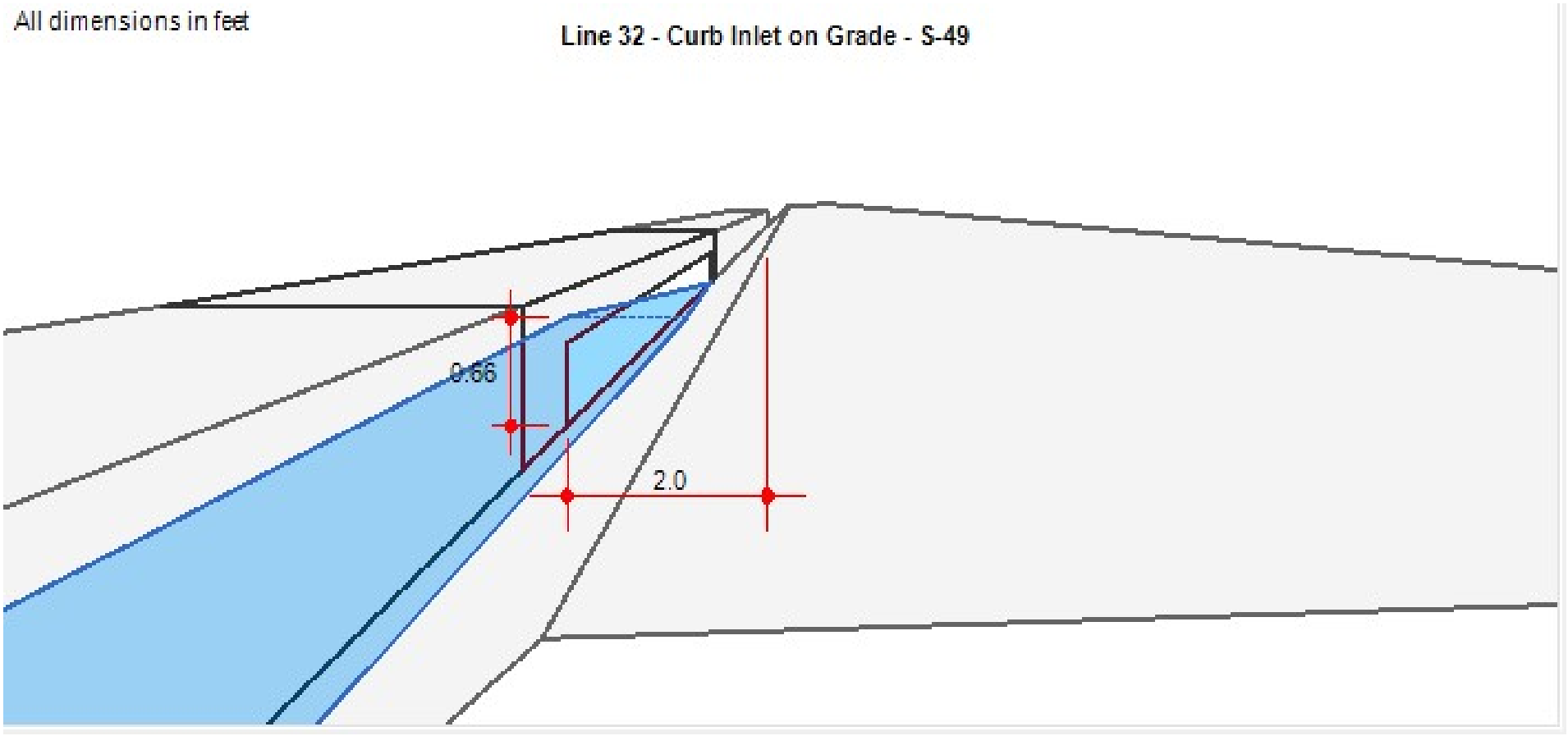



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



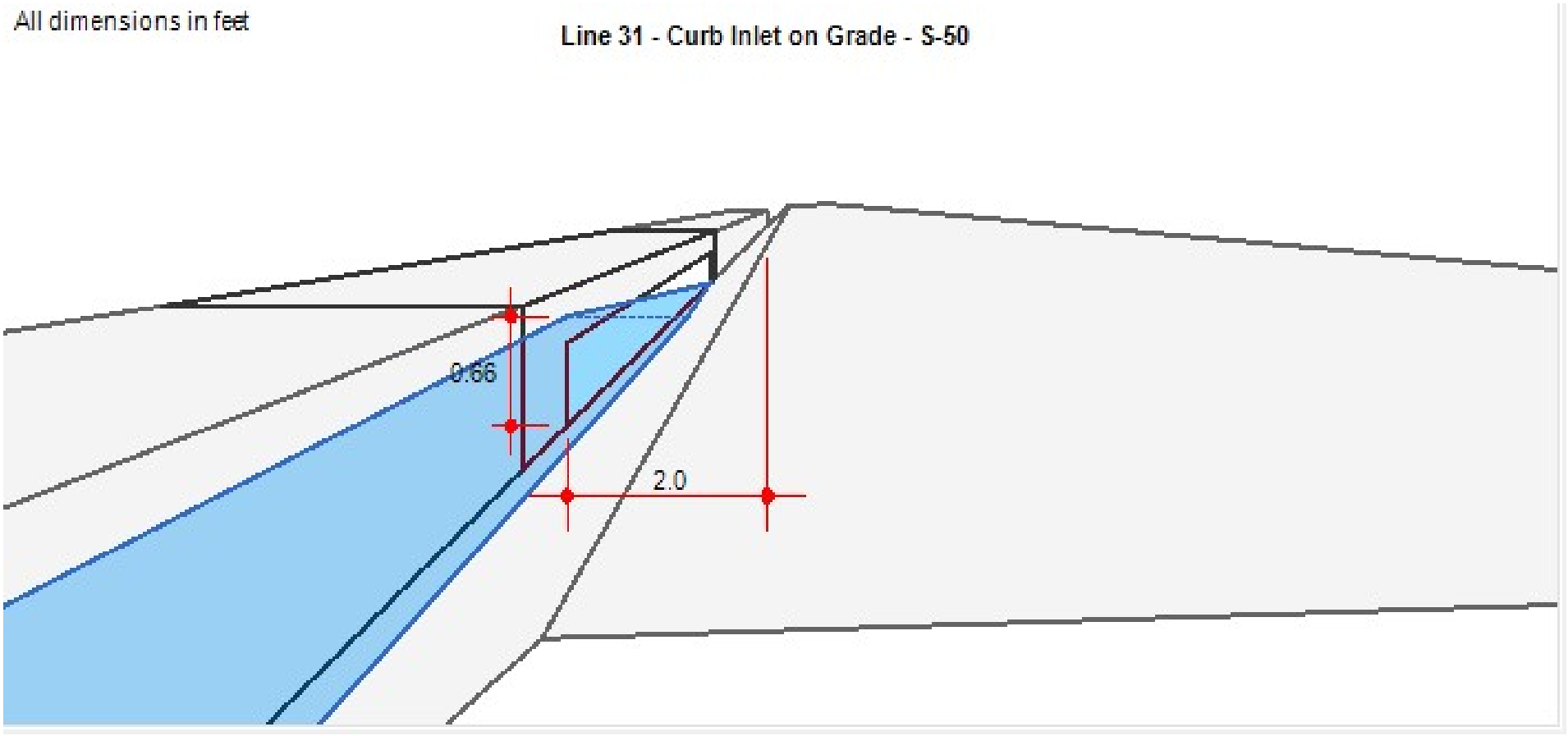



