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DRAINAGE REPORT

Creekwood Condominium Project
270 & 280 Casa Grande Road
PETALUMA, California
APN : 017-040-051 & 016

Job No.: 192119

March 23, 2021

Prepared by: NOF

Reviewed by: Alan D. Fulkerson, R.C.E. 48277

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GENERAL STATEMENTS

Project Overview

This project is located in the city of Petaluma, on Casa Grande Road, adjacent to the Casa Grande Highschool, see Vicinity Map & Aerial Context on page 5 of this report. The subject property is a low-density rural residential site that includes two residences located on Casa Grande Road approximately one-quarter mile southerly of Ely Road. The site is also bounded by City of Petaluma property to the east where Adobe Creek is located, PEP Senior Housing Facility to the north and the approved Casa Grande Subdivision to the south.

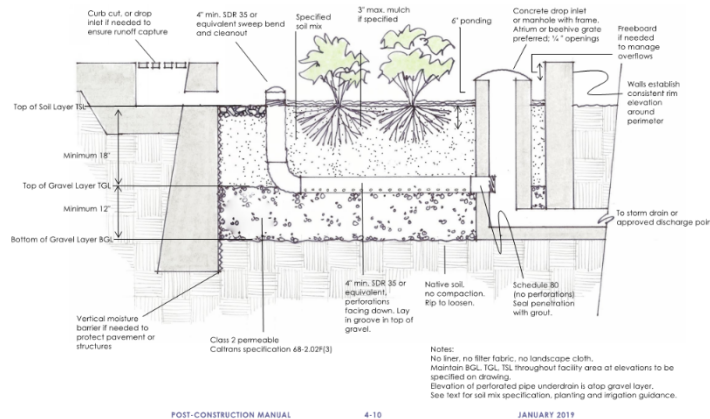
Site elevations ranging between 44 and 48feet NAVD 1988. The existing site is relatively flat, with existing slope ranging between 2-6%.

The site is impacted by a flood plain based on information shown on the FEMA Flood Insurance Rate Map Community Panel Number 06097C 1001G, Effective Date October 2, 2015. All floodway waters are contained within the banks of Adobe Creek

The finished floor elevation of the buildings varies between 47.75' – 49.50' NGVD 88. These elevations are 2ft +/- above the mapped 100 year flood base elevations. Please see appendix E for the "C-12 Site Sections Exhibit" for additional detail.

Stormwater Treatment

The project has designed two BASMAA bioretention basin areas to receive the run off from the improved site. Appendix E presents the "C-14 Preliminary LID Exhibit" provides an overview of the tabulation of the site's areas & coverage for the sizing of the BASMAA Basins. Below is a typical detail from the current BASMAA Manual.



This report addresses design calculations for the development and grading for 42 new condominium units. The project will implement low impact design features in accordance with BASMAA design guidelines / City of Petaluma Standards. Runoff from the impervious roof and roadway areas will be routed to bioretention basins located at the NE and SE limits of the site. Storm water will be conveyed to these basins with Drain Line located in the rear yards of the condo units, as well as the system below the public street. Curb underdrains will be installed along the units frontage with the (N) Street. Please see appendix E for the "C-14 Preliminary LID Exhibit" for additional detail, and "C-16 Catchment Map" for additional detail.

Hydrology/Hydraulic Parameters of Calculations

All hydrology/hydraulic calculations presented in this report are in accordance with Sonoma Water Flood Management Design Manual dated March 2020 (SCWA FDM). All design peak flows were calculated using the Modified Rational Method ($Q = K C I A$) and a Manning's n value of 0.012 for plastic pipe. See the discussion of the runoff coefficient in this report for an overview of how a site composite C-Factor was determined based on the soils present on site & the proposed improvements & impermeable areas.

Precipitation Data

Precipitation data was obtained through NOAA Atlas 14, Volume 6, Version 2. Point precipitation frequency estimates and are presented in appendix A of this report. The tabular data obtained was utilized to build I-D-F curves for use in these calculations which are in appendix B this report.

Time of Concentration

Based on the catchment area of less than $\frac{1}{2}$ acres, a time of concentration of 10 minutes has been used for the design calculations, in accordance with the approximate travel times presented in Table 3-3 of the SCWA FDM. An excerpt of from the design manual is presented below.

Table 3-3. Estimated Overland Flow Travel Time

Description	Time of concentration for overland flow	Maximum size
Commercial	0.117 hr (7 min)	2.0 ac
Lot sizes < $\frac{1}{2}$ ac	0.167 hr (10 min)	2.0 ac
Lot sizes $\geq \frac{1}{2}$ ac	0.250 hr (15 min)	2.0 ac

Rainfall Intensity

Since the area of interest is less than 1 sq mi, a 10 year storm and 100 year storm were considered for this analysis. This is in accordance with section 3.3.4 of the FDM, see an excerpt of table 3-2 below.

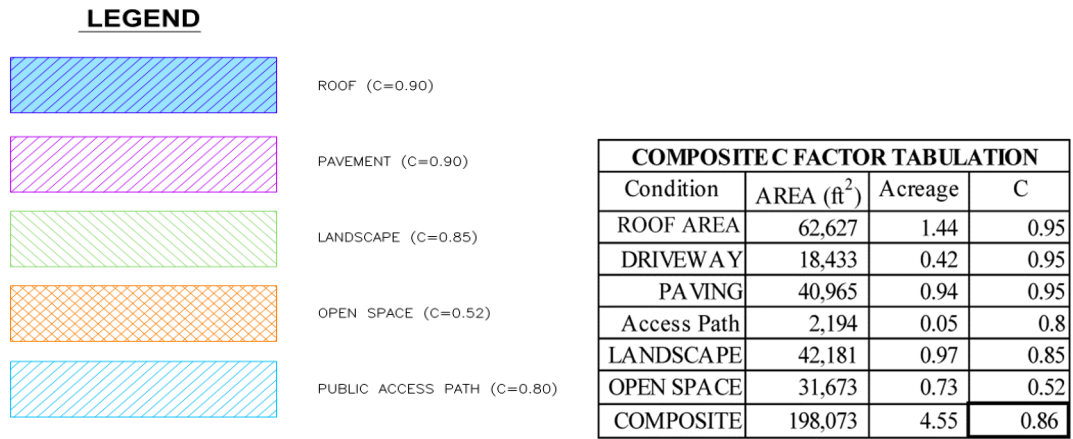
Table 3-2. Minimum Design Flows

Waterway Type	Watershed Area	Design Flow
Minor waterway	1 sq mi or less	10-year peak flow
Secondary waterway	Between 1 and 4 sq mi	25-year peak flow
Major waterway	4 sq mi or more	100-year peak flow

Runoff Coefficient

The runoff coefficients for the analysis were determined per the provisions of flood design manual section 3.4.1.1 for the pre & post improvement conditions. The NRCS reports

show that the site is underlain by Clear Lake Clay and should be classified as hydrologic soil group D. Below is an excerpt from the “C-15 Composite C-Map” see appendix E for additional detail.



Drainage Areas

The catchment areas for the area of interest were assessed for the post improvement configurations. These are presented on layout “C-16 Post Improvement Catchment Map”, see appendix E for additional detail. The public street pavements, front yards, & portions of the units roof areas drain to the curb & gutters on site, which are collected by 6 Catch Basins dispersed through the site. The remaining roof areas & rear yards are routed to area drain inlets located in the rear yards with a lateral servicing each units’ tributary area.

Hydraulic Grade Line

The hydraulic grade lines calculated for the 10 Year storm event are presented in appendices _ & _. The proposed storm drain system retains all flows within the pipes & structures for the anticipated 10 Year storm event / intensity. The hydraulic grade line data is presented in tabular form, as well as projected onto the layouts in “C-11 Storm Drain Profiles”.

The portions of the project site are located within the FEMA 100 year flood plain. Please see appendix E for the “C-2 Existing Conditions” & “C-8 Preliminary Grading” exhibits. For the 100 year event, the finish floor elevations throughout the site have been set a min of 1ft above the mapped flood elevation. See “C-12 Site Sections”. The overland release for the site is presented on the grading plan. The road profile has been designed to route water back to Casa Grande road and the gutters have been designed to retain no more than 0.4’ during overland flow conditions.

Please see appendix F for the FEMA FIRM Mapping.



VICINITY MAP
N.T.S.

1. Site Vicinity Map



2. Aerial Photo of Overall Parcel

APPENDICES

APPENDIX A: NOAA ATLAS DATA

Page 1 of 4



NOAA Atlas 14, Volume 6, Version 2
Location name: Petaluma, California, USA*
Latitude: 38.2401°, Longitude: -122.5966°
Elevation: 42.9 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

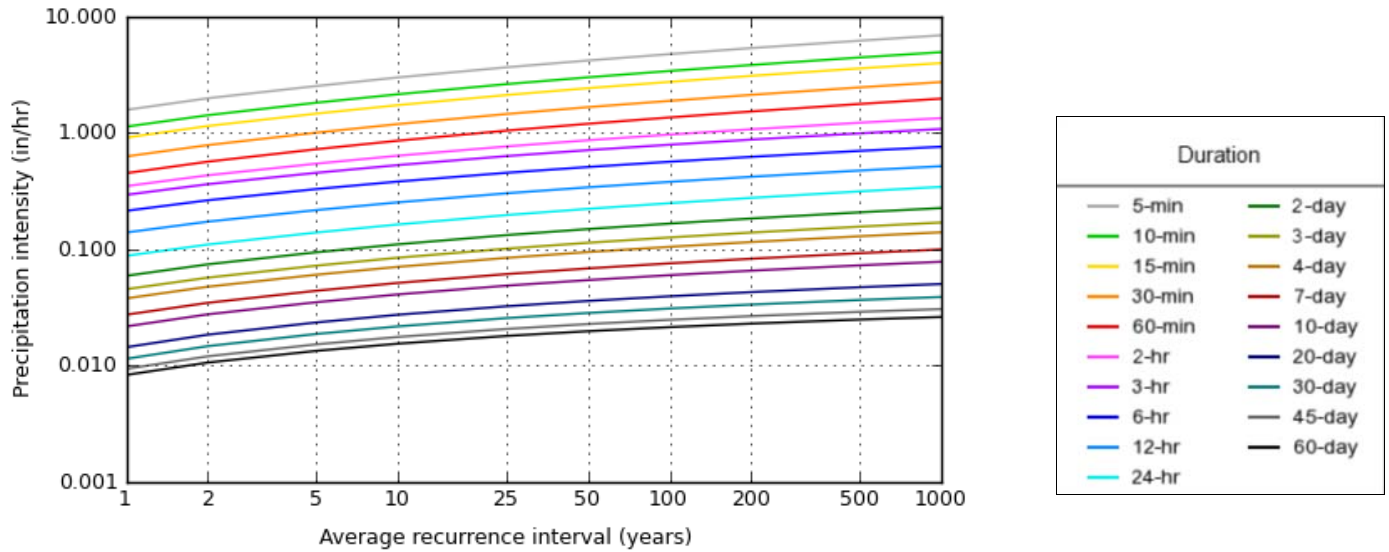
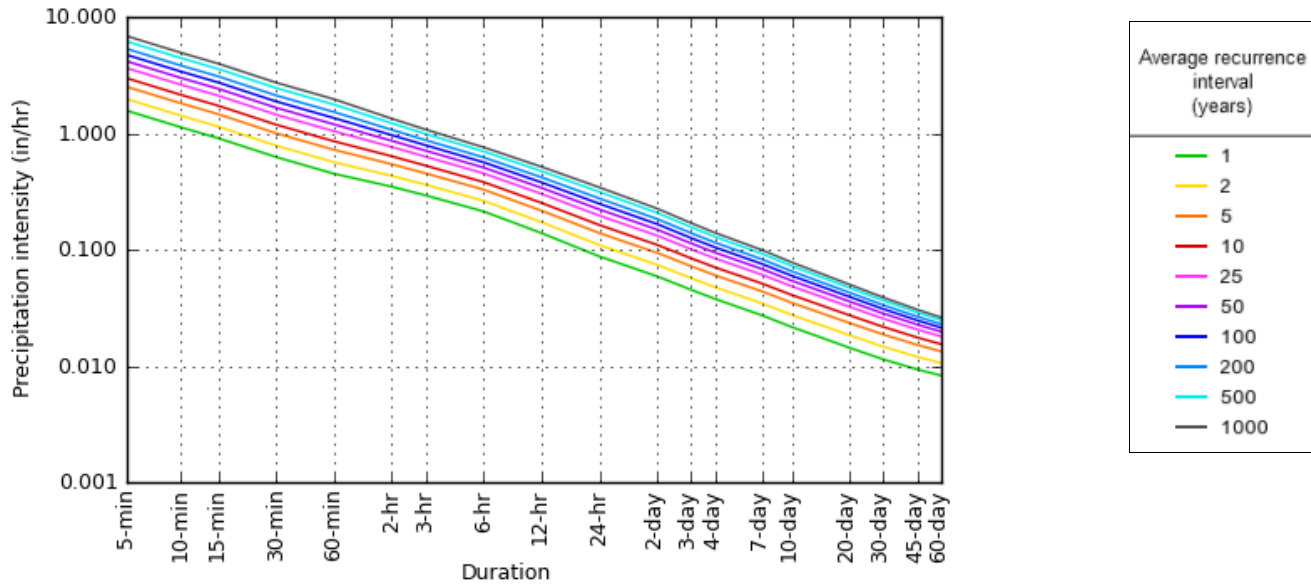
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.57 (1.40-1.79)	1.98 (1.75-2.24)	2.52 (2.23-2.88)	2.99 (2.63-3.44)	3.65 (3.07-4.37)	4.18 (3.43-5.14)	4.74 (3.79-5.99)	5.34 (4.13-6.96)	6.18 (4.56-8.47)	6.88 (4.87-9.80)
10-min	1.13 (1.00-1.28)	1.42 (1.26-1.61)	1.81 (1.60-2.06)	2.14 (1.88-2.47)	2.62 (2.21-3.13)	2.99 (2.47-3.68)	3.40 (2.71-4.29)	3.82 (2.96-4.99)	4.43 (3.26-6.07)	4.93 (3.49-7.03)
15-min	0.908 (0.808-1.03)	1.14 (1.02-1.30)	1.46 (1.29-1.66)	1.73 (1.52-1.99)	2.11 (1.78-2.52)	2.42 (1.99-2.96)	2.74 (2.19-3.46)	3.08 (2.38-4.02)	3.57 (2.63-4.90)	3.97 (2.81-5.66)
30-min	0.626 (0.556-0.710)	0.784 (0.698-0.892)	1.00 (0.888-1.14)	1.19 (1.04-1.37)	1.45 (1.22-1.74)	1.66 (1.36-2.04)	1.88 (1.50-2.38)	2.12 (1.64-2.77)	2.45 (1.81-3.36)	2.73 (1.93-3.89)
60-min	0.450 (0.401-0.511)	0.565 (0.502-0.642)	0.722 (0.640-0.823)	0.855 (0.750-0.984)	1.04 (0.880-1.25)	1.20 (0.983-1.47)	1.35 (1.08-1.71)	1.53 (1.18-1.99)	1.77 (1.30-2.42)	1.97 (1.39-2.80)
2-hr	0.348 (0.310-0.395)	0.432 (0.384-0.490)	0.543 (0.481-0.620)	0.636 (0.558-0.732)	0.763 (0.643-0.914)	0.862 (0.710-1.06)	0.965 (0.772-1.22)	1.07 (0.830-1.40)	1.22 (0.899-1.67)	1.34 (0.946-1.91)
3-hr	0.293 (0.261-0.332)	0.362 (0.322-0.411)	0.453 (0.401-0.516)	0.528 (0.463-0.608)	0.630 (0.531-0.755)	0.709 (0.583-0.871)	0.790 (0.632-0.999)	0.874 (0.676-1.14)	0.989 (0.729-1.36)	1.08 (0.763-1.54)
6-hr	0.214 (0.190-0.242)	0.263 (0.234-0.299)	0.328 (0.291-0.374)	0.381 (0.335-0.439)	0.453 (0.382-0.543)	0.508 (0.418-0.624)	0.564 (0.451-0.713)	0.622 (0.481-0.811)	0.699 (0.515-0.958)	0.759 (0.538-1.08)
12-hr	0.139 (0.124-0.158)	0.173 (0.153-0.196)	0.217 (0.192-0.247)	0.253 (0.222-0.291)	0.302 (0.255-0.362)	0.340 (0.280-0.418)	0.379 (0.303-0.479)	0.419 (0.324-0.547)	0.474 (0.349-0.649)	0.516 (0.366-0.736)
24-hr	0.088 (0.079-0.099)	0.110 (0.099-0.125)	0.139 (0.125-0.158)	0.163 (0.145-0.187)	0.196 (0.170-0.232)	0.222 (0.189-0.267)	0.249 (0.207-0.305)	0.276 (0.224-0.347)	0.314 (0.245-0.410)	0.343 (0.260-0.462)
2-day	0.059 (0.053-0.067)	0.074 (0.067-0.084)	0.094 (0.084-0.107)	0.110 (0.098-0.126)	0.132 (0.114-0.156)	0.149 (0.126-0.179)	0.166 (0.138-0.204)	0.184 (0.149-0.231)	0.207 (0.162-0.271)	0.226 (0.171-0.304)
3-day	0.045 (0.041-0.051)	0.057 (0.051-0.065)	0.072 (0.065-0.082)	0.085 (0.075-0.097)	0.101 (0.087-0.119)	0.114 (0.096-0.137)	0.126 (0.105-0.155)	0.139 (0.113-0.175)	0.156 (0.122-0.204)	0.170 (0.129-0.228)
4-day	0.038 (0.034-0.043)	0.048 (0.043-0.054)	0.060 (0.054-0.069)	0.071 (0.063-0.081)	0.084 (0.073-0.099)	0.095 (0.080-0.114)	0.105 (0.087-0.129)	0.115 (0.093-0.145)	0.129 (0.101-0.169)	0.140 (0.106-0.188)
7-day	0.027 (0.025-0.031)	0.035 (0.031-0.039)	0.044 (0.039-0.050)	0.051 (0.046-0.059)	0.061 (0.053-0.072)	0.068 (0.058-0.082)	0.076 (0.063-0.093)	0.083 (0.067-0.104)	0.092 (0.072-0.121)	0.100 (0.075-0.134)
10-day	0.022 (0.020-0.025)	0.028 (0.025-0.031)	0.035 (0.031-0.040)	0.041 (0.036-0.047)	0.049 (0.042-0.057)	0.054 (0.046-0.065)	0.060 (0.050-0.074)	0.065 (0.053-0.082)	0.073 (0.057-0.095)	0.078 (0.059-0.105)
20-day	0.014 (0.013-0.016)	0.018 (0.017-0.021)	0.023 (0.021-0.027)	0.027 (0.024-0.031)	0.032 (0.028-0.038)	0.036 (0.031-0.043)	0.039 (0.033-0.048)	0.043 (0.035-0.054)	0.047 (0.037-0.062)	0.050 (0.038-0.068)
30-day	0.011 (0.010-0.013)	0.015 (0.013-0.017)	0.019 (0.017-0.021)	0.022 (0.019-0.025)	0.026 (0.022-0.030)	0.028 (0.024-0.034)	0.031 (0.026-0.038)	0.033 (0.027-0.042)	0.037 (0.029-0.048)	0.039 (0.029-0.052)
45-day	0.009 (0.008-0.011)	0.012 (0.011-0.014)	0.015 (0.014-0.017)	0.018 (0.016-0.020)	0.021 (0.018-0.024)	0.023 (0.019-0.027)	0.025 (0.021-0.030)	0.027 (0.022-0.034)	0.029 (0.023-0.038)	0.031 (0.023-0.041)
60-day	0.008 (0.007-0.009)	0.011 (0.010-0.012)	0.013 (0.012-0.015)	0.015 (0.014-0.018)	0.018 (0.016-0.021)	0.020 (0.017-0.024)	0.021 (0.018-0.026)	0.023 (0.019-0.029)	0.025 (0.019-0.032)	0.026 (0.020-0.035)

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

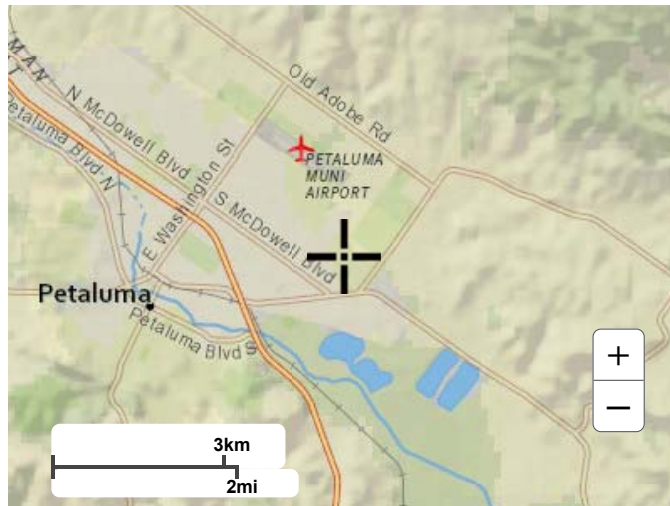
PDS-based intensity-duration-frequency (IDF) curves
 Latitude: 38.2401°, Longitude: -122.5966°



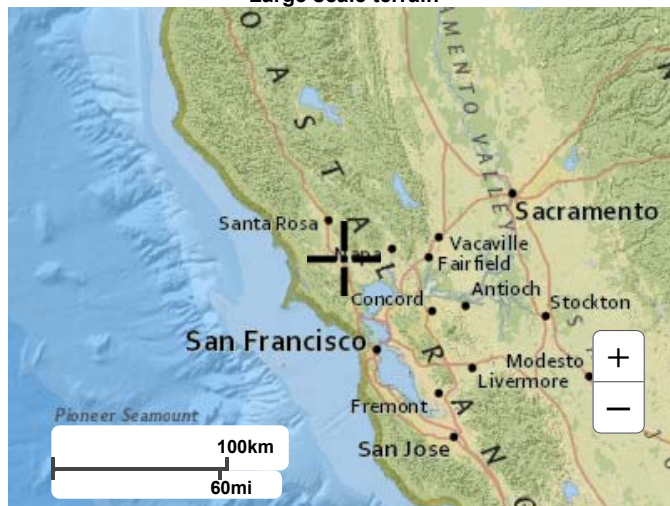
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Maps & aerials

Small scale terrain



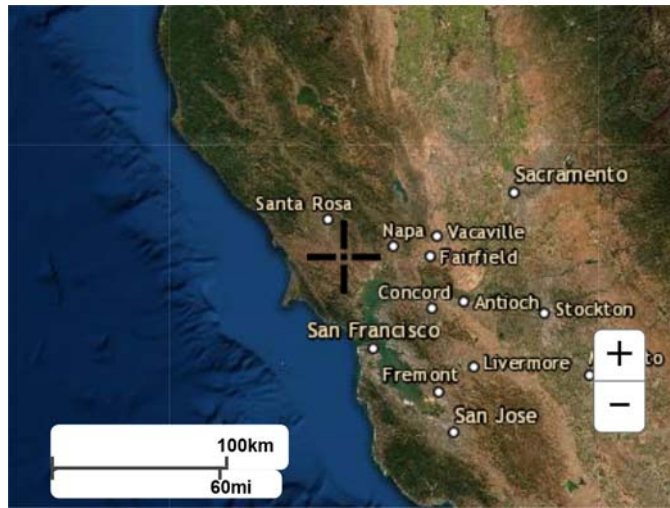
Large scale terrain



Large scale map



Large scale aerial



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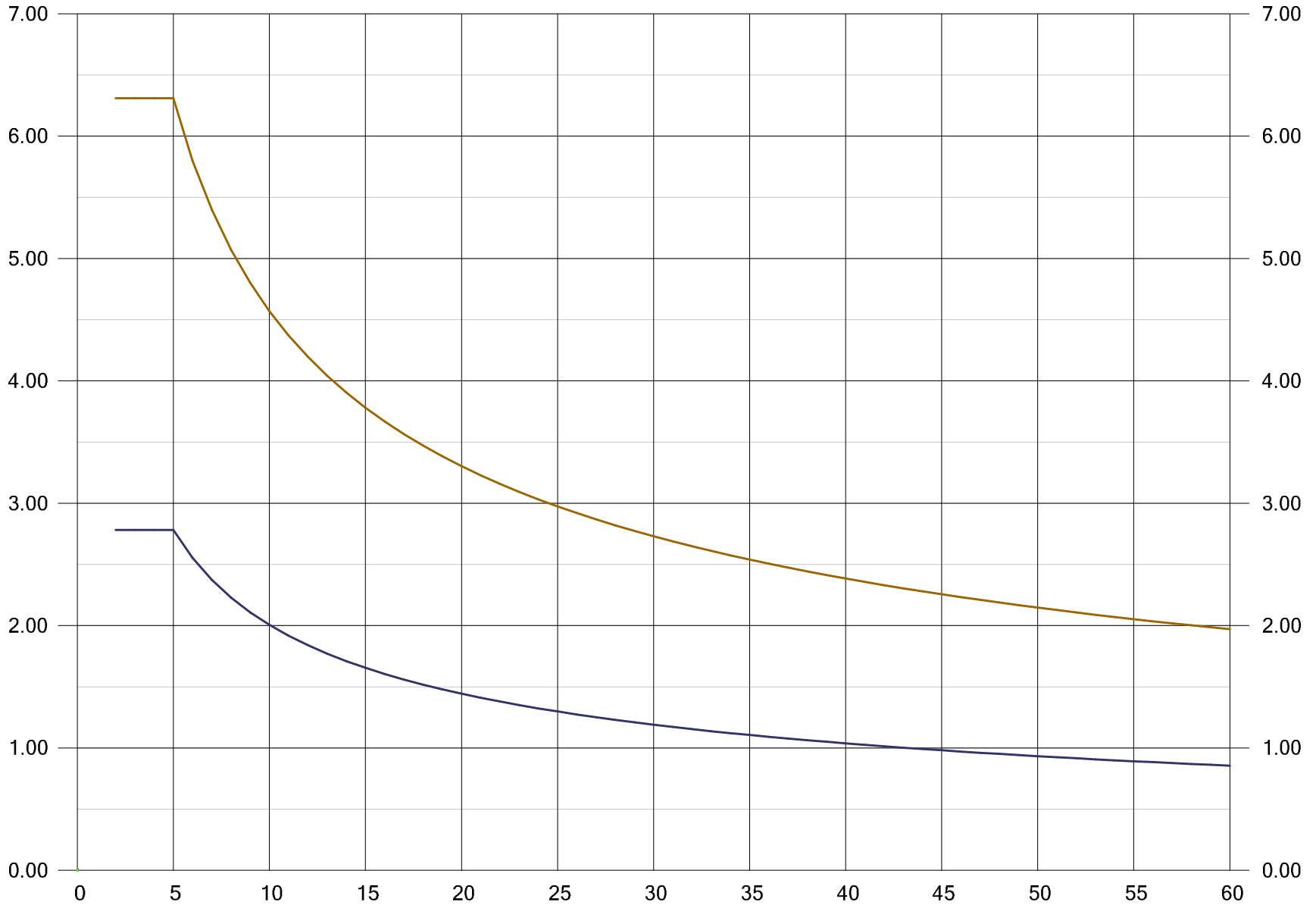
[Disclaimer](#)

APPENDIX B: HYDRAFLOW IDF CURVE DATA

Storm Sewer IDF Curves

IDF file: Creekwood IDF ATLAS Power.IDF

Int. (in/hr)



100-Yr

10-Yr

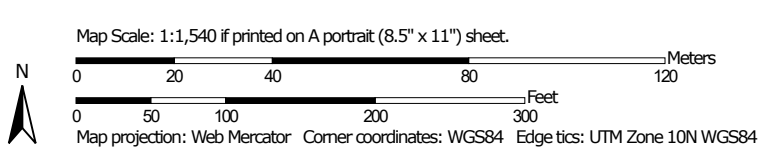
Time (min)

APPENDIX C: NRCS SOIL MAP & REPORT

Soil Map—Sonoma County, California




Soil Map may not be valid at this scale.



