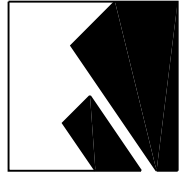


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PRELIMINARY HYDROLOGY AND HYDRAULICS REPORT
STEELE LANE APARTMENTS

OCTOBER 2022

CIVIL DESIGN CONSULTANTS, INC.
2200 Range Avenue, Suite 204
Santa Rosa, CA 95403
(707) 542-4820



PRELIMINARY DRAINAGE REPORT

FOR

STEELE LANE APARTMENTS

*Located at
1650 West Steele Lane
Santa Rosa, CA*

APN 041-042-012

Prepared for

Patrick O'Neil
Stagecoach Development Company, Inc.
19 Leona Drive
San Rafael, CA 94903

October 2022



Prepared by

*CIVIL DESIGN CONSULTANTS, INC.
2200 RANGE AVENUE, SUITE 204
SANTA ROSA, CA 95403*

INTRODUCTION

The Steel Lane Apartments site is located at 1650 West Steele Lane in the City of Santa Rosa. The project consists of 0.98 acres and is contained within one assessor's parcels, APN 041-042-012. The site is currently vacant and consists of native grasses and a handful of trees. There are no existing drainage features onsite.

The project is proposed by Stagecoach Development Company, Inc, as a single, non-phased project. The project proposes the construction of 3 separate apartment buildings consisting of a total of 36 rental units, a leasing office and an onsite laundry facility. The proposed improvements also include site amenities and tenant parking on the property. A new storm drain system will be constructed with this project that will collect overland flow and convey it through an underground pipe network that will connect into the existing 15" storm drain system within Meadowbrook Court.

BRIEF SUMMARY

The following hydrology and hydraulic calculations show that the proposed storm drain system that drains to Meadowbrook Court has the capacity to accept runoff from the proposed development. For more information, see the conclusions section at the end of this report.

HYDROLOGY

The following hydrology calculations were calculated using variables of the Incremental Rational Method (IRM). The variables used in the analysis were obtained from Sonoma Water's Flood Management Design Manual (FMDM). Runoff coefficients (C) were based on FMDM Appendix C, Table C-1, and reflect the existing and ultimate land use of the property and the surrounding areas. Precipitation data was taken from NOAA Atlas 14, which provides site specific rainfall depths and intensities for various storm events. The initial time of concentrations are set at 7 minutes per the proposed land use. Due to the size of the project, the storm drain system will be designed for the 10-year event. A final drainage report will be prepared with the construction permit drawings to show the 100-year storm will not threaten the finish floors of the proposed buildings.

In order to demonstrate to the City of Santa Rosa that the proposed storm drain system is adequately sized and has the capacity to accept runoff from the proposed development, an analysis of the site hydrology has been prepared. The hydrology calculations were performed using the Hydraflow Storm Sewers Extension for Civil 3D developed and marketed by Autodesk. This software suite calculates the peak flow of a catchment by simultaneously calculating a basin's hydrologic characteristics and hydraulic capacity. This differs from the traditional approach of calculating the hydrology independent of any hydraulic or backwater effects. In some situations, this sort of analysis appears to lengthen the time of concentration of a basin due to the velocity in the pipes of the system being calculated under backwater conditions rather than under full-flow/ gravity depth velocities. Such an approach is slightly less conservative but is probably more realistic. Further explanation of the implications of this approach is discussed in the Hydraulic Section of this submittal.

A hydrology map has been prepared and submitted with this package to delineate the proposed hydrologic conditions. The hydrology map defines the limits of the basins tributary to the points of connection to the existing storm drain system within Meadowbrook Court. This map is used as the basis for determining the peak runoff quantities discharged into the system, as determined by existing, proposed, and future land uses. Treatment facilities associated with the Storm Water Low Impact Development Submittal are assumed to be full during the design storm, and any beneficial effects from these features have been ignored to be conservative.

Table C-1. Runoff Coefficients (Cs) (Incremental Rational Method)

Land Use	Lot Size (acres)	Impervious Fraction	Average Slope (%)			
			0-2	>2-6	>6-12	>12
Soil Type A						
Residential ¹						
Rural		0.03	0.24	0.28	0.34	0.38
Very low density	2	0.11	0.29	0.34	0.38	0.42
	1	0.24	0.38	0.42	0.46	0.49
Low density	1/2	0.32	0.43	0.47	0.50	0.53
	1/3	0.41	0.50	0.53	0.56	0.58
Medium-low density	1/4	0.49	0.55	0.58	0.60	0.62
Medium density	1/8	0.70	0.70	0.71	0.73	0.74
Medium-high density	1/18	1	0.90	0.90	0.90	0.90
Business, commercial, etc.		1	0.90	0.90	0.90	0.90
General industrial		1	0.90	0.90	0.90	0.90
Parks and recreation		0.05	0.25	0.25	0.30	0.35
Ag and open space		0.02	0.23	0.23	0.28	0.33
Soil Type B						
Residential ¹						
Rural		0.03	0.28	0.33	0.39	0.43
Very low density	2	0.11	0.34	0.38	0.43	0.47
	1	0.24	0.42	0.45	0.50	0.53
Low density	1/2	0.32	0.47	0.50	0.54	0.57
	1/3	0.41	0.53	0.56	0.59	0.61
Medium-low density	1/4	0.49	0.58	0.60	0.63	0.65
Medium density	1/8	0.70	0.71	0.73	0.74	0.76
Medium-high density	1/18	1	0.90	0.90	0.90	0.90
Business, commercial, etc.		1	0.90	0.90	0.90	0.90
General industrial		1	0.90	0.90	0.90	0.90
Parks and recreation		0.05	0.25	0.30	0.34	0.40
Ag and open space		0.02	0.23	0.28	0.33	0.38
Soil Type C						
Residential ¹						
Rural		0.03	0.33	0.38	0.43	0.47
Very low density	2	0.11	0.38	0.42	0.47	0.51
	1	0.24	0.45	0.49	0.53	0.57
Low density	1/2	0.32	0.50	0.53	0.57	0.60

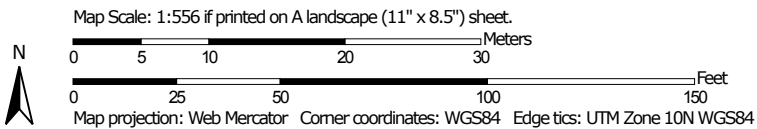
Land Use	Lot Size (acres)	Impervious Fraction	Average Slope (%)			
			0-2	>2-6	>6-12	>12
	1/3	0.41	0.56	0.59	0.62	0.64
Medium-low density	1/4	0.49	0.60	0.63	0.65	0.68
Medium density	1/8	0.70	0.73	0.74	0.76	0.77
Medium-high density	1/18	1	0.90	0.90	0.90	0.90
Business, commercial, etc.		1	0.90	0.90	0.90	0.90
General industrial		1	0.90	0.90	0.90	0.90
Parks and recreation		0.05	0.34	0.39	0.44	0.48
Ag and open space		0.02	0.33	0.38	0.43	0.47
Soil Type D						
Residential ¹						
Rural		0.03	0.38	0.43	0.48	0.52
Very low density	2	0.11	0.42	0.47	0.52	0.55
	1	0.24	0.49	0.53	0.57	0.60
Low density	1/2	0.32	0.54	0.57	0.61	0.63
	1/3	0.41	0.59	0.62	0.65	0.67
Medium-low density	1/4	0.49	0.63	0.65	0.68	0.70
Medium density	1/8	0.70	0.74	0.76	0.77	0.78
Medium-high density	1/18	1	0.90	0.90	0.90	0.90
Business, commercial		1	0.90	0.90	0.90	0.90
General industrial		1	0.90	0.90	0.90	0.90
Parks and recreation		0.05	0.39	0.44	0.49	0.53
Ag and open space		0.02	0.38	0.42	0.48	0.52

¹ Percent impervious values are based on analysis conducted by ESA for Sonoma County Water Agency (Sonoma Water) in 2014, using a sample of existing developed areas.

² For residential areas, composite C values were developed as follows: C values for soil type from Los Angeles County Hydrology Manual (1991) were modified for slope using the vegetated areas curve from Plate B-1 of SCWA (1983) for pervious areas within a given slope range and a C of 0.90 for all impervious areas.

Source: Approach adapted from McCuen 1989

Soil Map—Sonoma County, California
(1650 West Steele Lane)



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

3/29/2019
Page 1 of 3

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: Sonoma County, California

Survey Area Data: Version 12, Sep 13, 2018

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

Date(s) aerial images were photographed: Jul 1, 2018—Jul 31, 2018

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
ZaA	Zamora silty clay loam, moist, 0 to 2 percent slopes, MLRA 14	1.2	100.0%
Totals for Area of Interest		1.2	100.0%

Sonoma County, California

ZaA—Zamora silty clay loam, moist, 0 to 2 percent slopes, MLRA 14

Map Unit Setting

National map unit symbol: 2xcbw

Elevation: 20 to 260 feet

Mean annual precipitation: 27 to 43 inches

Mean annual air temperature: 58 to 59 degrees F

Frost-free period: 288 to 325 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Zamora and similar soils: 85 percent

Minor components: 15 percent

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

Description of Zamora

Setting

Landform: Stream terraces, alluvial fans

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from volcanic and sedimentary rock

Typical profile

A1 - 0 to 5 inches: silty clay loam

A2 - 5 to 17 inches: clay loam

A3 - 17 to 29 inches: clay loam

Bt1 - 29 to 41 inches: clay loam

Bt2 - 41 to 55 inches: sandy clay loam

Bt3 - 55 to 60 inches: gravelly clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.2 to 0.5 mmhos/cm)

Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): 1

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Cole

Percent of map unit: 4 percent

Hydric soil rating: No

Yolo

Percent of map unit: 4 percent

Hydric soil rating: No

Cortina

Percent of map unit: 3 percent

Hydric soil rating: No

Pajaro

Percent of map unit: 3 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

Landform: Depressions

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Sonoma County, California

Survey Area Data: Version 12, Sep 13, 2018



NOAA Atlas 14, Volume 6, Version 2
Location name: Santa Rosa, California, USA*
Latitude: 38.4596°, Longitude: -122.7342°
Elevation: 138.01 ft**

* source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.87 (1.66-2.12)	2.24 (1.99-2.54)	2.74 (2.42-3.12)	3.16 (2.76-3.64)	3.73 (3.14-4.48)	4.19 (3.44-5.15)	4.66 (3.72-5.89)	5.16 (4.00-6.74)	5.86 (4.32-8.03)	6.41 (4.54-9.13)
10-min	1.34 (1.19-1.52)	1.60 (1.42-1.82)	1.96 (1.73-2.24)	2.26 (1.98-2.60)	2.68 (2.26-3.20)	3.00 (2.47-3.68)	3.34 (2.67-4.22)	3.70 (2.86-4.83)	4.19 (3.10-5.75)	4.59 (3.25-6.55)
15-min	1.08 (0.960-1.22)	1.29 (1.15-1.47)	1.58 (1.40-1.80)	1.82 (1.60-2.10)	2.16 (1.82-2.58)	2.42 (1.99-2.97)	2.69 (2.15-3.40)	2.98 (2.31-3.89)	3.38 (2.49-4.64)	3.70 (2.62-5.28)
30-min	0.754 (0.670-0.856)	0.904 (0.802-1.03)	1.11 (0.978-1.26)	1.27 (1.12-1.47)	1.51 (1.27-1.81)	1.69 (1.39-2.08)	1.88 (1.50-2.38)	2.08 (1.61-2.72)	2.36 (1.74-3.24)	2.59 (1.83-3.69)
60-min	0.525 (0.467-0.597)	0.630 (0.559-0.716)	0.770 (0.682-0.879)	0.887 (0.778-1.02)	1.05 (0.885-1.26)	1.18 (0.969-1.45)	1.31 (1.05-1.66)	1.45 (1.12-1.90)	1.65 (1.22-2.26)	1.80 (1.28-2.57)
2-hr	0.394 (0.350-0.446)	0.471 (0.418-0.536)	0.570 (0.505-0.651)	0.650 (0.570-0.749)	0.756 (0.638-0.906)	0.836 (0.688-1.03)	0.916 (0.732-1.16)	0.996 (0.771-1.30)	1.10 (0.814-1.51)	1.18 (0.839-1.69)
3-hr	0.332 (0.295-0.377)	0.397 (0.352-0.451)	0.479 (0.424-0.546)	0.543 (0.477-0.626)	0.628 (0.529-0.752)	0.690 (0.568-0.848)	0.752 (0.601-0.950)	0.813 (0.629-1.06)	0.892 (0.658-1.22)	0.952 (0.674-1.36)
6-hr	0.249 (0.222-0.283)	0.298 (0.265-0.339)	0.358 (0.317-0.408)	0.404 (0.354-0.465)	0.463 (0.391-0.555)	0.507 (0.416-0.622)	0.548 (0.438-0.693)	0.589 (0.456-0.769)	0.641 (0.473-0.878)	0.679 (0.481-0.968)
12-hr	0.175 (0.156-0.199)	0.209 (0.186-0.238)	0.251 (0.222-0.287)	0.283 (0.249-0.327)	0.325 (0.274-0.389)	0.354 (0.291-0.435)	0.383 (0.306-0.484)	0.410 (0.317-0.536)	0.446 (0.329-0.611)	0.471 (0.334-0.672)
24-hr	0.120 (0.108-0.136)	0.145 (0.130-0.164)	0.174 (0.156-0.199)	0.197 (0.176-0.226)	0.227 (0.196-0.268)	0.248 (0.210-0.298)	0.268 (0.222-0.329)	0.287 (0.233-0.362)	0.312 (0.244-0.408)	0.330 (0.250-0.445)
2-day	0.078 (0.070-0.088)	0.096 (0.086-0.109)	0.118 (0.105-0.134)	0.134 (0.119-0.154)	0.155 (0.134-0.183)	0.170 (0.144-0.205)	0.184 (0.153-0.227)	0.198 (0.160-0.249)	0.215 (0.168-0.281)	0.228 (0.172-0.307)
3-day	0.059 (0.053-0.067)	0.074 (0.066-0.084)	0.092 (0.082-0.105)	0.106 (0.094-0.121)	0.123 (0.106-0.145)	0.135 (0.114-0.162)	0.146 (0.122-0.180)	0.157 (0.128-0.198)	0.171 (0.134-0.224)	0.181 (0.137-0.244)
4-day	0.049 (0.044-0.056)	0.062 (0.056-0.070)	0.078 (0.070-0.088)	0.089 (0.080-0.103)	0.104 (0.090-0.123)	0.114 (0.097-0.138)	0.124 (0.103-0.153)	0.134 (0.108-0.168)	0.145 (0.113-0.190)	0.154 (0.116-0.207)
7-day	0.035 (0.031-0.039)	0.044 (0.040-0.050)	0.056 (0.050-0.063)	0.064 (0.057-0.073)	0.075 (0.064-0.088)	0.082 (0.070-0.099)	0.089 (0.074-0.109)	0.096 (0.077-0.120)	0.104 (0.081-0.136)	0.110 (0.083-0.148)
10-day	0.028 (0.025-0.032)	0.035 (0.032-0.040)	0.044 (0.040-0.051)	0.051 (0.045-0.059)	0.059 (0.051-0.070)	0.065 (0.055-0.079)	0.071 (0.059-0.087)	0.076 (0.062-0.096)	0.082 (0.064-0.108)	0.087 (0.066-0.117)
20-day	0.018 (0.017-0.021)	0.023 (0.021-0.027)	0.029 (0.026-0.034)	0.034 (0.030-0.039)	0.039 (0.034-0.046)	0.043 (0.036-0.052)	0.046 (0.038-0.057)	0.050 (0.040-0.062)	0.053 (0.042-0.070)	0.056 (0.043-0.076)
30-day	0.015 (0.013-0.017)	0.019 (0.017-0.021)	0.024 (0.021-0.027)	0.027 (0.024-0.031)	0.031 (0.027-0.037)	0.034 (0.029-0.041)	0.037 (0.031-0.045)	0.039 (0.032-0.050)	0.042 (0.033-0.055)	0.044 (0.034-0.060)
45-day	0.012 (0.011-0.014)	0.015 (0.014-0.017)	0.019 (0.017-0.022)	0.022 (0.019-0.025)	0.025 (0.022-0.030)	0.027 (0.023-0.033)	0.029 (0.024-0.036)	0.031 (0.025-0.039)	0.034 (0.026-0.044)	0.035 (0.027-0.047)
60-day	0.011 (0.010-0.012)	0.014 (0.012-0.015)	0.017 (0.015-0.019)	0.019 (0.017-0.022)	0.022 (0.019-0.026)	0.024 (0.020-0.029)	0.026 (0.021-0.032)	0.027 (0.022-0.034)	0.029 (0.023-0.038)	0.030 (0.023-0.041)

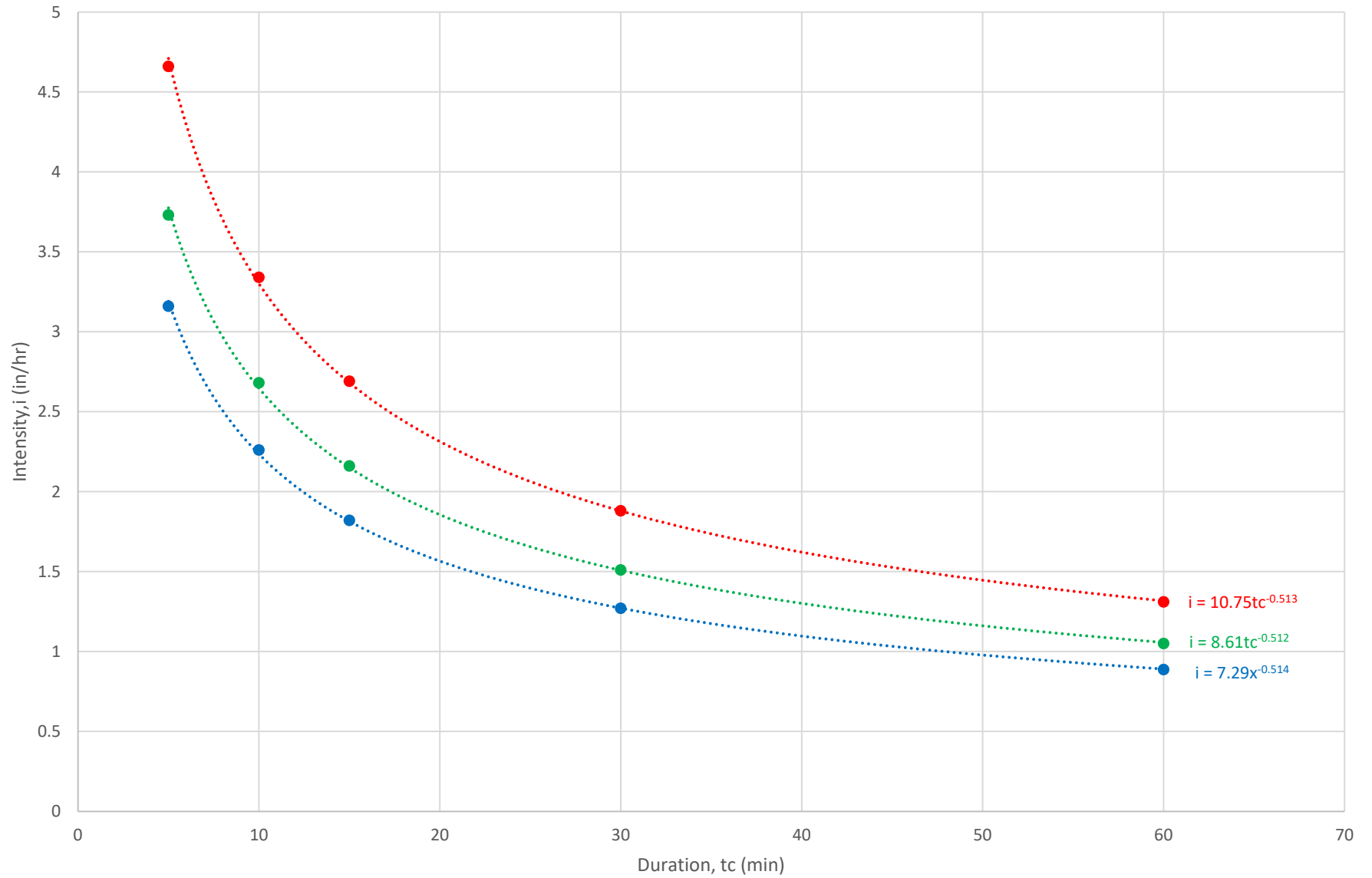
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

STEELE LANE APARTMENTS - Rainfall Intensity vs Duration

10-Year 25-Year 100-Year 10-Year IDF Curve 25-Year IDF Curve 100-Year IDF Curve



HYDRAULICS

Basis

As was mentioned in the preceding section, the hydraulics of the project were analyzed simultaneously with the hydrology of the project. Therefore, the hydraulics and hydrology are more interdependent than had they been analyzed separately.