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



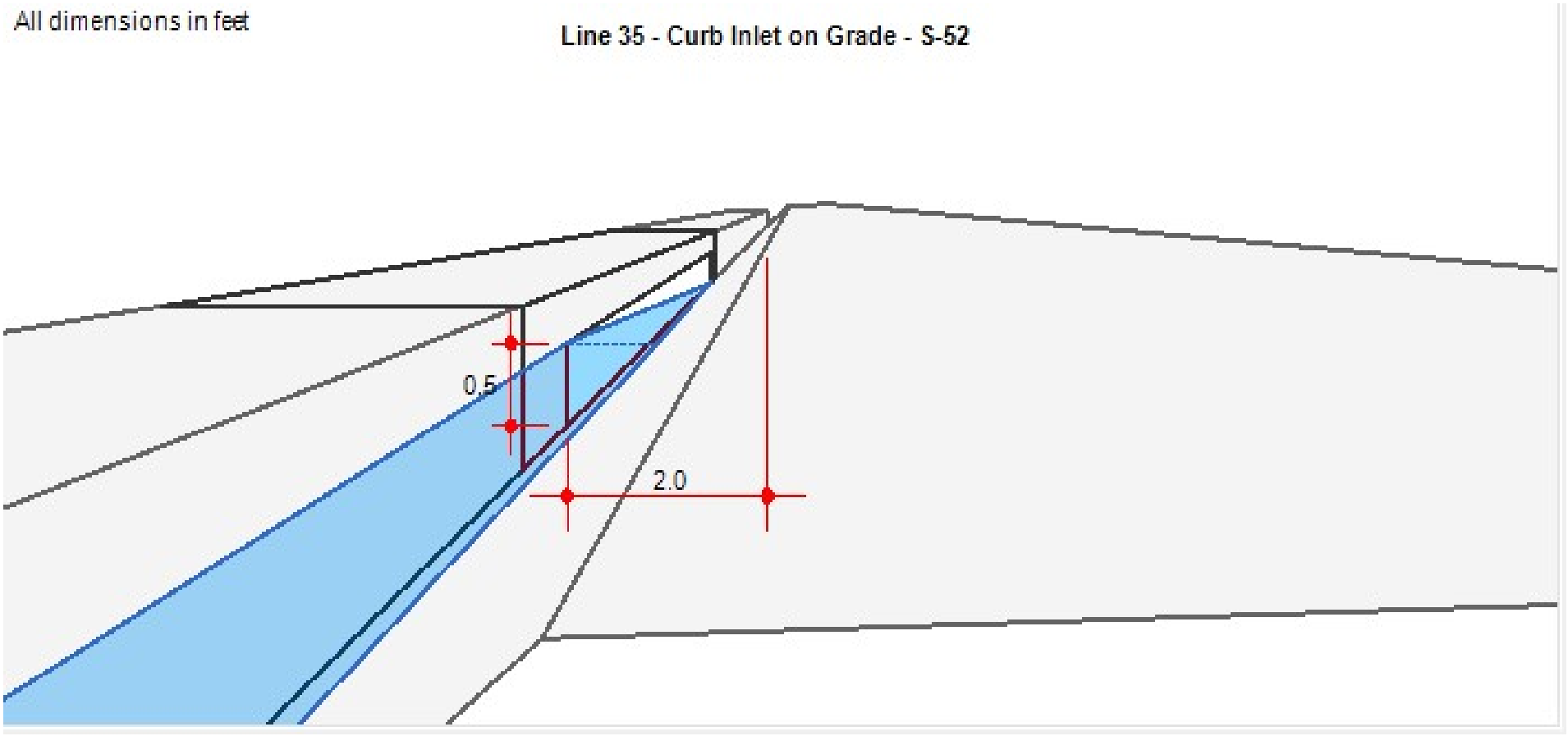



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



