APPROVED FOR CONSTRUCTION

SEGUIN TEXAS

01/14/2022

IMPROVEMENTS WITHIN UNIT 2 & 3, AS PROVIDED WITH THIS REPORT, ARE SUBJECT TO REVIEW AS PART OF THE FORMAL SUBDIVISION CONSTRUCTION PERMIT APPLICATION FOR EACH RESPECTIVE PHASE.

EST. 1980 CUDE ENGINEERS

Cordova Trails, Unit 1

STORMWATER MANAGEMENT PLAN

September 23, 2021

Prepared for:
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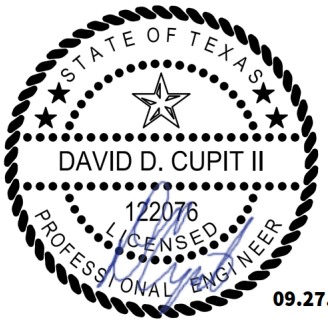

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STORMWATER MANAGEMENT PLAN

FOR

Cordova Trails, Unit 1

PROJECT SCOPE:

The proposed 39.93 acre single family residential subdivision includes the construction of street infrastructure, drainage facilities, sidewalks, driveways, utility construction and 177 single family residential homes. Access to the site, located in the City of Seguin, will be provided through Cordova Road. Stormwater from this proposed development will ultimately be conveyed to the Guadaluper River Watershed.

SITE PARAMETERS:

Plat name: Cordova Trails, Unit 1

Plat Acreage: 39.93 Ac.

JURISDICTIONAL AUTHORITY:

- This property IS located within the Seguin Municipal City Limits.
- This Property IS NOT located within the limits of the Edwards Aquifer Transition Zone per the latest maps published by the Texas Commission on Environmental Quality.
- This property IS NOT located adjacent to the FEMA Floodplain.
- This property lies within the jurisdiction of the Guadalupe River Watershed Team.
- This property lies within the watershed of Geronimo Creek.
- This property is depicted on Flood Insurance Rate Map, Community Panel Number 48187C0140F dated November 2, 2007.
- This property is located on the Geronimo USGS Quadrangle Map and the Geronimo tile image from the 2012 CoSA GIS Imagery.

METHODOLOGY:

The Rational Method was used to compute the existing and proposed onsite hydrology for this project because of the ease of use. In order to obtain the Time of Concentrations for each drainage area, the Seelye Chart was used to determine the overland (sheet) flow for a maximum of 300 feet. The maximum time for overland flow is twenty (20) minutes and the minimum time is five (5) minutes. For the shallow concentrated flow, the TR-55 method was used. Channel flow was calculated at six (6) feet per second (FPS) over the length of the flow. The overall Time of Concentration is found by adding the overland flow, shallow concentrated flow, and the channel flow together.

The runoff coefficient (C-value) was found using the Table 4-10 of the TxDOT Hydraulic Design Manual, dated July 2016, as a reference. Slopes Up to 1% were assumed for all areas of the site. For the existing undeveloped conditions, a C-value of 0.44 was used for Cultivated or Range (Grass Cover < 50% of Area). For the proposed development, a C-value of 0.65 was used for average residential areas. A runoff coefficient of 0.68 was used for ultimate development calculations where the future land use is unknown. These values were used to calculate a composite C-value for each drainage area for existing, and proposed conditions.

The rainfall intensities were obtained from the 2018 NOAA Atlas 14 precipitation frequency estimates. The previously calculated time of concentration and C-values were used in the chart to determine the rainfall intensities for the 2, 10, 25, 50, and 100 year storm events.

To compute the existing and ultimate hydrology for the shed and design the proposed drainage facilities, the soil conservation service method (SCS) was utilized. Please refer to the Shed Analysis for the detailed calculations and time of concentrations for the ultimate shed and detention facilities.

Please note that the Rational Method hydrology was used for sizing the onsite drainage curb inlets, storm sewers and open channels, since the onsite and upstream drainage areas amounted to less than 100 acres. The SCS Method hydrology was used to for sizing the detention and retention facilities only as a conservative alternative to the Rational Method to insure that the ponds are adequately sized for all onsite and upstream drainage areas for each storm event.

SITE ANALYSIS

EXISTING SITE CONDITION NARRATIVE:

At the present time, the proposed onsite area is undeveloped and consists of natural ground with small grain or row crop cover. Stormwater from the site flows to seven (7) accumulations points. Runoff from an 11.40 ac.area (A1) at the Summit at Cordova Subdivison flows to an existing detention facility at the southwest corner of Savannah Prairie and Windmill Prairie. A 19.86 ac. area (A2) captures runoff discharged from the detention facility in A1, and convey the runoff to an undeveloped lot east of the intersection of Emily Lane and Windmill. A 10.56 ac. area (A3) captures runoff from A2 and flows to an existing detention facility east of the intersection of Prairie Flower and Windmill Prairie. The combined runoff from Areas A1 through A3 is conveyed to Accumulation Point 4, located at the northen end of the existing earthen channel in the 30' drainage easement at the southwest boundary of the project site.

A 1.39 ac.area (A5) conveys runoff discharged from Accumulation Point 4 to the outfall of the existing 30' drainage easement (Point 5). A 32.43 ac.area at the southern portion of the project site (A6) conveys runoff from Point 5 along the existing bar ditch to the southeast corner of the site. Runoff from a 67.24 ac.area at the northern portion of the project site (A7) conveys runoff to the eastern boundary of the site. All approximate slopes are up to 1%. A runoff coefficient of 0.44 was used to analyze the existing undeveloped conditions. Please refer to the site drainage computations section for existing site hydrology exhibits and detailed calculations of time of concentrations and flow values for the existing site.

PROPOSED SITE CONDITION NARRATIVE:

The proposed overall development of the site includes the construction of a single family residential subdivision with street infrastructure, drainage facilities, sidewalks, driveways, utility construction and single family residential homes. There are 408 proposed lots for 94.19 developable site acres, which yields a density of 4.33 lots per acre, and thus an average residential runoff coefficient value is acceptable. Stormwater from the site flows to twenty six (26) accumulation points in proposed conditions. The offsite accumulation points from the Summit at Cordova Subdivision (1-4) remain the same in proposed conditions. Areas A5 through A9 capture runoff from the Summit at Cordova and conveys the flow to a series of earthen channels and pipe culverts along the western and southern boundaries of the site and to a combination detention/retention pond at the southeast corner of the site (A11). Runoff from a 5.20 ac. area (A10) is conveyed to a curb inlet near the eastern site entrance and to the southeast pond. The combined runoff to the southeast pond is discharged to the southeast corner of the site at Accumulation Point 12.

Areas A13 through A25 conveys the flow to a series of pipe culverts and to a combination detention/retention pond at the northeast corner of the site. The combined runoff to the northeast pond is discharged to the eastern boundary of the site at Accumulation Point 25. Runoff from a 4.53 ac.area at the eastern corner of the site is conveyed to the eastern boundary of the site and ultimately along the same downstream flow path of the northeast pond. A runoff coefficient of 0.65 was used for the proposed conditions exhibit. Please refer to the site drainage computations section for proposed site hydrology exhibit and detailed calculations of time of concentrations and flow values for the proposed site.

SHED ANALYSIS

METHODOLOGY:

In order to perform the detention analysis for this project, a terrain model of the site was created. The elevation data was created by combining onsite survey data with StratMap 2017 Lidar raster data provided by Texas Natural Resources Information System for the Geronimo Southwest quarter-quadrangle.

These data were used to generate a terrain surface and 1' contours. These were then used to delineate drainage areas and to calculate the time of concentration for the drainage areas. The TR-55 method was used for time of concentration calculations.

To calculate the time of concentration for each drainage area, the TR-55 equation 3-3 was used to determine the overland (sheet) flow for a maximum of 150 feet. For the shallow concentrated flow, TR-55 equation 3-4 was used to calculate velocity. Channel flow was calculated using Manning's equation for channel flow travel time. The overall Time of Concentration is found by adding the overland flow, shallow concentrated flow, and the channel flow together. The overall Lag time was calculated as 0.6Tc for use with hydrologic calculations.

HEC-HMS v4.2.1 was used for hydrologic calculations. These calculations used the SCS Runoff Curve Number for loss calculations and the SCS Unit Hydrograph with the standard transform, peak rate factor of 484. The curve number (CN) values and impervious percentages were established using guidance provided in the USDA NRCS Technical Release 55, Urban Hydrology for Small Watersheds. CN values were selected from tables 2-2a and 2-2b of the TR-55 publication. The land-use categories were determined using USDA NAIP digital ortho-imagery taken in 2018. The USDA Web Soil Survey was referenced for hydrologic soil group classification data. Please see exhibit E3 for a map of the soils classified by USDA hydrologic soil group. Please see exhibits E4 and E5 for existing and project conditions maps of land-use, respectively.

In reference to the rainfall modeling, HEC-HMS hypothetical storms were created using rainfall depths from the USGS "Atlas of Depth-Duration Frequency of Precipitation Annual Maxima for Texas", Scientific Investigation Report 2004-5041 (TxDOT Implementation Report 5-1301-01-1). Twenty-four-hour Type-III storm simulations were run using 2-yr, 10-yr, 25-yr, 50-yr, and 100-yr depths. The approximate rainfall depths indicated by the USGS Report for the project location are shown in the table below.

STORM RECURRENCE INTERVAL	1 DAY DURATION PRECIPITATION DEPTH (INCHES)	HEC-HMS METEOROLOGICAL MODEL
2-YEAR	3.60	SEGUIN_002
10-YEAR	6.10	SEGUIN_010
25-YEAR	7.50	SEGUIN_025
50-YEAR	8.90	SEGUIN_050
100-YEAR	10.10	SEGUIN_100

EXISTING CONDITIONS:

Attachment E6 provides a depiction of the four drainage areas analyzed in the existing conditions stage of this study. The proposed subdivision can be divided into two drainage areas in the existing condition. These areas are DA 01 and DA 02 on exhibit E6. DA 01 drains to the west into cultivated land. DA 02 drains to a bar ditch that conveys eastward along Cordova Road. This bar ditch and the cultivated field ultimately drain to the same unnamed tributary to Geronimo Tributary 6 where it crosses SH-123.

A portion of an existing subdivision to the west drains into DA 02. This upstream area, DA 03, is made up of fully developed, medium density subdivision units.

The remaining drainage area, DA 04, is downstream of the proposed development. The point of accumulation for DA 04 is a driveway culvert that is approximately 1250 feet downstream of DA 02. This culvert was included in the analysis for compliance with the city of Seguin's UDC section 4.6.1.

HEC-HMS 4.2.1 was used to create the existing basin model, "01_EXISTING". The schematic below shows the 01_EXISTING basin model layout. The two blue lines, R_02 and R_04, are reaches used to route flow from an upstream area being channeled through a downstream area to the next point of discharge. Manning's equation for channel flow travel time was used to calculate the lag time for each reach. The drainage elements and their hydrologic parameters are listed in Table 1 below.

HEC-HMS MODEL SCHEMATIC EXISTING CONDITIONS

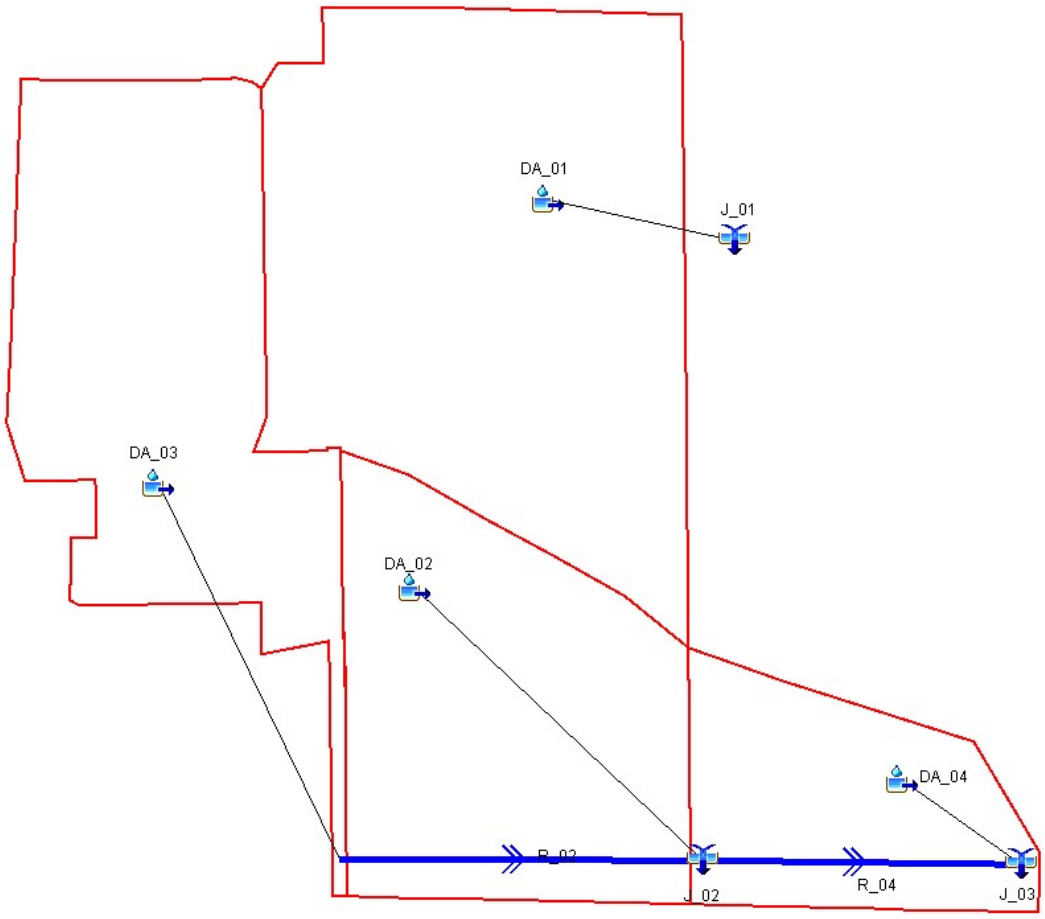

TABLE 1 - EXISTING HYDROLOGIC PARAMETERS					
SUBBASIN	AREA (SM)	INITIAL ABS. (IN)	CURVE NUMBER	IMPERVIOUS (%)	LAG TIME (MIN)
DA_01	0.1005	0.3185	86.26	4.77	27.47
DA_02	0.0586	0.3000	86.96	1.29	36.55
DA_03	0.0662	0.3518	85.04	42.36*	33.27
DA_04	0.0317	0.3200	86.21	2.20	43.87
R_02	-	-	-	-	11.60
R_04	-	-	-	-	4.66

*Drainage area DA_03 is an upstream contributing area. The impervious area was increased by 25% in all model simulations

PROJECT/ULTIMATE CONDITIONS

Attachment E7 shows the six drainage areas analyzed in the project condition. In the project condition, the area that corresponds with existing DA 01 is split into two drainage areas: one detained, and one by-passed. These areas are DA 01A and DA01B, respectively.

In the project condition, the area that corresponds with existing DA 02 is also split into two drainage areas: one detained, and one bypassed. These areas are DA 02A and DA 02B, respectively. To model the project conditions, the basin model, "02_PROJECT" was created. The schematic below shows the 02_PROJECT basin model layout. Reach R_02 is improved in the project condition. For this reason, the velocity through R_02 was assumed to be 6 ft/s in the project condition. Table 2 lists the project conditions basin elements and their parameters.

HEC-HMS MODEL SCHEMATIC PROJECT CONDITIONS

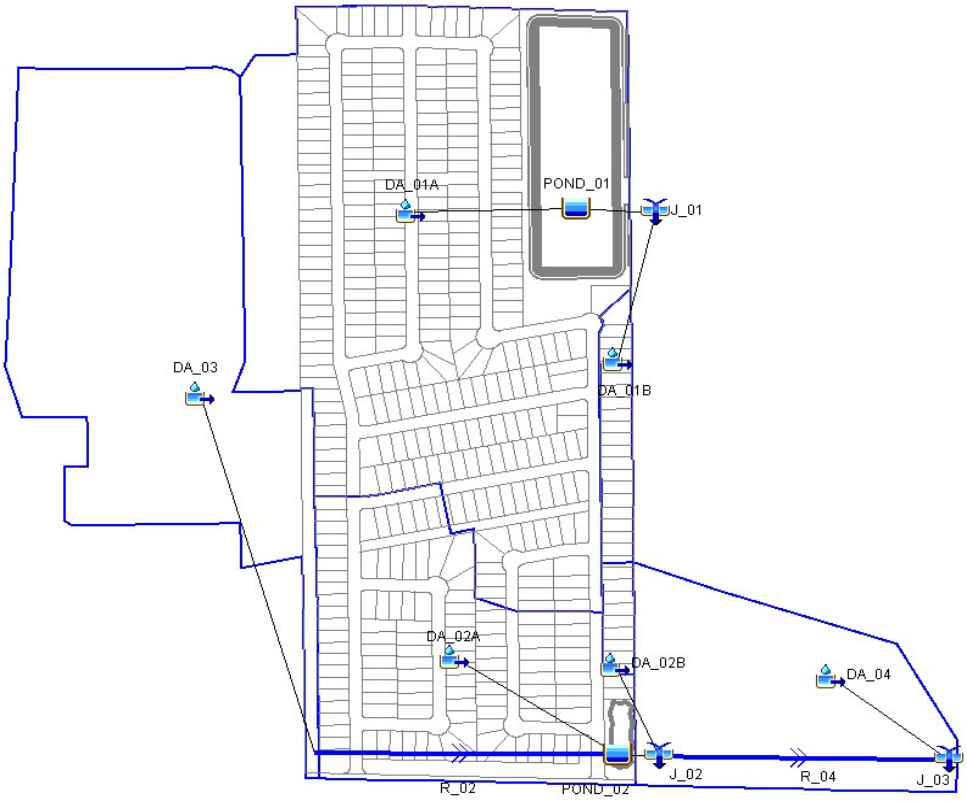

TABLE 2 - PROJECT HYDROLOGIC PARAMETERS					
SUBBASIN	AREA (SM)	INITIAL ABS. (IN)	CURVE NUMBER	IMPERVIOUS (%)	LAG TIME (MIN)
DA_01A	0.1106	0.2367	89.42	58.59	19.82
DA_01B	0.0052	0.1882	91.40	62.27	10.12
DA_02A	0.0425	0.2186	90.15	63.00	19.54
DA_02B	0.0021	0.2089	90.54	58.34	9.36
DA_03	0.0650	0.3531	85.00	43.21*	33.27
DA_04	0.0317	0.3204	86.19	2.11	43.87
R_02	-	-	-	-	3.50
R_04	-	-	-	-	4.66

*Drainage area DA_03 is an upstream contributing area. The impervious area was increased by 25% in all model simulations

In the project conditions model, "DA_01A" flows into "POND_01" and is detained before discharging to the adjoining property to the east. This pond was designed with a 105' wide, trapezoidal weir with a crest elevation of 591.50'. Below this crest elevation, a permanent wet pool retention pond is planned. Table 3 shows the elevation-area relationship used to calculate the detention storage volume for "POND_01". The final design for this pond will comply with all the city of Seguin's requirements.

TABLE 3 - POND 1 STAGE-STORAGE						
CONTOUR ELEVATION FT	CONTOUR AREA SF	CONTOUR AREA AC	INCREMENTAL VOLUME AC-FT	INCREMENTAL VOLUME CF	CUMULATIVE VOLUME AC-FT	CUMULATIVE VOLUME CF
591.50	419,967	9.64	0.00	0.00	0.00	0.00
592.00	424,268	9.74	0.02	211058.71	4.85	211058.71
592.50	428,587	9.84	0.45	213213.68	9.74	424272.39
593.00	433,123	9.94	0.80	215427.42	14.69	639699.81
593.50	437,953	10.05	0.59	217768.96	19.68	857468.77

In the project conditions model, "DA_02A" flows into "POND_02" and is detained before discharging to the adjoining property to the east. This pond was designed with a two-stage, trapezoidal weir with a lower stage crest elevation of 591.74'. Table 4 shows the elevation-area relationship used to calculate the detention storage volume for "POND_02".

TABLE 4 - POND 2 STAGE-STORAGE						
CONTOUR ELEVATION FT	CONTOUR AREA SF	CONTOUR AREA AC	INCREMENTAL VOLUME AC-FT	INCREMENTAL VOLUME CF	CUMULATIVE VOLUME AC-FT	CUMULATIVE VOLUME CF
591.74	0.00	0.00	0.00	0.00	0.00	0.00
592.00	6027.61	0.14	0.02	783.59	0.02	783.59
593.00	33388.17	0.77	0.45	19707.89	0.47	20491.48
594.00	36395.40	0.84	0.80	34891.79	1.27	55383.26
594.69	38493.67	0.88	0.59	25836.73	1.86	81219.99

Table 5 below provides a summary of peak discharges in the existing and project conditions. The project conditions values for J_01 are a combination of the hydrographs of Pond 1 and DA 01B. The project conditions values for J_02 are a combination of the hydrographs of Pond 2 and DA 02B. Element J_03 represents the culvert that is approximately 1250 feet downstream of the proposed subdivision outfall at Pond 2. Simulations for all required storms show that this design reduces peak discharges at all locations of outflow.

TABLE 5 - PEAK DISCHARGE SUMMARY															
OUTFLOW LOCATION	EXISTING CONDITIONS OUTFLOW (CFS)					PROJECT DETAINED OUTFLOW (CFS)					DISCHARGE REDUCTION (CFS)				
	2-YR	10-YR	25-YR	50-YR	100-YR	2-YR	10-YR	25-YR	50-YR	100-YR	2-YR	10-YR	25-YR	50-YR	100-YR
J_01	78.6	155.5	201.1	244.9	279.2	76.3	148.5	192.9	236.3	271.4	2.3	7.0	8.2	8.6	7.8
J_02	92.0	175.0	224.2	271.5	308.6	91.7	169.8	215.0	258.7	292.9	0.3	5.2	9.2	12.8	15.7
J_03	110.7	212.1	272.2	330.0	375.2	109.2	203.4	258.7	312.0	353.8	1.5	8.7	13.5	18.0	21.4

RETENTION/DETENTION POND 1

In the existing condition, approximately 64 acres drains to the cultivated property to the east. The peak discharges for the 2-yr, 10-yr, 25-yr, 50-yr- and 100-yr storms were 78.6, 155.5, 201.1, 244.9, and 279.2 cfs, respectively. These flows correspond to existing conditions model element J_01 in Table 5.

Under project conditions, an area of approximately 73 acres drains to the same location before entering the cultivated property to the east. Of the 73 acres, roughly 70 acres is to be collected and routed to facility that will serve as a permanent retention/detention pond. The facility outfall was designed so that the entire 73 acres would have peak discharges less than the corresponding 64 acres under existing conditions. The total developed peak discharges for the 2-yr, 10-yr, 25-yr, 50-yr- and 100-yr storms were 76.3, 148.5, 192.9, 236.3, and 271.4 cfs, respectively. These flows correspond to project model element J_01 in Table 5. The Pond 1 outfall was designed to have peak discharges of 74.4, 144.5, 188.0, 230.4, and 264.0 cfs. This is a gravity flow trapezoidal weir design with 3:1 side slopes and an opening with top width of 76.0' at the crest elevation of 591.5'.

The excess volume as designed for stormwater detention is to be between elevations 591.50' and 592.70', providing for 11.77 ac-ft of stormwater detention storage during a storm. During the 100-yr storm simulation, peak storage used for detention was computed to be 11.3 ac-ft with a peak water surface elevation of 592.70'. The top of this retention/detention pond is designed to be 593.71' to provide at least 1.00' of freeboard. The retention basin portion of this facility will be maintained between elevations 563.50' and 591.50'. The maximum side slopes of this pond will be limited to 3:1.

DETENTION POND 2

In the existing condition, approximately 37.5 acres of the subject property drains into the bar ditch along Cordova Road before draining to the east. Under existing conditions, this part of the property receives runoff from The Summit at Cordova Subdivision to the west. The area draining from this existing development is 42.4 acres. Under existing conditions, the combined peak discharges for the 2-yr, 10-yr, 25-yr, 50-yr- and 100-yr storms were 92.0, 175.0, 224.2, 271.5, and 308.6 cfs, respectively. These flows correspond to existing model element J_02 in Table 5.

Under project conditions, 27.5 acres of the subject property drains to the bar ditch before exiting the property heading east. Of the 27.5 acres, 26.1 acres is to be collected and routed to a facility that will serve as detention pond. This facility was designed to receive runoff from the 26.1 acres and combine it with the intercepted upgradient flow from The Summit at Cordova.
The facility outfall was designed so that the combined peak discharges leaving the proposed development were less than the flows leaving under existing conditions. Including intercepted upgradient flow, the total developed peak discharges for the 2-yr, 10-yr, 25-yr, 50-yr- and 100-yr storms were 91.7, 169.8, 215.0, 258.7, and 292.9 cfs, respectively. These flows correspond to project conditions model element J_02 in Table 5. The Pond 2 outfall was designed to have gravity flow peak discharges of 90.5, 167.2, 211.8, 254.8, and 288.6 cfs. This was accomplished with a two-stage of trapezoidal weir. Each stage has 3:1 side slopes. The bottom stage has a crest width of 14.25' and a crest elevation of 591.74. The upper stage has a top width of 177.10' with a crest elevation of 593.24'. The geometry was modelled in HEC-HMS using two dam tops that have geometry equal to the design when combined side-by-side.

The excess volume as designed for stormwater detention is to be between elevations 591.74' and 593.69'. During the 100-yr storm simulation, peak storage used for detention was computed to be 0.98 ac-ft with a peak water surface elevation of 593.69'.

The top of Pond 2 is designed to be 594.69' to provide 1.0' of freeboard. The maximum side slopes of this pond will be limited to 3:1.

Table 6 summarizes the pond discharge parameters for the 2-yr, 10-yr, 25-yr, 50-yr- and 100-yr storms. For all simulations, the discharge velocities were found to be less than 6 ft/s.

TABLE 9 - DETENTION OUTFALL HYDRAULICS

OUTFALL STRUCTURE	2-YR				10-YR				25-YR				50-YR				100-YR			
	Q	WSE	A	V	Q	WSE	A	V	Q	WSE	A	V	Q	WSE	A	V	Q	WSE	A	V
	CFS	FT	SF	FT/S	CFS	FT	SF	FT/S	CFS	FT	SF	FT/S	CFS	FT	SF	FT/S	CFS	FT	SF	FT/S
POND 1	74.4	592.03	41.12	1.81	144.5	592.31	63.53	2.27	188.0	592.47	76.54	2.46	230.4	592.60	87.23	2.64	264.0	592.70	95.52	2.76
POND 2	90.5	593.27	28.94	3.13	167.2	593.48	66.19	2.53	211.8	593.56	80.40	2.63	254.8	593.63	92.85	2.74	288.6	593.69	103.52	2.79

V= Q/A

A = FLOW CROSS-SECTIONAL AREA AT OUTFALL STRUCTURE

ATTACHMENTS:

*Aerial Photograph – Area View
*Aerial Photograph – Site View
*Flood Insurance Rate Map – Area View
*Flood Insurance Rate Map – Site View
*Impervious Cover Site Map – Existing Conditions
*Impervious Cover Site Map – Proposed Conditions
*Location Map-Area View
*Location Map-Site View
*SARA – Bexar County Flood Map-Area View
*SARA – Bexar County Flood Map-Site View
*USGS Quadrangle Map – Area View
*USGS Quadrangle Map – Site View
*Exhibit E1 – Existing Drainage Area Plan
*Exhibit E2 – Proposed Drainage Area Plan
*Exhibit E3 - USDA Soils Exhibit
*Exhibit E4 – Existing Land Use Exhibit
*Exhibit E5 – Project land Use Exhibit
*Exhibit E6 - Existing Drainage Area Exhibit
*Exhibit E7 – Project Drainage Area Exhibit
*Exhibit E8 – Impervious Area and Composite CN Calculation (Existing Conditions)
*Exhibit E9 - Impervious Area and Composite CN Calculation (Project Conditions)
*Exhibit E10 – Street Cross Section Locations
*Exhibit E11 – Drainage Cross Section Locations
*Exhibit E12– 2000' Downstream Analysis

SITE MAPS

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CORDOVA TRAILS

AERIAL PHOTOGRAPH (AREA VIEW)

DATE: 6/11/2020 ***JOB NO.:*** # 03480.000

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AERIAL PHOTOGRAPH (SITE VIEW)

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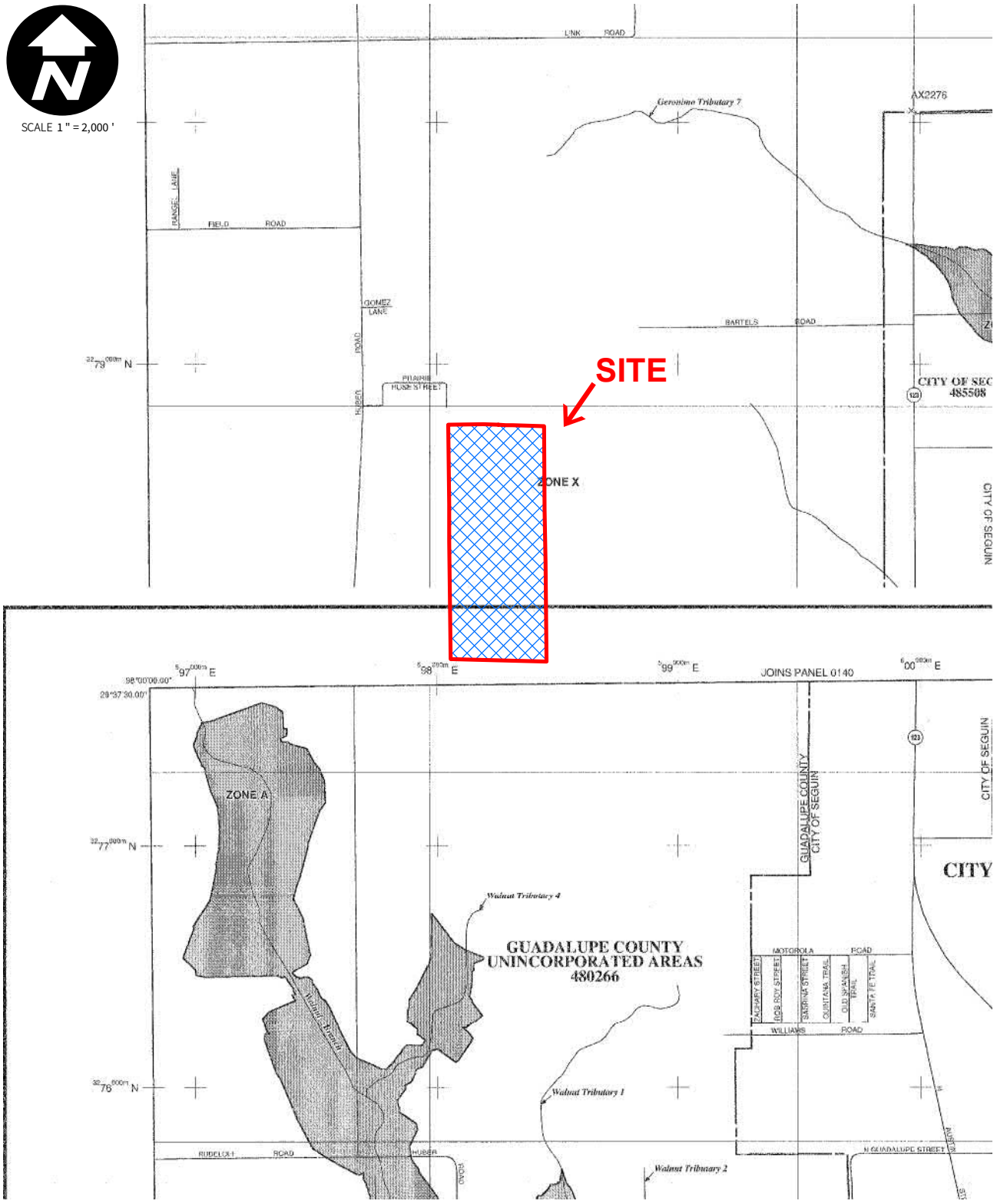

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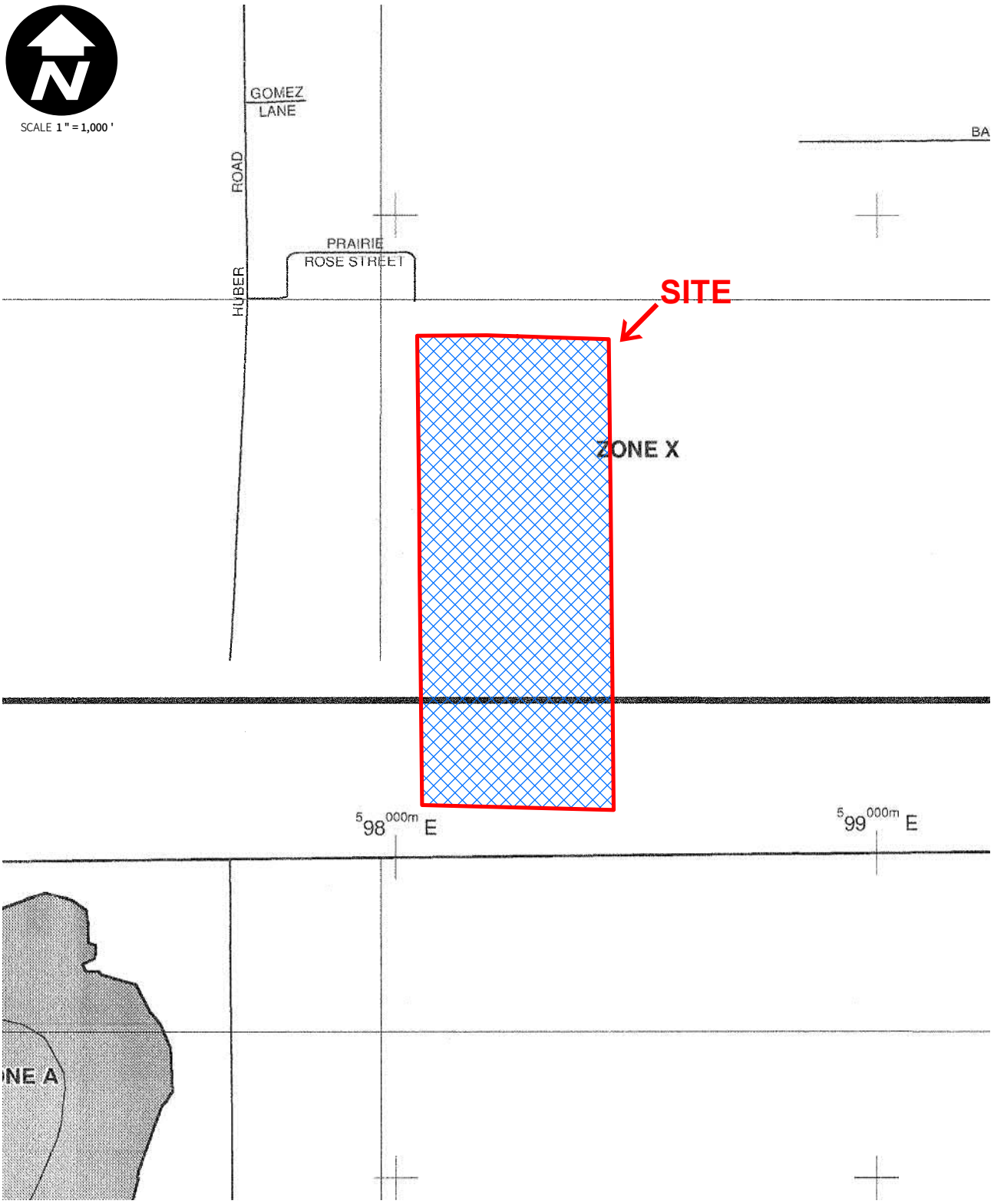
CORDOVA TRAILS

FLOOD INSURANCE RATE MAP (AREA VIEW)

DATE: 6/11/2020 **JOB NO.:** # 03480.000



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FLOOD INSURANCE RATE MAP (SITE VIEW)

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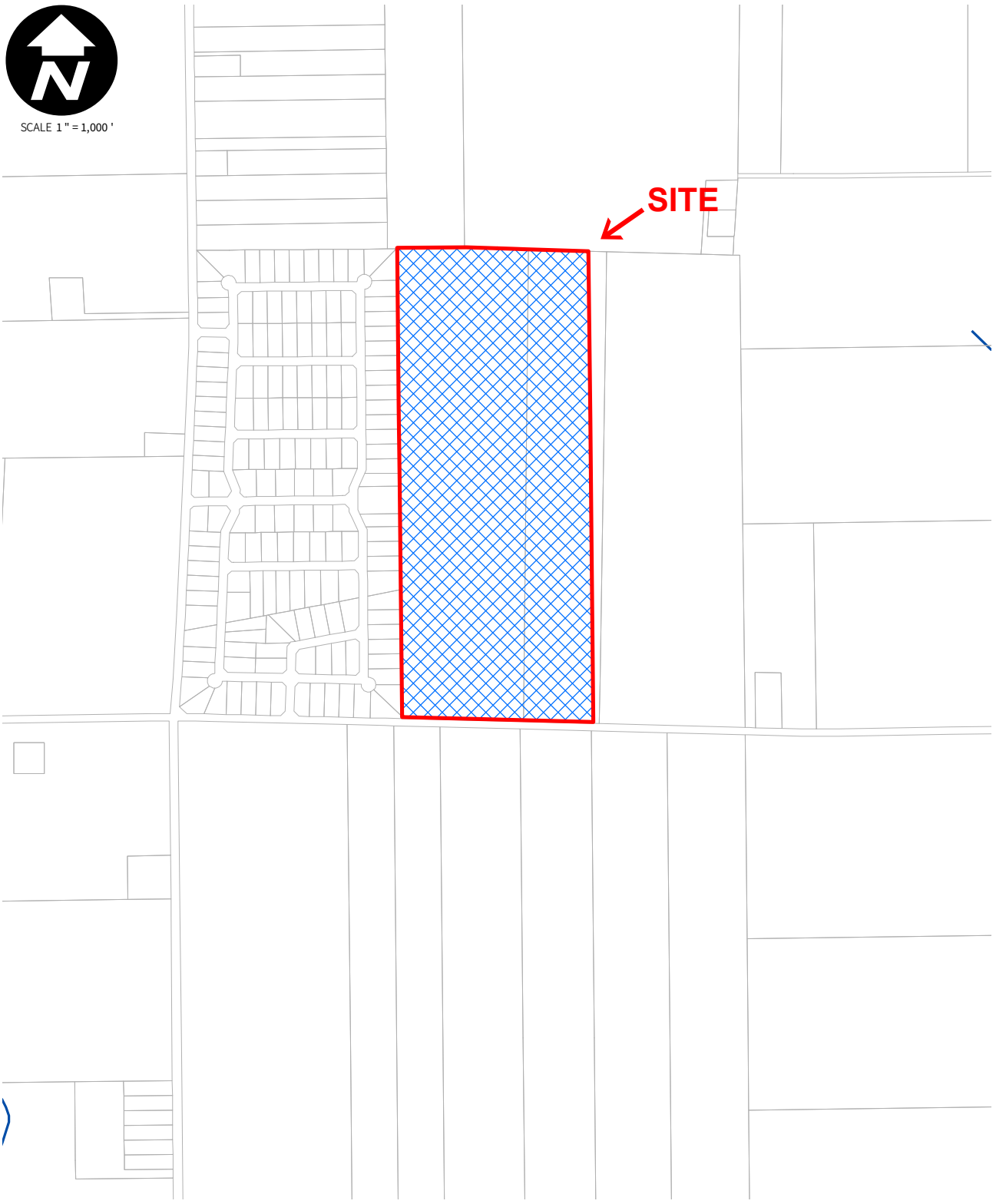

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CORDOVA TRAILS

IMPERVIOUS COVER - EXISTING CONDITIONS

DATE: 6/11/2020 ***JOB NO.:*** # 03480.000

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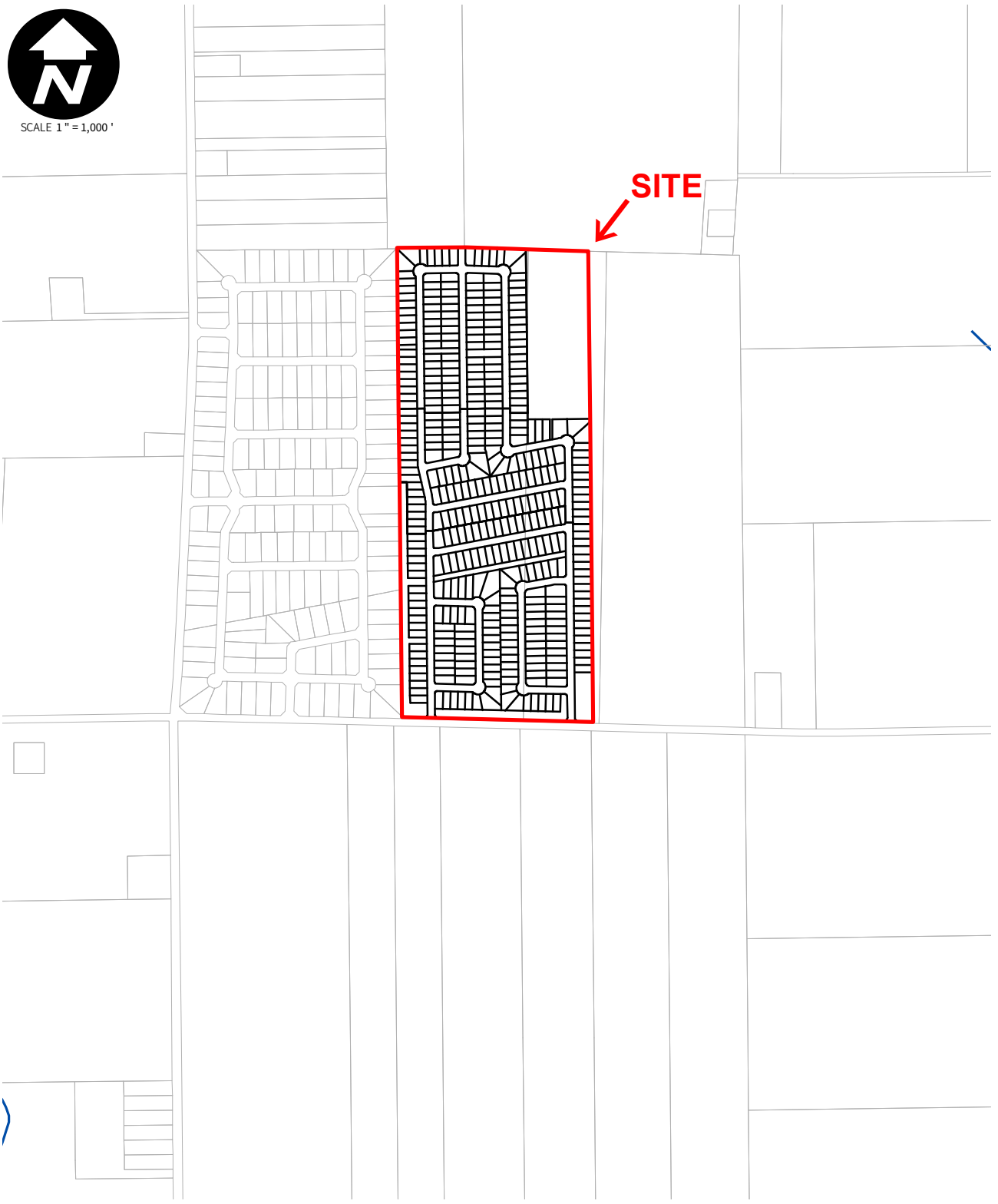
FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14



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TBPLS No. 10048500

CORDOVA TRAILS

IMPERVIOUS COVER - PROPOSED CONDITIONS

DATE: 6/11/2020 ***JOB NO.:*** # 03480.000

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CORDOVA TRAILS

LOCATION MAP (AREA VIEW)

DATE: 6/11/2020 **JOB NO.:** # 03480.000

Document Path: C:\GIS\SWMP\03480.000_Cordova_Tract_MDP\Cordova_Tract_MDP_8x11_LOCATION_MAP_AREA_VIEW.mxd

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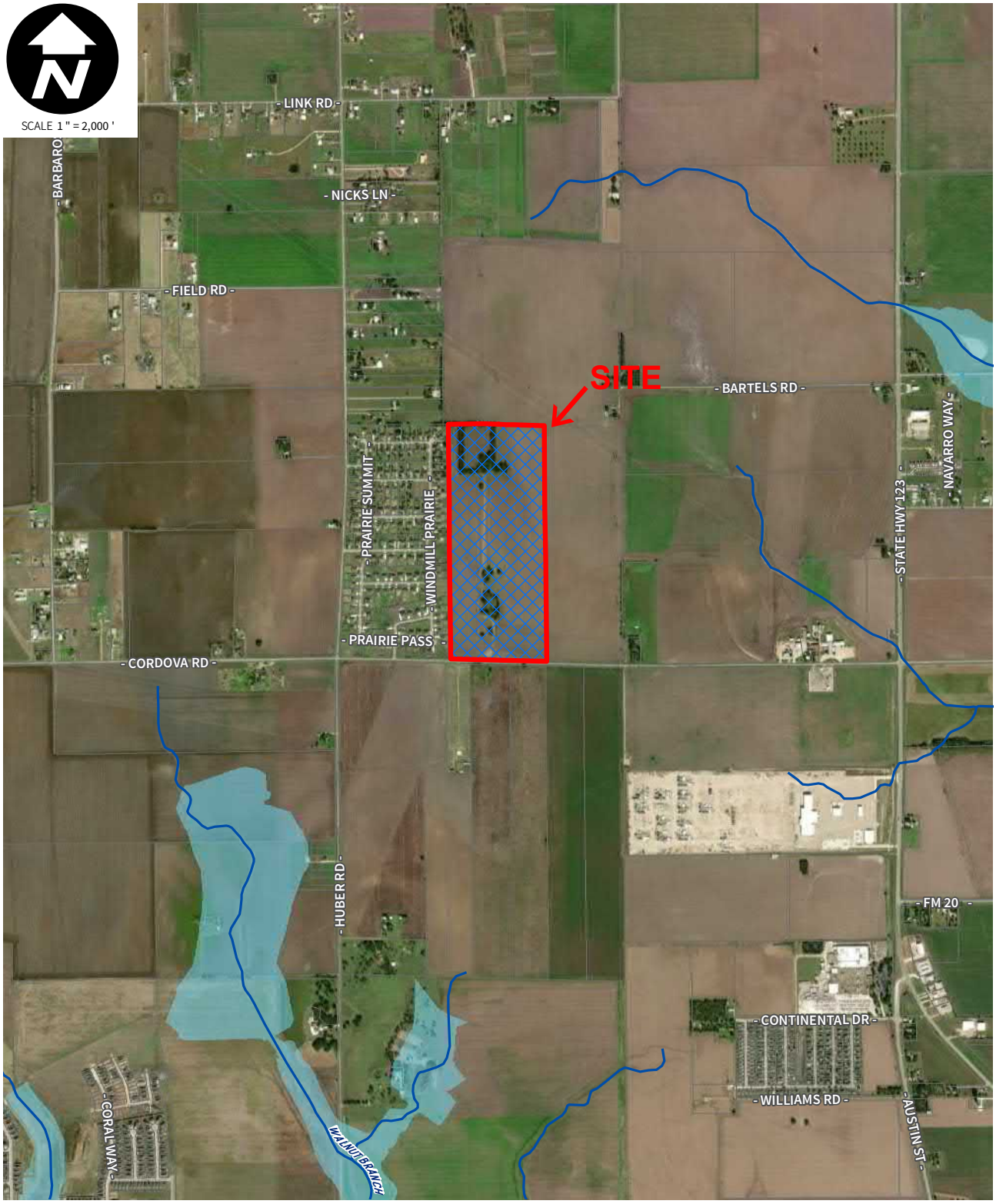
TBPLS No. 10048500