System Analysis

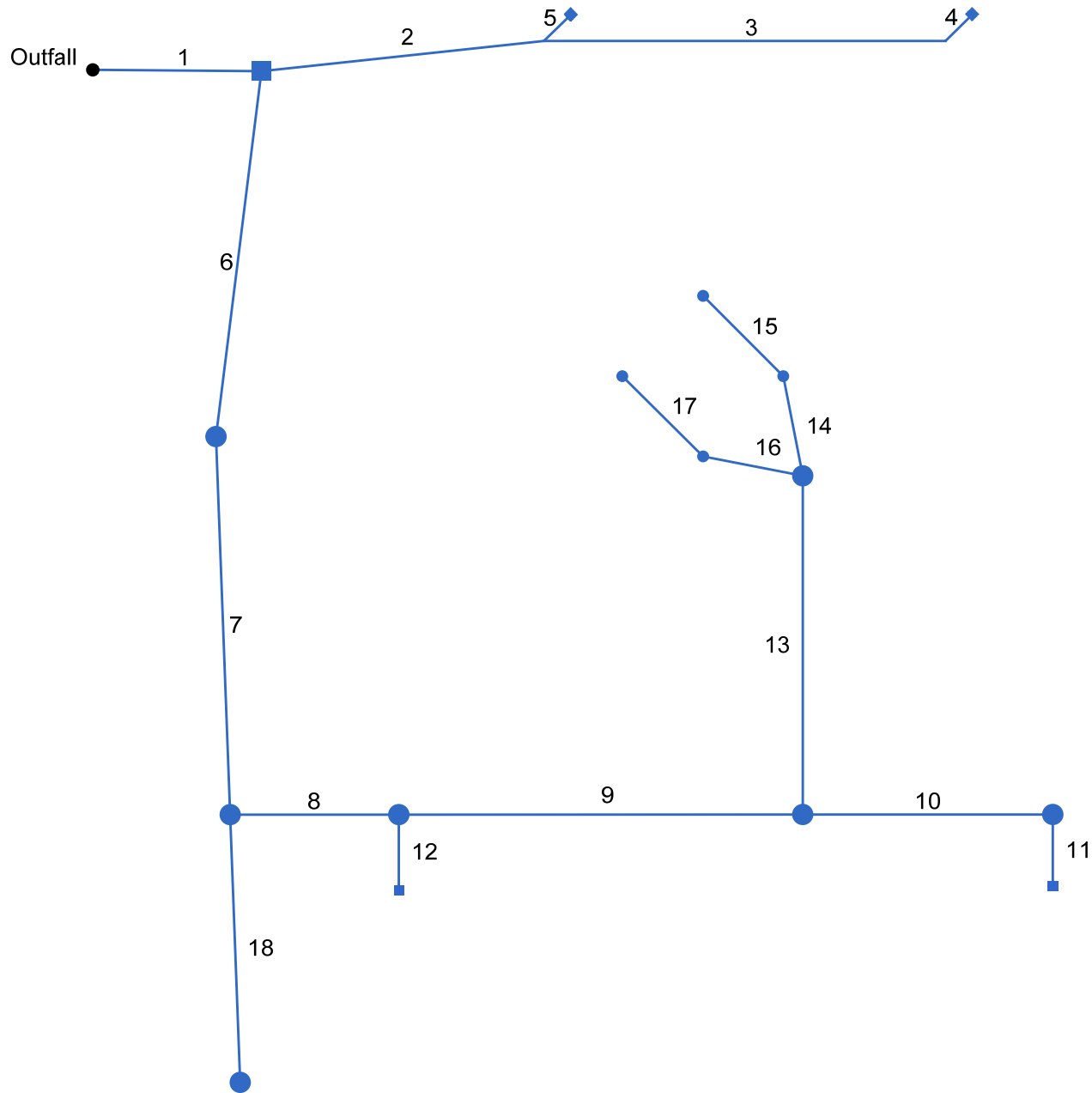
The proposed onsite storm drain system has two connection points to the storm drain system within Meadowbrook Court. The first connection is the proposed 15" storm drain within the projects drive aisle to the existing 15" storm drain within the northbound lane of Meadowbrook Court. The second connection point is the proposed 15" storm drain connecting to the existing 21" storm drain crossing Meadowbrook Court at the northwest corner of the project site. The system was analyzed as a model with a single outfall at the existing catch basin across Meadowbrook Court from the second connection point.

The Autodesk software automatically computes minor losses at junctions and inlets based on data adapted from FHWA HEC No. 22. The backwater analysis of the storm drain systems is based on this method. Also, since the proposed storm drain system consists of HDPE plastic pipes, the Manning's n for the pipes has been set at 0.012 per FMDM Table D.2-4.

Starting HGL

Sonoma Water does not have reliable and/or up to date hydraulic data of the existing storm drain system within Meadowbrook Court therefore the flow line of the gutter pan at the second connection was used as the starting 10-year HGL elevation. The 10-year starting HGL was set to an elevation of 133.60. This was done as a conservative measure to assure that the existing storm drain system within Meadowbrook Court is analyzed as flowing at maximum capacity and prove that the proposed storm drain system can convey the runoff from the proposed improvements. The analysis was accomplished by backwatering against the 10-year hydraulic grade line as previously mentioned.

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



Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	36	0	DrCrb	0.00	0.82	0.90	7.0	129.54	0.31	129.65	21	Cir	0.014	1.50	133.60	LINE 1
2	1	60	-7	MH	0.00	0.00	0.00	0.0	129.75	0.50	130.05	15	Cir	0.012	0.67	135.17	LINE 2
3	2	85	6	MH	0.00	0.00	0.00	0.0	130.33	0.51	130.76	8	Cir	0.012	0.75	135.68	LINE 3
4	3	8	-45	DrGrt	0.00	0.15	0.90	7.0	130.76	0.49	130.80	8	Cir	0.012	1.00	134.82	LINE 4
5	2	8	-39	DrGrt	0.00	0.05	0.90	7.0	130.15	0.50	130.19	8	Cir	0.012	1.00	134.28	LINE 5
6	1	78	97	MH	0.00	0.00	0.00	0.0	129.75	0.31	129.99	15	Cir	0.014	0.19	134.28	LINE 6
7	6	80	-9	MH	0.00	0.00	0.00	0.0	130.01	0.31	130.26	15	Cir	0.014	1.00	134.69	LINE 7
8	7	36	-88	MH	0.00	0.00	0.00	0.0	130.36	0.50	130.54	15	Cir	0.012	1.00	135.14	LINE 8
9	8	86	0	MH	0.00	0.00	0.00	0.0	130.54	0.50	130.97	12	Cir	0.012	1.00	135.71	LINE 9
10	9	53	0	MH	0.00	0.00	0.00	0.0	130.97	0.51	131.24	12	Cir	0.012	1.00	135.55	LINE 10
11	10	15	90	DrGrt	0.00	0.29	0.90	7.0	131.34	0.52	131.42	12	Cir	0.012	1.00	135.01	LINE 11
12	8	16	90	DrGrt	0.00	0.16	0.90	7.0	130.64	0.50	130.72	12	Cir	0.012	1.00	134.64	LINE 12
13	9	72	-90	MH	0.00	0.00	0.00	0.0	131.07	0.50	131.43	12	Cir	0.012	0.98	136.76	LINE 13
14	13	22	-11	DrGrt	0.00	0.04	0.90	7.0	131.43	0.51	131.54	8	Cir	0.012	0.92	135.58	LINE 14
15	14	24	-34	DrGrt	0.00	0.07	0.90	7.0	131.54	0.50	131.66	8	Cir	0.012	1.00	135.49	LINE 15
16	13	22	-79	DrGrt	0.00	0.04	0.90	7.0	131.53	0.51	131.64	8	Cir	0.012	0.92	136.16	LINE 16
17	16	24	34	DrGrt	0.00	0.05	0.90	7.0	131.64	0.50	131.76	8	Cir	0.012	1.00	136.16	LINE 17
18	7	57	0	MH	0.00	1.19	0.90	7.0	130.26	0.32	130.44	15	Cir	0.014	1.00	134.74	LINE 18
Project File: WSL-HnH MODEL-single outfall.stm												Number of lines: 18				Date: 10/12/2022	

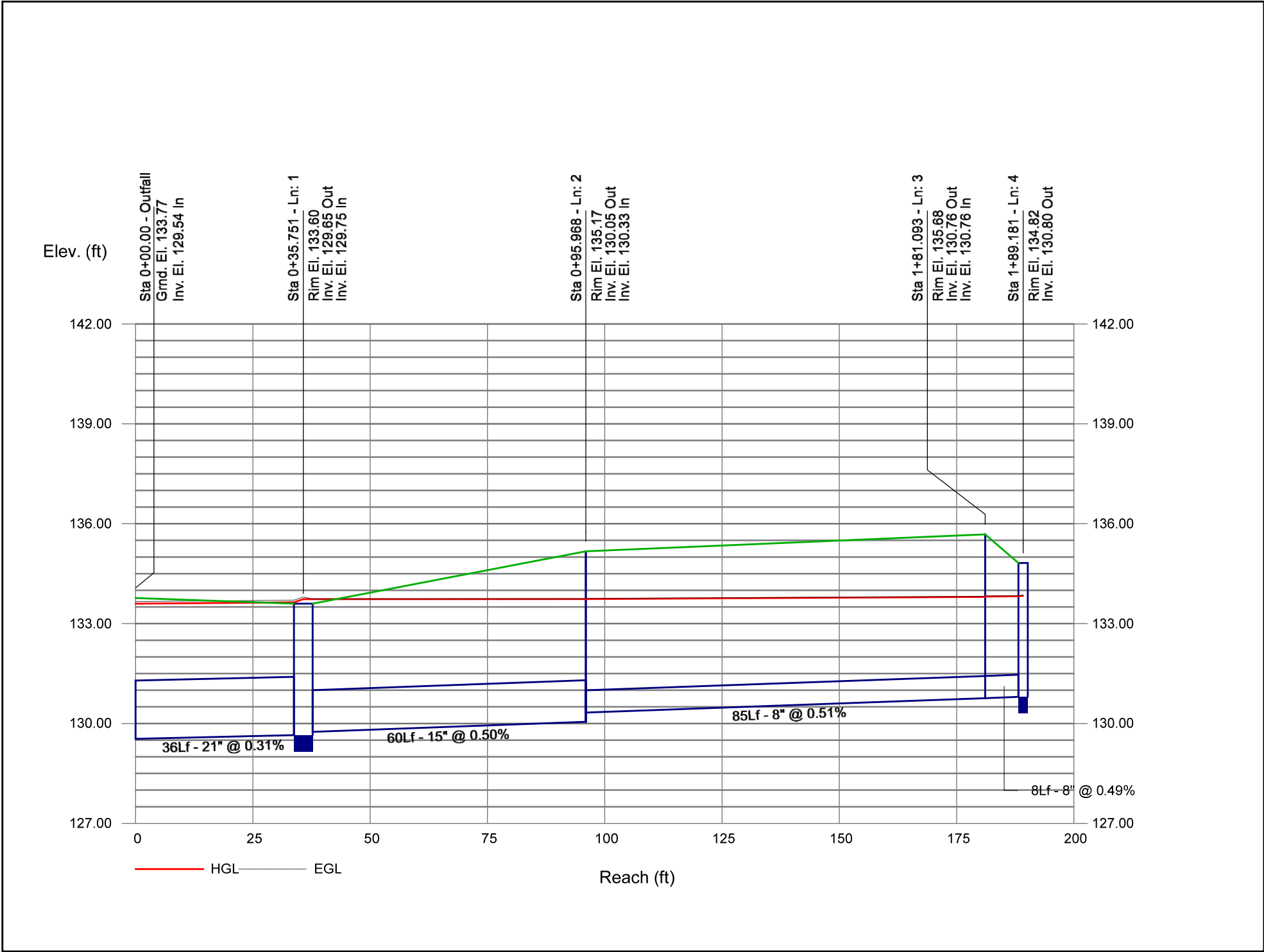
Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (I) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr (min)	Total (min)	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
18	7	57	1.19	1.19	0.90	1.07	1.07	7.0	7.0	2.7	2.87	3.37	2.34	15	0.32	130.26	130.44	134.33	134.46	134.69	134.74	LINE 18
17	16	24	0.05	0.05	0.90	0.05	0.05	7.0	7.0	2.7	0.12	0.92	0.35	8	0.50	131.64	131.76	134.45	134.45	136.16	136.16	LINE 17
16	13	22	0.04	0.09	0.90	0.04	0.08	7.0	8.2	2.5	0.20	0.94	0.57	8	0.51	131.53	131.64	134.44	134.44	136.76	136.16	LINE 16
15	14	24	0.07	0.07	0.90	0.06	0.06	7.0	7.0	2.7	0.17	0.92	0.48	8	0.50	131.54	131.66	134.45	134.46	135.58	135.49	LINE 15
14	13	22	0.04	0.11	0.90	0.04	0.10	7.0	7.8	2.5	0.25	0.93	0.72	8	0.51	131.43	131.54	134.44	134.45	136.76	135.58	LINE 14
13	9	72	0.00	0.20	0.00	0.00	0.18	0.0	8.8	2.4	0.43	2.73	0.55	12	0.50	131.07	131.43	134.42	134.43	135.71	136.76	LINE 13
12	8	16	0.16	0.16	0.90	0.14	0.14	7.0	7.0	2.7	0.39	2.73	0.49	12	0.50	130.64	130.72	134.35	134.35	135.14	134.64	LINE 12
11	10	15	0.29	0.29	0.90	0.26	0.26	7.0	7.0	2.7	0.70	2.79	0.89	12	0.52	131.34	131.42	134.45	134.46	135.55	135.01	LINE 11
10	9	53	0.00	0.29	0.00	0.00	0.26	0.0	7.3	2.6	0.69	2.75	0.87	12	0.51	130.97	131.24	134.42	134.44	135.71	135.55	LINE 10
9	8	86	0.00	0.49	0.00	0.00	0.44	0.0	11.0	2.1	0.94	2.73	1.19	12	0.50	130.54	130.97	134.35	134.40	135.14	135.71	LINE 9
8	7	36	0.00	0.65	0.00	0.00	0.59	0.0	12.2	2.0	1.18	4.96	0.96	15	0.50	130.36	130.54	134.33	134.34	134.69	135.14	LINE 8
7	6	80	0.00	1.84	0.00	0.00	1.66	0.0	12.8	2.0	3.26	3.34	2.66	15	0.31	130.01	130.26	133.98	134.22	134.28	134.69	LINE 7
6	1	78	0.00	1.84	0.00	0.00	1.66	0.0	13.3	1.9	3.20	3.32	2.61	15	0.31	129.75	129.99	133.74	133.96	133.60	134.28	LINE 6
5	2	8	0.05	0.05	0.90	0.05	0.05	7.0	7.0	2.7	0.12	0.93	0.35	8	0.50	130.15	130.19	133.74	133.74	135.17	134.28	LINE 5
4	3	8	0.15	0.15	0.90	0.14	0.14	7.0	7.0	2.7	0.36	0.92	1.04	8	0.49	130.76	130.80	133.82	133.82	135.68	134.82	LINE 4
3	2	85	0.00	0.15	0.00	0.00	0.14	0.0	7.1	2.7	0.36	0.93	1.03	8	0.51	130.33	130.76	133.74	133.80	135.17	135.68	LINE 3
2	1	60	0.00	0.20	0.00	0.00	0.18	0.0	8.5	2.4	0.44	4.94	0.36	15	0.50	129.75	130.05	133.74	133.74	133.60	135.17	LINE 2
1	End	36	0.82	2.86	0.90	0.74	2.57	7.0	13.8	1.9	4.88	8.16	2.03	21	0.31	129.54	129.65	133.60	133.64	133.77	133.60	LINE 1
Project File: WSL-HnH MODEL-single outfall.stm																Number of lines: 18				Run Date: 10/12/2022		
NOTES:Intensity = 7.29 / (Inlet time + 0.00) ^ 0.51; Return period =Yrs. 10 ; c = cir e = ellip b = box																						