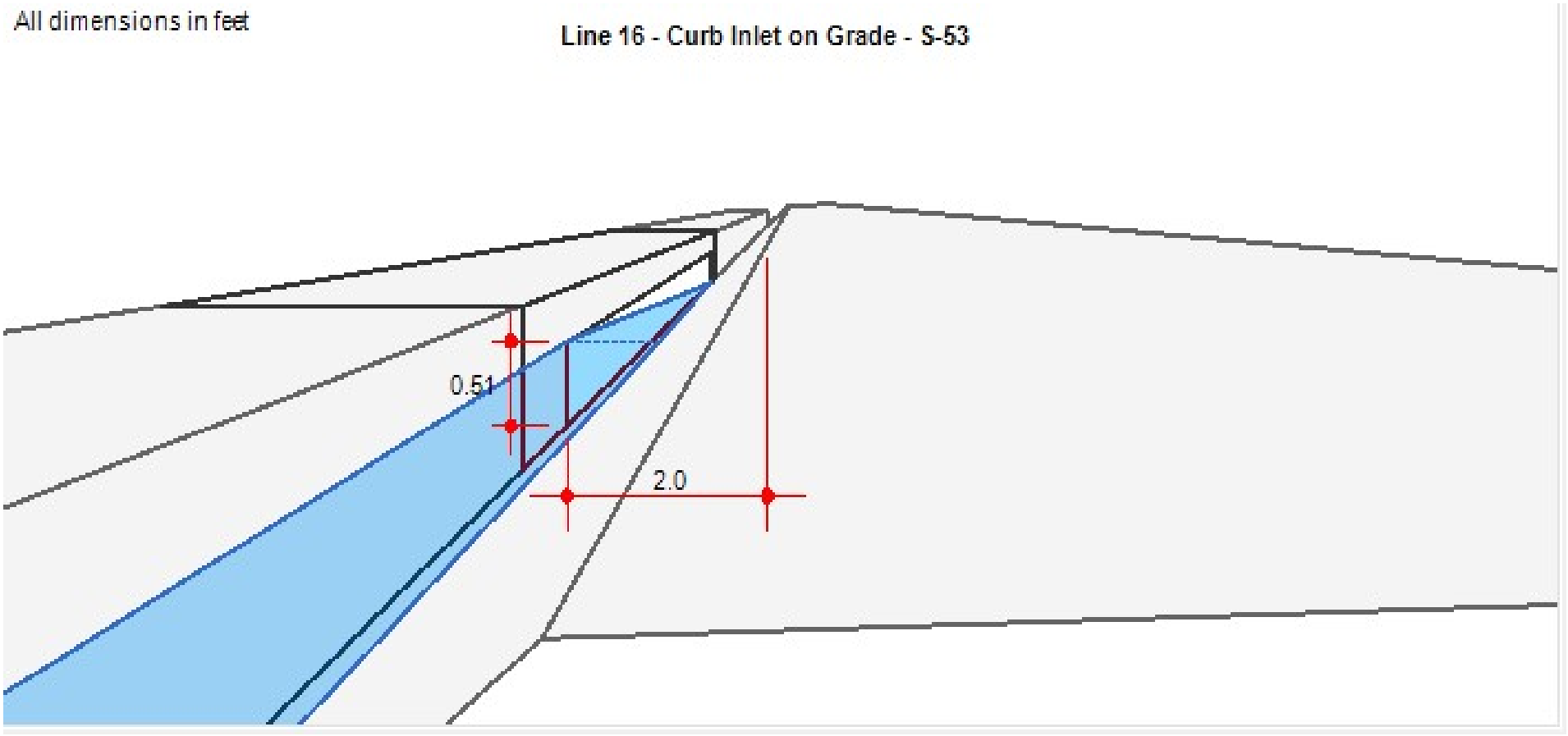



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



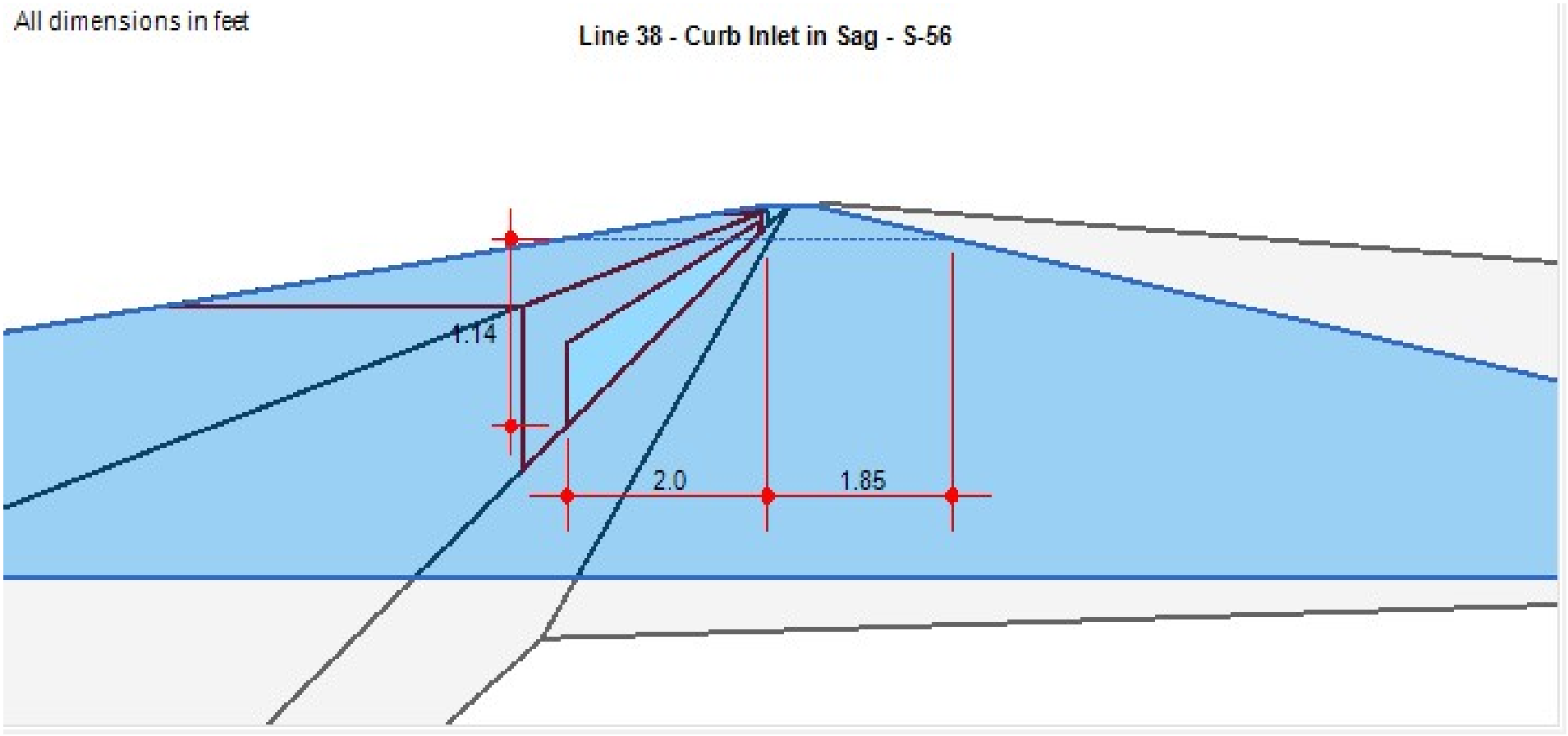