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 14, May 29, 2020

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

Date(s) aerial images were photographed: Jun 1, 2020—Jun 5, 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
CeA	Clear Lake clay, sandy substratum, drained, 0 to 2 percent slopes, MLRA 14	4.4	100.0%
Totals for Area of Interest		4.4	100.0%

Hydrologic Soil Group and Surface Runoff

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having 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.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

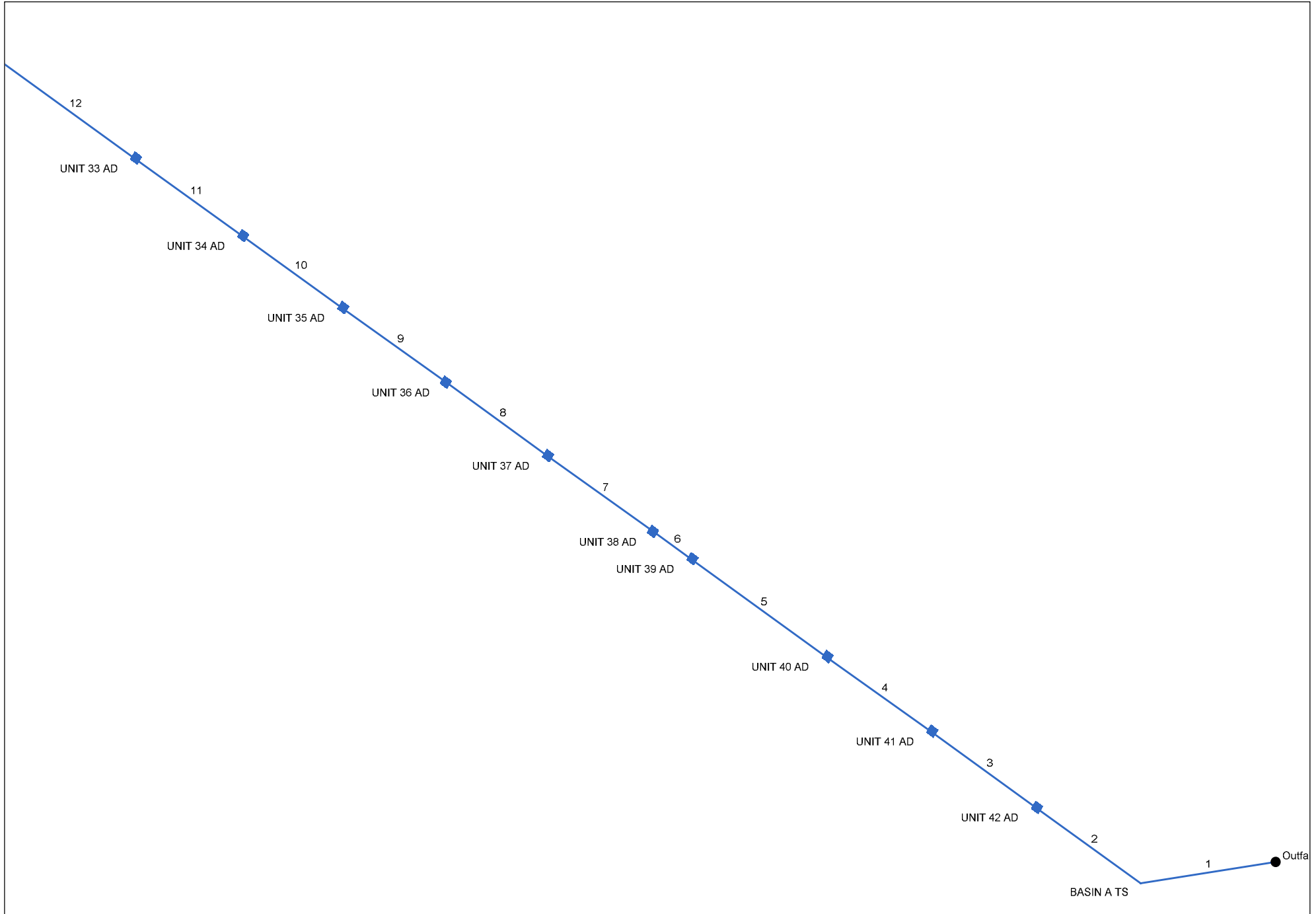
Hydrologic Soil Group and Surface Runoff—Sonoma County, California			
Map symbol and soil name	Pct. of map unit	Surface Runoff	Hydrologic Soil Group
CeA—Clear Lake clay, sandy substratum, drained, 0 to 2 percent slopes, MLRA 14			
Clear lake, drained, sandy substratum	85	High	D

Data Source Information

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 14, May 29, 2020

APPNEDIX D: HYDRAFLOW PLOTS & TABLES

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



Project File: Creekwood Basin A Collector.stm

Number of lines: 12

Date: 3/16/2021

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	TS TO BASIN A	0.44	6	Cir	29.026	42.75	43.04	0.999	43.07	43.38	n/a	43.38	End	None
2	AD-42 [48]	0.44	6	Cir	27.811	43.04	43.32	1.007	43.38	43.66	0.08	43.66	1	Generic
3	AD-41 [47]	0.40	6	Cir	28.000	43.32	43.60	1.000	43.66	43.92	n/a	43.92 j	2	Generic
4	AD-40 [46]	0.35	6	Cir	27.500	43.60	43.88	1.018	43.92	44.18	n/a	44.18 j	3	Generic
5	AD-39 [45]	0.33	6	Cir	36.001	43.87	44.23	1.000	44.18	44.52	n/a	44.52 j	4	Generic
6	AD-38 [44]	0.29	6	Cir	10.000	44.23	44.33	1.000	44.52	44.60	n/a	44.60 j	5	Generic
7	AD-37 [43]	0.25	6	Cir	27.990	44.33	44.61	1.000	44.60	44.86	n/a	44.86 j	6	Generic
8	AD-36 [42]	0.21	6	Cir	27.000	44.61	44.88	1.000	44.86	45.11	n/a	45.11 j	7	Generic
9	AD-35 [41]	0.16	6	Cir	27.500	44.88	45.16	1.018	45.11	45.36	n/a	45.36 j	8	Generic
10	AD-34 [40]	0.12	6	Cir	26.494	45.16	45.42	0.981	45.36	45.59	n/a	45.59 j	9	Generic
11	AD-33 [39]	0.08	6	Cir	28.507	45.42	45.71	1.017	45.59	45.85	n/a	45.85 j	10	Generic
12	AD-32 [38]	0.04	6	Cir	36.000	45.71	46.07	1.000	45.85	46.16	n/a	46.16 j	11	Generic

Project File: Creekwood Basin A Collector.stm

Number of lines: 12

Run Date: 3/15/2021

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (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	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	29.026	0.00	0.33	0.00	0.00	0.27	0.0	17.2	1.6	0.44	0.61	3.24	6	1.00	42.75	43.04	43.07	43.38	0.00	44.27	TS TO BASIN A
2	1	27.811	0.03	0.33	0.83	0.02	0.27	10.0	17.0	1.6	0.44	0.61	3.13	6	1.01	43.04	43.32	43.38	43.66	44.27	47.72	AD-42 [48]
3	2	28.000	0.04	0.30	0.83	0.03	0.25	10.0	16.8	1.6	0.40	0.61	2.93	6	1.00	43.32	43.60	43.66	43.92	47.72	47.61	AD-41 [47]
4	3	27.500	0.02	0.26	0.83	0.02	0.22	10.0	16.6	1.6	0.35	0.61	2.74	6	1.02	43.60	43.88	43.92	44.18	47.61	47.66	AD-40 [46]
5	4	36.001	0.03	0.24	0.83	0.02	0.20	10.0	16.3	1.6	0.33	0.61	2.67	6	1.00	43.87	44.23	44.18	44.52	47.66	47.66	AD-39 [45]
6	5	10.000	0.03	0.21	0.83	0.02	0.17	10.0	16.2	1.7	0.29	0.61	2.55	6	1.00	44.23	44.33	44.52	44.60	47.66	47.66	AD-38 [44]
7	6	27.990	0.03	0.18	0.83	0.02	0.15	10.0	15.9	1.7	0.25	0.61	2.41	6	1.00	44.33	44.61	44.60	44.86	47.66	47.66	AD-37 [43]
8	7	27.000	0.04	0.15	0.83	0.03	0.12	10.0	15.6	1.7	0.21	0.61	2.26	6	1.00	44.61	44.88	44.86	45.11	47.66	47.66	AD-36 [42]
9	8	27.500	0.03	0.11	0.83	0.02	0.09	10.0	15.1	1.7	0.16	0.61	1.98	6	1.02	44.88	45.16	45.11	45.36	47.66	47.66	AD-35 [41]
10	9	26.494	0.03	0.08	0.83	0.02	0.07	10.0	14.4	1.8	0.12	0.60	1.81	6	0.98	45.16	45.42	45.36	45.59	47.66	47.66	AD-34 [40]
11	10	28.507	0.03	0.05	0.83	0.02	0.04	10.0	13.4	1.8	0.08	0.61	1.53	6	1.02	45.42	45.71	45.59	45.85	47.66	47.68	AD-33 [39]
12	11	36.000	0.02	0.02	0.83	0.02	0.02	10.0	10.0	2.1	0.04	0.61	1.12	6	1.00	45.71	46.07	45.85	46.16	47.68	47.79	AD-32 [38]

Project File: Creekwood Basin A Collector.stm

Number of lines: 12

Run Date: 3/15/2021

NOTES: Intensity = 6.93 / (Inlet time + 0.20) ^ 0.51; Return period = Yrs. 10 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter						Inlet			Byp Line No	
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)		Depr (in)
1	BASIN A TS	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
2	UNIT 42 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
3	UNIT 41 AD	0.07	0.00	0.07	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
4	UNIT 40 AD	0.04	0.00	0.04	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
5	UNIT 39 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
6	UNIT 38 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
7	UNIT 37 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
8	UNIT 36 AD	0.07	0.00	0.07	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
9	UNIT 35 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
10	UNIT 34 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
11	UNIT 33 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
12	UNIT 32 AD	0.04	0.00	0.04	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off

Project File: Creekwood Basin A Collector.stm

Number of lines: 12

Run Date: 3/15/2021

NOTES: Inlet N-Values = 0.016; Intensity = 6.93 / (Inlet time + 0.20) ^ 0.51; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

Hydraulic Grade Line Computations

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream								Check		JL coeff (K)	Minor loss (ft)
			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)		
1	6	0.44	42.75	43.07	0.32	0.13	3.37	0.15	43.22	0.000	29.026	43.04	43.38	0.34**	0.14	3.12	0.15	43.53	0.000	0.000	n/a	0.75	n/a
2	6	0.44	43.04	43.38	0.34	0.14	3.14	0.15	43.53	0.000	27.811	43.32	43.66	0.34**	0.14	3.13	0.15	43.81	0.000	0.000	n/a	0.50	0.08
3	6	0.40	43.32	43.66	0.34	0.13	2.86	0.14	43.80	0.000	28.000	43.60	43.92 j	0.32**	0.13	3.01	0.14	44.06	0.000	0.000	n/a	0.50	n/a
4	6	0.35	43.60	43.92	0.32	0.12	2.63	0.13	44.05	0.000	27.500	43.88	44.18 j	0.30**	0.12	2.86	0.13	44.31	0.000	0.000	n/a	0.50	0.06
5	6	0.33	43.87	44.18	0.31	0.12	2.56	0.12	44.30	0.000	36.001	44.23	44.52 j	0.29**	0.12	2.78	0.12	44.64	0.000	0.000	n/a	0.50	0.06
6	6	0.29	44.23	44.52	0.29	0.11	2.44	0.11	44.63	0.000	10.000	44.33	44.60 j	0.27**	0.11	2.65	0.11	44.71	0.000	0.000	n/a	0.50	0.05
7	6	0.25	44.33	44.60	0.27	0.10	2.30	0.10	44.70	0.000	27.990	44.61	44.86 j	0.25**	0.10	2.53	0.10	44.96	0.000	0.000	n/a	0.50	0.05
8	6	0.21	44.61	44.86	0.25	0.09	2.13	0.09	44.95	0.000	27.000	44.88	45.11 j	0.23**	0.09	2.39	0.09	45.20	0.000	0.000	n/a	0.50	0.04
9	6	0.16	44.88	45.11	0.23	0.07	1.78	0.07	45.18	0.000	27.500	45.16	45.36 j	0.20**	0.07	2.18	0.07	45.43	0.000	0.000	n/a	0.50	0.04
10	6	0.12	45.16	45.36	0.20	0.06	1.62	0.06	45.42	0.000	26.494	45.42	45.59 j	0.17**	0.06	1.99	0.06	45.65	0.000	0.000	n/a	0.50	n/a
11	6	0.08	45.42	45.59	0.17	0.04	1.30	0.05	45.64	0.000	28.507	45.71	45.85 j	0.14**	0.04	1.77	0.05	45.89	0.000	0.000	n/a	0.50	0.02
12	6	0.04	45.71	45.85	0.14	0.02	0.82	0.03	45.88	0.000	36.000	46.07	46.16 j	0.09**	0.02	1.43	0.03	46.19	0.000	0.000	n/a	1.00	0.03

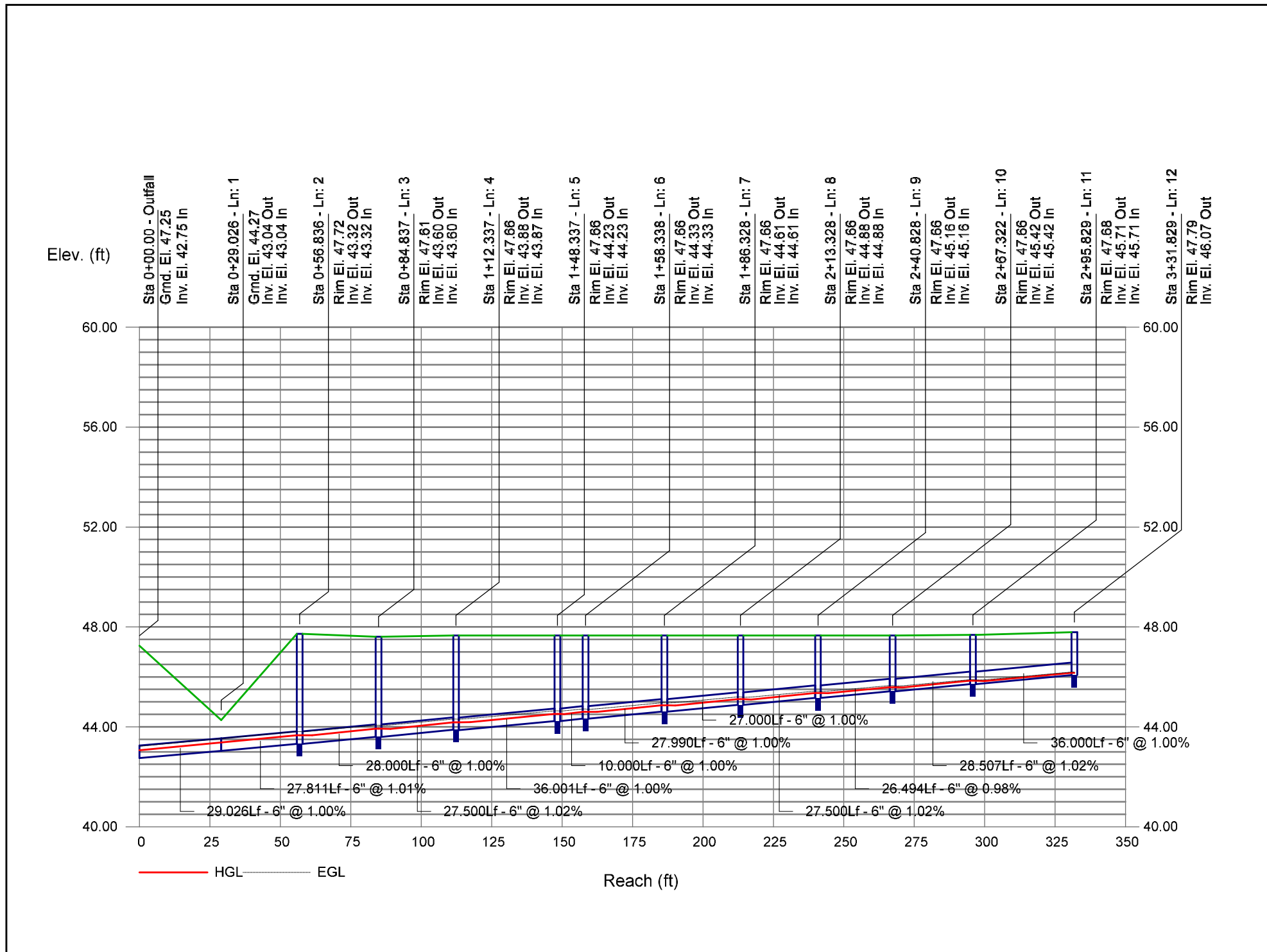
Project File: Creekwood Basin A Collector.stm

Number of lines: 12

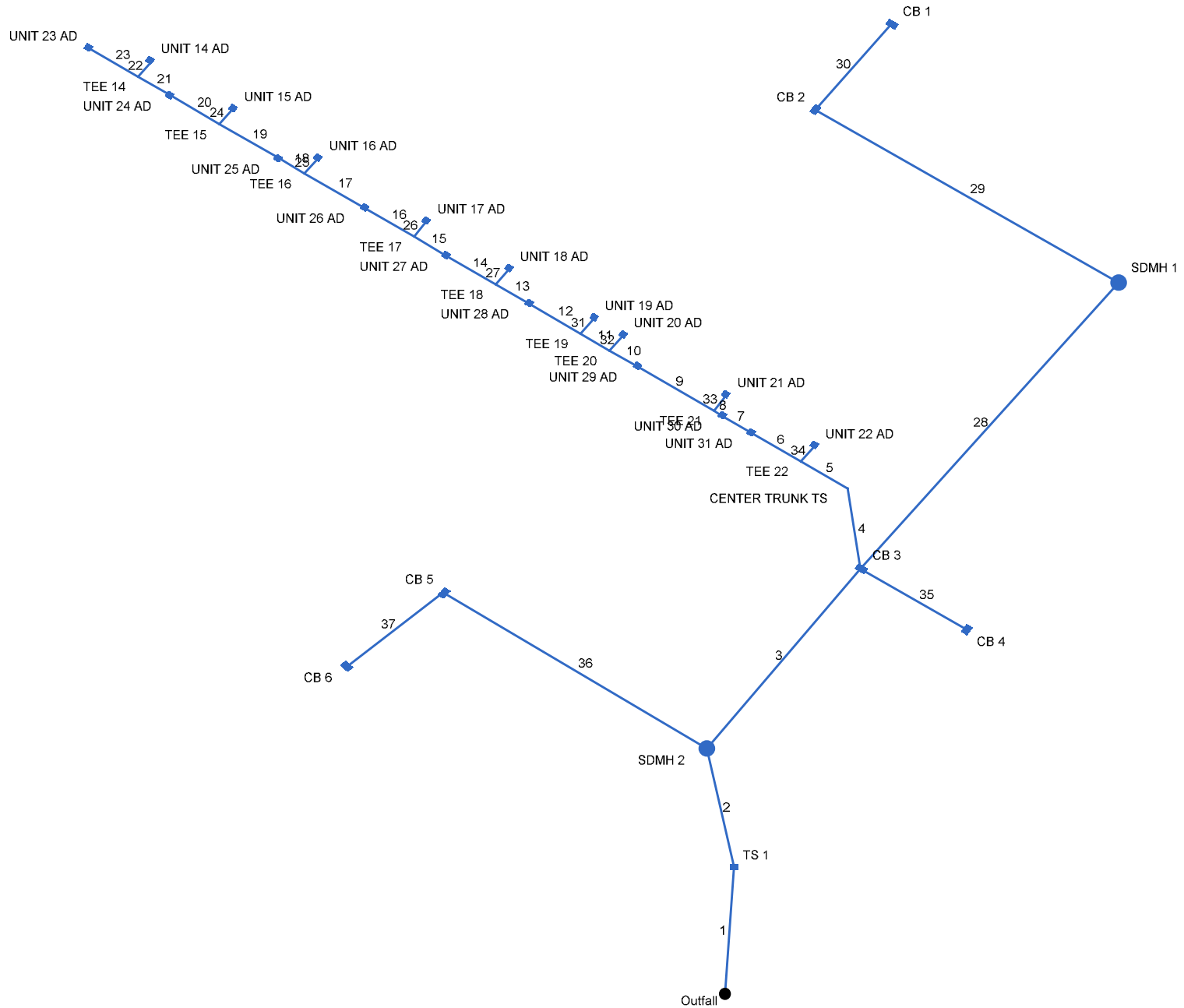
Run Date: 3/15/2021

Notes: ; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Storm Sewer Profile



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



Project File: Creekwood Basin A Mid Block Collector.stm

Number of lines: 37

Date: 3/15/2021

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	TS-1 TO BASIN A	4.15	15	Cir	43.618	42.50	42.61	0.252	43.32	43.67	0.11	43.78	End	DropCurb
2	SDMH-2 TO TS-1	4.17	15	Cir	41.179	42.86	42.96	0.243	44.11	44.21	0.13	44.34	1	Manhole
3	CB-3 [3]	2.79	15	Cir	74.853	42.96	43.15	0.254	44.34*	44.46*	0.12	44.58	2	DropCurb
4	TS- CB-3	0.77	6	Cir	27.761	43.15	43.29	0.504	44.58*	45.03*	0.18	45.21	3	None
5	LAT 22-TS	0.77	6	Cir	15.846	43.29	43.37	0.505	45.21*	45.46*	0.24	45.70	4	None
6	AD-31 [37]	0.74	6	Cir	17.000	43.37	43.46	0.529	45.70*	45.95*	0.11	46.06	5	Generic
7	AD-30 [36]	0.67	6	Cir	10.000	43.45	43.50	0.500	46.06*	46.19*	0.09	46.28	6	Generic
8	LAT 21-30	0.63	6	Cir	2.824	43.50	43.51	0.354	46.28*	46.31*	0.16	46.47	7	None
9	AD-29 [35]	0.60	6	Cir	26.176	43.51	43.64	0.497	46.47*	46.73*	0.07	46.80	8	Generic
10	LAT 20-29	0.56	6	Cir	9.000	43.64	43.69	0.556	46.80*	46.88*	0.13	47.00	9	None
11	LAT 19-20	0.50	6	Cir	10.000	43.69	43.74	0.500	47.00*	47.07*	0.10	47.17	10	None
12	AD-28 [34]	0.46	6	Cir	18.000	43.74	43.83	0.500	47.17*	47.28*	0.04	47.32	11	Generic
13	LAT 18-28	0.44	6	Cir	11.000	43.83	43.89	0.545	47.32*	47.38*	0.08	47.45	12	None
14	AD-27[33]	0.39	6	Cir	17.000	43.89	43.98	0.529	47.45*	47.53*	0.03	47.56	13	Generic
15	LAT 17-27	0.35	6	Cir	11.000	43.97	44.03	0.545	47.56*	47.59*	0.05	47.64	14	None
16	AD-26 [32]	0.31	6	Cir	17.000	44.03	44.12	0.529	47.64*	47.69*	0.02	47.71	15	Generic
17	LAT 16-26	0.27	6	Cir	20.000	44.11	44.21	0.500	47.71*	47.75*	0.03	47.77	16	None
18	AD-25 [31]	0.22	6	Cir	9.000	44.21	44.26	0.556	47.77*	47.79*	0.01	47.80	17	Generic
19	LAT 15-25	0.18	6	Cir	20.000	44.25	44.35	0.500	47.80*	47.81*	0.01	47.83	18	None
20	AD-24 [30]	0.15	6	Cir	17.000	44.35	44.44	0.529	47.83*	47.84*	0.00	47.84	19	Generic
21	LAT 14 - 24	0.11	6	Cir	11.000	44.43	44.49	0.545	47.84*	47.85*	0.00	47.85	20	None
22	AD-14 [20]	0.08	6	Cir	6.750	44.49	44.56	1.037	47.85*	47.85*	0.00	47.86	21	Generic
23	AD-23 [29]	0.03	6	Cir	17.000	44.49	44.58	0.529	47.85*	47.85*	0.00	47.85	21	Generic
24	AD-15 [21]	0.03	6	Cir	6.750	44.35	44.42	1.037	47.83*	47.83*	0.00	47.83	19	Generic

Project File: Creekwood Basin A Mid Block Collector.stm

Number of lines: 37

Run Date: 3/15/2021

NOTES: Return period = 10 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	AD-16 [22]	0.05	6	Cir	6.750	44.21	44.28	1.037	47.77*	47.77*	0.00	47.78	17	Generic
26	AD-17 [23]	0.05	6	Cir	6.750	44.03	44.10	1.037	47.64*	47.64*	0.00	47.65	15	Generic
27	AD-18 [24]	0.05	6	Cir	6.750	43.89	43.96	1.037	47.45*	47.46*	0.00	47.46	13	Generic
28	SDMH-1 TO CB-3	1.52	15	Cir	121.295	43.15	43.45	0.247	44.58	44.64	0.02	44.66	3	Manhole
29	CB-2 [2]	1.60	15	Cir	102.768	43.45	43.71	0.253	44.66	44.70	0.05	44.76	28	DropCurb
30	CB-1 [1]	0.90	15	Cir	36.000	43.71	43.80	0.250	44.76	44.76	0.01	44.78	29	DropCurb
31	AD-19 [25]	0.05	6	Cir	6.750	43.74	43.81	1.037	47.17*	47.17*	0.00	47.18	11	Generic
32	AD-20 [26]	0.07	6	Cir	6.750	43.69	43.76	1.037	47.00*	47.00*	0.00	47.01	10	Generic
33	AD-21 [27]	0.03	6	Cir	6.750	43.51	43.58	1.037	46.47*	46.47*	0.00	46.47	8	Generic
34	AD-22 [28]	0.03	6	Cir	6.750	43.37	43.44	1.037	45.70*	45.70*	0.00	45.70	5	Generic
35	CB-4 [4]	0.42	15	Cir	36.000	43.15	43.24	0.250	44.58*	44.58*	0.00	44.59	3	DropCurb
36	CB-5 [5]	1.65	15	Cir	90.373	42.96	43.19	0.254	44.34	44.39	0.04	44.43	2	DropCurb
37	CB-6 [6]	0.92	15	Cir	36.654	43.19	43.28	0.246	44.43	44.44	0.01	44.45	36	DropCurb