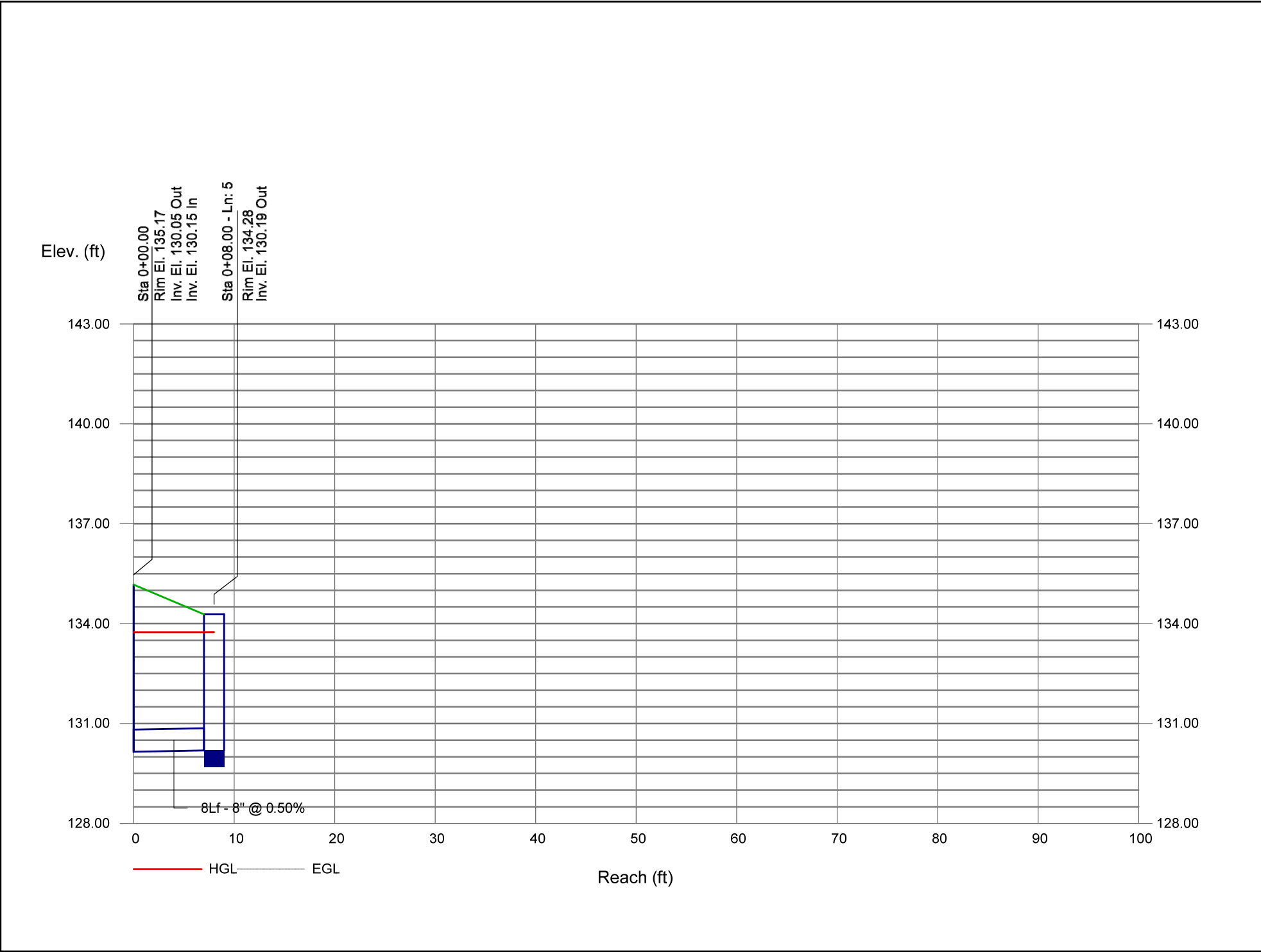
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss	
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)			
	(in)	(cfs)									(ft)											(K)	(ft)	
1	21	4.88	129.54	133.60	1.75	2.40	2.03	0.06	133.66	0.110	36	129.65	133.64	1.75	2.41	2.03	0.06	133.70	0.110	0.110	0.039	1.50	0.10	
2	15	0.44	129.75	133.74	1.25	1.23	0.36	0.00	133.74	0.004	60	130.05	133.74	1.25	1.23	0.36	0.00	133.74	0.004	0.004	0.002	0.67	0.00	
3	8	0.36	130.33	133.74	0.67	0.35	1.03	0.02	133.76	0.075	85	130.76	133.80	0.67	0.35	1.03	0.02	133.82	0.075	0.075	0.064	0.75	0.01	
4	8	0.36	130.76	133.82	0.67	0.35	1.04	0.02	133.83	0.077	8	130.80	133.82	0.67	0.35	1.04	0.02	133.84	0.077	0.077	0.006	1.00	0.02	
5	8	0.12	130.15	133.74	0.67	0.35	0.35	0.00	133.74	0.009	8	130.19	133.74	0.67	0.35	0.35	0.00	133.74	0.009	0.009	0.001	1.00	0.00	
6	15	3.20	129.75	133.74	1.25	1.23	2.61	0.11	133.84	0.285	78	129.99	133.96	1.25	1.23	2.61	0.11	134.06	0.284	0.284	0.223	0.19	0.02	
7	15	3.26	130.01	133.98	1.25	1.23	2.66	0.11	134.09	0.296	80	130.26	134.22	1.25	1.23	2.66	0.11	134.33	0.296	0.296	0.238	1.00	0.11	
8	15	1.18	130.36	134.33	1.25	1.23	0.96	0.01	134.34	0.029	36	130.54	134.34	1.25	1.23	0.96	0.01	134.35	0.029	0.029	0.010	1.00	0.01	
9	12	0.94	130.54	134.35	1.00	0.79	1.19	0.02	134.37	0.059	86	130.97	134.40	1.00	0.79	1.19	0.02	134.42	0.059	0.059	0.051	1.00	0.02	
10	12	0.69	130.97	134.42	1.00	0.79	0.87	0.01	134.44	0.032	53	131.24	134.44	1.00	0.79	0.87	0.01	134.45	0.032	0.032	0.017	1.00	0.01	
11	12	0.70	131.34	134.45	1.00	0.79	0.89	0.01	134.46	0.033	15	131.42	134.46	1.00	0.79	0.89	0.01	134.47	0.033	0.033	0.005	1.00	0.01	
12	12	0.39	130.64	134.35	1.00	0.79	0.49	0.00	134.35	0.010	16	130.72	134.35	1.00	0.79	0.49	0.00	134.36	0.010	0.010	0.002	1.00	0.00	
13	12	0.43	131.07	134.42	1.00	0.79	0.55	0.00	134.43	0.012	72	131.43	134.43	1.00	0.79	0.55	0.00	134.44	0.012	0.012	0.009	0.98	0.00	
14	8	0.25	131.43	134.44	0.67	0.35	0.72	0.01	134.45	0.037	22	131.54	134.45	0.67	0.35	0.72	0.01	134.45	0.037	0.037	0.008	0.92	0.01	
15	8	0.17	131.54	134.45	0.67	0.35	0.48	0.00	134.46	0.017	24	131.66	134.46	0.67	0.35	0.48	0.00	134.46	0.017	0.017	0.004	1.00	0.00	
16	8	0.20	131.53	134.44	0.67	0.35	0.58	0.01	134.44	0.024	22	131.64	134.44	0.67	0.35	0.57	0.01	134.45	0.024	0.024	0.005	0.92	0.00	
17	8	0.12	131.64	134.45	0.67	0.35	0.35	0.00	134.45	0.009	24	131.76	134.45	0.67	0.35	0.35	0.00	134.45	0.009	0.009	0.002	1.00	0.00	
18	15	2.87	130.26	134.33	1.25	1.23	2.34	0.09	134.41	0.230	57	130.44	134.46	1.25	1.23	2.34	0.09	134.54	0.229	0.229	0.131	1.00	0.09	
Project File: WSL-HnH MODEL-single outfall.stm														Number of lines: 18					Run Date: 10/12/2022					
; c = cir e = ellip b = box																								