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



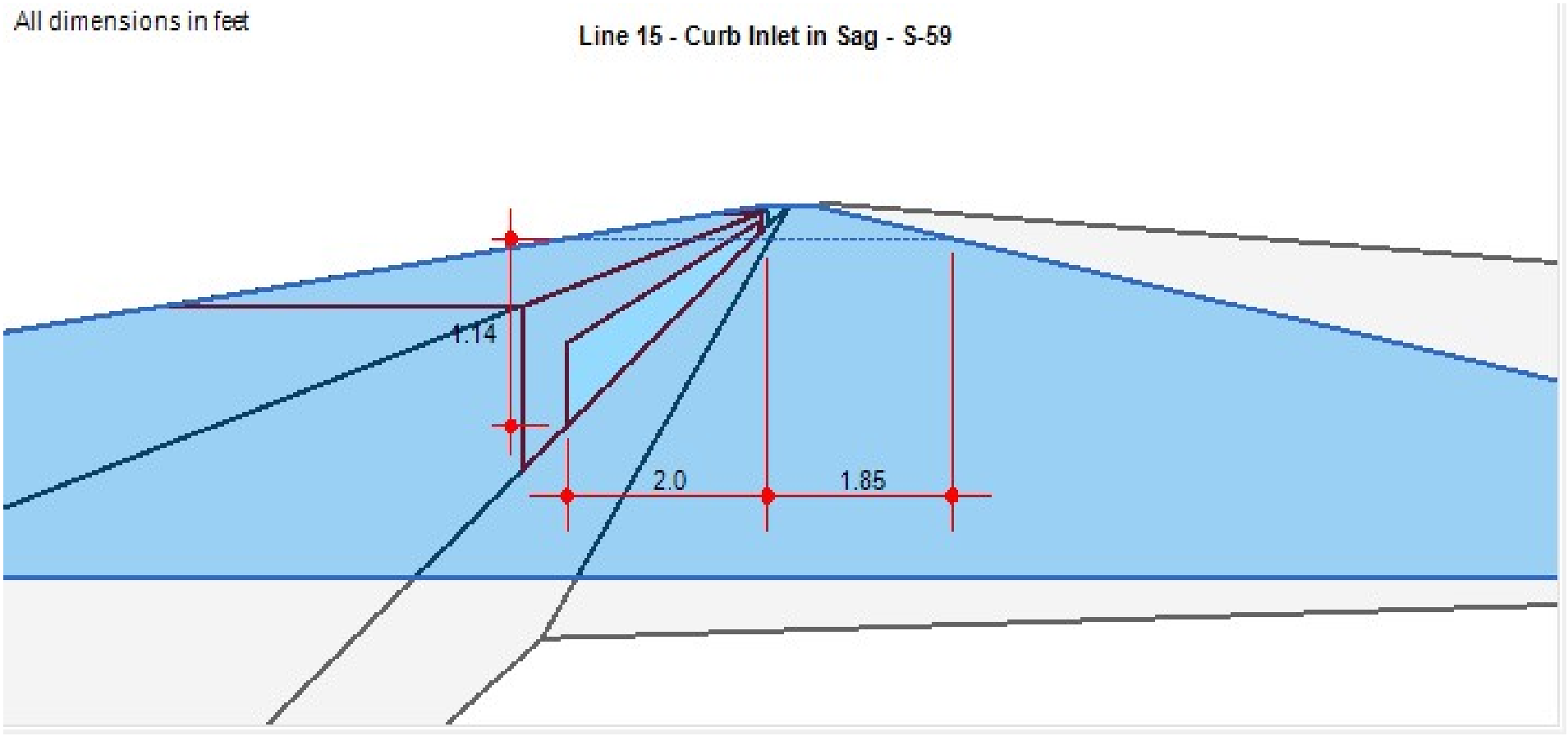



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