Project File: Creekwood Basin A Mid Block Collector.stm

Number of lines: 37

Run Date: 3/15/2021

NOTES: Return period = 10 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (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	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	43.618	0.00	3.00	0.00	0.00	2.49	0.0	14.8	1.7	4.15	3.51	4.29	15	0.25	42.50	42.61	43.32	43.67	0.00	46.33	TS-1 TO BASIN A
2	1	41.179	0.00	3.00	0.00	0.00	2.49	0.0	14.6	1.7	4.17	3.45	3.40	15	0.24	42.86	42.96	44.11	44.21	46.33	46.01	SDMH-2 TO TS-1
3	2	74.853	0.18	1.97	0.83	0.15	1.64	10.0	14.1	1.7	2.79	3.52	2.27	15	0.25	42.96	43.15	44.34	44.46	46.01	46.01	CB-3 [3]
4	3	27.761	0.00	0.54	0.00	0.00	0.45	0.0	14.0	1.7	0.77	0.43	3.91	6	0.50	43.15	43.29	44.58	45.03	46.01	44.52	TS- CB-3
5	4	15.846	0.00	0.54	0.00	0.00	0.45	0.0	13.9	1.7	0.77	0.43	3.91	6	0.50	43.29	43.37	45.21	45.46	44.52	44.53	LAT 22-TS
6	5	17.000	0.05	0.52	0.83	0.04	0.43	10.0	13.9	1.7	0.74	0.44	3.78	6	0.53	43.37	43.46	45.70	45.95	44.53	47.63	AD-31 [37]
7	6	10.000	0.03	0.47	0.83	0.02	0.39	10.0	13.8	1.7	0.67	0.43	3.42	6	0.50	43.45	43.50	46.06	46.19	47.63	47.67	AD-30 [36]
8	7	2.824	0.00	0.44	0.00	0.00	0.37	0.0	13.8	1.7	0.63	0.36	3.20	6	0.35	43.50	43.51	46.28	46.31	47.67	44.68	LAT 21-30
9	8	26.176	0.03	0.42	0.83	0.02	0.35	10.0	13.7	1.7	0.60	0.43	3.07	6	0.50	43.51	43.64	46.47	46.73	44.68	47.71	AD-29 [35]
10	9	9.000	0.00	0.39	0.00	0.00	0.32	0.0	13.6	1.7	0.56	0.45	2.86	6	0.56	43.64	43.69	46.80	46.88	47.71	44.85	LAT 20-29
11	10	10.000	0.00	0.35	0.00	0.00	0.29	0.0	13.6	1.7	0.50	0.43	2.57	6	0.50	43.69	43.74	47.00	47.07	44.85	44.90	LAT 19-20
12	11	18.000	0.02	0.32	0.83	0.02	0.27	10.0	13.4	1.7	0.46	0.43	2.36	6	0.50	43.74	43.83	47.17	47.28	44.90	47.71	AD-28 [34]
13	12	11.000	0.00	0.30	0.00	0.00	0.25	0.0	13.4	1.7	0.44	0.45	2.22	6	0.55	43.83	43.89	47.32	47.38	47.71	45.05	LAT 18-28
14	13	17.000	0.03	0.27	0.83	0.02	0.22	10.0	13.2	1.8	0.39	0.44	2.00	6	0.53	43.89	43.98	47.45	47.53	45.05	47.83	AD-27[33]
15	14	11.000	0.00	0.24	0.00	0.00	0.20	0.0	13.2	1.8	0.35	0.45	1.79	6	0.55	43.97	44.03	47.56	47.59	47.83	45.19	LAT 17-27
16	15	17.000	0.03	0.21	0.83	0.02	0.17	10.0	13.0	1.8	0.31	0.44	1.57	6	0.53	44.03	44.12	47.64	47.69	45.19	47.89	AD-26 [32]
17	16	20.000	0.00	0.18	0.00	0.00	0.15	0.0	12.8	1.8	0.27	0.43	1.36	6	0.50	44.11	44.21	47.71	47.75	47.89	45.37	LAT 16-26
18	17	9.000	0.03	0.15	0.83	0.02	0.12	10.0	12.6	1.8	0.22	0.45	1.14	6	0.56	44.21	44.26	47.77	47.79	45.37	48.15	AD-25 [31]
19	18	20.000	0.00	0.12	0.00	0.00	0.10	0.0	12.3	1.8	0.18	0.43	0.92	6	0.50	44.25	44.35	47.80	47.81	48.15	45.51	LAT 15-25
20	19	17.000	0.03	0.10	0.83	0.02	0.08	10.0	12.0	1.8	0.15	0.44	0.78	6	0.53	44.35	44.44	47.83	47.84	45.51	48.08	AD-24 [30]
21	20	11.000	0.00	0.07	0.00	0.00	0.06	0.0	11.7	1.9	0.11	0.45	0.55	6	0.55	44.43	44.49	47.84	47.85	48.08	45.65	LAT 14 - 24
22	21	6.750	0.05	0.05	0.83	0.04	0.04	10.0	10.0	2.0	0.08	0.62	0.42	6	1.04	44.49	44.56	47.85	47.85	45.65	48.34	AD-14 [20]

Project File: Creekwood Basin A Mid Block Collector.stm

Number of lines: 37

Run Date: 3/15/2021

NOTES: Intensity = 6.06 / (Inlet time + 0.10) ^ 0.48; Return period = Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (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	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	21	17.000	0.02	0.02	0.83	0.02	0.02	10.0	10.0	2.0	0.03	0.44	0.17	6	0.53	44.49	44.58	47.85	47.85	45.65	48.00	AD-23 [29]
24	19	6.750	0.02	0.02	0.83	0.02	0.02	10.0	10.0	2.0	0.03	0.62	0.17	6	1.04	44.35	44.42	47.83	47.83	45.51	48.26	AD-15 [21]
25	17	6.750	0.03	0.03	0.83	0.02	0.02	10.0	10.0	2.0	0.05	0.62	0.25	6	1.04	44.21	44.28	47.77	47.77	45.37	48.21	AD-16 [22]
26	15	6.750	0.03	0.03	0.83	0.02	0.02	10.0	10.0	2.0	0.05	0.62	0.25	6	1.04	44.03	44.10	47.64	47.64	45.19	48.00	AD-17 [23]
27	13	6.750	0.03	0.03	0.83	0.02	0.02	10.0	10.0	2.0	0.05	0.62	0.25	6	1.04	43.89	43.96	47.45	47.46	45.05	47.86	AD-18 [24]
28	3	121.295	0.00	1.00	0.00	0.00	0.83	0.0	12.1	1.8	1.52	3.48	1.25	15	0.25	43.15	43.45	44.58	44.64	46.01	46.26	SDMH-1 TO CB-3
29	28	102.768	0.46	1.00	0.83	0.38	0.83	10.0	10.8	1.9	1.60	3.52	1.43	15	0.25	43.45	43.71	44.66	44.70	46.26	46.57	CB-2 [2]
30	29	36.000	0.54	0.54	0.83	0.45	0.45	10.0	10.0	2.0	0.90	3.50	0.85	15	0.25	43.71	43.80	44.76	44.76	46.57	46.66	CB-1 [1]
31	11	6.750	0.03	0.03	0.83	0.02	0.02	10.0	10.0	2.0	0.05	0.62	0.25	6	1.04	43.74	43.81	47.17	47.17	44.90	47.81	AD-19 [25]
32	10	6.750	0.04	0.04	0.83	0.03	0.03	10.0	10.0	2.0	0.07	0.62	0.34	6	1.04	43.69	43.76	47.00	47.00	44.85	47.80	AD-20 [26]
33	8	6.750	0.02	0.02	0.83	0.02	0.02	10.0	10.0	2.0	0.03	0.62	0.17	6	1.04	43.51	43.58	46.47	46.47	44.68	47.73	AD-21 [27]
34	5	6.750	0.02	0.02	0.83	0.02	0.02	10.0	10.0	2.0	0.03	0.62	0.17	6	1.04	43.37	43.44	45.70	45.70	44.53	47.57	AD-22 [28]
35	3	36.000	0.25	0.25	0.83	0.21	0.21	10.0	10.0	2.0	0.42	3.50	0.34	15	0.25	43.15	43.24	44.58	44.58	46.01	46.10	CB-4 [4]
36	2	90.373	0.48	1.03	0.83	0.40	0.85	10.0	10.8	1.9	1.65	3.53	1.36	15	0.25	42.96	43.19	44.34	44.39	46.01	46.05	CB-5 [5]
37	36	36.654	0.55	0.55	0.83	0.46	0.46	10.0	10.0	2.0	0.92	3.47	0.76	15	0.25	43.19	43.28	44.43	44.44	46.05	46.31	CB-6 [6]

Project File: Creekwood Basin A Mid Block Collector.stm

Number of lines: 37

Run Date: 3/15/2021

NOTES: Intensity = 6.06 / (Inlet time + 0.10) ^ 0.48; Return period = Yrs. 10 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter						Inlet			By Line No		
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)		Depr (in)	
1	TS 1	0.00	0.00	0.00	0.00	DrCrb	4.0	1.00	0.00	0.00	0.00	Sag	0.00	0.020	0.020	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
2	SDMH 2	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
3	CB 3	0.30	0.00	0.30	0.00	DrCrb	4.0	1.00	0.00	0.00	0.00	Sag	0.00	0.020	0.020	0.000	0.22	10.76	0.22	10.76	0.0	Off	
4	CENTER TRUNK	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
5	TEE 22	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
6	UNIT 31 AD	0.08	0.00	0.08	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
7	UNIT 30 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
8	TEE 21	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
9	UNIT 29 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
10	TEE 20	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
11	TEE 19	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
12	UNIT 28 AD	0.03	0.00	0.03	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
13	TEE 18	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
14	UNIT 27 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
15	TEE 17	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
16	UNIT 26 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
17	TEE 16	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
18	UNIT 25 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
19	TEE 15	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
20	UNIT 24 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
21	TEE 14	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
22	UNIT 14 AD	0.08	0.00	0.08	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
23	UNIT 23 AD	0.03	0.00	0.03	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	

Project File: Creekwood Basin A Mid Block Collector.stm

Number of lines: 37

Run Date: 3/15/2021

NOTES: Inlet N-Values = 0.016; Intensity = 6.06 / (Inlet time + 0.10) ^ 0.48; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter						Inlet			By Line No	
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)		Depr (in)
24	UNIT 15 AD	0.03	0.00	0.03	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
25	UNIT 16 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
26	UNIT 17 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
27	UNIT 18 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
28	SDMH 1	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
29	CB 2	0.77	0.00	0.77	0.00	DrCrb	4.0	1.00	0.00	0.00	0.00	Sag	0.00	0.020	0.020	0.000	0.40	20.11	0.40	20.11	0.0	Off
30	CB 1	0.90	0.00	0.90	0.00	DrCrb	4.0	1.00	0.00	0.00	0.00	Sag	0.00	0.020	0.020	0.000	0.45	22.38	0.45	22.38	0.0	Off
31	UNIT 19 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
32	UNIT 20 AD	0.07	0.00	0.07	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
33	UNIT 21 AD	0.03	0.00	0.03	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
34	UNIT 22 AD	0.03	0.00	0.03	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off
35	CB 4	0.42	0.00	0.42	0.00	DrCrb	4.0	1.00	0.00	0.00	0.00	Sag	0.00	0.020	0.020	0.000	0.27	13.39	0.27	13.39	0.0	Off
36	CB 5	0.80	0.00	0.80	0.00	DrCrb	4.0	1.00	0.00	0.00	0.00	Sag	0.00	0.020	0.020	0.000	0.41	20.69	0.41	20.69	0.0	Off
37	CB 6	0.92	0.00	0.92	0.00	DrCrb	4.0	1.00	0.00	0.00	0.00	Sag	0.00	0.020	0.020	0.000	0.45	22.66	0.45	22.66	0.0	Off

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Number of lines: 37

Run Date: 3/15/2021

NOTES: Inlet N-Values = 0.016; Intensity = 6.06 / (Inlet time + 0.10) ^ 0.48; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

Hydraulic Grade Line Computations

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream								Check		JL coeff (K)	Minor loss (ft)
			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)		
1	15	4.15	42.50	43.32	0.82	0.86	4.84	0.36	43.69	0.591	43.618	42.61	43.67	1.06	1.11	3.73	0.22	43.89	0.332	0.461	0.201	0.50	0.11
2	15	4.17	42.86	44.11	1.25*	1.23	3.40	0.18	44.29	0.356	41.179	42.96	44.21	1.25	1.23	3.40	0.18	44.39	0.349	0.353	0.145	0.75	0.13
3	15	2.79	42.96	44.34	1.25	1.23	2.27	0.08	44.42	0.159	74.853	43.15	44.46	1.25	1.23	2.27	0.08	44.54	0.159	0.159	0.119	1.50	0.12
4	6	0.77	43.15	44.58	0.50	0.20	3.91	0.24	44.82	1.594	27.761	43.29	45.03	0.50	0.20	3.91	0.24	45.26	1.594	1.594	0.442	0.77	0.18
5	6	0.77	43.29	45.21	0.50	0.20	3.91	0.24	45.45	1.601	15.846	43.37	45.46	0.50	0.20	3.91	0.24	45.70	1.600	1.601	0.254	1.00	0.24
6	6	0.74	43.37	45.70	0.50	0.20	3.78	0.22	45.92	1.491	17.000	43.46	45.95	0.50	0.20	3.78	0.22	46.18	1.491	1.491	0.253	0.50	0.11
7	6	0.67	43.45	46.06	0.50	0.20	3.42	0.18	46.25	1.222	10.000	43.50	46.19	0.50	0.20	3.42	0.18	46.37	1.222	1.222	0.122	0.50	0.09
8	6	0.63	43.50	46.28	0.50	0.20	3.20	0.16	46.44	1.072	2.824	43.51	46.31	0.50	0.20	3.20	0.16	46.47	1.072	1.072	0.030	1.00	0.16
9	6	0.60	43.51	46.47	0.50	0.20	3.07	0.15	46.61	0.985	26.176	43.64	46.73	0.50	0.20	3.07	0.15	46.87	0.985	0.985	0.258	0.50	0.07
10	6	0.56	43.64	46.80	0.50	0.20	2.86	0.13	46.93	0.853	9.000	43.69	46.88	0.50	0.20	2.86	0.13	47.00	0.852	0.852	0.077	1.00	0.13
11	6	0.50	43.69	47.00	0.50	0.20	2.57	0.10	47.11	0.689	10.000	43.74	47.07	0.50	0.20	2.57	0.10	47.17	0.689	0.689	0.069	1.00	0.10
12	6	0.46	43.74	47.17	0.50	0.20	2.36	0.09	47.26	0.581	18.000	43.83	47.28	0.50	0.20	2.36	0.09	47.37	0.581	0.581	0.105	0.50	0.04
13	6	0.44	43.83	47.32	0.50	0.20	2.22	0.08	47.40	0.513	11.000	43.89	47.38	0.50	0.20	2.22	0.08	47.45	0.513	0.513	0.056	1.00	0.08
14	6	0.39	43.89	47.45	0.50	0.20	2.00	0.06	47.52	0.420	17.000	43.98	47.53	0.50	0.20	2.00	0.06	47.59	0.419	0.420	0.071	0.50	0.03
15	6	0.35	43.97	47.56	0.50	0.20	1.79	0.05	47.61	0.334	11.000	44.03	47.59	0.50	0.20	1.79	0.05	47.64	0.334	0.334	0.037	1.00	0.05
16	6	0.31	44.03	47.64	0.50	0.20	1.57	0.04	47.68	0.259	17.000	44.12	47.69	0.50	0.20	1.57	0.04	47.73	0.258	0.259	0.044	0.50	0.02
17	6	0.27	44.11	47.71	0.50	0.20	1.36	0.03	47.74	0.193	20.000	44.21	47.75	0.50	0.20	1.36	0.03	47.77	0.193	0.193	0.039	1.00	0.03
18	6	0.22	44.21	47.77	0.50	0.20	1.14	0.02	47.79	0.135	9.000	44.26	47.79	0.50	0.20	1.14	0.02	47.81	0.135	0.135	0.012	0.50	0.01
19	6	0.18	44.25	47.80	0.50	0.20	0.92	0.01	47.81	0.089	20.000	44.35	47.81	0.50	0.20	0.92	0.01	47.83	0.089	0.089	0.018	1.00	0.01
20	6	0.15	44.35	47.83	0.50	0.20	0.78	0.01	47.84	0.063	17.000	44.44	47.84	0.50	0.20	0.78	0.01	47.85	0.063	0.063	0.011	0.50	0.00
21	6	0.11	44.43	47.84	0.50	0.20	0.55	0.00	47.85	0.032	11.000	44.49	47.85	0.50	0.20	0.55	0.00	47.85	0.032	0.032	0.003	1.00	0.00
22	6	0.08	44.49	47.85	0.50	0.20	0.42	0.00	47.85	0.019	6.750	44.56	47.85	0.50	0.20	0.42	0.00	47.86	0.019	0.019	0.001	1.00	0.00

Project File: Creekwood Basin A Mid Block Collector.stm

Number of lines: 37

Run Date: 3/15/2021

Notes: * depth assumed ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream								Check		JL coeff (K)	Minor loss (ft)
			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)		
23	6	0.03	44.49	47.85	0.50	0.20	0.17	0.00	47.85	0.003	17.000	44.58	47.85	0.50	0.20	0.17	0.00	47.85	0.003	0.003	0.001	1.00	0.00
24	6	0.03	44.35	47.83	0.50	0.20	0.17	0.00	47.83	0.003	6.750	44.42	47.83	0.50	0.20	0.17	0.00	47.83	0.003	0.003	0.000	1.00	0.00
25	6	0.05	44.21	47.77	0.50	0.20	0.25	0.00	47.78	0.007	6.750	44.28	47.77	0.50	0.20	0.25	0.00	47.78	0.007	0.007	0.000	1.00	0.00
26	6	0.05	44.03	47.64	0.50	0.20	0.25	0.00	47.64	0.007	6.750	44.10	47.64	0.50	0.20	0.25	0.00	47.65	0.007	0.007	0.000	1.00	0.00
27	6	0.05	43.89	47.45	0.50	0.20	0.25	0.00	47.46	0.007	6.750	43.96	47.46	0.50	0.20	0.25	0.00	47.46	0.007	0.007	0.000	1.00	0.00
28	15	1.52	43.15	44.58	1.25	1.23	1.24	0.02	44.61	0.047	121.295	43.45	44.64	1.19	1.20	1.26	0.02	44.66	0.041	0.044	0.054	1.00	0.02
29	15	1.60	43.45	44.66	1.21	1.22	1.32	0.03	44.69	0.046	102.768	43.71	44.70	0.99	1.05	1.53	0.04	44.74	0.056	0.051	0.052	1.50	0.05
30	15	0.90	43.71	44.76	1.05	1.10	0.82	0.01	44.77	0.016	36.000	43.80	44.76	0.96	1.02	0.89	0.01	44.78	0.019	0.017	0.006	1.00	0.01
31	6	0.05	43.74	47.17	0.50	0.20	0.25	0.00	47.18	0.007	6.750	43.81	47.17	0.50	0.20	0.25	0.00	47.18	0.007	0.007	0.000	1.00	0.00
32	6	0.07	43.69	47.00	0.50	0.20	0.34	0.00	47.00	0.012	6.750	43.76	47.00	0.50	0.20	0.34	0.00	47.01	0.012	0.012	0.001	1.00	0.00
33	6	0.03	43.51	46.47	0.50	0.20	0.17	0.00	46.47	0.003	6.750	43.58	46.47	0.50	0.20	0.17	0.00	46.47	0.003	0.003	0.000	1.00	0.00
34	6	0.03	43.37	45.70	0.50	0.20	0.17	0.00	45.70	0.003	6.750	43.44	45.70	0.50	0.20	0.17	0.00	45.70	0.003	0.003	0.000	1.00	0.00
35	15	0.42	43.15	44.58	1.25	1.23	0.34	0.00	44.59	0.004	36.000	43.24	44.58	1.25	1.23	0.34	0.00	44.59	0.004	0.004	0.001	1.00	0.00
36	15	1.65	42.96	44.34	1.25	1.23	1.35	0.03	44.37	0.056	90.373	43.19	44.39	1.20	1.21	1.36	0.03	44.42	0.049	0.052	0.047	1.48	0.04
37	15	0.92	43.19	44.43	1.24	1.23	0.75	0.01	44.44	0.016	36.654	43.28	44.44	1.16	1.19	0.77	0.01	44.45	0.015	0.015	0.006	1.00	0.01

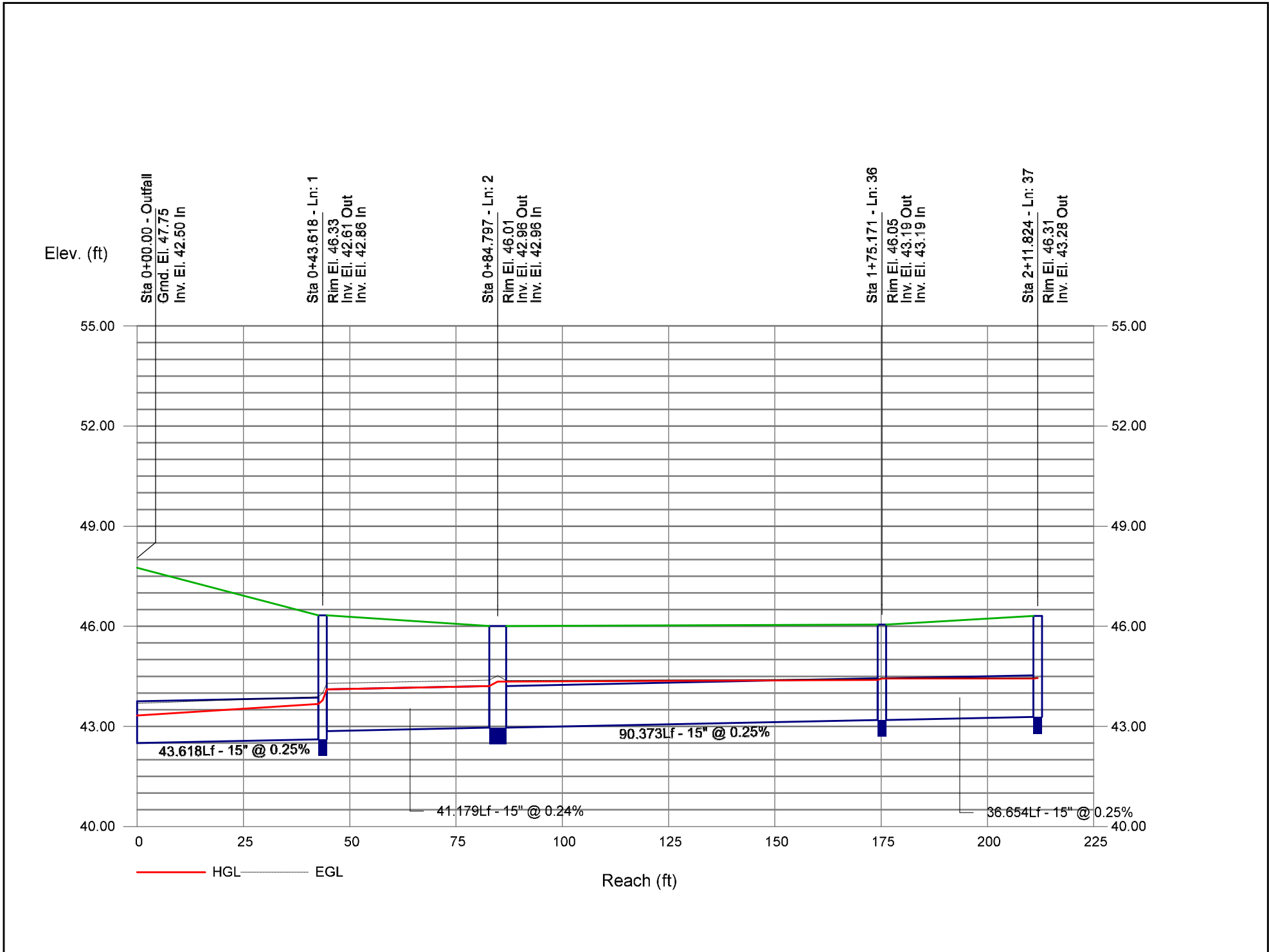
Project File: Creekwood Basin A Mid Block Collector.stm