CORDOVA TRAILS

LOCATION MAP (SITE VIEW)

DATE: 6/11/2020 **JOB NO.:** # 03480.000



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CORDOVA TRAILS

SARA FLOODPLAIN (AREA VIEW)

DATE: 6/11/2020 ***JOB NO.:*** # 03480.000

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CORDOVA TRAILS

SARA FLOODPLAIN (SITE VIEW)

DATE: 6/11/2020 ***JOB NO.:*** # 03480.000

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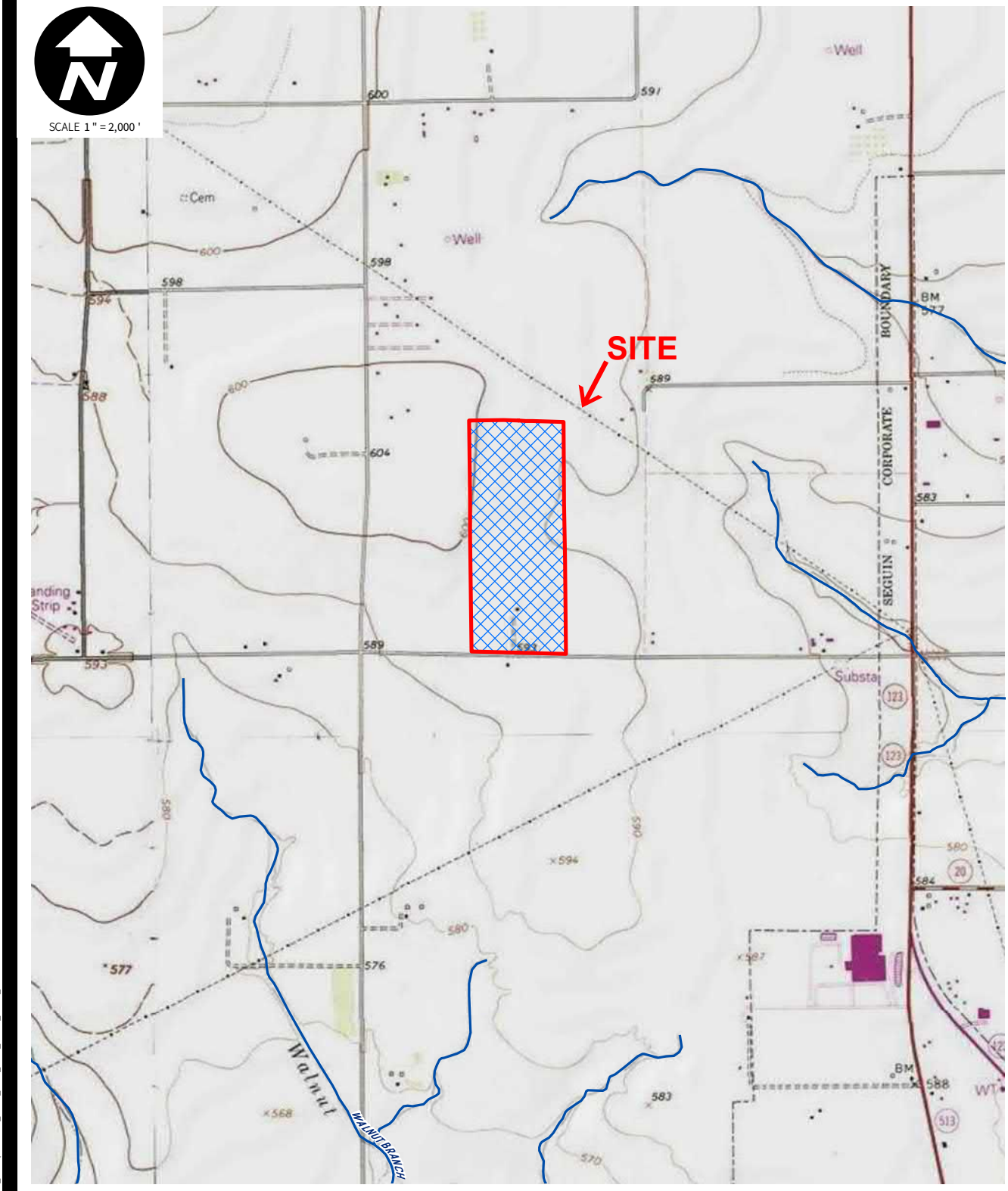

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TBPLS No. 10048500

CORDOVA TRAILS

U.S.G.S. QUAD MAP (AREA VIEW)

DATE: 6/11/2020 ***JOB NO.:*** # 03480.000

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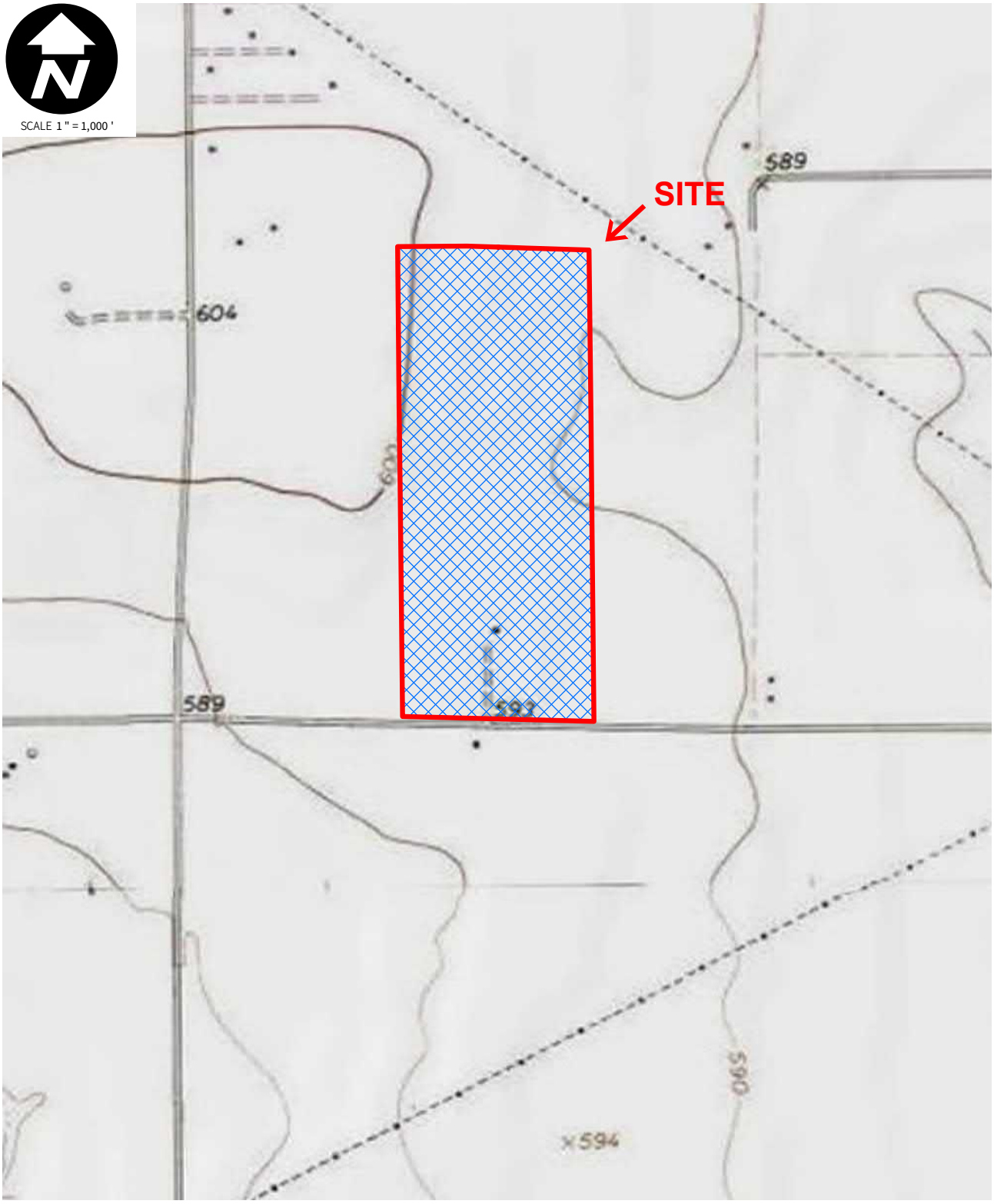

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CORDOVA TRAILS

U.S.G.S. QUAD MAP (SITE VIEW)

DATE: 6/11/2020 **JOB NO.:** # 03480.000

Document Path: C:\GIS\SWMP\03480.000_Cordova_Tract_MDP\Cordova_Tract_MDP_8x11_USGS_SITE_VIEW.mxd

SITE DRAINAGE COMPUTATIONS

CUDE ENGINEERS

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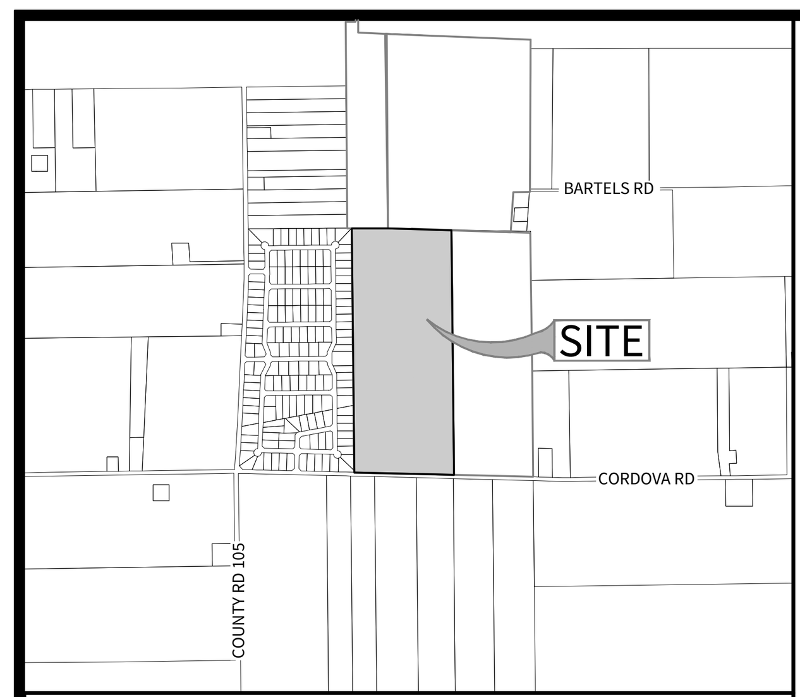
TBPE NO. 455
TBPLS NO. 10048500



LOCATION MAP
N.T.S.

OWNER/DEVELOPER:

ASHTON WOODS HOMES
CONTACT PERSON: KYLE LENTS
17319 SAN PEDRO, SUITE 140
SAN ANTONIO,TX 78232
TEL: (210) 632-0753

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: DAVID CUPIT, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

SCALE: 1" =300'

LEGEND

- DRAINAGE AREA
- Tc FLOW PATH
- ACCUMULATION POINT (XX)
- DETENTION POND

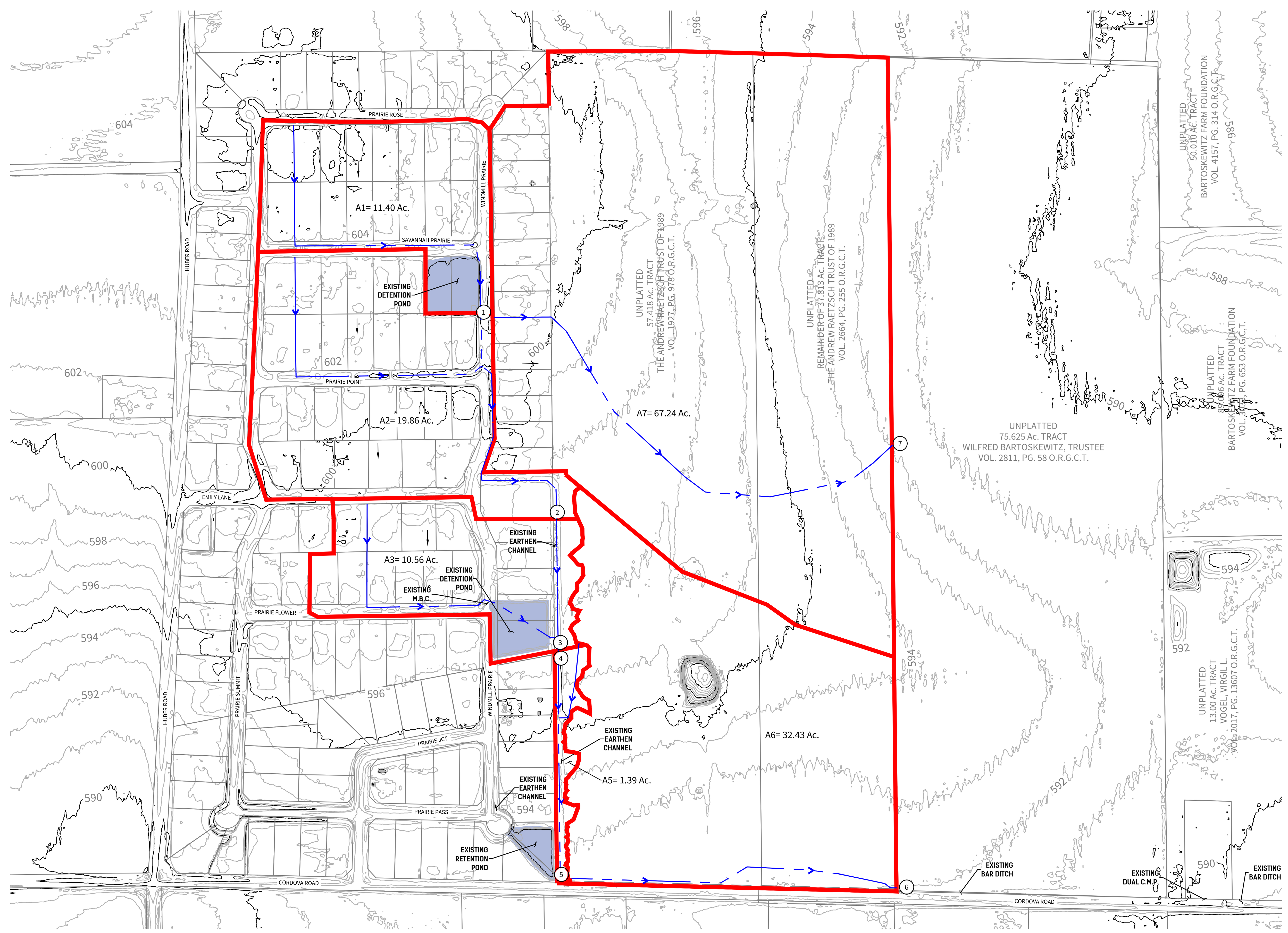
Project Name: Cordova Tract
Calculation Summary for Time of Concentrations

		Sheet Flow Tc Compuations						Shallow Conc. Tc Compuations						Concentrated Tc Computations						Overall			
Drainage Shed	Shed Area (Ac.)	Length	Paved (Y or N)	Upstream Elev.	Downstream Elev	Slope	Time of Concentration	Length	Paved (Y or N)	Upstream Elev.	Downstream Elev	Slope	Time of Concentration	Length	Upstream Elev.	Downstream Elev	Slope	Velocity (fps)	Time of Concentration	Time of Concentration (min	Lag Time (0.6 x Tc) (min)	Time of Concentration (hrs)	Lag Time (0.6 x Tc) (hrs)
1	**11.40**	300.00	N	605.18	603.34	0.61%	20.00	162.27	N	603.34	602.34	0.62%	2.18	2532.00				6	7.03	**29.21**	17.53	0.487	0.292
2	**19.86**	300.00	N	602.50	601.39	0.37%	20.00	158.56	N	601.39	600.81	0.37%	2.58	2091.00				6	5.81	**28.39**	17.03	0.473	0.284
3	**10.56**	300.00	N	599.11	598.10	0.34%	20.00	97.22	N	598.10	597.78	0.33%	1.6	2414.00				6	6.71	**28.31**	16.98	0.472	0.283
4	**0.00**	300.00	N	605.18	603.34	0.61%	20.00	162.27	N	603.34	602.34	0.62%	2.18	2532.00				6	7.03	**29.21**	17.53	0.487	0.292
5	**1.39**	300.00	N	596.84	594.34	0.83%	20.00							613.39				6	1.70	**21.70**	13.02	0.362	0.217
6	**32.43**	300.00	N	596.84	594.34	0.83%	20.00							1927.12				6	5.35	**25.35**	15.21	0.423	0.254
7	**67.24**	300.00	N	597.94	597.48	0.15%	20.00	650.00	N	597.48	594.87	0.40%	10.41	1519.27				6	4.22	**34.63**	20.78	0.577	0.346

Project Name: Cordova Tract
HYDROLOGY CALCULATIONS:

PT. #	AREA (Ac.)	AREA OF ACCUMULATION (Ac.)	TOTAL ACRES	C	Tc	I2	I10	I25	I50	I100	Q2	Q10	Q25	Q50	Q100
1	11.40	= A1	**11.40**	0.65	29.21	2.94	4.56	5.42	6.25	7.20	21.78	33.82	**40.16**	**46.32**	**53.38**
2	19.86	= A2	**19.86**	0.65	28.39	2.99	4.64	5.51	6.36	7.32	38.61	59.94	**71.15**	**82.07**	**94.55**
3	10.56	= A3	**10.56**	0.65	28.31	3.00	4.65	5.52	6.37	7.34	20.57	31.92	**37.90**	**43.71**	**50.36**
4	0.00	= A1:A3	**41.82**	0.65	29.21	2.94	4.56	5.42	6.25	7.20	40.27	69.87	**83.55**	**96.07**	**109.87**
5	1.39	= A1:A3 + A5	**1.39**	0.44	21.70	3.50	5.42	6.42	7.39	8.50	42.41	73.18	**87.47**	**100.59**	**115.07**
6	32.43	= A1:A3 + A5:A6	**33.82**	0.44	25.35	3.20	4.96	5.88	6.78	7.81	87.88	146.73	**174.72**	**201.15**	**230.85**
7	67.24	= A7	**67.24**	0.44	34.63	2.64	4.11	4.89	5.64	6.51	78.23	121.64	**144.62**	**166.97**	**192.59**

*REFERENCE STORMWATER REPORT FOR DETENTION POND INFLOW AND OUTFLOW RATES



APPROVED FOR CONSTRUCTION SEGUIN TEXAS
01/14/2022

RATIONAL METHOD HYDROLOGY - FOR SIZING OF ONSITE DRAINAGE CURB INLETS, STORM SEWERS, AND CHANNELS ONLY

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CORDOVA TRAILS

EXISTING DRAINAGE AREA PLAN

DATE
09/02/2020

PROJECT NO.
03480.002

DRAWN BY
AC

CHECKED BY
DDC/JC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.

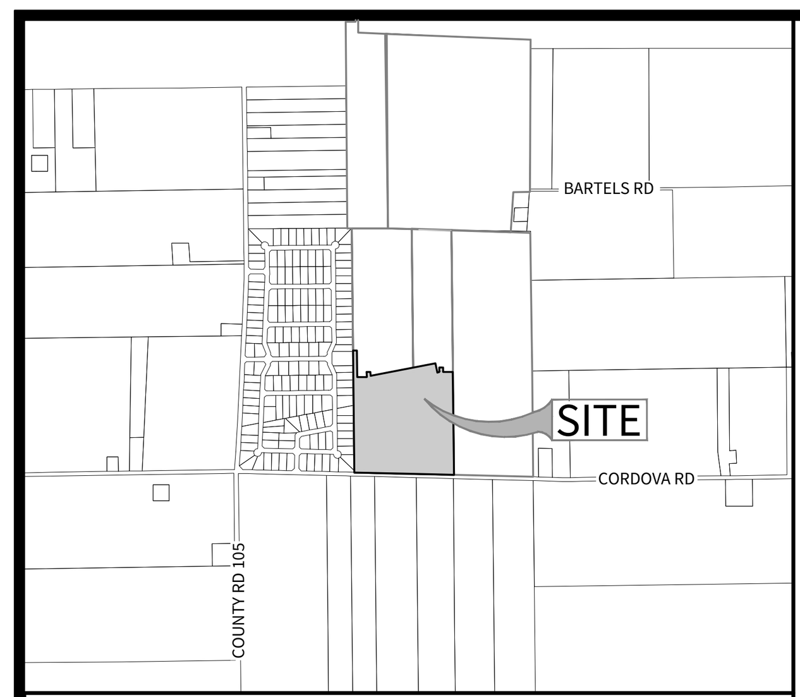
STATE OF TEXAS
DAVID D. CUPIT II
72076
LICENSED PROFESSIONAL ENGINEER
07.29.21

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

PLAT NO.

E1

FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CPJENGR 2022-01-14



LOCATION MAP

N.T.S.

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TEL: (210) 681-2951
FAX: (210) 523-7112

SCALE: 1" =300'

Project Name: Cordova Trails
Calculation Summary for Time of Concentrations

Drainage Shed	Shed Area (Ac.)	Sheet Flow Tc Computations: Length	Paved (Y or N)	Upstream Elev.	Downstream Elev	Slope	Time of Concentration	Shallow Conc. Tc Computations: Length	Paved (Y or N)	Upstream Elev.	Downstream Elev	Slope	Time of Concentration	Concentrated Tc Computations: Length	Upstream Elev.	Downstream Elev	Slope	Velocity (fps)	Time of Concentration	Overall: Time of Concentration (min)	Lag Time (0.6 x Tc) (min)	Time of Concentration (hrs)	Lag Time (0.6 x Tc) (hrs)
1	11.40	300.00	N	605.18	603.34	0.61%	20.00	162.27	N	603.34	602.34	0.62%	2.18	2532.00				6	7.03	29.21	17.53	0.487	0.292
2	19.60	300.00	N	602.50	601.39	0.37%	20.00	158.56	N	601.39	600.81	0.37%	2.58	2091.00				6	5.81	28.39	17.03	0.473	0.284
3	9.88	300.00	N	599.11	598.10	0.34%	20.00	97.22	N	598.10	597.78	0.33%	1.6	2414.00				6	6.71	28.31	16.98	0.472	0.283
4	0.00	300.00	N	605.18	603.34	0.61%	20.00	162.27	N	603.34	602.34	0.62%	2.18	2532.00				6	7.03	29.21	17.53	0.487	0.292
5A	1.57	220.00	N	599.04	598.34	0.32%	20.00							188.00				6	0.52	20.52	12.31	0.342	0.205
5B	3.17	220.00	N	599.04	598.34	0.32%	20.00							1635.51				6	4.54	24.54	14.73	0.409	0.245
5C	0.86	220.00	N	599.04	598.34	0.32%	20.00							1810.33				6	5.03	25.03	15.02	0.417	0.250
6	10.03	235.00	N	600.61	597.71	1.23%	20.00							554.00				6	1.54	21.54	12.92	0.359	0.215
7	0.00	220.00	N	599.04	598.34	0.32%	20.00							1810.33				6	5.03	25.03	15.02	0.417	0.250
8	3.80	141.46	N	596.49	588.14	5.90%	12.00							835.05				6	2.32	14.32	8.59	0.239	0.143
8A	0.72	25.38	N	595.90	592.86	11.98%	10.00							877.98				6	2.44	12.44	7.46	0.207	0.124
9	0.00	220.00	N	599.04	598.34	0.32%	20.00							2854.04				6	7.93	27.93	16.76	0.465	0.279
10	5.20	130.00	N	602.88	601.44	1.11%	16.00							857.07				6	2.38	18.38	11.03	0.306	0.184
11	1.39	172.62	N	595.25	593.80	0.84%	20.00											6		20.00	12.00	0.333	0.200
12	0.00	220.00	N	599.04	598.34	0.32%	20.00							2933.28				6	8.15	28.15	16.89	0.469	0.281
13	11.17	300.00	N	599.18	598.68	0.17%	20.00	81.65	N	598.68	597.18	1.84%	0.62	240.76				6	0.67	21.29	12.77	0.355	0.213
14	9.73	300.00	N	600.81	596.56	1.42%	20.00	51.20	N	596.56	596.16	0.78%	0.61	408.21				6	1.13	21.74	13.05	0.362	0.217
15	0.00	300.00	N	599.18	598.68	0.17%	20.00	81.65	N	598.68	597.18	1.84%	0.62	609.97				6	1.69	22.31	13.39	0.372	0.223
16	9.29	150.00	N	598.89	597.25	1.09%	17.00							670.00				6	1.86	18.86	11.32	0.314	0.189
17	0.00	300.00	N	599.18	598.68	0.17%	20.00	81.65	N	598.68	597.18	1.84%	0.62	897.88				6	2.49	23.11	13.87	0.385	0.231
18	3.50	110.00	N	598.60	597.22	1.25%	14.00							606.95				6	1.69	15.69	9.41	0.261	0.157
19	0.00	300.00	N	599.18	598.68	0.17%	20.00	81.65	N	598.68	597.18	1.84%	0.62	1190.17				6	3.31	23.93	14.36	0.399	0.239
20	14.14	225.46	N	602.59	600.19	1.06%	20.00							1000.00				6	2.78	22.78	13.67	0.380	0.228
21	4.46	263.36	N	599.63	596.69	1.11%	20.00							347.24				6	0.96	20.96	12.58	0.349	0.210
22	0.00	225.46	N	602.99	600.88	0.94%	20.00							1438.55				6	4.00	24.00	14.40	0.400	0.240
23	5.42	190.00	N	596.68	594.51	1.14%	19.00							197.12				6	0.55	19.55	11.73	0.326	0.195
24	14.22	300.00	N	593.71	591.50	0.74%	20.00							467.99				6	1.30	21.30	12.78	0.355	0.213
25	0.00	225.46	N	602.99	600.88	0.94%	20.00							2443.53				6	6.79	26.79	16.07	0.446	0.268
26	4.53	125.1	N	599.8	593.7	4.92%	12.00											6		12.00	7.20	0.200	0.120

Project Name: Cordova Trails
HYDROLOGY CALCULATIONS:

PT. #	AREA (Ac.)	AREA OF ACCUMULATION (Ac.)	TOTAL ACRES	C	Tc	I2	I10	I25	I50	I100	Q2	Q10	Q25	Q50	Q100
1	11.40	= A1	11.40	0.65	29.21	2.94	4.56	5.42	6.25	7.20	21.78	33.82	40.16	46.32	53.38
2	19.60	= A2	19.60	0.65	28.39	2.99	4.64	5.51	6.36	7.32	38.11	59.15	70.22	80.99	93.31
3	9.88	= A3	9.88	0.65	28.31	3.00	4.65	5.52	6.37	7.34	19.24	29.87	35.46	40.90	47.11
4	0.00	= A1:A3	40.88	0.65	29.21	2.94	4.56	5.42	6.25	7.20	40.27	69.87	83.55	96.07	109.87
5A	1.57	= A5A	1.57	0.65	20.52	3.61	5.58	6.61	7.61	8.75	3.68	5.70	6.75	7.77	8.93
5B	3.17	= A5A+A5B	4.74	0.65	24.54	3.26	5.05	5.99	6.91	7.95	10.05	15.57	18.47	21.28	24.50
5C	0.86	= A1:A4+A5A+A5B+A5C	5.60	0.62	25.03	3.22	5.00	5.93	6.83	7.87	51.37	87.08	103.97	119.60	136.96
6	10.03	= A6	10.03	0.65	21.54	3.51	5.44	6.44	7.42	8.53	22.89	35.45	42.00	48.36	55.62
7	0.00	= A1:A4 + A5:A6	15.63	0.65	25.03	3.22	5.00	5.93	6.83	7.87	73.02	120.65	143.78	165.48	189.78
8	3.80	= A8	3.80	0.65	14.32	4.34	6.69	7.91	9.08	10.41	10.71	16.53	19.53	22.43	25.72
8A	0.72	= A8A	0.72	0.65	12.44	4.63	7.14	8.42	9.66	11.07	2.17	3.34	3.94	4.52	5.18
9	0.00	= A1:A4 + A5:A6 + A8	19.43	0.65	27.93	3.02	4.69	5.57	6.42	7.39	78.42	129.08	153.83	177.13	203.24
10	5.20	= A10	5.20	0.65	18.38	3.83	5.92	7.00	8.05	9.25	12.93	20.00	23.67	27.22	31.28
11	1.39	= A11	1.39	0.65	20.00	3.66	5.66	6.70	7.71	8.87	3.30	5.11	6.06	6.97	8.01
12	0.00	= A1:A4 + A5:A6 + A8:A8A + A10:A11	26.74	0.65	28.15	3.01	4.67	5.54	6.39	7.36	92.53	150.98	179.83	207.11	237.80
13	11.17	'= A13	11.17	0.65	21.29	3.53	5.47	6.48	7.46	8.58	25.66	39.73	47.07	54.19	62.33
14	9.73	= A14	9.73	0.65	21.74	3.49	5.41	6.41	7.38	8.49	22.09	34.21	40.54	46.68	53.69
15	0.00	= A13:A14	20.90	0.65	22.31	3.44	5.33	6.32	7.28	8.37	46.77	72.45	85.85	98.88	113.75
16	9.29	= A16	9.29	0.65	18.86	3.77	5.84	6.91	7.95	9.14	22.79	35.26	41.73	48.01	55.17
17	0.00	= A13:A14 + A16	30.19	0.65	23.11	3.37	5.23	6.20	7.14	8.22	66.22	102.61	121.63	140.12	161.23
18	3.50	= A18	3.50	0.65	15.69	4.15	6.41	7.57	8.70	9.99	9.44	14.58	17.23	19.80	22.73
19	0.00	= A13:A14 + A16 + A18	33.69	0.65	23.93	3.31	5.13	6.08	7.01	8.06	72.46	112.30	133.15	153.42	176.57
20	14.14	= A20	14.14	0.65	22.78	3.40	5.27	6.25	7.20	8.28	31.28	48.46	57.43	66.15	76.11
21	4.46	= A21	4.46	0.65	20.96	3.56	5.52	6.54	7.53	8.65	10.33	16.00	18.95	21.82	25.09
22	0.00	= A20:A22	18.60	0.65	24.00	3.30	5.12	6.07	6.99	8.05	39.94	61.90	73.39	84.57	97.33
23	5.42	= A23	5.42	0.65	19.55	3.70	5.73	6.78	7.81	8.97	13.04	20.19	23.90	27.50	31.61
24	14.22	= A24	14.22	0.65	21.30	3.53	5.47	6.48	7.46	8.58	32.66	50.57	59.90	68.97	79.32
25	0.00	= A13:A14 + A16 + A18+A20:A22+A23:A24	71.93	0.65	26.79	3.10	4.80	5.70	6.57	7.57	144.80	224.65	266.59	307.37	353.99
26	4.53	= A26	4.53	0.65	12.00	4.70	7.25	8.55	9.81	11.24	13.84	21.35	25.18	28.88	33.09

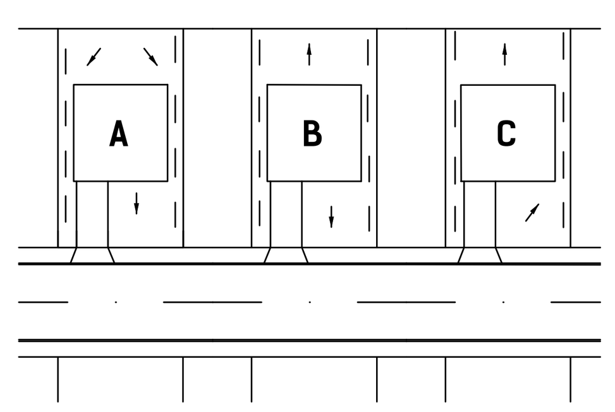
*REFERENCE STORMWATER REPORT FOR DETENTION POND INFLOW AND OUTFLOW RATES (& SCS HYDROLOGY)

NOTE:

- THE WATER SURFACE ELEVATION AT THE INLET LOCATION OF DRAINS "C" AND "CA" OVERTOPS THE CROWN OF THE ROAD PER THE STREET CAPACITY ANALYSIS IN THE STORMWATER MANAGEMENT PLAN. AS SUCH, THE COMBINED FLOWS FROM POINT 6 ARE EVENLY DISTRIBUTED BETWEEN TWO 25' INLETS (SEE DRAINS "C" & "CA" ON SHEET 21 OF 29)
- THE WATER SURFACE ELEVATION AT THE INLET LOCATION OF DRAIN "D" OVERTOPS THE CROWN OF THE ROAD PER THE STREET CAPACITY ANALYSIS IN THE STORMWATER MANAGEMENT PLAN. AS SUCH, THE COMBINED FLOWS FROM POINT 10 ARE EVENLY DISTRIBUTED BETWEEN TWO 15' INLETS (SEE DRAIN "D" ON SHEET 22 OF 29)

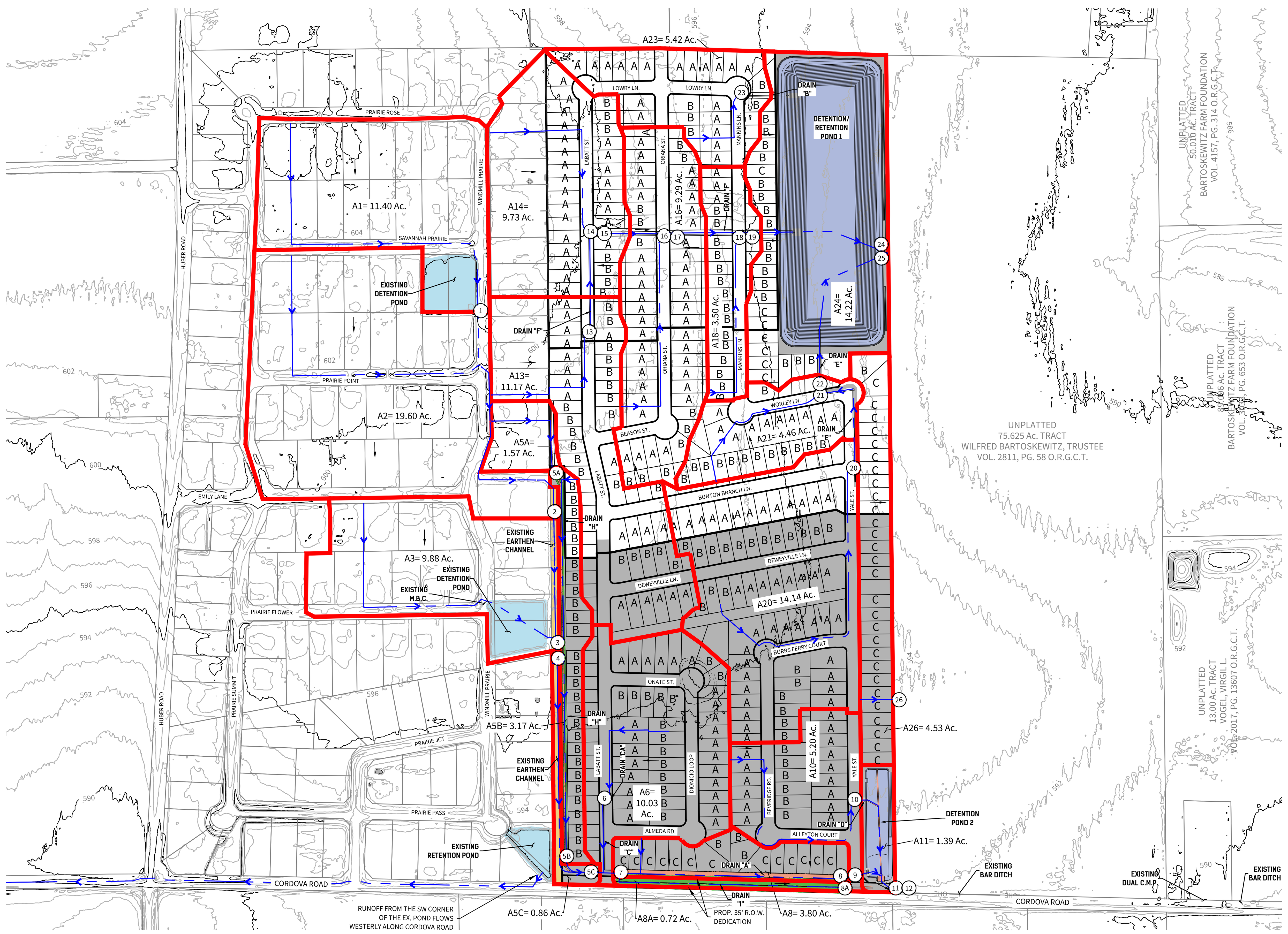
LEGEND

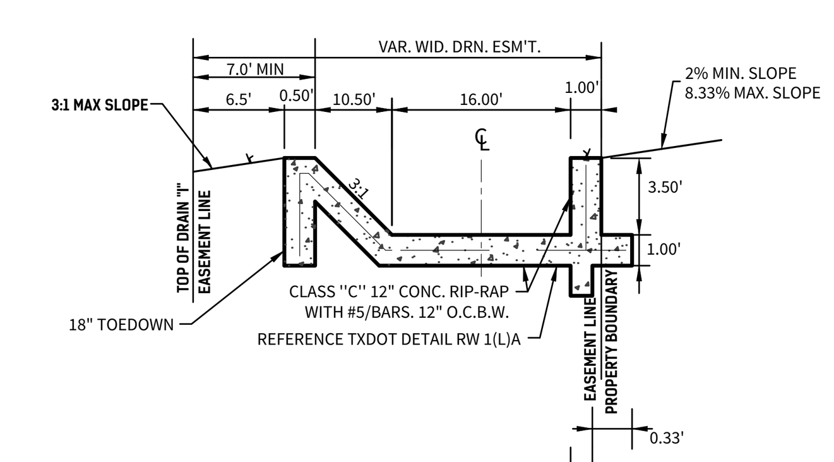
- UNIT BOUNDARY
- DRAINAGE AREA
- Tc FLOW PATH
- ACCUMULATION POINT
- EXISTING EARTHEN DRAIN
- PROPOSED EARTHEN DRAIN
- EXISTING CONCRETE DRAIN
- PROPOSED CONCRETE DRAIN
- EXISTING DETENTION POND
- PROPOSED DETENTION POND



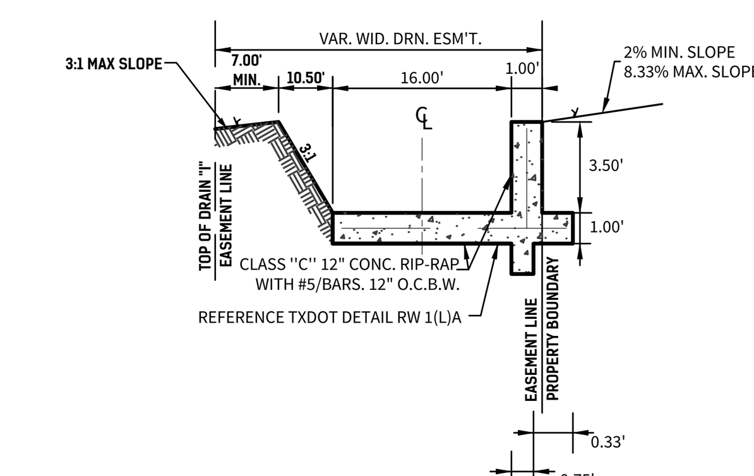
TYPICAL LOT SITE PLAN

N.T.S.

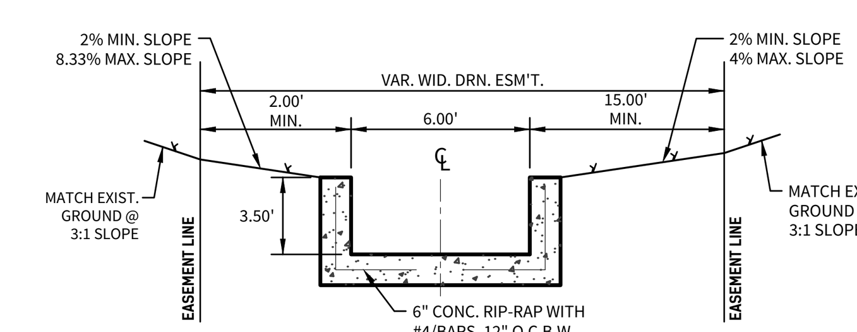




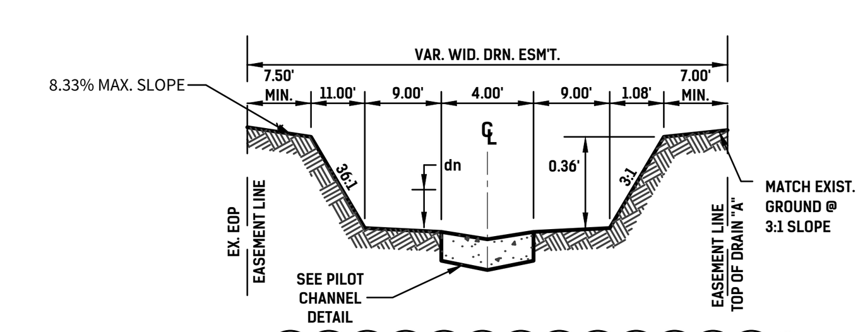
(N.T.S.) DRAIN "A" SECTION "A-1" & "A-3"



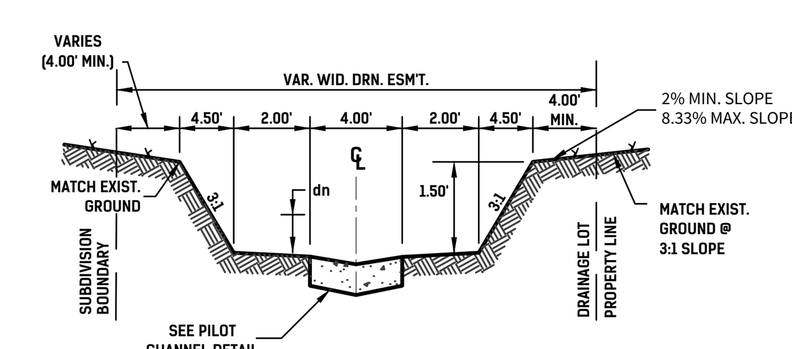
DRAIN "A" SECTION "A-2" (N.T.S.)



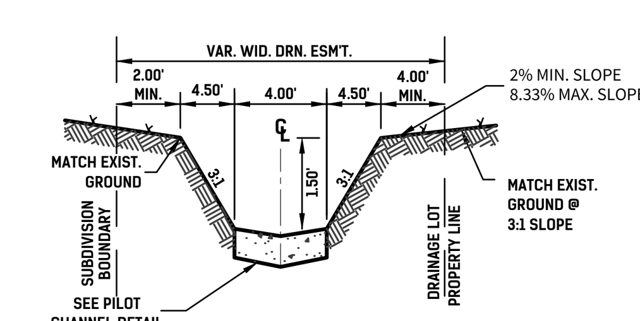
DRAIN "D" SECTION "D-1" (N.T.S.)



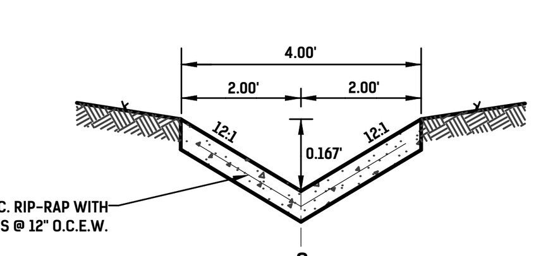
BAR DRAIN "I" SECTION "I-1" (N.T.S.)



DRAIN "H" SECTION "H-1" (N.T.S.)



DRAIN "H" SECTION "H-2" (N.T.S.)



PILOT CHANNEL DETAIL

(N.T.S.)

APPROVED FOR CONSTRUCTION SEGUIN TEXAS

01/14/2022

RATIONAL METHOD HYDROLOGY - FOR SIZING OF ONSITE DRAINAGE CURB INLETS, STORM SEWERS, AND CHANNELS ONLY

CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORDOVA TRAILS SUBDIVISION UNIT 1

DRAINAGE AREA PLAN

DATE 09/23/2021

PROJECT NO. 03480.002

DRAWN BY AC

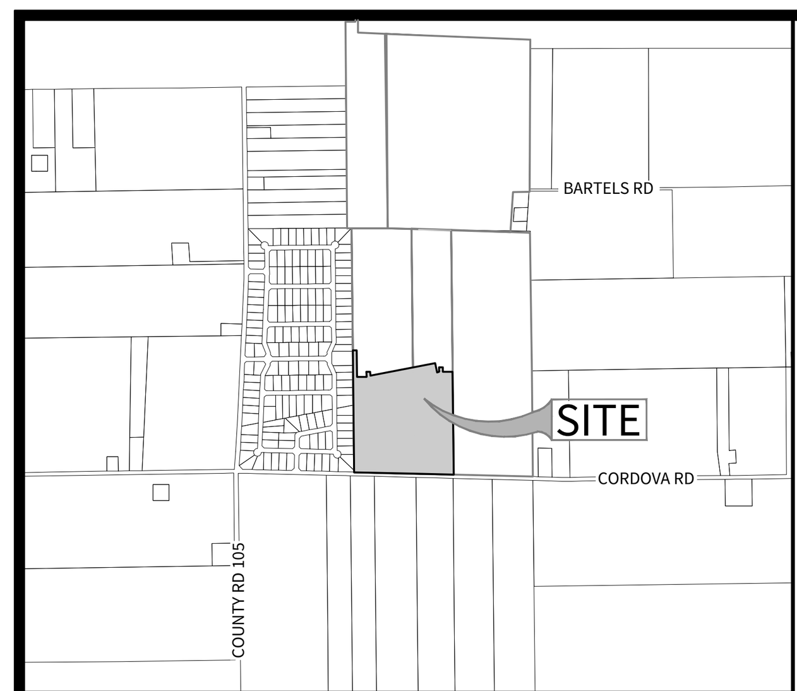
CHECKED BY DDC/JC

REVISIONS
1. 09/23/2021 - REVISED DRAIN CROSS SECTIONS
2.
3.
4.
5.
6.
7.
8.
9.