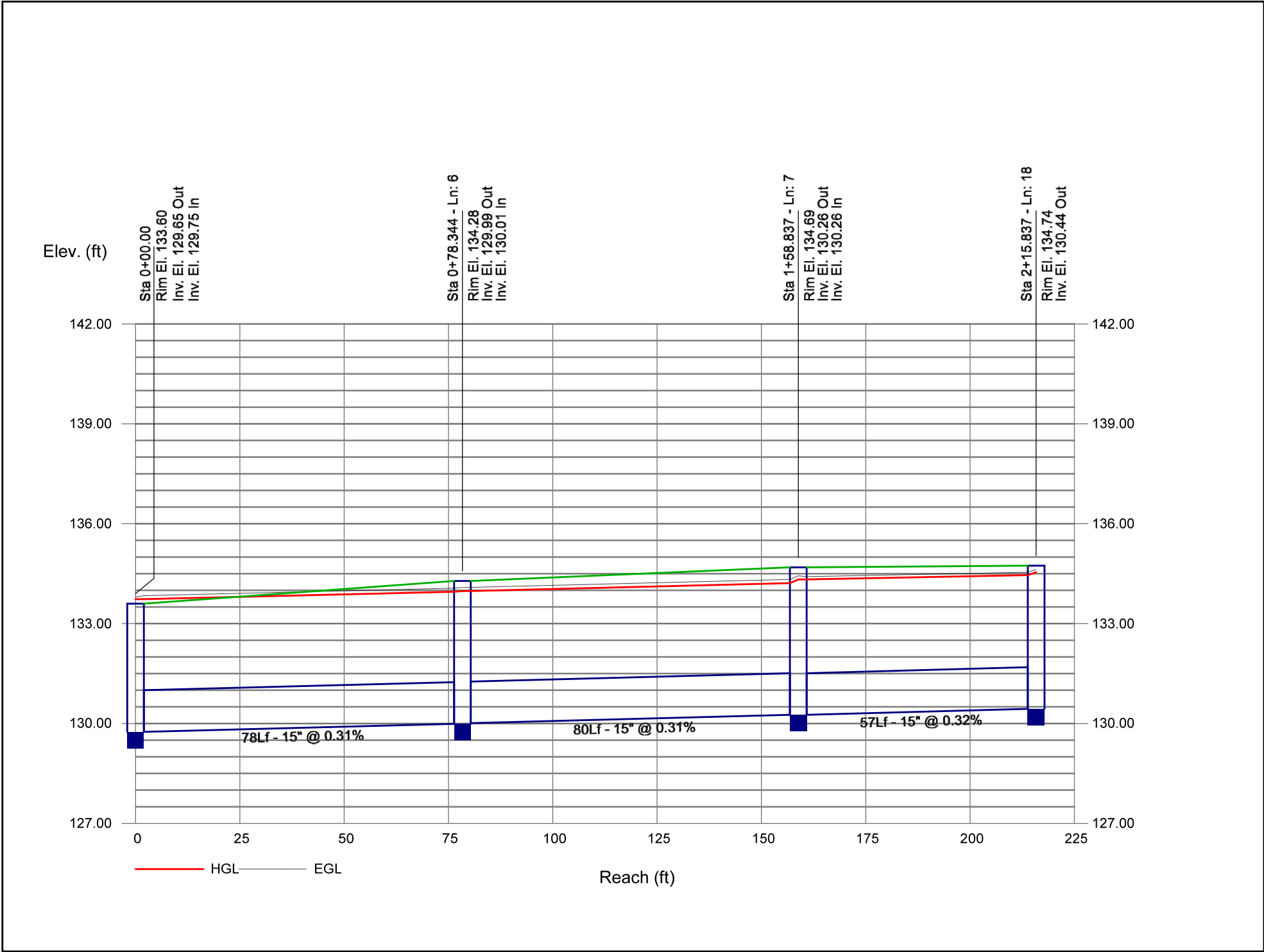
Storm Sewer Profile



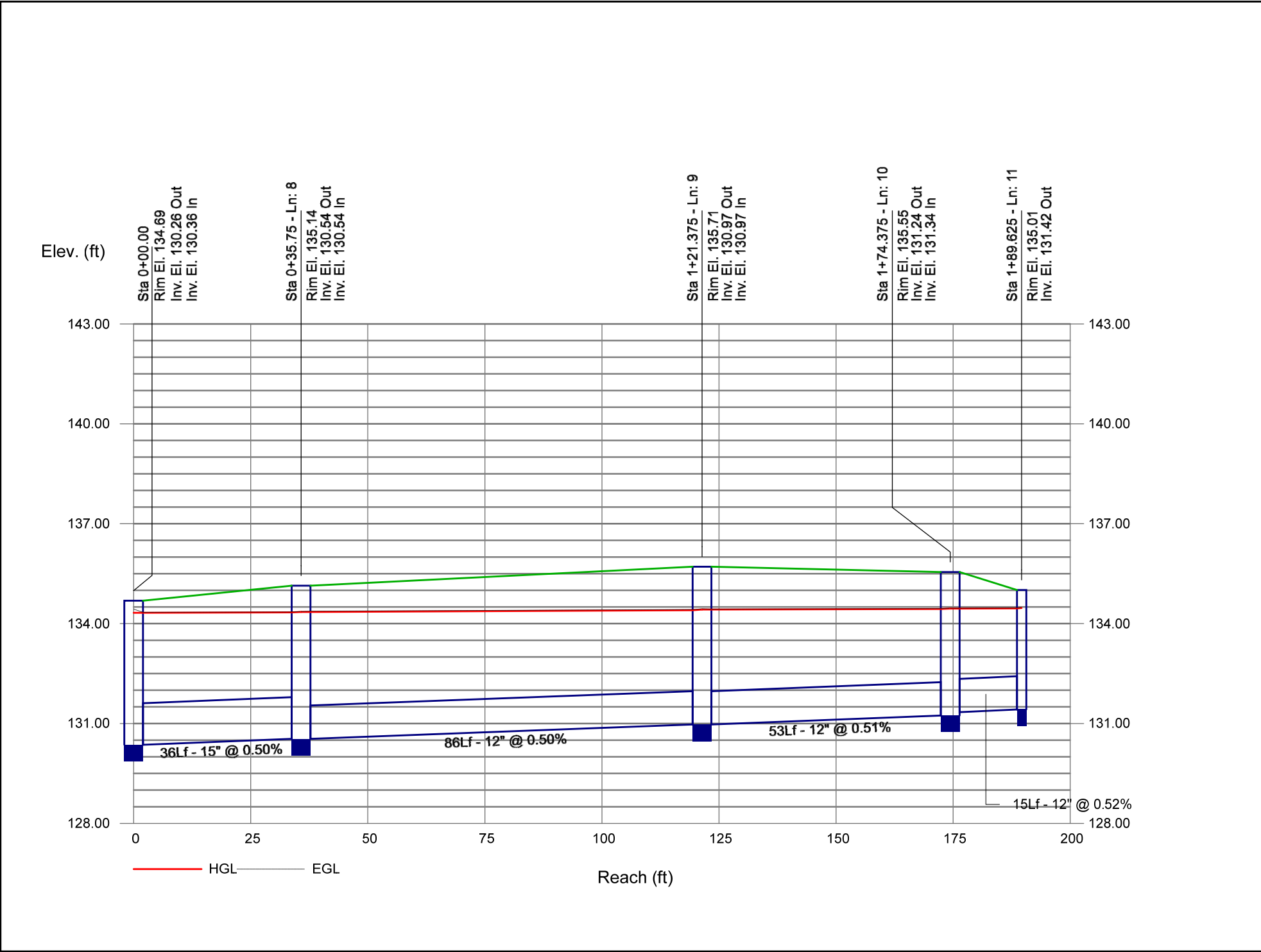
Storm Sewer Profile



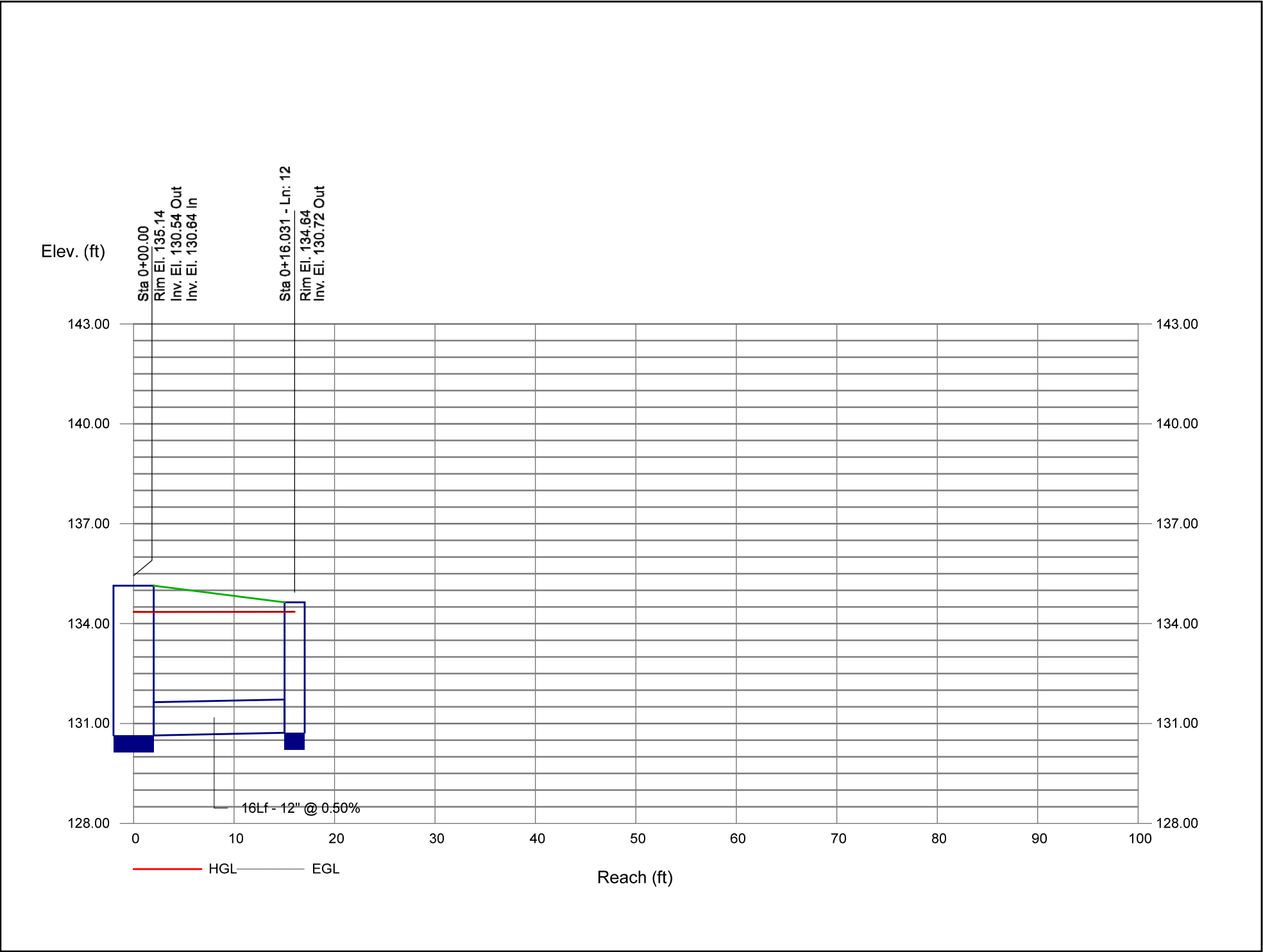
Storm Sewer Profile



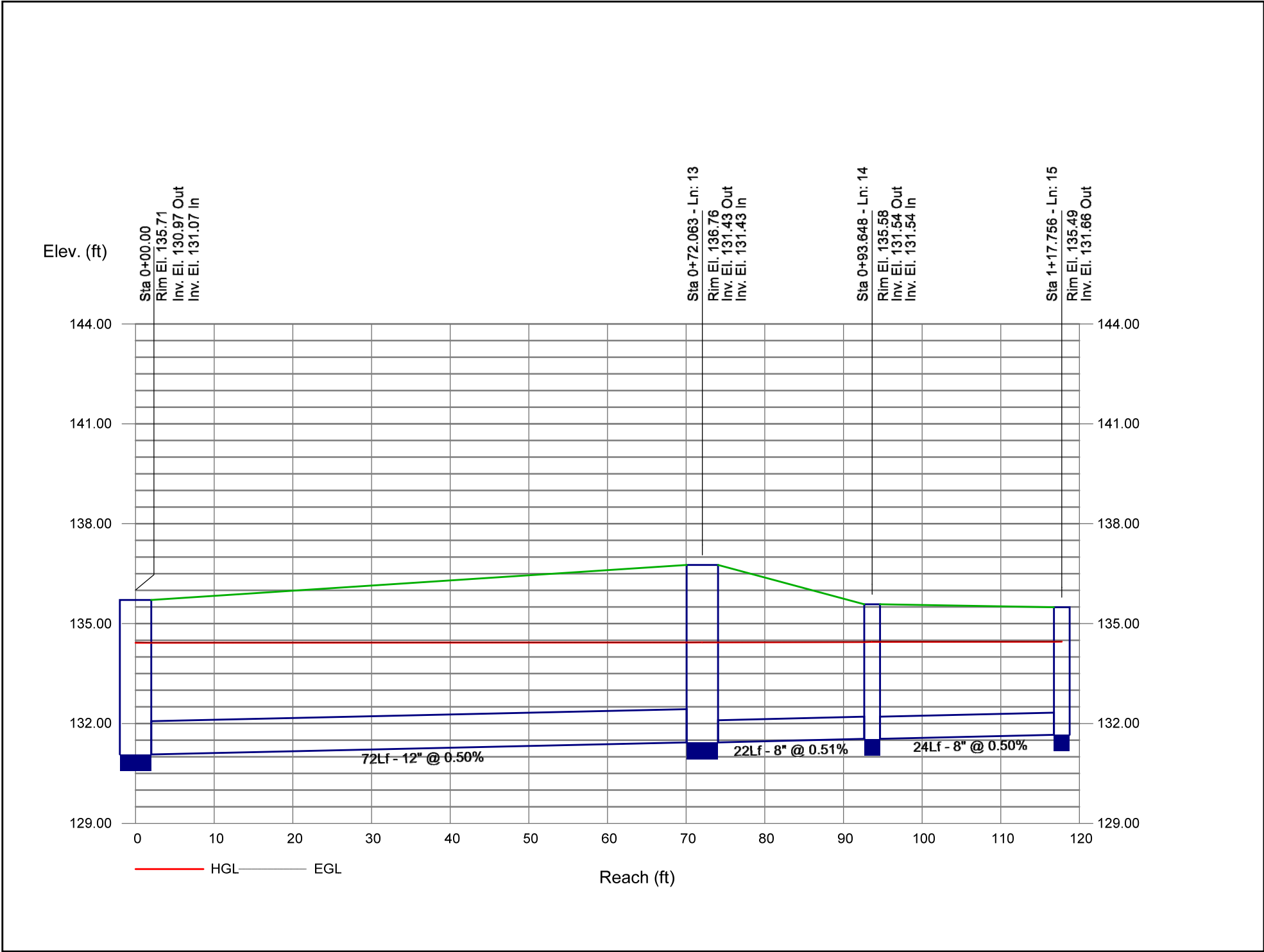
Storm Sewer Profile



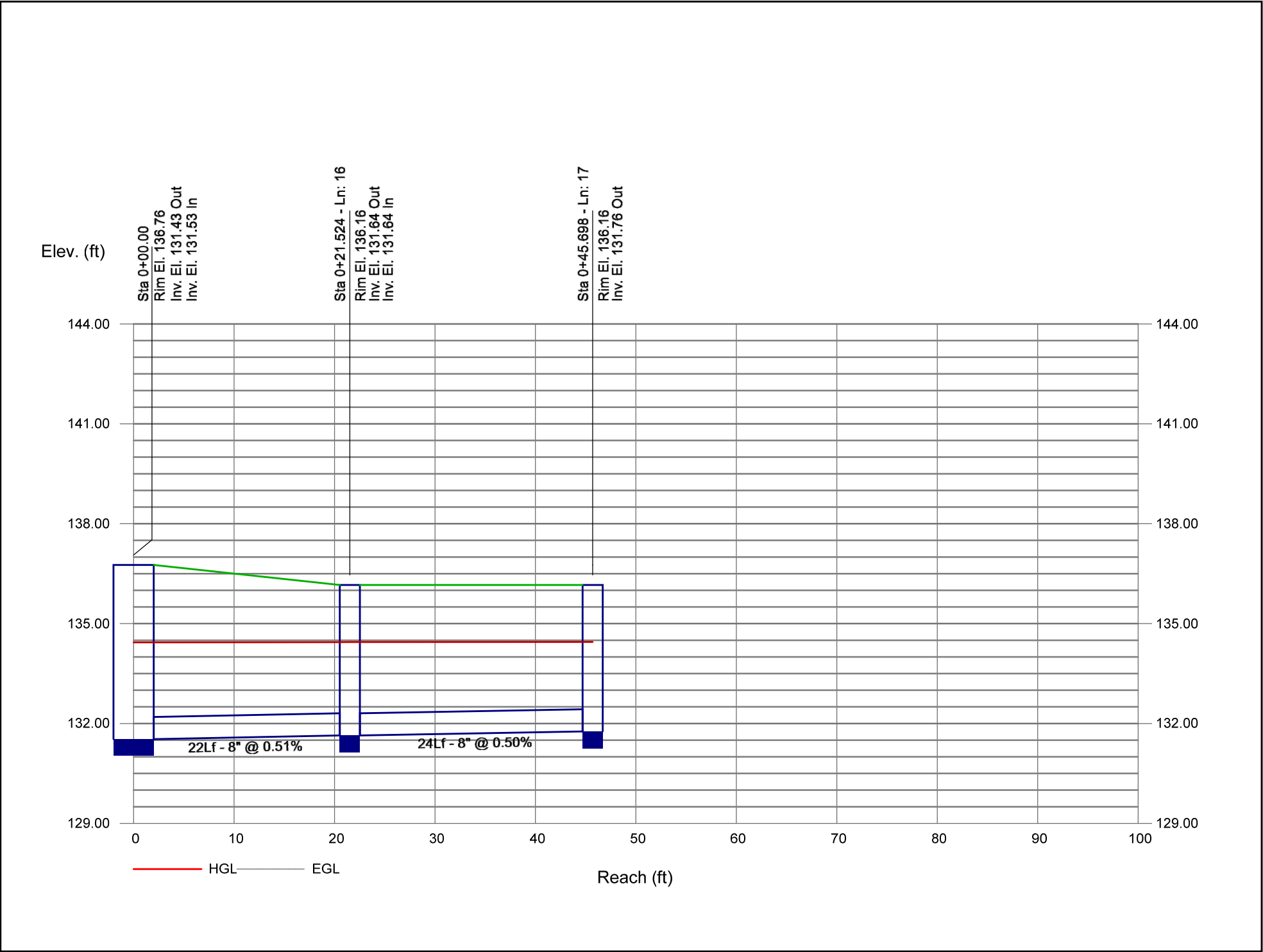
Storm Sewer Profile



Storm Sewer Profile



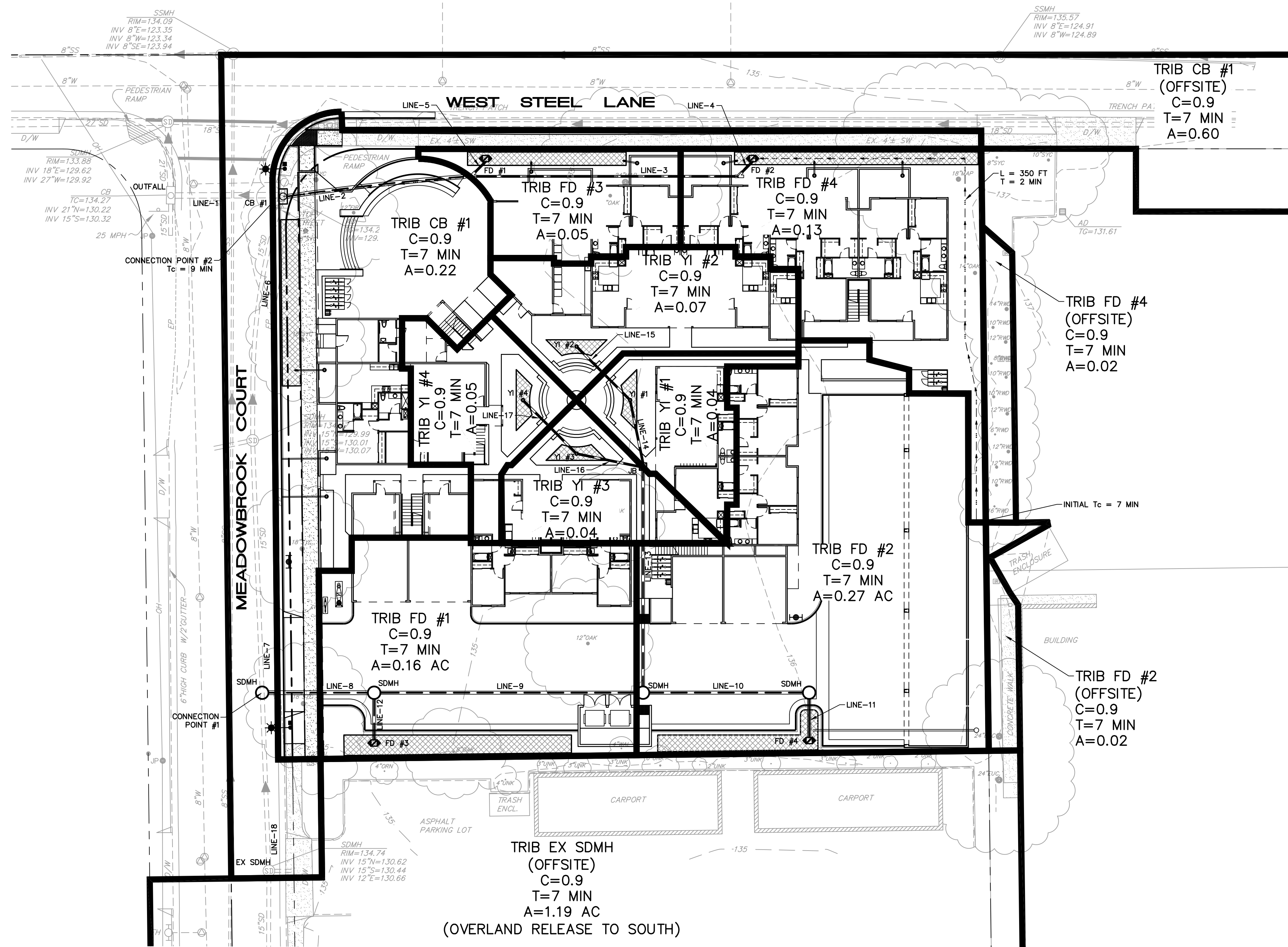
Storm Sewer Profile



CONCLUSIONS

Analysis of the proposed storm drain system shows that the system is fully capable of accepting discharge produced by the 10-year storm event from the proposed development. Ponding does not occur at any of the proposed low points/inlets throughout the project site demonstrating that the proposed system is adequately sized.

Exhibits



OVERLAND HYDROLOGY

Q=CAI

TOTAL A = 1.67 ACRES
WEIGHTED C = 0.9

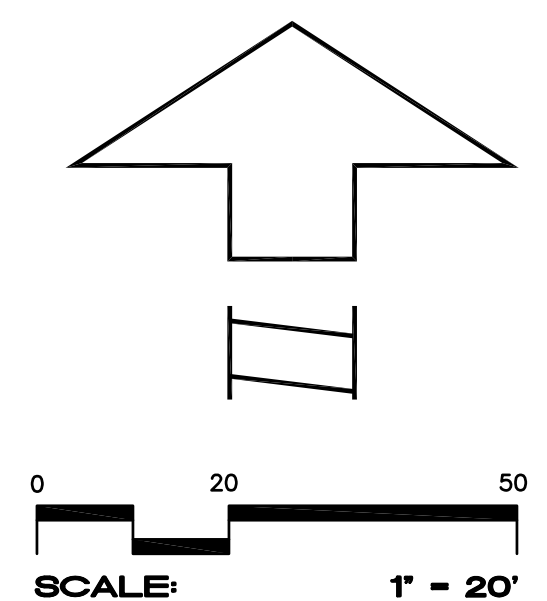
Q-100 =
 $(0.90) * (1.67) * (10.75) / (9) ^{(0.513)}$
Q-100 = 5.23 CFS

Q-10 =
 $(0.90) * (1.67) * (7.29) / (9) ^{(0.514)}$
Q10 = 3.54 CFS

Q-OVERLAND = Q-100 - Q-10 =
1.69 CFS

NOTES:

T = L / (2.5 FT/SEC) / (60 SEC/MIN)
Tc @ POC = INITIAL Tc + T



CIVIL DESIGN CONSULTANTS, INC.
2200 Range Avenue, Suite 204
Santa Rosa, CA 95403
(707) 542-4820

PRELIMINARY HYDROLOGY MAP
STEELE LANE APARTMENTS
1650 WEST STEELE LANE
SANTA ROSA, CA
APN: 041-042-012
DOC. NO. 2017-076633
OCTOBER 2022

JOB NO.
19-107

SHEET NO.

1

OF 1 SHEETS

BENCHMARK

CITY OF SANTA ROSA BENCHMARK D-146, BEING A BRASS DISK IN WELL MONUMENT NEAR THE CENTERLINE INTERSECTION OF WEST STEELE LANE AND HARDIES LANE. ELEVATION = 132.40.

OWNER

PATRICK O'NEIL
STAGECOACH DEVELOPMENT
COMPANY, INC.
19 LEONA DRIVE
SAN RAFAEL, CA 94903
(415) 491-4091

ARCHITECT

HEDGPETH ARCHITECTS
INGRID ANDERSON
2321 BETHARDS DRIVE, SUITE B
SANTA ROSA, CA 95404
(707) 523-7010

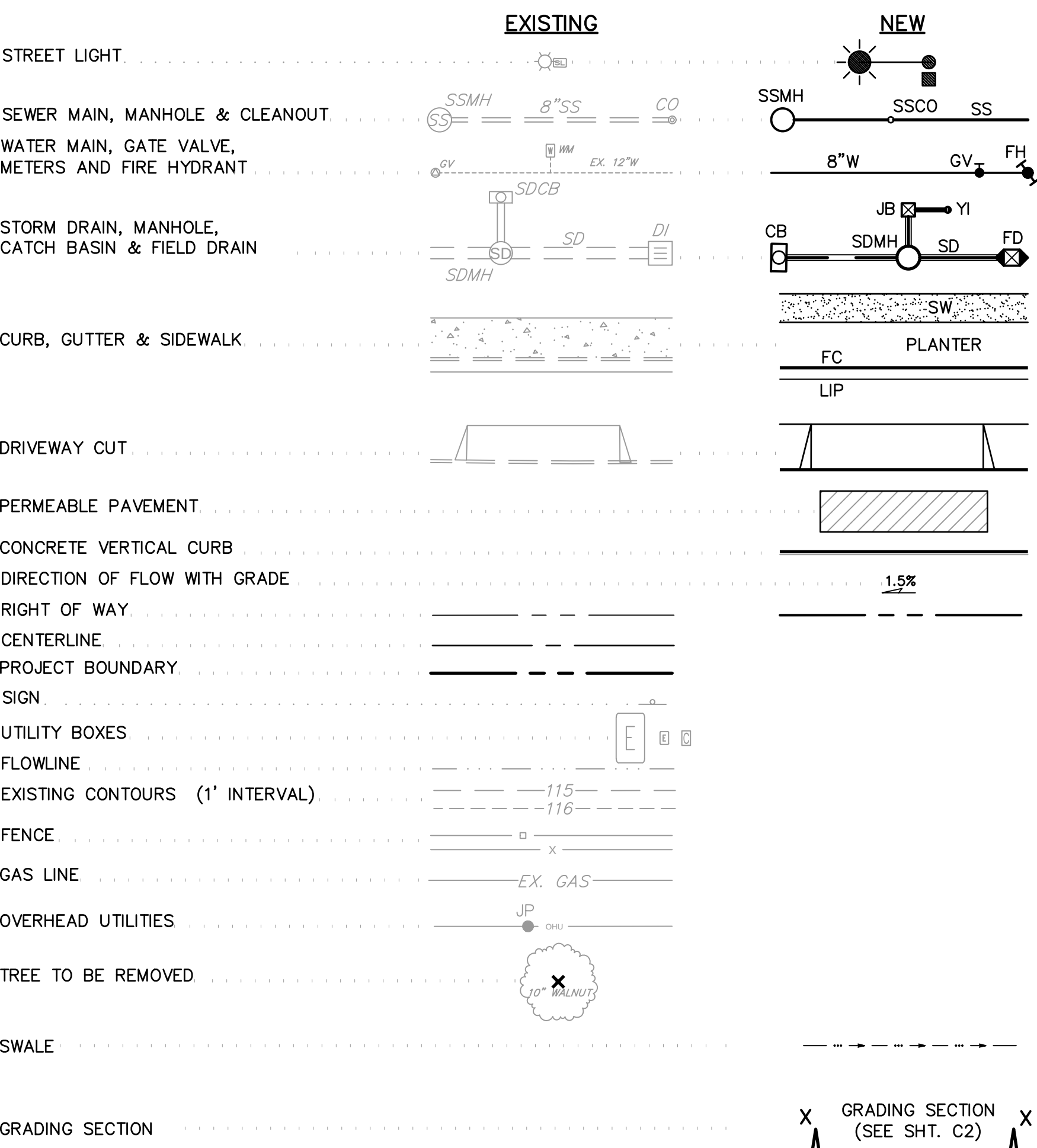
ENGINEER

CIVIL DESIGN CONSULTANTS, INC.
2200 RANGE AVENUE, SUITE 204
SANTA ROSA, CA 95403
(707) 542-4820

SURVEYOR

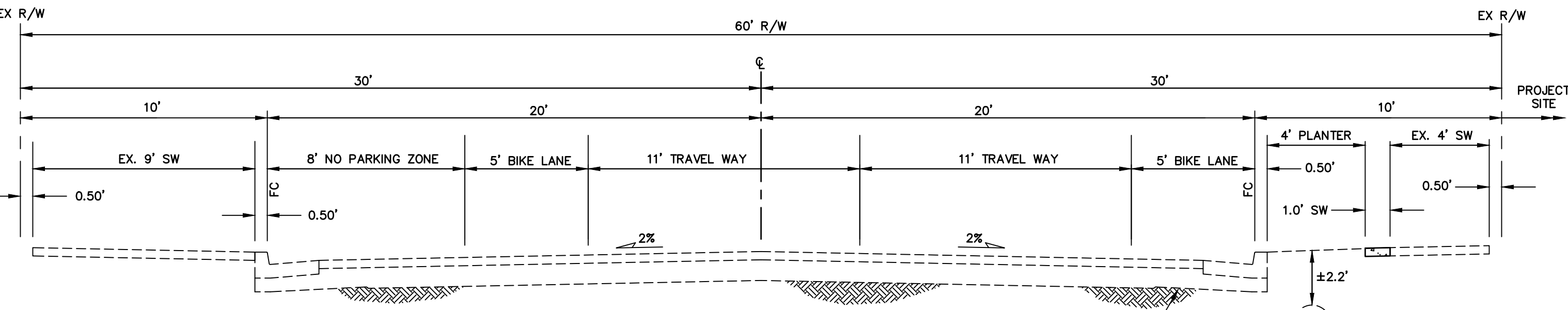
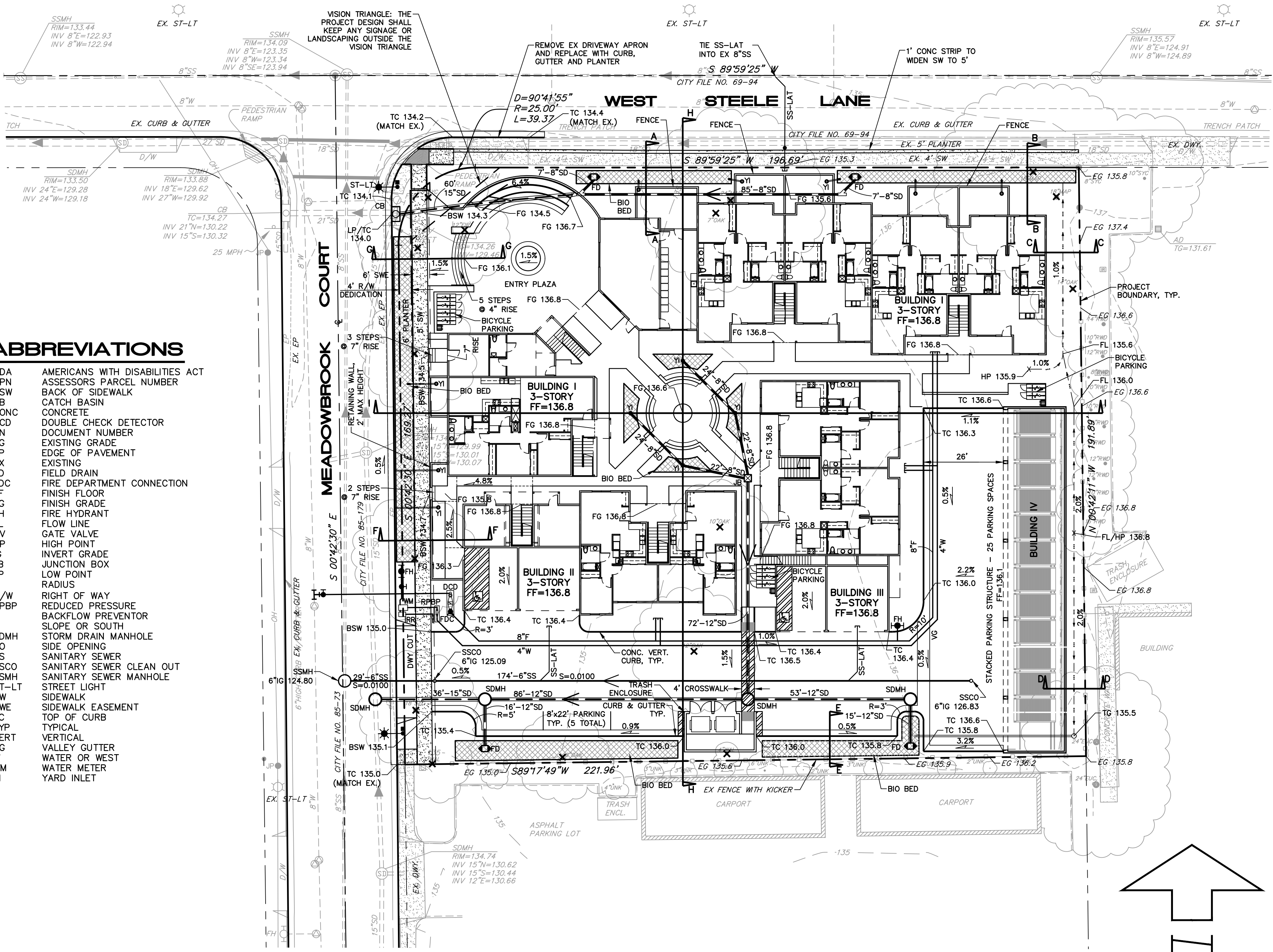
MIKE FORD LAND SURVEYING
8910 SONOMA HWY, SUITE 12B
KENWOOD, CA 95452
(707) 833-6468