Number of lines: 37

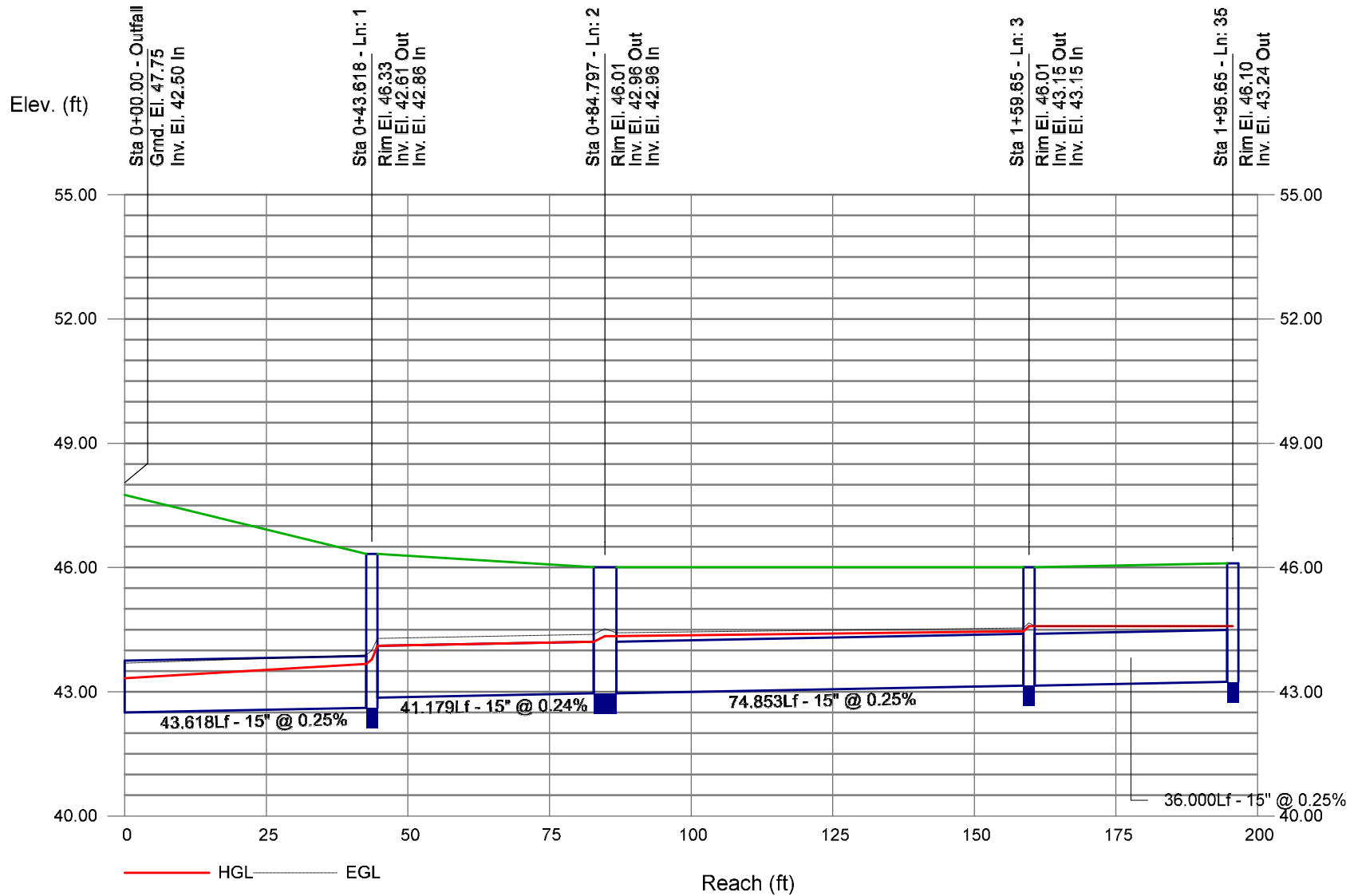
Run Date: 3/15/2021

Notes: * depth assumed ; c = cir e = ellip b = box

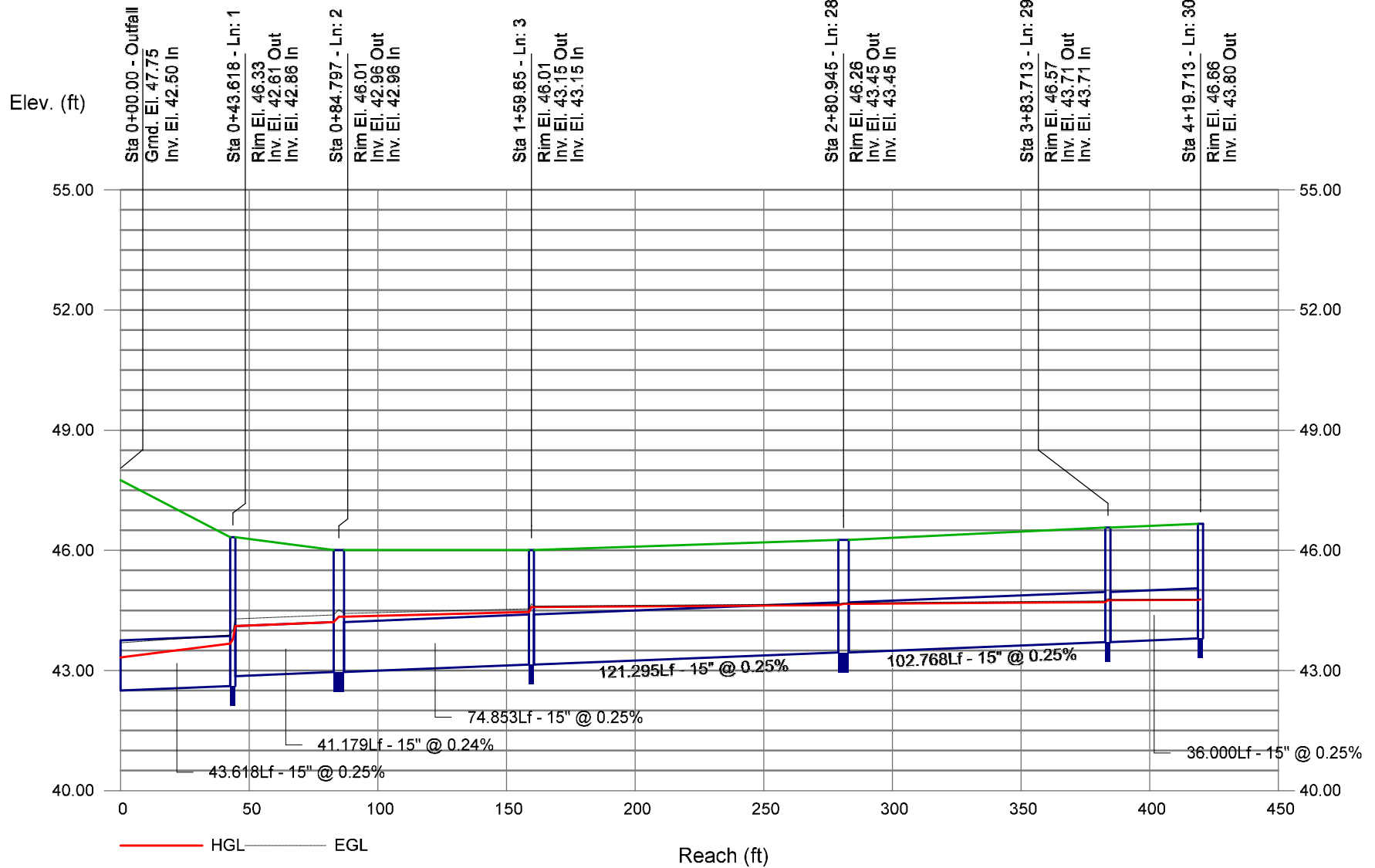
Storm Sewer Profile



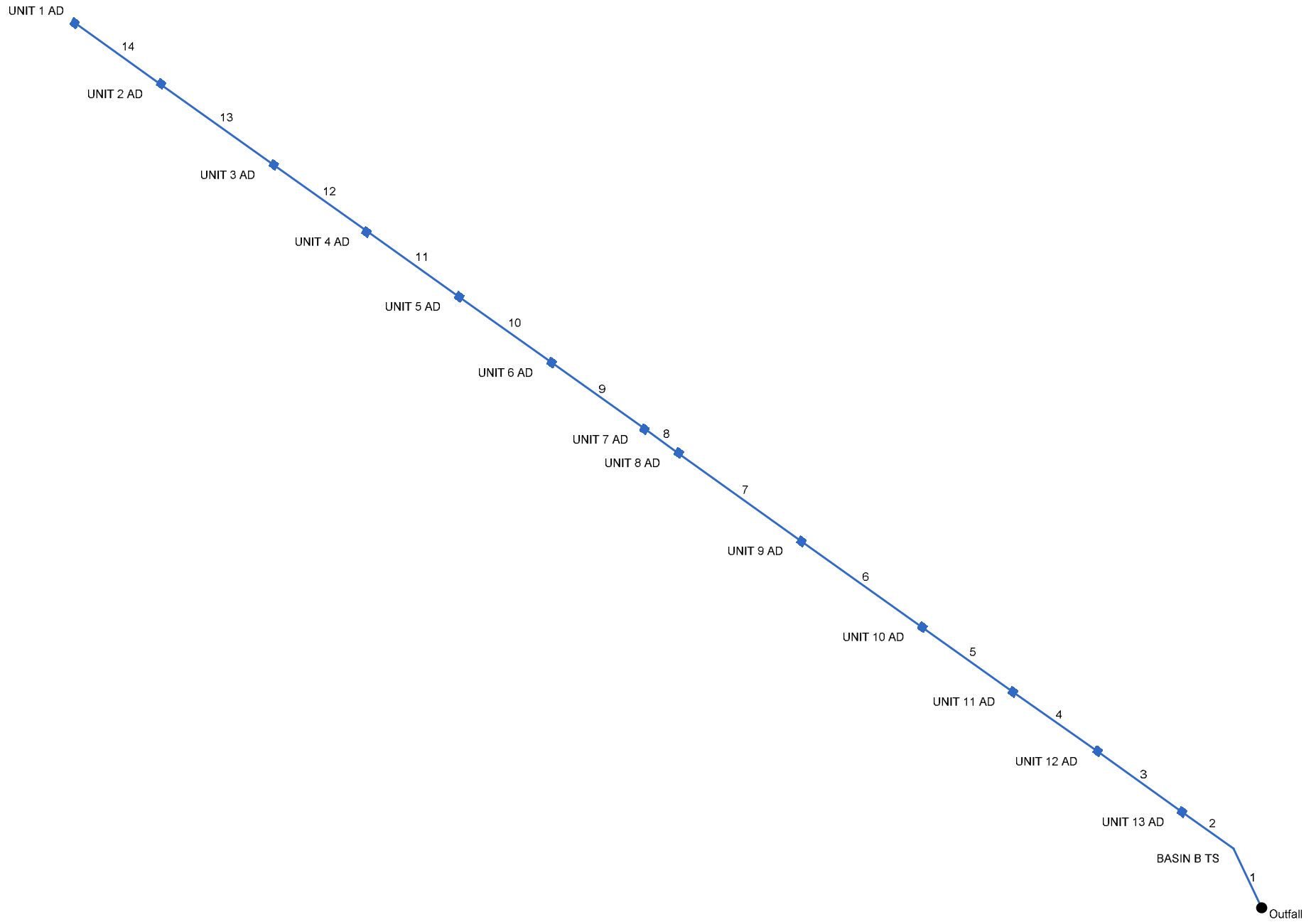
Storm Sewer Profile



Storm Sewer Profile



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



Project File: Creekwood Basin B Collector.stm

Number of lines: 14

Date: 3/16/2021

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	TS - BASIN B	0.51	6	Cir	16.308	43.75	43.91	0.981	44.10	44.27	0.09	44.27	End	None
2	AD-13 [19]	0.51	6	Cir	15.948	43.91	44.07	1.003	44.27	44.43	n/a	44.43	1	Generic
3	AD-12 [18]	0.49	6	Cir	26.000	44.07	44.33	1.000	44.43	44.69	n/a	44.69 j	2	Generic
4	AD-11 [17]	0.45	6	Cir	25.500	44.33	44.59	1.020	44.69	44.93	n/a	44.93 j	3	Generic
5	AD-10 [16]	0.42	6	Cir	27.750	44.59	44.87	1.009	44.93	45.20	n/a	45.20 j	4	Generic
6	AD-9 [15]	0.38	6	Cir	36.750	44.87	45.24	1.007	45.20	45.55	n/a	45.55 j	5	Generic
7	AD-8 [14]	0.34	6	Cir	37.750	45.24	45.62	1.007	45.55	45.92	n/a	45.92 j	6	Generic
8	AD-7 [13]	0.29	6	Cir	9.990	45.62	45.72	1.001	45.92	45.99	n/a	45.99 j	7	Generic
9	AD-6 [12]	0.25	6	Cir	28.750	45.72	46.01	1.009	45.99	46.26	n/a	46.26 j	8	Generic
10	AD-5 [11]	0.19	6	Cir	28.250	46.01	46.29	0.991	46.26	46.51	n/a	46.51 j	9	Generic
11	AD-4 [10]	0.16	6	Cir	27.750	46.29	46.57	1.009	46.51	46.77	n/a	46.77 j	10	Generic
12	AD-3 [9]	0.12	6	Cir	28.750	46.57	46.86	1.009	46.77	47.03	n/a	47.03 j	11	Generic
13	AD-2 [8]	0.08	6	Cir	34.500	46.86	47.21	1.014	47.03	47.35	n/a	47.35 j	12	Generic
14	AD-1 [7]	0.05	6	Cir	26.000	47.21	47.47	1.000	47.35	47.58	n/a	47.58 j	13	Generic

Project File: Creekwood Basin B Collector.stm

Number of lines: 14

Run Date: 3/15/2021

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (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	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	16.308	0.00	0.37	0.00	0.00	0.31	0.0	16.1	1.7	0.51	0.60	3.38	6	0.98	43.75	43.91	44.10	44.27	0.00	45.14	TS - BASIN B
2	1	15.948	0.02	0.37	0.83	0.02	0.31	10.0	16.0	1.7	0.51	0.61	3.34	6	1.00	43.91	44.07	44.27	44.43	45.14	48.45	AD-13 [19]
3	2	26.000	0.03	0.35	0.83	0.02	0.29	10.0	15.9	1.7	0.49	0.61	3.21	6	1.00	44.07	44.33	44.43	44.69	48.45	48.11	AD-12 [18]
4	3	25.500	0.02	0.32	0.83	0.02	0.27	10.0	15.7	1.7	0.45	0.61	3.07	6	1.02	44.33	44.59	44.69	44.93	48.11	47.99	AD-11 [17]
5	4	27.750	0.03	0.30	0.83	0.02	0.25	10.0	15.5	1.7	0.42	0.61	3.01	6	1.01	44.59	44.87	44.93	45.20	47.99	47.92	AD-10 [16]
6	5	36.750	0.03	0.27	0.83	0.02	0.22	10.0	15.2	1.7	0.38	0.61	2.86	6	1.01	44.87	45.24	45.20	45.55	47.92	47.69	AD-9 [15]
7	6	37.750	0.04	0.24	0.83	0.03	0.20	10.0	14.9	1.7	0.34	0.61	2.74	6	1.01	45.24	45.62	45.55	45.92	47.69	47.92	AD-8 [14]
8	7	9.990	0.03	0.20	0.83	0.02	0.17	10.0	14.8	1.7	0.29	0.61	2.51	6	1.00	45.62	45.72	45.92	45.99	47.92	47.96	AD-7 [13]
9	8	28.750	0.04	0.17	0.83	0.03	0.14	10.0	14.5	1.7	0.25	0.61	2.40	6	1.01	45.72	46.01	45.99	46.26	47.96	47.94	AD-6 [12]
10	9	28.250	0.02	0.13	0.83	0.02	0.11	10.0	14.1	1.8	0.19	0.60	2.14	6	0.99	46.01	46.29	46.26	46.51	47.94	48.13	AD-5 [11]
11	10	27.750	0.03	0.11	0.83	0.02	0.09	10.0	13.6	1.8	0.16	0.61	2.11	6	1.01	46.29	46.57	46.51	46.77	48.13	48.14	AD-4 [10]
12	11	28.750	0.03	0.08	0.83	0.02	0.07	10.0	12.9	1.9	0.12	0.61	1.84	6	1.01	46.57	46.86	46.77	47.03	48.14	48.29	AD-3 [9]
13	12	34.500	0.02	0.05	0.83	0.02	0.04	10.0	11.6	2.0	0.08	0.61	1.57	6	1.01	46.86	47.21	47.03	47.35	48.29	48.46	AD-2 [8]
14	13	26.000	0.03	0.03	0.83	0.02	0.02	10.0	10.0	2.1	0.05	0.61	1.38	6	1.00	47.21	47.47	47.35	47.58	48.46	48.58	AD-1 [7]

Project File: Creekwood Basin B Collector.stm

Number of lines: 14

Run Date: 3/15/2021

NOTES: Intensity = 6.93 / (Inlet time + 0.20) ^ 0.51; Return period = Yrs. 10 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter						Inlet			By Line No		
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)		Depr (in)	
1	BASIN B TS	0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	Off
2	UNIT 13 AD	0.04	0.00	0.04	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
3	UNIT 12 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
4	UNIT 11 AD	0.04	0.00	0.04	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
5	UNIT 10 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
6	UNIT 9 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
7	UNIT 8 AD	0.07	0.00	0.07	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
8	UNIT 7 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
9	UNIT 6 AD	0.07	0.00	0.07	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
10	UNIT 5 AD	0.04	0.00	0.04	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
11	UNIT 4 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
12	UNIT 3 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
13	UNIT 2 AD	0.04	0.00	0.04	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	
14	UNIT 1 AD	0.05	0.00	0.05	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.30	12.00	0.30	12.00	0.0	Off	

Project File: Creekwood Basin B Collector.stm

Number of lines: 14

Run Date: 3/15/2021

NOTES: Inlet N-Values = 0.016; Intensity = 6.93 / (Inlet time + 0.20) ^ 0.51; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

Hydraulic Grade Line Computations

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream								Check		JL coeff (K)	Minor loss (ft)
			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)		
1	6	0.51	43.75	44.10	0.35	0.15	3.44	0.17	44.28	0.000	16.308	43.91	44.27	0.36**	0.15	3.33	0.17	44.45	0.000	0.000	n/a	0.54	0.09
2	6	0.51	43.91	44.27	0.36	0.15	3.34	0.17	44.45	0.000	15.948	44.07	44.43	0.36**	0.15	3.34	0.17	44.61	0.000	0.000	n/a	0.50	n/a
3	6	0.49	44.07	44.43	0.36	0.15	3.17	0.16	44.60	0.000	26.000	44.33	44.69 j	0.36**	0.15	3.26	0.16	44.85	0.000	0.000	n/a	0.50	n/a
4	6	0.45	44.33	44.69	0.36	0.14	2.99	0.15	44.84	0.000	25.500	44.59	44.93 j	0.34**	0.14	3.14	0.15	45.08	0.000	0.000	n/a	0.50	0.08
5	6	0.42	44.59	44.93	0.34	0.14	2.96	0.15	45.08	0.000	27.750	44.87	45.20 j	0.33**	0.14	3.06	0.15	45.35	0.000	0.000	n/a	0.50	n/a
6	6	0.38	44.87	45.20	0.33	0.13	2.78	0.13	45.33	0.000	36.750	45.24	45.55 j	0.31**	0.13	2.95	0.13	45.69	0.000	0.000	n/a	0.50	n/a
7	6	0.34	45.24	45.55	0.31	0.12	2.65	0.12	45.68	0.000	37.750	45.62	45.92 j	0.30**	0.12	2.83	0.12	46.04	0.000	0.000	n/a	0.50	n/a
8	6	0.29	45.62	45.92	0.30	0.11	2.36	0.11	46.03	0.000	9.990	45.72	45.99 j	0.27**	0.11	2.65	0.11	46.10	0.000	0.000	n/a	0.50	0.05
9	6	0.25	45.72	45.99	0.27	0.10	2.28	0.10	46.09	0.000	28.750	46.01	46.26 j	0.25**	0.10	2.52	0.10	46.36	0.000	0.000	n/a	0.50	n/a
10	6	0.19	46.01	46.26	0.25	0.08	1.95	0.08	46.34	0.000	28.250	46.29	46.51 j	0.22**	0.08	2.32	0.08	46.59	0.000	0.000	n/a	0.50	n/a
11	6	0.16	46.29	46.51	0.22	0.07	2.00	0.08	46.58	0.000	27.750	46.57	46.77 j	0.20**	0.07	2.21	0.08	46.85	0.000	0.000	n/a	0.50	0.04
12	6	0.12	46.57	46.77	0.20	0.06	1.65	0.06	46.84	0.000	28.750	46.86	47.03 j	0.17**	0.06	2.03	0.06	47.10	0.000	0.000	n/a	0.50	0.03
13	6	0.08	46.86	47.03	0.17	0.05	1.34	0.05	47.08	0.000	34.500	47.21	47.35 j	0.14**	0.05	1.80	0.05	47.40	0.000	0.000	n/a	0.50	0.03
14	6	0.05	47.21	47.35	0.14	0.03	1.16	0.04	47.39	0.000	26.000	47.47	47.58 j	0.11**	0.03	1.60	0.04	47.62	0.000	0.000	n/a	1.00	n/a

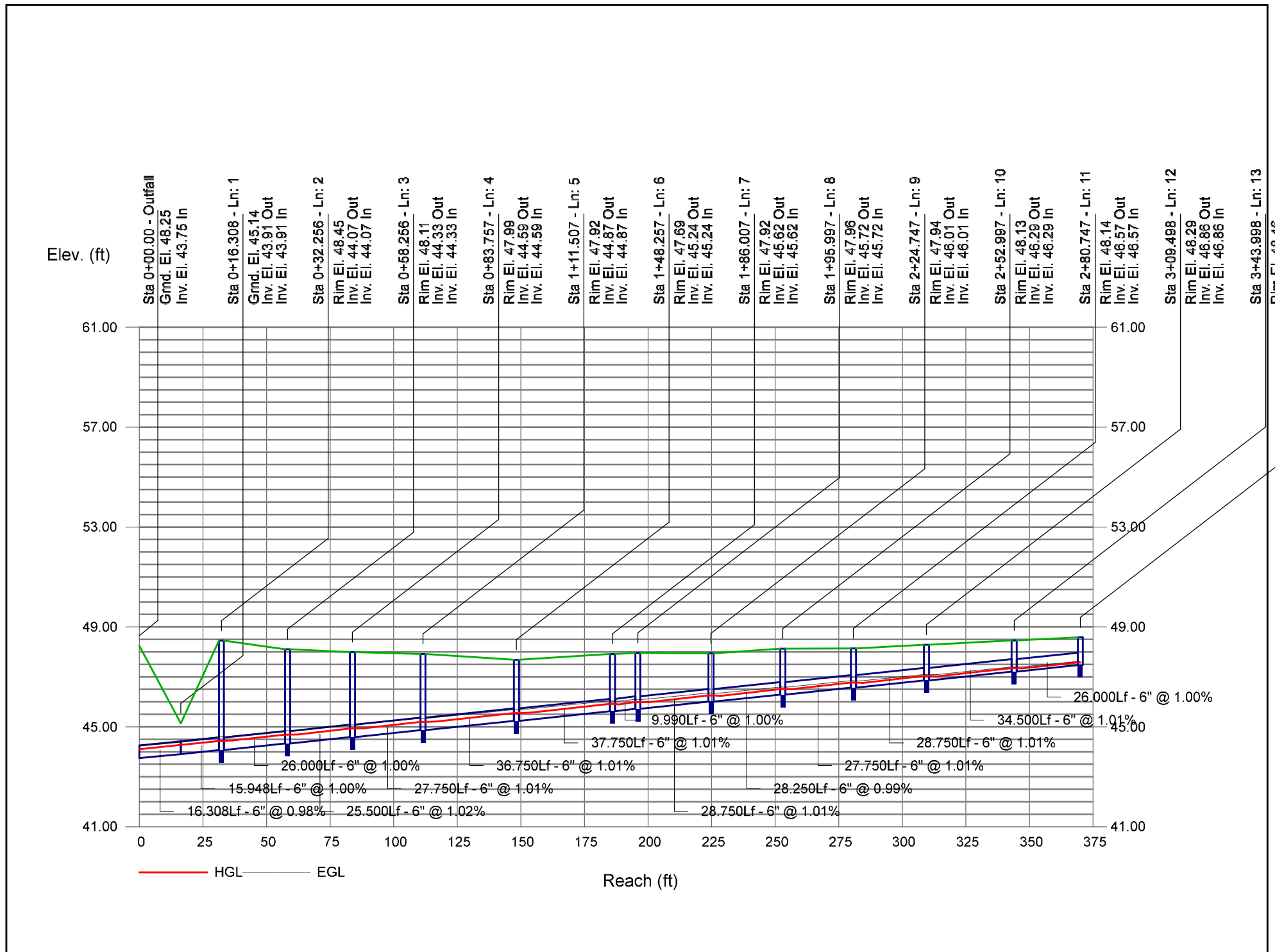
Project File: Creekwood Basin B Collector.stm

Number of lines: 14

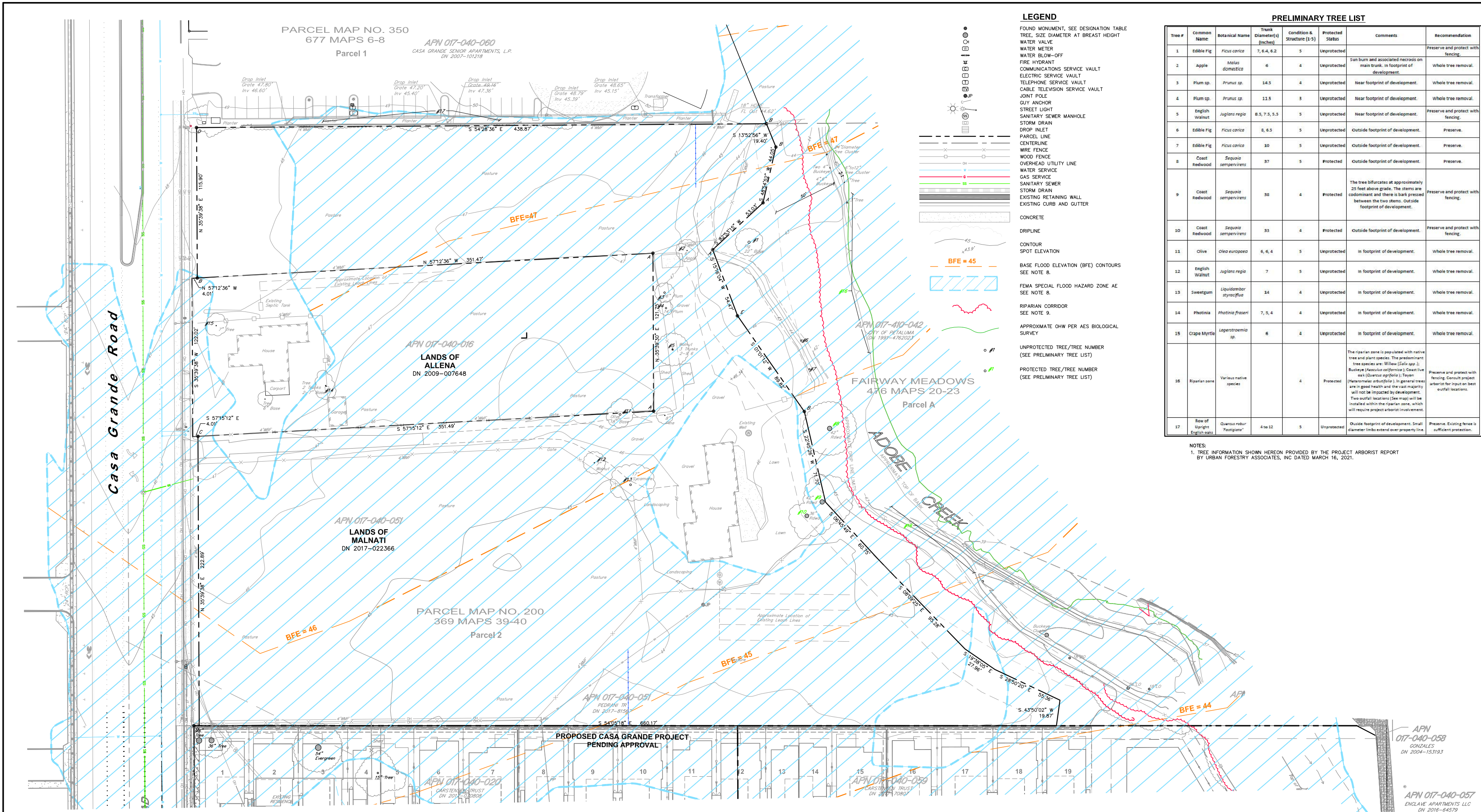
Run Date: 3/15/2021

Notes: ; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Storm Sewer Profile



APPENDIX E: CIVIL SITE PLANS



- LEGEND**
- FOUND MONUMENT, SEE DESIGNATION TABLE
 - TREE, SIZE DIAMETER AT BREAST HEIGHT
 - WATER VALVE
 - WATER METER
 - WATER BLOW-OFF
 - FIRE HYDRANT
 - COMMUNICATIONS SERVICE VAULT
 - ELECTRIC SERVICE VAULT
 - TELEPHONE SERVICE VAULT
 - CABLE TELEVISION SERVICE VAULT
 - JOINT POLE
 - GUY ANCHOR
 - STREET LIGHT
 - SANITARY SEWER MANHOLE
 - STORM DRAIN
 - DROP INLET
 - PARCEL LINE
 - CENTERLINE
 - WIRE FENCE
 - WOOD FENCE
 - OVERHEAD UTILITY LINE
 - WATER SERVICE
 - GAS SERVICE
 - SANITARY SEWER
 - STORM DRAIN
 - EXISTING RETAINING WALL
 - EXISTING CURB AND GUTTER
 - CONCRETE
 - DRIFLINE
 - CONTOUR
 - SPOT ELEVATION
 - BASE FLOOD ELEVATION (BFE) CONTOURS SEE NOTE 8.
 - FEMA SPECIAL FLOOD HAZARD ZONE AE SEE NOTE 8.
 - RIPARIAN CORRIDOR SEE NOTE 9.
 - APPROXIMATE OHW PER AES BIOLOGICAL SURVEY
 - UNPROTECTED TREE/TREE NUMBER (SEE PRELIMINARY TREE LIST)
 - PROTECTED TREE/TREE NUMBER (SEE PRELIMINARY TREE LIST)