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C1

FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14



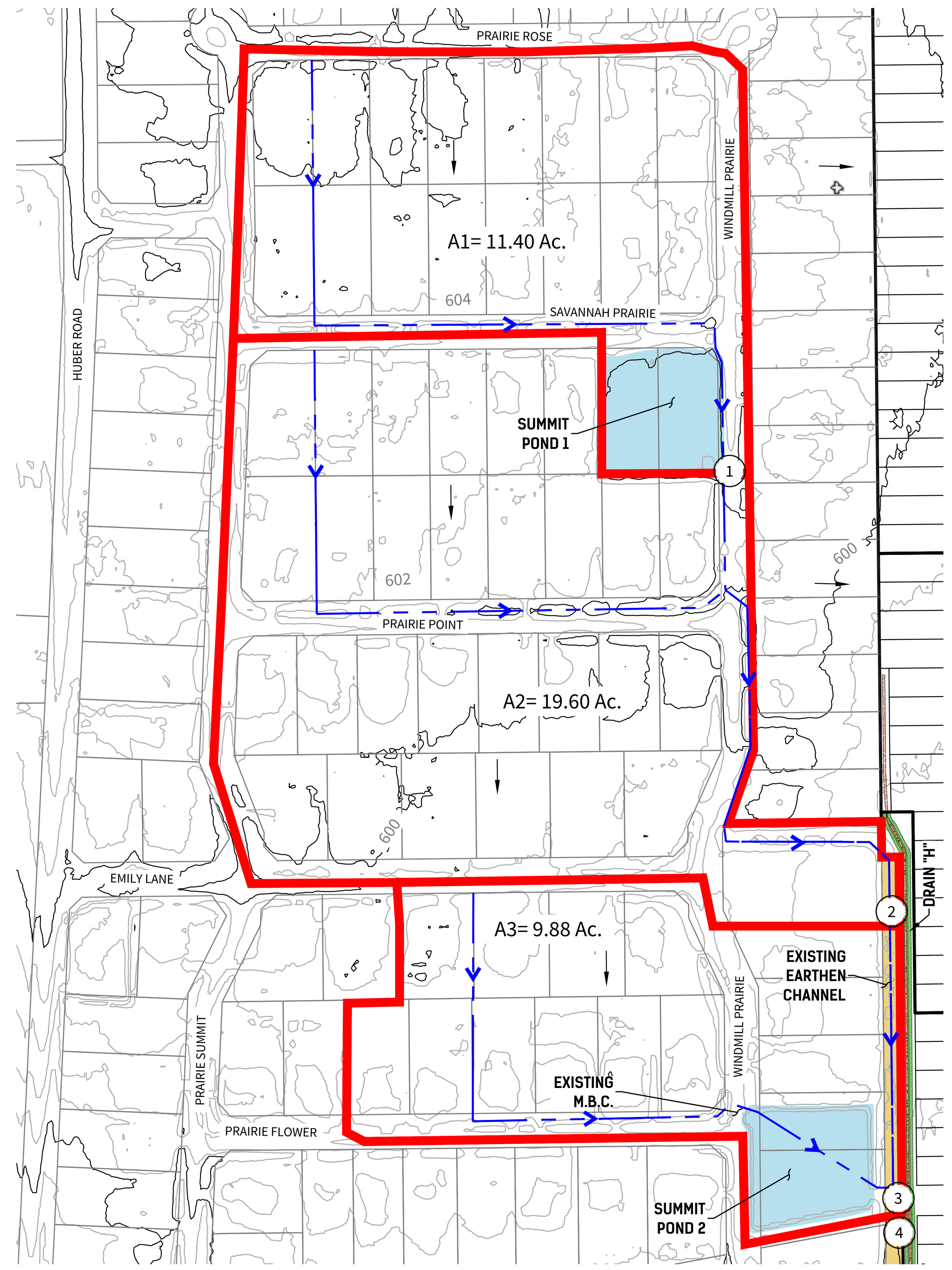
LOCATION MAP
N.T.S.

OWNER/DEVELOPER:
ASHTON WOODS HOMES
CONTACT PERSON: KYLE LENTS
17319 SAN PEDRO, SUITE 140
SAN ANTONIO,TX 78232
TEL: (210) 632-0753

CIVIL ENGINEER:
M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: DAVID CUPIT, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

SCALE: 1" = 200'

LEGEND
- UNIT BOUNDARY
- DRAINAGE AREA
- Tc FLOW PATH
- ACCUMULATION POINT
- EXISTING EARTHEN DRAIN
- PROPOSED EARTHEN DRAIN
- EXISTING CONCRETE DRAIN
- PROPOSED CONCRETE DRAIN
- EXISTING DETENTION POND
- PROPOSED DETENTION POND



Project Name: The Summit Subdivision
Calculation Summary for Time of Concentrations

		Sheet Flow Tc Compuations						Shallow Conc. Tc Compuations						Concentrated Tc Computations						Overall			
Drainage Shed	Shed Area (Ac.)	Length	Paved (Y or N)	Upstream Elev.	Downstream Elev	Slope	Time of Concentration	Length	Paved (Y or N)	Upstream Elev.	Downstream Elev	Slope	Time of Concentration	Length	Upstream Elev.	Downstream Elev	Slope	Velocity (fps)	Time of Concentration	Time of Concentration (min	Lag Time (0.6 x Tc) (min)	Time of Concentration (hrs)	Lag Time (0.6 x Tc) (hrs)
1	**11.40**	300.00	N	605.18	603.34	0.61%	20.00	162.27	N	603.34	602.34	0.62%	2.18	2532.00				6	7.03	**29.21**	17.53	0.487	0.292
2	**19.60**	300.00	N	602.50	601.39	0.37%	20.00	158.56	N	601.39	600.81	0.37%	2.58	2091.00				6	5.81	**28.39**	17.03	0.473	0.284
3	**9.88**	300.00	N	599.11	598.10	0.34%	20.00	97.22	N	598.10	597.78	0.33%	1.6	2414.00				6	6.71	**28.31**	16.98	0.472	0.283
4	**0.00**	300.00	N	605.18	603.34	0.61%	20.00	162.27	N	603.34	602.34	0.62%	2.18	2532.00				6	7.03	**29.21**	17.53	0.487	0.292

Project Name: The Summit Subdivision
HYDROLOGY CALCULATIONS:

PT. #	AREA (Ac.)	AREA OF ACCUMULATION (Ac.)	TOTAL ACRES	C	Tc	I2	I10	I25	I50	I100	Q2	Q10	Q25	Q50	Q100
1	11.40	= A1	**11.40**	0.65	29.21	2.94	4.56	5.42	6.25	7.20	21.78	33.82	**40.16**	**46.32**	**53.38**
2	19.60	= A2	**19.60**	0.65	28.39	2.99	4.64	5.51	6.36	7.32	38.11	59.15	**70.22**	**80.99**	**93.31**
3	9.88	= A3	**9.88**	0.65	28.31	3.00	4.65	5.52	6.37	7.34	19.24	29.87	**35.46**	**40.90**	**47.11**
4	0.00	= A1:A3	**40.88**	0.65	29.21	2.94	4.56	5.42	6.25	7.20	40.27	69.87	**83.55**	**96.07**	**109.87**

APPROVED FOR CONSTRUCTION
SEGUIN TEXAS
01/14/2022

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4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
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CORDOVA TRAILS SUBDIVISION UNIT 1
THE SUMMIT SUBDIVISION - DRAINAGE AREA PLAN

DATE
09/24/2021
PROJECT NO.
03480.002
DRAWN BY
AC
CHECKED BY
DDC/JC

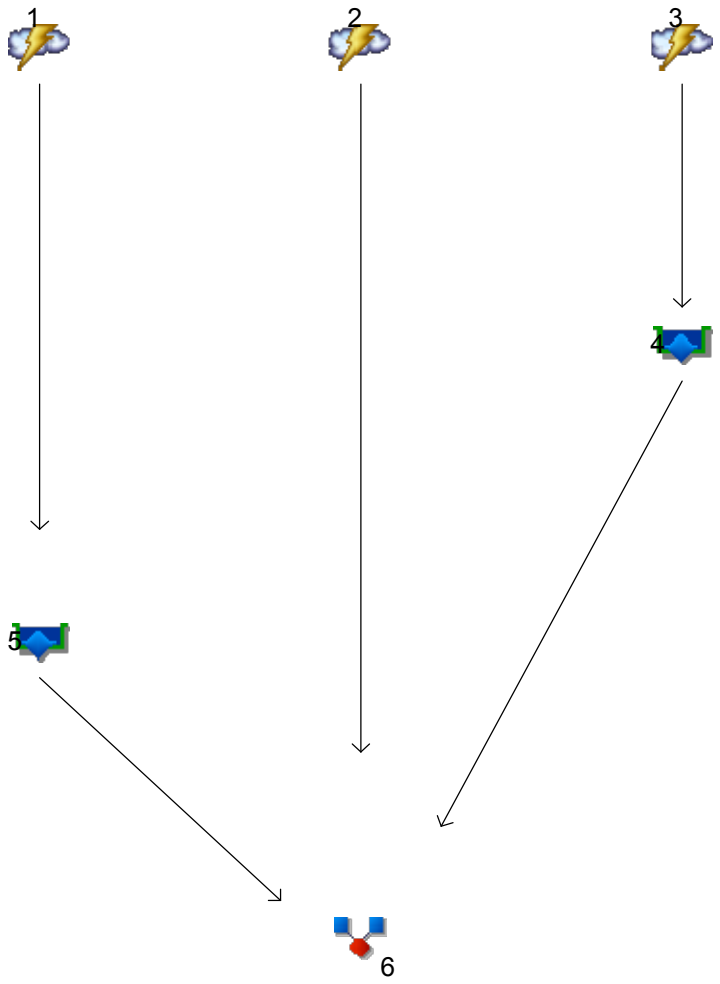
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

EXH

Hydraflow Table of Contents

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	Rational	A-1
2	Rational	A-2
3	Rational	A-3
4	Reservoir	Summit Pond 1
5	Reservoir	Summit Pond 2
6	Combine	A-4

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Rational	------	-------	21.81	-------	-------	33.88	40.21	-------	53.47	A-1
2	Rational	------	-------	38.47	-------	-------	59.73	70.87	-------	94.21	A-2
3	Rational	------	-------	19.71	-------	-------	30.61	36.32	-------	48.27	A-3
4	Reservoir	3	-------	8.491	-------	-------	12.81	14.25	-------	16.95	Summit Pond 1
5	Reservoir	1	-------	2.056	-------	-------	4.019	5.535	-------	9.423	Summit Pond 2
6	Combine	2, 4, 5	-------	40.27	-------	-------	69.87	83.55	-------	109.87	A-4

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

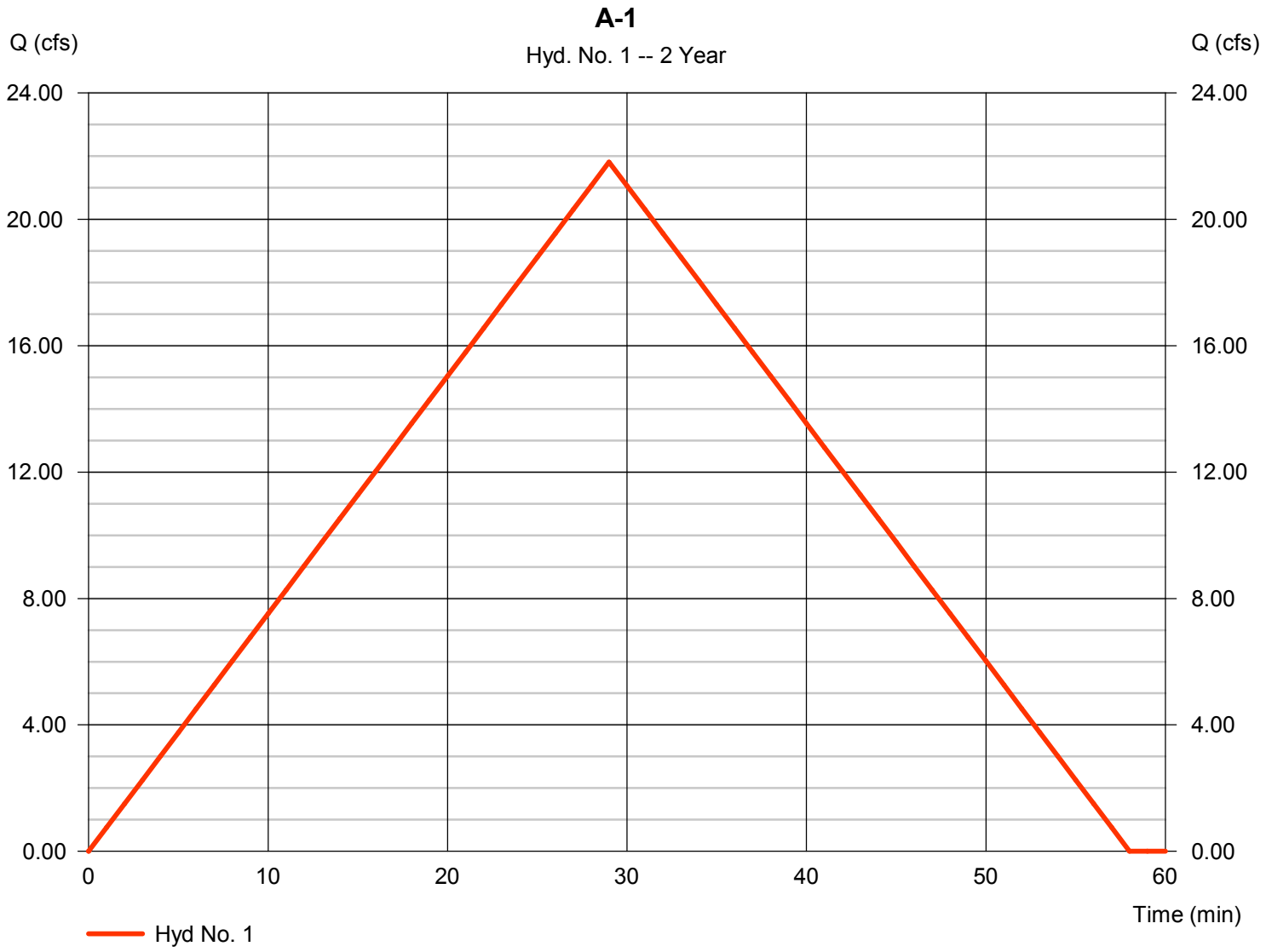
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	21.81	1	29	37,956	------	------	------	A-1
2	Rational	38.47	1	28	64,624	------	------	------	A-2
3	Rational	19.71	1	28	33,114	------	------	------	A-3
4	Reservoir	8.491	1	44	33,097	3	596.16	23,414	Summit Pond 1
5	Reservoir	2.056	1	55	36,707	1	599.74	34,737	Summit Pond 2
6	Combine	40.27	1	28	134,428	2, 4, 5	------	------	A-4

Hydrograph Report

Hyd. No. 1

A-1

Hydrograph type	=	Rational	Peak discharge	=	21.81 cfs
Storm frequency	=	2 yrs	Time to peak	=	29 min
Time interval	=	1 min	Hyd. volume	=	37,956 cuft
Drainage area	=	11.400 ac	Runoff coeff.	=	0.65
Intensity	=	2.944 in/hr	Tc by User	=	29.00 min
IDF Curve	=	Seguin.IDF	Asc/Rec limb fact	=	1/1

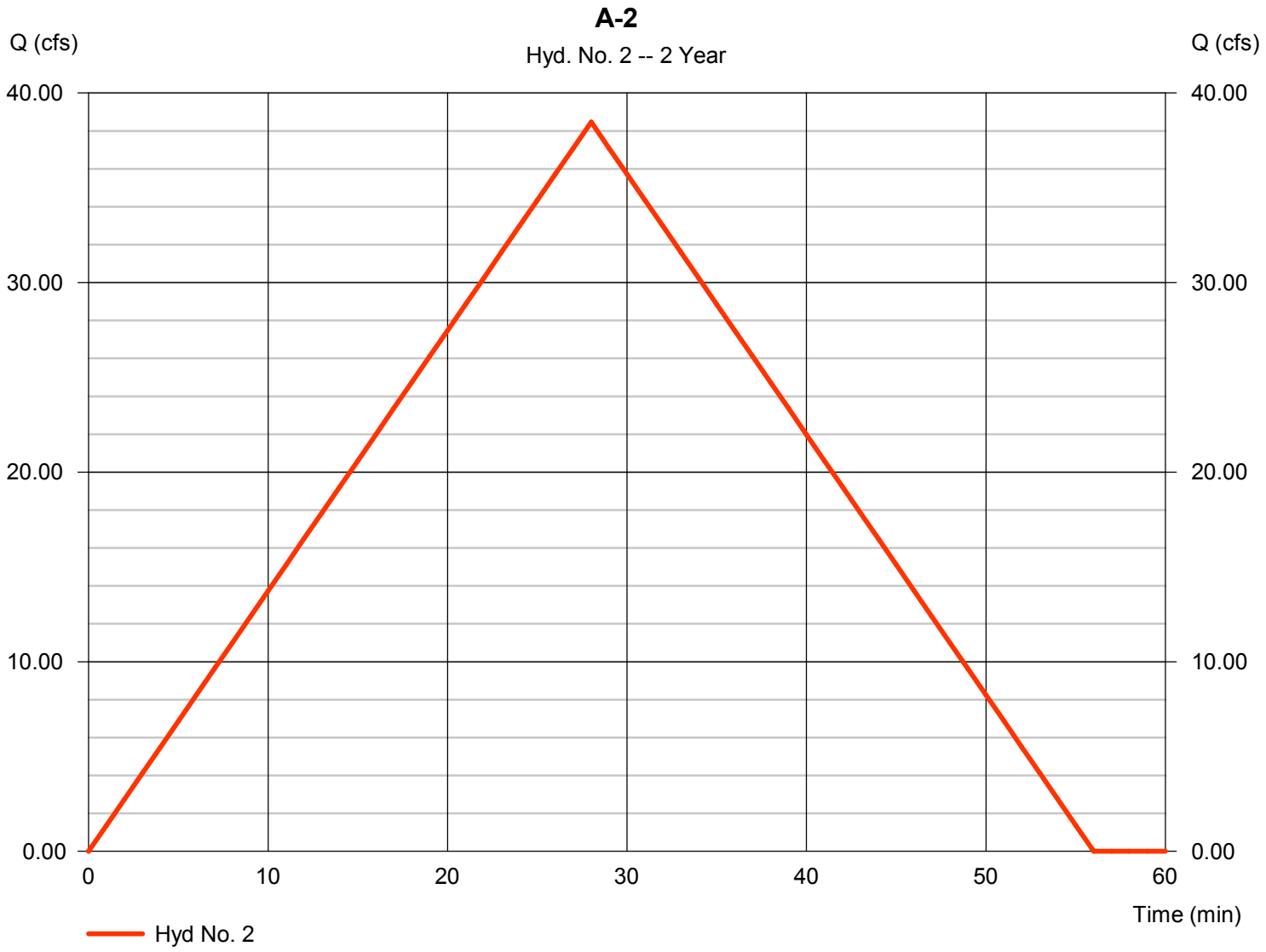


Hydrograph Report

Hyd. No. 2

A-2

Hydrograph type	=	Rational	Peak discharge	=	38.47 cfs
Storm frequency	=	2 yrs	Time to peak	=	28 min
Time interval	=	1 min	Hyd. volume	=	64,624 cuft
Drainage area	=	19.730 ac	Runoff coeff.	=	0.65
Intensity	=	2.999 in/hr	Tc by User	=	28.00 min
IDF Curve	=	Seguin.IDF	Asc/Rec limb fact	=	1/1

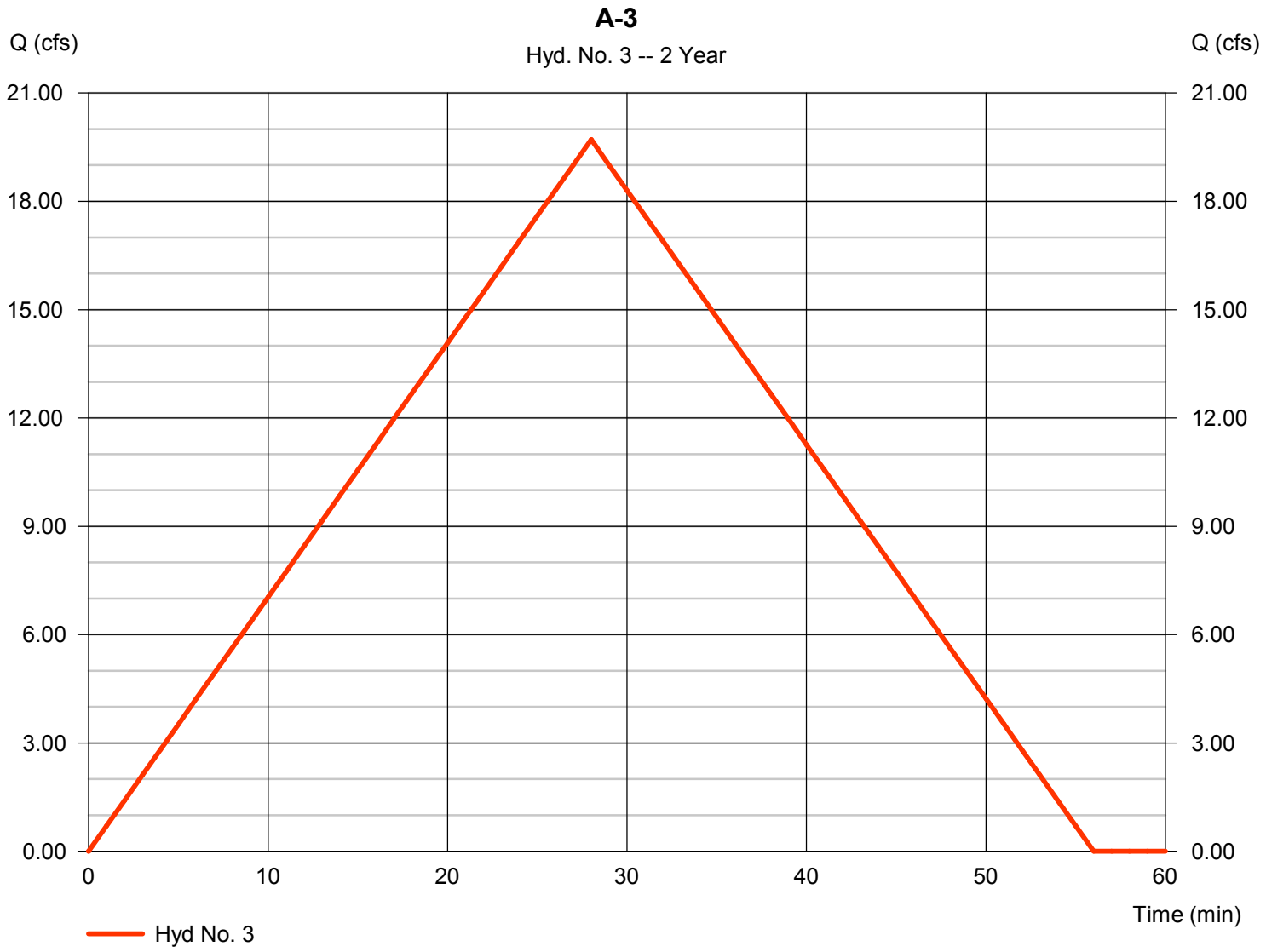


Hydrograph Report

Hyd. No. 3

A-3

Hydrograph type	=	Rational	Peak discharge	=	19.71 cfs
Storm frequency	=	2 yrs	Time to peak	=	28 min
Time interval	=	1 min	Hyd. volume	=	33,114 cuft
Drainage area	=	10.110 ac	Runoff coeff.	=	0.65
Intensity	=	2.999 in/hr	Tc by User	=	28.00 min
IDF Curve	=	Seguin.IDF	Asc/Rec limb fact	=	1/1



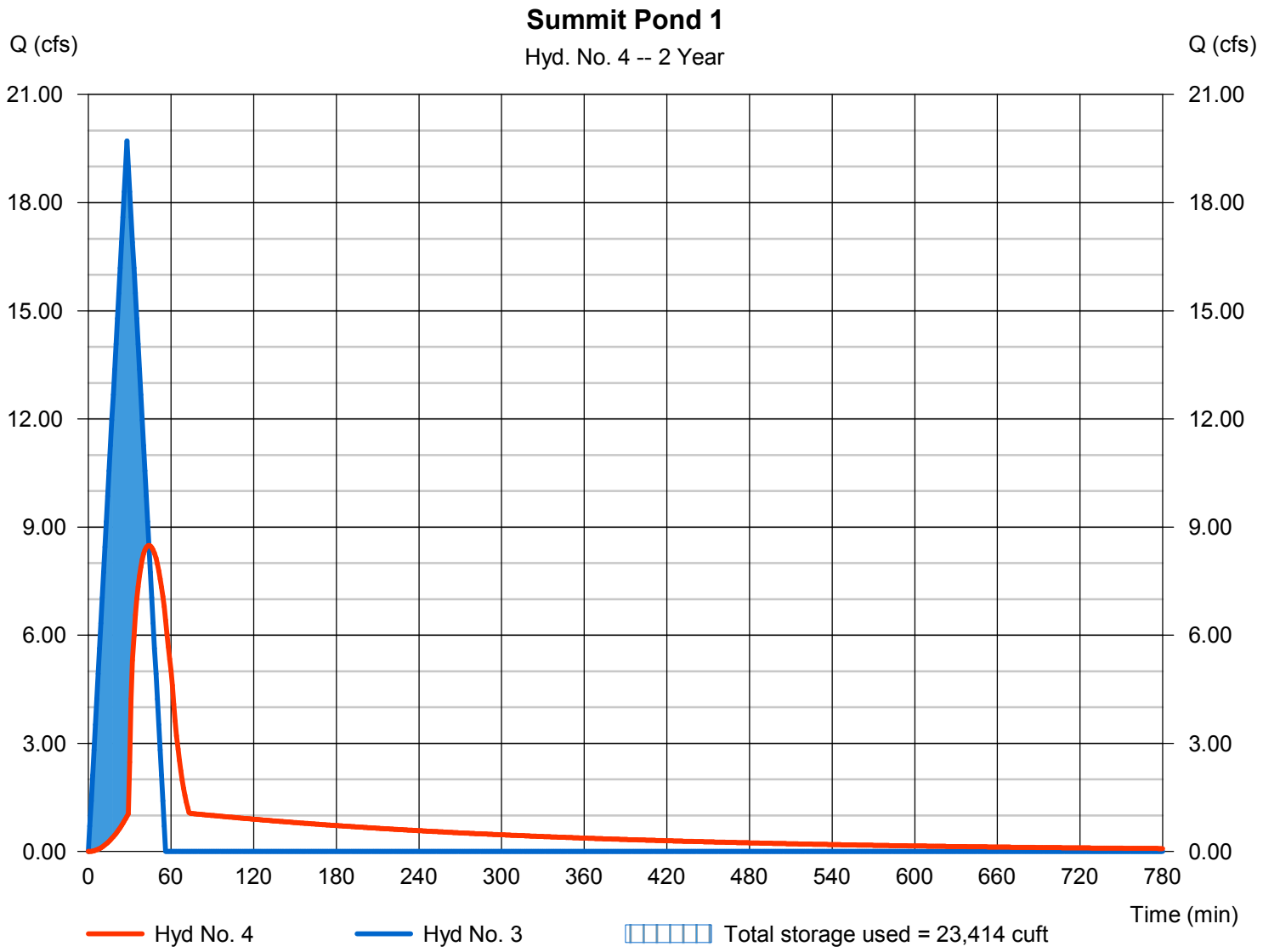
Hydrograph Report

Hyd. No. 4

Summit Pond 1

Hydrograph type	= Reservoir	Peak discharge	= 8.491 cfs
Storm frequency	= 2 yrs	Time to peak	= 44 min
Time interval	= 1 min	Hyd. volume	= 33,097 cuft
Inflow hyd. No.	= 3 - A-3	Max. Elevation	= 596.16 ft
Reservoir name	= Summit Pond 1	Max. Storage	= 23,414 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Summit Pond 1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 595.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	595.50	33,050	0	0
0.50	596.00	36,657	17,417	17,417
1.00	596.50	38,861	18,875	36,292
1.50	597.00	41,136	19,995	56,287
2.00	597.50	44,280	21,347	77,634

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 6.00	0.00	0.00	0.00
Span (in)	= 78.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 595.50	0.00	0.00	0.00
Length (ft)	= 0.50	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

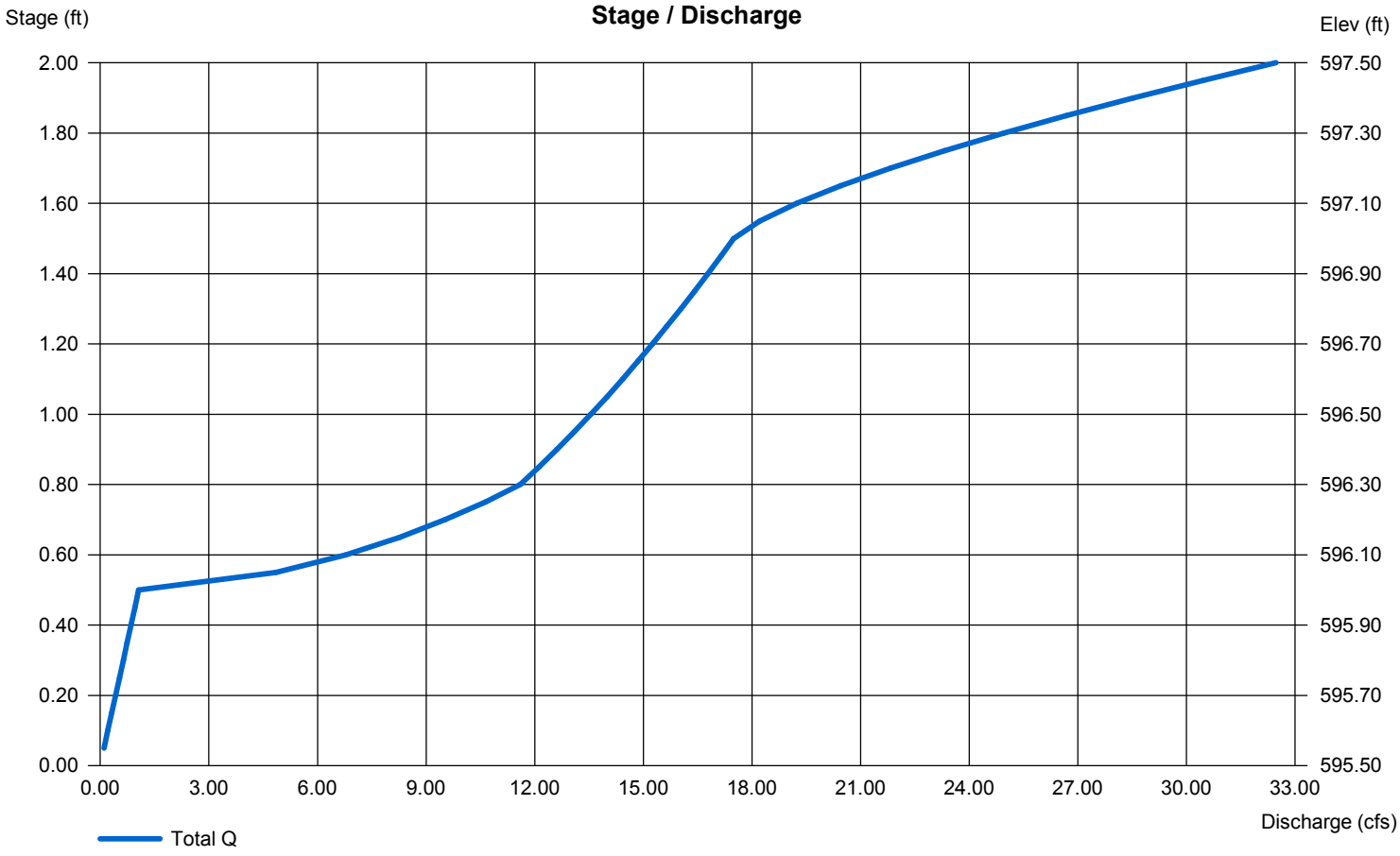
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 597.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



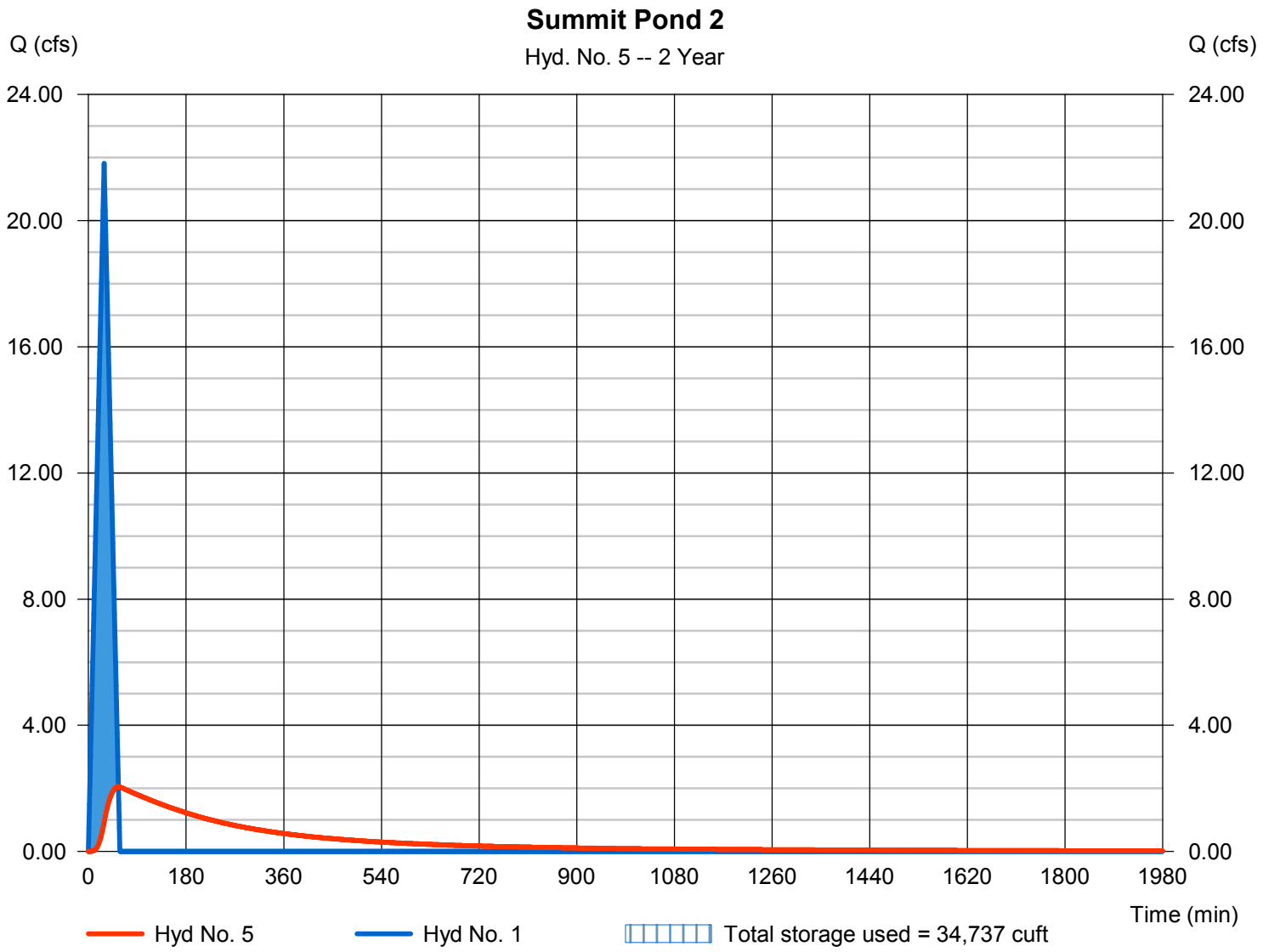
Hydrograph Report

Hyd. No. 5

Summit Pond 2

Hydrograph type	=	Reservoir	Peak discharge	=	2.056 cfs
Storm frequency	=	2 yrs	Time to peak	=	55 min
Time interval	=	1 min	Hyd. volume	=	36,707 cuft
Inflow hyd. No.	=	1 - A-1	Max. Elevation	=	599.74 ft
Reservoir name	=	Summit Pond 2	Max. Storage	=	34,737 cuft

Storage Indication method used.



Pond Report

Pond No. 2 - Summit Pond 2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 599.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	599.00	45,969	0	0
0.50	599.50	47,242	23,300	23,300
1.00	600.00	48,531	23,940	47,240
1.50	600.50	49,837	24,589	71,829
2.00	601.00	51,159	25,246	97,074

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 2	0	0	0
Invert El. (ft)	= 599.00	0.00	0.00	0.00
Length (ft)	= 16.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

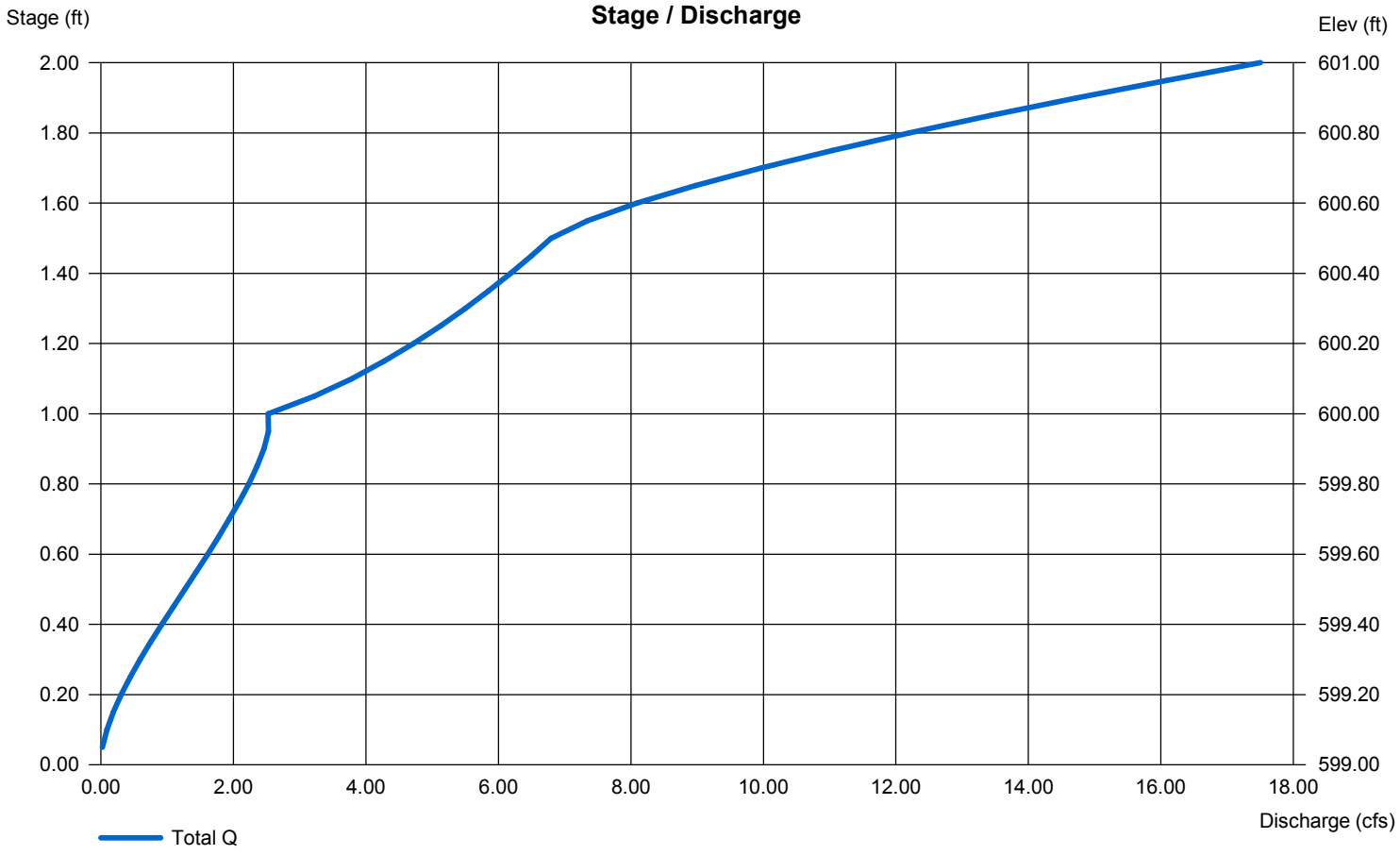
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 7.00	0.00	0.00	0.00
Crest El. (ft)	= 600.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



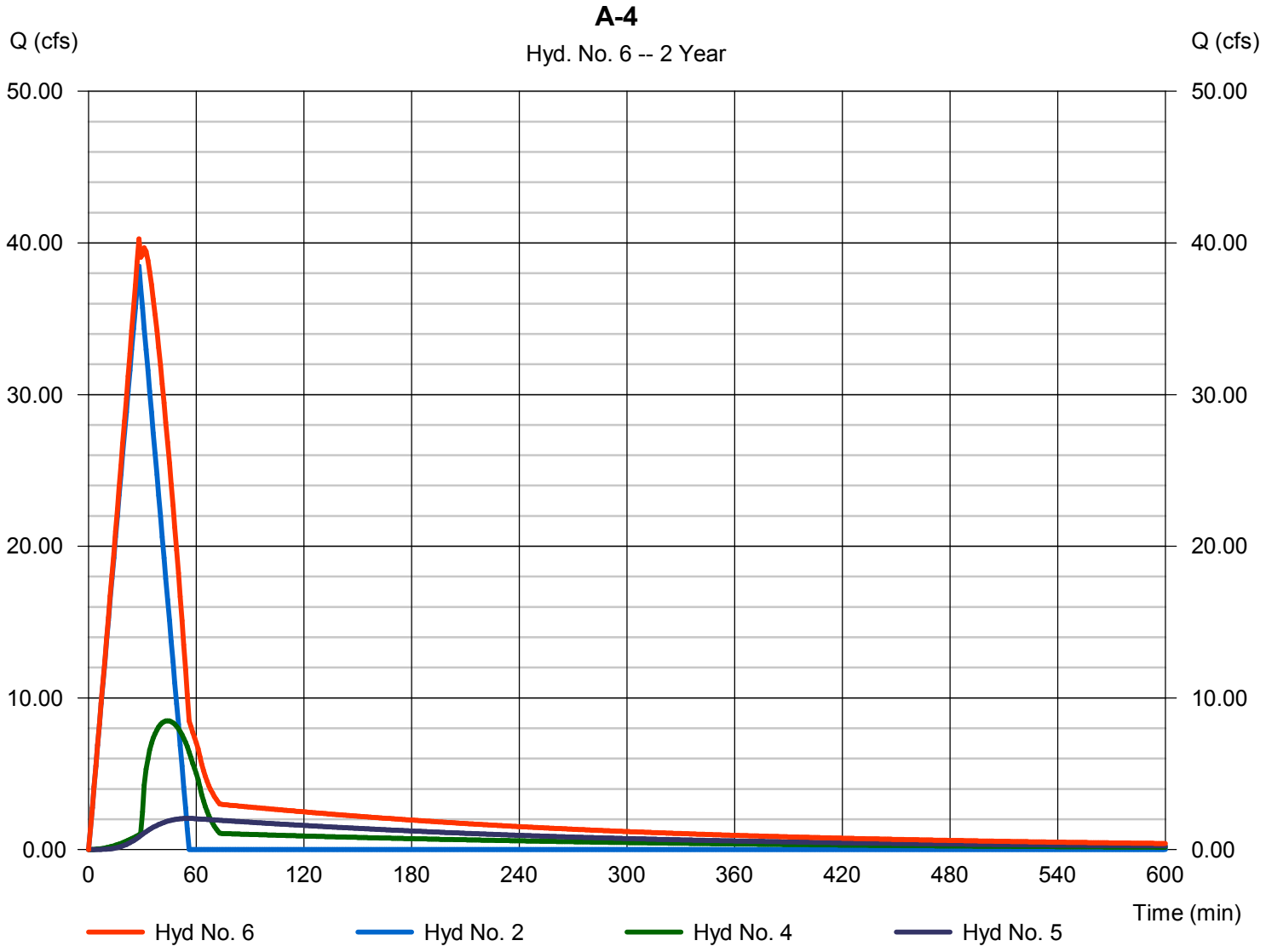
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Thursday, 07 / 29 / 2021

Hyd. No. 6

A-4

Hydrograph type	= Combine	Peak discharge	= 40.27 cfs
Storm frequency	= 2 yrs	Time to peak	= 28 min
Time interval	= 1 min	Hyd. volume	= 134,428 cuft
Inflow hyds.	= 2, 4, 5	Contrib. drain. area	= 19.730 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