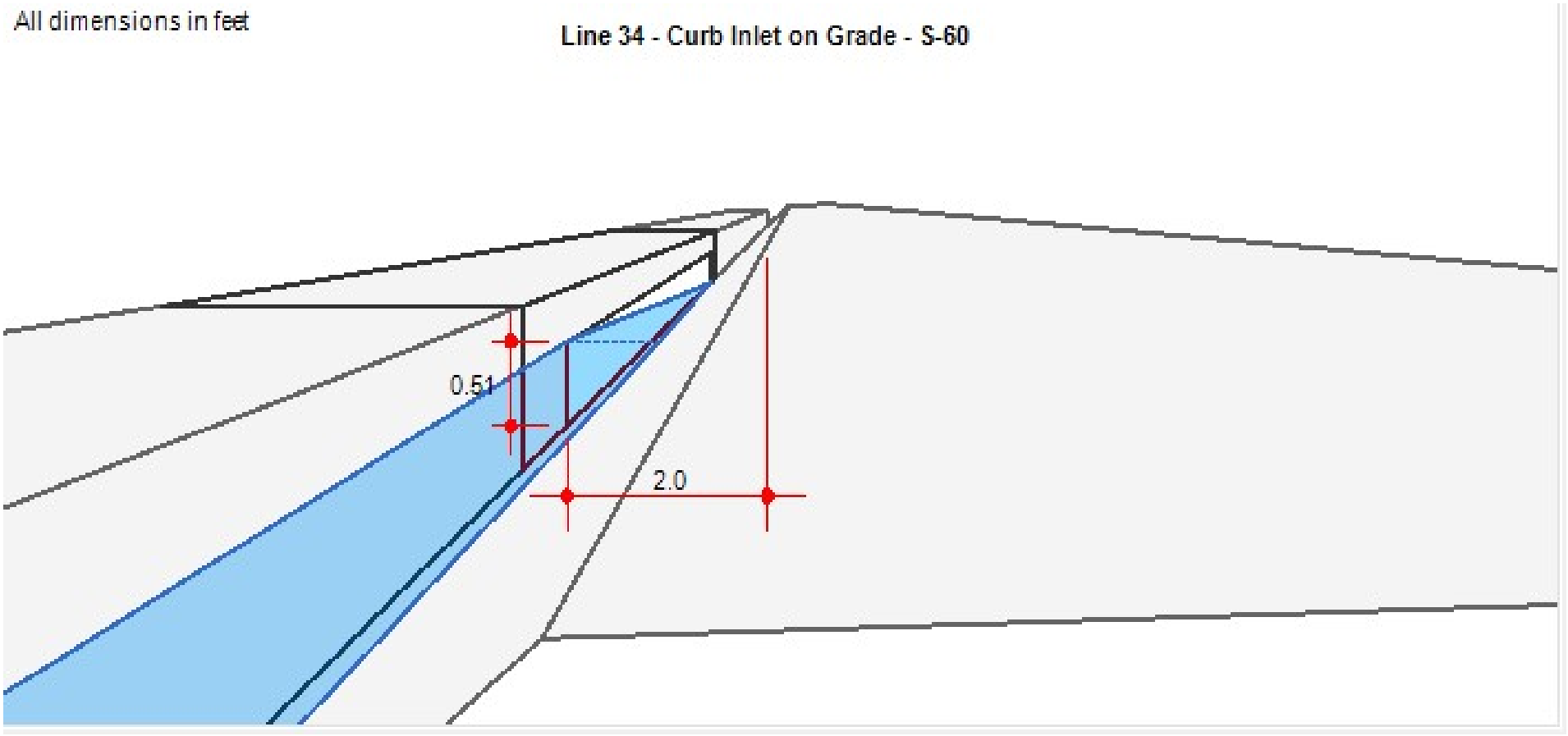



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



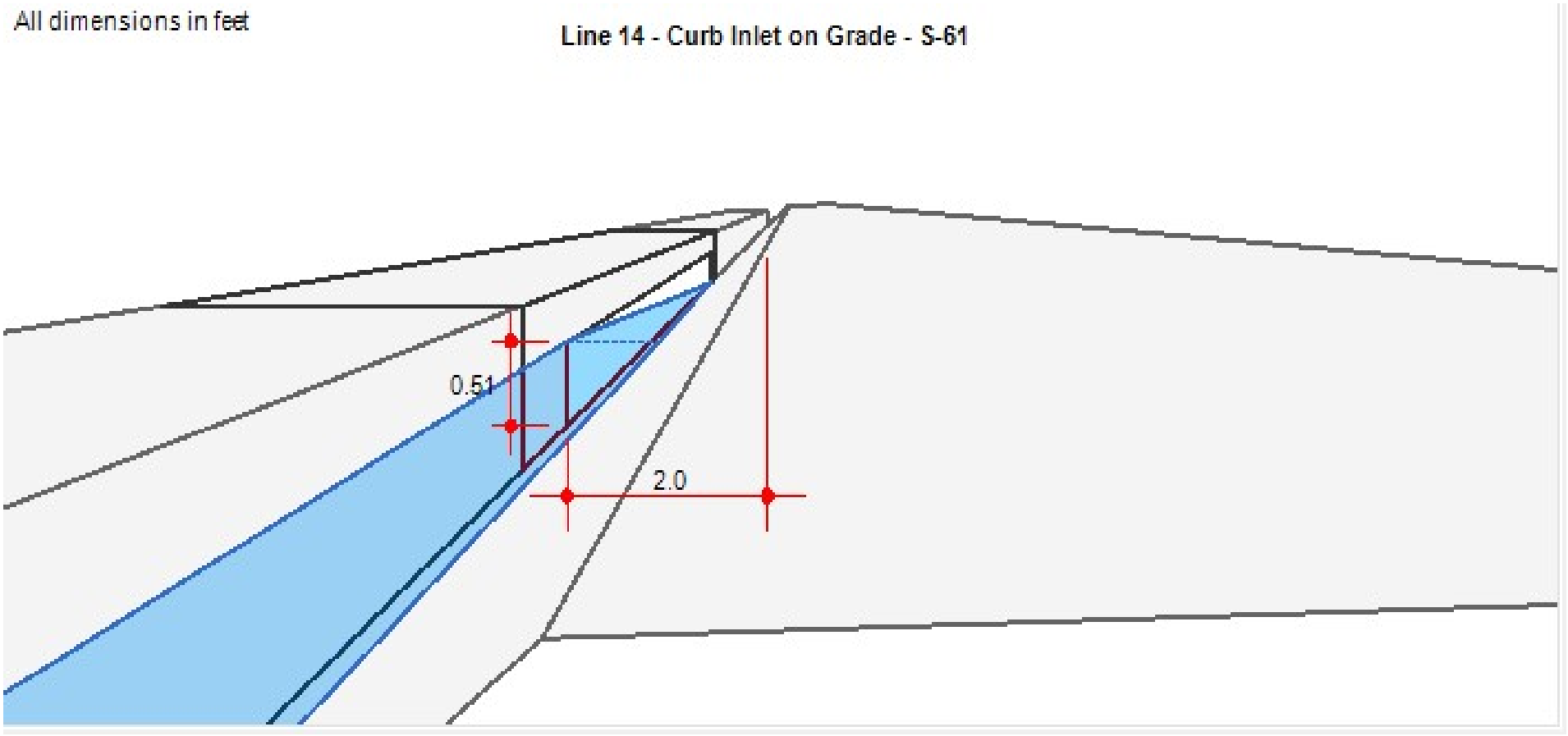