PRELIMINARY TREE LIST

Tree #	Common Name	Botanical Name	Trunk Diameter (inches)	Condition & Structure (1-5)	Protected Status	Comments	Recommendation
1	Edible Fig	Ficus carica	7, 6.4, 6.2	5	Unprotected	Sun burn and associated necrosis on main trunk in footprint of development.	Preserve and protect with fencing.
2	Apple	Malus domestica	6	4	Unprotected		Whole tree removal.
3	Plum sp.	Prunus sp.	14.5	4	Unprotected	Near footprint of development.	Whole tree removal.
4	Plum sp.	Prunus sp.	11.5	3	Unprotected	Near footprint of development.	Whole tree removal.
5	English Walnut	Juglans regia	8.5, 7.5, 5.3	3	Unprotected	Near footprint of development.	Preserve and protect with fencing.
6	Edible Fig	Ficus carica	8, 6.5	5	Unprotected	Outside footprint of development.	Preserve.
7	Edible Fig	Ficus carica	10	5	Unprotected	Outside footprint of development.	Preserve.
8	Coast Redwood	Sequoia sempervirens	57	5	Protected	Outside footprint of development.	Preserve.
9	Coast Redwood	Sequoia sempervirens	38	4	Protected	The tree bifurcates at approximately 25 feet above grade. The stems are codominant and there is bark spread between the two stems. Outside footprint of development.	Preserve and protect with fencing.
10	Coast Redwood	Sequoia sempervirens	33	4	Protected	Outside footprint of development.	Preserve and protect with fencing.
11	Olive	Olea europaea	5, 6, 4	5	Unprotected	In footprint of development.	Whole tree removal.
12	English Walnut	Juglans regia	7	5	Unprotected	In footprint of development.	Whole tree removal.
13	Sweetgum	Liquidambar styraciflua	14	4	Unprotected	In footprint of development.	Whole tree removal.
14	Phytolitia	Phytolitia fraxinifera	7, 5, 4	4	Unprotected	In footprint of development.	Whole tree removal.
15	Grape Myrtle	Lagerstroemia sp.	6	4	Unprotected	In footprint of development.	Whole tree removal.
16	Riparian zone	Various native species		4	Protected	The riparian zone is populated with native tree and shrub species. The predominant tree species are: Willow (Salix spp.), Buckeye (Aesculus californica), Coast live oak (Quercus agrifolia), Toyon (Heteromeles arbutifolia). In general trees are in good health and the vast majority will not be impacted by development. Two outfall locations (See map) will be installed within the riparian zone, which will require project architect involvement.	Preserve and protect with fencing. Consult project architect for input on best outfall locations.
17	Row of Mangroves	Quercus rubra 'Fastigiata'	4 to 12	5	Unprotected	Outside footprint of development. Small diameter limbs extend over property line.	Preserve. Existing fence is sufficient protection.

NOTES:
1. TREE INFORMATION SHOWN HEREON PROVIDED BY THE PROJECT ARBORIST REPORT BY URBAN FORESTRY ASSOCIATES, INC DATED MARCH 16, 2021.

- NOTES**
- TOPOGRAPHIC INFORMATION SHOWN HERE IS BASED UPON A FIELD SURVEY PERFORMED BY STEVEN J. LAFRANCHI & ASSOCIATES, INC. ON MAY 3 and 5, 2020. SUPPLEMENTAL INFORMATION UPDATED ON MARCH 15, 2021.
 - VERTICAL DATUM: ELEVATION IS BASED ON FOUND MONUMENT "CALFIELD" WHICH IS PART OF THE CSRC CENTRAL COAST HEIGHT MODERNIZATION PROJECT 2007-2008. ELEVATION 11.42 NAVD88 DATUM. A LOCAL JOB BENCHMARK HAS BEEN ESTABLISHED ON SITE, BEING A MAG NAIL & WASHER, STAMPED "SLS CONTROL", IN ASPHALT DRIVEWAY AT NORTHWEST CORNER OF SUBJECT PARCEL. ELEVATION=9.01, NAVD 1988 DATUM.
 - HORIZONTAL DATUM: PARCEL MAP NO. 200, RECORDED IN BOOK 369 OF MAPS, AT PAGES 39-40, SONOMA COUNTY RECORDS.
 - UNDERGROUND UTILITIES WERE PLOTTED USING SURFACE EVIDENCE AND RECORD INFORMATION. RECORD INFORMATION WAS DERIVED FROM CITY OF PETALUMA UTILITY MAPPING AS SHOWN ON PAGE 1-05. UNDERGROUND UTILITIES MAY EXIST THAT ARE NOT SHOWN HEREON. UNDERGROUND UTILITIES MAY NOT BE LOCATED AS SHOWN HEREON. IT IS RECOMMENDED THAT AN UNDERGROUND UTILITY LOCATION COMPANY MARK THE UTILITIES PRIOR TO ANY CONSTRUCTION. ONLY BY POT-HOLING FOR EXISTING UTILITIES CAN THEIR LOCATION BE KNOWN.
 - ROCK OUTCROPPINGS ARE SHOWN WHERE VISIBLE. ROCKS MAY EXIST UNDER THE SURFACE THAT ARE NOT VISIBLE AND ARE THIS NOT SHOWN ON THIS MAP.
 - TITLE REPORT PREPARED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY, ORDER NUMBER 6062000460, DATED JANUARY 14, 2021 AND NUMBER 6062000465 DATED JANUARY 14, 2021.
 - THIS DOCUMENT AND THE INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF STEVEN J. LAFRANCHI & ASSOCIATES, INC. UNAUTHORIZED USE, COPYING, DISCLOSURE OR PUBLICATION BY ANY METHOD IS PROHIBITED WITHOUT THE WRITTEN APPROVAL OF STEVEN J. LAFRANCHI & ASSOCIATES, INC. ASSUMES NO RESPONSIBILITY FOR ANY UNAUTHORIZED DUPLICATION OF INFORMATION THAT MAY APPEAR ON ANOTHER PLAN OR MAP.
 - FLOODWAY BOUNDARIES AND BASE FLOOD ELEVATION (BFE) CONTOURS ARE PER FEMA FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL NUMBER 06097C 1001G, EFFECTIVE DATE OCTOBER 2, 2015.
 - RIPARIAN CORRIDOR LOCATION INFORMATION IS BASED UPON A FIELD SURVEY PERFORMED BY ANALYTICAL ENVIRONMENTAL SERVICES.

- MONUMENT DESIGNATION**
- A FOUND 3/4" IRON PIPE, TAGGED "RCE 13677"
 - B FOUND 3/4" IRON PIPE, TAG ILLEGIBLE
 - C FOUND 3/4" IRON PIPE, NOT TAG
 - D FOUND REBAR
 - E FOUND 3/4" IRON PIPE, DISTURBED

- ABBREVIATIONS**
- APN ASSESSORS' PARCEL NUMBER
 - DN DOCUMENT NUMBER
 - SCR SONOMA COUNTY RECORDS
 - SSMH SANITARY SEWER MANHOLE
 - INV INVERT
 - PP POWER POLE
 - JP JOINT POLE
 - SS SANITARY SEWER
 - WMF WIRE MESH FENCE
 - WBF WOOD BOARD FENCE

REVISIONS BY

EXISTING CONDITIONS EXHIBIT
 CREEKWOOD CONDOMINIUM PROJECT
 270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
 PETALUMA CALIFORNIA

STEVEN J. LAFRANCHI & ASSOCIATES, INC.
 CIVIL ENGINEERS - LAND SURVEYORS
 LAND PLANNERS - LANDSCAPE ARCHITECTS
 PETALUMA THEATRE SQUARE
 PETALUMA, CALIFORNIA 94952
 (707) 762-3122 FAX (707) 762-3239

DATE: 2021.03.24
 SCALE: 1"=30'
 DESIGN: S.J. LAFRANCHI, NCF
 DRAWING: CRK HSM JTG NCF
 CHECK: S.J.
 JOB: CREEKWOOD
 JOB No: 192119
 SHEET
C-3
 OF 19 SHEETS



PRELIMINARY TREE LIST

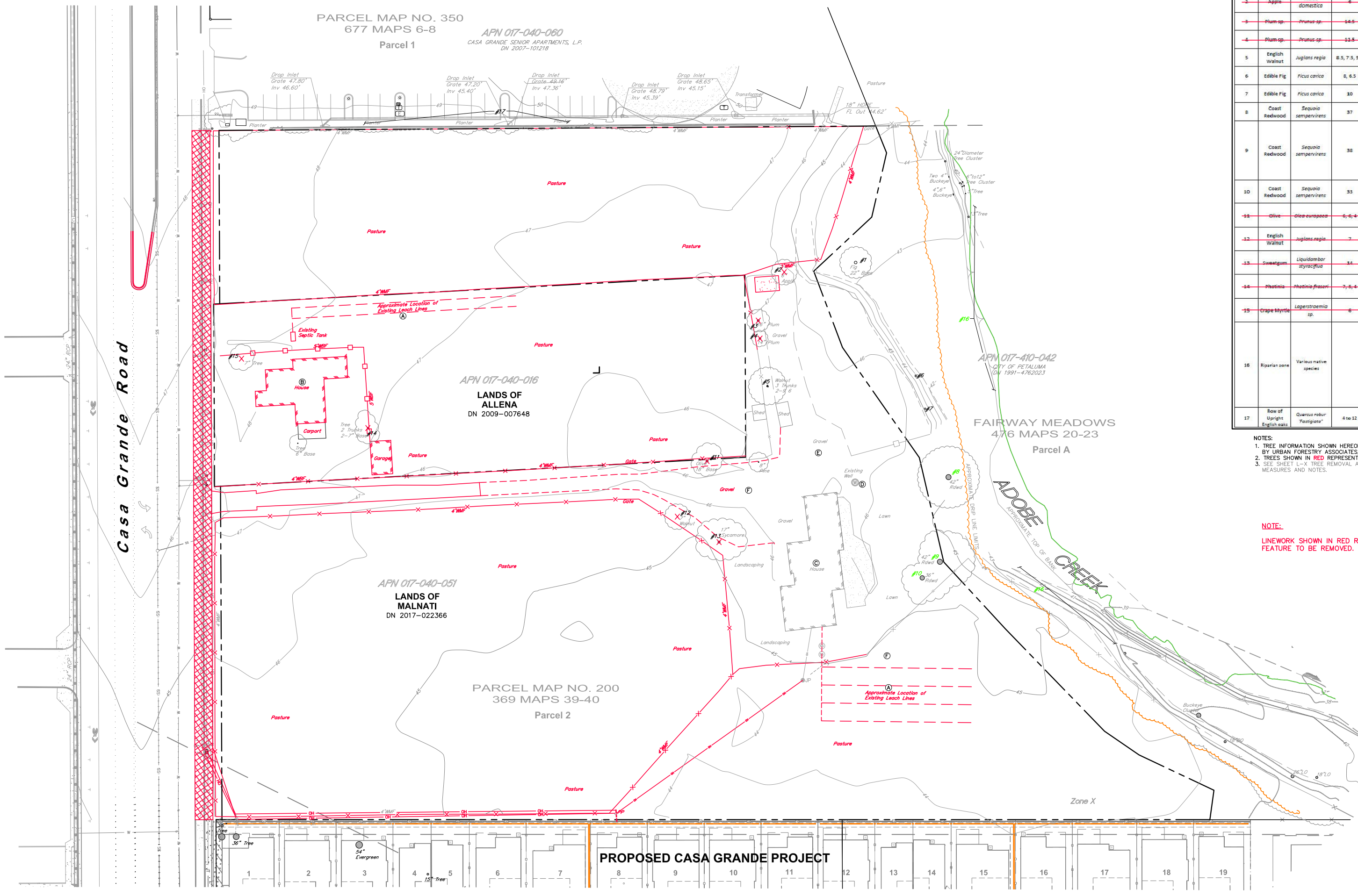
Tree #	Common Name	Botanical Name	Trunk Diameter(s) (inches)	Condition & Structure (1-5)	Protected Status	Comments	Recommendation
1	Edible Fig	Ficus carica	7, 6-4, 6.2	5	Unprotected		Preserve and protect with fencing.
2	Apple	Malus domestica	6	4	Unprotected	Sun burn and associated necrosis on main trunk - in footprint of development.	Whole tree removal.
3	Plum sp.	Prunus sp.	14.5	4	Unprotected	Near footprint of development.	Whole tree removal.
4	Plum sp.	Prunus sp.	13.5	5	Unprotected	Near footprint of development.	Whole tree removal.
5	English Walnut	Juglans regia	8.5, 7.5, 5.5	5	Unprotected	Near footprint of development.	Preserve and protect with fencing.
6	Edible Fig	Ficus carica	8, 6.5	5	Unprotected	Outside footprint of development.	Preserve.
7	Edible Fig	Ficus carica	30	5	Unprotected	Outside footprint of development.	Preserve.
8	Coast Redwood	Sequoia sempervirens	37	5	Protected	Outside footprint of development.	Preserve.
9	Coast Redwood	Sequoia sempervirens	38	4	Protected	The tree bifurcates at approximately 28 feet above grade. The predominant tree species are codominant and there is bark pressure between the two stems. Outside footprint of development.	Preserve and protect with fencing.
10	Coast Redwood	Sequoia sempervirens	33	4	Protected	Outside footprint of development.	Preserve and protect with fencing.
11	Olive	Olea europaea	6, 6, 4	5	Unprotected	In footprint of development.	Whole tree removal.
12	English Walnut	Juglans regia	7	5	Unprotected	In footprint of development.	Whole tree removal.
13	Sweetgum	Liquidambar styraciflua	34	4	Unprotected	In footprint of development.	Whole tree removal.
14	Platanus	Platanus fraxinifolia	7, 5, 4	4	Unprotected	In footprint of development.	Whole tree removal.
15	Crape Myrtle	Lagerstroemia sp.	6	4	Unprotected	In footprint of development.	Whole tree removal.
16	Riparian zone	Various native species		4	Protected	The riparian zone is populated with native tree and shrub species. The predominant tree species are Willow (Salix spp.), Buckeye (Aesculus californica), Coast Redwood (Sequoia sempervirens), Toyon (Neranthus arbutifolia). In general trees are in good health and the vast majority will not be impacted by development. Two outfall locations (See map) will be installed within the riparian zone, which will require project architect involvement.	Preserve and protect with fencing. Consult project architect for input on best outfall locations.
17	Box of Ligustrum	Quercus robur 'Fastigata'	4 to 12	5	Unprotected	Outside footprint of development. Small diameter limbs extend over property line.	Preserve. Existing fence is sufficient protection.

- NOTES:
- TREE INFORMATION SHOWN HEREON PROVIDED BY THE PROJECT ARBORIST REPORT BY URBAN FORESTRY ASSOCIATES, INC. DATED MARCH 16, 2021.
 - TREES SHOWN IN RED REPRESENT EXISTING TREES TO BE REMOVED.
 - SEE SHEET L-X TREE REMOVAL AND PROTECTION PLAN FOR TREE PROTECTION MEASURES AND NOTES.

NOTE:
LINEWORK SHOWN IN RED REPRESENTS EXISTING FEATURE TO BE REMOVED.

LEGEND

	FOUND MONUMENT, SEE DESIGNATION TABLE
	TREE, SIZE DIAMETER AT BREAST HEIGHT
	WATER VALVE
	WATER METER
	WATER BLOW-OFF
	FIRE HYDRANT
	COMMUNICATIONS SERVICE VAULT
	ELECTRIC SERVICE VAULT
	TELEPHONE SERVICE VAULT
	CABLE TELEVISION SERVICE VAULT
	JOINT POLE
	GUY ANCHOR
	STREET LIGHT
	SANITARY SEWER MANHOLE
	STORM DRAIN
	DROP INLET
	PARCEL LINE
	CENTERLINE
	WIRE FENCE
	WOOD FENCE
	OVERHEAD UTILITY LINE
	WATER SERVICE
	GAS SERVICE
	SANITARY SEWER
	STORM DRAIN
	EXISTING RETAINING WALL
	EXISTING CURB AND GUTTER
	CONCRETE
	DRIPLINE
	CONTOUR
	RIPARIAN CORRIDOR
	SEE C-3 EXISTING CONDITIONS EXHIBIT FOR INFORMATION.
	APPROXIMATE GHW PER AES BIOLOGICAL SURVEY
	TREE TO BE REMOVED
	UNPROTECTED TREE/TREE NUMBER
	PROTECTED TREE/TREE NUMBER



TREE PROTECTION NOTES

- PLASTIC OR CHAIN LINK TREE PROTECTION FENCING SHOULD BE INSTALLED AT THE DRIFLINES OF TREES TO BE PRESERVED. TEMPORARY ACCESS IS REQUIRED WITHIN THE FENCED AREA. THE FENCE MAY BE REMOVED WITH THE APPROVAL OF THE PROJECT OR MONITORING ARBORIST, AND REPLACED AT THE EDGE OF REQUIRED ACCESS.
- A PRE-CONSTRUCTION MEETING WITH THE TREE SERVICE TO PERFORM PRUNING AND THE PROJECT ARBORIST IS RECOMMENDED TO AGREE ON EXTENT AND SPECIFICS OF PRUNING.
- PRUNING SHOULD BE THE MINIMUM NECESSARY FOR HAZARD REDUCTION OR NECESSARY ACCESS, (I.E. THE REMOVAL OF DEADWOOD 2" AND LARGER, ETC.). VERTICAL CLEARANCE, AND CROWN RESTORATION, IT SHOULD BE DONE BY TRAINED, QUALIFIED TREE WORKERS ACCORDING TO ISA PRUNING GUIDELINES AND ANSI 300 STANDARDS.
- THE PROJECT ARBORIST OR DESIGNATED MONITORING ARBORIST SHALL BE NOTIFIED 48 HOURS IN ADVANCE TO BE PRESENT WHEN GRADING OR TRENCHING WILL BE OCCURRING WITHIN THE DRIFLINES OF TREES TO BE PRESERVED. WHERE POSSIBLE, ROOTS LARGER THAN 2" DIAMETER SHALL BE PRESERVED IN TRENCHES, WITH LINES INSTALLED UNDER THEM. IF ANY ROOTS LARGER THAN 1" ARE ENCOUNTERED THAT CANNOT BE PRESERVED, THEY SHOULD BE CUT CLEANLY ACROSS THE FACE OF THE ROOT WITH A SHARP SAW.
- NO PARKING, STORAGE OF MATERIALS, DISPOSAL OF WASTE, OPERATION OF EQUIPMENT OR OTHER CONSTRUCTION ACTIVITY SHALL OCCUR WITHIN DRIFLINES OF TREES TO REMAIN.
- A 4" DEEP LAYER OF ARBORMULCH (CHIPPED FOLIAGE, BRANCHES AND BARK) SHALL BE APPLIED TO THE SOIL SURFACE WITHIN THE DRIFLINES OF THE TREES TO BE PRESERVED, AND MAINTAINED AS A PERMANENT TOP DRESSING.

TREE PRESERVATION NOTES

- TREE PRESERVATION INFORMATION SHOWN IS BASED ON AN ARBORIST REPORT, PREPARED BY URBAN FORESTRY ASSOCIATES, INC. ON MARCH 16, 2021.
- TREES WERE MEASURED AT BREAST HEIGHT ABOVE THE GROUND WHERE PRACTICAL. TREES MAY EXIST ON SITE THAT HAVE MULTIPLE TRUNKS, BRANCHES THAT TOUCH THE GROUND OR HAVE GROWN IN AN IRREGULAR MANNER.
- REFER TO LANDSCAPE PLANS L-1 FOR TREE MITIGATION INFORMATION.

KEY NOTES

- REMOVAL OF SEPTIC SYSTEMS REQUIRE A PERMIT FROM THE COUNTY OF SONOMA, RIND WELL AND SEPTIC DIVISIONS.
- THE EXISTING HOUSE WAS CONSTRUCTED CIRCA 1950.
- EXISTING RESIDENCE TO REMAIN.
- EXISTING WELL TO REMAIN.
- NOT A PART OF DEVELOPMENT PROJECT (DESIGNATED REMAINDER).
- PROPOSED BOUNDARY FOR DESIGNATED REMAINDER.

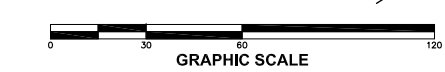
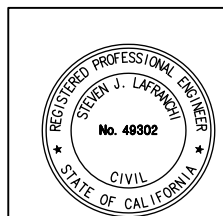
ABBREVIATIONS

APN	ASSESSORS' PARCEL NUMBER
DN	DOCUMENT NUMBER
SCR	SONOMA COUNTY RECORDS
SSMH	SANITARY SEWER MANHOLE
INV	INVERT
PP	POWER POLE
JP	JOINT POLE
SS	SANITARY SEWER
WMF	WIRE MESH FENCE
WBF	WOOD BOARD FENCE

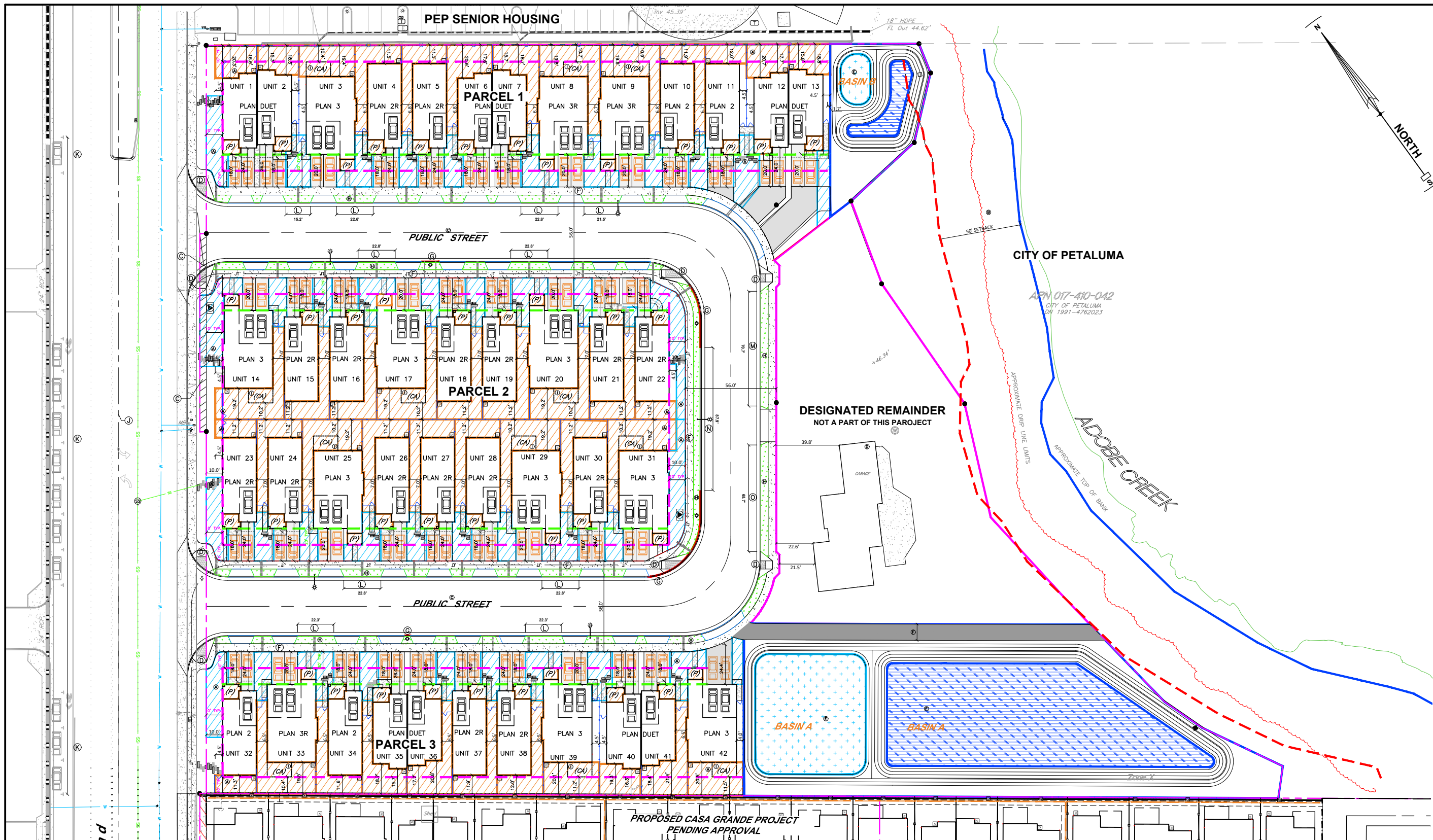
DEMOLITION AND PRESERVATION PLAN
 CREEKWOOD CONDOMINIUM PROJECT
 270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
 PETALUMA CALIFORNIA

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 DESIGN: S.J.L. ADF, NDF
 DRAWING: CRK HSM JTG JTG
 CHECK: S.J.L.
 JOB: CREEKWOOD
 JOB No: 192119
 SHEET
C-4
 OF 19 SHEETS



REVISIONS	BY



LEGEND

EXISTING	PROPOSED	PROPERTY LINE
		CENTERLINE
		EASEMENT LINE
		STORM DRAIN
		STORM DRAIN MANHOLE
		CATCH BASIN
		DROP INLET
		WATER LINE
		WATER LATERAL/METER
		SANITARY SEWER/MANHOLE
		CLEANOUT
		JOINT TRENCH
		DESIGNATED REMAINDER SEE KEYNOTE D.
		PARCEL A (DETENTION BASIN)
		BASE FLOOD ELEVATION (BFE)
		BASE FLOOD ELEVATION (BFE) CONTOURS
		PROPOSED PUBLIC MULTI-USE PATH
		RIPARIAN CORRIDOR SEE EXISTING CONDITIONS EXHIBIT FOR INFORMATION.
		BASIN AREA (BASMAA TREATMENT)
		BASIN AREA (FLOODWATER DETENTION)
		USABLE OPEN SPACE (REAR & SIDE YARDS)
		USABLE OPEN SPACE (FRONT YARDS)
		10FT BLDG SETBACK (FRONT / SIDE / REAR)
		20FT GARAGE SETBACK
		50FT SETBACK FROM TOP OF BANK
		APPROXIMATE TOP OF BANK FOR ADOBE CREEK
		APPROXIMATE OHW PER AES BIOLOGICAL SURVEY

- ### KEYNOTES
- USABLE OPEN SPACE AS DEFINED IN THE CITY OF PETALUMA IMPLEMENTING ZONING ORDINANCE DATED JUNE 2008 (REVISION DATE JULY 10, 2014) AND ON THIS SHEET. SEE LOT DATA TABLE FOR AREA SQUARE FEET. SEE LEGEND FOR AREAS DEFINED AS USABLE AREA.
 - APPROXIMATE 50' DEVELOPMENT SETBACK FROM TOP OF BANK.
 - DEDICATION TO THE CITY OF PETALUMA AS A PUBLIC RIGHT-OF-WAY.
 - PROPOSED ADA COMPLIANT RAMP.
 - PROPOSED BIORETENTION AREA. SEE PRELIMINARY GRADING AND POST CONSTRUCTION STORMWATER CONTROL PLANS FOR INFORMATION.
 - PROPOSED 5' PUBLIC SIDEWALK.
 - NO PARKING, CURB PAINTED RED.
 - PROPOSED LANDSCAPE AREA. SEE LANDSCAPE PLANS FOR INFORMATION.
 - "CALIFORNIA ROOM" IS A COVERED PATIO. SEE ARCHITECTURAL PLANS FOR INFORMATION.
 - CENTERLINE RIGHT-OF-WAY OF CASA GRANDE ROAD.
 - EXISTING 11 PUBLIC PARKING SPACES ON CASA GRANDE ROAD ALONG PROJECT FRONTAGE. SHOWN FOR INFORMATIONAL PURPOSES, NOT ASSOCIATED WITH THIS PROJECT.
 - PROPOSED 10 PUBLIC PARKING SPACES ON (N) PUBLIC STREET.
 - PROPOSED 4 PUBLIC PARKING SPACES ON (N) PUBLIC STREET.
 - PROPOSED 4 TO 5 PUBLIC PARKING SPACES ON (N) PUBLIC STREET.
 - PROPOSED 3 TO 4 PUBLIC PARKING SPACES ON (N) PUBLIC STREET.