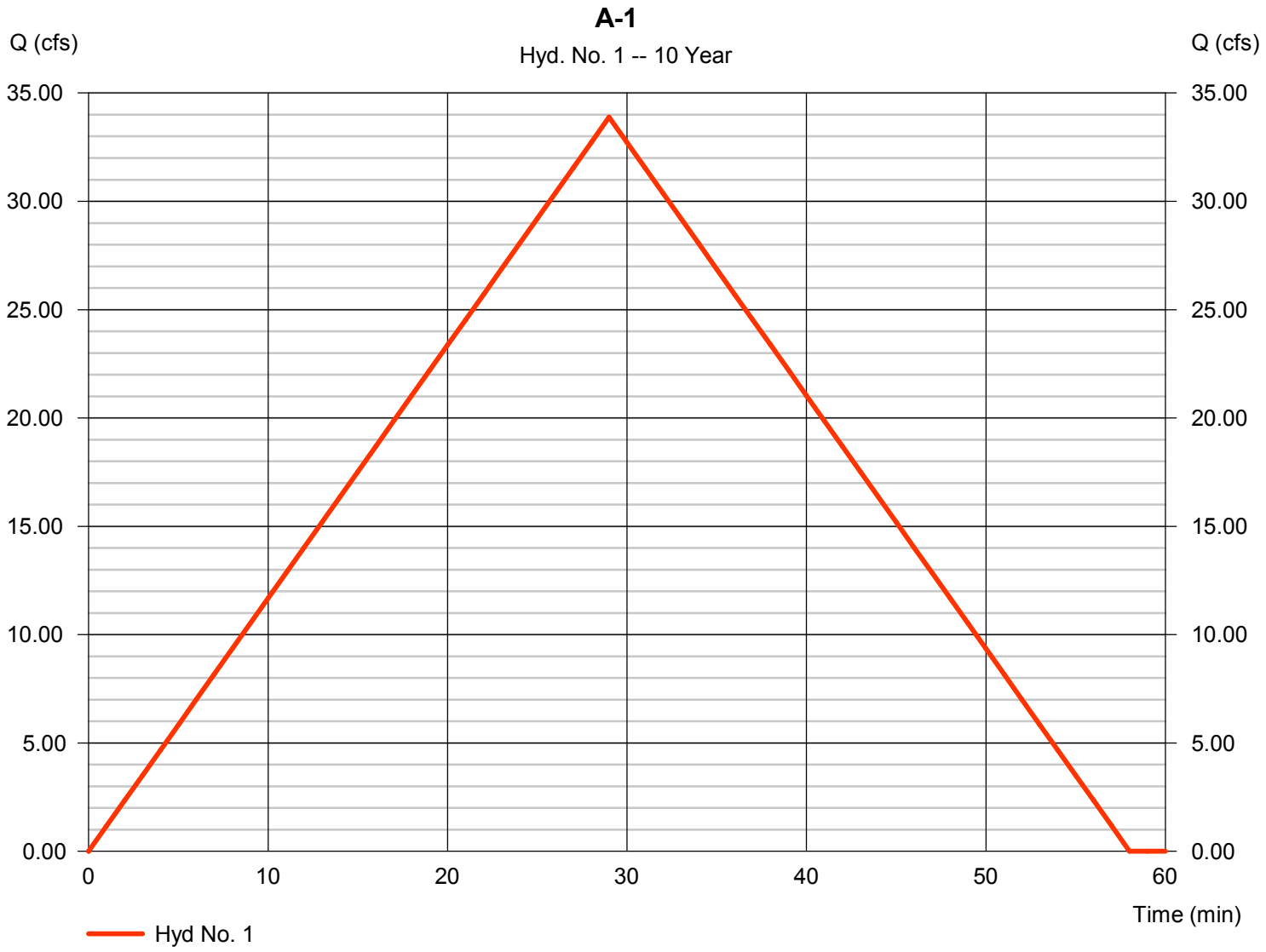
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	33.88	1	29	58,954	------	------	------	A-1
2	Rational	59.73	1	28	100,347	------	------	------	A-2
3	Rational	30.61	1	28	51,420	------	------	------	A-3
4	Reservoir	12.81	1	44	51,403	3	596.42	33,295	Summit Pond 1
5	Reservoir	4.019	1	55	57,615	1	600.12	53,321	Summit Pond 2
6	Combine	69.87	1	28	209,365	2, 4, 5	------	------	A-4

Hydrograph Report

Hyd. No. 1

A-1

Hydrograph type	=	Rational	Peak discharge	=	33.88 cfs
Storm frequency	=	10 yrs	Time to peak	=	29 min
Time interval	=	1 min	Hyd. volume	=	58,954 cuft
Drainage area	=	11.400 ac	Runoff coeff.	=	0.65
Intensity	=	4.572 in/hr	Tc by User	=	29.00 min
IDF Curve	=	Seguin.IDF	Asc/Rec limb fact	=	1/1

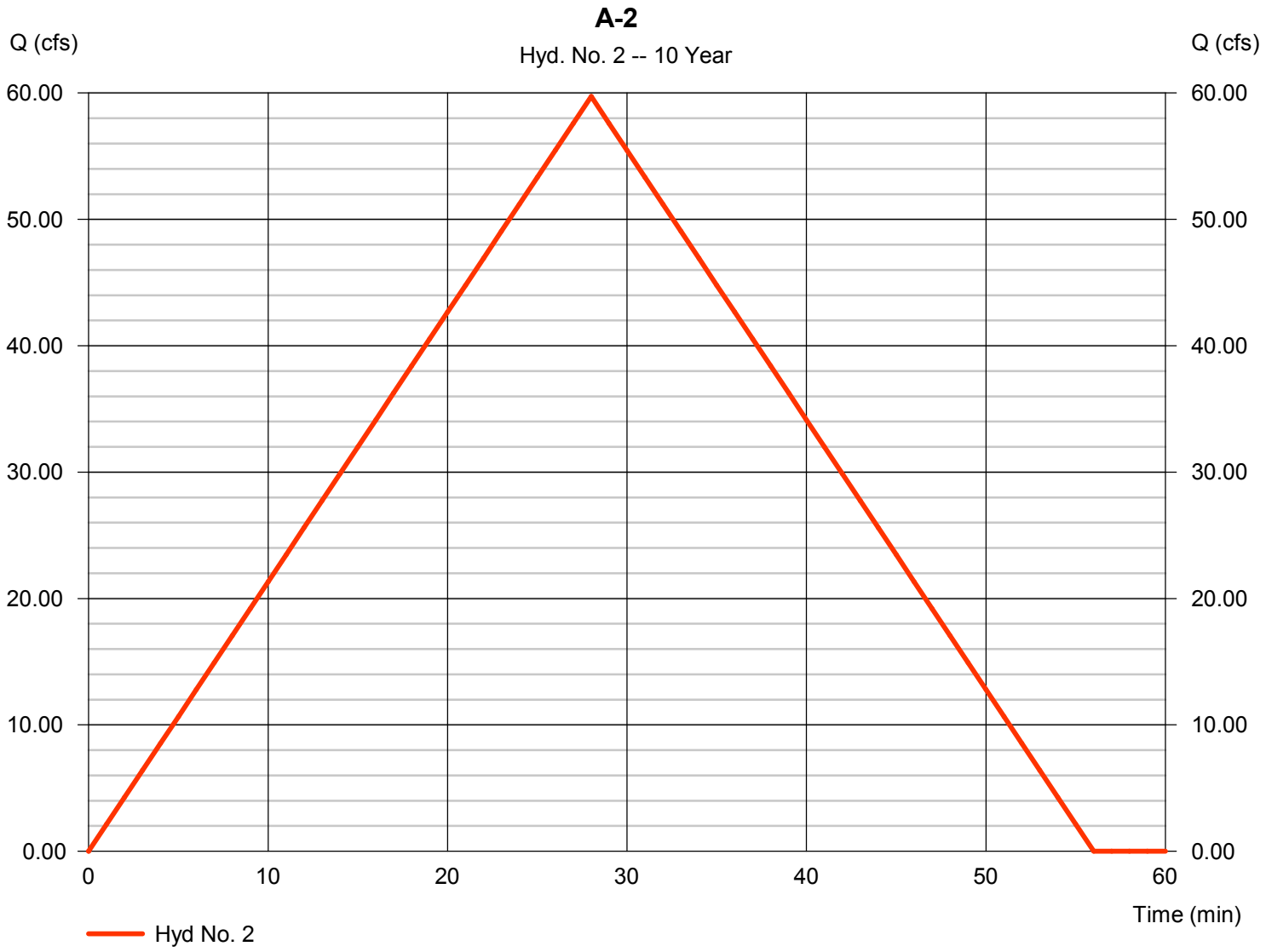


Hydrograph Report

Hyd. No. 2

A-2

Hydrograph type	= Rational	Peak discharge	= 59.73 cfs
Storm frequency	= 10 yrs	Time to peak	= 28 min
Time interval	= 1 min	Hyd. volume	= 100,347 cuft
Drainage area	= 19.730 ac	Runoff coeff.	= 0.65
Intensity	= 4.658 in/hr	Tc by User	= 28.00 min
IDF Curve	= Seguin.IDF	Asc/Rec limb fact	= 1/1

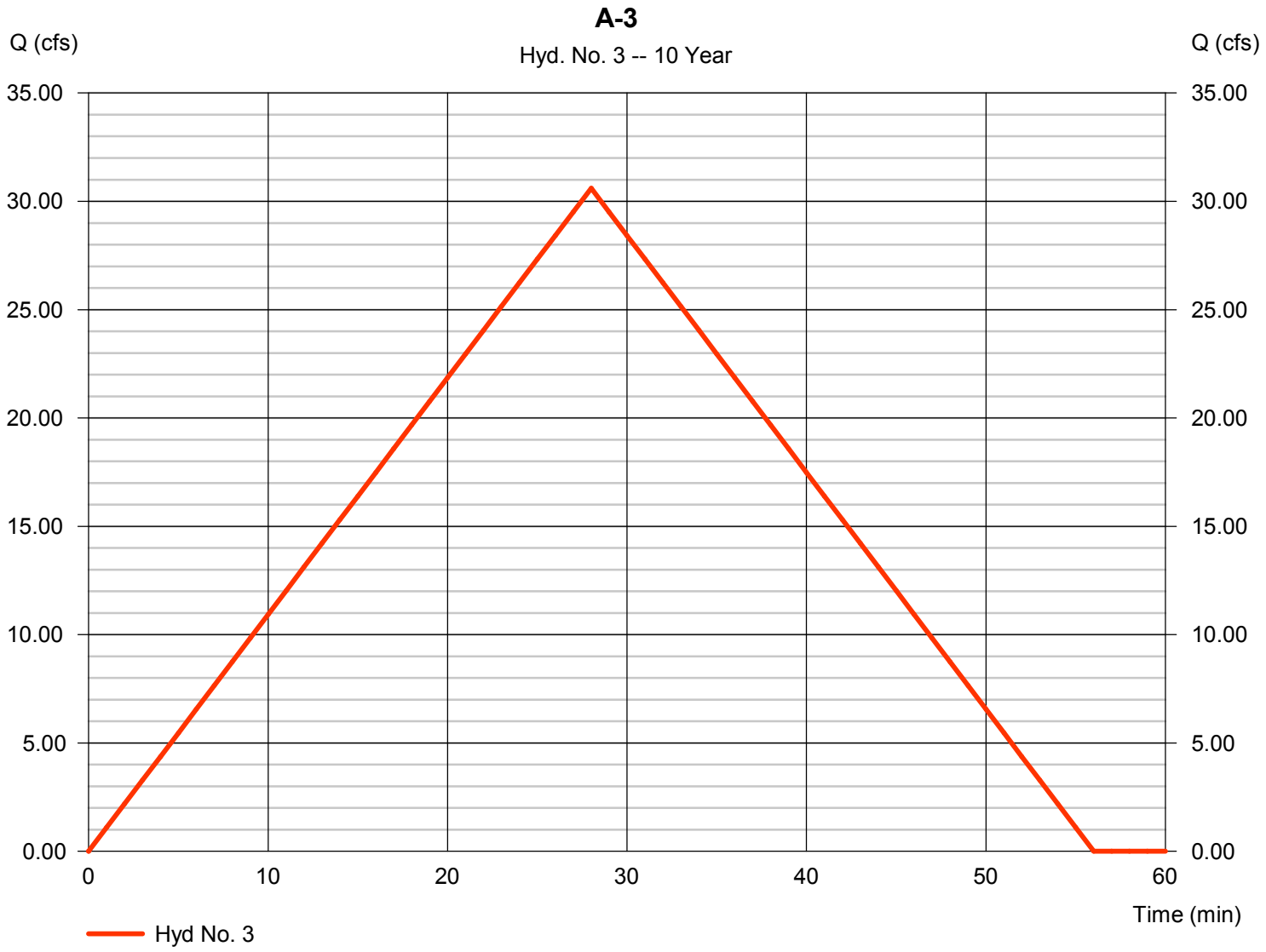


Hydrograph Report

Hyd. No. 3

A-3

Hydrograph type	= Rational	Peak discharge	= 30.61 cfs
Storm frequency	= 10 yrs	Time to peak	= 28 min
Time interval	= 1 min	Hyd. volume	= 51,420 cuft
Drainage area	= 10.110 ac	Runoff coeff.	= 0.65
Intensity	= 4.658 in/hr	Tc by User	= 28.00 min
IDF Curve	= Seguin.IDF	Asc/Rec limb fact	= 1/1



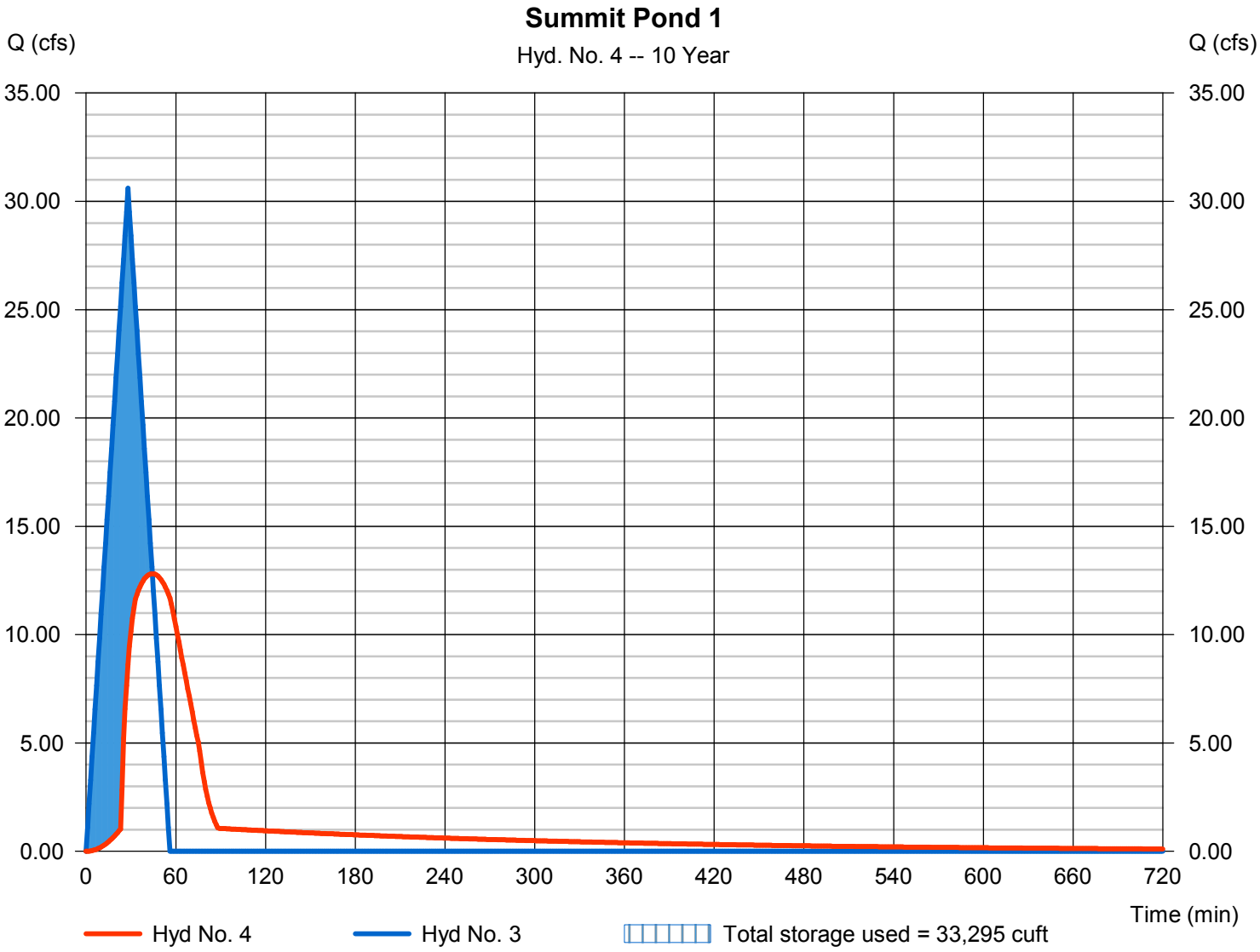
Hydrograph Report

Hyd. No. 4

Summit Pond 1

Hydrograph type	= Reservoir	Peak discharge	= 12.81 cfs
Storm frequency	= 10 yrs	Time to peak	= 44 min
Time interval	= 1 min	Hyd. volume	= 51,403 cuft
Inflow hyd. No.	= 3 - A-3	Max. Elevation	= 596.42 ft
Reservoir name	= Summit Pond 1	Max. Storage	= 33,295 cuft

Storage Indication method used.



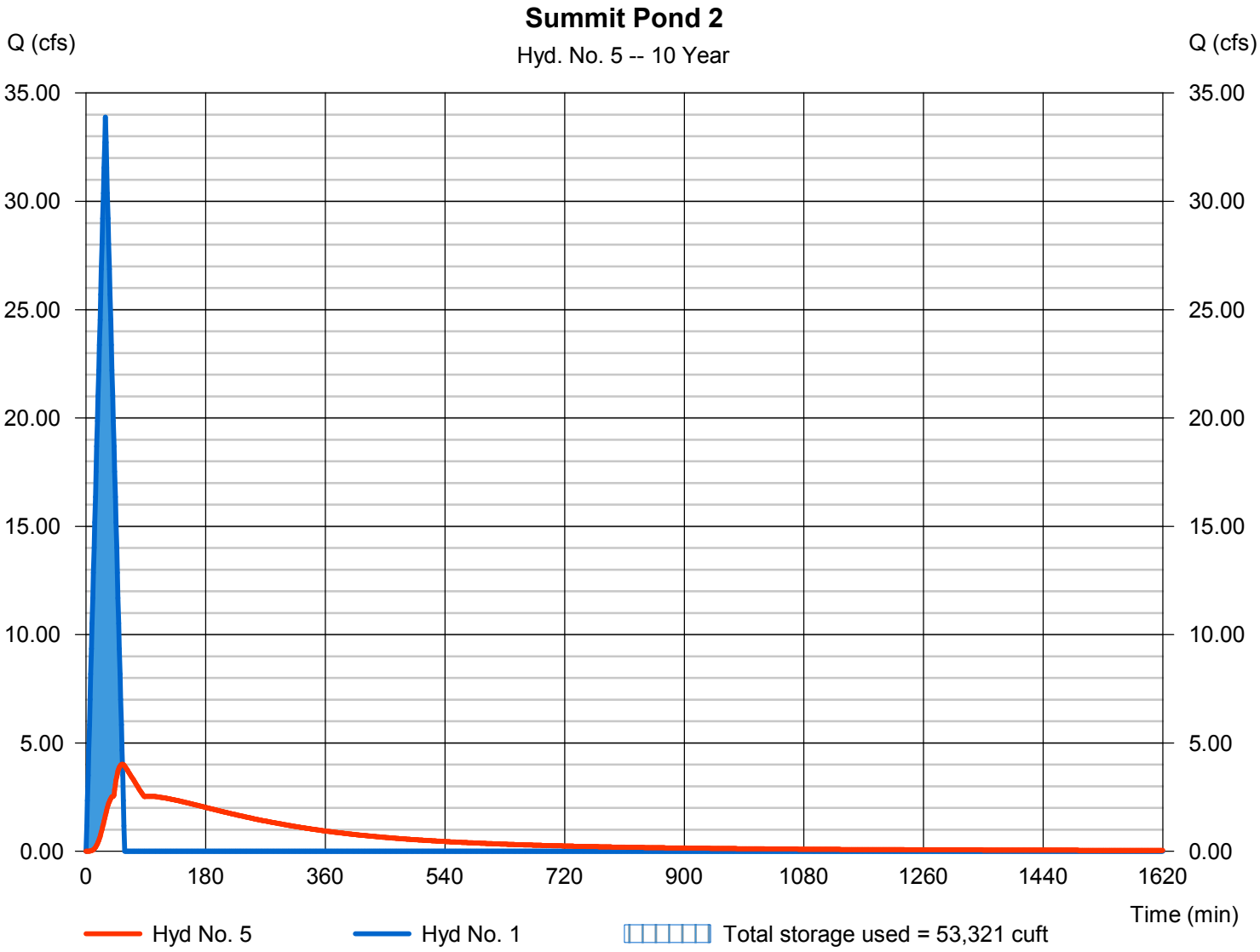
Hydrograph Report

Hyd. No. 5

Summit Pond 2

Hydrograph type	= Reservoir	Peak discharge	= 4.019 cfs
Storm frequency	= 10 yrs	Time to peak	= 55 min
Time interval	= 1 min	Hyd. volume	= 57,615 cuft
Inflow hyd. No.	= 1 - A-1	Max. Elevation	= 600.12 ft
Reservoir name	= Summit Pond 2	Max. Storage	= 53,321 cuft

Storage Indication method used.

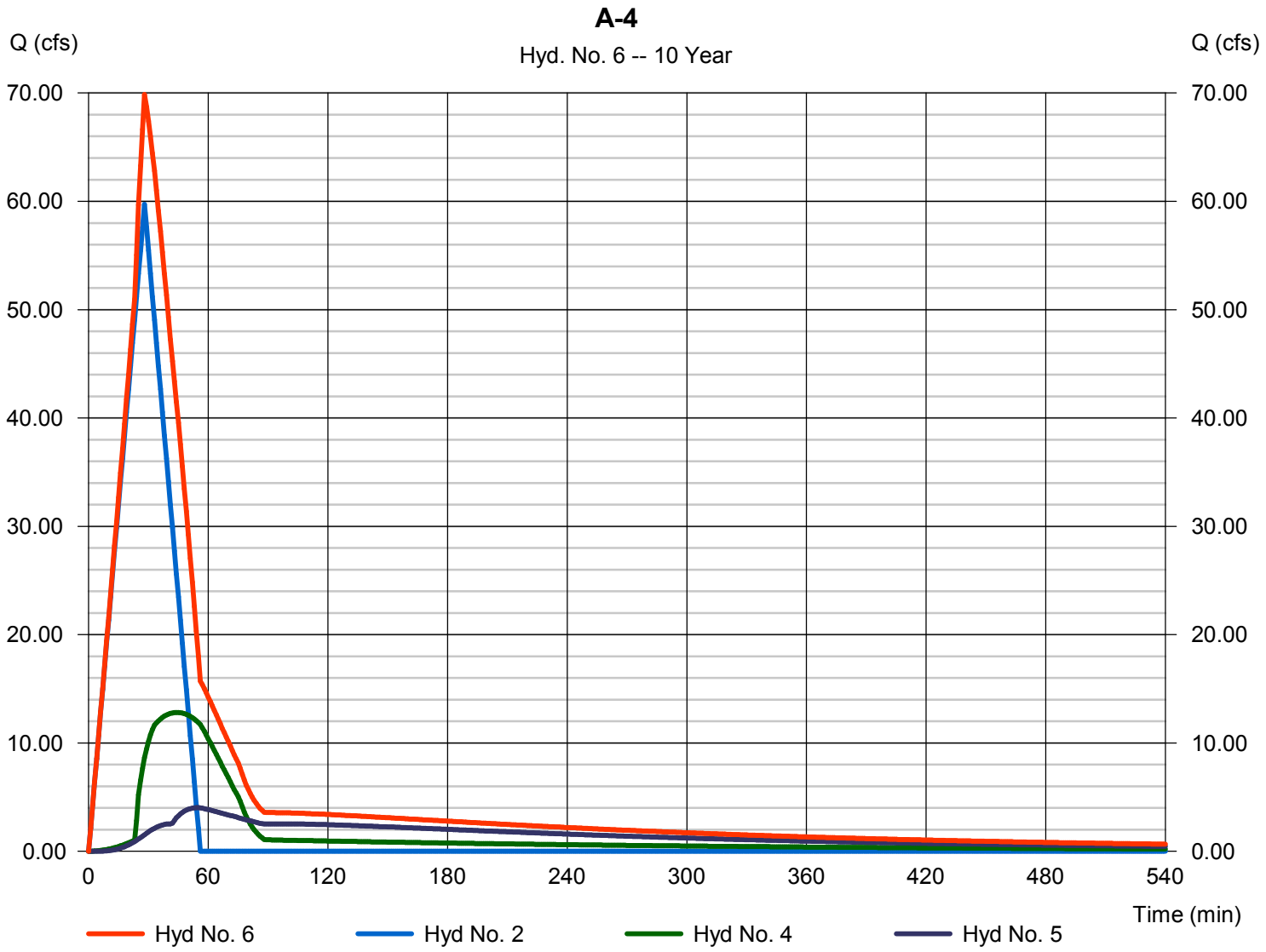


Hydrograph Report

Hyd. No. 6

A-4

Hydrograph type	=	Combine	Peak discharge	=	69.87 cfs
Storm frequency	=	10 yrs	Time to peak	=	28 min
Time interval	=	1 min	Hyd. volume	=	209,365 cuft
Inflow hyds.	=	2, 4, 5	Contrib. drain. area	=	19.730 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

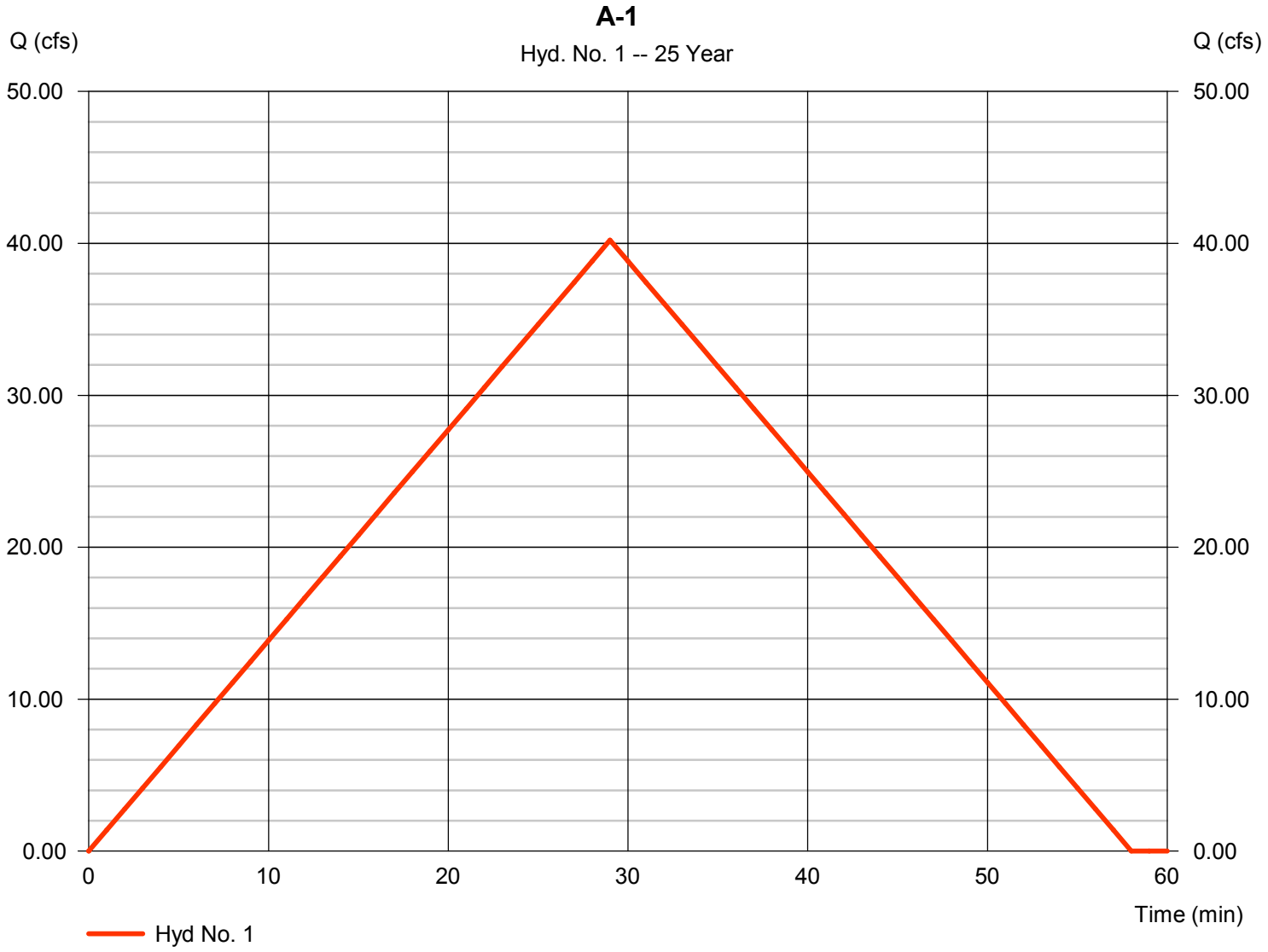
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	40.21	1	29	69,967	------	------	------	A-1
2	Rational	70.87	1	28	119,065	------	------	------	A-2
3	Rational	36.32	1	28	61,011	------	------	------	A-3
4	Reservoir	14.25	1	45	60,994	3	596.58	39,445	Summit Pond 1
5	Reservoir	5.535	1	54	68,604	1	600.30	62,243	Summit Pond 2
6	Combine	83.55	1	28	248,662	2, 4, 5	------	------	A-4

Hydrograph Report

Hyd. No. 1

A-1

Hydrograph type	=	Rational	Peak discharge	=	40.21 cfs
Storm frequency	=	25 yrs	Time to peak	=	29 min
Time interval	=	1 min	Hyd. volume	=	69,967 cuft
Drainage area	=	11.400 ac	Runoff coeff.	=	0.65
Intensity	=	5.427 in/hr	Tc by User	=	29.00 min
IDF Curve	=	Seguin.IDF	Asc/Rec limb fact	=	1/1

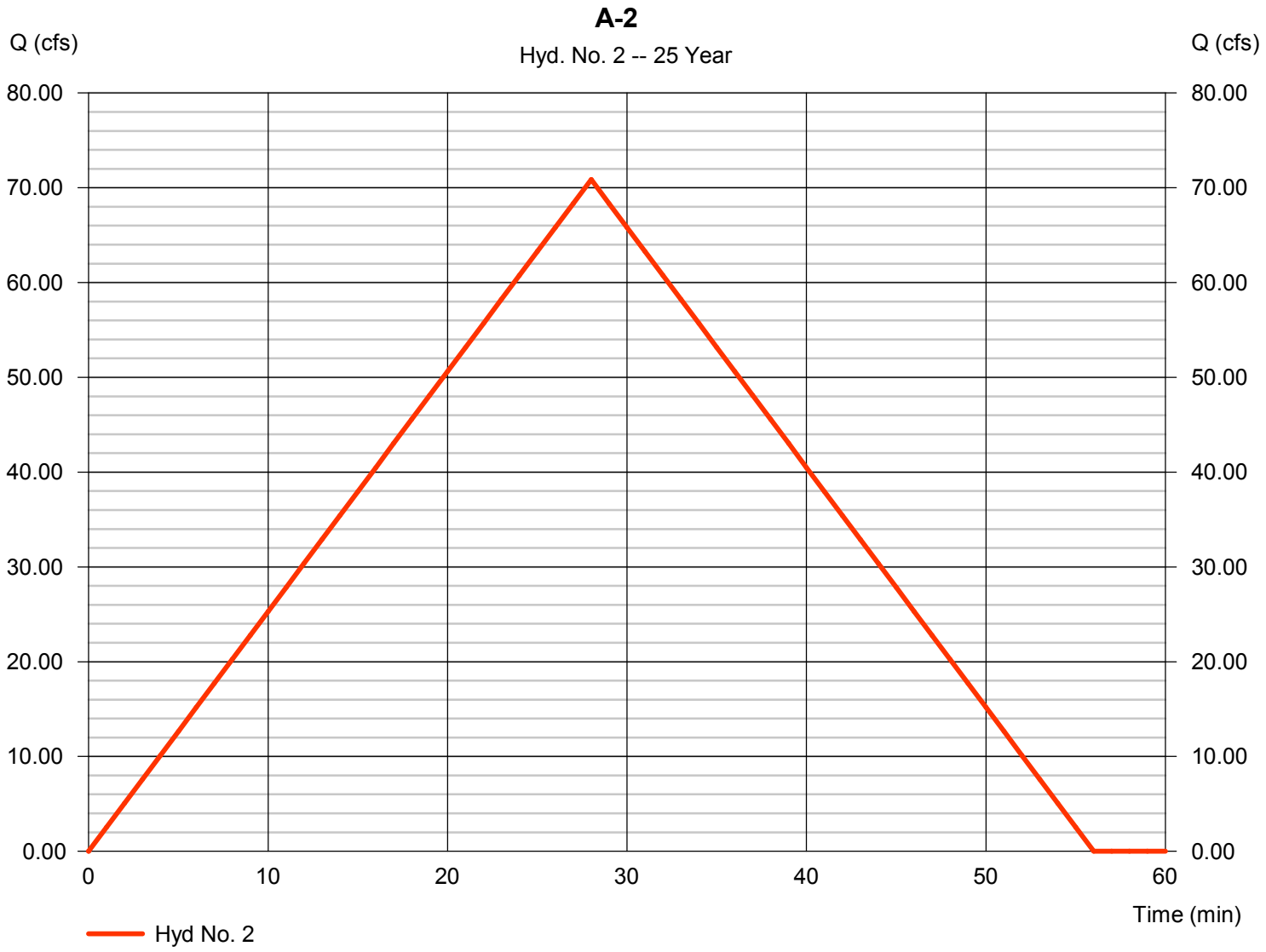


Hydrograph Report

Hyd. No. 2

A-2

Hydrograph type	=	Rational	Peak discharge	=	70.87 cfs
Storm frequency	=	25 yrs	Time to peak	=	28 min
Time interval	=	1 min	Hyd. volume	=	119,065 cuft
Drainage area	=	19.730 ac	Runoff coeff.	=	0.65
Intensity	=	5.526 in/hr	Tc by User	=	28.00 min
IDF Curve	=	Seguin.IDF	Asc/Rec limb fact	=	1/1

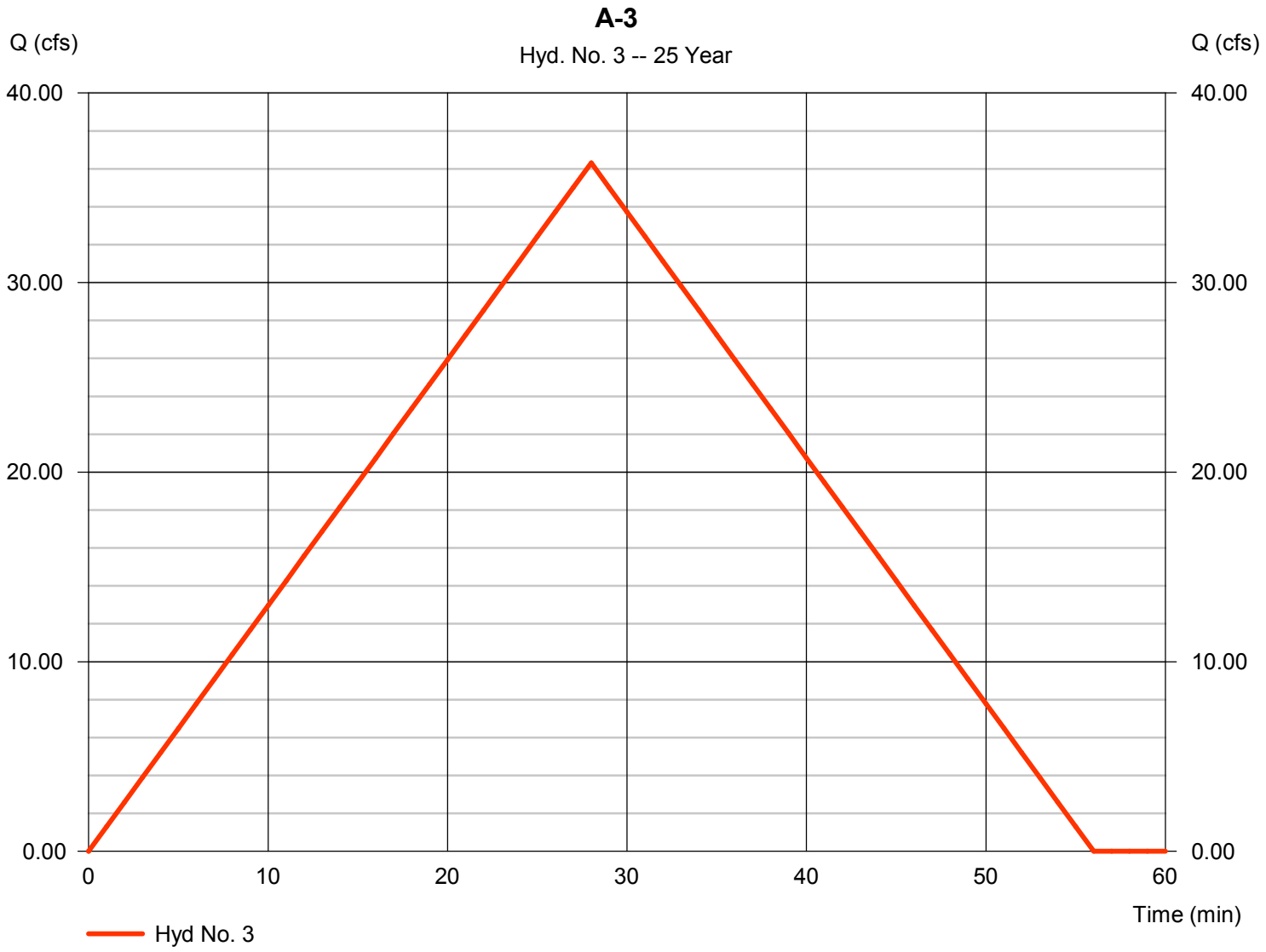


Hydrograph Report

Hyd. No. 3

A-3

Hydrograph type	=	Rational	Peak discharge	=	36.32 cfs
Storm frequency	=	25 yrs	Time to peak	=	28 min
Time interval	=	1 min	Hyd. volume	=	61,011 cuft
Drainage area	=	10.110 ac	Runoff coeff.	=	0.65
Intensity	=	5.526 in/hr	Tc by User	=	28.00 min
IDF Curve	=	Seguin.IDF	Asc/Rec limb fact	=	1/1



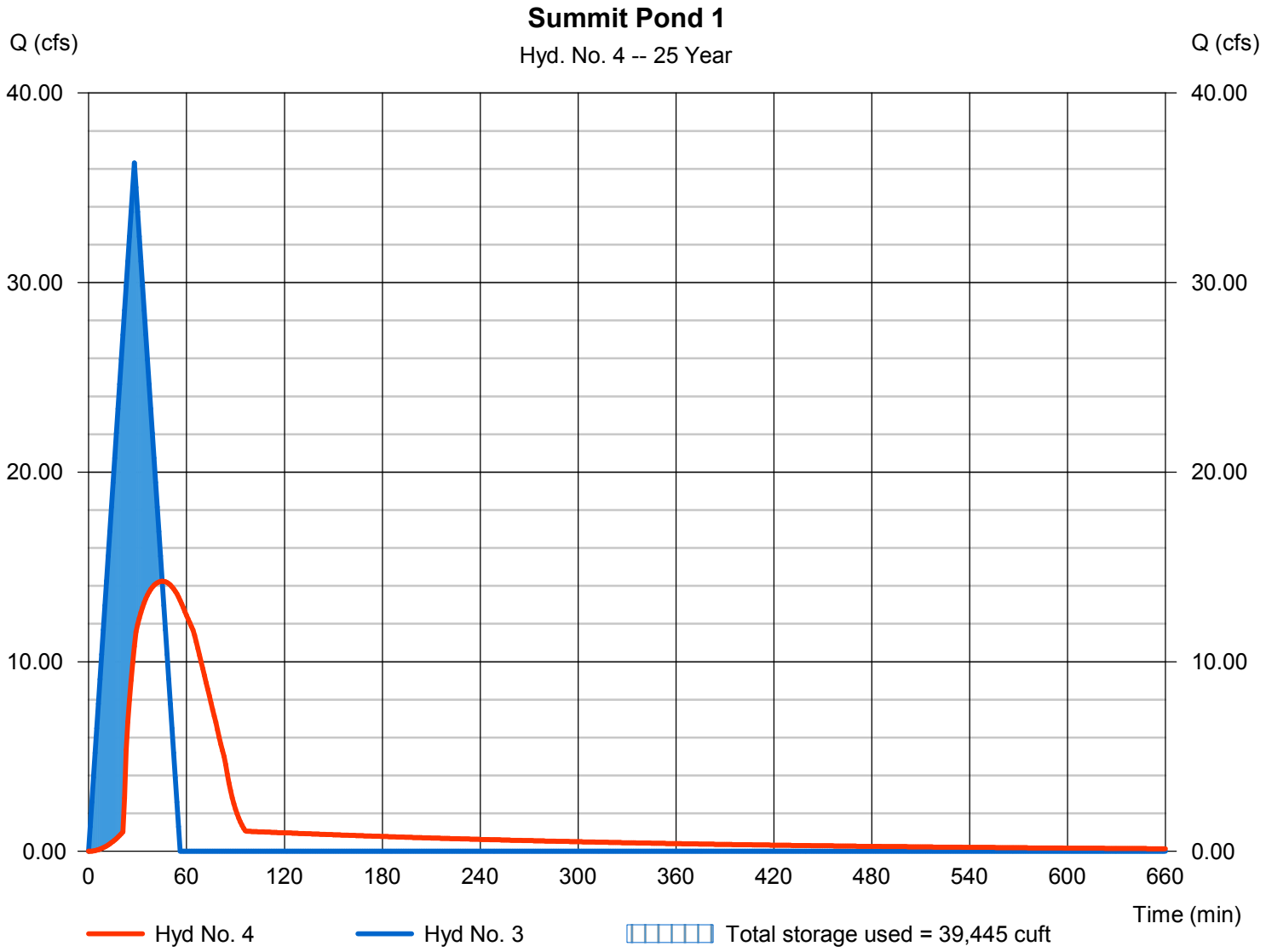
Hydrograph Report

Hyd. No. 4

Summit Pond 1

Hydrograph type	= Reservoir	Peak discharge	= 14.25 cfs
Storm frequency	= 25 yrs	Time to peak	= 45 min
Time interval	= 1 min	Hyd. volume	= 60,994 cuft
Inflow hyd. No.	= 3 - A-3	Max. Elevation	= 596.58 ft
Reservoir name	= Summit Pond 1	Max. Storage	= 39,445 cuft

Storage Indication method used.



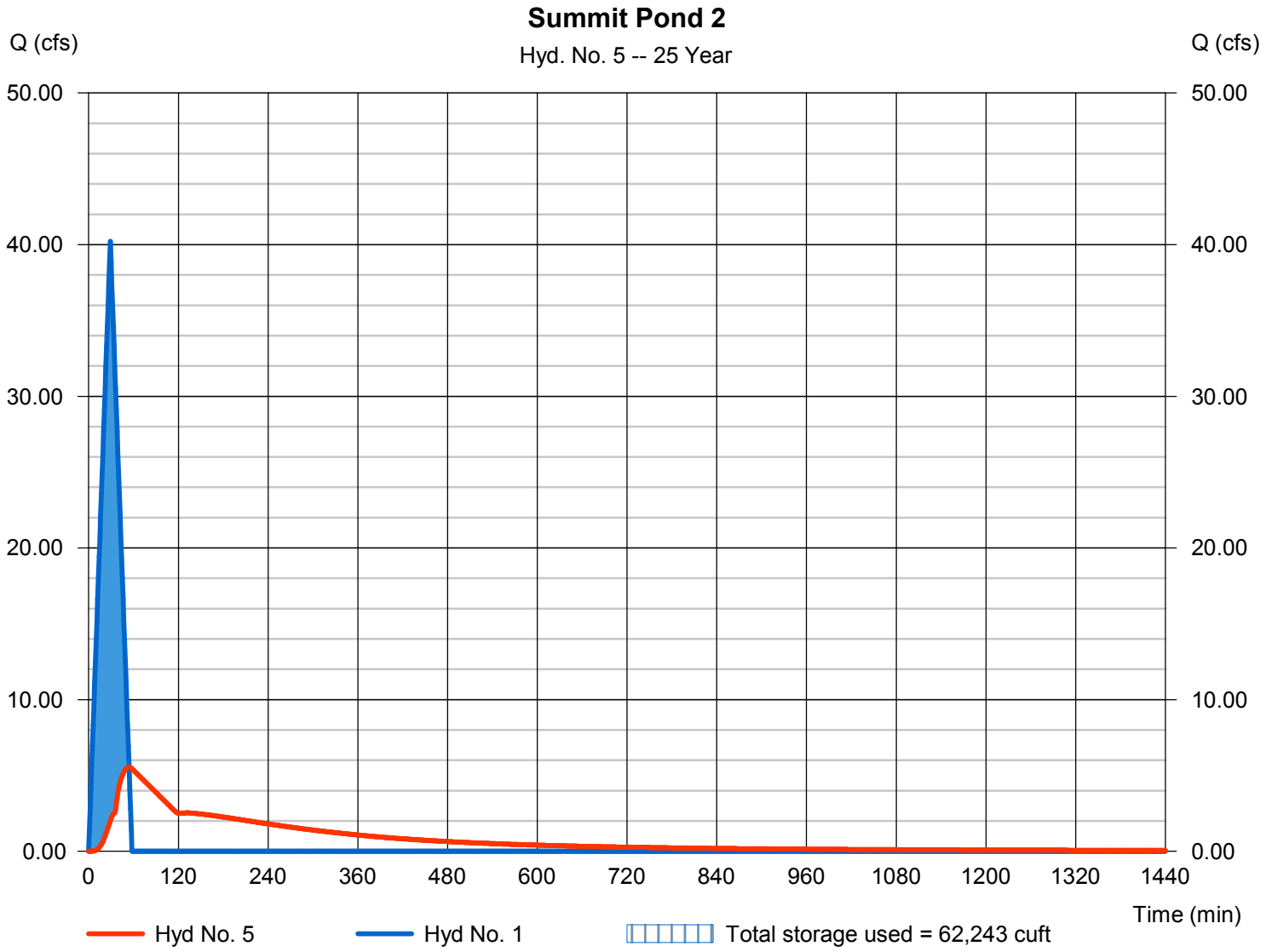
Hydrograph Report

Hyd. No. 5

Summit Pond 2

Hydrograph type	= Reservoir	Peak discharge	= 5.535 cfs
Storm frequency	= 25 yrs	Time to peak	= 54 min
Time interval	= 1 min	Hyd. volume	= 68,604 cuft
Inflow hyd. No.	= 1 - A-1	Max. Elevation	= 600.30 ft
Reservoir name	= Summit Pond 2	Max. Storage	= 62,243 cuft

Storage Indication method used.