LEGEND

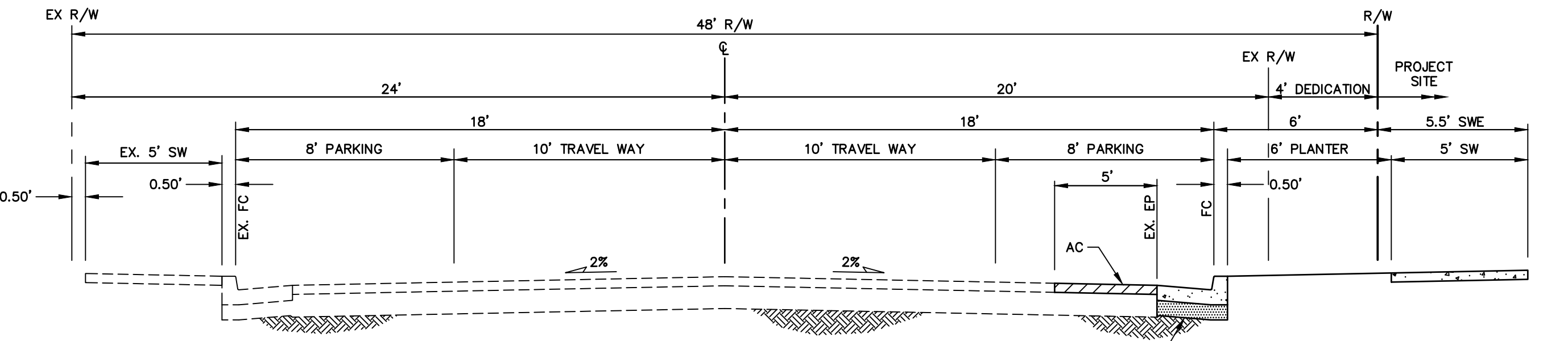


ABBREVIATIONS

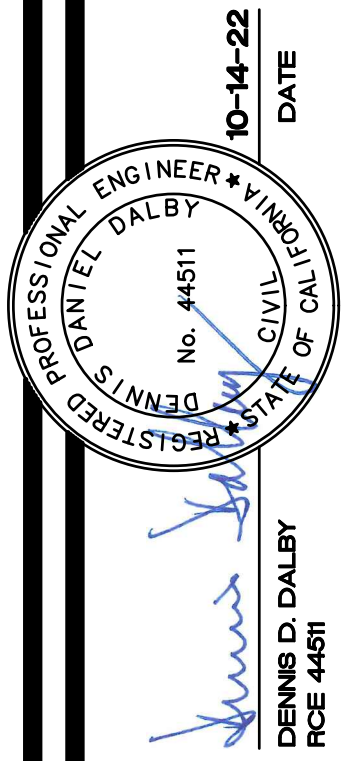
ADA	AMERICANS WITH DISABILITIES ACT
APN	ASSESSORS PARCEL NUMBER
BSW	BACK OF SIDEWALK
CB	CATCH BASIN
CONC	CONCRETE
DCD	DOUBLE CHECK DETECTOR
DN	DOCUMENT NUMBER
EG	EXISTING GRADE
EP	EDGE OF PAVEMENT
EX	EXISTING
FD	FIELD DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FF	FINISH FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
GV	GATE VALVE
HP	HIGH POINT
IG	INVERT GRADE
JB	JUNCTION BOX
LP	LOW POINT
R	RADIUS
R/W	RIGHT OF WAY
RPBP	REDUCED PRESSURE BACKFLOW PREVENTOR SLOPE OR SOUTH
S	STORM DRAIN MANHOLE
SDMH	SIDE OPENING
SS	SANITARY SEWER
SSCO	SANITARY SEWER CLEAN OUT
SSMH	SANITARY SEWER MANHOLE
ST-LT	STREET LIGHT
SW	SIDEWALK
SWE	SIDEWALK EASEMENT
TC	TOP OF CURB
TP	TYPICAL
VERT	VERTICAL
VG	VALLEY GUTTER
W	WATER OR WEST
WM	WATER METER
YI	YARD INLET



MAIN STREET - PUBLIC
WEST STEELE LANE



MINOR STREET - PUBLIC
MEADOWBROOK COURT



CIVIL DESIGN CONSULTANTS, INC.

2200 Range Avenue, Suite 204
Santa Rosa, CA 95403
(707) 542-4820

SITE GRADING AND UTILITY PLAN

STEELE LANE APARTMENTS

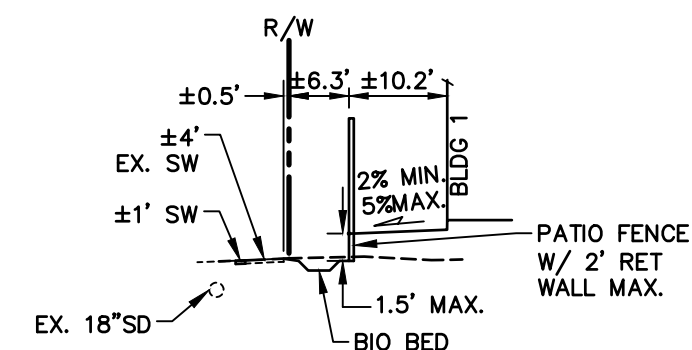
1650 WEST STEELE LANE
SANTA ROSA, CA
APN: 041-042-012
DOC. NO. 2017-076633

JOB NO.
19-107

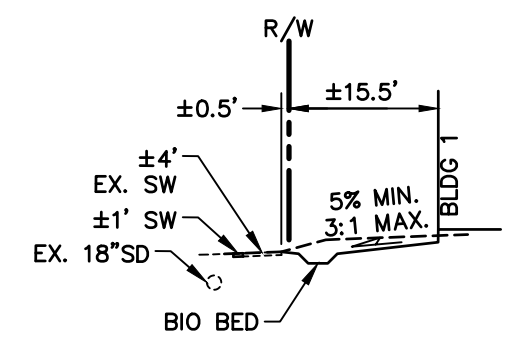
SHEET NO.

Q1

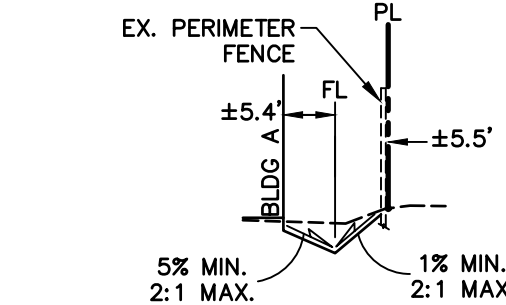
OF 2 SHEETS



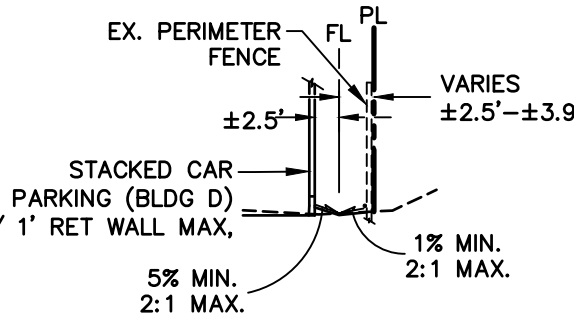
SECTION A-A
1" = 20' HORZ.
1" = 10' VERT.



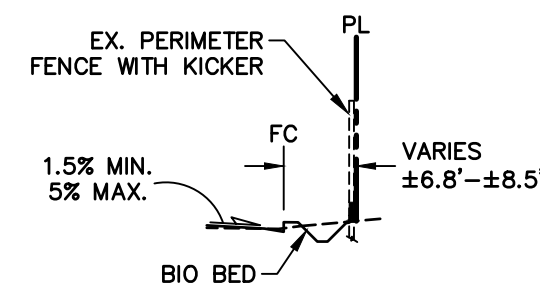
SECTION B-B
1" = 20' HORZ.
1" = 10' VERT.



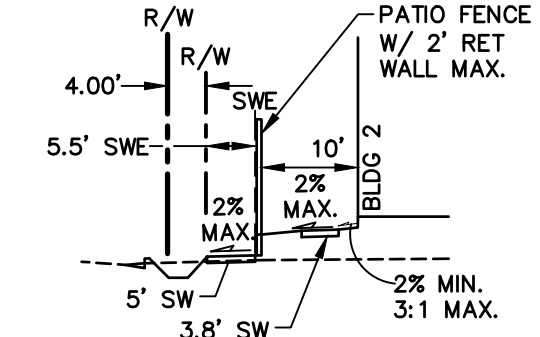
SECTION C-C
1" = 20' HORZ.
1" = 10' VERT.



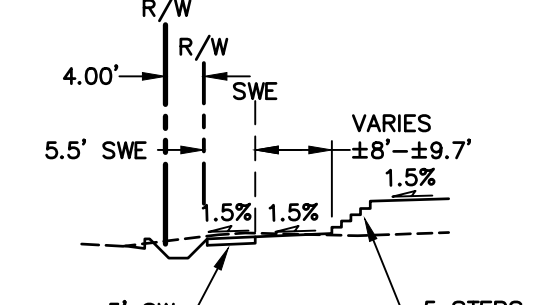
SECTION D-D
1" = 20' HORZ.
1" = 10' VERT.



SECTION E-E
1" = 20' HORZ.
1" = 10' VERT.

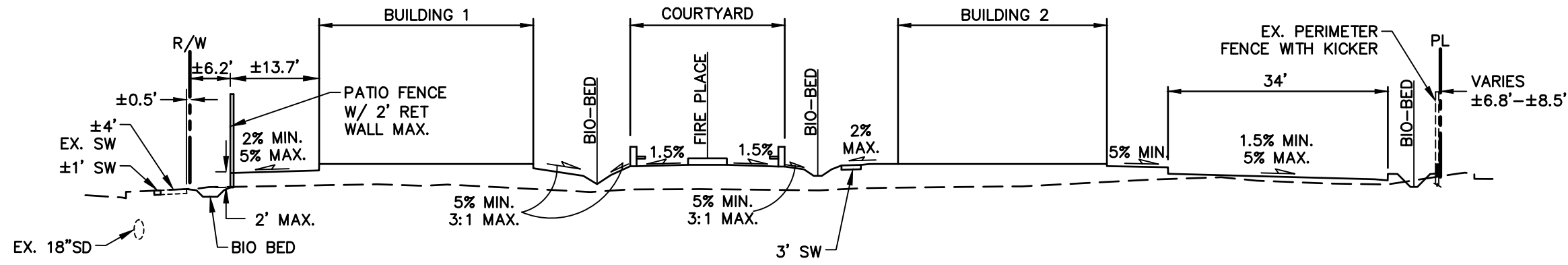


SECTION F-F
1" = 20' HORZ.
1" = 10' VERT.

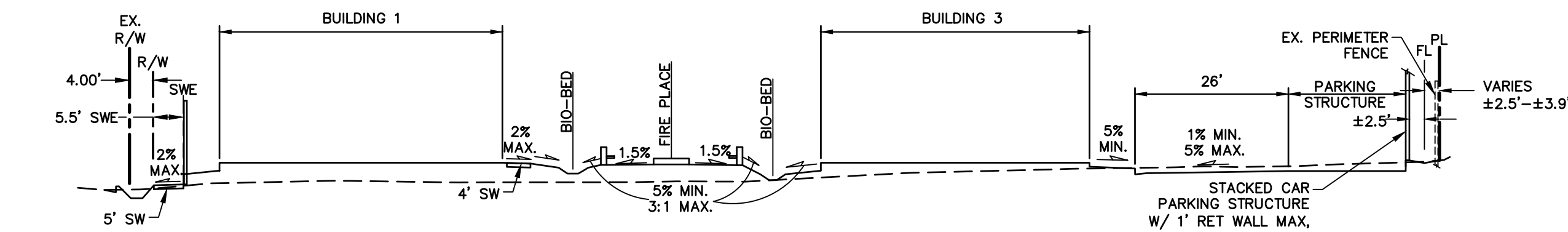


SECTION G-G
1" = 20' HORZ.
1" = 10' VERT.

GRADING SECTIONS

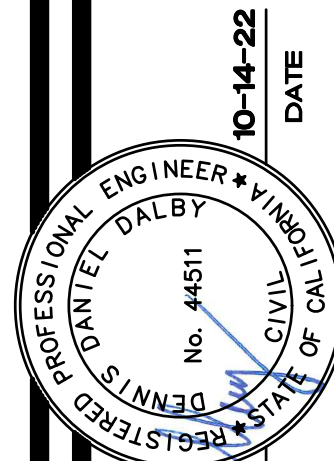


SECTION H-H
1" = 20' HORZ.
1" = 10' VERT.



SECTION I-I
1" = 20' HORZ.
1" = 10' VERT.

SITE/BUILDING SECTIONS



CIVIL DESIGN CONSULTANTS, INC.

2200 Rende Avenue, Suite 204
Santa Rosa, CA 95403
(707) 542-4820

GRADING SECTIONS AND SITE BUILDING SECTIONS

STEELE LANE APARTMENTS

1650 WEST STEELE LANE
SANTA ROSA, CA
APN: 041-042-012
DOC. NO. 2017-076633

JOB NO.
19-107

SHEET NO.

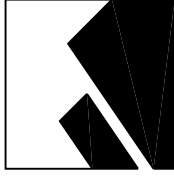
C2

OF 2 SHEETS

INITIAL STORM WATER LOW IMPACT DEVELOPMENT SUBMITTAL STEELE LANE APARTMENTS

NOVEMBER 2022

CIVIL DESIGN CONSULTANTS, INC.
2200 Range Avenue, Suite 204
Santa Rosa, CA 95403
(707) 542-4820



INITIAL
STORM WATER LOW IMPACT DEVELOPMENT SUBMITTAL

for

Steele Lane Apartments

Located at
1650 West Steele Lane
Santa Rosa, CA

APN 041-042-012

Prepared for

Patrick O'Neil
Stagecoach Development Company, Inc.
19 Leona Drive
San Rafael, CA 94903

November 2022



Prepared by

CIVIL DESIGN CONSULTANTS, INC.
2200 RANGE AVENUE, SUITE 204
SANTA ROSA, CA 95403

CONTENTS

- 1 INTRODUCTION**
- 2 PROJECT DESCRIPTION**
- 3 POLLUTION PREVENTION MEASURES**
- 4 TYPES OF BMP'S SELECTED TO MITIGATE POLLUTANTS
AND PROVIDE VOLUME CAPTURE**
- 5 RESPONSIBILITY FOR BMP MAINTENANCE**

ATTACHMENTS

Determination Worksheet
Initial SW LID Hydrology Map
BMP Details
Stormwater Calculator Spreadsheets
Soils Analysis
BMP Selection Tables
Maintenance Checklists
Standard Maintenance/Monitoring Agreement

1 INTRODUCTION

The Steele Lane Apartments project site is within the permit boundary of the recently adopted National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Storm Water Permit which regulates discharges into the watershed with the intent to reduce storm water pollution and protect the water quality of our local creeks and waterways and continue to promote groundwater recharge. The City of Santa Rosa and the County of Sonoma have adopted the Storm Water Low Impact Development (LID) Technical Design Manual. This Initial Storm Water Low Impact Development Submittal (ISWLIDS) was developed to show compliance with its requirements.

Standard Urban Storm Water Mitigation Plan (SUSMP) requirements are part of the Storm Water Management Plan that is an enforceable part of the reissued municipal storm water NPDES permit for the City of Santa Rosa, the County of Sonoma and Sonoma Water. Satisfying the SUSMP and the NPDES Permit will require meeting the following goals to the maximum extent practicable:

1. Prevent pollutants generated at the site from leaving the site.
2. Prevent increases in Storm Water runoff for 1.0 inch of rainfall over a 24 hour period.
3. Strive to maximize the amount of land left in a natural undisturbed condition.

This Initial SW LID Submittal will provide the following information:

- Project Description
- Pollution Prevention Measures
- Types of BMP selected to mitigate pollutants and provide volume capture.
- Responsibility for BMP maintenance
- Location and design of BMP (on project drawings)

2 PROJECT DESCRIPTION

The Steele Lane Apartments project site is located at 1650 West Steele Lane, within the City of Santa Rosa.

The property contains an area of 0.98 acres and is contained within one assessor parcel, APN 041-042-012. Additionally, the project proposes 0.09 acres of improvements to the frontage along Meadowbrook Court and West Steele Lane, bringing the total project area to 1.07 acres. The existing site appears to be vacant, containing a handful of trees and some native grasses.

The project is proposed by Stagecoach Development Company, Inc. as a single, non-phased development. The project proposes to construct 36 rental units, a leasing office, and onsite laundry facilities within three separate three story buildings. The project will also feature a parking lot with stacked parking structure and some site amenities.

The project will collect overland flow and route it to a series of proposed stormwater treatment facilities before entering the underground drainage system. These features will be constructed over aggregate layers where stormwater will be retained. This pre-treatment design feature shall not only remove pollutants, but also will reduce the amount of runoff by capturing and infiltrating storm water onsite. The treatment facilities are proposed at various locations throughout the project site, providing treatment for each of the site tributaries. The purpose of these devices and their effect on the quality and quantity of runoff leaving the developed site will be further explained throughout this report.