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



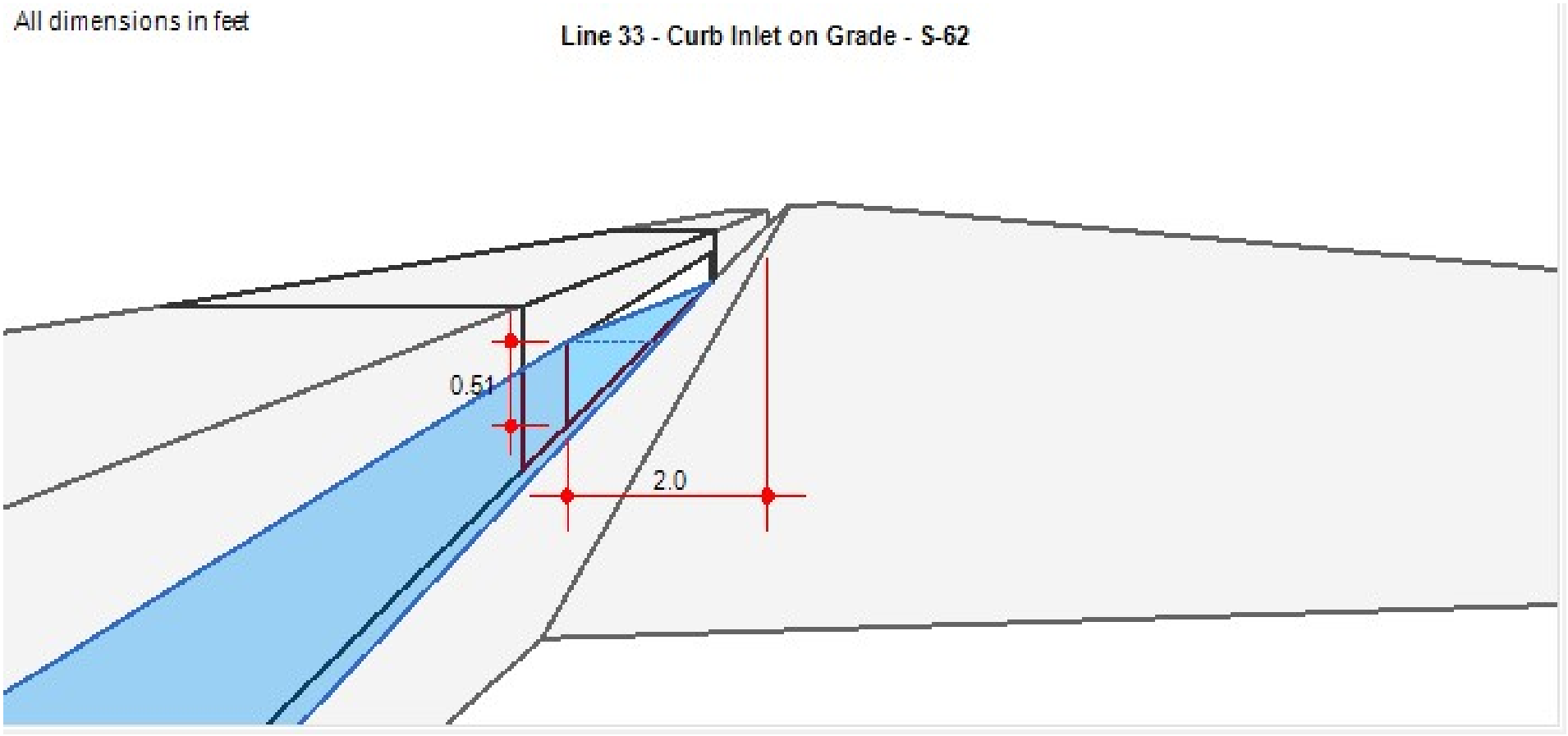



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