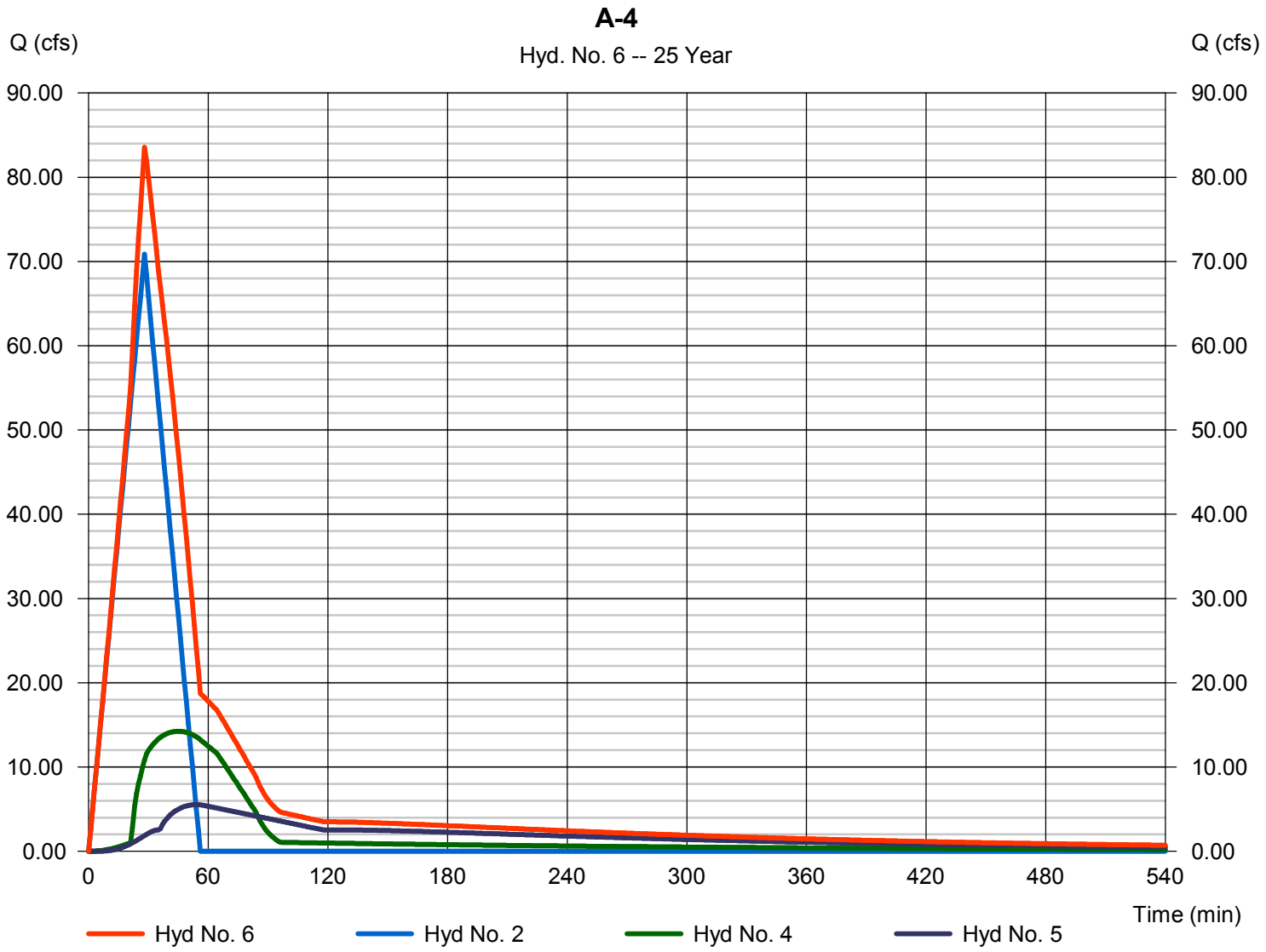


Hydrograph Report

Hyd. No. 6

A-4

Hydrograph type	=	Combine	Peak discharge	=	83.55 cfs
Storm frequency	=	25 yrs	Time to peak	=	28 min
Time interval	=	1 min	Hyd. volume	=	248,662 cuft
Inflow hyds.	=	2, 4, 5	Contrib. drain. area	=	19.730 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

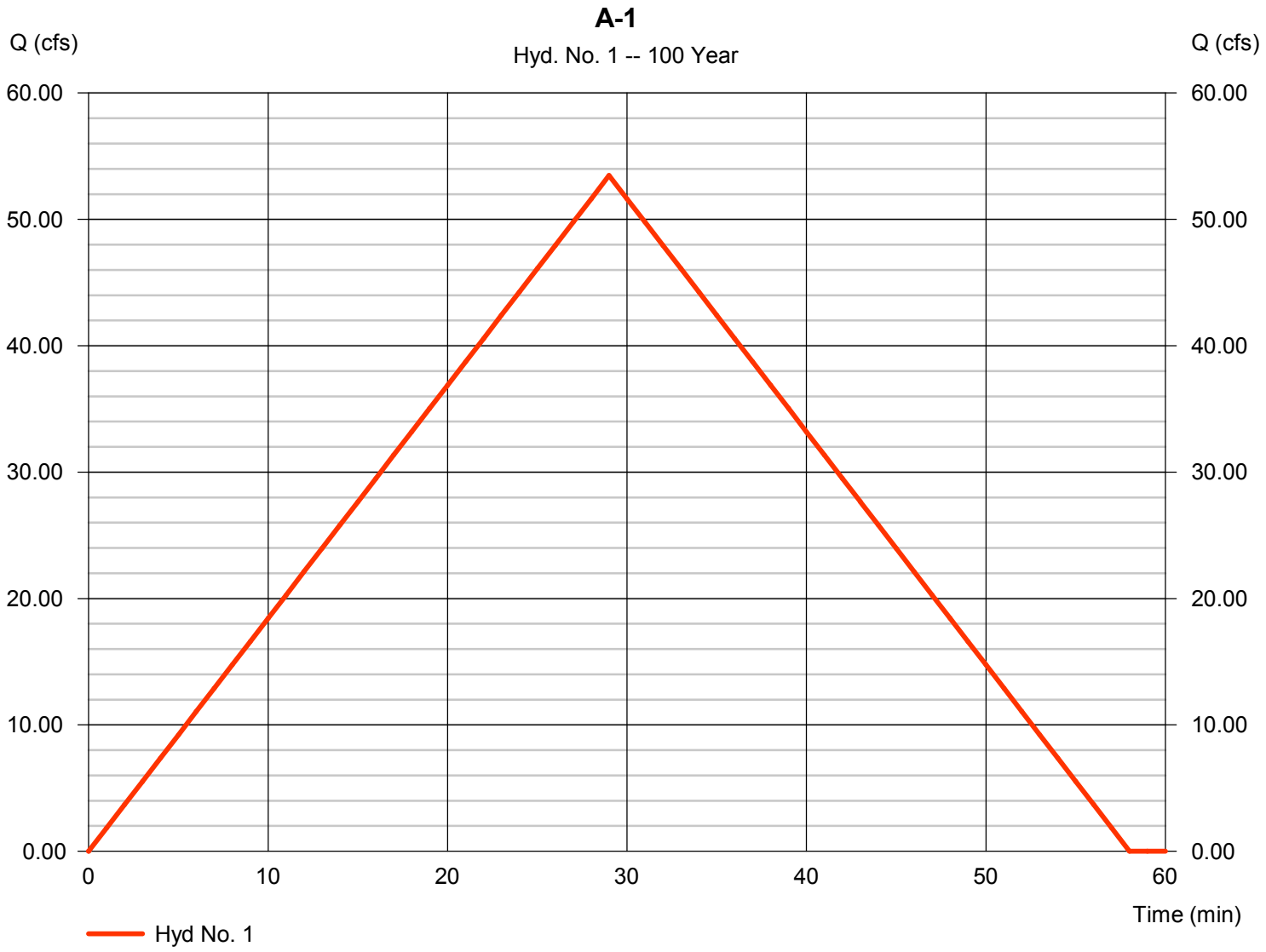
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	53.47	1	29	93,038	------	------	------	A-1
2	Rational	94.21	1	28	158,267	------	------	------	A-2
3	Rational	48.27	1	28	81,099	------	------	------	A-3
4	Reservoir	16.95	1	46	81,082	3	596.92	53,242	Summit Pond 1
5	Reservoir	9.423	1	53	91,640	1	600.67	80,543	Summit Pond 2
6	Combine	109.87	1	28	330,989	2, 4, 5	------	------	A-4

Hydrograph Report

Hyd. No. 1

A-1

Hydrograph type	=	Rational	Peak discharge	=	53.47 cfs
Storm frequency	=	100 yrs	Time to peak	=	29 min
Time interval	=	1 min	Hyd. volume	=	93,038 cuft
Drainage area	=	11.400 ac	Runoff coeff.	=	0.65
Intensity	=	7.216 in/hr	Tc by User	=	29.00 min
IDF Curve	=	Seguin.IDF	Asc/Rec limb fact	=	1/1

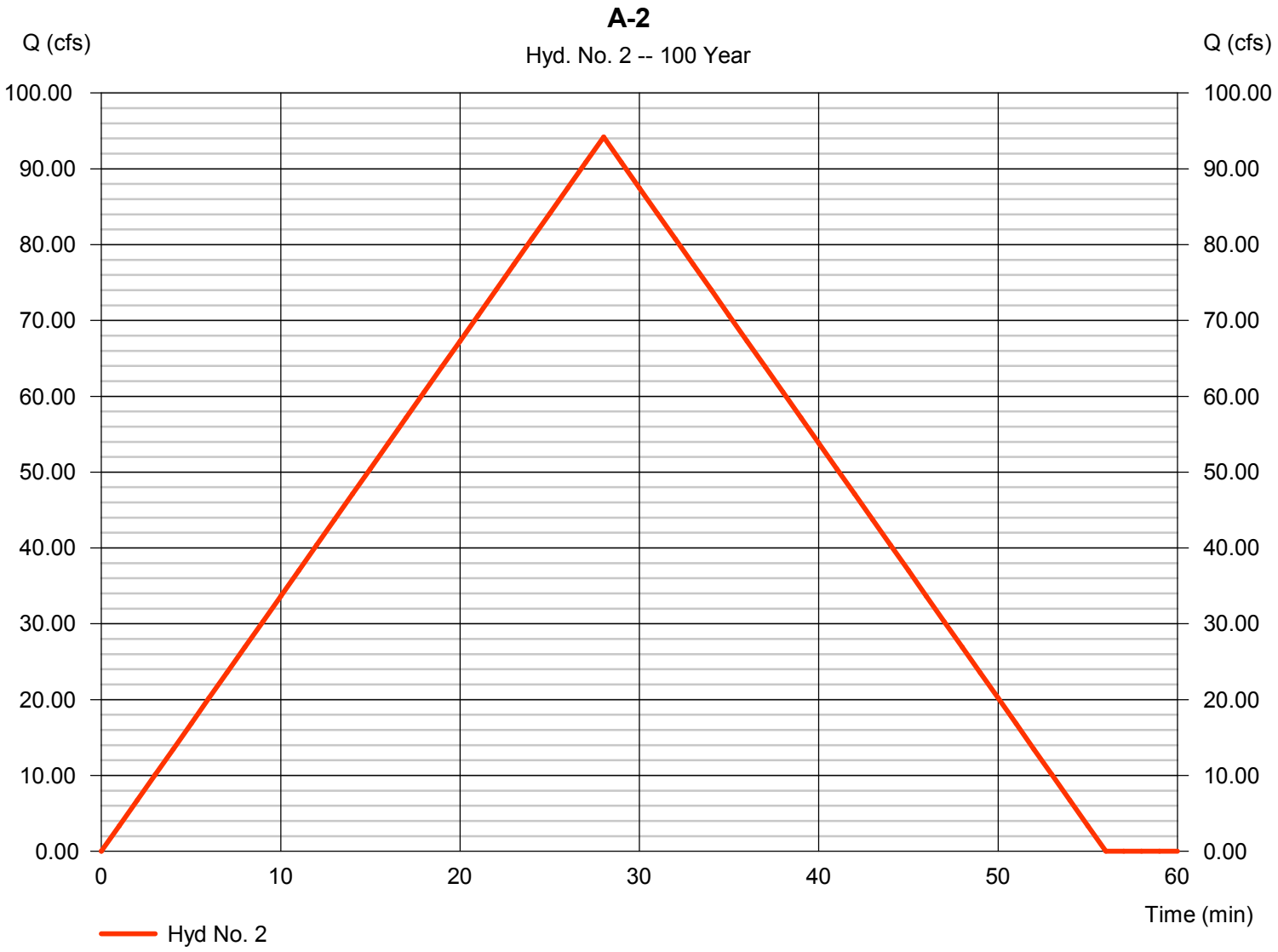


Hydrograph Report

Hyd. No. 2

A-2

Hydrograph type	=	Rational	Peak discharge	=	94.21 cfs
Storm frequency	=	100 yrs	Time to peak	=	28 min
Time interval	=	1 min	Hyd. volume	=	158,267 cuft
Drainage area	=	19.730 ac	Runoff coeff.	=	0.65
Intensity	=	7.346 in/hr	Tc by User	=	28.00 min
IDF Curve	=	Seguin.IDF	Asc/Rec limb fact	=	1/1

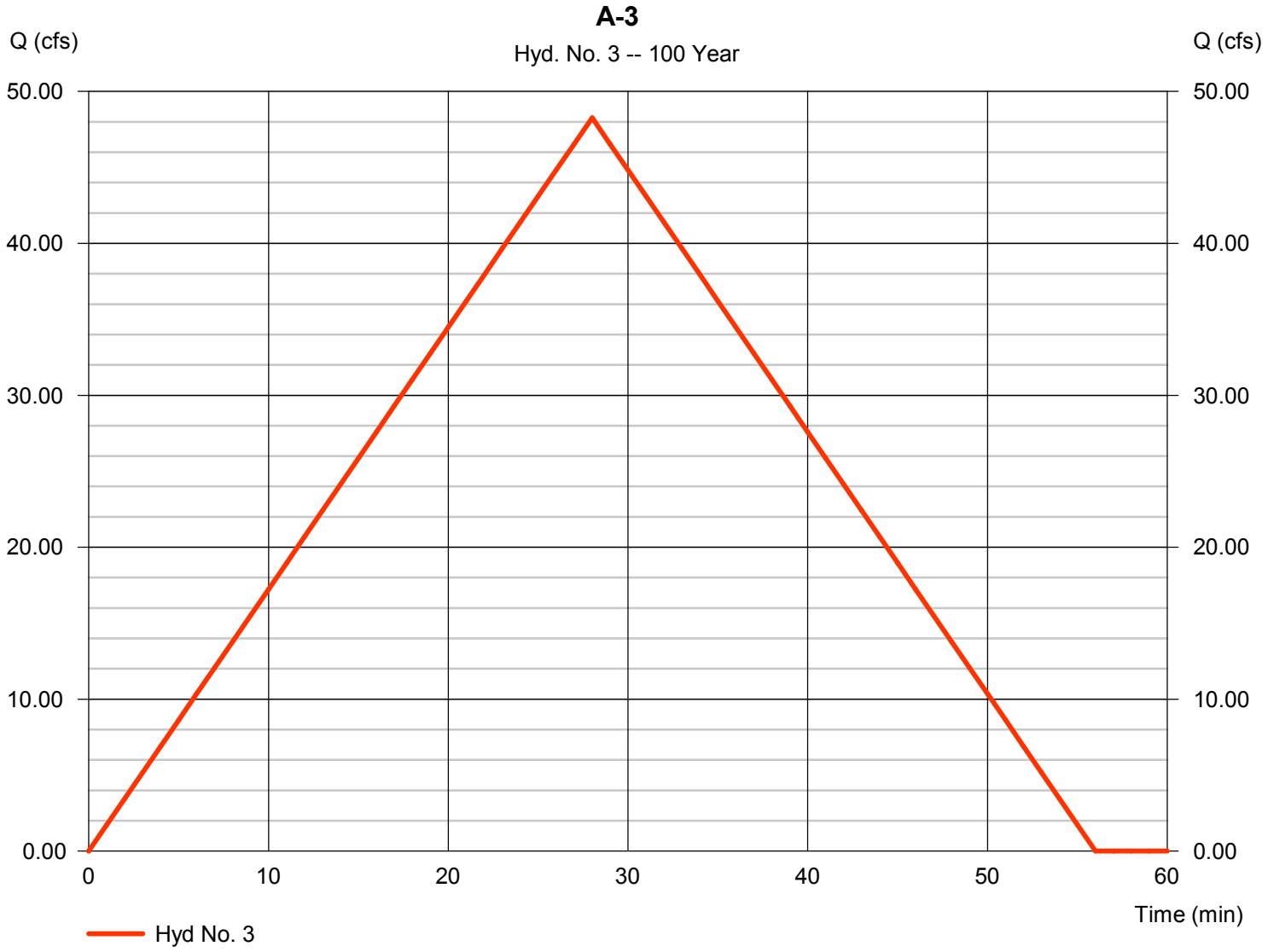


Hydrograph Report

Hyd. No. 3

A-3

Hydrograph type	=	Rational	Peak discharge	=	48.27 cfs
Storm frequency	=	100 yrs	Time to peak	=	28 min
Time interval	=	1 min	Hyd. volume	=	81,099 cuft
Drainage area	=	10.110 ac	Runoff coeff.	=	0.65
Intensity	=	7.346 in/hr	Tc by User	=	28.00 min
IDF Curve	=	Seguin.IDF	Asc/Rec limb fact	=	1/1



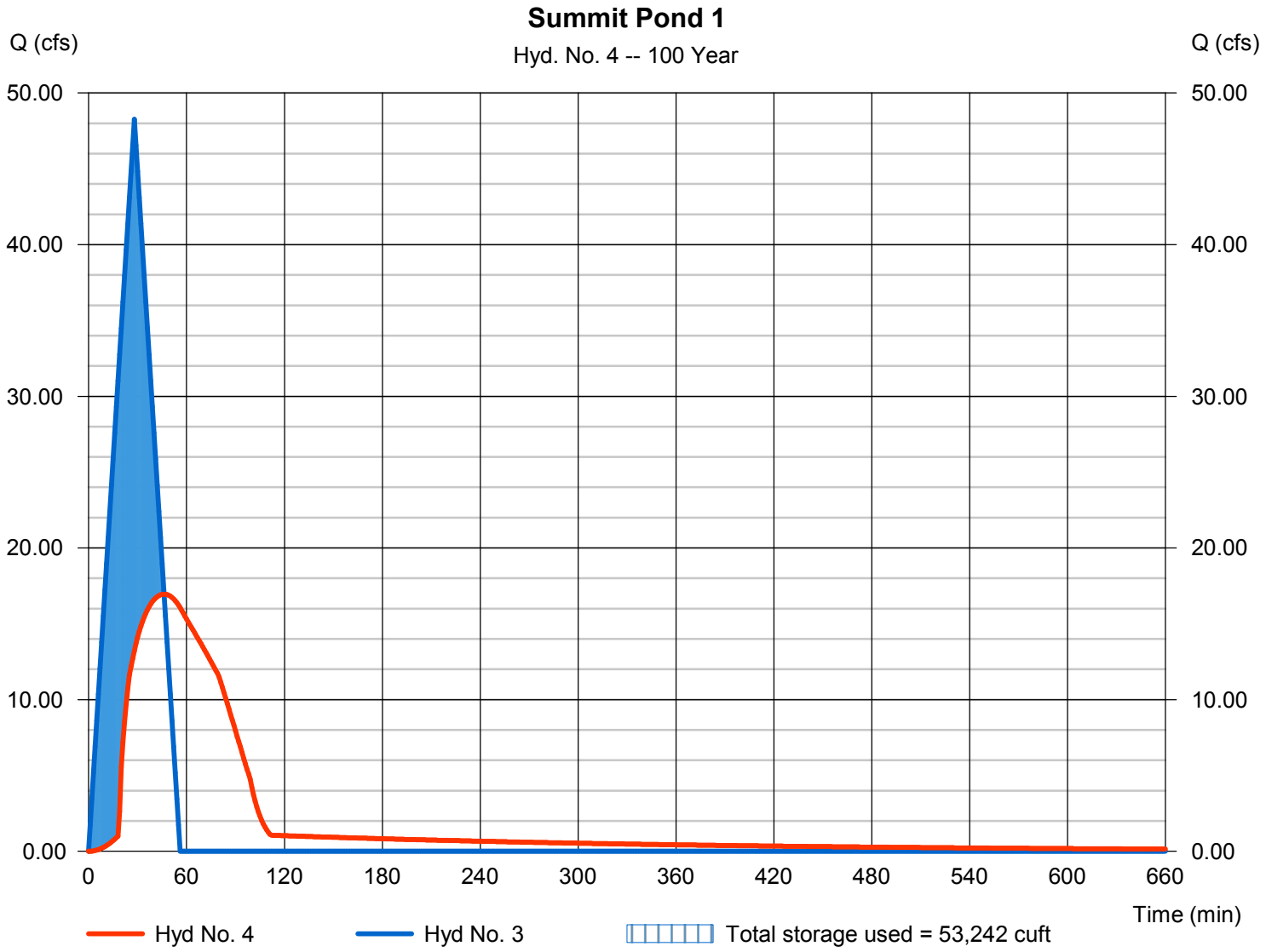
Hydrograph Report

Hyd. No. 4

Summit Pond 1

Hydrograph type	= Reservoir	Peak discharge	= 16.95 cfs
Storm frequency	= 100 yrs	Time to peak	= 46 min
Time interval	= 1 min	Hyd. volume	= 81,082 cuft
Inflow hyd. No.	= 3 - A-3	Max. Elevation	= 596.92 ft
Reservoir name	= Summit Pond 1	Max. Storage	= 53,242 cuft

Storage Indication method used.



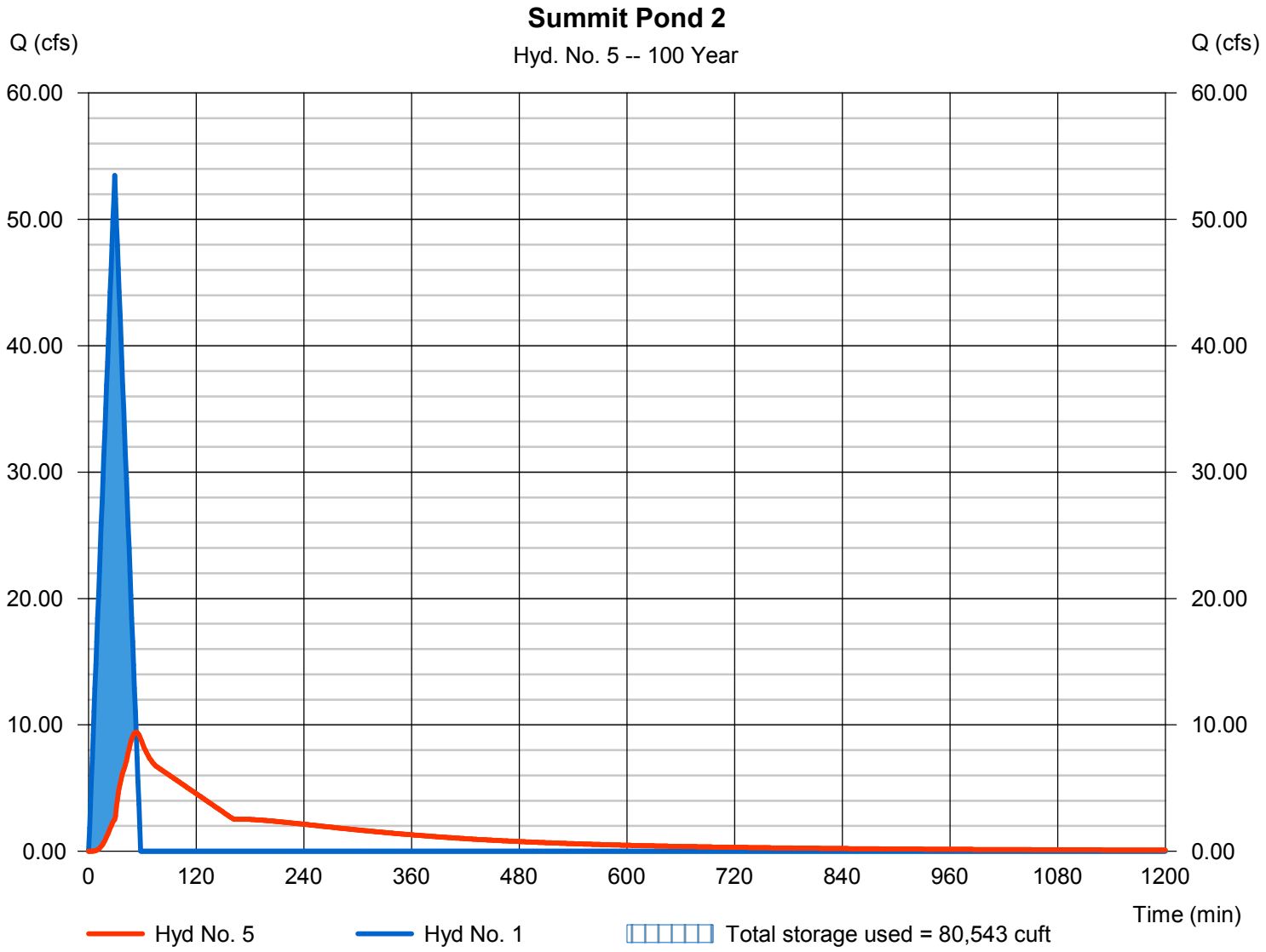
Hydrograph Report

Hyd. No. 5

Summit Pond 2

Hydrograph type	= Reservoir	Peak discharge	= 9.423 cfs
Storm frequency	= 100 yrs	Time to peak	= 53 min
Time interval	= 1 min	Hyd. volume	= 91,640 cuft
Inflow hyd. No.	= 1 - A-1	Max. Elevation	= 600.67 ft
Reservoir name	= Summit Pond 2	Max. Storage	= 80,543 cuft

Storage Indication method used.

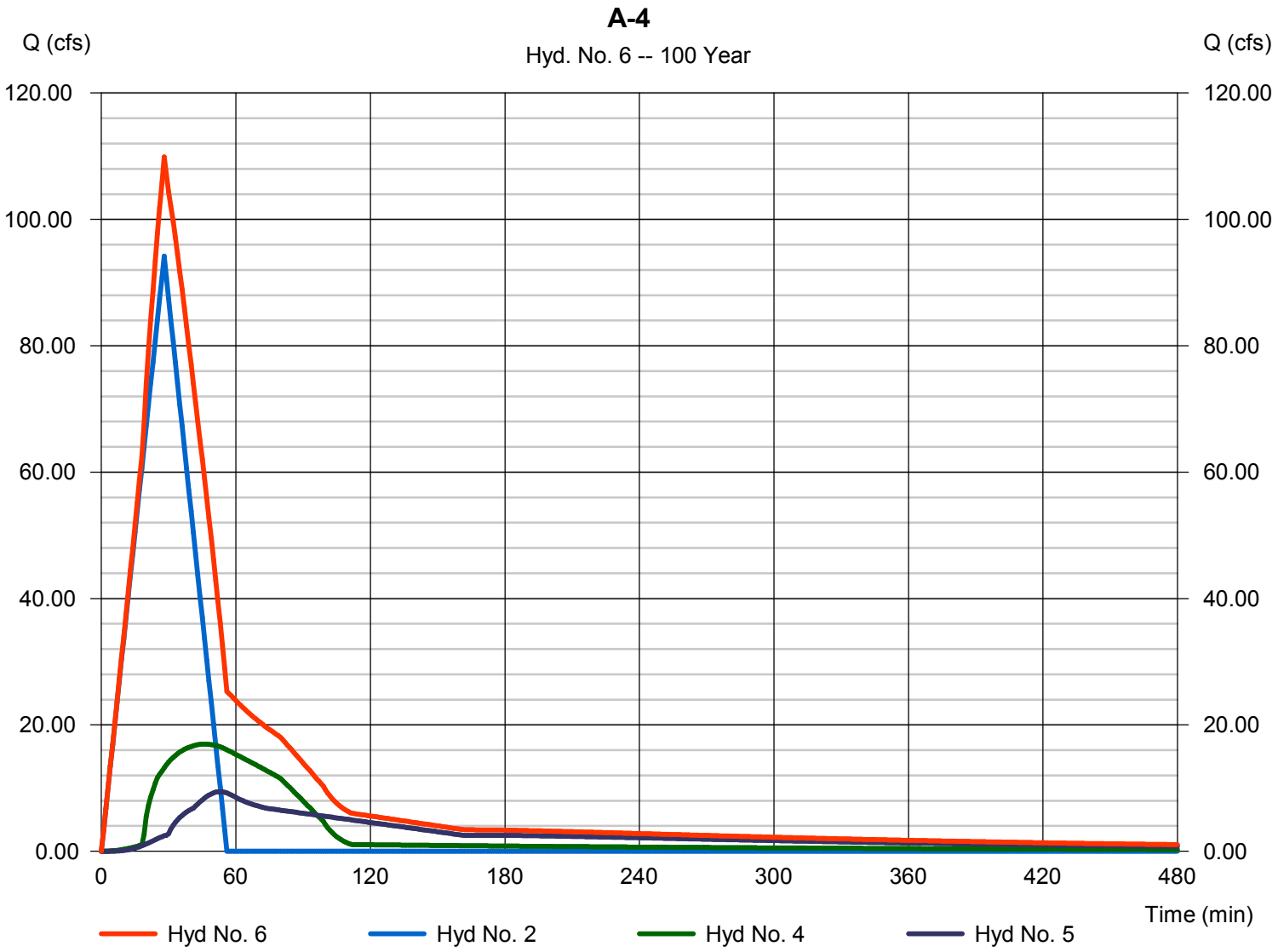


Hydrograph Report

Hyd. No. 6

A-4

Hydrograph type	=	Combine	Peak discharge	=	109.87 cfs
Storm frequency	=	100 yrs	Time to peak	=	28 min
Time interval	=	1 min	Hyd. volume	=	330,989 cuft
Inflow hyds.	=	2, 4, 5	Contrib. drain. area	=	19.730 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	769.4391	41.3999	1.3083	--------
3	0.0000	0.0000	0.0000	--------
5	1051.5210	42.1999	1.3121	--------
10	1167.6980	41.9999	1.3003	--------
25	1354.6379	42.4999	1.2928	--------
50	1646.0110	43.5999	1.3003	--------
100	2040.9370	44.9999	1.3115	--------

File name: Seguin.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.08	4.44	3.93	3.52	3.18	2.89	2.65	2.43	2.25	2.09	1.95	1.83
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.69	5.86	5.20	4.66	4.21	3.83	3.51	3.23	2.99	2.78	2.59	2.43
10	7.82	6.86	6.08	5.45	4.93	4.49	4.11	3.79	3.51	3.26	3.05	2.85
25	9.21	8.09	7.19	6.46	5.85	5.33	4.89	4.51	4.18	3.89	3.63	3.41
50	10.55	9.29	8.27	7.44	6.74	6.15	5.65	5.21	4.83	4.50	4.20	3.94
100	12.07	10.65	9.50	8.55	7.76	7.09	6.51	6.02	5.58	5.20	4.86	4.56

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	2.20	0.00	3.30	4.25	5.77	6.80	7.95
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

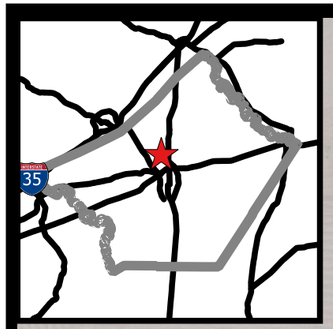
SHED DRAINAGE COMPUTATIONS

CUDE ENGINEERS

4122 POND HILL ROAD, STE 101
SAN ANTONIO, TEXAS 78231

PHONE: (210) 681-2951
CUDEENGINEERS.COM

TBPE NO. 455
TBPLS NO. 10048500



GOMEZ LN

BARTELS RD

PRAIRIE ROSE

ALICE

SAVANNAH PRAIRIE

PRAIRIE PT

DA_01
63.61 ACRES

DA_03
42.39 ACRES

HUBER RD

EMILY LN

PRAIRIE FLOWER

PRAIRIE SUMMIT

WINDMILL PRAIRIE

PRAIRIE JUNCTION

PRAIRIE PASS

DA_02
37.51 ACRES

DA_04
20.29 ACRES

CORDOVA RD

Legend

EXISTING DRAINAGE AREAS

USDA HYDROLOGIC SOIL GROUPS

- A
- B
- C
- D

CUDE ENGINEERS

CUDEENGINEERS.COM

4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TEXAS 78232
P: (210) 681.2951 • F: (210) 523.7112
SBE Certified Firm I TBPE Firm No. 455
TBPLS Firm No. 10048500

CORDOVA TRAILS SUBDIVISION

USDA SOILS EXHIBIT

DATE
8/31/2020

PROJECT NO.
03480

DRAWN BY:
BR

CHECKED BY:
WPM

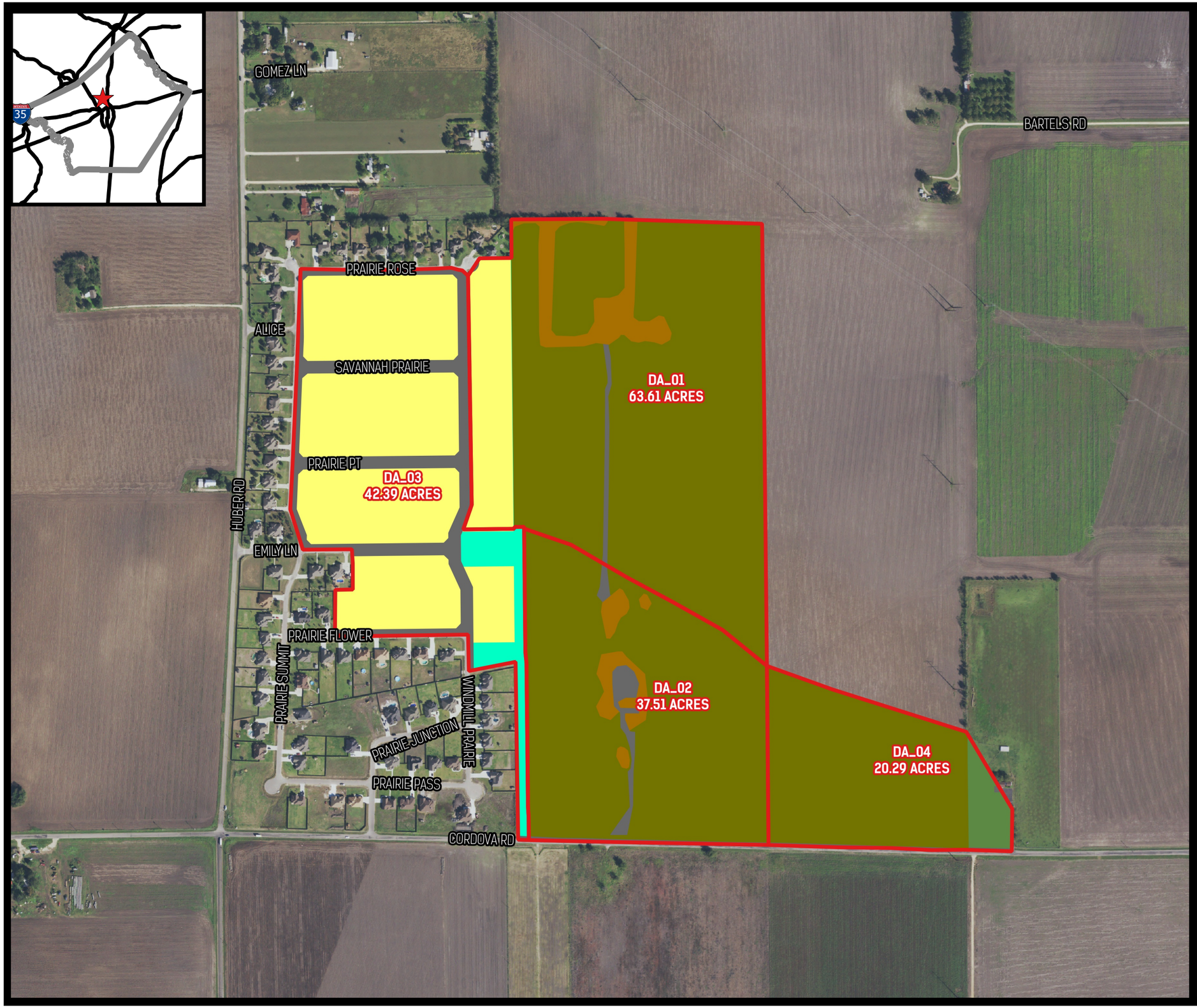
NORTH

SCALE
0 500'

E3

P:\03480\0001\P-GIS\03480_EXH_SOILS_MAP.mxd

FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14



Legend

- EXISTING DRAINAGE AREAS

EXISTING LAND USE

- UNDEV-MEADOW
- ORCHARD
- UNDEV-WOODS
- RES-HOMESTEAD
- RES-LOW DENSITY
- RES-MED DENSITY
- RES-HIGH DENSITY
- RES-MULTI-FAMILY
- INDUSTRIAL-LIGHT
- COMMERCIAL
- INDUSTRIAL
- TRANSPORTATION
- MINING
- OPEN-URBAN
- OPEN-CULTVATED
- OPEN-EASEMENTS
- UTILITIES
- MIXED USE
- WATER

CUDE ENGINEERS
EST. 1980
CUDEENGINEERS.COM

4122 POND HILL ROAD, SUITE 101
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SBE Certified Firm I TBPE Firm No. 455
TBPLS Firm No. 10048500

CORDOVA TRAILS SUBDIVISION

EXISTING LAND USE EXHIBIT

DATE
8/31/2020

PROJECT NO.
03480

DRAWN BY:
BR

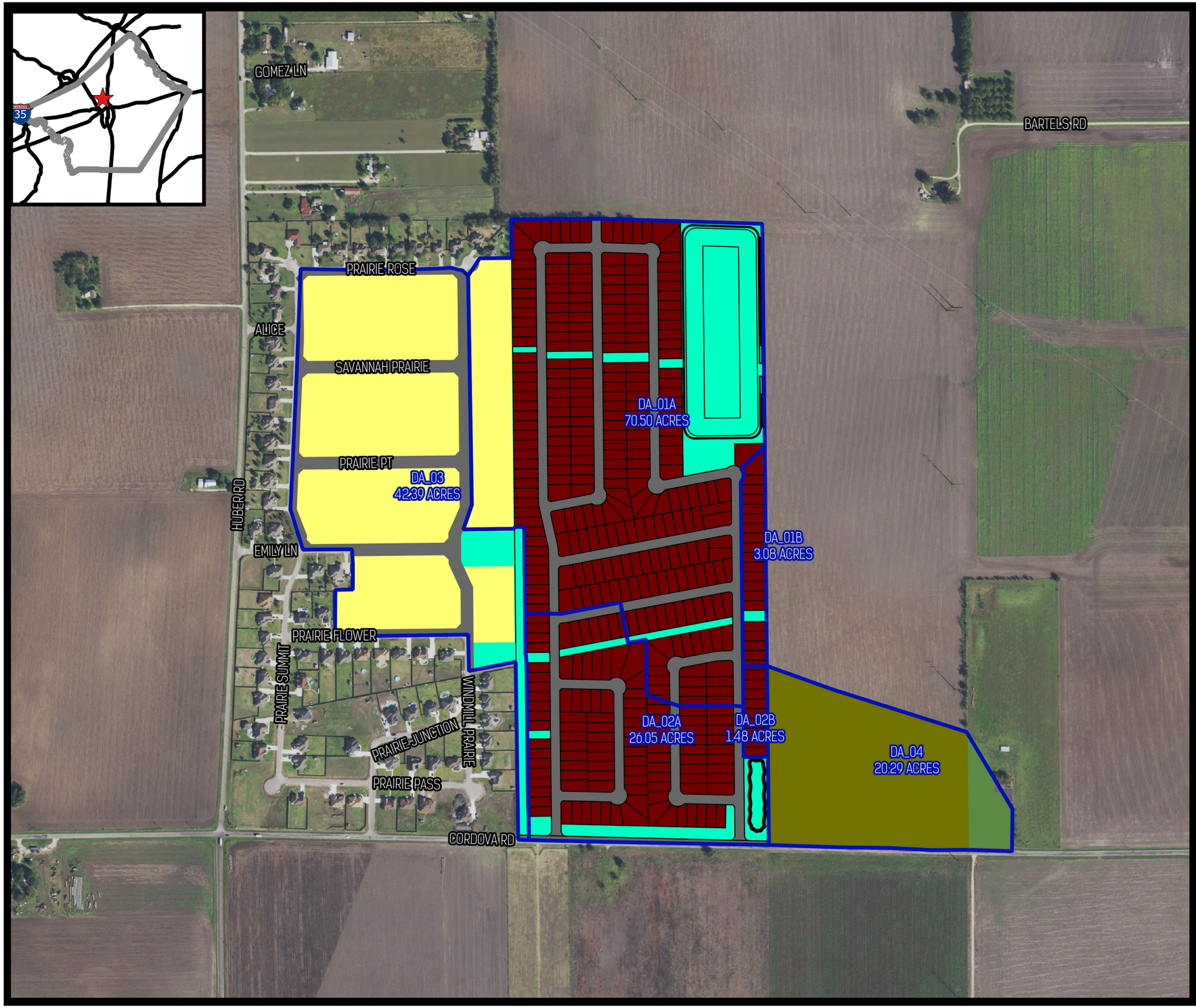
CHECKED BY:
WPM

NORTH

SCALE
0 500'

E4

P:\03480\00\9-GIS\03480_E02_EX_LU_MAP.mxd



Legend

- PROJECT DRAINAGE AREAS
- LAND PLAN

PROJECT LAND USE

- UNDEV-MEADOW
- ORCHARD
- UNDEV-WOODS
- RES-HOMESTEAD
- RES-LOW DENSITY
- RES-MED DENSITY
- RES-HIGH DENSITY
- RES-MULTI-FAMILY
- INDUSTRIAL-LIGHT
- COMMERCIAL
- INDUSTRIAL
- TRANSPORTATION
- MINING
- OPEN-URBAN
- OPEN-CULTVATED
- OPEN-EASEMENTS
- UTILITIES
- MIXED USE
- WATER

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4122 POND HILL ROAD, SUITE 101
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SBE Certified Firm I TBPE Firm No. 455
TBPLS Firm No. 10048500

CORDOVA TRAILS SUBDIVISION

PROJECT LAND USE EXHIBIT

DATE
7/21/2021

PROJECT NO.
03480

DRAWN BY:
JC

CHECKED BY:
WPM

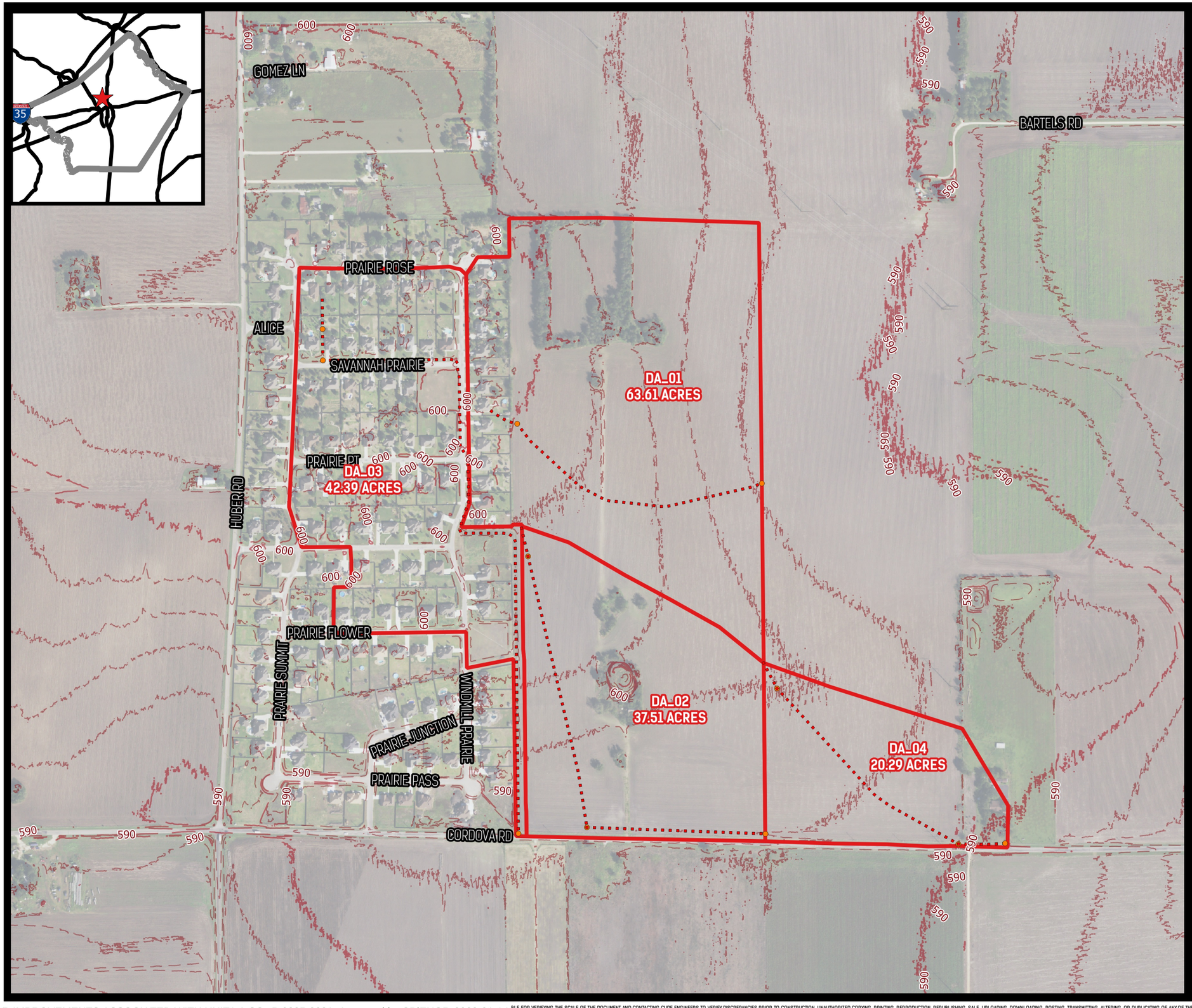
NORTH

SCALE
0 500'

E5

P:\03480\00010-GIS\03480_E03_PDJ_LU_MAP.mxd

FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14



Legend

- EXISTING TIME OF CONCENTRATION PATH
- EXISTING DRAINAGE AREAS

EXISTING CONTOURS

- 2' CONTOURS
- 10' CONTOURS

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EST. 1980

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SBE Certified Firm I TBPE Firm No. 455
TBPLS Firm No. 10048500