The project site's native soil has been classified by the Natural Resources Conservation Service as Clear Lake Clay (CeA) and is in Hydrologic Soil Group D. This is a poorly drained soil with the expected infiltration rate to be less than 0.20 in/hr. Due to the very low expected infiltration rate, the selected LID features will be Priority 2 containing subsurface perforated pipe to prevent surface ponding of storm water. The site soil classification has been confirmed by the geotechnical report prepared for the project. No site specific percolation/infiltration studies have been performed.

The attached plan titled "Initial SW LID Hydrology Map" shows the proposed grading pattern for the project along with the drainage tributary areas and proposed treatment facilities. Treatment facility details showing volume capture designed to meet the 100% volume capture goal can be found in the attachments section of this document.

3 POLLUTION PREVENTION MEASURES

A portion of roof drains of the buildings will be disconnected from the storm drain system, allowing storm drainage to surface flow over landscaped areas to a stormwater treatment facility before entering the underground storm drain system.

The project will incorporate a robust Landscape plan including interceptor trees that will be planted throughout the project.

The total tributary area used for volume capture calculations has been reduced by taking credit for these measures.

4 TYPES OF BMP'S SELECTED TO MITIGATE POLLUTANTS AND PROVIDE VOLUME CAPTURE

Best Management Practices (BMP's) are design features that address the quality and quantity of the storm waters that flow from a development. In most cases, these BMP's are used to mitigate a development's impact on the quality of storm water by treating or cleaning the storm water. Some controls have dual treatment control measure capabilities, not only treating, but also containing a required volume of storm water. The project will implement bio-retention beds to mitigate pollutants and provide volume capture for the 85th percentile 24-hour storm. Volume capture is accomplished by incorporating an area for storm water storage beneath the bio-retention beds.

Bio-retention beds have been selected for this project because of their ability to remove pollutants through a variety of natural physical, biological and chemical treatment processes. These BMP's are considered a Low Impact Development (LID) device for treatment control. They have also been selected because they provide an excellent opportunity for the runoff to settle any suspended solids and remove hydrocarbons, both of which have been identified as pollutants that can degrade the downstream receiving waters of the project. Compared to pipe networks, bio-retention beds with gravel storage areas will reduce runoff from the site and provide ground water recharge. This provides the opportunity to reduce the peak flow in a basin. For this project we have selected aggregate consisting of ¾ inch to 1-1/2 inch structural soil for the storage area. The structural soil has a porosity of 30%. This provides the opportunity to reduce the peak flow in a basin.

The structural soil shall meet standards set forth in the City of Santa Rosa Low Impact Development Design Manual reference document 'E' and geotechnical report. The structural soil will also provide an environment for landscaping to thrive as it is composed of angular rocks and fine organics, providing an excellent environment for water infiltration and plant growth.

The widening of the existing sidewalk along West Steele Lane, the new pedestrian ramp at the intersection of West Steele and Meadowbrook, and a small portion of the on-site entry area cannot be captured and treated directly. An existing shallow storm drain runs under the West Steele planter strip between the curb and the sidewalk and maintains ±2 feet of cover throughout the planter strip. This existing shallow storm drain prohibits the construction of roadside bio-retention bed in the West Steele planter strip. Volume capture for the untreated area will be accomplished by oversizing the roadside bio-retention bed (BMP 1) along Meadowbrook Court. A storm water filter insert will be installed in the new storm drain catch basin adjacent to BMP 1. The 1,840 SF of untreated/uncaptured area and the 3,158 SF of the existing Meadowbrook Court pavement offset area are highlighted on the LID exhibit attached.

This project meets the Design Goal by achieving 100% volume capture.

5 RESPONSIBILITY FOR BMP MAINTENANCE

All treatment control devices serving the project are located within the project site, or within the right of way of Meadowbrook Court. The property owner will be responsible for the surface and sub-surface oversight and maintenance of the treatment control devices.

Attached is a Draft of the Maintenance Agreement for Monitoring Storm Water BMP Facilities and Declaration of Covenants.

ATTACHMENTS

FOR OFFICE USE ONLY:

Does this project require permanent storm water BMP's?

☐ Y ☐ N

Date Submitted: _____



Print Form

File No:	Quadrant
Related Files:	
Set:	
Department Use Only	

2017 Storm Water LID Determination Worksheet

PURPOSE AND APPLICABILITY: This determination worksheet is intended to satisfy the specific requirements of "ORDER NO. R1-2015-0030, NPDES NO. CA0025054 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS." Additional design requirements imposed by Governing Agencies, such as local grading ordinances, CAL Green, CEQA, 401 permitting, and hydraulic design for flood control still apply as appropriate. Additionally, coverage under another regulation may trigger the requirement to design in accordance with the Storm Water LID Technical Design Manual.

Part 1: Project Information

Steele Lane Apartments

Project Name

1650 West Steele Lane

Project Site Address

Santa Rosa / CA / 95403

Project City/State/Zip

Stagecoach Development Company, Inc.

Applicant (owner or developer) Name

19 Leona Drive

Applicant Mailing Address

San Rafael / CA / 94903

Applicant City/State/Zip

(415) 491-4091

Applicant Phone/Email/Fax

Permit Number(s) - (if applicable)

Civil Design Consultants, Inc.

Designer Name

Santa Rosa / CA / 95403

Designer City/State/Zip

2200 Range Avenue, Suite 204

Designer Mailing Address

(707)542-4820

Designer Phone/Email

Type of Application/Project:

☐ Subdivision
 ☐ Grading Permit
 ☐ Building Permit
 ☐ Hillside Development
☒ Design Review
 ☐ Use Permit
 ☐ Encroachment
 ☐ Time Extensions
 ☐ Other : _____

PART 2: Project Exemptions

1. Is this a project that creates or replaces *less than* 10,000 square feet of impervious surface¹, including all project phases and off-site improvements?

☐ Yes
 ☒ No

¹ Impervious surface replacement, such as the reconstruction of parking lots or excavation to roadway subgrades, is not a routine maintenance activity. Reconstruction is defined as work that replaces surfaces down to the subgrade. Overlays, resurfacing, trenching and patching are defined as maintenance activities per section VI.D.2.b.

2. Is this project a routine maintenance activity² that is being conducted to maintain original line and grade, hydraulic capacity, and original purpose of facility such as resurfacing existing roads and parking lots?

☐ Yes ☒ No

3. Is this project a stand alone pedestrian pathway, trail or off-street bike lane?

☐ Yes ☒ No

4. Did you answer "YES" to any of the questions in Part 2?

☐ **YES:** This project will *not* need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 Permit. **Please complete the "Exemption Signature Section" on Page 4.**

☒ **NO:** Please complete the remainder of this worksheet.

Part 3: Project Triggers

Projects that Trigger Requirements:

Please answer the following questions to determine whether this project requires permanent Storm Water BMP's and the submittal of a SW LIDs as required by the NPDES MS4 Permit order No. R1-2015-0030.

1. Does this project create or replace a combined total of 10,000 square feet or more of impervious surface¹ including all project phases and off-site improvements?

☒ Yes ☐ No

2. Does this project create or replace a combined total or 10,000 square feet or more of impervious streets, roads, highways, or freeway construction or reconstruction³? ☒ Yes ☐ No

3. Does this project create or replace a combined total of 1.0 acre or more of impervious surface¹ including all project phases and off-site improvements? ☐ Yes ☒ No

4. Did you answer "YES" to any of the above questions in Part 3?

☒ **YES:** This project will need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 Permit. **Please complete remainder of worksheet and sign the "Acknowledgement Signature Section" on Page 4.**

☐ **NO:** This project will *not* need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 permit. **Please complete the "Exemption Signature Section" on Page 4.**

¹ Impervious surface replacement, such as the reconstruction of parking lots or excavation to roadway subgrades, is not a routine maintenance activity. Reconstruction is defined as work that replaces surfaces down to the subgrade. Overlays, resurfacing, trenching and patching are defined as maintenance activities per section VI.D.2.b.

² "Routine Maintenance Activity" includes activities such as overlays and/or resurfacing of existing roads or parking lots as well as trenching and patching activities and reroofing activities per section VI.D.2.b.

³ "Reconstruction" is defined as work that extends into the subgrade of a pavement per section VI.D.2.b.

Part 4: Project Description

1. Total Project area: ☒ square feet
☐ acres

2. Existing land use(s): (check all that apply)

☐ Commercial ☐ Industrial ☐ Residential ☐ Public ☒ Other

Description of buildings, significant site features (creeks, wetlands, heritage trees), etc.:

The site is currently vacant, containing some trees and native grasses.

3. Existing impervious surface area: ☒ square feet
☐ acres

4. Proposed Land Use(s): (check all that apply)

☐ Commercial ☐ Industrial ☒ Residential ☐ Public ☐ Other

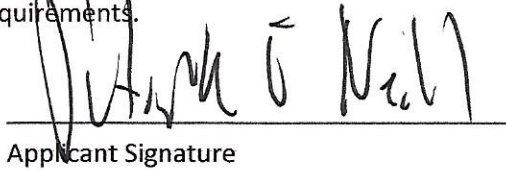
Description of buildings, significant site features (creeks, wetlands, heritage trees), etc.:

The proposed project will create 36 apartment units, a leasing office, and laundry facility within 3 three-story buildings. Additionally, the site will feature a parking lot, stacked parking structure, and some site amenities.

5. Existing impervious surface area: ☒ square feet
☐ acres

Acknowledgment Signature Section:

As the property owner or developer, I understand that this project is required to implement permanent Storm Water Best Management Practices and provide a Storm Water Low Impact Development Submittal (SW LIDS) as required by the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) Permit Order No. R1-2015-0030. *Any unknown responses must be resolved to determine if the project is subject to these requirements.



Applicant Signature

11/13/2019

Date

Exemption Signature Section:

As the property owner or developer, I understand that this project as currently designed does not require permanent Storm Water BMP's nor the submittal of a Storm Water Low Impact Development Submittal (SW LIDS) as required by the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) Permit*. I understand that redesign may require submittal of a new Determination Worksheet and may require permanent Storm Water BMP's.

Applicant Signature

Date

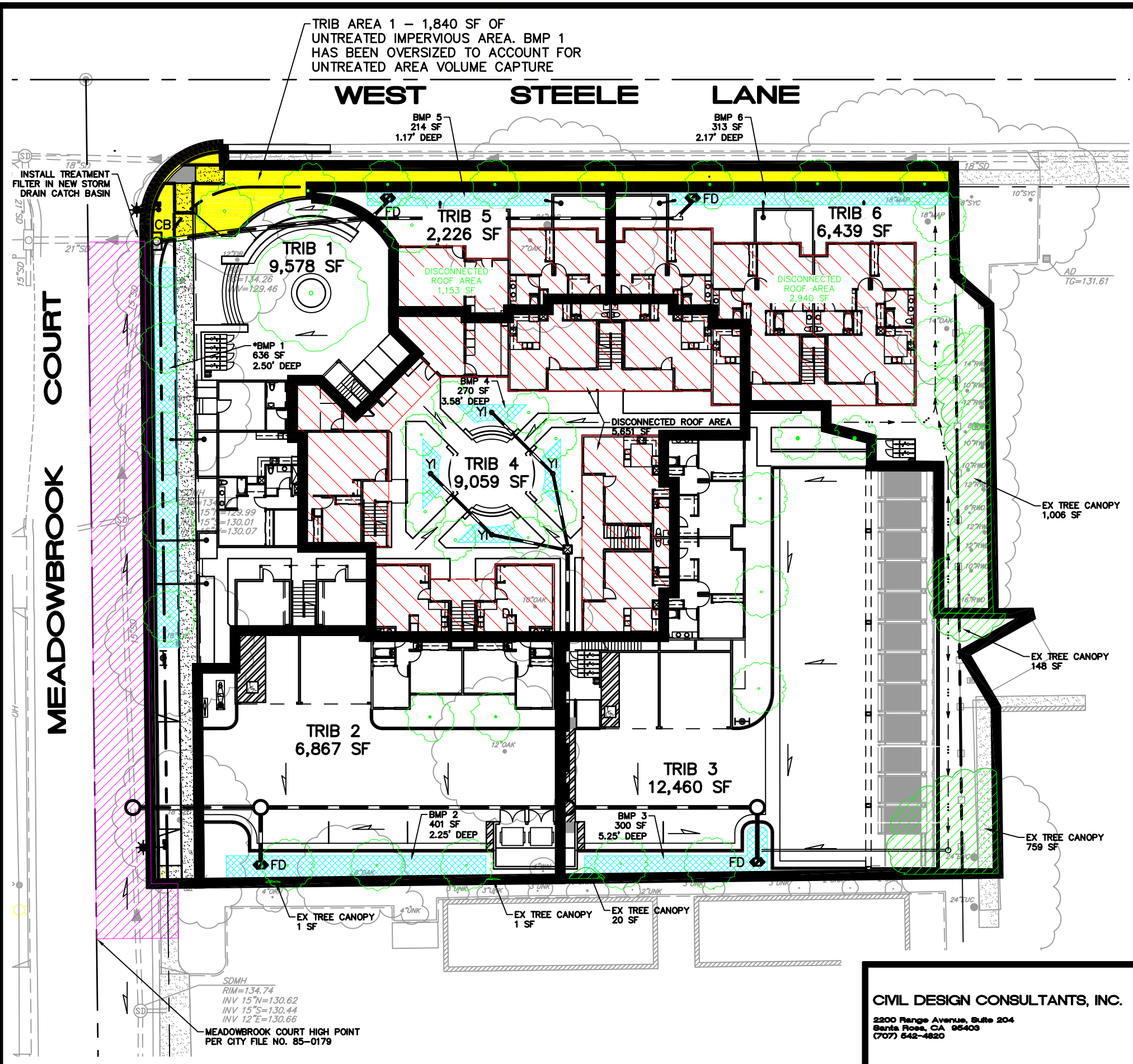
* This determination worksheet is intended to satisfy the specific requirements of "ORDER NO. R1-2015-0030, NPDES NO. CA0025054 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS." Additional design requirements imposed by Governing Agencies, such as local grading ordinances, CAL Green, CEQA, 401 permitting, and hydraulic design for flood control still apply as appropriate. Additionally, coverage under another regulation may trigger the requirement to design in accordance with the Storm Water LID Technical Design Manual.

Implementation Requirements: All calculations shall be completed using the "Storm Water Calculator" available at: www.srcity.org/stormwaterLID

Hydromodification Control/100% Volume Capture: Capture (infiltration and/or reuse) of 100% of the volume of runoff generated by a 1.0" 24-hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual method. This is a retention requirement.

Treatment Requirement: Treatment of 100% of the flow calculated using the modified Rational Method and a known intensity of 0.20 inches per hour.

Delta Volume Capture Requirement: Capture (infiltration and/or reuse) of the increase in volume of storm water due to development generated by a 1.0" 24-hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual method. This is a retention requirement.

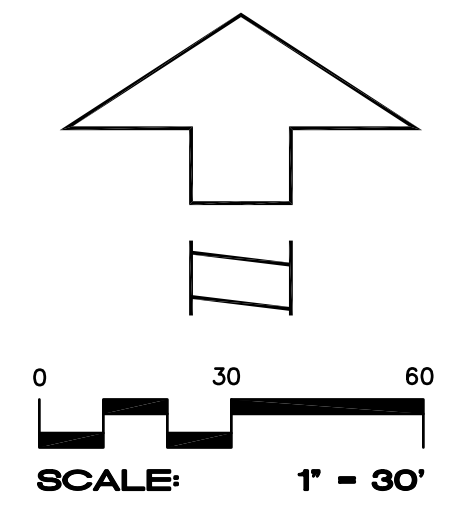


LEGEND

- DISCONNECTED ROOF AREA
- BIO-RETENTION BED
- TRIBUTARY BOUNDARY
- INTERCEPTOR TREE
- EXISTING TREE CANOPY (TO BE PRESERVED)
- UNTREATED/UNCAPTURED AREA (1,840 SF)
- OFFSET AREA (3,158 SF)

*BMP 1 HAS BEEN SIZED TO ACCOMMODATE THE EXISTING HALF STREET SECTION OF MEADOWBROOK COURT AS AN OFFSET TO THE 1,840 SF OF UNTREATED/UNCAPTURED AREA ALONG THE WEST STEELE LANE FRONTAGE IN TRIBUTARY 1.

BMP 1 HAS BEEN SIZED WITH AN ADDITIONAL 3,158 SF OF EXISTING MEADOWBROOK COURT PAVEMENT OFFSET AREA ADDED TO THE 9,578 SF AREA OF TRIBUTARY 1 FOR A TOTAL 12,736 SF.

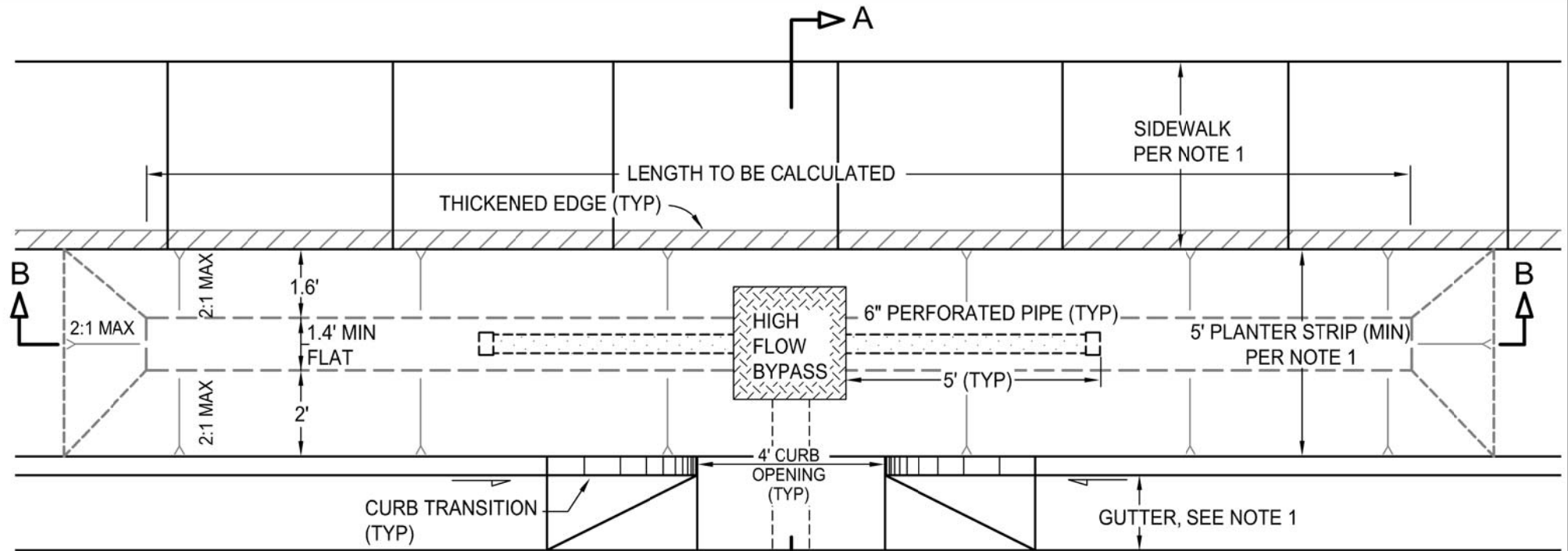


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INITIAL SW LID HYDROLOGY MAP
STEELE LANE APARTMENTS
1650 WEST STEEL LANE
SANTA ROSA, CALIFORNIA