CONDO UNIT DATA TABLES

Unit #	Plan Type	Elevation Style	Color Scheme	California Unit (CA)	Parking		BR/BA	Unit (Ft ²)	USABLE OPEN SPACE (Ft ²)				
					Total	Covered			TOTAL	PORCH (P) (BA)			
1*	1 Reverse	Contemporary	2	Not Available	3 total	1 garage	2 driveway	3/2.5	1,395	94	491	790	
2*	1	Contemporary	3	Not Available	3 total	1 garage	2 driveway	3/2.5	1,395	737	94	634	209
3	3	Farmhouse	1	Option	4 total	2 garage	2 driveway	3/2.5	2,121	1,158	64	669	425
4	2	American Cottage	5	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,127	94	656	376.5
5	2	Contemporary	3	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,033	94	617	322
6*	1 Reverse	Farmhouse	4	Not Available	3 total	1 garage	2 driveway	3/2.5	1,395	1,038	94	783	161
7*	1	Farmhouse	5	Not Available	3 total	1 garage	2 driveway	3/2.5	1,395	1,091	94	776	221
8	3 Reverse	Farmhouse	6	Option	4 total	2 garage	2 driveway	3/2.5	2,121	1,499	64	1010	425
9	3 Reverse	Contemporary	2	Option	4 total	2 garage	2 driveway	3/2.5	2,121	1,393	64	972	357
10	2	Farmhouse	5	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,040	94	628	318
11	2	American Cottage	3	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	842	94	306	442
12	1 Reverse	Farmhouse	6	Not Available	3 total	1 garage	2 driveway	3/2.5	1,395	874	94	503	277
13	1	Farmhouse	4	Not Available	3 total	1 garage	2 driveway	3/2.5	1,395	890	94	445	351
14	3	Farmhouse	6	Option	4 total	2 garage	2 driveway	3/2.5	2,121	2,121	64	1082	975
15	2 Reverse	Contemporary	1	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,037	94	635	308
16	2 Reverse	American Cottage	2	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,142	94	678	370
17	3	Contemporary	3	Not Available	4 total	2 garage	2 driveway	3/2.5	2,121	1,401	64	976	361
18	2 Reverse	Farmhouse	4	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,037	94	635	308
19	2 Reverse	American Cottage	6	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,142	94	678	370
20	3	Farmhouse	5	Option	4 total	2 garage	2 driveway	3/2.5	2,121	1,401	64	976	361
21	2 Reverse	Contemporary	2	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	925	94	635	196
22	2 Reverse	Farmhouse	4	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,213	94	285	834
23	2 Reverse	American Cottage	1	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,071	94	285	692
24	2 Reverse	Contemporary	3	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,037	94	635	308
25	3	Farmhouse	5	Option	4 total	2 garage	2 driveway	3/2.5	2,121	1,401	64	976	361
26	2 Reverse	American Cottage	4	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,142	94	678	370
27	2 Reverse	Contemporary	2	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,045	94	635	316
28	2 Reverse	Farmhouse	6	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,037	94	635	308
29	3	Contemporary	1	Option	4 total	2 garage	2 driveway	3/2.5	2,121	1,401	64	976	361
30	2 Reverse	American Cottage	3	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,121	94	666	361
31	3	Farmhouse	4	Option	4 total	2 garage	2 driveway	3/2.5	2,121	2,012	64	1081	867
32	2	Farmhouse	4	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,069	94	287	688
33	3 Reverse	Contemporary	2	Option	4 total	2 garage	2 driveway	3/2.5	2,121	1,366	64	956	346
34	2	Contemporary	1	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,112	94	660	358
35*	1 Reverse	Farmhouse	6	Not Available	3 total	1 garage	2 driveway	3/2.5	1,395	982	94	734	154
36*	1	Farmhouse	5	Not Available	3 total	1 garage	2 driveway	3/2.5	1,395	1,033	94	788	151
37	2 Reverse	Farmhouse	4	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,022	94	627	301
38	2 Reverse	American Cottage	3	Not Available	3 total	1 garage	2 driveway	3/2.5	1,660	1,123	94	674	355
39	3	Farmhouse	6	Option	4 total	2 garage	2 driveway	3/2.5	2,121	1,165	64	697	404
40	1	Contemporary	2	Not Available	3 total	1 garage	2 driveway	3/2.5	1,395	754	94	460	200
41	1 Reverse	Contemporary	1	Not Available	3 total	1 garage	2 driveway	3/2.5	1,395	1,153	94	850	208.5
42	3	Contemporary	3	Option	4 total	2 garage	2 driveway	3/2.5	2,121	1,161	64	699	398

BUILDING SETBACK TABLES

Unit #	BLDG	GARAGE	FRONT		REAR	SIDE LOT LEFT FACING	SIDE LOT RIGHT FACING
			10.0	10.0			
1	10.0	20.0	10.0	10.0	-	10.0	-
2	10.0	20.0	10.0	10.0	-	-	-
3	10.0	20.0	10.0	10.0	-	-	-
4	10.0	20.0	10.0	10.0	-	-	-
5	10.0	20.0	10.0	10.0	-	-	-
6	10.0	20.0	10.0	10.0	-	-	-
7	10.0	20.0	10.0	10.0	-	-	-
8	10.0	20.0	10.0	10.0	-	-	-
9	10.0	20.0	10.0	10.0	-	-	-
10	10.0	20.0	10.0	10.0	-	-	-
11	10.0	20.0	10.0	10.0	-	-	-
12	10.0	20.0	10.0	10.0	-	-	-
13	10.0	20.0	10.0	10.0	-	-	-
14	10.0	20.0	-	-	-	10.0	-
15	10.0	20.0	-	-	-	-	-
16	10.0	20.0	-	-	-	-	-
17	10.0	20.0	-	-	-	-	-
18	10.0	20.0	-	-	-	-	-
19	10.0	20.0	-	-	-	-	-
20	10.0	20.0	-	-	-	-	-
21	10.0	20.0	-	-	-	-	-
22	10.0	20.0	-	-	10.0	-	-
23	10.0	20.0	-	-	-	-	-
24	10.0	20.0	-	-	-	-	-
25	10.0	20.0	-	-	-	-	-
26	10.0	20.0	-	-	-	-	-
27	10.0	20.0	-	-	-	-	-
28	10.0	20.0	-	-	-	-	-
29	10.0	20.0	-	-	-	-	-
30	10.0	20.0	-	-	-	-	-
31	10.0	20.0	-	-	-	10.0	-
32	10.0	20.0	10.0	10.0	-	-	-
33	10.0	20.0	10.0	10.0	-	-	-
34	10.0	20.0	10.0	10.0	-	-	-
35	10.0	20.0	10.0	10.0	-	-	-
36	10.0	20.0	10.0	10.0	-	-	-
37	10.0	20.0	10.0	10.0	-	-	-
38	10.0	20.0	10.0	10.0	-	-	-
39	10.0	20.0	10.0	10.0	-	-	-
40	10.0	20.0	10.0	10.0	-	-	-
41	10.0	20.0	10.0	10.0	-	-	-
42	10.0	20.0	10.0	10.0	-	-	-

BUILDING SETBACK NOTES

- SETBACKS FROM PRINCIPAL AND ACCESSORY STRUCTURES SHALL BE DEFINED AS A DISTANCE MEASURED PERPENDICULAR FROM EITHER A PROPERTY LINE OR THE BACK OF SIDEWALK, WHICH EVER IS THE MOST RESTRICTIVE.
- SETBACK DIMENSIONS SHOWN ON THIS PLAN ARE THE TRUE DISTANCE FROM STRUCTURES TO THE PROPERTY LINE. ALL STRUCTURES ARE IN COMPLIANCE WITH SETBACKS AS SHOWN ON THE BUILDING SETBACK TABLE.

USABLE OPEN SPACE: INCLUDES THE AGGREGATE AREA OF SIDE AND REAR YARDS, PATIOS, AND BALCONIES AND DECKS HAVING A DEPTH OF NOT LESS THAN (3) FEET AND AREAS NOT LESS THAN 30 SQUARE FEET ON A BUILDING SITE OR BUILDING WHICH IS AVAILABLE AND ACCESSIBLE TO THE OCCUPANTS OF THE BUILDING OR BUILDING SITE FOR PURPOSES OF ACTIVE AND/OR PASSIVE OUTDOOR RECREATION. THIS AREA IS EXCLUSIVE OF DRIVEWAYS, AREAS FOR OFF-STREET PARKING AND SERVICES, AND GROUND LEVEL AREAS WITH A WIDTH OF LESS THAN FIVE (5) FEET OR MAXIMUM DIMENSION OF UNDER TEN (10) FEET.

COVERAGE: THE PERCENT OF TOTAL SITE AREA COVERED BY STRUCTURES, OPEN OR ENCLOSED, EXCLUDING UNCOVERED STEPS, PATIOS AND TERRACES. PERCENT COVERAGE HAS BEEN CALCULATED USING GROSS AREA OF LOTS.

SITE COVERAGE CALCULATIONS

PARCEL	GROSS AREA (Ft ²)	UNITS	DENSITY (UNIT/acre)	COVERED AREA (Ft ²)	% COVERAGE SITE
PARCEL 1	40,070	13	14.14	21,085	53%
PARCEL 2	51,000	18	15.38	29,760	58%
PARCEL 3	58,380	11	8.21	18,422	32%
SITE TOTAL	149,450	42	12.24	69,267	46%

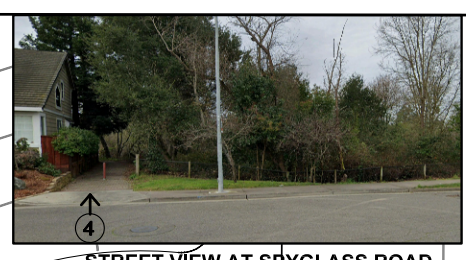
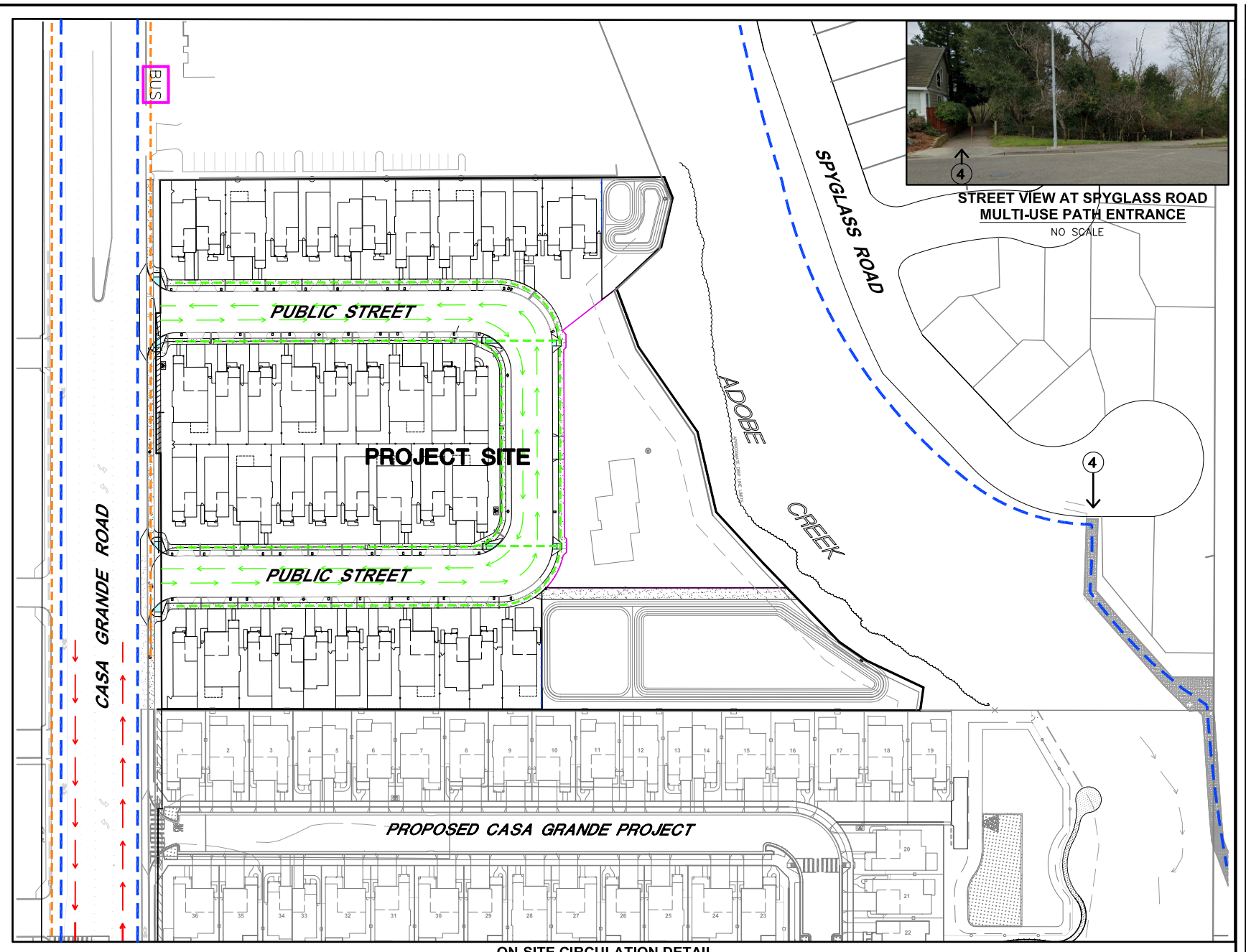
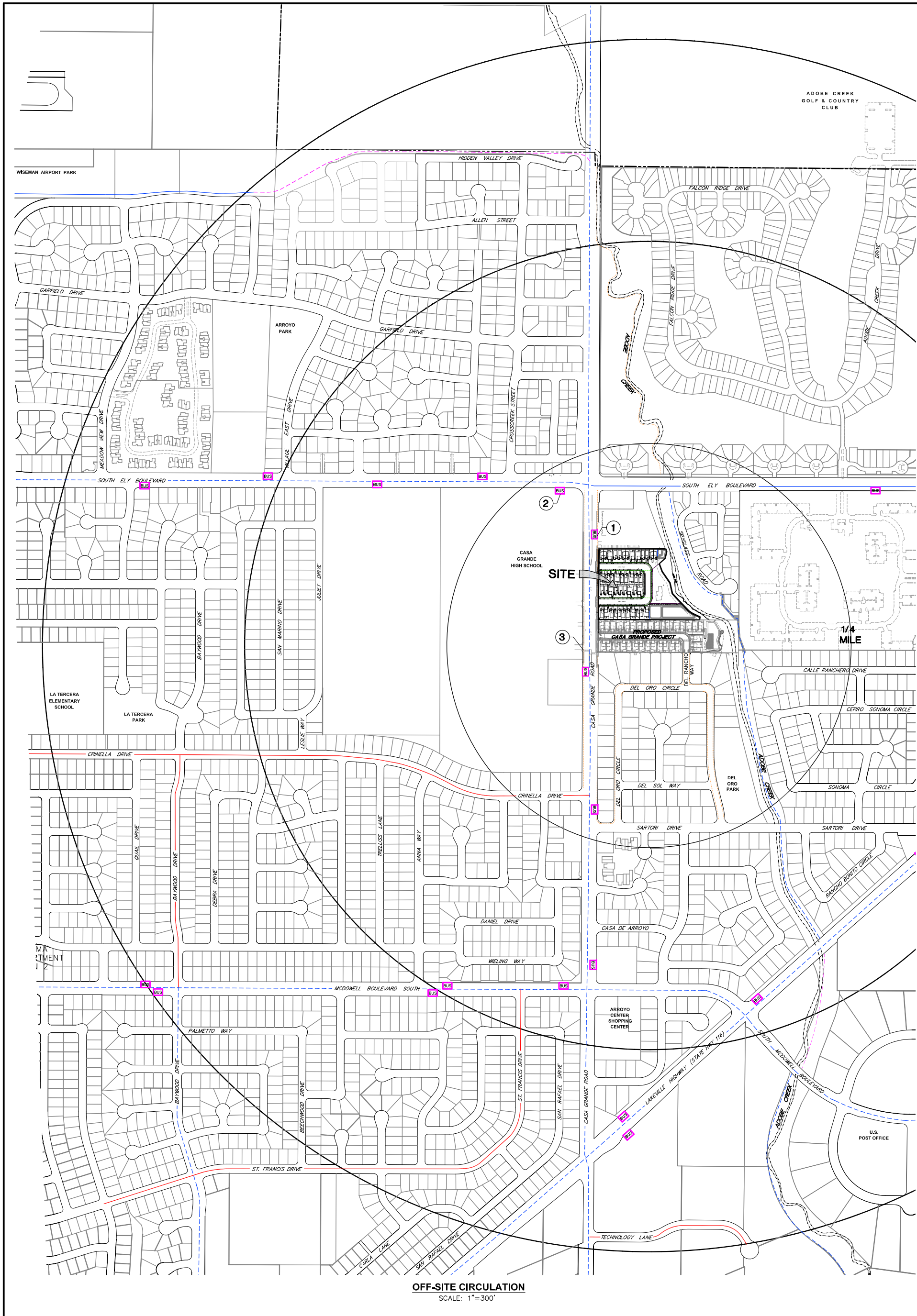
NOTES

- SEE SHEET C-3 FOR THE EXISTING CONDITIONS
- SEE SHEET C-4 FOR DEMOLITION & PRESERVATION PLAN
- SEE SHEET C-5 FOR THE VESTING TENTATIVE PARCEL MAP
- SEE SHEET C-7 FOR THE CIRCULATION PLAN
- SEE SHEET C-9 FOR THE PRELIMINARY UTILITY PLAN
- SEE SHEET C-10 FOR THE SECTIONS KEYMAP
- SEE SHEET C-11 FOR THE STREET & STORM DRAIN PROFILE
- SEE SHEET C-12 FOR THE PRELIMINARY SITE SECTION
- SEE SHEET C-13 FOR THE PRELIMINARY CONDOMINIUM PLAN
- SEE SHEET C-14 FOR THE PRELIMINARY LID STORM WATER PLAN
- SEE SHEET C-15 FOR THE POST IMPROVEMENT HYDROLOGY
- SEE SHEET C-16 FOR THE POST IMPROVEMENT CATCHMENT MAP

TYPICAL STANDARD VEHICLE DETAIL

NOTE: THE MODELS SHOWN DEMONSTRATE VEHICLES WHICH VARY IN SIZE THAT CAN DETERMINE THE NUMBER OF AVAILABLE PARKING SPACES. VEHICLES MAY VARY. SEE SPECIFIC DEALER SPECS FOR INFORMATION.

PARK

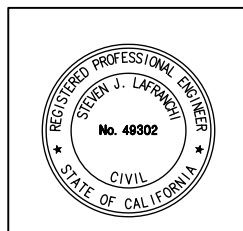


KEY NOTES:

- 1 EXISTING TRANSIT STOP ALONG CASA GRANDE ROAD, ADJACENT TO PEP FACILITY, TO BE UPGRADED.
- 2 EXISTING TRANSIT STOP ALONG ELY BLVD, ADJACENT TO CASA GRANDE HIGH SCHOOL, TO BE UPGRADED.
- 3 POTENTIAL LOCATION FOR ENHANCED PEDESTRIAN CROSSING ALONG CASA GRANDE ROAD.
- 4 EXISTING ENTRANCE TO MULTI-USE PATH AT SPYGLASS ROAD.

LEGEND

- PROPOSED PUBLIC PEDESTRIAN ACCESS
- EXISTING PUBLIC PEDESTRIAN ACCESS
- PROPOSED PUBLIC VEHICULAR ACCESS
- EXISTING PUBLIC VEHICULAR ACCESS
- BICYCLE**
- CLASS 1 (EXIST.)
- CLASS 1 (PROPOSED)
- CLASS 2 (EXIST.)
- CLASS 2 (PROPOSED)
- CLASS 3 (EXIST.)
- CLASS 3 (PROPOSED)
- BUS STOP LOCATION**
- BUS STOP LOCATION



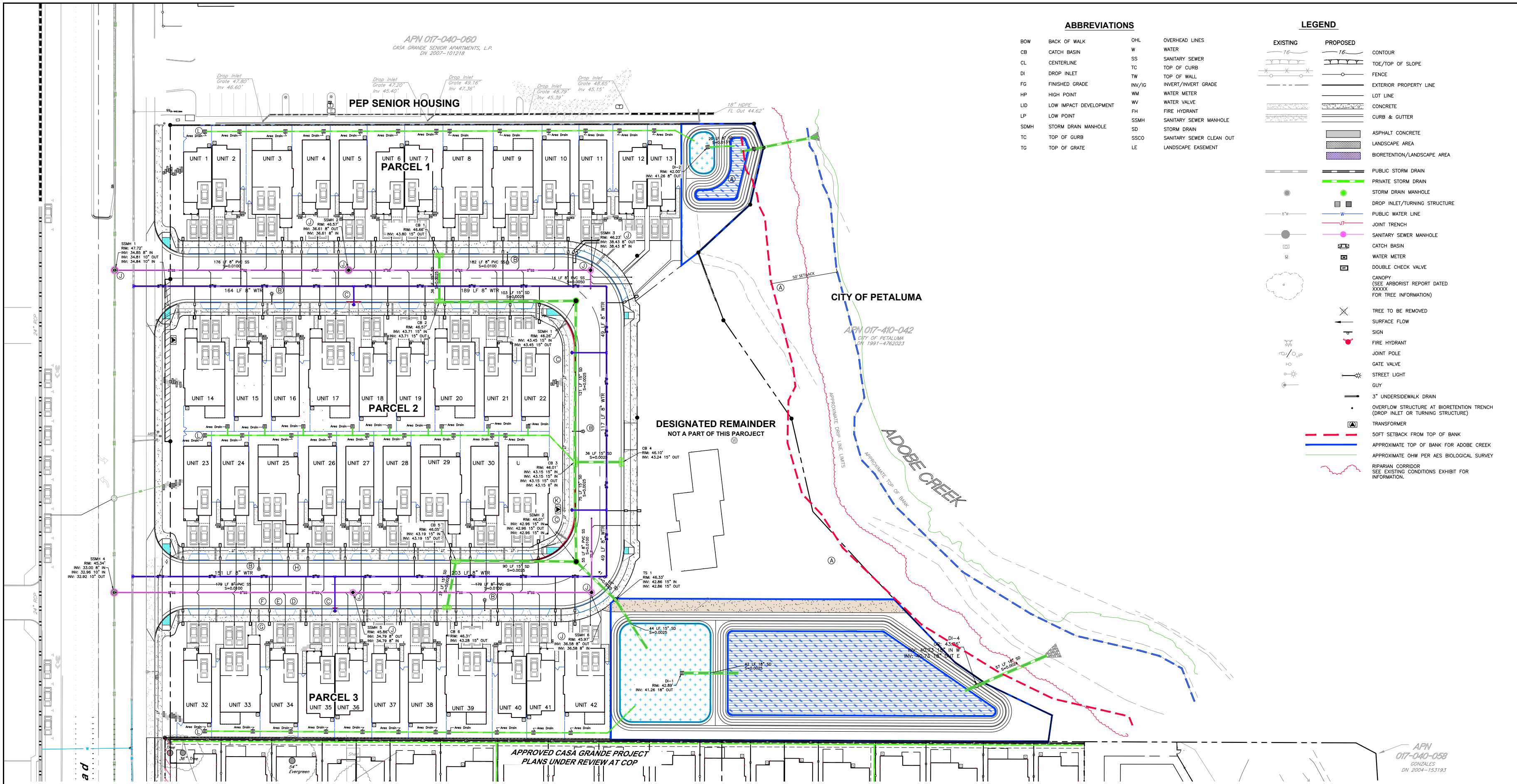
REVISIONS	BY

CIRCULATION PLAN
CREEKWOOD CONDOMINIUM PROJECT
270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
PETALUMA CALIFORNIA

STEVEN J. LAFRANCHI & ASSOCIATES, INC.
CIVIL ENGINEERS - LAND SURVEYORS
LAND PLANNERS - LANDSCAPE ARCHITECTS
PETALUMA THEATRE SQUARE
PETALUMA, CALIFORNIA 94952
(707) 762-3122 FAX (707) 762-3239

DATE:	2021.03.24
SCALE:	AS SHOWN
DESIGN:	S.J.L. ADF, NDF
DRAWING:	CRK HSM JTG NDF
CHECK:	S.J.
JOB:	CREEKWOOD
JOB No:	192119
SHEET	C-7
OF	19 SHEETS