CORDOVA TRAILS SUBDIVISION

EXISTING DRAINAGE AREA EXHIBIT

DATE
8/31/2020

PROJECT NO.
03480

DRAWN BY:
BR

CHECKED BY:
WPM

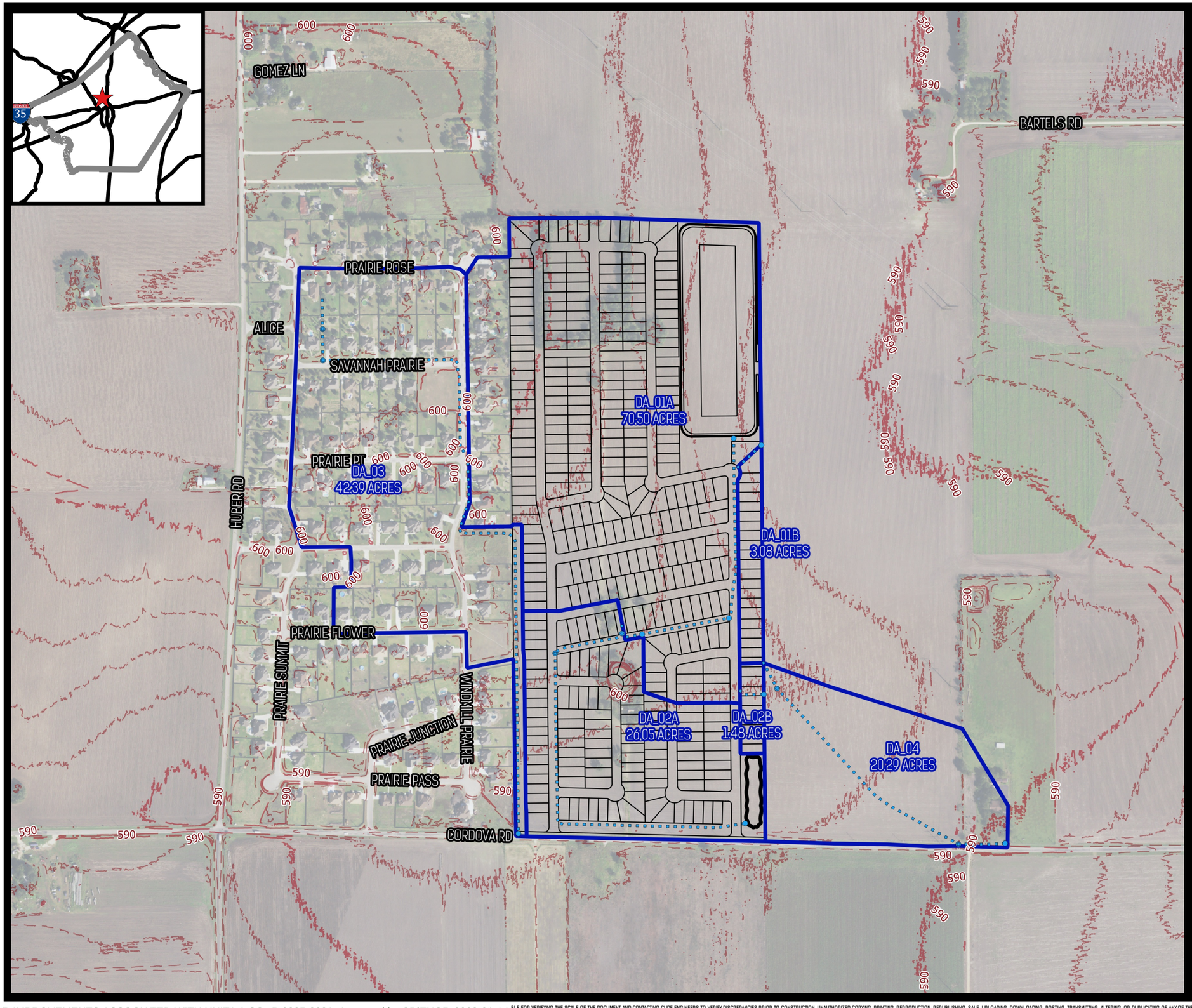
NORTH

SCALE
0 500'

E6

P:\03480\00019-GIS\03480_EDA_EX_DA_MAP.mxd

FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14



Legend

- PROJECT TIME OF CONCENTRATION PATH
- PROJECT DRAINAGE AREAS
- LAND PLAN

EXISTING CONTOURS

- 2' CONTOURS
- 10' CONTOURS

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SBE Certified Firm I TBPE Firm No. 455
TBPLS Firm No. 10048500

CORDOVA TRAILS SUBDIVISION

PROJECT DRAINAGE AREA EXHIBIT

DATE
7/21/2021

PROJECT NO.
03480

DRAWN BY:
JC

CHECKED BY:
WPM

NORTH

SCALE
0 500'

E7

P:\03480\0001\9-GIS\03480_EDS_PRJ_DA_MAP.mxd

FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14

EXISTING CONDITIONS

DA_ID_2	COVER	HSG	CN	AREA	% IMP
DA_01	OPEN	D	80	2287.111086	0.1
DA_01	RES-1/2	D	85	2313.760805	0.25
DA_01	RES-1/2	D	85	19222.72089	0.25
DA_01	RES-1/2	D	85	21678.66976	0.25
DA_01	RES-1/2	D	85	21761.90262	0.25
DA_01	RES-1/2	D	85	21779.63811	0.25
DA_01	RES-1/2	D	85	21779.6952	0.25
DA_01	RES-1/2	D	85	21779.87114	0.25
DA_01	RES-1/2	D	85	21779.88542	0.25
DA_01	RES-1/2	D	85	21779.92096	0.25
DA_01	RES-1/2	D	85	21779.98051	0.25
DA_01	RES-1/2	D	85	21780.10429	0.25
DA_01	RES-1/2	D	85	21780.11122	0.25
DA_01	RES-1/2	D	85	21780.35646	0.25
DA_01	RES-1/2	D	85	21780.39193	0.25
DA_01	RES-1/2	D	85	21782.02971	0.25
DA_01	ROW(DIRT)	D	89	33411.68096	1
DA_01	ROW(PAVED)	D	93	449.8853112	0.7
DA_01	ROW(PAVED)	D	93	868.2563792	0.7
DA_01	ROW(PAVED)	D	93	3609.229939	0.7
DA_01	SMALL GRAIN	D	87	175889.0797	0
DA_01	SMALL GRAIN	D	87	559871.9611	0
DA_01	SMALL GRAIN	D	87	1511192.625	0
DA_01	WOODS	D	79	178836.403	0
DA_02	ROW(DIRT)	D	89	9086.299561	1
DA_02	ROW(DIRT)	D	89	51029.05569	1
DA_02	ROW(PAVED)	D	93	21152.68838	1
DA_02	SMALL GRAIN	D	87	0.003639091	0
DA_02	SMALL GRAIN	D	87	1463092.554	0
DA_02	WOODS	D	79	4285.115218	0
DA_02	WOODS	D	79	6704.685159	0
DA_02	WOODS	D	79	24420.22636	0
DA_02	WOODS	D	79	54090.22594	0
DA_03	OPEN	D	80	0.003639111	0.1
DA_03	OPEN	D	80	1143.909311	0.1
DA_03	OPEN	D	80	27114.90614	0.1
DA_03	OPEN	D	80	51383.46943	0.1
DA_03	OPEN	D	80	84612.9436	0.1
DA_03	RES-1/2	C	80	106.7802899	0.25
DA_03	RES-1/2	C	80	119.5158173	0.25
DA_03	RES-1/2	C	80	663.2105976	0.25
DA_03	RES-1/2	C	80	755.8815346	0.25
DA_03	RES-1/2	C	80	788.457817	0.25
DA_03	RES-1/2	C	80	1011.554281	0.25
DA_03	RES-1/2	C	80	1249.196544	0.25
DA_03	RES-1/2	C	80	5418.203553	0.25
DA_03	RES-1/2	C	80	5521.037976	0.25
DA_03	RES-1/2	C	80	6071.325215	0.25
DA_03	RES-1/2	C	80	6956.170932	0.25
DA_03	RES-1/2	C	80	8003.269125	0.25
DA_03	RES-1/2	C	80	8291.340612	0.25
DA_03	RES-1/2	C	80	9827.616523	0.25
DA_03	RES-1/2	C	80	11908.09841	0.25
DA_03	RES-1/2	C	80	15166.43862	0.25
DA_03	RES-1/2	C	80	15547.26709	0.25
DA_03	RES-1/2	C	80	15840.39131	0.25
DA_03	RES-1/2	C	80	16041.56736	0.25
DA_03	RES-1/2	C	80	16296.49614	0.25
DA_03	RES-1/2	C	80	19649.64842	0.25
DA_03	RES-1/2	C	80	19948.06041	0.25
DA_03	RES-1/2	C	80	21498.97524	0.25
DA_03	RES-1/2	C	80	21778.7399	0.25
DA_03	RES-1/2	C	80	21778.8251	0.25
DA_03	RES-1/2	C	80	21778.84557	0.25
DA_03	RES-1/2	C	80	21778.85604	0.25

DA_ID_2	COVER	HSG	CN	AREA	% IMP
DA_03	RES-1/2	C	80	21778.87221	0.25
DA_03	RES-1/2	C	80	21779.86786	0.25
DA_03	RES-1/2	C	80	22074.56841	0.25
DA_03	RES-1/2	C	80	23143.91978	0.25
DA_03	RES-1/2	C	80	23531.86402	0.25
DA_03	RES-1/2	C	80	23718.22513	0.25
DA_03	RES-1/2	C	80	23728.96516	0.25
DA_03	RES-1/2	D	85	2.822380302	0.25
DA_03	RES-1/2	D	85	17.31152741	0.25
DA_03	RES-1/2	D	85	2555.590295	0.25
DA_03	RES-1/2	D	85	3759.220587	0.25
DA_03	RES-1/2	D	85	5565.114339	0.25
DA_03	RES-1/2	D	85	5938.417642	0.25
DA_03	RES-1/2	D	85	6232.756253	0.25
DA_03	RES-1/2	D	85	6890.879516	0.25
DA_03	RES-1/2	D	85	7698.726592	0.25
DA_03	RES-1/2	D	85	8713.643451	0.25
DA_03	RES-1/2	D	85	10775.21729	0.25
DA_03	RES-1/2	D	85	11654.81109	0.25
DA_03	RES-1/2	D	85	13247.6261	0.25
DA_03	RES-1/2	D	85	13473.87745	0.25
DA_03	RES-1/2	D	85	14588.61448	0.25
DA_03	RES-1/2	D	85	15504.49728	0.25
DA_03	RES-1/2	D	85	16188.71782	0.25
DA_03	RES-1/2	D	85	18174.77142	0.25
DA_03	RES-1/2	D	85	20530.79551	0.25
DA_03	RES-1/2	D	85	20789.4325	0.25
DA_03	RES-1/2	D	85	21109.33019	0.25
DA_03	RES-1/2	D	85	21399.57748	0.25
DA_03	RES-1/2	D	85	21709.52827	0.25
DA_03	RES-1/2	D	85	21756.67109	0.25
DA_03	RES-1/2	D	85	21775.18731	0.25
DA_03	RES-1/2	D	85	21779.14053	0.25
DA_03	RES-1/2	D	85	21779.17221	0.25
DA_03	RES-1/2	D	85	21779.18981	0.25
DA_03	RES-1/2	D	85	21779.20323	0.25
DA_03	RES-1/2	D	85	21779.23487	0.25
DA_03	RES-1/2	D	85	21779.29794	0.25
DA_03	RES-1/2	D	85	21779.97468	0.25
DA_03	RES-1/2	D	85	21779.99175	0.25
DA_03	RES-1/2	D	85	21780.02303	0.25
DA_03	RES-1/2	D	85	21791.76349	0.25
DA_03	RES-1/2	D	85	21798.83816	0.25
DA_03	RES-1/2	D	85	21942.45375	0.25
DA_03	RES-1/2	D	85	21987.12318	0.25
DA_03	RES-1/2	D	85	22032.11471	0.25
DA_03	RES-1/2	D	85	22050.53249	0.25
DA_03	RES-1/2	D	85	22411.21191	0.25
DA_03	RES-1/2	D	85	22594.35167	0.25
DA_03	RES-1/2	D	85	22718.78614	0.25
DA_03	RES-1/2	D	85	22736.49106	0.25
DA_03	RES-1/2	D	85	22754.0985	0.25
DA_03	RES-1/2	D	85	22756.8695	0.25
DA_03	RES-1/2	D	85	22800.25648	0.25
DA_03	RES-1/2	D	85	23766.59514	0.25
DA_03	RES-1/2	D	85	23915.21614	0.25
DA_03	RES-1/2	D	85	23974.1504	0.25
DA_03	RES-1/2	D	85	24061.66597	0.25
DA_03	ROW(PAVED)	C	92	117902.8897	0.7
DA_03	ROW(PAVED)	D	93	1229.801807	1
DA_03	ROW(PAVED)	D	93	217558.1843	0.7
DA_04	RES-HOMESTEAD	D	86	90854.74458	0.12
DA_04	ROW(PAVED)	D	93	789.0655665	1
DA_04	ROW(PAVED)	D	93	18633.74416	1
DA_04	SMALL GRAIN	D	87	773735.8587	0

DA_ID	A-SM	COMP-CN	% IMP	TR55_Ia
DA_01	0.1005	86.26	4.77	0.3185
DA_02	0.0586	86.96	1.29	0.3000
DA_03	0.0662	85.04	42.36	0.3518
DA_04	0.0317	86.21	2.20	0.3200

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SBE Certified Firm I TBPE Firm No. 455
TBPLS Firm No. 10048500

CORDOVA TRAILS SUBDIVISION

IMPERVIOUS AREA AND COMPOSITE CN CALCULATION
EXISTING CONDITIONS

DATE
7/21/2021

PROJECT NO.
03480

DRAWN BY:
JC

CHECKED BY:
WPM

E8

P:\03480\00\9-GIS\03480_E00_HYDROCALCS_EXISTING.dgz

PROJECT CONDITIONS

DA_ID	COVER	HSG	CN	AREA	% IMP
DA_01A	OPEN	D	80	28.95971528	10%
DA_01A	OPEN	D	80	2317.572235	10%
DA_01A	OPEN	D	80	4101.150607	10%
DA_01A	OPEN	D	80	9592.15935	10%
DA_01A	OPEN	D	80	12589.30577	10%
DA_01A	OPEN	D	80	21482.61692	10%
DA_01A	OPEN	D	80	529139.2155	10%
DA_01A	RES-1/2	D	85	2313.760805	25%
DA_01A	RES-1/2	D	85	19261.96676	25%
DA_01A	RES-1/2	D	85	21678.66976	25%
DA_01A	RES-1/2	D	85	21761.90262	25%
DA_01A	RES-1/2	D	85	21779.63811	25%
DA_01A	RES-1/2	D	85	21779.6952	25%
DA_01A	RES-1/2	D	85	21779.87114	25%
DA_01A	RES-1/2	D	85	21779.88542	25%
DA_01A	RES-1/2	D	85	21779.92096	25%
DA_01A	RES-1/2	D	85	21779.98051	25%
DA_01A	RES-1/2	D	85	21780.10429	25%
DA_01A	RES-1/2	D	85	21780.11122	25%
DA_01A	RES-1/2	D	85	21780.35646	25%
DA_01A	RES-1/2	D	85	21780.39193	25%
DA_01A	RES-1/2	D	85	21782.02971	25%
DA_01A	RES-1/8	D	92	333.6529192	65%
DA_01A	RES-1/8	D	92	12883.53732	65%
DA_01A	RES-1/8	D	92	61359.41943	65%
DA_01A	RES-1/8	D	92	68157.3082	65%
DA_01A	RES-1/8	D	92	73750.58666	65%
DA_01A	RES-1/8	D	92	76531.96261	65%
DA_01A	RES-1/8	D	92	116770.1986	65%
DA_01A	RES-1/8	D	92	120047.4695	65%
DA_01A	RES-1/8	D	92	122206.8533	65%
DA_01A	RES-1/8	D	92	123205.5261	65%
DA_01A	RES-1/8	D	92	169005.7417	65%
DA_01A	RES-1/8	D	92	172054.6004	65%
DA_01A	RES-1/8	D	92	218824.3713	65%
DA_01A	RES-1/8	D	92	386436.8566	65%
DA_01A	ROW(PAVED)	D	93	4927.371629	70%
DA_01A	ROW(PAVED)	D	93	229338.3485	76%
DA_01A	ROW(PAVED)	D	93	230667.9323	76%
DA_01A	SMALL GRAIN	D	87	446.8182443	0%
DA_01B	OPEN	D	80	7214.58288	10%
DA_01B	RES-1/8	D	92	28742.12121	65%
DA_01B	RES-1/8	D	92	97841.1689	65%
DA_01B	ROW(PAVED)	D	93	0.527338285	76%
DA_01B	SMALL GRAIN	D	87	439.5489332	0%
DA_02A	OPEN	D	80	15012.50624	10%
DA_02A	OPEN	D	80	23450.67958	10%
DA_02A	OPEN	D	80	54151.97129	10%
DA_02A	OPEN	D	80	61611.65729	10%
DA_02A	RES-1/8	D	92	68.00228229	65%
DA_02A	RES-1/8	D	92	24987.35045	65%
DA_02A	RES-1/8	D	92	41987.56892	65%
DA_02A	RES-1/8	D	92	44786.88079	65%
DA_02A	RES-1/8	D	92	47919.68396	65%
DA_02A	RES-1/8	D	92	127778.5762	65%
DA_02A	RES-1/8	D	92	147657.5927	65%
DA_02A	RES-1/8	D	92	309510.8173	65%
DA_02A	ROW(PAVED)	D	93	28686.22319	100%
DA_02A	ROW(PAVED)	D	93	76185.67919	76%
DA_02A	ROW(PAVED)	D	93	136977.9512	76%
DA_02B	RES-1/8	D	92	0.344095417	65%
DA_02B	RES-1/8	D	92	58295.93102	65%
DA_03	OPEN	D	80	1245.44025	10%
DA_03	OPEN	D	80	27114.90614	10%
DA_03	OPEN	D	80	51383.46943	10%

DA_ID	COVER	HSG	CN	AREA	% IMP
DA_03	OPEN	D	80	84453.71101	10%
DA_03	RES-1/2	C	80	106.7802899	25%
DA_03	RES-1/2	C	80	119.5158173	25%
DA_03	RES-1/2	C	80	663.2105976	25%
DA_03	RES-1/2	C	80	755.8815346	25%
DA_03	RES-1/2	C	80	788.457817	25%
DA_03	RES-1/2	C	80	1011.554281	25%
DA_03	RES-1/2	C	80	1249.196544	25%
DA_03	RES-1/2	C	80	5418.203553	25%
DA_03	RES-1/2	C	80	5521.037976	25%
DA_03	RES-1/2	C	80	6071.325215	25%
DA_03	RES-1/2	C	80	6956.170932	25%
DA_03	RES-1/2	C	80	8003.269125	25%
DA_03	RES-1/2	C	80	8291.340612	25%
DA_03	RES-1/2	C	80	9827.616523	25%
DA_03	RES-1/2	C	80	11908.09841	25%
DA_03	RES-1/2	C	80	15166.43862	25%
DA_03	RES-1/2	C	80	15547.26709	25%
DA_03	RES-1/2	C	80	15840.39131	25%
DA_03	RES-1/2	C	80	16041.56736	25%
DA_03	RES-1/2	C	80	16296.49614	25%
DA_03	RES-1/2	C	80	19649.64842	25%
DA_03	RES-1/2	C	80	19948.06041	25%
DA_03	RES-1/2	C	80	21498.97524	25%
DA_03	RES-1/2	C	80	21778.7399	25%
DA_03	RES-1/2	C	80	21778.8251	25%
DA_03	RES-1/2	C	80	21778.84557	25%
DA_03	RES-1/2	C	80	21778.85604	25%
DA_03	RES-1/2	C	80	21778.87221	25%
DA_03	RES-1/2	C	80	21779.86786	25%
DA_03	RES-1/2	C	80	22074.56841	25%
DA_03	RES-1/2	C	80	23143.91978	25%
DA_03	RES-1/2	C	80	23531.86402	25%
DA_03	RES-1/2	C	80	23718.22513	25%
DA_03	RES-1/2	C	80	23728.96516	25%
DA_03	RES-1/2	D	85	2.822380302	25%
DA_03	RES-1/2	D	85	17.31152741	25%
DA_03	RES-1/2	D	85	2555.590295	25%
DA_03	RES-1/2	D	85	3759.220587	25%
DA_03	RES-1/2	D	85	5565.114339	25%
DA_03	RES-1/2	D	85	5938.417642	25%
DA_03	RES-1/2	D	85	6232.756253	25%
DA_03	RES-1/2	D	85	6890.879516	25%
DA_03	RES-1/2	D	85	7698.726592	25%
DA_03	RES-1/2	D	85	8713.643451	25%
DA_03	RES-1/2	D	85	10775.21729	25%
DA_03	RES-1/2	D	85	11654.81109	25%
DA_03	RES-1/2	D	85	13247.6261	25%
DA_03	RES-1/2	D	85	13473.87745	25%
DA_03	RES-1/2	D	85	14588.61448	25%
DA_03	RES-1/2	D	85	15504.49728	25%
DA_03	RES-1/2	D	85	16188.71782	25%
DA_03	RES-1/2	D	85	18174.77142	25%
DA_03	RES-1/2	D	85	20530.79551	25%
DA_03	RES-1/2	D	85	20789.4325	25%
DA_03	RES-1/2	D	85	21109.33019	25%
DA_03	RES-1/2	D	85	21399.57748	25%
DA_03	RES-1/2	D	85	21709.52827	25%
DA_03	RES-1/2	D	85	21756.67109	25%
DA_03	RES-1/2	D	85	21775.18731	25%
DA_03	RES-1/2	D	85	21779.14053	25%
DA_03	RES-1/2	D	85	21779.17221	25%
DA_03	RES-1/2	D	85	21779.18981	25%
DA_03	RES-1/2	D	85	21779.20323	25%
DA_03	RES-1/2	D	85	21779.23487	25%

DA_ID	COVER	HSG	CN	AREA	% IMP
DA_03	RES-1/2	D	85	21779.29794	25%
DA_03	RES-1/2	D	85	21779.97468	25%
DA_03	RES-1/2	D	85	21779.99175	25%
DA_03	RES-1/2	D	85	21780.02303	25%
DA_03	RES-1/2	D	85	21791.76349	25%
DA_03	RES-1/2	D	85	21798.83816	25%
DA_03	RES-1/2	D	85	21942.45375	25%
DA_03	RES-1/2	D	85	21987.12318	25%
DA_03	RES-1/2	D	85	22032.11471	25%
DA_03	RES-1/2	D	85	22050.53249	25%
DA_03	RES-1/2	D	85	22411.21191	25%
DA_03	RES-1/2	D	85	22594.35167	25%
DA_03	RES-1/2	D	85	22718.78614	25%
DA_03	RES-1/2	D	85	22736.49106	25%
DA_03	RES-1/2	D	85	22754.0985	25%
DA_03	RES-1/2	D	85	22756.8695	25%
DA_03	RES-1/2	D	85	22800.25648	25%
DA_03	RES-1/2	D	85	23766.59514	25%
DA_03	RES-1/2	D	85	23915.21614	25%
DA_03	RES-1/2	D	85	23974.1504	25%
DA_03	RES-1/2	D	85	24061.66597	25%
DA_03	RES-1/8	D	92	0.133217003	65%
DA_03	RES-1/8	D	92	0.284177478	65%
DA_03	ROW(PAVED)	C	92	117902.8897	70%
DA_03	ROW(PAVED)	D	93	1279.365363	100%
DA_03	ROW(PAVED)	D	93	217558.1843	70%
DA_04	RES-HOMESTEAD	D	86	90854.74458	12%
DA_04	ROW(PAVED)	D	93	19419.73755	100%
DA_04	SMALL GRAIN	D	87	773711.8041	0%

DA_ID	A-SM	COMP-CN	% IMP	TR55_Ia
DA_01A	0.1106	89.42	58.59	0.2367
DA_01B	0.0052	91.40	62.27	0.1882
DA_02A	0.0425	90.15	63.00	0.2186
DA_02B	0.0021	90.54	58.34	0.2089
DA_03	0.0650	85.00	43.21*	0.3531
DA_04	0.0317	86.19	2.11	0.3204

CUDE ENGINEERS
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SBE Certified Firm I TBPE Firm No. 455
TBPLS Firm No. 10048500

CORDOVA TRAILS SUBDIVISION

IMPERVIOUS AREA AND COMPOSITE CN CALCULATION
PROJECT CONDITIONS

DATE
7/21/2021

PROJECT NO.
03480

DRAWN BY:
JC

CHECKED BY:
WPM

E9

1 OF 1

P:\03480\0001\0-GIS\03480_E07_HYDROCALCS_PROJECT.dgn

FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14

Project Data:		Comments:
PROJECT	CORDOVA TRACT	
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	EXISTING	
BY:	BR	
WATERSHED NAME	DA_01	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
Developed - High D. Residential (1/4 Acres)	47	53	0.28000	100%	0.28
			0.00000		0
			0.00000		0
			Total	100%	0.28

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
1	150	601.48	599.67	1.21%	3.6			25.76	25.76

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
2	1442.2	599.67	591.73	0.55%	n	1.2				20.03
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
									UPSTREAM CARRY OVER Tc (Minutes)	
									Total Tc (Minutes)	45.79
									Lag Time (Minutes)	27.47
									Lag Time (Hours)	0.46

Project Data:		Comments:
PROJECT	CORDOVA TRACT	
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	PROJECT	
BY:	BR	
WATERSHED NAME	DA_01A	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
Undeveloped - Maintained Grass		100	0.28000	100%	0.28
			0.00000		0
			0.00000		0
			Total	100%	0.28

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
1	141.52	603.35	602	0.95%	3.6			27.02	27.02

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
2	353.13	602	597.95	1.15%	n	1.73				3.4
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
3	943.31	597.95	592.5	0.58%					6.00	2.62

UPSTREAM CARRY OVER Tc (Minutes)	
Total Tc (Minutes)	33.04
Lag Time (Minutes)	19.82
Lag Time (Hours)	0.33

Project Data:		Comments:
PROJECT	CORDOVA TRACT	
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	PROJECT	
BY:	BR	
WATERSHED NAME	DA_01B	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
Developed - High D. Residential (1/4 Acres)	47	100	0.28000	100%	0.28
			0.00000		0
			0.00000		0
			Total	100%	0.28

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
1	134.61	595.09	591.32	2.80%	3.6			16.87	16.87

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)

UPSTREAM CARRY OVER Tc (Minutes)	
Total Tc (Minutes)	16.87
Lag Time (Minutes)	10.12
Lag Time (Hours)	0.17

Project Data:		Comments:
PROJECT	CORDOVA TRACT	
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	EXISTING	
BY:	BR	
WATERSHED NAME	DA_02	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
Undeveloped - Grass Short Prairie			0.15000	100%	0.15
			0.00000		0
			0.00000		0
			Total	100%	0.15

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
1	150	598	597.49	0.34%	3.6			25.96	25.96

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
2	1499	597.49	593	0.30%	n	0.88				28.39
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
3	712.76	593	591.94	0.15%					1.81	6.56

UPSTREAM CARRY OVER Tc (Minutes)	
Total Tc (Minutes)	60.91
Lag Time (Minutes)	36.55
Lag Time (Hours)	0.61

Project Data:		Comments:
PROJECT	CORDOVA TRACT	
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	PROJECT	
BY:	BR	
WATERSHED NAME	DA_02A	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
Developed - Med. D. Residential (1/3 Acres)	40	60	0.17135	100%	0.17135
			0.00000		0
			0.00000		0
			Total	100%	0.17135

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
1	150	599.73	598.86	0.58%	3.6			23.32	23.32

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
2	134.25	598.86	598.02	0.63%	n	1.28				1.75
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
3	2696.9	598.02	592.39	0.21%					6.00	7.49

UPSTREAM CARRY OVER Tc (Minutes)	
Total Tc (Minutes)	32.56
Lag Time (Minutes)	19.54
Lag Time (Hours)	0.33

Project Data:		Comments:
PROJECT	CORDOVA TRACT	
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	PROJECT	
BY:	BR	
WATERSHED NAME	DA_02B	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
Developed - High D. Residential (1/4 Acres)	47	53	0.28000	100%	0.28
			0.00000		0
			0.00000		0
			Total	100%	0.28

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
1	130	597.82	593.69	3.18%	3.6			15.6	15.6

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)

UPSTREAM CARRY OVER Tc (Minutes)	
Total Tc (Minutes)	15.60
Lag Time (Minutes)	9.36
Lag Time (Hours)	0.16

Project Data:		Comments:
PROJECT	CORDOVA TRACT	
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	EXISTING	
BY:	BR	
WATERSHED NAME	DA_03	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
Developed - Med. D. Residential (1/3 Acres)	41	100	0.28000	100%	0.28
			0.00000		0
			0.00000		0
			Total	100%	0.28

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
1	150	605.4	604.55	0.57%	3.6			34.85	34.85

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
2	162.24	604.55	602.45	1.29%	n	1.84				1.47
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
3	3443.3	602.45	592.99	0.28%					3.00	19.13

UPSTREAM CARRY OVER Tc (Minutes)	
Total Tc (Minutes)	55.45
Lag Time (Minutes)	33.27
Lag Time (Hours)	0.55

Project Data:		Comments:
PROJECT	CORDOVA TRACT	
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	PROJECT	
BY:	BR	
WATERSHED NAME	DA_03	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
Developed - Med. D. Residential (1/3 Acres)	41	59	0.28000	100%	0.28
			0.00000		0
			0.00000		0
			Total	100%	0.28

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
1	150	605.4	604.55	0.57%	3.6			34.85	34.85

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
2	162.24	604.55	602.45	1.29%	n	1.84				1.47
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
3	3443.3	602.45	592.99	0.28%					3.00	19.13

UPSTREAM CARRY OVER Tc (Minutes)	
Total Tc (Minutes)	55.45
Lag Time (Minutes)	33.27
Lag Time (Hours)	0.55

Project Data:		Comments:
PROJECT	CORDOVA TRACT	
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	EXISTING	
BY:	BR	
WATERSHED NAME	DA_04	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
Undeveloped - Grass Short Prairie		100	0.15000	100%	0.15
			0.00000		0
			0.00000		0
			Total	100%	0.15

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
1	150	594.14	594.04	0.07%	3.6			49.71	49.71

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
2	1255.1	594.04	589.99	0.32%	n	0.92				22.74
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
3	242.66	589.99	589.6	0.16%					6.00	0.67

UPSTREAM CARRY OVER Tc (Minutes)	
Total Tc (Minutes)	73.12
Lag Time (Minutes)	43.87
Lag Time (Hours)	0.73

Project Data:		Comments:
PROJECT	CORDOVA TRACT	
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	PROJECT	
BY:	BR	
WATERSHED NAME	DA_04	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
Undeveloped - Grass Short Prairie		100	0.15000	100%	0.15
			0.00000		0
			0.00000		0
			Total	100%	0.15

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
1	150	594.14	594.04	0.07%	3.6			49.71	49.71

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
2	1255.1	594.04	589.99	0.32%	n	0.92				22.74
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
3	242.66	589.99	589.6	0.16%					6.00	0.67

UPSTREAM CARRY OVER Tc (Minutes)	
Total Tc (Minutes)	73.12
Lag Time (Minutes)	43.87
Lag Time (Hours)	0.73

Project Data:		Comments:
PROJECT	CORDOVA TRACT	THE SHEET CALCULATES THE EXISTING ROUTING REACH LAG TIME FOR THE MAIN CHANNEL PASSING THROUGH DA_02
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	EXISTING	
BY:	BR	
WATERSHED NAME	R_02	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
			0.00000		0
			0.00000		0
			0.00000		0
			Total	INCOMPLETE	INCOMPLETE

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
					3.6				0

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
1	2102.7	595.01	591.94	0.15%	40	10	1.50	0.030	1.81	19.33
									UPSTREAM CARRY OVER Tc (Minutes)	
									Total Tc (Minutes)	19.33
									Lag Time (Minutes)	11.60
									Lag Time (Hours)	0.19

Project Data:		Comments:
PROJECT	CORDOVA TRACT	THE SHEET CALCULATES THE PROPOSE ROUTING REACH LAG TIME FOR THE MAIN CHANNEL PASSING THROUGH DA_02
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	PROJECT	
BY:	BR	
WATERSHED NAME	R_02	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
			0.00000		0
			0.00000		0
			0.00000		0
			Total	INCOMPLETE	INCOMPLETE

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
					3.6				0

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
1	2102.7	595.01	591.94						6.00	5.84
			``							

UPSTREAM CARRY OVER Tc (Minutes)	
Total Tc (Minutes)	5.84
Lag Time (Minutes)	3.50
Lag Time (Hours)	0.06

Project Data:		Comments:
PROJECT	CORDOVA TRACT	THE SHEET CALCULATES THE EXISTING ROUTING REACH LAG TIME FOR THE BAR DITCH AND PARALLEL CONVEYANCE PASSING THROUGH DA_04
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	EXISTING	
BY:	BR	
WATERSHED NAME	R_04	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
			0.00000		0
			0.00000		0
			0.00000		0
			Total	INCOMPLETE	INCOMPLETE

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
					3.6				0

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
1	1248.1	591.94	589.6	0.19%	500	50	1.70	0.023	2.68	7.77
									UPSTREAM CARRY OVER Tc (Minutes)	
									Total Tc (Minutes)	7.77
									Lag Time (Minutes)	4.66
									Lag Time (Hours)	0.08

Project Data:		Comments:
PROJECT	CORDOVA TRACT	THE SHEET CALCULATES THE EXISTING ROUTING REACH LAG TIME FOR THE BAR DITCH AND PARALLEL CONVEYANCE PASSING THROUGH DA_04
LOCATION	SEGUIN ETJ	
COUNTY	Guadalupe	
DATE	21-Jul-2021	
BASIN COND.	PROJECT	
BY:	BR	
WATERSHED NAME	R_04	

TIME OF CONCENTRATION

Overland Sheet Flow

Land Use	% Conc	% Grass	n value	% Land Use	Inc. 'n'
			0.00000		0
			0.00000		0
			0.00000		0
			Total	INCOMPLETE	INCOMPLETE

Segment	L (300' Max.)	Start Elev.	End Elev.	Slope	Precipitation (IN)			Tc (Minutes) Calculated	Tc (Minutes) Used
					3.6				0

Shallow Concentrated Flow

Segment	Length	Start	End	Slope	Paved	Velocity				Tc (Minutes)
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					
					n					

Channel Flow

Segment	Length	Start	End	Slope	Top	Bottom	Depth	n	Velocity	Tc (Minutes)
1	1248.1	591.94	589.6	0.19%	500	50	1.70	0.023	2.68	7.77
									UPSTREAM CARRY OVER Tc (Minutes)	
									Total Tc (Minutes)	7.77
									Lag Time (Minutes)	4.66
									Lag Time (Hours)	0.08

HEC-HMS REPORT
BASIN MODEL METHODS
LOSS METHOD : SCS CURVE NUMBER
TRANSFORM METHOD : SCS UNIT HYDROGRAPH
ROUTING METHOD : LAG

- - - - - - - - - - - - - - - - - -

CUDE ENGINEERS
TBPE NO. 455

HYDROLOGIC STUDY - SUMMARY OF DATA

BASIN MODEL: 01_EXISTING

DESCRIPTION:
VERSION: 4.2.1
UNIT SYSTEM: English

SUBBASIN TABLE

NAME	AREA (SQMI)	LOSS METHOD	IMPERVIOUS (%)	INITIAL ABSTRACTION (IN)	CN	TRANSFORM METHOD	SCS LAG (MIN)	SCS GRAPH TYPE
DA_01	0.1005	SCS	4.77	0.32	86.26	SCS	27.47	STANDARD
DA_03	0.06624	SCS	42.36	0.35	85.04	SCS	33.27	STANDARD
DA_02	0.05864	SCS	1.29	0.3	86.96	SCS	36.55	STANDARD
DA_04	0.03167	SCS	2.2	0.32	86.21	SCS	43.87	STANDARD

REACH TABLE

NAME	ROUTING METHOD	LAG (MIN)
R_02	Lag	11.6
R_04	Lag	4.66

LAST MODIFIED 15 July 2021 - 21:04:15

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HEC-HMS REPORT
BASIN MODEL METHODS
LOSS METHOD : SCS CURVE NUMBER
TRANSFORM METHOD : SCS UNIT HYDROGRAPH
ROUTING METHOD : LAG

- - - - - - - - - - - - - - - - - -

CUDE ENGINEERS
TBPE NO. 455

HYDROLOGIC STUDY - SUMMARY OF DATA

BASIN MODEL: 02_PROJECT

DESCRIPTION:
VERSION: 4.2.1
UNIT SYSTEM: English

SUBBASIN TABLE

NAME	AREA (SQMI)	LOSS METHOD	IMPERVIOUS (%)	INITIAL ABSTRACTION (IN)	CN	TRANSFORM METHOD	SCS LAG (MIN)	SCS GRAPH TYPE
DA_03	0.06498	SCS	43.21	0.35	85	SCS	33.27	STANDARD
DA_02A	0.04249	SCS	63	0.22	90.15	SCS	19.54	STANDARD
DA_02B	0.00210	SCS	58.34	0.21	90.54	SCS	9.36	STANDARD
DA_04	0.03167	SCS	2.11	0.32	86.19	SCS	43.87	STANDARD
DA_01A	0.11057	SCS	58.59	0.24	89.42	SCS	19.82	STANDARD
DA_01B	0.00524	SCS	62.27	0.19	91.4	SCS	10.12	STANDARD

REACH TABLE

NAME	ROUTING METHOD	LAG (MIN)
R_02	Lag	3.5
R_04	Lag	4.66

RESERVOIR TABLE

NAME	ROUTING METHOD	ELEVATION-AREA TABLE	DAM TOP CROSS-SECTION	
POND_02	Controlled Outflow	POND_02	POND_02_W1	POND_02_W2
POND_01	Controlled Outflow	POND_01	POND_01_W1	

For the data contained in elevation-area tables "POND_01" and "POND_02," please refer to Tables 3 and 4 in the SWMP report.
For the data contained in dam top cross-section tables "POND_01_W1," "POND_02_W1," and "POND_02_W2," please refer to Tables 6, 7, and 8 in the SWMP report.

LAST MODIFIED 20 July 2021 - 15:13:27

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HEC-HMS REPORT
SIMULATION RUN
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TBPE NO. 455

HYDROLOGIC STUDY - SUMMARY OF RESULTS

SIMULATION RUN : "EX_002"
DESCRIPTION : "2-YEAR EXISTING SIMULATION"
BASIN MODEL : "01_EXISTING"
METEOROLOGICAL MODEL : "SEGUIN_002"
CONTROL SPECIFICATION : "Control 1"
SIMULATION START : "31Dec2018, 24:00"
SIMULATION END : "02Jan2019, 00:05"

SUBBASIN TABLE

SUBBASIN	DRAINAGE AREA(SQMI)	PRECIPITATION (IN)	LOSS (IN)	EXCESS (IN)	PEAK DISCHARGE (CFS)	UNIT PEAK DISCHARGE (CFS/SQMI)	TIME OF PEAK	DISCHARGE VOLUME (AC-FT)
DA_01	0.1005	3.60	1.32	2.28	78.6	782.09	01Jan2019, 12:30	12.12
DA_03	0.06624	3.60	0.86	2.74	52.8	797.1	01Jan2019, 12:35	9.61
DA_02	0.05864	3.60	1.31	2.29	40.1	683.83	01Jan2019, 12:40	7.08
DA_04	0.03167	3.60	1.36	2.24	19.1	603.09	01Jan2019, 12:50	3.73

JUNCTION TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE (CF/S)	TIME OF PEAK	UNIT PEAK DISCHARGE (CFS/SQMI)	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
J_02	0.12488	92.0	01Jan2019, 12:45	736.71	16.67	2.50
J_01	0.1005	78.6	01Jan2019, 12:30	782.09	12.12	2.26
J_03	0.15655	110.7	01Jan2019, 12:50	707.12	20.39	2.44

REACH TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE IN (CFS)	TIME OF PEAK IN	PEAK DISCHARGE OUT (CFS)	TIME OF PEAK OUT	REDUCTION COEFFICIENT	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
R_02	0.06624	52.8	01Jan2019, 12:35	52.4	01Jan2019, 12:50	0.99	9.59	2.71
R_04	0.12488	92.0	01Jan2019, 12:45	91.7	01Jan2019, 12:50	1	16.66	2.50

LATEST SIMULATION

21Jul2021, 10:22:27

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TBPE NO. 455

HYDROLOGIC STUDY - SUMMARY OF RESULTS

SIMULATION RUN : "EX_010"
DESCRIPTION : "10-YEAR EXISTING SIMULATION"
BASIN MODEL : "01_EXISTING"
METEOROLOGICAL MODEL : "SEGUIN_010"
CONTROL SPECIFICATION : "Control 1"
SIMULATION START : "31Dec2018, 24:00"
SIMULATION END : "02Jan2019, 00:05"

SUBBASIN TABLE

SUBBASIN	DRAINAGE AREA(SQMI)	PRECIPITATION (IN)	LOSS (IN)	EXCESS (IN)	PEAK DISCHARGE (CFS)	UNIT PEAK DISCHARGE (CFS/SQMI)	TIME OF PEAK	DISCHARGE VOLUME (AC-FT)
DA_01	0.1005	6.05	1.49	4.56	155.5	1547.26	01Jan2019, 12:30	24.30
DA_03	0.06624	6.05	0.98	5.07	98.0	1479.47	01Jan2019, 12:35	17.80
DA_02	0.05864	6.05	1.47	4.58	79.1	1348.91	01Jan2019, 12:40	14.21
DA_04	0.03167	6.05	1.54	4.51	38.0	1199.87	01Jan2019, 12:45	7.55

JUNCTION TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE (CF/S)	TIME OF PEAK	UNIT PEAK DISCHARGE (CFS/SQMI)	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
J_02	0.12488	175.0	01Jan2019, 12:45	1401.35	31.97	4.80
J_01	0.1005	155.5	01Jan2019, 12:30	1547.26	24.30	4.53
J_03	0.15655	212.1	01Jan2019, 12:50	1354.84	39.49	4.73

REACH TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE IN (CFS)	TIME OF PEAK IN	PEAK DISCHARGE OUT (CFS)	TIME OF PEAK OUT	REDUCTION COEFFICIENT	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
R_02	0.06624	98.0	01Jan2019, 12:35	97.4	01Jan2019, 12:45	0.99	17.76	5.03
R_04	0.12488	175.0	01Jan2019, 12:45	174.2	01Jan2019, 12:50	1	31.95	4.80

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21Jul2021, 10:22:28

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HYDROLOGIC STUDY - SUMMARY OF RESULTS

SIMULATION RUN : "EX_025"
DESCRIPTION : "25-YEAR EXISTING SIMULATION"
BASIN MODEL : "01_EXISTING"
METEOROLOGICAL MODEL : "SEGUIN_025"
CONTROL SPECIFICATION : "Control 1"
SIMULATION START : "31Dec2018, 24:00"
SIMULATION END : "02Jan2019, 00:05"

SUBBASIN TABLE

SUBBASIN	DRAINAGE AREA(SQMI)	PRECIPITATION (IN)	LOSS (IN)	EXCESS (IN)	PEAK DISCHARGE (CFS)	UNIT PEAK DISCHARGE (CFS/SQMI)	TIME OF PEAK	DISCHARGE VOLUME (AC-FT)
DA_01	0.1005	7.50	1.54	5.96	201.1	2001	01Jan2019, 12:30	31.74
DA_03	0.06624	7.50	1.02	6.48	124.9	1885.57	01Jan2019, 12:35	22.75
DA_02	0.05864	7.50	1.52	5.98	102.2	1742.84	01Jan2019, 12:40	18.55
DA_04	0.03167	7.50	1.59	5.91	49.2	1553.52	01Jan2019, 12:45	9.88

JUNCTION TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE (CF/S)	TIME OF PEAK	UNIT PEAK DISCHARGE (CFS/SQMI)	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
J_02	0.12488	224.2	01Jan2019, 12:45	1795.32	41.26	6.20
J_01	0.1005	201.1	01Jan2019, 12:30	2001	31.74	5.92
J_03	0.15655	272.2	01Jan2019, 12:50	1738.74	51.11	6.12

REACH TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE IN (CFS)	TIME OF PEAK IN	PEAK DISCHARGE OUT (CFS)	TIME OF PEAK OUT	REDUCTION COEFFICIENT	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
R_02	0.06624	124.9	01Jan2019, 12:35	124.2	01Jan2019, 12:45	0.99	22.71	6.43
R_04	0.12488	224.2	01Jan2019, 12:45	223.1	01Jan2019, 12:50	1	41.23	6.19

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HYDROLOGIC STUDY - SUMMARY OF RESULTS

SIMULATION RUN : "EX_050"
DESCRIPTION : "50-YEAR EXISTING SIMULATION"
BASIN MODEL : "01_EXISTING"
METEOROLOGICAL MODEL : "SEGUIN_050"
CONTROL SPECIFICATION : "Control 1"
SIMULATION START : "31Dec2018, 24:00"
SIMULATION END : "02Jan2019, 00:05"

SUBBASIN TABLE

SUBBASIN	DRAINAGE AREA(SQMI)	PRECIPITATION (IN)	LOSS (IN)	EXCESS (IN)	PEAK DISCHARGE (CFS)	UNIT PEAK DISCHARGE (CFS/SQMI)	TIME OF PEAK	DISCHARGE VOLUME (AC-FT)
DA_01	0.1005	8.90	1.58	7.32	244.9	2436.82	01Jan2019, 12:30	39.00
DA_03	0.06624	8.90	1.04	7.86	150.8	2276.57	01Jan2019, 12:35	27.58
DA_02	0.05864	8.90	1.56	7.34	124.3	2119.71	01Jan2019, 12:40	22.79
DA_04	0.03167	8.90	1.63	7.27	60.1	1897.69	01Jan2019, 12:45	12.16

JUNCTION TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE (CF/S)	TIME OF PEAK	UNIT PEAK DISCHARGE (CFS/SQMI)	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
J_02	0.12488	271.5	01Jan2019, 12:45	2174.09	50.31	7.55
J_01	0.1005	244.9	01Jan2019, 12:30	2436.82	39.00	7.28
J_03	0.15655	330.0	01Jan2019, 12:50	2107.95	62.44	7.48

REACH TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE IN (CFS)	TIME OF PEAK IN	PEAK DISCHARGE OUT (CFS)	TIME OF PEAK OUT	REDUCTION COEFFICIENT	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
R_02	0.06624	150.8	01Jan2019, 12:35	150.0	01Jan2019, 12:45	0.99	27.52	7.79
R_04	0.12488	271.5	01Jan2019, 12:45	270.1	01Jan2019, 12:50	0.99	50.28	7.55

LATEST SIMULATION

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HYDROLOGIC STUDY - SUMMARY OF RESULTS

SIMULATION RUN : "EX_100"
DESCRIPTION : "100-YEAR EXISTING SIMULATION"
BASIN MODEL : "01_EXISTING"
METEOROLOGICAL MODEL : "SEGUIN_100"
CONTROL SPECIFICATION : "Control 1"
SIMULATION START : "31Dec2018, 24:00"
SIMULATION END : "02Jan2019, 00:05"