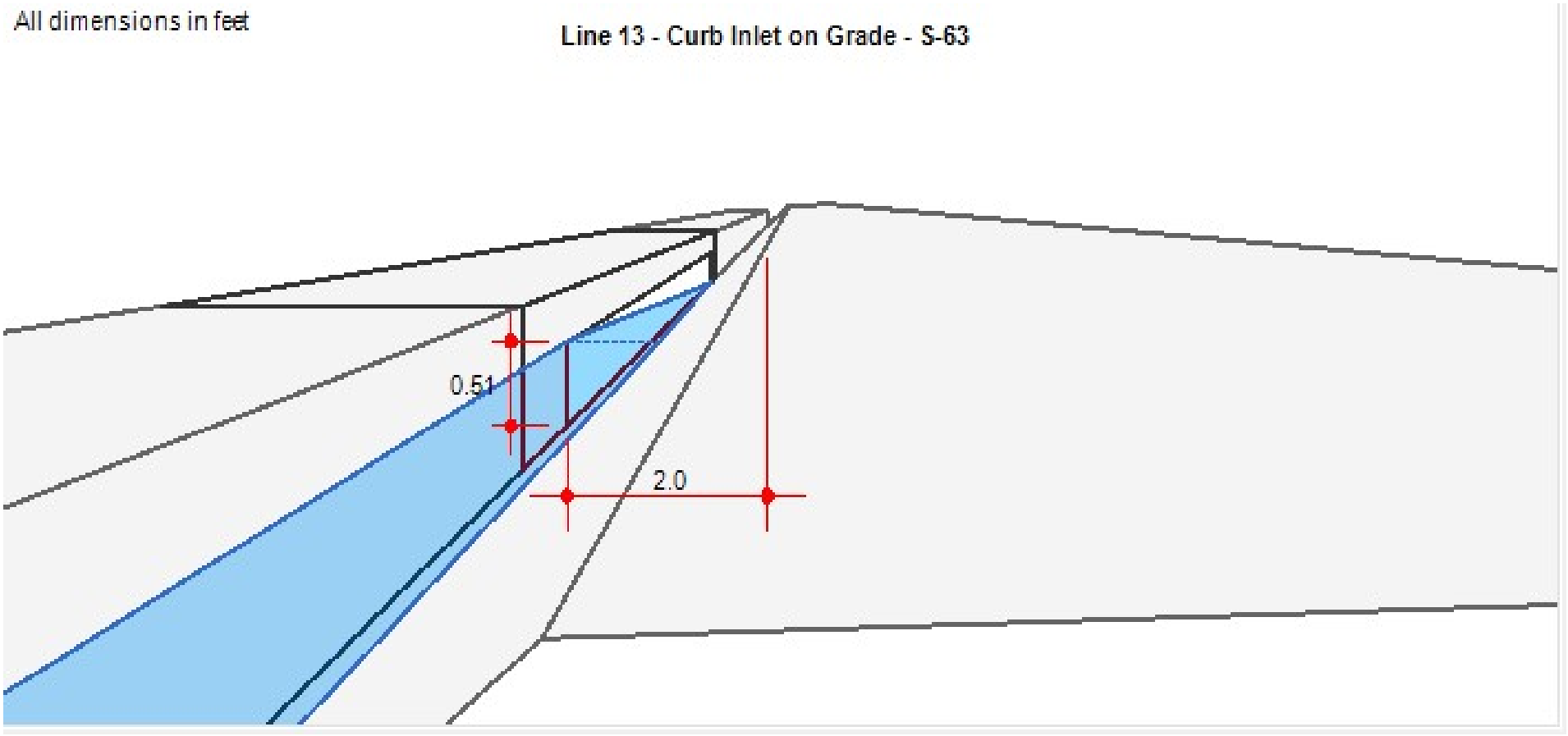



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (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