JOB NO.
19-107
SHEET NO.
1
OF 1 SHEET

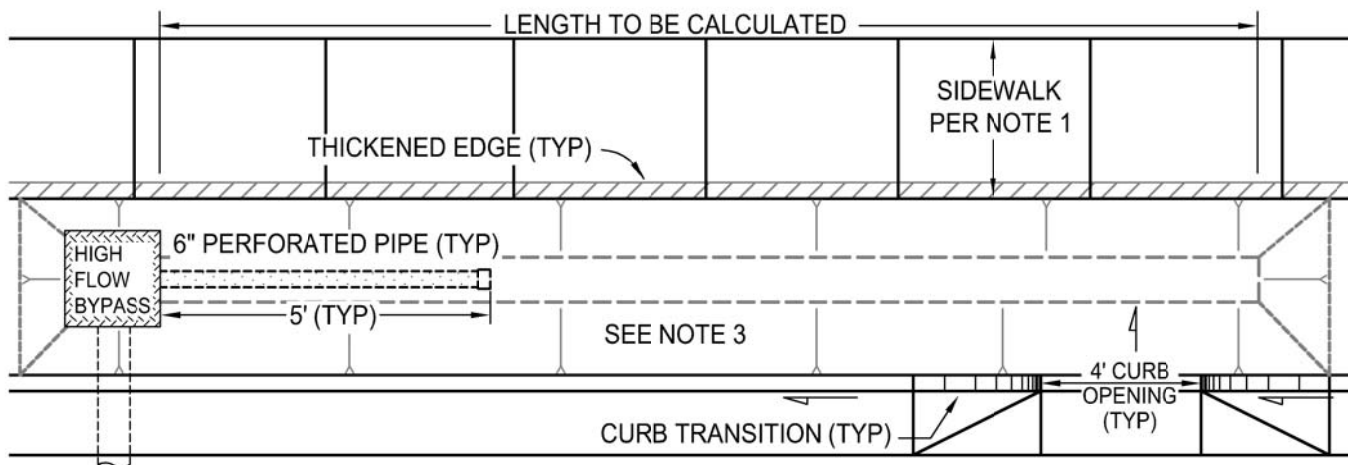
NOVEMBER 2022



PLAN
TYPE A - CURB OPENING AT LOW POINT

NOTE:

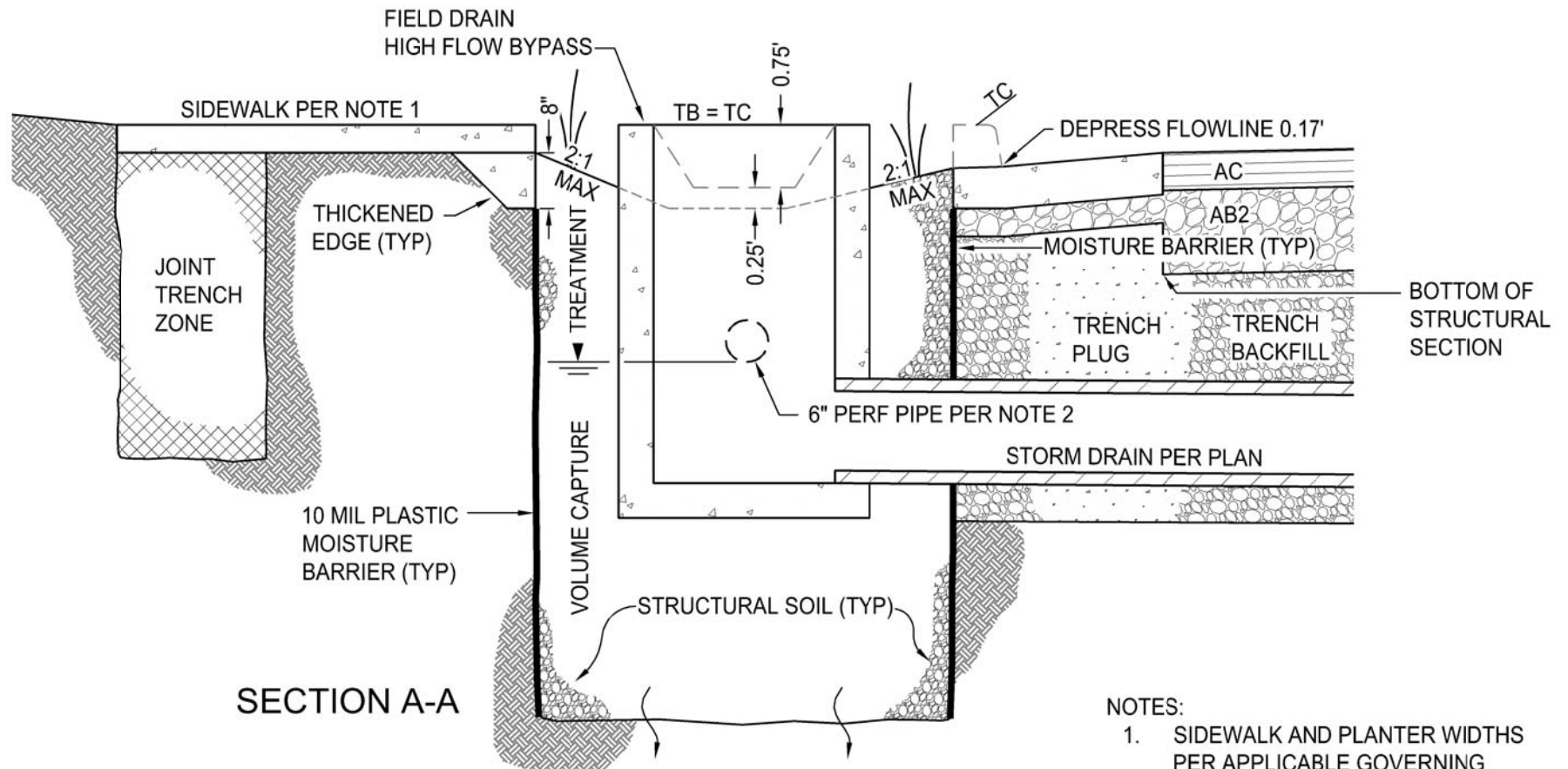
1. SIDEWALK, GUTTER AND PLANTER WIDTHS PER APPLICABLE MUNICIPAL STANDARDS (TYP).
2. TOP OF 6" PERFORATED PIPE TO BE SET 6" BELOW ROAD STRUCTURAL SECTION, MIN.
3. TYPE A MINIMUM DIMENSIONS AND GRADES APPLY TO TYPE B.



TYPE B -CURB OPENING ALONG A SLOPE

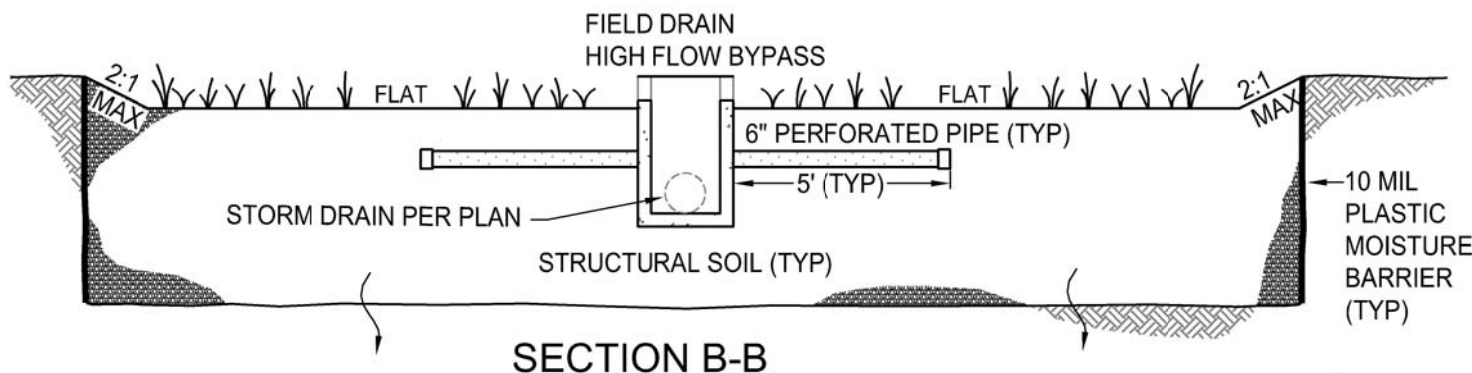
Not to Scale

PRIORITY 2 ROADSIDE BIORETENTION - CURB OPENING		
SCALE: NONE	DATE: 04/06/17	
DWN. DIT CHK. HM	SHEET 1 of 2	P2-04



NOTES:

1. SIDEWALK AND PLANTER WIDTHS PER APPLICABLE GOVERNING AGENCY STANDARDS (TYP).
2. TOP OF 6" PERFORATED PIPE TO BE SET 6" BELOW BOTTOM OF ROAD STRUCTURAL SECTION.



Not to Scale

PRIORITY 2
ROADSIDE BIORETENTION
- CURB OPENING
SECTION A-A & B-B

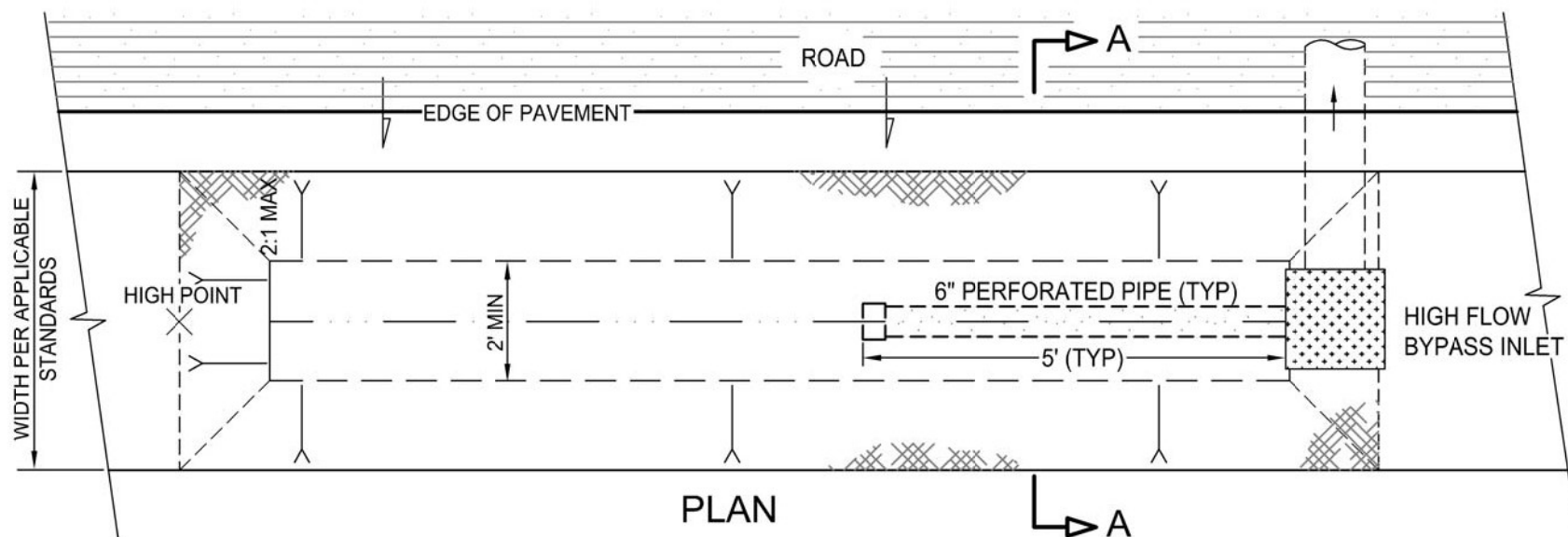
SCALE: NONE

DATE: 04/06/17

DWN. DIT
CHK. HM

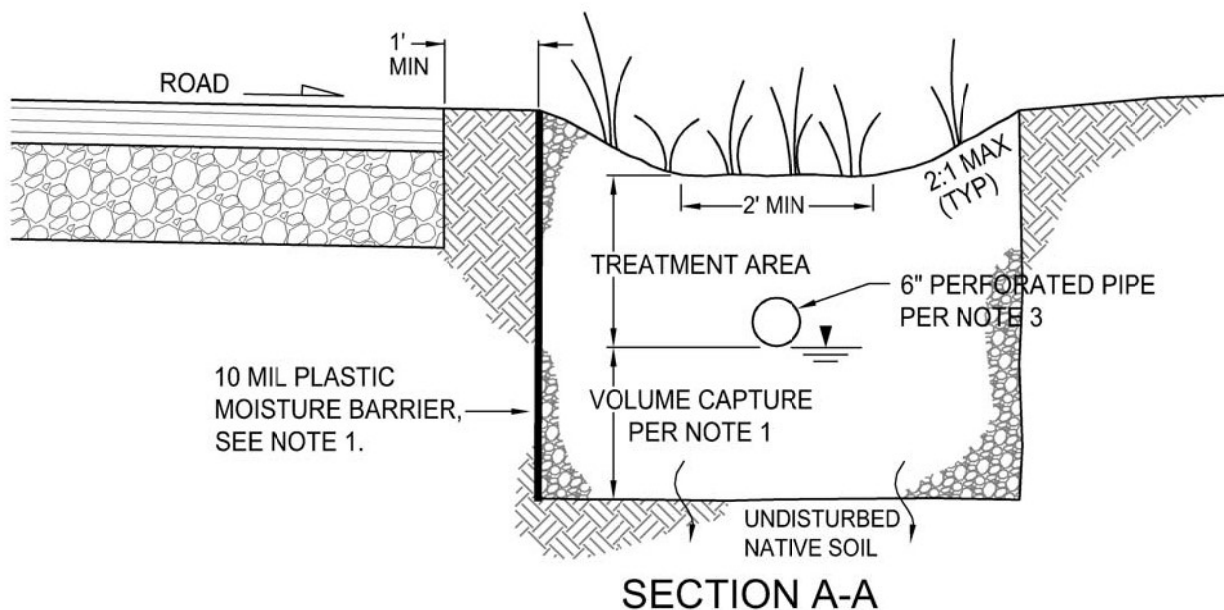
SHEET 2 of 2

P2-04



NOTES:

1. SOIL TO BE SPECIFIED BY DESIGN ENGINEER TO PROVIDE VOLUME CAPTURE AND MEET GOVERNING AGENCY REQUIREMENTS. IF NON STRUCTURAL SOIL IS SELECTED A CUTOFF WALL IS REQUIRED IN PLACE OF A MOISTURE BARRIER.
2. SWALE MUST CONVEY DESIGN FLOWS PER GOVERNING AGENCY DESIGN STANDARDS.
3. TOP OF 6" PERFORATED PIPE TO BE SET 6" BELOW BOTTOM OF ROAD STRUCTURAL SECTION.



SIMILAR TO P1-02
WITH A PERFORATED
DRAIN PIPE

**PRIORITY 2
ROADSIDE BIORETENTION
- NO CURB AND GUTTER**

SCALE: *NONE* DATE: *04/06/17*

DWN. *DIT*
CHK. *HM*

P2-05

Not to Scale



STORM WATER CALCULATOR

LID BMP Summary Page & Site Global Values

Project Information: Project Name: Steele Lane Apartments Address/Location: 1650 West Steele Lane Designer: Matt Lawton Date: 11/28/2022	Site Information: Mean Seasonal Precipitation (MSP) of Project Site: 30.00 (inches) K=MSP/3(K= 1.00 Impervious area - pre development: 0.0 ft ² Impervious area - post development: 34,027.0 ft ²	Based upon the pre and post development impervious area, the post construction BMP requirement is: Delta Volume & Treatment
---	---	---

Summary of Saved BMP Results:

	Tributary Area			Requirements		BMP Design Results						
			Hydromodification Control			Flow Base Treatment		Delta Volume Capture				
BMP ID:	Tributary Area (ft ² .)	Runoff Reduction Measures (Y/N)		Type of Requirement Met		Percent Achieved	Required V _{Hydromod} (ft ³)	Achieved (ft ³)	Required Q Treatment (cfs)	Achieved (ft ³)	Required Vdelta (ft ³)	Achieved (ft ³)
1	TRIB-1	12,736	Yes	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening	102.9	463.4016	477.0000				
2	TRIB-2	6,867	Yes	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening	101.3	267.3083	270.6750				
3	TRIB-3	12,460	Yes	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening	101.4	465.9630	472.5000				
4	TRIB-4	9,059	Yes	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	100.9	287.4635	289.9800				
5	TRIB-5	2,226	Yes	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	102.9	72.9786	75.1140				
6	TRIB-6	6,439	Yes	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	101.1	201.5940	203.7630				
7												
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STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Steele Lane Apartments**BMP ID: **TRIB-1**BMP Design Criteria: **Delta Volume & Treatment**Type of BMP Design: **Priority 2: P2-04 Roadside Bioretention - Curb Opening**BMP's Physical Tributary Area: **12,736.0** ft²

Description/Notes: BMP 1 has been sized with an additional 3,158 SF of existing Meadowbrook Court pavement offset area added to the 9,578 SF area of Tributary 1 for a total 12,736 SF to accommodate the 1,840 SF of untreated/uncaptured area along the West Steele Lane frontage

Runoff Reduction Measures

Resulting reduced Tributary Area used for BMP sizing = **11,036.0** ft²Total Runoff Reduction Measures = **1,700.0** ft²

Interceptor Trees

Number of **new** interceptor **Evergreen Trees**: **3**Number of **new** interceptor **Deciduous Trees**: **11**Square footage of qualifying **existing tree canopy**: **0.0** ft²Total Number of **New** trees in BMP Tributary Area: **14**

Disconnected Roof Drains

Select disconnection condition: **Select disconnection condition**

Disconnected Roof Drains Method 1

Roof area of disconnected downspouts: **0** ft²

Disconnected Roof Drains Method 2

Percent of rooftop area: **0** %Select Density: **1** Units per Acre

Paved Area Disconnection

Paved Area Type: **Select paved area type**Alternatively designed paved area: **0.0** ft²

Buffer Strips & Bovine Terraces

Area draining to a Buffer Strip or Bovine Terrace: **0.0** ft²

Hydromodification Requirement: 100% Volume Capture; V_{HYDROMOD}

V_{HYDROMOD} = **463.40** ft³Post development hydrologic soil type within tributary area: **C: 0.05 - 0.15 in/hr infiltration (transmission) rate**Post development ground cover description: **Urban districts - Commercial and business**CN_{POST}: **94**User Composite post development CN: **0.0**

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = **102.93** %

	BMP Volume Below Ground
Porosity:	0.30
Depth below perforated pipe if present:	2.50 ft
Width:	0.00 ft
Length:	0.00 ft
Area:	636.00 ft ²

	Ponded Water Above Ground
Depth:	0.00 ft
Width:	0.00 ft
Length:	0.00 ft
Area:	0.00 ft ²



STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Steele Lane Apartments**BMP ID: **TRIB-2**BMP Design Criteria: **Delta Volume & Treatment**Type of BMP Design: **Priority 2: P2-04 Roadside Bioretention - Curb Opening**BMP's Physical Tributary Area: **6,867.0** ft²

Description/Notes:

Runoff Reduction Measures

Resulting reduced Tributary Area used for BMP sizing = **6,366.0** ft²Total Runoff Reduction Measures = **501.0** ft²

Interceptor Trees

Number of **new** interceptor **Evergreen Trees**: **0**Number of **new** interceptor **Deciduous Trees**: **5**Square footage of qualifying **existing tree canopy**: **2.0** ft²Total Number of **New** trees in BMP Tributary Area: **5**

Disconnected Roof Drains

Select disconnection condition: **Select disconnection condition**

Disconnected Roof Drains Method 1

Roof area of disconnected downspouts: **0** ft²

Disconnected Roof Drains Method 2

Percent of rooftop area: **0** %Select Density: **1** Units per Acre

Paved Area Disconnection

Paved Area Type: **Select paved area type**Alternatively designed paved area: **0.0** ft²