SUBBASIN TABLE

SUBBASIN	DRAINAGE AREA(SQMI)	PRECIPITATION (IN)	LOSS (IN)	EXCESS (IN)	PEAK DISCHARGE (CFS)	UNIT PEAK DISCHARGE (CFS/SQMI)	TIME OF PEAK	DISCHARGE VOLUME (AC-FT)
DA_01	0.1005	10.00	1.61	8.39	279.2	2778.11	01Jan2019, 12:30	44.75
DA_03	0.06624	10.00	1.06	8.94	171.1	2583.03	01Jan2019, 12:35	31.38
DA_02	0.05864	10.00	1.58	8.42	141.6	2414.73	01Jan2019, 12:40	26.14
DA_04	0.03167	10.00	1.66	8.34	68.6	2166.09	01Jan2019, 12:45	13.96

JUNCTION TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE (CF/S)	TIME OF PEAK	UNIT PEAK DISCHARGE (CFS/SQMI)	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
J_02	0.12488	308.6	01Jan2019, 12:45	2471.17	57.46	8.63
J_01	0.1005	279.2	01Jan2019, 12:30	2778.11	44.75	8.35
J_03	0.15655	375.2	01Jan2019, 12:50	2396.68	71.38	8.55

REACH TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE IN (CFS)	TIME OF PEAK IN	PEAK DISCHARGE OUT (CFS)	TIME OF PEAK OUT	REDUCTION COEFFICIENT	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
R_02	0.06624	171.1	01Jan2019, 12:35	170.2	01Jan2019, 12:45	0.99	31.32	8.87
R_04	0.12488	308.6	01Jan2019, 12:45	306.9	01Jan2019, 12:50	0.99	57.42	8.62

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HYDROLOGIC STUDY - SUMMARY OF RESULTS

SIMULATION RUN : "PRJ_002"
DESCRIPTION : "2-YEAR PROJECT SIMULATION"
BASIN MODEL : "02_PROJECT"
METEOROLOGICAL MODEL : "SEGUIN_002"
CONTROL SPECIFICATION : "Control 1"
SIMULATION START : "31Dec2018, 24:00"
SIMULATION END : "02Jan2019, 00:05"

SUBBASIN TABLE

SUBBASIN	DRAINAGE AREA(SQMI)	PRECIPITATION (IN)	LOSS (IN)	EXCESS (IN)	PEAK DISCHARGE (CFS)	UNIT PEAK DISCHARGE (CFS/SQMI)	TIME OF PEAK	DISCHARGE VOLUME (AC-FT)
DA_03	0.06498	3.60	0.85	2.75	51.9	798.71	01Jan2019, 12:35	9.46
DA_02A	0.04249	3.60	0.39	3.21	49.3	1160.27	01Jan2019, 12:20	7.26
DA_02B	0.00210	3.60	0.42	3.18	3.1	1476.19	01Jan2019, 12:10	0.36
DA_04	0.03167	3.60	1.37	2.23	19.0	599.94	01Jan2019, 12:50	3.73
DA_01A	0.11057	3.60	0.46	3.14	125.2	1132.31	01Jan2019, 12:20	18.45
DA_01B	0.00524	3.60	0.35	3.25	7.7	1469.47	01Jan2019, 12:10	0.91

JUNCTION TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE (CF/S)	TIME OF PEAK	UNIT PEAK DISCHARGE (CFS/SQMI)	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
J_02	0.10957	91.7	01Jan2019, 12:35	836.91	17.07	2.92
J_03	0.14124	109.2	01Jan2019, 12:40	773.15	20.78	2.76
J_01	0.11581	76.3	01Jan2019, 12:40	658.84	18.79	3.04

REACH TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE IN (CFS)	TIME OF PEAK IN	PEAK DISCHARGE OUT (CFS)	TIME OF PEAK OUT	REDUCTION COEFFICIENT	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
R_02	0.06498	51.9	01Jan2019, 12:35	51.7	01Jan2019, 12:40	1	9.46	2.73
R_04	0.10957	91.7	01Jan2019, 12:35	90.9	01Jan2019, 12:40	0.99	17.06	2.92

RESERVOIR TABLE

RESERVOIR	PEAK INFLOW (CFS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION (FT)	PEAK STORAGE (AC-FT)
POND_02	92.0	90.5	593.27	0.64
POND_01	125.2	74.4	592.03	5.09

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21Jul2021, 11:40:38

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SIMULATION RUN
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TBPE NO. 455

HYDROLOGIC STUDY - SUMMARY OF RESULTS

SIMULATION RUN : "PRJ_010"
DESCRIPTION : "10-YEAR PROJECT SIMULATION"
BASIN MODEL : "02_PROJECT"
METEOROLOGICAL MODEL : "SEGUIN_010"
CONTROL SPECIFICATION : "Control 1"
SIMULATION START : "31Dec2018, 24:00"
SIMULATION END : "02Jan2019, 00:05"

SUBBASIN TABLE

SUBBASIN	DRAINAGE AREA(SQMI)	PRECIPITATION (IN)	LOSS (IN)	EXCESS (IN)	PEAK DISCHARGE (CFS)	UNIT PEAK DISCHARGE (CFS/SQMI)	TIME OF PEAK	DISCHARGE VOLUME (AC-FT)
DA_03	0.06498	6.05	0.97	5.08	96.2	1480.46	01Jan2019, 12:35	17.50
DA_02A	0.04249	6.05	0.42	5.63	86.0	2024.01	01Jan2019, 12:20	12.71
DA_02B	0.00210	6.05	0.46	5.59	5.5	2619.05	01Jan2019, 12:10	0.63
DA_04	0.03167	6.05	1.54	4.51	37.9	1196.72	01Jan2019, 12:45	7.54
DA_01A	0.11057	6.05	0.51	5.54	220.2	1991.5	01Jan2019, 12:20	32.59
DA_01B	0.00524	6.05	0.38	5.67	13.4	2557.25	01Jan2019, 12:10	1.58

JUNCTION TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE (CF/S)	TIME OF PEAK	UNIT PEAK DISCHARGE (CFS/SQMI)	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
J_02	0.10957	169.8	01Jan2019, 12:30	1549.69	30.80	5.27
J_03	0.14124	203.4	01Jan2019, 12:35	1440.1	38.32	5.09
J_01	0.11581	148.5	01Jan2019, 12:40	1282.27	33.38	5.41

REACH TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE IN (CFS)	TIME OF PEAK IN	PEAK DISCHARGE OUT (CFS)	TIME OF PEAK OUT	REDUCTION COEFFICIENT	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
R_02	0.06498	96.2	01Jan2019, 12:35	95.8	01Jan2019, 12:40	1	17.49	5.05
R_04	0.10957	169.8	01Jan2019, 12:30	168.7	01Jan2019, 12:35	0.99	30.78	5.27

RESERVOIR TABLE

RESERVOIR	PEAK INFLOW (CFS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION (FT)	PEAK STORAGE (AC-FT)
POND_02	166.0	167.2	593.48	0.81
POND_01	220.2	144.5	592.31	7.91

LATEST SIMULATION

21Jul2021, 11:40:40

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SIMULATION RUN
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HYDROLOGIC STUDY - SUMMARY OF RESULTS

SIMULATION RUN : "PRJ_025"
DESCRIPTION : "25-YEAR PROJECT SIMULATION"
BASIN MODEL : "02_PROJECT"
METEOROLOGICAL MODEL : "SEGUIN_025"
CONTROL SPECIFICATION : "Control 1"
SIMULATION START : "31Dec2018, 24:00"
SIMULATION END : "02Jan2019, 00:05"

SUBBASIN TABLE

SUBBASIN	DRAINAGE AREA(SQMI)	PRECIPITATION (IN)	LOSS (IN)	EXCESS (IN)	PEAK DISCHARGE (CFS)	UNIT PEAK DISCHARGE (CFS/SQMI)	TIME OF PEAK	DISCHARGE VOLUME (AC-FT)
DA_03	0.06498	7.50	1.00	6.50	122.6	1886.73	01Jan2019, 12:35	22.36
DA_02A	0.04249	7.50	0.43	7.07	107.6	2532.36	01Jan2019, 12:20	15.96
DA_02B	0.00210	7.50	0.47	7.03	6.9	3285.71	01Jan2019, 12:10	0.79
DA_04	0.03167	7.50	1.60	5.90	49.2	1553.52	01Jan2019, 12:45	9.87
DA_01A	0.11057	7.50	0.52	6.98	276.3	2498.87	01Jan2019, 12:20	41.03
DA_01B	0.00524	7.50	0.39	7.11	16.7	3187.02	01Jan2019, 12:10	1.99

JUNCTION TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE (CF/S)	TIME OF PEAK	UNIT PEAK DISCHARGE (CFS/SQMI)	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
J_02	0.10957	215.0	01Jan2019, 12:30	1962.22	39.06	6.68
J_03	0.14124	258.7	01Jan2019, 12:35	1831.63	48.91	6.49
J_01	0.11581	192.9	01Jan2019, 12:40	1665.66	42.11	6.82

REACH TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE IN (CFS)	TIME OF PEAK IN	PEAK DISCHARGE OUT (CFS)	TIME OF PEAK OUT	REDUCTION COEFFICIENT	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
R_02	0.06498	122.6	01Jan2019, 12:35	122.0	01Jan2019, 12:40	1	22.35	6.45
R_04	0.10957	215.0	01Jan2019, 12:30	213.5	01Jan2019, 12:35	0.99	39.04	6.68

RESERVOIR TABLE

RESERVOIR	PEAK INFLOW (CFS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION (FT)	PEAK STORAGE (AC-FT)
POND_02	209.9	211.8	593.56	0.88
POND_01	276.3	188.0	592.47	9.40

LATEST SIMULATION

21Jul2021, 11:40:41

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HYDROLOGIC STUDY - SUMMARY OF RESULTS

SIMULATION RUN : "PRJ_050"
DESCRIPTION : "50-YEAR PROJECT SIMULATION"
BASIN MODEL : "02_PROJECT"
METEOROLOGICAL MODEL : "SEGUIN_050"
CONTROL SPECIFICATION : "Control 1"
SIMULATION START : "31Dec2018, 24:00"
SIMULATION END : "02Jan2019, 00:05"

SUBBASIN TABLE

SUBBASIN	DRAINAGE AREA(SQMI)	PRECIPITATION (IN)	LOSS (IN)	EXCESS (IN)	PEAK DISCHARGE (CFS)	UNIT PEAK DISCHARGE (CFS/SQMI)	TIME OF PEAK	DISCHARGE VOLUME (AC-FT)
DA_03	0.06498	8.90	1.03	7.87	148.0	2277.62	01Jan2019, 12:35	27.09
DA_02A	0.04249	8.90	0.44	8.46	128.4	3021.89	01Jan2019, 12:20	19.11
DA_02B	0.00210	8.90	0.48	8.42	8.2	3904.76	01Jan2019, 12:10	0.94
DA_04	0.03167	8.90	1.64	7.26	60.1	1897.69	01Jan2019, 12:45	12.15
DA_01A	0.11057	8.90	0.53	8.37	330.2	2986.34	01Jan2019, 12:20	49.20
DA_01B	0.00524	8.90	0.39	8.51	19.9	3797.71	01Jan2019, 12:10	2.37

JUNCTION TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE (CF/S)	TIME OF PEAK	UNIT PEAK DISCHARGE (CFS/SQMI)	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
J_02	0.10957	258.7	01Jan2019, 12:30	2361.05	47.08	8.06
J_03	0.14124	312.0	01Jan2019, 12:35	2209.01	59.20	7.86
J_01	0.11581	236.3	01Jan2019, 12:40	2040.41	50.57	8.19

REACH TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE IN (CFS)	TIME OF PEAK IN	PEAK DISCHARGE OUT (CFS)	TIME OF PEAK OUT	REDUCTION COEFFICIENT	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
R_02	0.06498	148.0	01Jan2019, 12:35	147.2	01Jan2019, 12:40	0.99	27.08	7.81
R_04	0.10957	258.7	01Jan2019, 12:30	256.7	01Jan2019, 12:35	0.99	47.05	8.05

RESERVOIR TABLE

RESERVOIR	PEAK INFLOW (CFS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION (FT)	PEAK STORAGE (AC-FT)
POND_02	252.2	254.8	593.63	0.94
POND_01	330.2	230.4	592.60	10.75

LATEST SIMULATION

21Jul2021, 11:40:42

CUDE ENGINEERS
- -
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HEC-HMS REPORT
SIMULATION RUN
- - - - - - - - - - - - - - - - - -
CUDE ENGINEERS
TBPE NO. 455

HYDROLOGIC STUDY - SUMMARY OF RESULTS

SIMULATION RUN : "PRJ_100"
DESCRIPTION : "100-YEAR PROJECT SIMULATION"
BASIN MODEL : "02_PROJECT"
METEOROLOGICAL MODEL : "SEGUIN_100"
CONTROL SPECIFICATION : "Control 1"
SIMULATION START : "31Dec2018, 24:00"
SIMULATION END : "02Jan2019, 00:05"

SUBBASIN TABLE

SUBBASIN	DRAINAGE AREA(SQMI)	PRECIPITATION (IN)	LOSS (IN)	EXCESS (IN)	PEAK DISCHARGE (CFS)	UNIT PEAK DISCHARGE (CFS/SQMI)	TIME OF PEAK	DISCHARGE VOLUME (AC-FT)
DA_03	0.06498	10.00	1.05	8.95	168.0	2585.41	01Jan2019, 12:35	30.83
DA_02A	0.04249	10.00	0.44	9.56	144.8	3407.86	01Jan2019, 12:20	21.58
DA_02B	0.00210	10.00	0.48	9.52	9.2	4380.95	01Jan2019, 12:10	1.06
DA_04	0.03167	10.00	1.66	8.34	68.6	2166.09	01Jan2019, 12:45	13.96
DA_01A	0.11057	10.00	0.54	9.46	372.5	3368.91	01Jan2019, 12:20	55.63
DA_01B	0.00524	10.00	0.39	9.61	22.5	4293.89	01Jan2019, 12:10	2.68

JUNCTION TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE (CF/S)	TIME OF PEAK	UNIT PEAK DISCHARGE (CFS/SQMI)	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
J_02	0.10957	292.9	01Jan2019, 12:30	2673.18	53.38	9.13
J_03	0.14124	353.8	01Jan2019, 12:35	2504.96	67.30	8.93
J_01	0.11581	271.4	01Jan2019, 12:35	2343.49	57.23	9.27

REACH TABLE

NAME	DRAINAGE AREA (SQMI)	PEAK DISCHARGE IN (CFS)	TIME OF PEAK IN	PEAK DISCHARGE OUT (CFS)	TIME OF PEAK OUT	REDUCTION COEFFICIENT	DISCHARGE VOLUME (AC-FT)	DISCHARGE VOLUME (IN)
R_02	0.06498	168.0	01Jan2019, 12:35	167.0	01Jan2019, 12:40	0.99	30.81	8.89
R_04	0.10957	292.9	01Jan2019, 12:30	290.6	01Jan2019, 12:35	0.99	53.34	9.13

RESERVOIR TABLE

RESERVOIR	PEAK INFLOW (CFS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION (FT)	PEAK STORAGE (AC-FT)
POND_02	285.4	288.6	593.69	0.98
POND_01	372.5	264.0	592.70	11.77

LATEST SIMULATION

21Jul2021, 11:40:43

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STREET CAPACITY ANALYSIS

CUDE ENGINEERS

4122 POND HILL ROAD, STE 101
SAN ANTONIO, TEXAS 78231

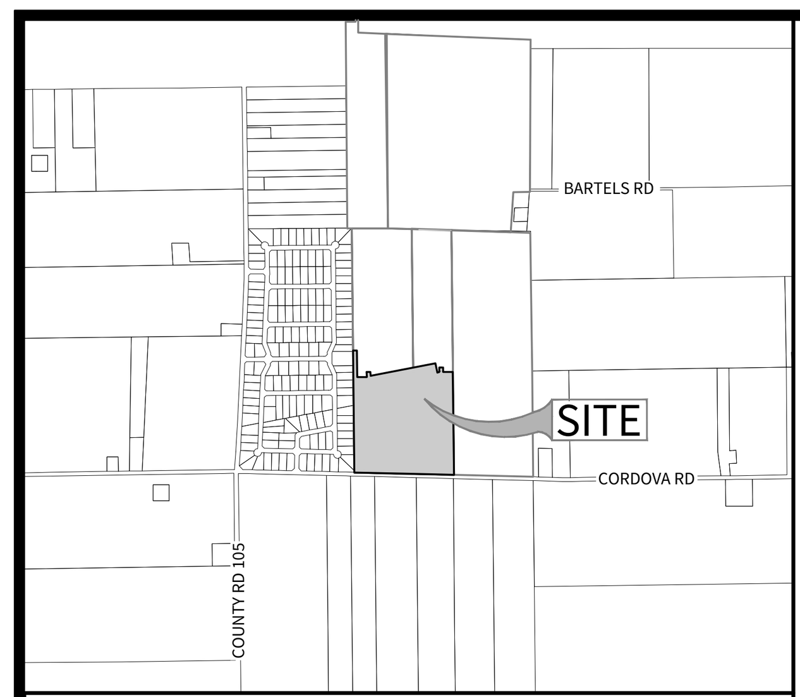
PHONE: (210) 681-2951
CUDEENGINEERS.COM

TBPE NO. 455
TBPLS NO. 10048500

Project Name: Legendary Trails Subdivision
Calculation Summary for Time of Concentrations & Ultimate Flow "Q"

Precipitation Area Atlas 14 = PA2

HYDROLOGY					Sheet Flow Tc Compuations						Shallow Conc. Tc Computations					Concentrated Tc Computations			Overall	INTENSITY				Q FLOW				
Drainage Shed	Area (Ac.)	AREA OF ACCUMULATION (Ac.)	Rational Shed Area (Ac.)	C	Length < 300'	Paved (Y or N)	Upstream Elev.	Downstream Elev	Slope	Time of Concentration	Length < 650'	Paved (Y or N)	Downstream Elev	Slope	Time of Concentration	Length	Velocity (fps)	Time of Concentration	Time of Concentration (min)	I5	I10	I25	I100	Q5	Q10	Q25	Q100	Drainage Shed
1	2.03	A1	2.03	0.65	140.00	N	603.94	601.77	1.55%	15.90						240.16	6	0.67	16.56	5.05	5.88	7.01	8.77	6.66	7.76	9.25	11.57	1
2	0.61	A1:A2	2.64	0.65	140.00	N	603.94	601.77	1.55%	15.90						433.62	6	1.20	17.10	4.96	5.78	6.89	8.62	8.51	9.92	11.82	14.79	2
3	3.34	A3	3.34	0.65	140.00	N	603.04	600.87	1.55%	15.90						442.00	6	1.23	17.13	4.96	5.77	6.89	8.61	10.77	12.53	14.96	18.69	3
4	4.37	A4	4.37	0.65	225.46	N	602.59	600.19	1.06%	19.91						329.22	6	0.91	20.82	4.48	5.21	6.22	7.75	12.73	14.80	17.67	22.01	4
5	2.01	A3:A5	9.72	0.65	225.46	N	602.59	600.19	1.06%	19.91						811.09	6	2.25	22.16	4.34	5.04	6.02	7.51	27.42	31.84	38.03	47.45	5
6	1.97	A6	1.97	0.65	130.00	N	602.88	601.44	1.11%	16.28						386.64	6	1.07	17.36	4.92	5.73	6.84	8.55	6.30	7.34	8.76	10.95	6
7	0.36	A6:A7	2.33	0.65	130.00	N	602.88	601.44	1.11%	16.28						706.73	6	1.96	18.25	4.79	5.58	6.66	8.32	7.25	8.45	10.09	12.60	7
8	0.78	A6:A8	3.11	0.65	130.00	N	602.88	601.44	1.11%	16.28						907.08	6	2.52	18.80	4.72	5.49	6.56	8.19	9.54	11.10	13.26	16.56	8
9	1.89	A9	1.89	0.65	122.60	N	602.35	599.30	2.49%	13.15						322.55	6	0.90	14.05	5.50	6.42	7.66	9.62	6.76	7.89	9.41	11.82	9
10	2.04	A10	2.04	0.65	163.49	N	604.23	602.42	1.11%	17.92						268.02	6	0.74	18.66	4.74	5.52	6.58	8.22	6.29	7.32	8.73	10.90	10
11	3.31	A10+A11	5.35	0.65	163.49	N	604.23	602.42	1.11%	17.92						753.14	6	2.09	20.01	4.57	5.32	6.35	7.92	15.89	18.50	22.08	27.54	11
12	3.01	A12	3.01	0.65	108.03	N	603.49	602.17	1.22%	14.96						626.40	6	1.74	16.70	5.02	5.85	6.98	8.73	9.82	11.45	13.66	17.08	12
13	0.36	A12:A13	3.37	0.65	108.03	N	603.49	602.17	1.22%	14.96						961.16	6	2.67	17.63	4.88	5.68	6.78	8.48	10.69	12.44	14.85	18.58	13
14	1.07	A12:A14	4.44	0.65	108.03	N	603.49	602.17	1.22%	14.96						1128.27	6	3.13	18.09	4.82	5.61	6.69	8.36	13.91	16.19	19.31	24.13	14



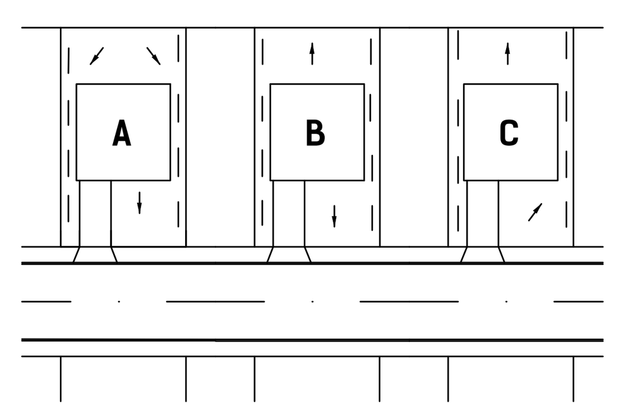
LOCATION MAP
N.T.S.

OWNER/DEVELOPER:
ASHTON WOODS HOMES
CONTACT PERSON: KYLE LENTS
17319 SAN PEDRO, SUITE 140
SAN ANTONIO,TX 78232
TEL: (210) 632-0753

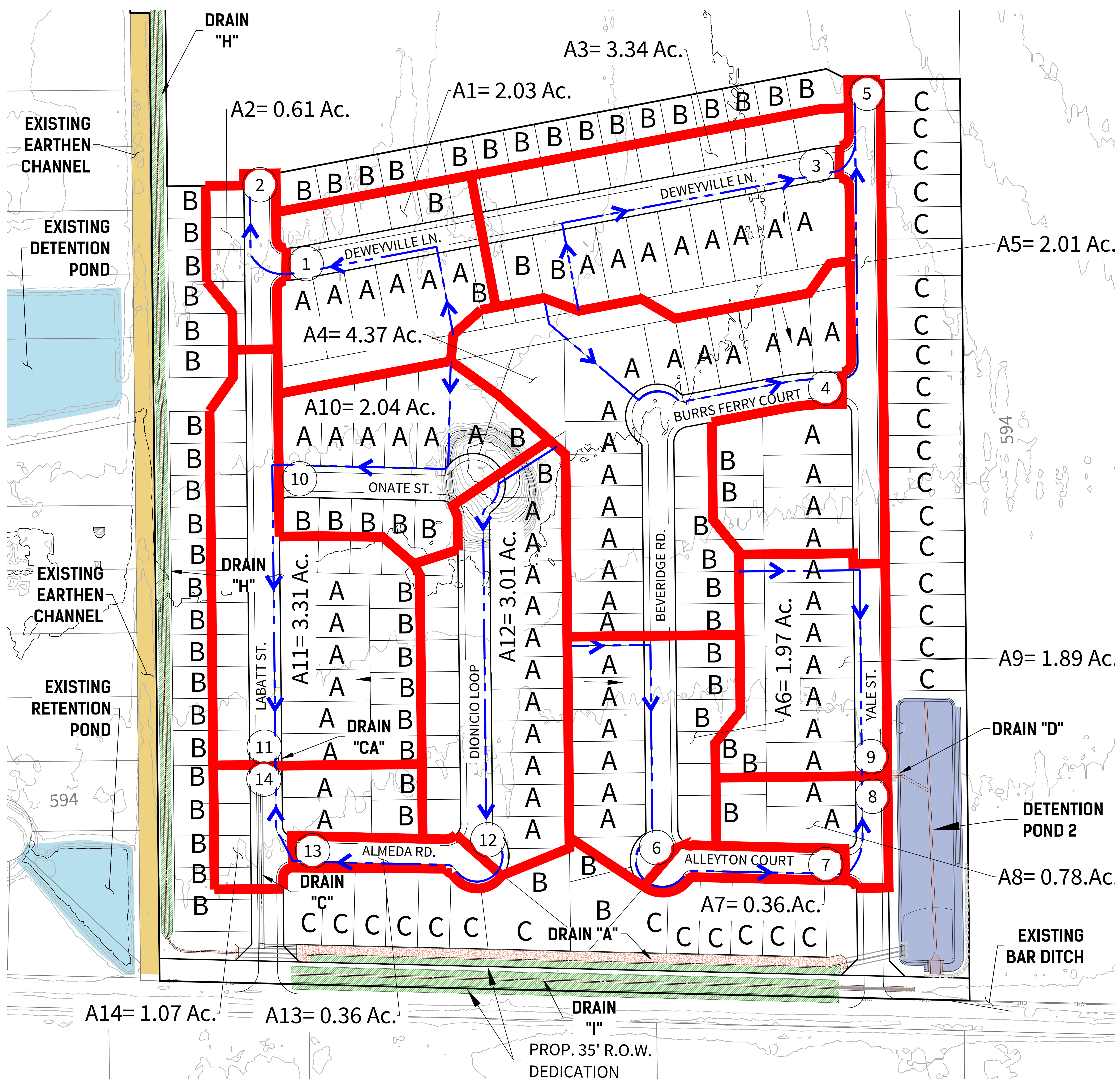
CIVIL ENGINEER:
M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: DAVID CUPIT, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

SCALE: 1" =300'

LEGEND
- UNIT BOUNDARY
- DRAINAGE AREA
- Tc FLOW PATH
- ACCUMULATION POINT
- EXISTING EARTHEN DRAIN
- PROPOSED EARTHEN DRAIN
- EXISTING CONCRETE DRAIN
- PROPOSED CONCRETE DRAIN
- EXISTING DETENTION POND
- PROPOSED DETENTION POND



TYPICAL LOT SITE PLAN
N.T.S.



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CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORDOVA TRAILS SUBDIVISION UNIT 1
STREET SUB-DRAINAGE AREAS

DATE	09/23/2021
PROJECT NO.	03480.002
DRAWN BY	AC
CHECKED BY	DDC/JC

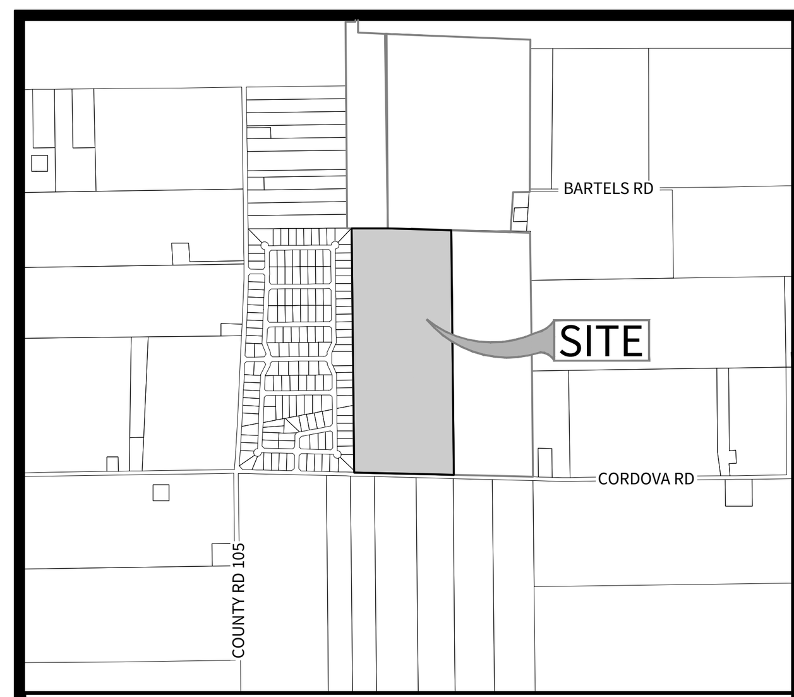
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

APPROVED FOR CONSTRUCTION SEGUIN TEXAS
01/14/2022

EXH
1 OF 1

FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14



LOCATION MAP
N.T.S.

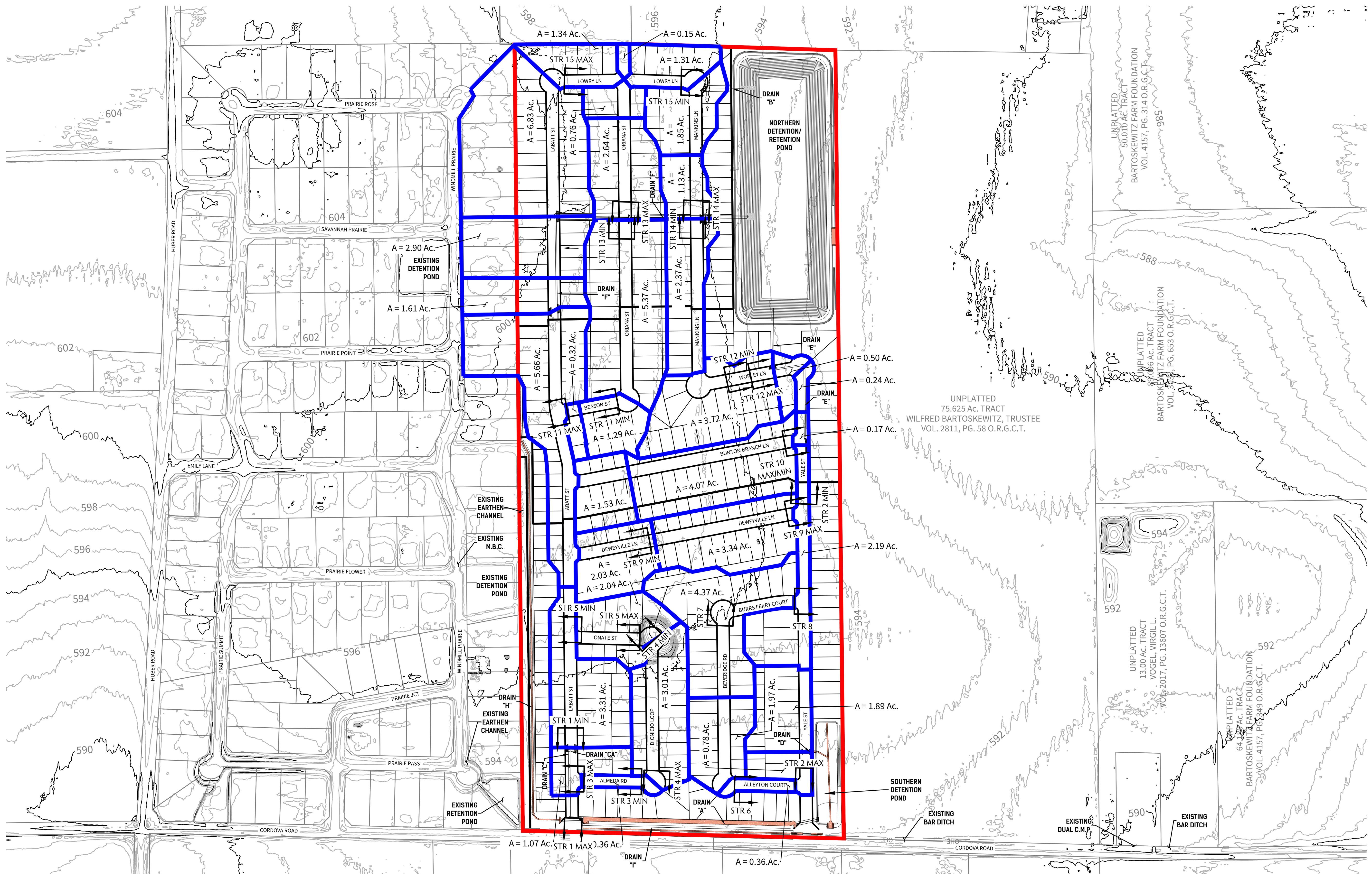
OWNER/DEVELOPER:
ASHTON WOODS HOMES
CONTACT PERSON: KYLE LENTS
17319 SAN PEDRO, SUITE 140
SAN ANTONIO,TX 78232
TEL: (210) 632-0753

CIVIL ENGINEER:
M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: DAVID CUPIT, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

SCALE: 1" =300'

LEGEND

SITE BOUNDARY	(red line)
DRAINAGE AREA BOUNDARY	(blue line)



APPROVED FOR CONSTRUCTION SEGUIN TEXAS
01/14/2022

PLAN AND PROFILE SHEETS HAVE NOT BEEN FINALIZED. HOWEVER, WE ARE SHOWING THE PROPOSED LOCAL STREETS AT MINIMUM PERCENT REPRESENTING THE WORST CASE SCENARIO FOR CAPACITY, PROVING THE PROPOSED DRAINAGE AREAS WILL WORK.

CUDEENGINEERS.COM
CUDE EST. 1980 ENGINEERS
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San Antonio, Texas 78231
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CORDOVA TRAILS SUBDIVISION UNIT 1
STREET CROSS SECTION LOCATIONS

DATE	09/23/2021
PROJECT NO.	03480.002
DRAWN BY	AC
CHECKED BY	DDC/JC

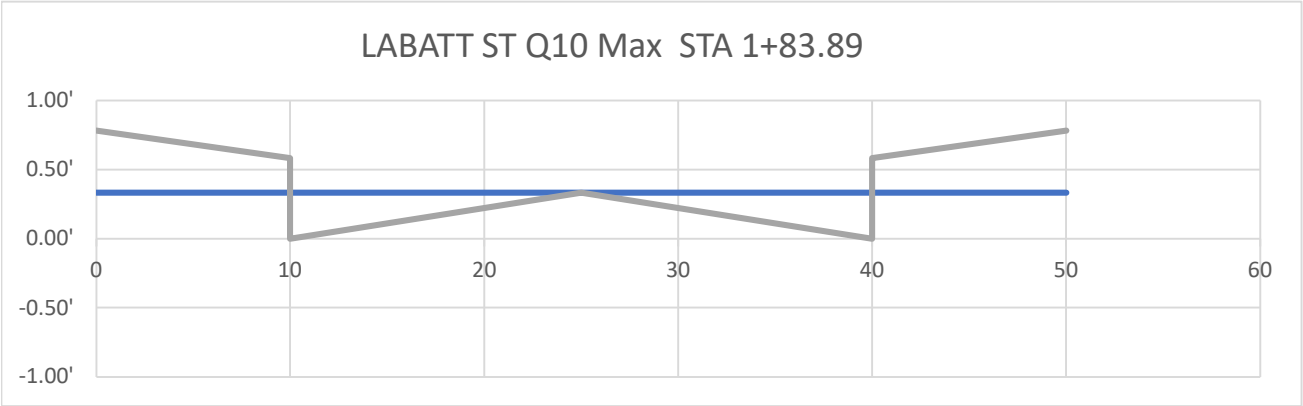
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.

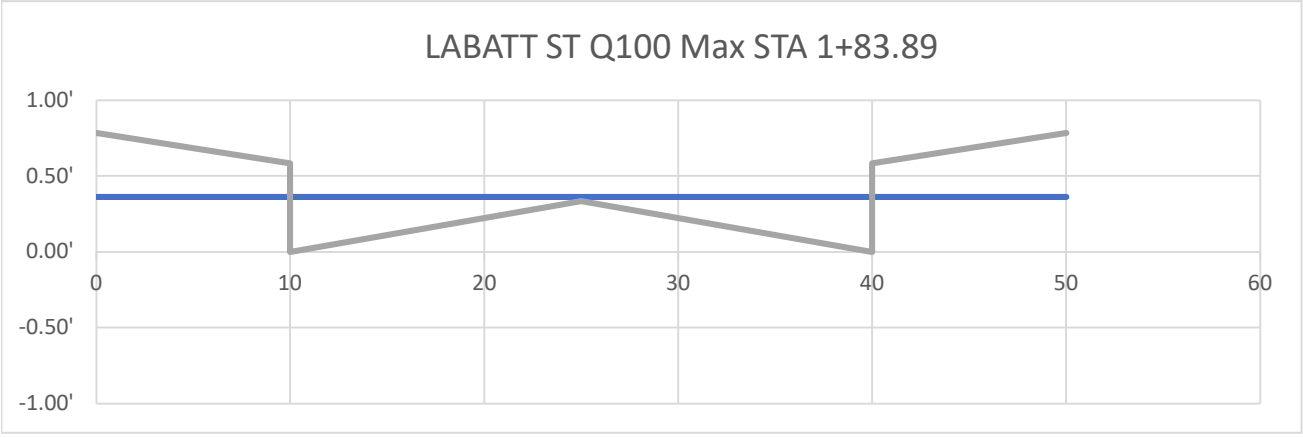
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

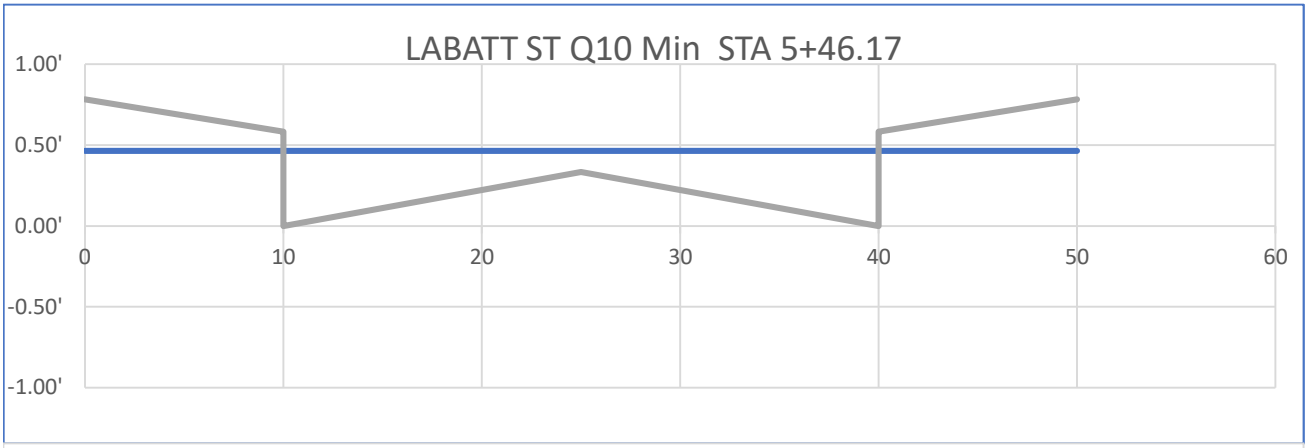
EXH

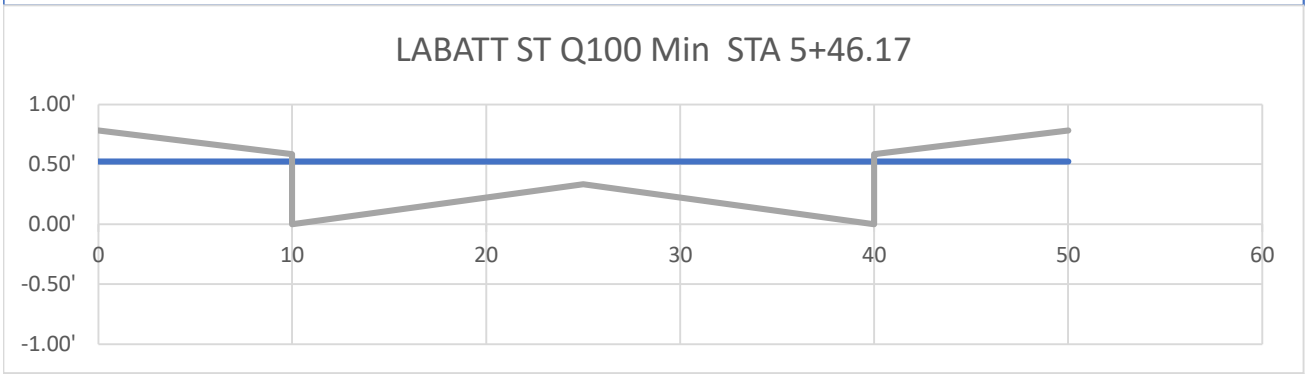
Cordova Trails

Name	LABATT ST Q10 Max	LABATT ST Q100 Max	LABATT ST Q10 Min	LABATT ST Q100 Min	YALE ST Q10 Max	YALE ST Q100 Max	YALE ST Q10 Min	YALE ST Q100 Min
STATION	1+83.89	1+83.89	5+46.17	5+46.17	2+41.98	2+41.98	14+77.49	14+77.49
Q (cfs)	16.19	24.13	18.50	27.54	11.10	16.56	31.84	47.45
Pvmt. Width LT	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'
Pvmt. Slope LT	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%
Pvmt. Wid RT	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'
Pvmt. Slope RT	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%
ROW Wid LT	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'
ROW Wid RT	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'	11.00'	10.00'
CROWN HEIGHT	0.33'	0.33'	0.33'	0.33'	0.33'	0.33'	0.33'	0.33'
n	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
Slope (%)	4.68%	4.68%	0.50%	0.50%	3.34%	3.34%	0.50%	0.50%
d_n (ft)	0.33'	0.36'	0.47'	0.52'	0.26'	0.34'	0.55'	0.68'
V (fps)	3.24	4.11	2.06	2.56	3.78	3.15	2.79	3.05






LABATT ST Q10 Min STA 5+46.17
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60


LABATT ST Q100 Min STA 5+46.17
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0.50'
0.00'
-0.50'
-1.00'
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10
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40
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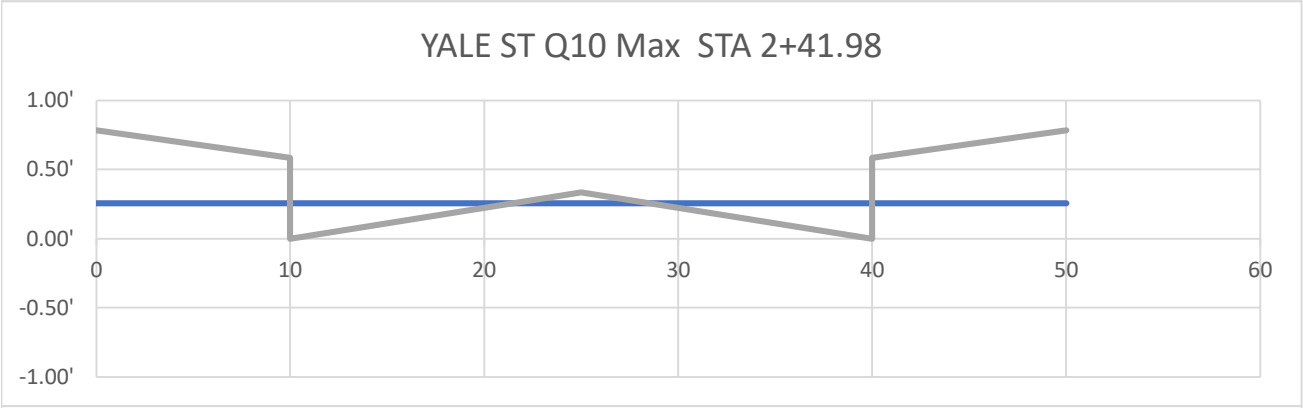
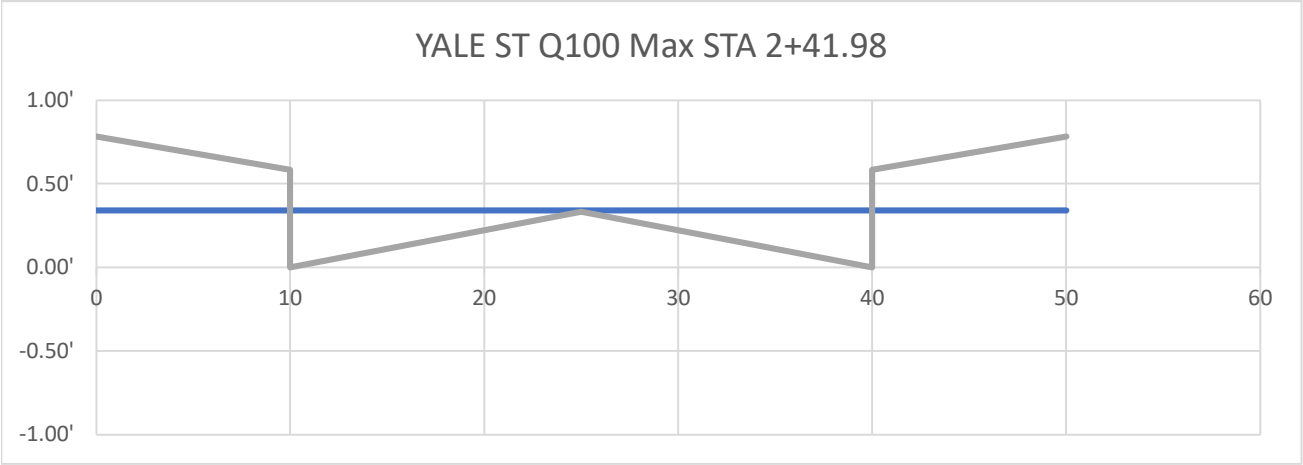
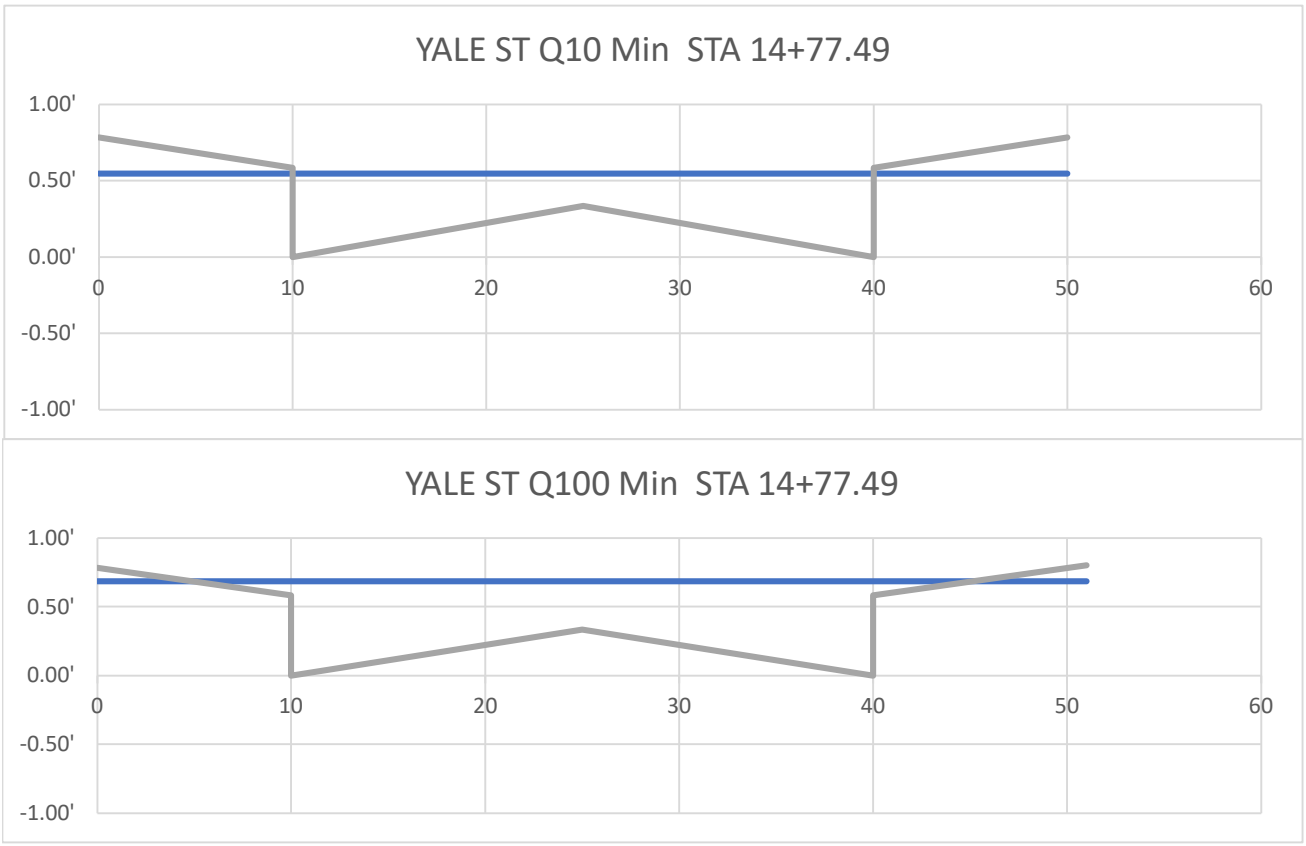
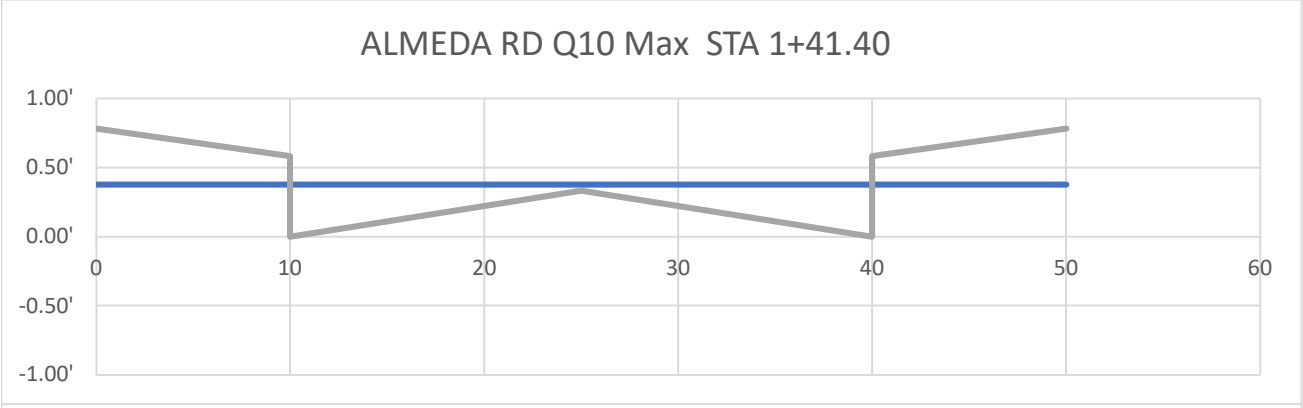