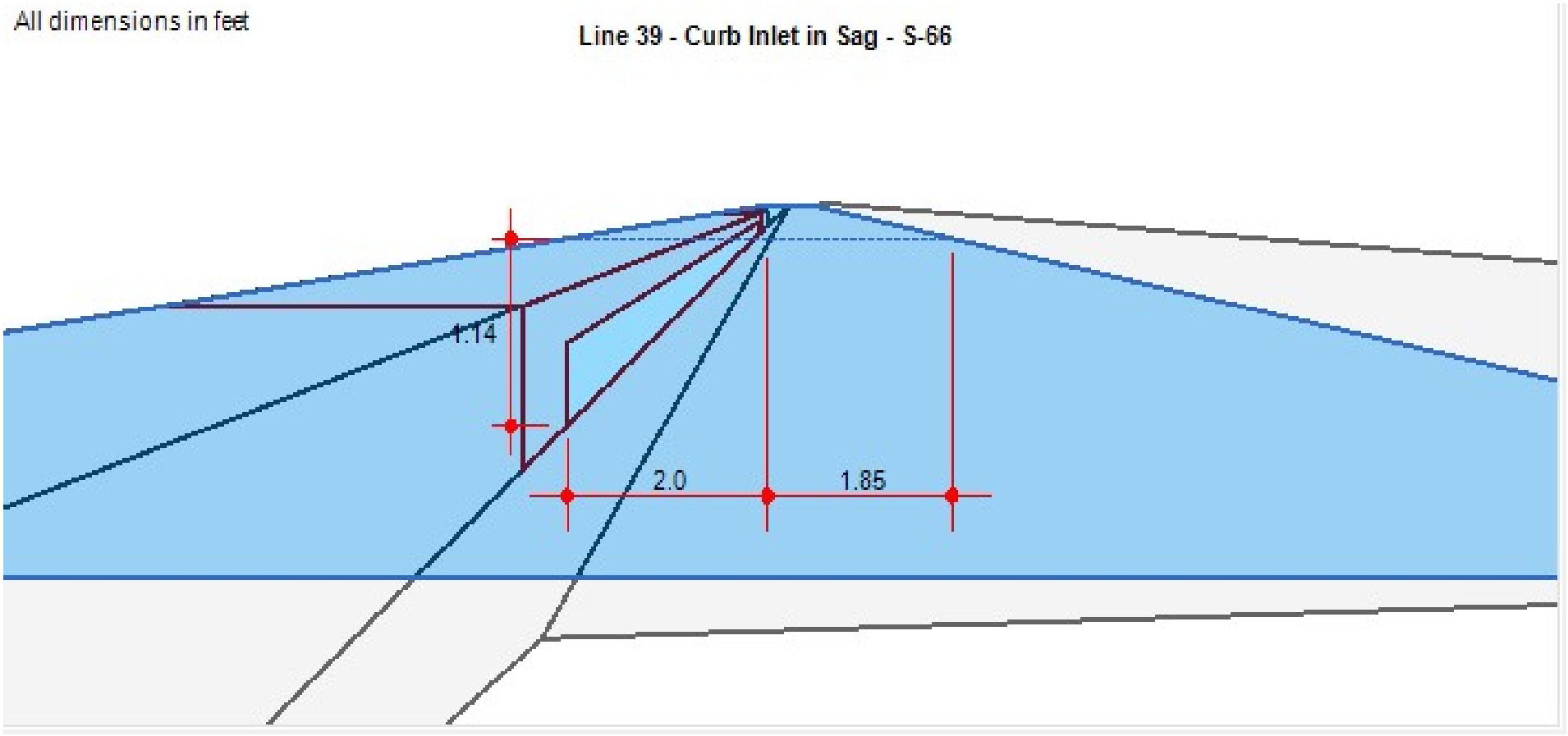



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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



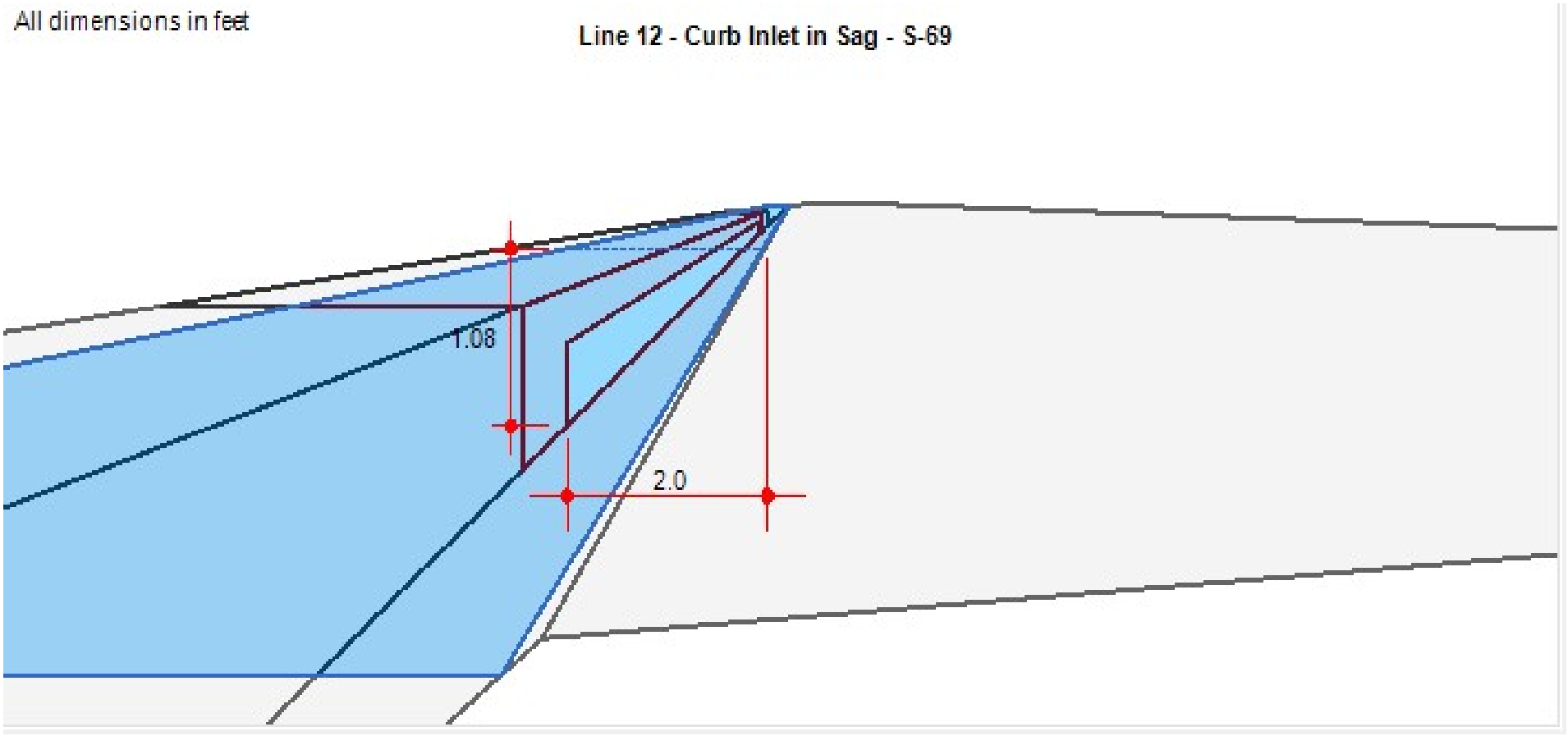



| Line # | Q | | | | Inlet | | | Gutter | | | | Depth | | Spread | | Byp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Catch (cfs) | Carry (cfs) | Capt (cfs) | Byp (cfs) | Length (ft) | Depr (in) | Throat (in) | Width (ft) | Slope (ft/ft) | Sw (ft/ft) | Sx (ft/ft) | Gutter (ft) | Inlet (ft) | Gutter (ft) | Inlet (ft) | Line (ft) |
| 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






| 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) |
| 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