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ABBREVIATIONS

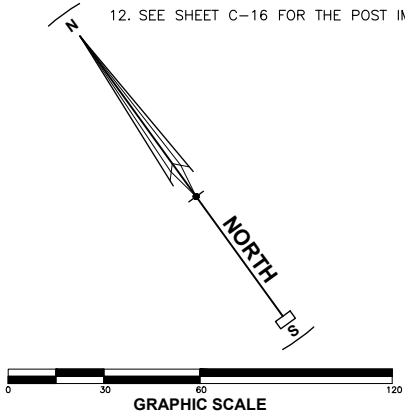
BOW	BACK OF WALK	OHL	OVERHEAD LINES
CB	CATCH BASIN	W	WATER
CL	CENTERLINE	SS	SANITARY SEWER
DI	DROP INLET	TC	TOP OF CURB
FG	FINISHED GRADE	TW	TOP OF WALL
HP	HIGH POINT	INV/G	INVERT/INVERT GRADE
LID	LOW IMPACT DEVELOPMENT	WM	WATER METER
LP	LOW POINT	WV	WATER VALVE
SDMH	STORM DRAIN MANHOLE	FH	FIRE HYDRANT
TC	TOP OF GURB	SSMH	SANITARY SEWER MANHOLE
TG	TOP OF GRATE	SD	STORM DRAIN
		SSCO	SANITARY SEWER CLEAN OUT
		LE	LANDSCAPE EASEMENT

LEGEND

EXISTING	PROPOSED	DESCRIPTION
(Symbol)	(Symbol)	CONTOUR
(Symbol)	(Symbol)	TOE/TOP OF SLOPE
(Symbol)	(Symbol)	FENCE
(Symbol)	(Symbol)	EXTERIOR PROPERTY LINE
(Symbol)	(Symbol)	LOT LINE
(Symbol)	(Symbol)	CONCRETE
(Symbol)	(Symbol)	CURB & GUTTER
(Symbol)	(Symbol)	ASPHALT CONCRETE
(Symbol)	(Symbol)	LANDSCAPE AREA
(Symbol)	(Symbol)	BIORETENTION/LANDSCAPE AREA
(Symbol)	(Symbol)	PUBLIC STORM DRAIN
(Symbol)	(Symbol)	PRIVATE STORM DRAIN
(Symbol)	(Symbol)	STORM DRAIN MANHOLE
(Symbol)	(Symbol)	DROP INLET/TURNING STRUCTURE
(Symbol)	(Symbol)	PUBLIC WATER LINE
(Symbol)	(Symbol)	JOINT TRENCH
(Symbol)	(Symbol)	SANITARY SEWER MANHOLE
(Symbol)	(Symbol)	CATCH BASIN
(Symbol)	(Symbol)	WATER METER
(Symbol)	(Symbol)	DOUBLE CHECK VALVE
(Symbol)	(Symbol)	CANOPY (SEE ARBORIST REPORT DATED XXXXX FOR TREE INFORMATION)
(Symbol)	(Symbol)	TREE TO BE REMOVED
(Symbol)	(Symbol)	SURFACE FLOW
(Symbol)	(Symbol)	SIGN
(Symbol)	(Symbol)	FIRE HYDRANT
(Symbol)	(Symbol)	JOINT POLE
(Symbol)	(Symbol)	GATE VALVE
(Symbol)	(Symbol)	STREET LIGHT
(Symbol)	(Symbol)	GUY
(Symbol)	(Symbol)	3" UNDERSIDEWALK DRAIN
(Symbol)	(Symbol)	OVERFLOW STRUCTURE AT BIORETENTION TRENCH (DROP INLET OR TURNING STRUCTURE)
(Symbol)	(Symbol)	TRANSFORMER
(Symbol)	(Symbol)	50FT SETBACK FROM TOP OF BANK
(Symbol)	(Symbol)	APPROXIMATE TOP OF BANK FOR ADOBE CREEK
(Symbol)	(Symbol)	APPROXIMATE CHW PER AES BIOLOGICAL SURVEY
(Symbol)	(Symbol)	RIPIARIAN CORRIDOR (SEE EXISTING CONDITIONS EXHIBIT FOR INFORMATION)

- KEYNOTES**
- Ⓐ 50' SETBACK FROM TOP OF BANK.
 - Ⓑ STREET LIGHT PER C.O.P. STD. 602.
 - Ⓒ FIRE HYDRANT PER C.O.P. STD. 857.
 - Ⓓ 3" SIDEWALK UNDERDRAIN PER C.O.P. STD. 404, TYPICAL.
 - Ⓔ 4" SANITARY SEWER LATERAL, TYPICAL.
 - Ⓕ WATER METER PER C.O.P. STD. 862, TYPICAL.
 - Ⓖ RESIDENTIAL DOUBLE CHECK VALVE BACK FLOW ASSEMBLY PER C.O.P. STD. 875, TYPICAL.
 - Ⓜ JOINT TRENCH LINE, SEE PLANS BY OTHERS.
 - Ⓟ PEDESTRIAN WALKWAY.
 - Ⓡ 48" SANITARY SEWER MANHOLE PER C.O.P. STD. 500.
 - Ⓢ PROPOSED TRANSFORMER LOCATION.
 - Ⓣ AREA DRAIN FOR ROOF AND YARD AREAS, DIRECTED TO BASMAA BASIN.
 - Ⓤ ALL PROPOSED IMPROVEMENTS SHALL BE LOCATED OUTSIDE THE RIPIARIAN BOUNDARY.
 - Ⓥ 60" INSIDE DROP MANHOLE PER COP STD. 503.
 - Ⓦ 24"x24" DROP INLET W/ TRAFFIC RATED ADA COMPLIANT GRATE.
 - Ⓧ BYPASS STRUCTURE - SEE DETAIL SHEET.

- NOTES**
1. SEE SHEET C-3 FOR THE EXISTING CONDITIONS
 2. SEE SHEET C-4 FOR DEMOLITION & PRESERVATION PLAN
 3. SEE SHEET C-5 FOR THE VESTING TENTATIVE PARCEL MAP
 4. SEE SHEET C-6 FOR THE SITE DEVELOPMENT PLAN
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 12. SEE SHEET C-16 FOR THE POST IMPROVEMENT CATCHMENT MAP



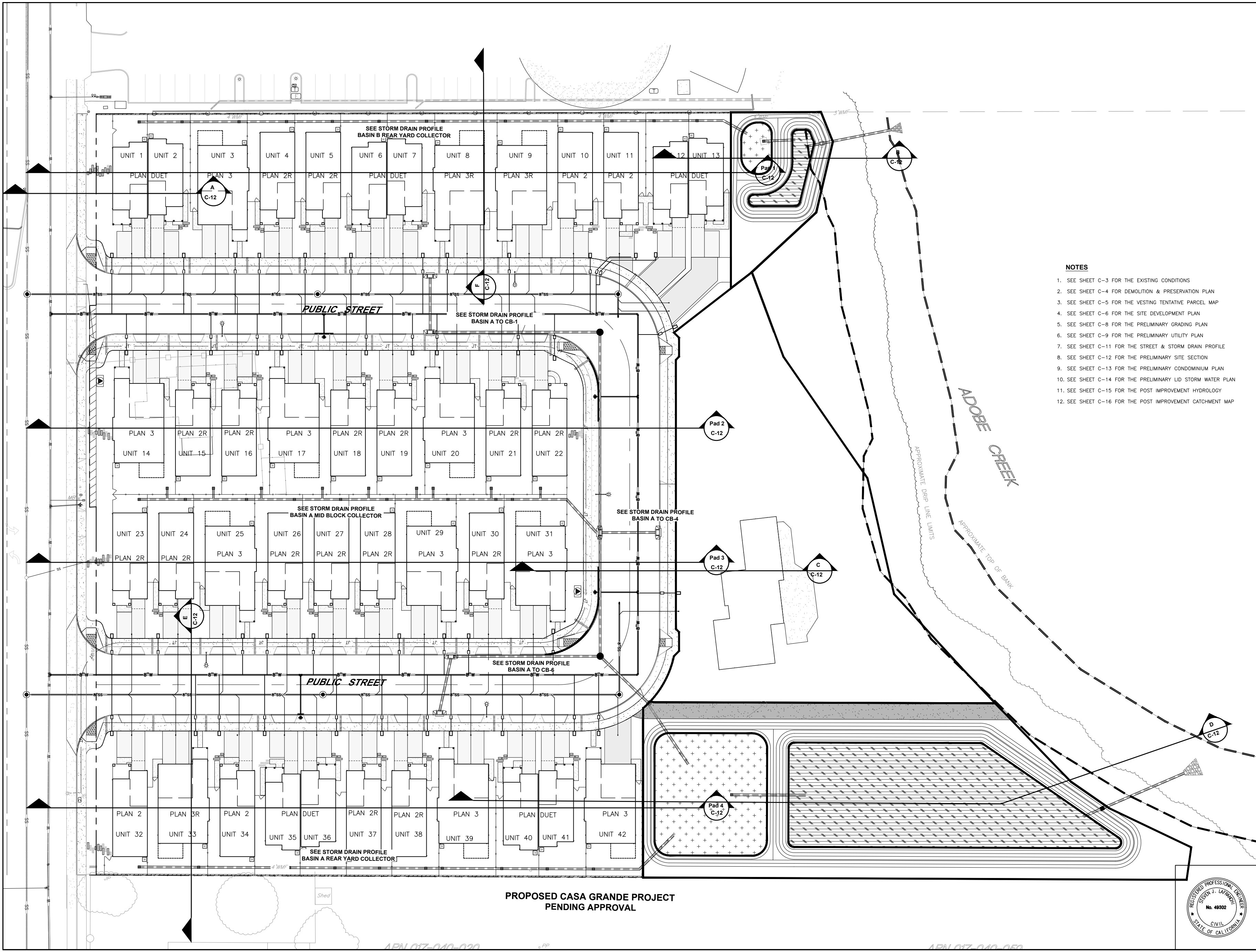
REVISIONS BY

PRELIMINARY UTILITY PLAN
CREEKWOOD CONDOMINIUM PROJECT
 270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
 PETALUMA, CALIFORNIA

STEVEN J. LAFRANCHI & ASSOCIATES, INC.
 CIVIL ENGINEERS - LAND SURVEYORS
 LAND PLANNERS - LANDSCAPE ARCHITECTS
 PETALUMA THEATRE SQUARE
 PETALUMA, CALIFORNIA 94952
 (707) 762-3122 FAX (707) 762-3239

DATE: 2021.03.24
 SCALE: 1"=30'
 DESIGN: SJL, ADF, NDF
 DRAWING: ORK, HSM, JTG, MCF
 CHECK: SJL
 JOB: CREEKWOOD
 JOB No: 192119
 SHEET
C-9
 OF 20 SHEETS

REVISIONS BY	DATE



- NOTES**
1. SEE SHEET C-3 FOR THE EXISTING CONDITIONS
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 9. SEE SHEET C-13 FOR THE PRELIMINARY CONDOMINIUM PLAN
 10. SEE SHEET C-14 FOR THE PRELIMINARY LID STORM WATER PLAN
 11. SEE SHEET C-15 FOR THE POST IMPROVEMENT HYDROLOGY
 12. SEE SHEET C-16 FOR THE POST IMPROVEMENT CATCHMENT MAP

**PROPOSED CASA GRANDE PROJECT
PENDING APPROVAL**

SITE SECTION & PROFILE KEYMAP
 CREEKWOOD CONDOMINIUM PROJECT
 270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
 PETALUMA CALIFORNIA

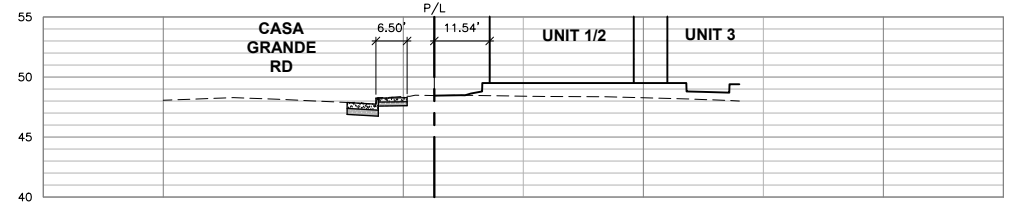
STEVEN J. LAFRANCHI & ASSOCIATES, INC.
 CIVIL ENGINEERS - LAND SURVEYORS
 LAND PLANNERS - LANDSCAPE ARCHITECTS
 440 SECOND STREET, SUITE 312
 PETALUMA, CALIFORNIA 94952
 (707) 762-3122 FAX (707) 762-2528



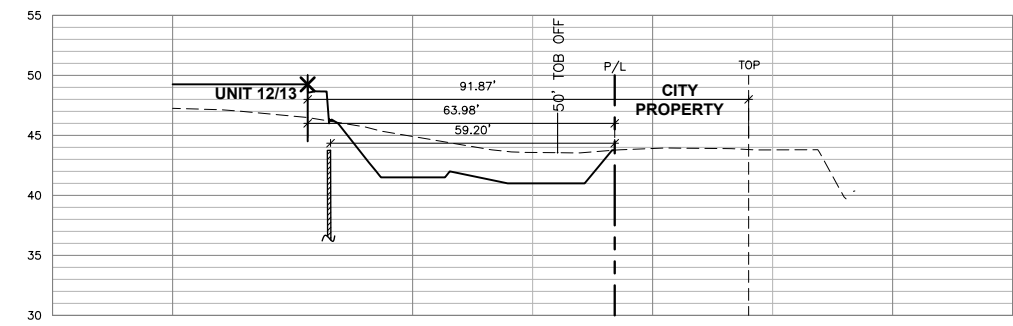
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 CHECK: S.J.L.
 JOB: CREEKWOOD
 JOB No: 192119

SHEET
C-10
 OF 20 SHEETS

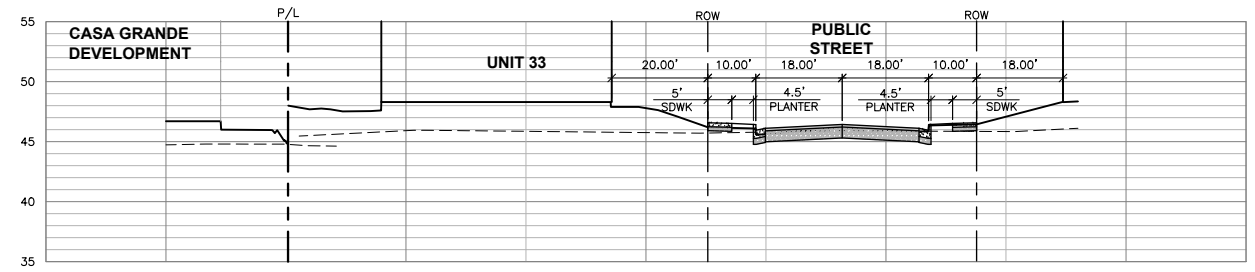
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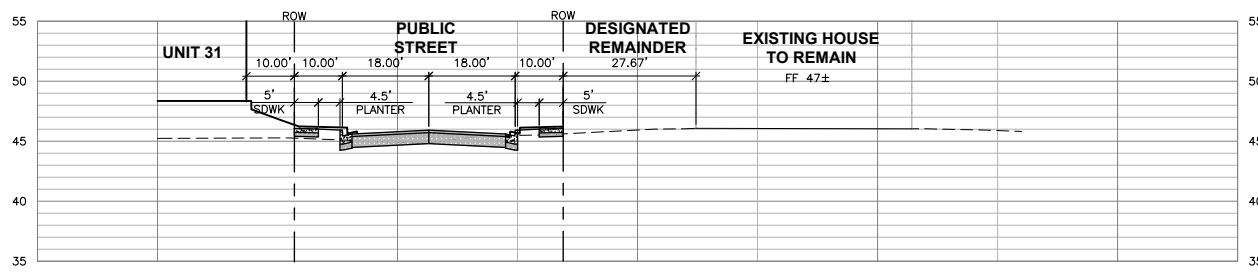
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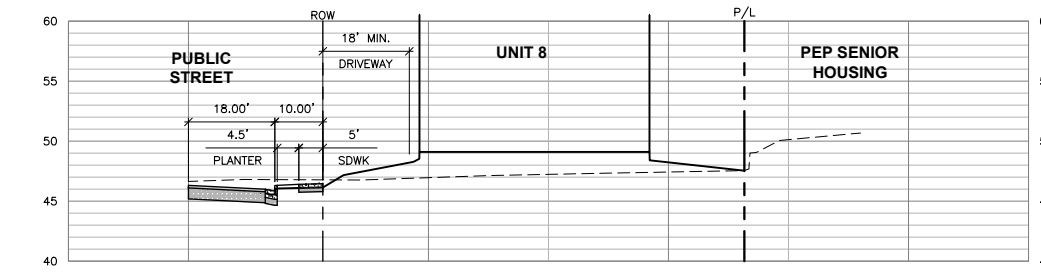
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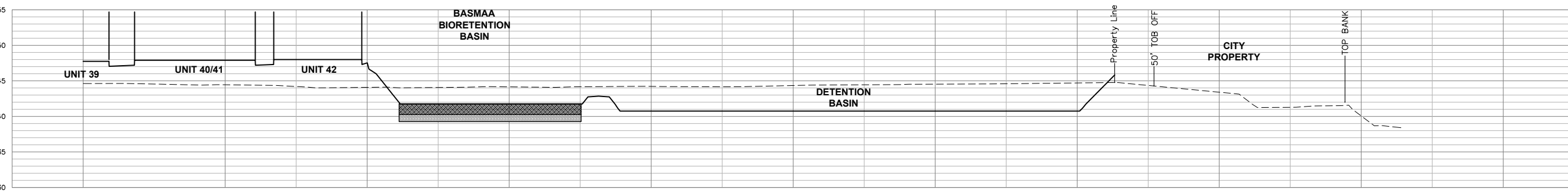
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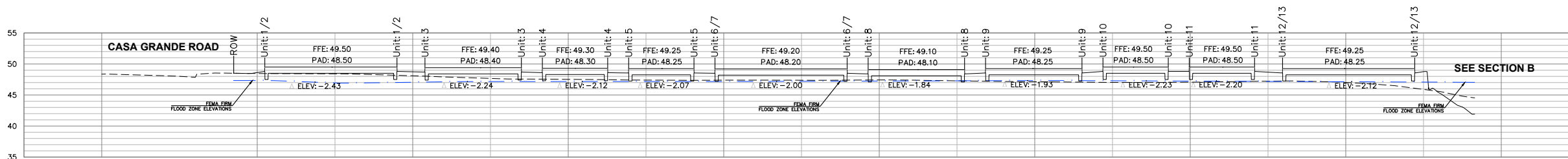
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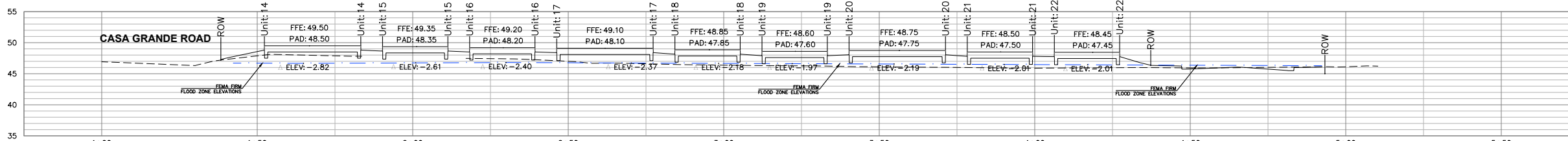
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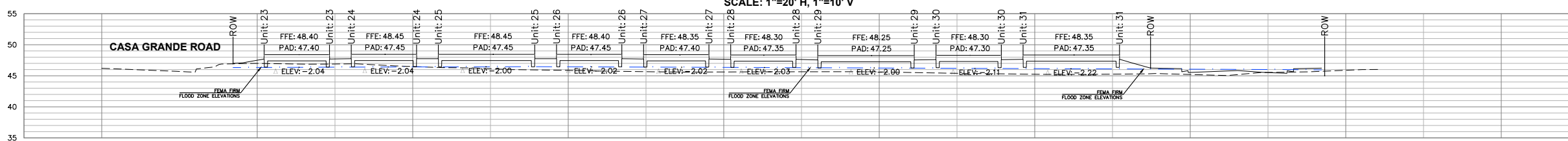
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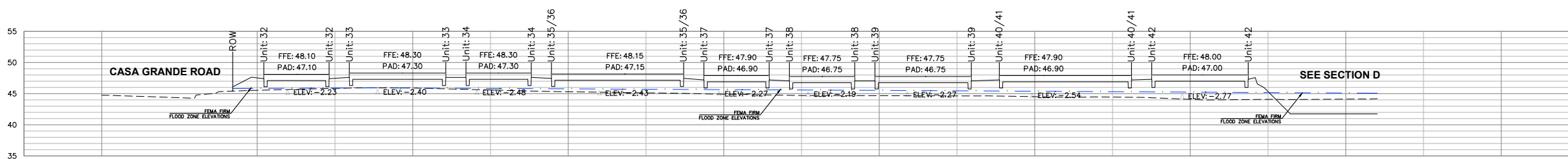
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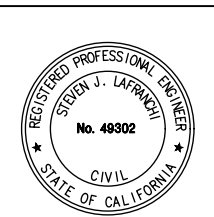
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Pad X-Section - 4
SCALE: 1"=20' H, 1"=10' V

NOTES

1. SEE SHEET C-3 FOR THE EXISTING CONDITIONS
2. SEE SHEET C-4 FOR DEMOLITION & PRESERVATION PLAN
3. SEE SHEET C-5 FOR THE VESTING TENTATIVE PARCEL MAP
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12. SEE SHEET C-16 FOR THE POST IMPROVEMENT CATCHMENT MAP



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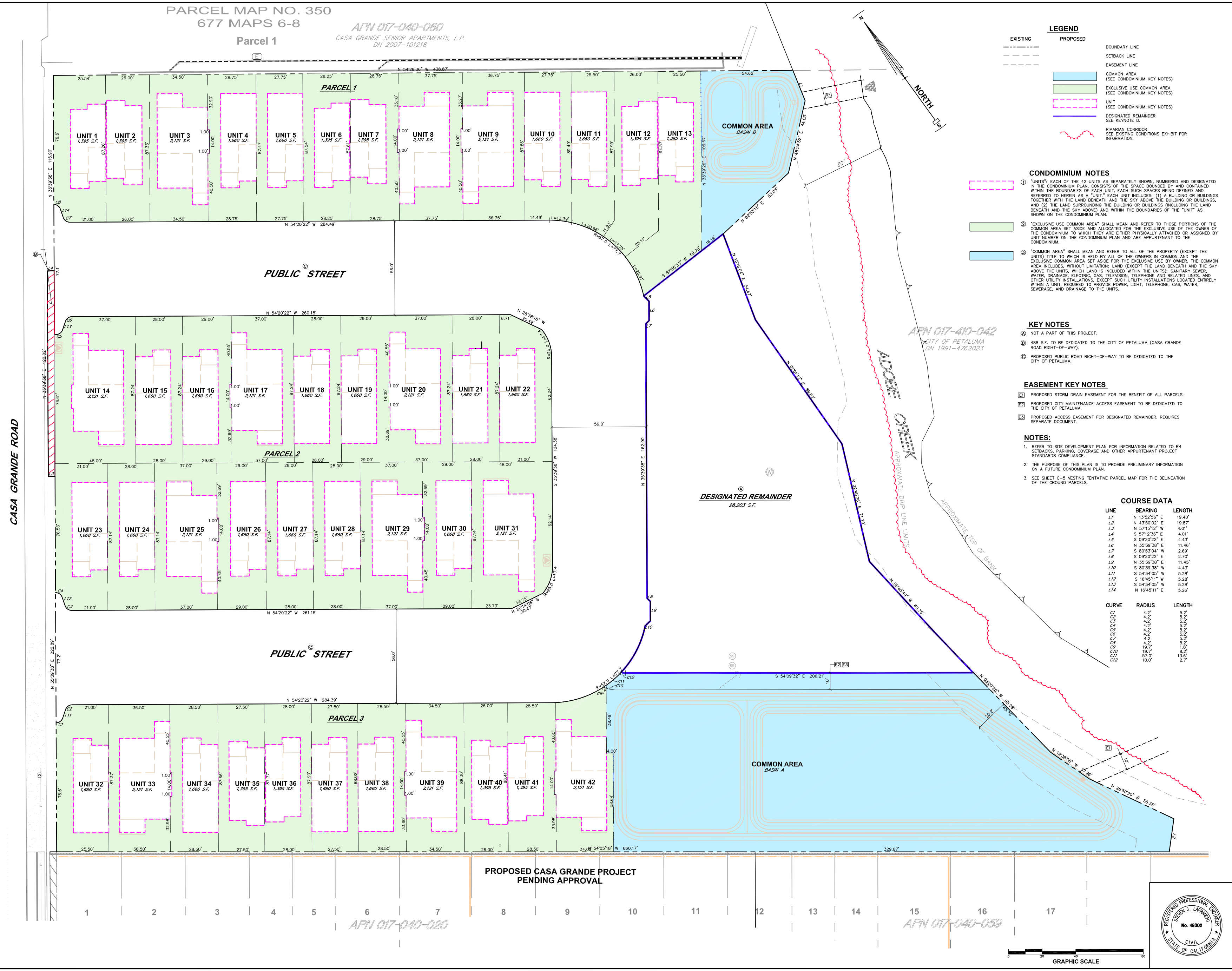
SECTIONS
 CREEKWOOD CONDOMINIUM PROJECT
 270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
 PETALUMA CALIFORNIA

STEVEN J. LAFRANCHI & ASSOCIATES, INC.
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 PETALUMA, CALIFORNIA 94952
 (707) 762-3122 FAX (707) 762-3239

DATE: 2021.03.24
 SCALE: AS SHOWN
 DESIGN: S.J.L., A.D.F., N.O.F.
 DRAWING: O.R.K., H.S.M., J.T.G., M.F.
 CHECK: S.J.L.
 JOB: CREEKWOOD
 JOB No: 192119
 SHEET
C-12
 OF 20 SHEETS

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REVISIONS	BY



LEGEND

---	EXISTING	---	BOUNDARY LINE
---	PROPOSED	---	SETBACK LINE
---		---	EASEMENT LINE
---		---	COMMON AREA (SEE CONDOMINIUM KEY NOTES)
---		---	EXCLUSIVE USE COMMON AREA (SEE CONDOMINIUM KEY NOTES)
---		---	UNIT (SEE CONDOMINIUM KEY NOTES)
---		---	DESIGNATED REMAINDER (SEE KEYNOTE D)
---		---	RIPARIAN CORRIDOR (SEE EXISTING CONDITIONS EXHIBIT FOR INFORMATION)

CONDOMINIUM NOTES

- "UNITS": EACH OF THE 42 UNITS AS SEPARATELY SHOWN, NUMBERED AND DESIGNATED IN THE CONDOMINIUM PLAN, CONSISTS OF THE SPACE BOUNDED BY AND CONTAINED WITHIN THE BOUNDARIES OF EACH UNIT, EACH SUCH SPACE BEING DEFINED AND REFERRED TO HEREIN AS A "UNIT". EACH UNIT INCLUDES: (1) A BUILDING OR BUILDINGS TOGETHER WITH THE LAND BENEATH AND THE SKY ABOVE THE BUILDING OR BUILDINGS, AND (2) THE LAND SURROUNDING THE BUILDING OR BUILDINGS (INCLUDING THE LAND BENEATH AND THE SKY ABOVE) AND WITHIN THE BOUNDARIES OF THE "UNIT" AS SHOWN ON THE CONDOMINIUM PLAN.
- "EXCLUSIVE USE COMMON AREA" SHALL MEAN AND REFER TO THOSE PORTIONS OF THE COMMON AREA SET ASIDE AND ALLOCATED FOR THE EXCLUSIVE USE OF THE OWNER OF THE CONDOMINIUM TO WHICH THEY ARE EITHER PHYSICALLY ATTACHED OR ASSIGNED BY UNIT NUMBER ON THE CONDOMINIUM PLAN AND ARE APPURTENANT TO THE CONDOMINIUM.
- "COMMON AREA" SHALL MEAN AND REFER TO ALL OF THE PROPERTY (EXCEPT THE UNITS) TITLE TO WHICH IS HELD BY ALL OF THE OWNERS IN COMMON AND THE EXCLUSIVE COMMON AREA SET ASIDE FOR THE EXCLUSIVE USE BY OWNER, THE COMMON AREA INCLUDES, WITHOUT LIMITATION: LAND (EXCEPT THE LAND BENEATH AND THE SKY ABOVE THE UNITS, WHICH LAND IS INCLUDED WITHIN THE UNITS); SANITARY SEWER, WATER, DRAINAGE, ELECTRIC, GAS, TELEVISION, TELEPHONE AND RELATED LINES, AND OTHER UTILITY INSTALLATIONS, EXCEPT SUCH UTILITY INSTALLATIONS LOCATED ENTIRELY WITHIN A UNIT, REQUIRED TO PROVIDE POWER, LIGHT, TELEPHONE, GAS, WATER, SEWERAGE, AND DRAINAGE TO THE UNITS.