Buffer Strips & Bovine Terraces

Area draining to a Buffer Strip or Bovine Terrace: **0.0** ft²

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

 $V_{HYDROMOD}$ = **267.31** ft³Post development hydrologic soil type within tributary area: **C: 0.05 - 0.15 in/hr infiltration (transmission) rate**Post development ground cover description: **Urban districts - Commercial and business**CN_{POST}: **94**User Composite post development CN: **0.0**

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = **101.26** %

	BMP Volume Below Ground
Porosity:	0.30
Depth below perforated pipe if present:	2.25 ft
Width:	0.00 ft
Length:	0.00 ft
Area:	401.00 ft ²

	Ponded Water Above Ground
Depth:	0.00 ft
Width:	0.00 ft
Length:	0.00 ft
Area:	0.00 ft ²



STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Steele Lane Apartments**BMP ID: **TRIB-3**BMP Design Criteria: **Delta Volume & Treatment**Type of BMP Design: **Priority 2: P2-04 Roadside Bioretention - Curb Opening**BMP's Physical Tributary Area: **12,460.0** ft²

Description/Notes:

Runoff Reduction Measures

Resulting reduced Tributary Area used for BMP sizing = **11,096.5** ft²Total Runoff Reduction Measures = **1,363.5** ft²

Interceptor Trees

Number of **new** interceptor **Evergreen Trees**: **2**Number of **new** interceptor **Deciduous Trees**: **5**Square footage of qualifying **existing tree canopy**: **927.0** ft²Total Number of **New** trees in BMP Tributary Area: **7**

Disconnected Roof Drains

Select disconnection condition: **Select disconnection condition**

Disconnected Roof Drains Method 1

Roof area of disconnected downspouts: **0** ft²

Disconnected Roof Drains Method 2

Percent of rooftop area: **0** %Select Density: **1** Units per Acre

Paved Area Disconnection

Paved Area Type: **Select paved area type**Alternatively designed paved area: **0.0** ft²

Buffer Strips & Bovine Terraces

Area draining to a Buffer Strip or Bovine Terrace: **0.0** ft²

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

 $V_{HYDROMOD}$ = **465.96** ft³Post development hydrologic soil type within tributary area: **C: 0.05 - 0.15 in/hr infiltration (transmission) rate**Post development ground cover description: **Urban districts - Commercial and business**CN_{POST}: **94**User Composite post development CN: **0.0**

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = **101.40** %

	BMP Volume Below Ground
Porosity:	0.30
Depth below perforated pipe if present:	5.25 ft
Width:	0.00 ft
Length:	0.00 ft
Area:	300.00 ft ²

	Ponded Water Above Ground
Depth:	0.00 ft
Width:	0.00 ft
Length:	0.00 ft
Area:	0.00 ft ²



STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Steele Lane Apartments**BMP ID: **TRIB-4**BMP Design Criteria: **Delta Volume & Treatment**Type of BMP Design: **Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter**BMP's Physical Tributary Area: **9,059.0** ft²

Description/Notes:

Runoff Reduction Measures

Resulting reduced Tributary Area used for BMP sizing = **6,846.3** ft²Total Runoff Reduction Measures = **2,212.8** ft²

Interceptor Trees

Number of **new** interceptor **Evergreen Trees**: **0**Number of **new** interceptor **Deciduous Trees**: **8**Square footage of qualifying **existing tree canopy**: **0.0** ft²Total Number of **New** trees in BMP Tributary Area: **8**

Disconnected Roof Drains

Select disconnection condition: **Runoff is directed across landscape; Width of area: 5' to 9'**

Disconnected Roof Drains Method 1

Roof area of disconnected downspouts: **5,651** ft²

Disconnected Roof Drains Method 2

Percent of rooftop area: **0** %Select Density: **1** Units per Acre

Paved Area Disconnection

Paved Area Type: **Select paved area type**Alternatively designed paved area: **0.0** ft²

Buffer Strips & Bovine Terraces

Area draining to a Buffer Strip or Bovine Terrace: **0.0** ft²

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

 $V_{HYDROMOD}$ = **287.46** ft³Post development hydrologic soil type within tributary area: **C: 0.05 - 0.15 in/hr infiltration (transmission) rate**Post development ground cover description: **Urban districts - Commercial and business**CN_{POST}: **94**User Composite post development CN: **0.0**

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = **100.88** %

	BMP Volume Below Ground
Porosity:	0.30
Depth below perforated pipe if present:	3.58 ft
Width:	0.00 ft
Length:	0.00 ft
Area:	270.00 ft ²

	Ponded Water Above Ground
Depth:	0.00 ft
Width:	0.00 ft
Length:	0.00 ft
Area:	0.00 ft ²



STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Steele Lane Apartments**BMP ID: **TRIB-5**BMP Design Criteria: **Delta Volume & Treatment**Type of BMP Design: **Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter**BMP's Physical Tributary Area: **2,226.0** ft²

Description/Notes:

Runoff Reduction Measures

Resulting reduced Tributary Area used for BMP sizing = **1,737.8** ft²Total Runoff Reduction Measures = **488.3** ft²

Interceptor Trees

Number of **new** interceptor **Evergreen Trees**: **1**Number of **new** interceptor **Deciduous Trees**: **0**Square footage of qualifying **existing tree canopy**: **0.0** ft²Total Number of **New** trees in BMP Tributary Area: **1**

Disconnected Roof Drains

Select disconnection condition: **Runoff is directed across landscape; Width of area: 5' to 9'**

Disconnected Roof Drains Method 1

Roof area of disconnected downspouts: **1,153** ft²

Disconnected Roof Drains Method 2

Percent of rooftop area: **0** %Select Density: **1** Units per Acre

Paved Area Disconnection

Paved Area Type: **Select paved area type**Alternatively designed paved area: **0.0** ft²

Buffer Strips & Bovine Terraces

Area draining to a Buffer Strip or Bovine Terrace: **0.0** ft²

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

 $V_{HYDROMOD}$ = **72.98** ft³Post development hydrologic soil type within tributary area: **C: 0.05 - 0.15 in/hr infiltration (transmission) rate**Post development ground cover description: **Urban districts - Commercial and business**CN_{POST}: **94**User Composite post development CN: **0.0**

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = **102.93** %

	BMP Volume Below Ground
Porosity:	0.30
Depth below perforated pipe if present:	1.17 ft
Width:	0.00 ft
Length:	0.00 ft
Area:	214.00 ft ²

	Ponded Water Above Ground
Depth:	0.00 ft
Width:	0.00 ft
Length:	0.00 ft
Area:	0.00 ft ²



STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Steele Lane Apartments**BMP ID: **TRIB-6**BMP Design Criteria: **Delta Volume & Treatment**Type of BMP Design: **Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter**BMP's Physical Tributary Area: **6,439.0** ft²

Description/Notes:

Runoff Reduction Measures

Resulting reduced Tributary Area used for BMP sizing = **4,801.0** ft²Total Runoff Reduction Measures = **1,638.0** ft²

Interceptor Trees

Number of **new** interceptor **Evergreen Trees**: **0**Number of **new** interceptor **Deciduous Trees**: **4**Square footage of qualifying **existing tree canopy**: **1,006.0** ft²Total Number of **New** trees in BMP Tributary Area: **4**

Disconnected Roof Drains

Select disconnection condition: **Runoff is directed across landscape; Width of area: 5' to 9'**

Disconnected Roof Drains Method 1

Roof area of disconnected downspouts: **2,940** ft²

Disconnected Roof Drains Method 2

Percent of rooftop area: **0** %Select Density: **1** Units per Acre

Paved Area Disconnection

Paved Area Type: **Select paved area type**Alternatively designed paved area: **0.0** ft²

Buffer Strips & Bovine Terraces

Area draining to a Buffer Strip or Bovine Terrace: **0.0** ft²

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

 $V_{HYDROMOD}$ = **201.59** ft³Post development hydrologic soil type within tributary area: **C: 0.05 - 0.15 in/hr infiltration (transmission) rate**Post development ground cover description: **Urban districts - Commercial and business**CN_{POST}: **94**User Composite post development CN: **0.0**

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = **101.08** %

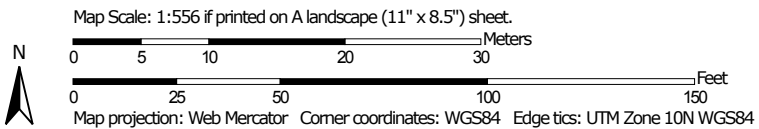
BMP Volume Below Ground

Porosity: **0.30**Depth below perforated pipe if present: **2.17** ftWidth: **0.00** ftLength: **0.00** ftArea: **313.00** ft²

Ponded Water Above Ground

Depth: **0.00** ftWidth: **0.00** ftLength: **0.00** ftArea: **0.00** ft²

Soil Map—Sonoma County, California
(1650 West Steele Lane)



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

3/29/2019
Page 1 of 3

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: Sonoma County, California
Survey Area Data: Version 12, Sep 13, 2018

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

Date(s) aerial images were photographed: Jul 1, 2018—Jul 31, 2018

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
ZaA	Zamora silty clay loam, moist, 0 to 2 percent slopes, MLRA 14	1.2	100.0%
Totals for Area of Interest		1.2	100.0%

Sonoma County, California

ZaA—Zamora silty clay loam, moist, 0 to 2 percent slopes, MLRA 14

Map Unit Setting

National map unit symbol: 2xcbw

Elevation: 20 to 260 feet

Mean annual precipitation: 27 to 43 inches

Mean annual air temperature: 58 to 59 degrees F

Frost-free period: 288 to 325 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Zamora and similar soils: 85 percent

Minor components: 15 percent

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

Description of Zamora

Setting

Landform: Stream terraces, alluvial fans

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from volcanic and sedimentary rock

Typical profile

A1 - 0 to 5 inches: silty clay loam

A2 - 5 to 17 inches: clay loam

A3 - 17 to 29 inches: clay loam

Bt1 - 29 to 41 inches: clay loam

Bt2 - 41 to 55 inches: sandy clay loam

Bt3 - 55 to 60 inches: gravelly clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.2 to 0.5 mmhos/cm)

Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): 1

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Cole

Percent of map unit: 4 percent

Hydric soil rating: No

Yolo

Percent of map unit: 4 percent

Hydric soil rating: No

Cortina

Percent of map unit: 3 percent

Hydric soil rating: No

Pajaro

Percent of map unit: 3 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

Landform: Depressions

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Sonoma County, California

Survey Area Data: Version 12, Sep 13, 2018

Project Name: _____

	Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with...										Achieves...		Treatment		Volume Capture		Runoff Reduction Measure		BMP in priority selected?		Unique Identifier of BMP per planes	Explanation of selection	Other notes.
				High Ground Water	Contamination	Slope Constraints	Treatment	Volume Capture	Runoff Reduction Measure	Yes	No															
Universal BMP- to be considered on all projects.	Living Roof	N/A	N/A		X	X	X		X	X																
	Rainwater Harvesting	N/A	N/A		X	X	X			X																
Runoff Reduction Measures	Interceptor Trees	N/A	N/A		X	X	X				X			✓												
	Bovine Terrace	RRM-01	Bovine Terrace		X						X															
	Vegetated Buffer Strip	RRM-02	Vegetated Buffer Strip								X															
	Impervious Area Disconnection	N/A	N/A		X	X	X				X			✓												
Priority 1- to be installed with no underdrains or liners. Must drain all staging water within 72 hours.	Bioretention	P1-02	Roadside Bioretention - no C & G							X	X															
	Vegetated Swale-with Bioretention	P1-06	Swale with Bioretention							X	X															
	Constructed Wetlands	N/A	N/A							X	X															
Priority 2 BMPs- with subsurface drains installed above the capture volume.	Bioretention	P2-02	Roadside Bioretention - Flush Design Roadside							X	X															
		P2-03	Roadside Bioretention-Contiguous SW							X	X															
		P2-04	Roadside Bioretention-Curb Opening							X	X				✓											
		P2-05	Roadside Bioretention- No C & G							X	X				✓											
	Constructed Wetlands	N/A	N/A							X	X															

Date: _____

Page ____ of ____

Date: _____ Inspector: _____
Start Time: _____ Project: _____
Stop Time: _____ Address: _____

S = Satisfactory * = Refer to Form B (Specials)
D = Deficient and/or Form C (Notes).

If Yes, attach Form B for Project.

[illegible]

Office Use:		
Complete:	Issues Corrective Action:	Re-Inspection Required:

Storm Water Quality Special Feature Maintenance Check List

Date: _____
Start Time: _____
Stop Time: _____

Inspector: _____
Project: _____
Address: _____

Inspection Status Codes:
S = Satisfactory * - See Notes on Form C
D = Deficient

Special Feature or Conditions											
Reference code	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11
Additional Special Maintenance Inspection Criteria	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.
	BMP ID:										

Office Use:
Complete: _____ Issues Corrective Action: _____ Re-Inspection Required: _____

Form C
Storm Water Quality Feature Maintenance Check List
- Inspection Notes -

Date: _____

Inspector: _____

Project: _____

Address: _____

[illegible]

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO: _____

City of Santa Rosa- Utilities Department
Storm Water & Creeks Section- Supervising Engineer
69 Stony Circle
Santa Rosa CA 95401

Project/Property: Steele Lane Apartments
APN(s): 041-042-012

Santa Rosa, California

**DECLARATION OF COVENANTS REGARDING MAINTENANCE OF
STORM WATER BMP FACILITIES**

This Declaration of Covenants Regarding Maintenance of Storm Water BMP Facilities ("Declaration") is made on this _____ day of _____, 20____, by _____
Stagecoach Development Company, Inc. ("Landowner")_____.

RECITALS

- A. Landowner is the fee simple owner of certain real property located in the City of Santa Rosa ("City"), Sonoma County, California, 041-042-012 and more fully described in Exhibit A to this Declaration ("Property").
- B. The City's National Pollutant Discharge Elimination System ("NPDES") Municipal Separate Storm Sewer System ("MS4") Permit, Order number R1-2009-0050, issued by the North Coast Regional Water Quality Control Board, requires the City to implement and enforce specific requirements for the construction and maintenance of onsite storm water management facilities/best management practices (collectively, "BMP") for development, redevelopment, and other applicable projects with the goal of mitigating impacts to storm water quality and runoff volume discharges into the MS4.
- C. Provisions of Chapter 17-12 and other applicable sections of the Santa Rosa City Code shall apply to the construction, inspection and maintenance of BMP facilities and the enforcement of MS4 Permit requirements.
- D. On _____, _____ approved Landowner's IMPROVEMENT PLANS _____ ("Plan") and a Final Standard Urban Stormwater Mitigation Plan (SUSMP) for the Property which require the construction and maintenance of BMP facilities on the Property (the "BMP Facilities") by Landowner. The BMP Facilities required under the SUSMP may include both built and

landscaping features. The PLAN may be inspected at the City of Santa Rosa, Department of Utilities, Storm Water & Creeks Section, 69 Stony Circle upon appointment.

- E. The SUSMP requires that Landowner make and execute this Declaration.

DECLARATION OF COVENANTS

NOW, THEREFORE, in consideration of the foregoing recitals, Landowner hereby covenants, agrees and declares as follows:

1. Landowner shall, at Landowner's sole cost and expense, construct, inspect, and maintain the BMP Facilities in accordance with the Plan and the SUSMP. Landowner shall assure that all BMPs remain fully functional and that all areas identified in the Plan and SUSMP for treatment and/or volume capture discharge to the specified BMP as designed.
2. Landowner shall keep all records related to annual inspections of BMP's by City and all records related to BMP maintenance for a period of at least five years. The records shall include records of any BMP Facilities corrections, repairs, and replacements. Landowner shall make these records available to the City upon request.
3. In the event Landowner fails to maintain the BMP Facilities in good working condition as solely determined by the City, the City may enter upon the Property and take whatever steps it deems reasonably necessary to maintain and/or make in good working condition, such BMP Facilities. It is expressly understood that the City is under no obligation to maintain or repair the BMP Facilities, and in no event shall this Declaration be construed to impose such an obligation on the City.
4. In the event that the City performs work of any nature, or expends any funds in the performance of such work for labor, use of equipment, supplies, materials, or the like, due to failure of the Landowner to perform its maintenance obligations under this Declaration, as solely determined by City, Landowner shall reimburse the City within 60 days of receipt of notice for all costs incurred by the City to undertake such work. Costs shall include, but are not limited to, the actual cost of construction, maintenance and/or repair, and administrative costs directly related to such work.
5. Any violation of the Plan or SUSMP by Landowner shall be deemed a public nuisance under Chapter 1-30 of the Santa Rosa City Code and City shall be entitled to the remedies available to it under Chapter 1-30 in addition to those available to it under Chapter 17-12. The remedies identified herein shall be in addition to and cumulative of all other remedies, criminal or civil, which may be pursued by the City.

6. Landowner shall indemnify, defend and hold harmless the City and its employees, officials, and agents, from and against any liability, (including liability for claims, suits, actions, arbitration proceedings, administrative proceedings, regulatory proceedings, losses, expenses or costs of any kind, whether actual, alleged or threatened, interest, defense costs, and expert witness fees), where the same relates to, or arises out of, the construction, presence, existence, inspection, or maintenance of BMP Facilities on the Property or the performance of the covenants underlying this Declaration by Landowner, its officers, employees, agents, contractors or sub-contractors, excepting only that resulting from the sole, active negligence or intentional misconduct of the City, its employees, officials, or agents. This indemnification obligation is not limited in any way by any limitation on the amount or type of damages or compensation payable to or for the Landowner or its agents under workers' compensation acts, disability benefits acts or other employees' benefits acts. If any judgment or claim against the City, its officials, agents, or employees, shall be entered, Landowner shall pay all cost and expenses in connection therewith.
7. If any provisions of this Declaration shall be held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.
8. This Declaration shall be governed according to the laws of the State of California. The parties hereto agree that the forum for the adjudication of any dispute related to this Declaration shall be brought exclusively and solely in Sonoma County, California.
9. Landowner shall not assign this Declaration to a third party without the express prior written consent of the City, provided that such consent will not be unreasonably withheld and that such consent shall not be required for Landowner to sell or lease the property to a third party.
10. Landowner binds itself, its partners, successors, legal representatives and assigns to the City, and to the partners, successors, legal representatives and assigns of the City with respect to all promises and agreements contained herein.
11. This Declaration shall be recorded by Landowner, and shall: a) constitute a "covenant running with the land;" b) be binding upon Landowner and Landowner's successors, heirs, and assigns in perpetuity; and, 3) benefit the City of Santa Rosa, its successors, and assigns. Any breach of this Declaration shall render Landowner

or Landowner's heirs, successors or assigns liable pursuant to the provisions of the Santa Rosa City Code.

12. Any notice, submittal or communication required or permitted to be served on Landowner or City may be served by personal delivery to the person or the office of the person identified below. Service may also be made by mail, by placing first-class postage, and addressed as indicated below, and depositing in the United States mail to:

City Representative:

City of Santa Rosa
Utilities Department
Storm Water & Creeks Section
Supervising Engineer
69 Stony Circle
Santa Rosa CA 95401

Landowner or Landowner Representative:

Name: _____
Address: Stagecoach Development
Company, Inc.
19 Leona Drive
San Rafael CA 94903

Executed as of the day and year first above stated.

LANDOWNER:

Name: _____

Signatures of Authorized Persons:

By: _____

Print Name: _____

Title: _____

By: _____

Print Name: _____

Title: _____

ATTACHMENTS:

Exhibit A- Property Description
Notary Acknowledgment