KEY NOTES

- NOT A PART OF THIS PROJECT.
- 488 S.F. TO BE DEDICATED TO THE CITY OF PETALUMA (CASA GRANDE ROAD RIGHT-OF-WAY).
- PROPOSED PUBLIC ROAD RIGHT-OF-WAY TO BE DEDICATED TO THE CITY OF PETALUMA.

EASEMENT KEY NOTES

- PROPOSED STORM DRAIN EASEMENT FOR THE BENEFIT OF ALL PARCELS.
- PROPOSED CITY MAINTENANCE ACCESS EASEMENT TO BE DEDICATED TO THE CITY OF PETALUMA.
- PROPOSED ACCESS EASEMENT FOR DESIGNATED REMAINDER, REQUIRES SEPARATE DOCUMENT.

NOTES:

- REFER TO SITE DEVELOPMENT PLAN FOR INFORMATION RELATED TO R4 SETBACKS, PARKING, COVERAGE AND OTHER APPURTENANT PROJECT STANDARDS COMPLIANCE.
- THE PURPOSE OF THIS PLAN IS TO PROVIDE PRELIMINARY INFORMATION ON A FUTURE CONDOMINIUM PLAN.
- SEE SHEET C-5 VESTING TENTATIVE PARCEL MAP FOR THE DELINEATION OF THE GROUND PARCELS.

COURSE DATA

LINE	BEARING	LENGTH
L1	N 13°52'56" E	19.40'
L2	N 43°50'02" E	19.87'
L3	N 57°15'12" W	4.01'
L4	S 57°12'36" E	4.01'
L5	S 09°20'22" E	4.43'
L6	N 35°39'38" E	11.46'
L7	S 80°53'04" W	2.69'
L8	S 09°20'22" E	2.70'
L9	N 35°39'38" E	11.44'
L10	S 80°39'38" W	4.43'
L11	S 54°34'05" W	5.28'
L12	S 16°45'11" W	5.28'
L13	S 54°34'05" W	5.28'
L14	N 16°45'11" E	5.28'

CURVE	RADIUS	LENGTH
C1	4.2'	18.2'
C2	4.2'	18.2'
C3	4.2'	18.2'
C4	4.2'	18.2'
C5	4.2'	18.2'
C6	4.2'	18.2'
C7	4.2'	18.2'
C8	4.2'	18.2'
C9	19.7'	1.8'
C10	19.7'	8.2'
C11	57.0'	13.6'
C12	16.0'	2.7'

CASA GRANDE ROAD

APN 017-410-042
CITY OF PETALUMA
DN 1991-4762023

ADOBE CREEK
APPROXIMATE DEEP LINE LIMITS

APPROXIMATE TOP OF BANK

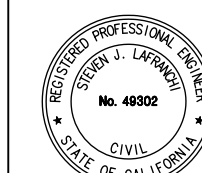
DESIGNATED REMAINDER
28,203 S.F.

PROPOSED CASA GRANDE PROJECT
PENDING APPROVAL

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

APN 017-040-020

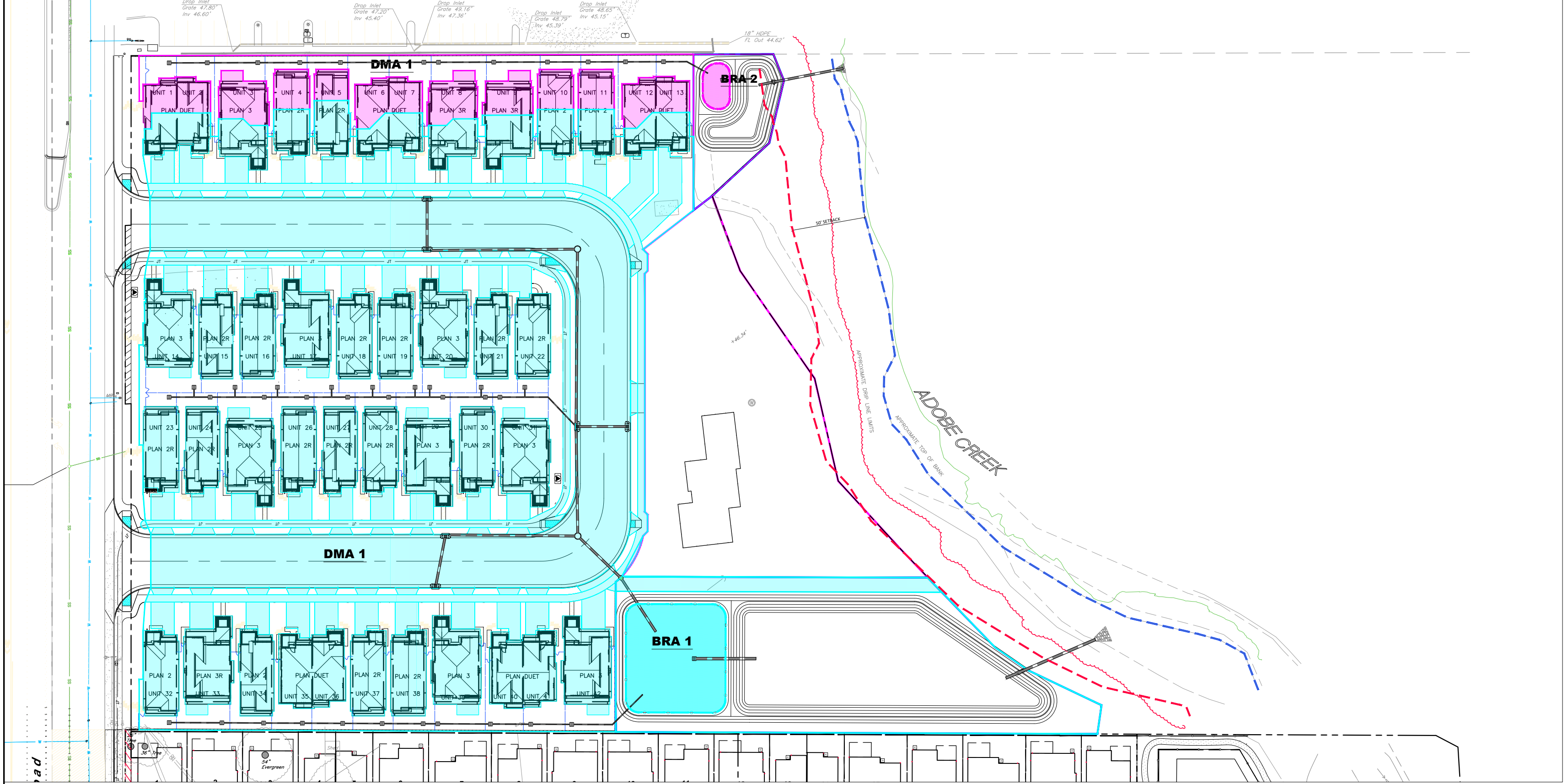
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PRELIMINARY CONDOMINIUM PLAN
CREEKWOOD CONDOMINIUM PROJECT
270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
PETALUMA CALIFORNIA

STEVEN J. LAFRANCHI & ASSOCIATES, INC.
CIVIL ENGINEERS - LAND SURVEYORS
LAND PLANNERS - LANDSCAPE ARCHITECTS
PETALUMA THEATRE SQUARE
PETALUMA, CALIFORNIA 94952
(707) 762-3122 FAX (707) 762-3239

DATE: 2021.03.24
SCALE: 1"=20'
DESIGN: S.J.L., A.D.F., N.O.F.
DRAWING: CRK HSM JTG NOF
CHECK: S.J.
JOB: CREEKWOOD
JOB No: 192119
SHEET
C-13
OF 19 SHEETS



LEGEND

- PROPERTY LINE
- STORM DRAIN LINE
- BRA** BASIN RETENTION AREA. SEE DETAIL SHEET C-15.
- DMA** DRAINAGE MANAGEMENT AREA (IMPERVIOUS SURFACES) ROOFS, AC PAVEMENT, SIDEWALK, DRIVEWAYS.
- DMA** DRAINAGE MANAGEMENT AREA (PERVIOUS SURFACES) LANDSCAPE AREAS, TURFBLOCK OR GRAVEL, OPEN OR POROUS PAVERS, GRANULAR PAVEMENT, GROUND COVER)

ABBREVIATION

- BRA BASIN RETENTION AREA OR FACILITY
- DMA DRAINAGE MANAGEMENT AREA

KEYNOTES

- Ⓢ ADD AS NEEDED

STORM WATER TREATMENT NOTES

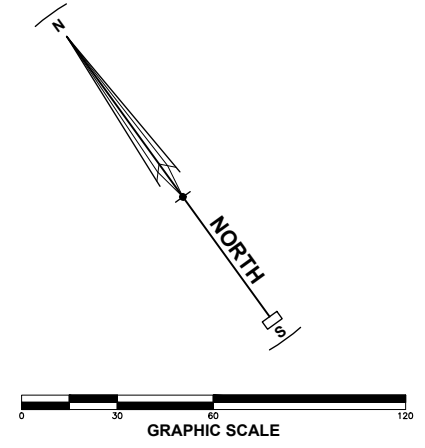
1. THE STORM WATER TREATMENT AND CONTROL PLAN IS BASED ON POST-CONSTRUCTION MANUAL GUIDELINES PREPARED BY THE BAY AREA STORM WATER MANAGEMENT AGENCIES ASSOCIATION (BASMAA) PHASE II COMMITTEE.
2. THE PRELIMINARY STORM WATER CONTROL PLAN EXHIBIT IDENTIFIES DRAINAGE MAINTENANCE AREAS (DMA) WITH CORRESPONDING BASIN RETENTION AREAS (BRA). THE BRA'S HAVE BEEN SIZED PER BASMAA TABLE 4.1 THROUGH 4.5. THE CALCULATIONS REQUIRE A BRA SIZE TO BE 4% OF THE CORRESPONDING DMA.
3. THE STORM WATER CONTROL PLAN IS SUBJECT TO REVISION BASED ON FINAL APPROVED CONSTRUCTION DOCUMENTS.

NOTES

1. SEE SHEET C-10 FOR PRELIMINARY GRADING AND DRAINAGE PLAN.
2. SEE SHEET C-11 FOR PRELIMINARY UTILITY PLAN.
3. SEE SHEET C-13 FOR SECTIONS
4. SEE SHEET C-16 FOR DETAILS.
5. SEE BASMAA STORM WATER CONTROL PLAN PREPARED BY SJLA AND DATED 10-09-2019 FOR BMP DESCRIPTIONS, SIZING CALCULATIONS, OPERATIONS AND MAINTENANCE.

DMA 1	DMA Area (s.f.)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	Basin Area A		
Roof	53,614.00	Roof	1.0	53,614.0	BRA 1		
Landscape	62,060	Landscape	0.1	6,206.0	Sizing Factor	Minimum Facility Area	Proposed Facility Area
Pavement	61,592	Hardscape	1.0	61,592.2			
Total				121,412.2	0.04	4856.5	4977

DMA 2	DMA Area (s.f.)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	Basin Area B		
Roof	9,013	Roof	1.0	9,013.0	BRA 2		
Landscape	11,794	Landscape	0.1	1,179.4	Sizing Factor	Minimum Facility Area	Proposed Facility Area
Pavement	0	Hardscape	1.0	0.0			
Total				10,192.4	0.04	407.7	510



REVISIONS	BY

PRELIMINARY LID & BASMAA BASIN EXHIBIT
 CREEKWOOD CONDOMINIUM PROJECT
 270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
 PETALUMA CALIFORNIA

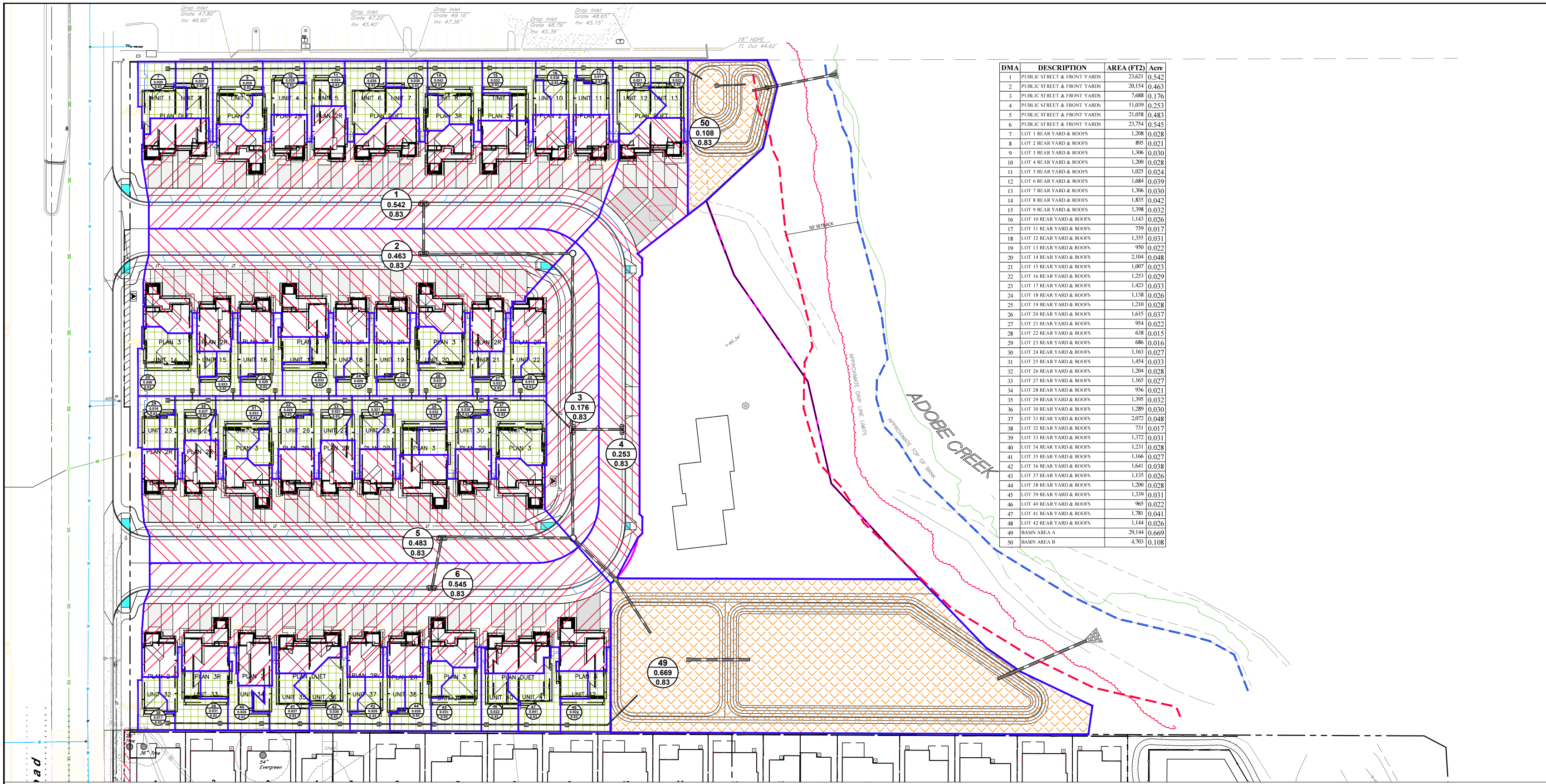
STEVEN J. LAFRANCHI & ASSOCIATES, INC.
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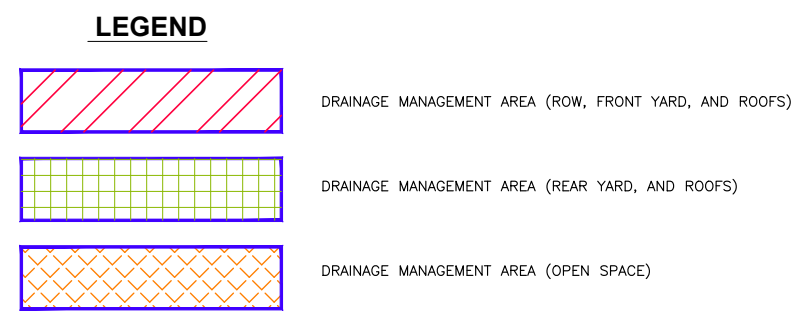
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 JOB: CREEKWOOD
 JOB No: 192119
 SHEET
C-14
 OF 20 SHEETS

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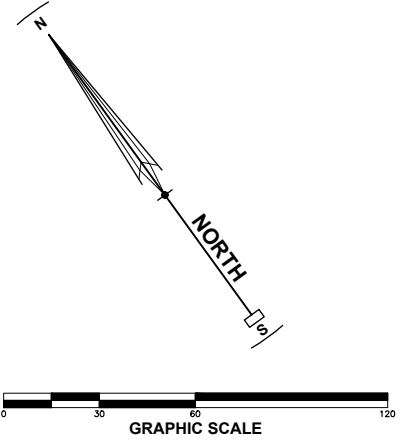
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DMA	DESCRIPTION	AREA (FT ²)	Acre
1	PUBLIC STREET & FRONT YARDS	23,621	0.542
2	PUBLIC STREET & FRONT YARDS	20,154	0.463
3	PUBLIC STREET & FRONT YARDS	7,688	0.176
4	PUBLIC STREET & FRONT YARDS	11,039	0.253
5	PUBLIC STREET & FRONT YARDS	21,088	0.483
6	PUBLIC STREET & FRONT YARDS	23,754	0.545
7	LOT 1 REAR YARD & ROOFS	1,208	0.028
8	LOT 2 REAR YARD & ROOFS	895	0.021
9	LOT 3 REAR YARD & ROOFS	1,306	0.030
10	LOT 4 REAR YARD & ROOFS	1,200	0.028
11	LOT 5 REAR YARD & ROOFS	1,025	0.024
12	LOT 6 REAR YARD & ROOFS	1,684	0.039
13	LOT 7 REAR YARD & ROOFS	1,306	0.030
14	LOT 8 REAR YARD & ROOFS	1,835	0.042
15	LOT 9 REAR YARD & ROOFS	1,398	0.032
16	LOT 10 REAR YARD & ROOFS	1,143	0.026
17	LOT 11 REAR YARD & ROOFS	759	0.017
18	LOT 12 REAR YARD & ROOFS	1,355	0.031
19	LOT 13 REAR YARD & ROOFS	950	0.022
20	LOT 14 REAR YARD & ROOFS	2,104	0.048
21	LOT 15 REAR YARD & ROOFS	1,007	0.023
22	LOT 16 REAR YARD & ROOFS	1,253	0.029
23	LOT 17 REAR YARD & ROOFS	1,423	0.033
24	LOT 18 REAR YARD & ROOFS	1,138	0.026
25	LOT 19 REAR YARD & ROOFS	1,210	0.028
26	LOT 20 REAR YARD & ROOFS	1,615	0.037
27	LOT 21 REAR YARD & ROOFS	954	0.022
28	LOT 22 REAR YARD & ROOFS	638	0.015
29	LOT 23 REAR YARD & ROOFS	686	0.016
30	LOT 24 REAR YARD & ROOFS	1,163	0.027
31	LOT 25 REAR YARD & ROOFS	1,454	0.033
32	LOT 26 REAR YARD & ROOFS	1,204	0.028
33	LOT 27 REAR YARD & ROOFS	1,165	0.027
34	LOT 28 REAR YARD & ROOFS	956	0.022
35	LOT 29 REAR YARD & ROOFS	1,395	0.032
36	LOT 30 REAR YARD & ROOFS	1,289	0.030
37	LOT 31 REAR YARD & ROOFS	2,072	0.048
38	LOT 32 REAR YARD & ROOFS	731	0.017
39	LOT 33 REAR YARD & ROOFS	1,372	0.031
40	LOT 34 REAR YARD & ROOFS	1,231	0.028
41	LOT 35 REAR YARD & ROOFS	1,166	0.027
42	LOT 36 REAR YARD & ROOFS	1,641	0.038
43	LOT 37 REAR YARD & ROOFS	1,135	0.026
44	LOT 38 REAR YARD & ROOFS	1,200	0.028
45	LOT 39 REAR YARD & ROOFS	1,339	0.031
46	LOT 40 REAR YARD & ROOFS	965	0.022
47	LOT 41 REAR YARD & ROOFS	1,781	0.041
48	LOT 42 REAR YARD & ROOFS	1,144	0.026
49	Basin Area A	29,144	0.669
50	Basin Area B	4,703	0.108



KEYNOTES
 ⓐ ADD AS NEEDED



REVISIONS	BY

PRELIMINARY CATCHMENT MAP: POST IMPROVEMENT
 CREEKWOOD CONDOMINIUM PROJECT
 270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
 PETALUMA CALIFORNIA

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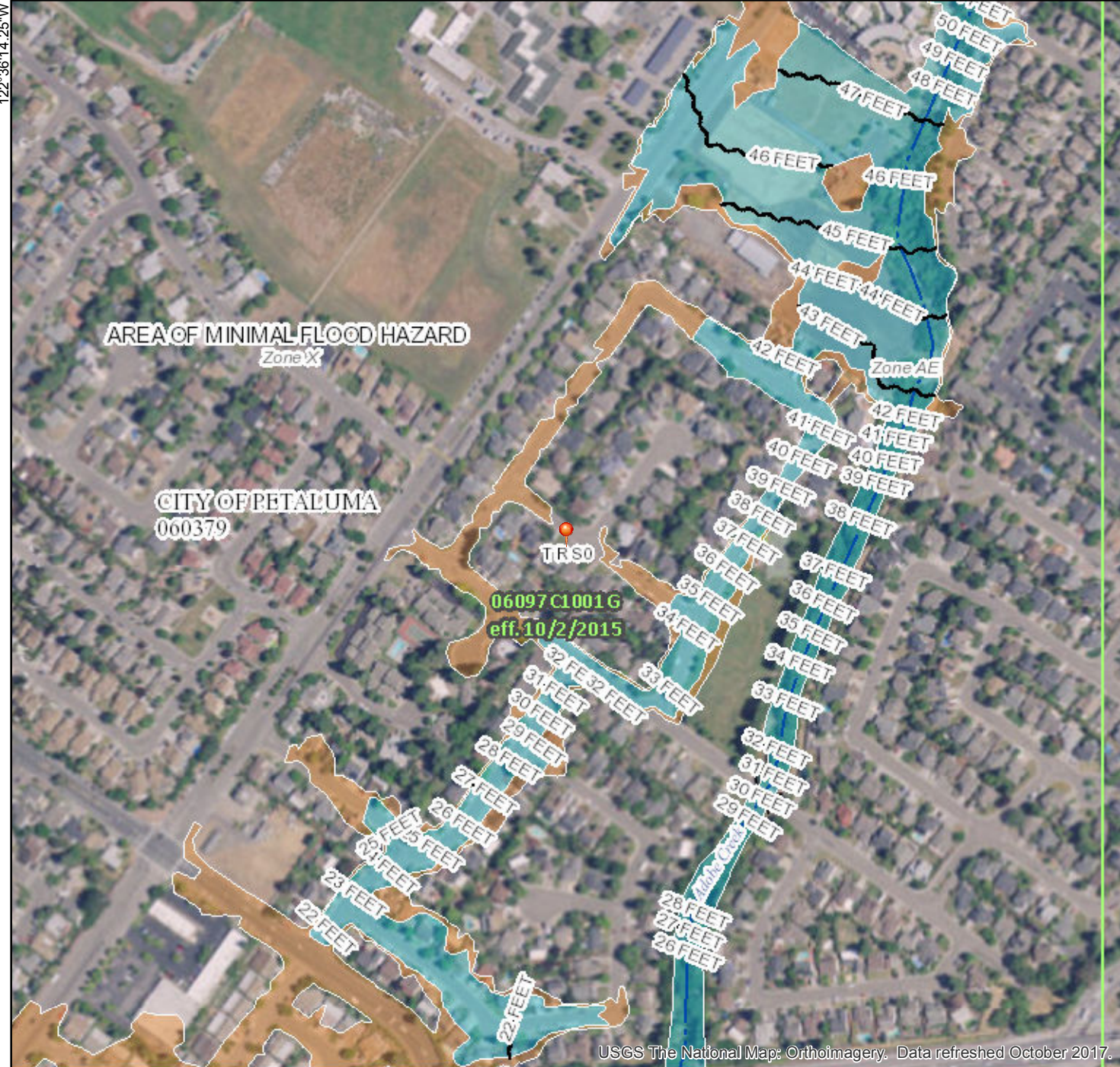
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 CHECK: SJL
 JOB: CREEKWOOD
 JOB No: 192119
 SHEET
C-16
 OF 20 SHEETS

APPENDIX F: FEMA FIRMETTE MAP

National Flood Hazard Layer FIRMette



38° 14' 32.35" N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway	

OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee. See Notes. Zone X
	Area with Flood Risk due to Levee Zone D

OTHER AREAS	Area of Minimal Flood Hazard Zone X
	NO SCREEN
	Effective LOMRs
	Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall

OTHER FEATURES	Cross Sections with 1% Annual Chance Water Surface Elevation
	20.2 17.5
	Coastal Transect
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature

MAP PANELS	Digital Data Available
	Digital Data Available
	No Digital Data Available
	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/10/2018 at 12:25:39 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.