YALE ST Q10 Max STA 2+41.98
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

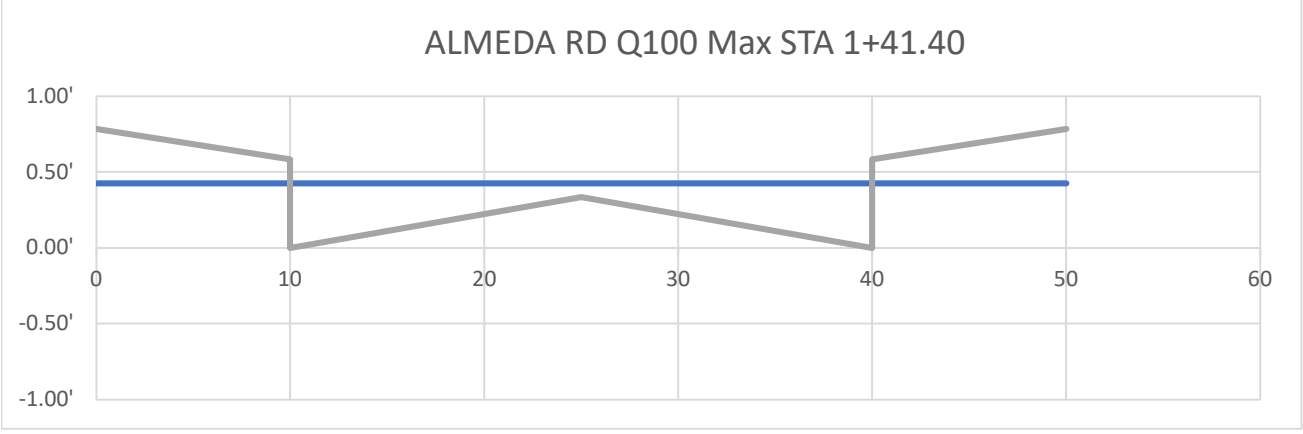

YALE ST Q100 Max STA 2+41.98
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

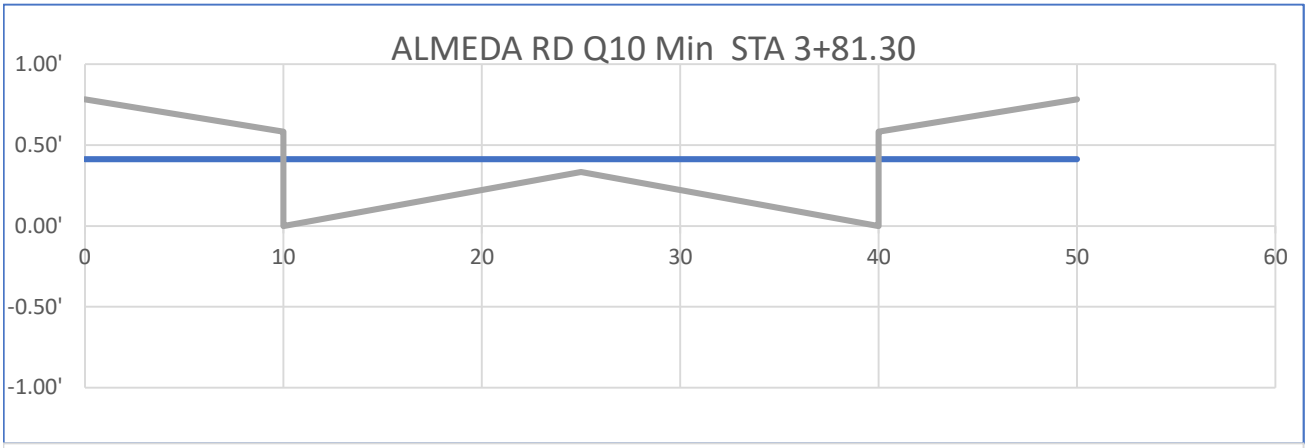

YALE ST Q10 Min STA 14+77.49
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60
YALE ST Q100 Min STA 14+77.49
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

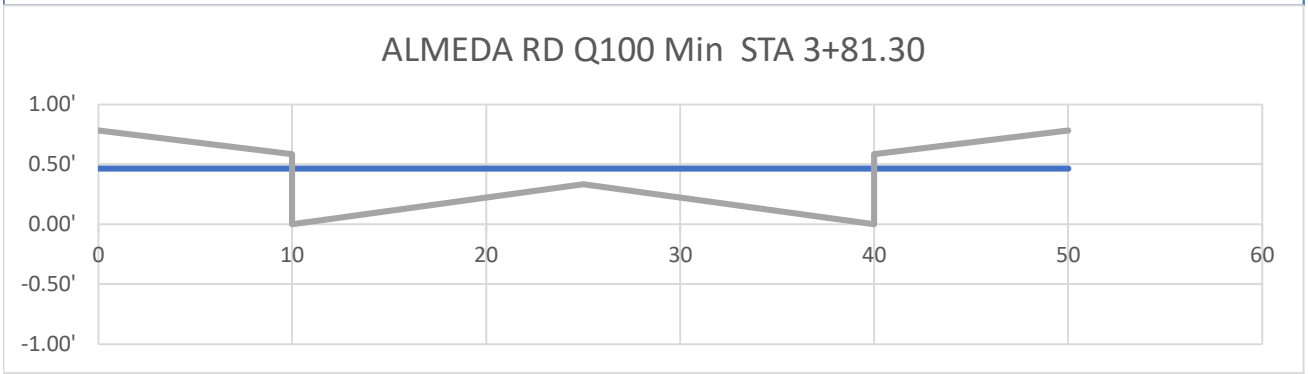
Cordova Trails

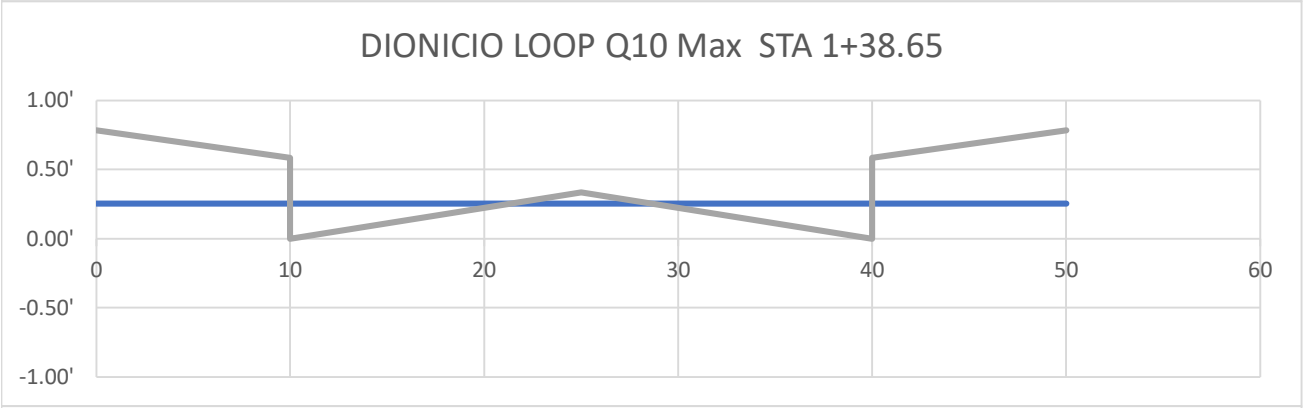
Name	ALMEDA RD Q10 Max	ALMEDA RD Q100 Max	ALMEDA RD Q10 Min	ALMEDA RD Q100 Min	DIONICIO LOOP Q10 Max	DIONICIO LOOP Q100 Max	DIONICIO LOOP Q10 Min	DIONICIO LOOP Q100 Min
STATION	1+41.40	1+41.40	3+81.30	3+81.30	1+38.65	1+38.65	2+16.81	2+16.81
Q (cfs)	12.44	18.58	12.44	18.58	11.45	17.08	11.45	17.08
Pvmt. Width LT	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'
Pvmt. Slope LT	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%
Pvmt. Wid RT	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'
Pvmt. Slope RT	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%
ROW Wid LT	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'
ROW Wid RT	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'	11.00'	10.00'
CROWN HEIGHT	0.33'	0.33'	0.33'	0.33'	0.33'	0.33'	0.33'	0.33'
n	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
Slope (%)	0.90%	0.90%	0.50%	0.50%	1.48%	1.48%	0.50%	0.50%
d_n (ft)	0.38'	0.43'	0.41'	0.47'	0.30'	0.39'	0.40'	0.45'
V (fps)	1.95	2.38	1.68	2.07	2.81	2.58	1.61	1.98






ALMEDA RD Q10 Min STA 3+81.30
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60


ALMEDA RD Q100 Min STA 3+81.30
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60


DIONICIO LOOP Q10 Max STA 1+38.65
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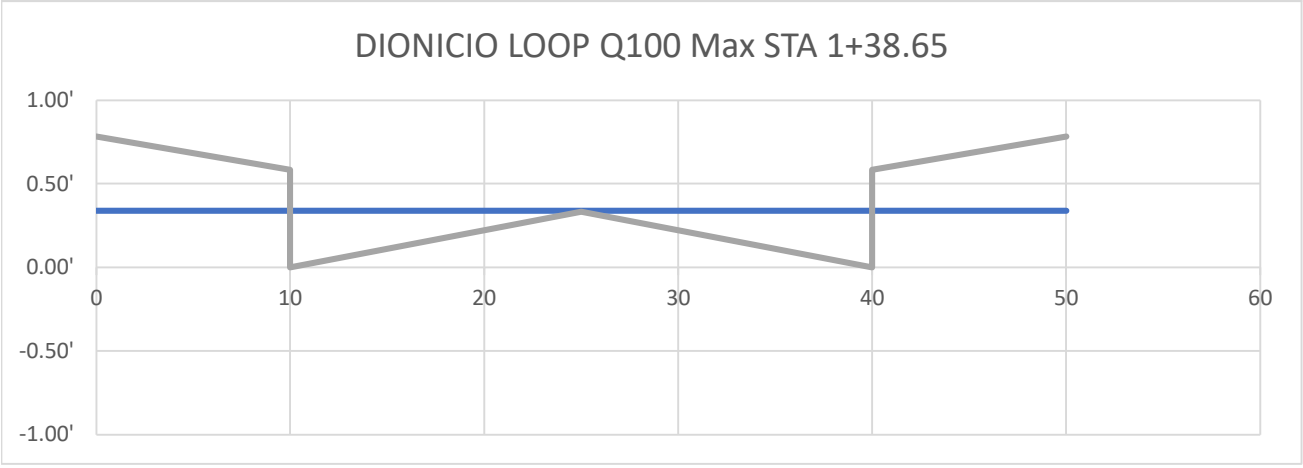
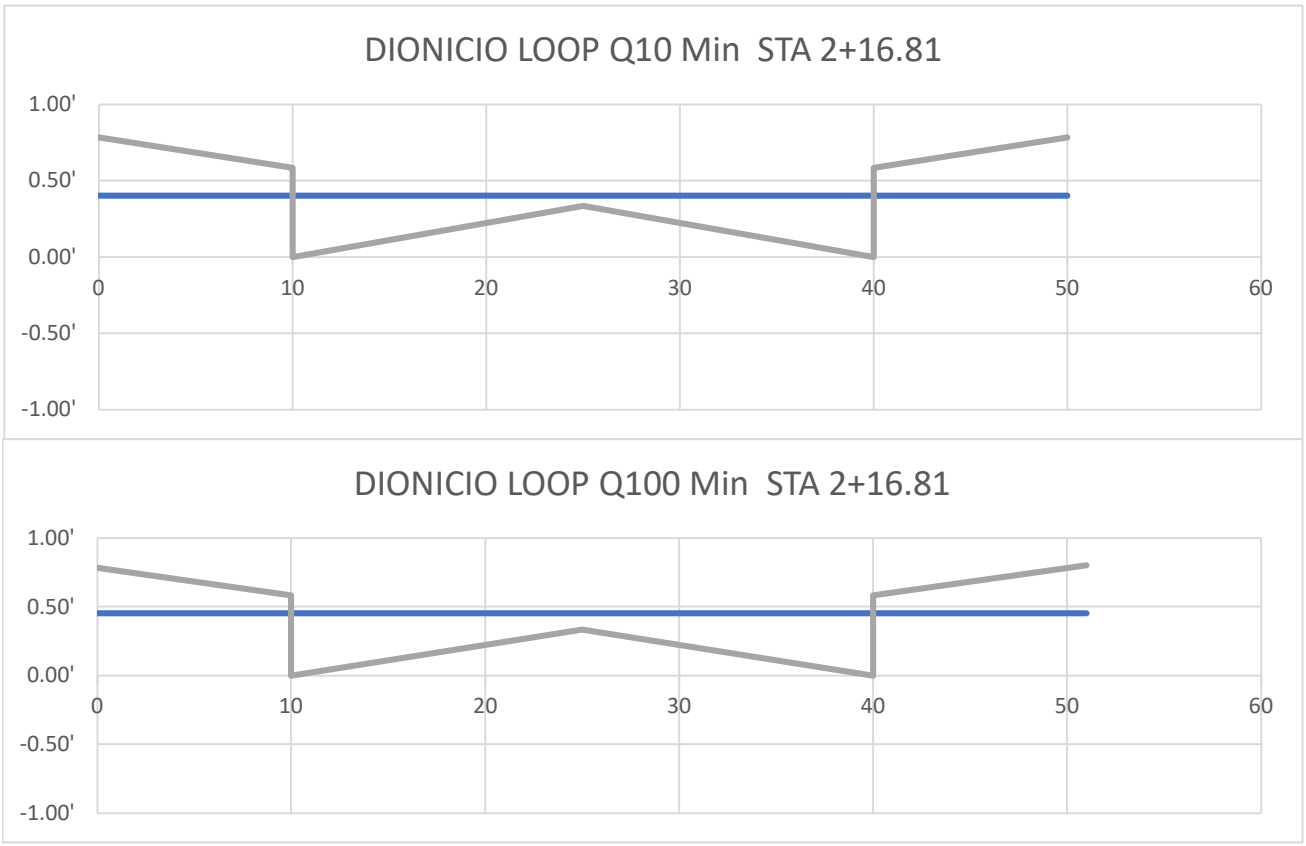
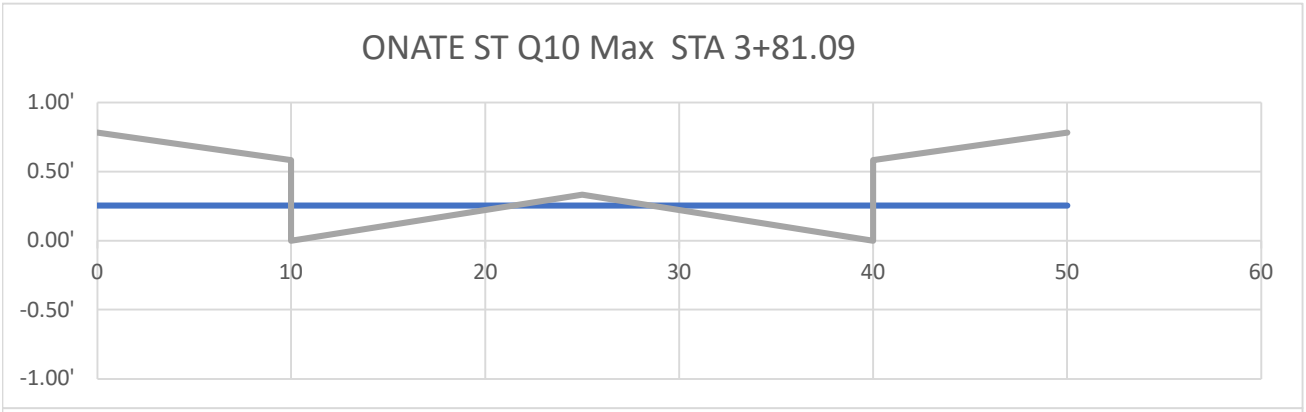
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

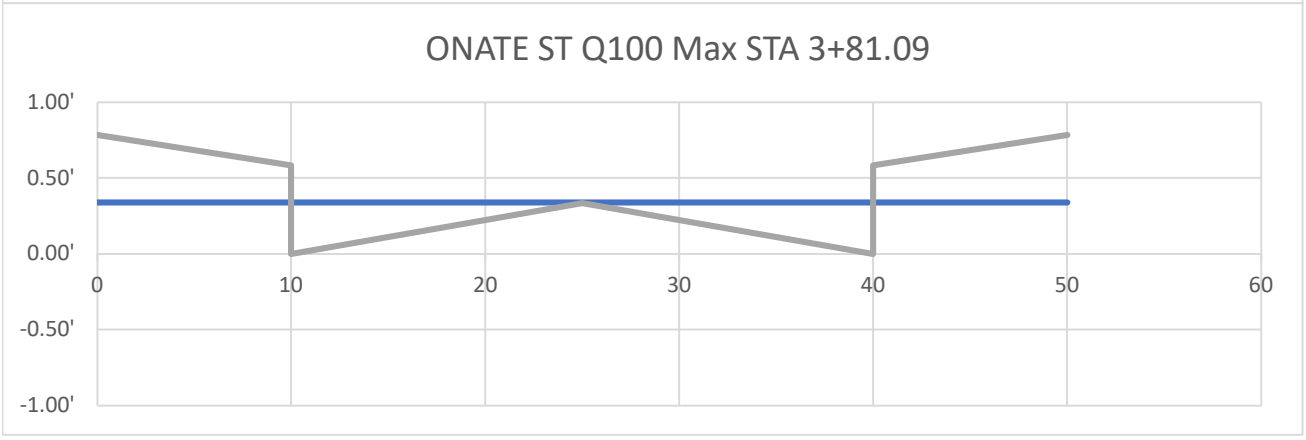

DIONICIO LOOP Q100 Max STA 1+38.65
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

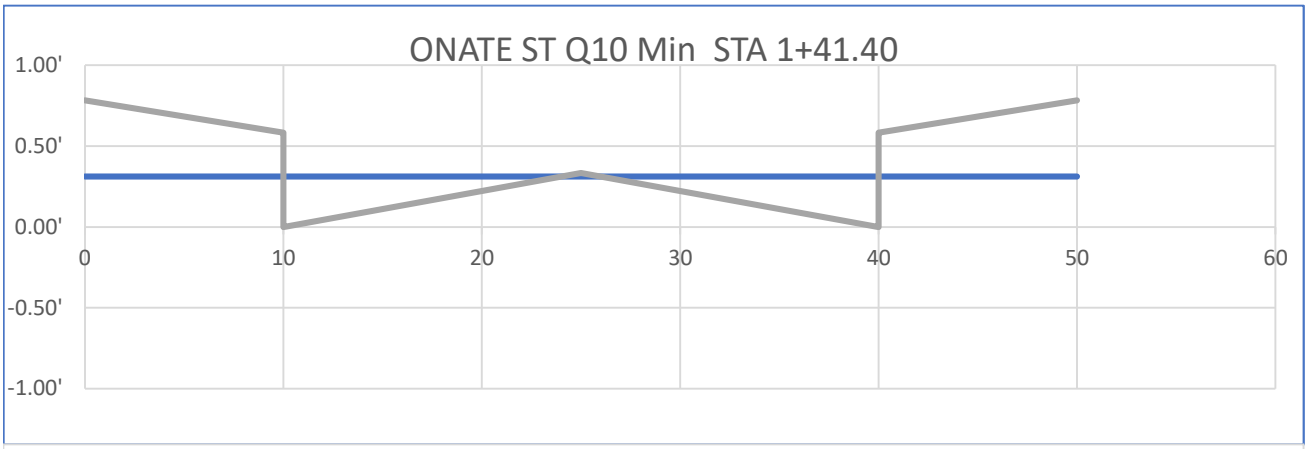

DIONICIO LOOP Q10 Min STA 2+16.81
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60
DIONICIO LOOP Q100 Min STA 2+16.81
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

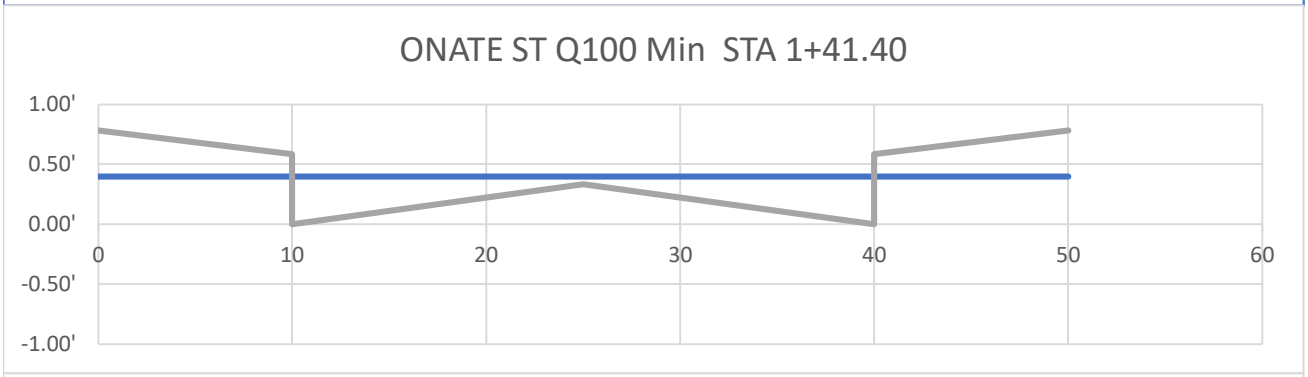
Cordova Trails

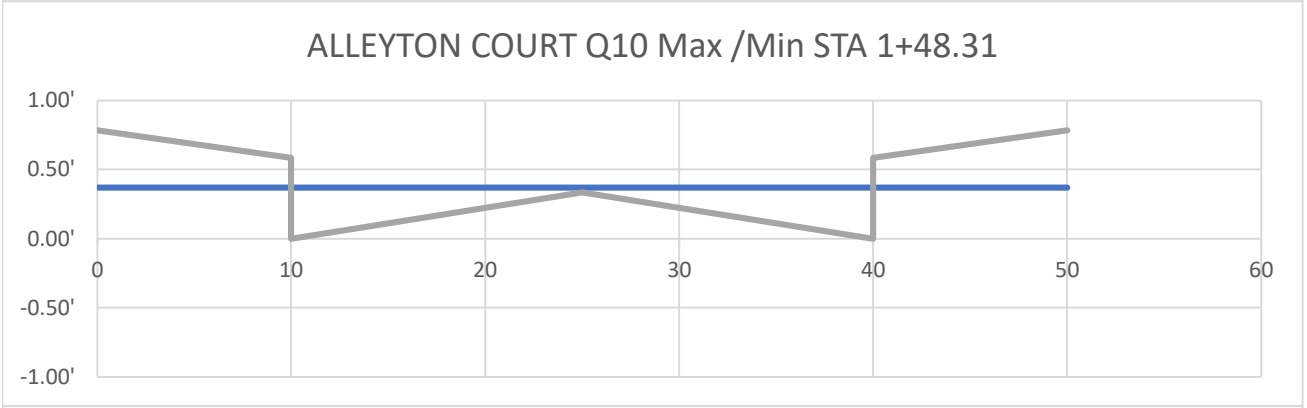
Name	ONATE ST Q10 Max	ONATE ST Q100 Max	ONATE ST Q10 Min	ONATE ST Q100 Min	ALLEYTON COURT Q10 Max /Min	ALLEYTON COURT Q100 Max/Min
STATION	3+81.09	3+81.09	1+41.40	1+41.40	1+48.31	1+48.31
Q (cfs)	7.32	10.90	7.32	10.90	8.45	12.60
Pvmt. Width LT	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'
Pvmt. Slope LT	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%
Pvmt. Wid RT	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'
Pvmt. Slope RT	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%
ROW Wid LT	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'
ROW Wid RT	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'
CROWN HEIGHT	0.33'	0.33'	0.33'	0.33'	0.33'	0.33'
n	0.018	0.018	0.018	0.018	0.018	0.018
Slope (%)	1.48%	1.48%	0.50%	0.50%	0.50%	0.50%
d_n (ft)	0.25'	0.34'	0.31'	0.40'	0.37'	0.41'
V (fps)	2.51	2.08	1.67	1.57	1.39	1.69

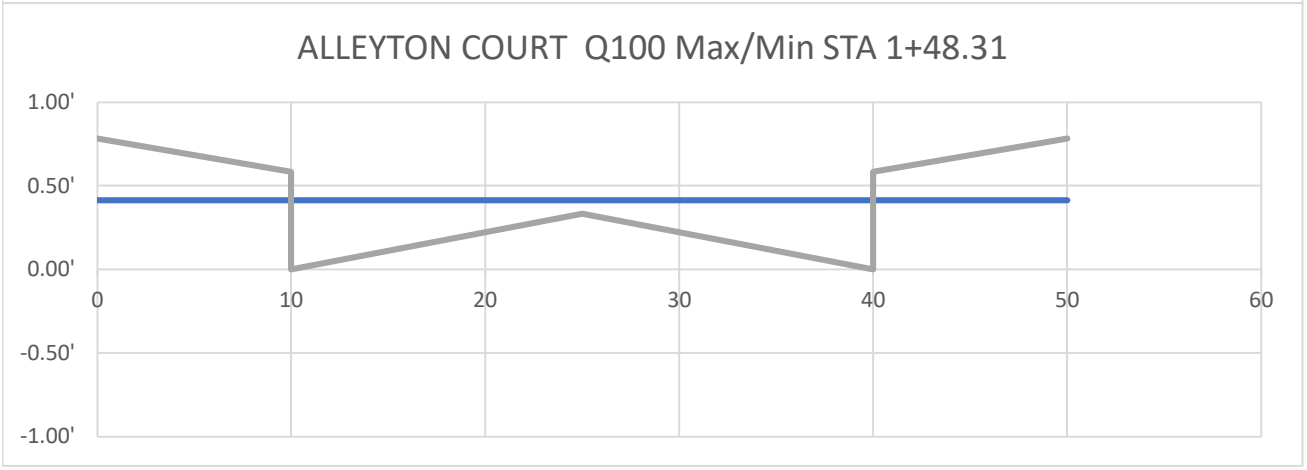





ONATE ST Q10 Min STA 1+41.40
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

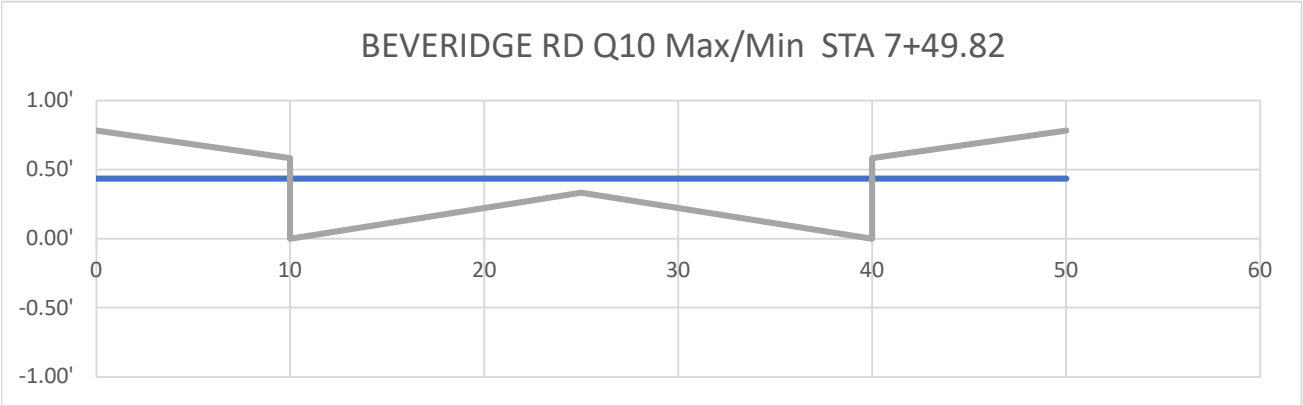

ONATE ST Q100 Min STA 1+41.40
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

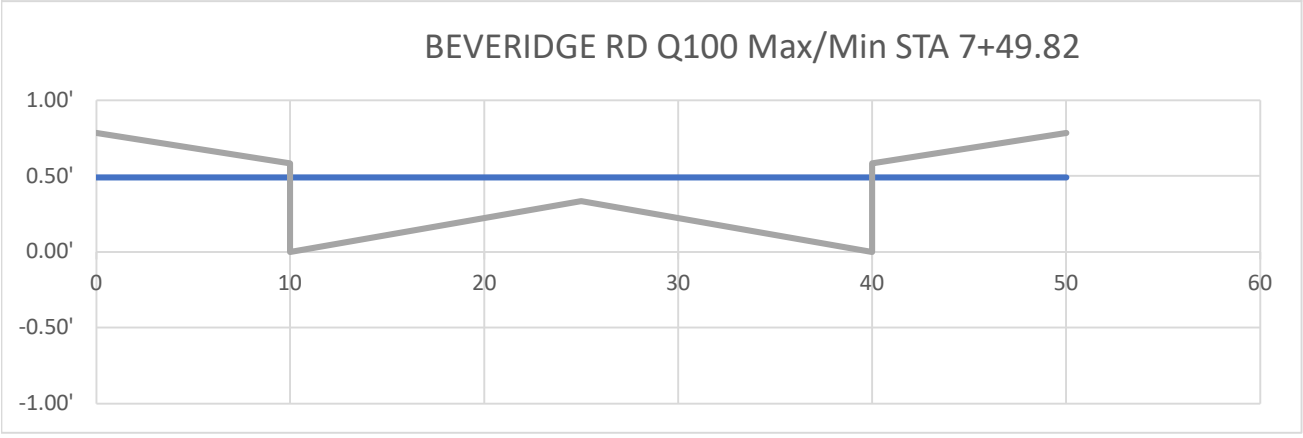

ALLEYTON COURT Q10 Max /Min STA 1+48.31
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

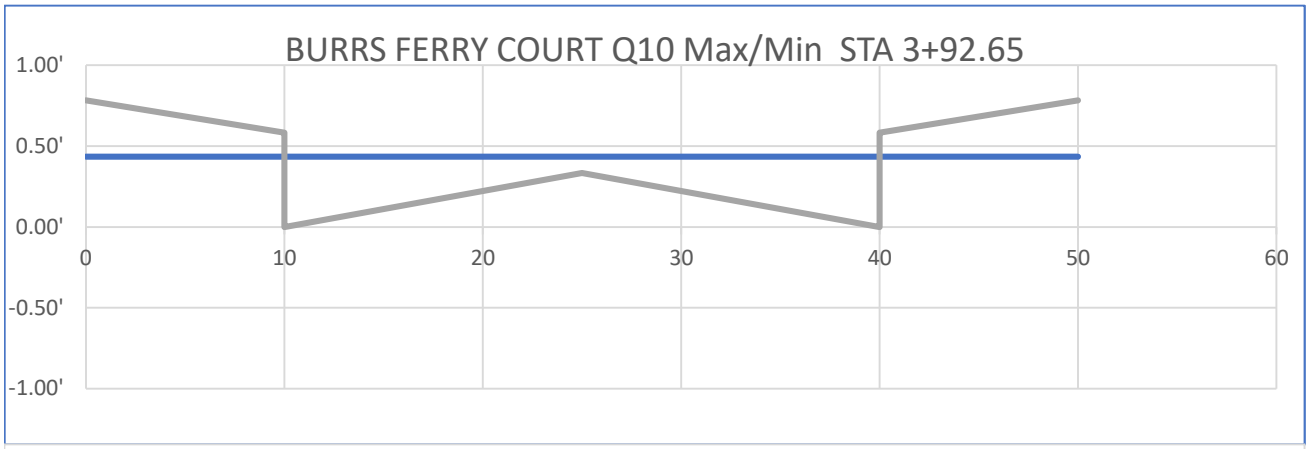

ALLEYTON COURT Q100 Max/Min STA 1+48.31
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

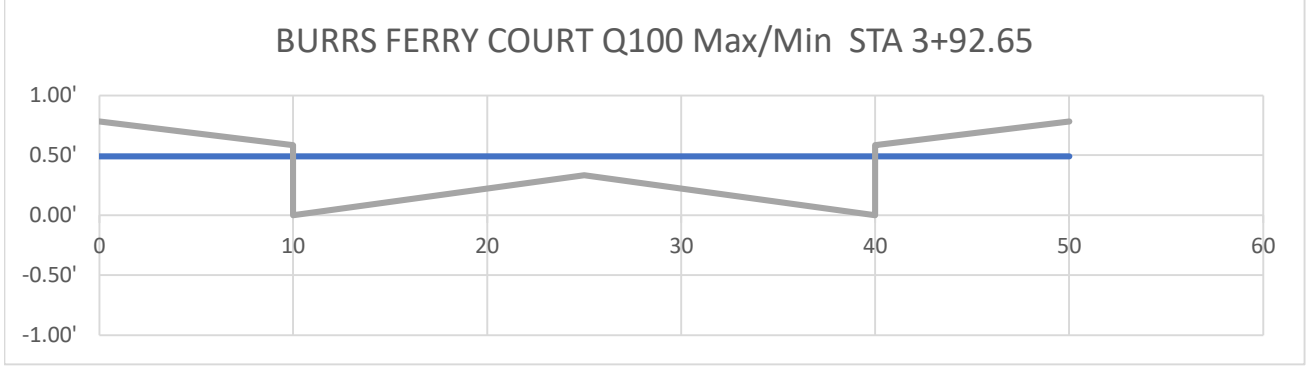
Cordova Trails

Name	BEVERIDGE RD Q10 Max/Min	BEVERIDGE RD Q100 Max/Min	BURRS FERRY COURT Q10 Max/Min	BURRS FERRY COURT Q100 Max/Min
STATION	7+49.82	7+49.82	3+92.65	3+92.65
Q (cfs)	14.80	22.01	14.80	22.01
Pvmt. Width LT	15.00'	15.00'	15.00'	15.00'
Pvmt. Slope LT	2.22%	2.22%	2.22%	2.22%
Pvmt. Wid RT	15.00'	15.00'	15.00'	15.00'
Pvmt. Slope RT	2.22%	2.22%	2.22%	2.22%
ROW Wid LT	10.00'	10.00'	10.00'	10.00'
ROW Wid RT	10.00'	10.00'	10.00'	10.00'
CROWN HEIGHT	0.33'	0.33'	0.33'	0.33'
n	0.018	0.018	0.018	0.018
Slope (%)	0.50%	0.50%	0.50%	0.50%
d_n (ft)	0.44'	0.49'	0.44'	0.49'
V (fps)	1.83	2.26	1.83	2.26





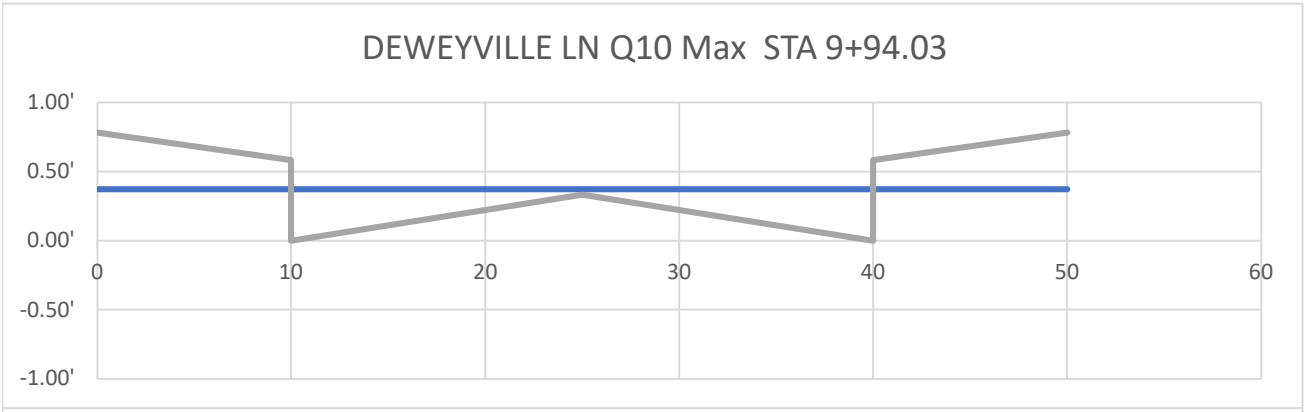

BURRS FERRY COURT Q10 Max/Min STA 3+92.65
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

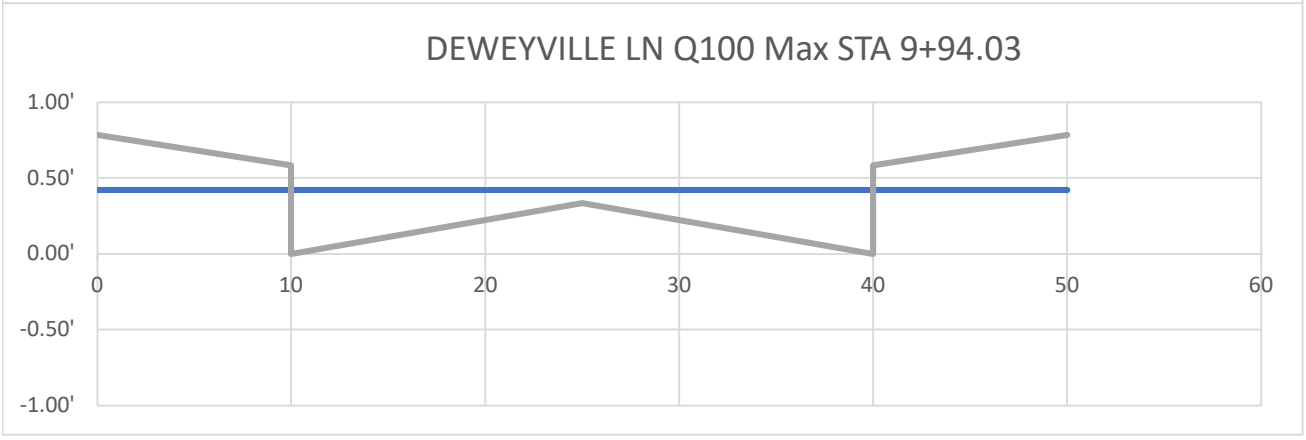

BURRS FERRY COURT Q100 Max/Min STA 3+92.65
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

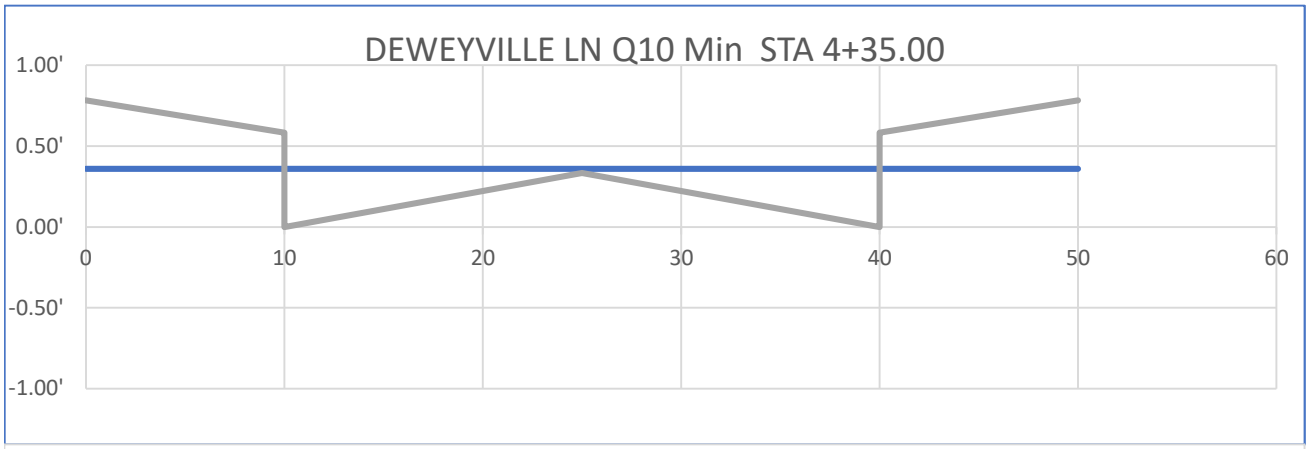
Cordova Trails

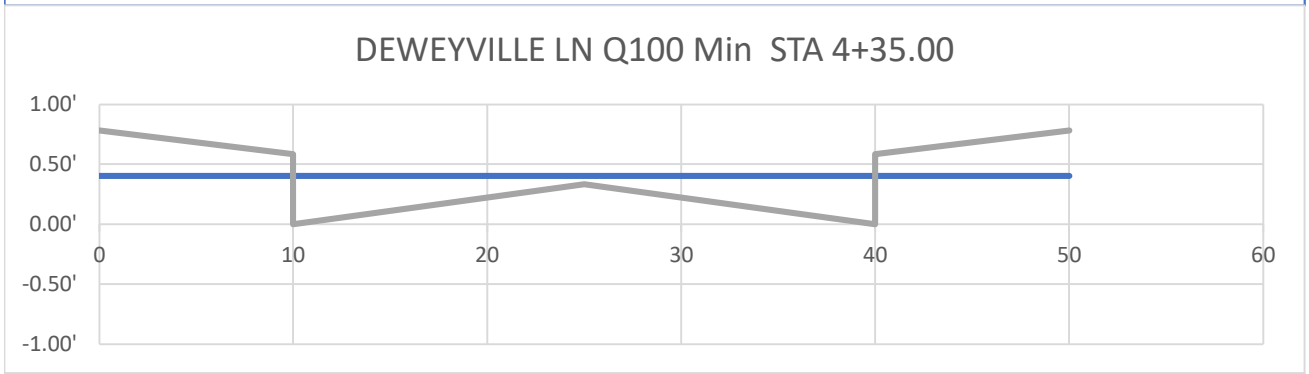
Name	DEWEYVILLE LN Q10 Max	DEWEYVILLE LN Q100 Max	DEWEYVILLE LN Q10 Min	DEWEYVILLE LN Q100 Min	BUNTON BRANCH LN Q10 Max/Min	BUNTON BRANCH LN Q100 Max/Min
STATION	9+94.03	9+94.03	4+35.00	4+35.00	9+94.03	9+94.03
Q (cfs)	12.53	18.69	7.76	11.57	41.19	64.70
Pvmt. Width LT	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'
Pvmt. Slope LT	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%
Pvmt. Wid RT	15.00'	15.00'	15.00'	15.00'	15.00'	15.00'
Pvmt. Slope RT	2.22%	2.22%	2.22%	2.22%	2.22%	2.22%
ROW Wid LT	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'
ROW Wid RT	10.00'	10.00'	10.00'	10.00'	10.00'	10.00'
CROWN HEIGHT	0.33'	0.33'	0.33'	0.33'	0.33'	0.33'
n	0.018	0.018	0.018	0.018	0.018	0.018
Slope (%)	1.00%	1.00%	0.50%	0.50%	0.75%	0.75%
d_n (ft)	0.37'	0.42'	0.36'	0.40'	0.56'	0.75'
V (fps)	2.01	2.45	1.33	1.62	3.53	3.66

Note:
Capacity of Streets located outside Unit 1 are not approved as part of this submittal and will be evaluated as part of the next phases of development.






DEWEYVILLE LN Q10 Min STA 4+35.00
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60


DEWEYVILLE LN Q100 Min STA 4+35.00
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0.50'
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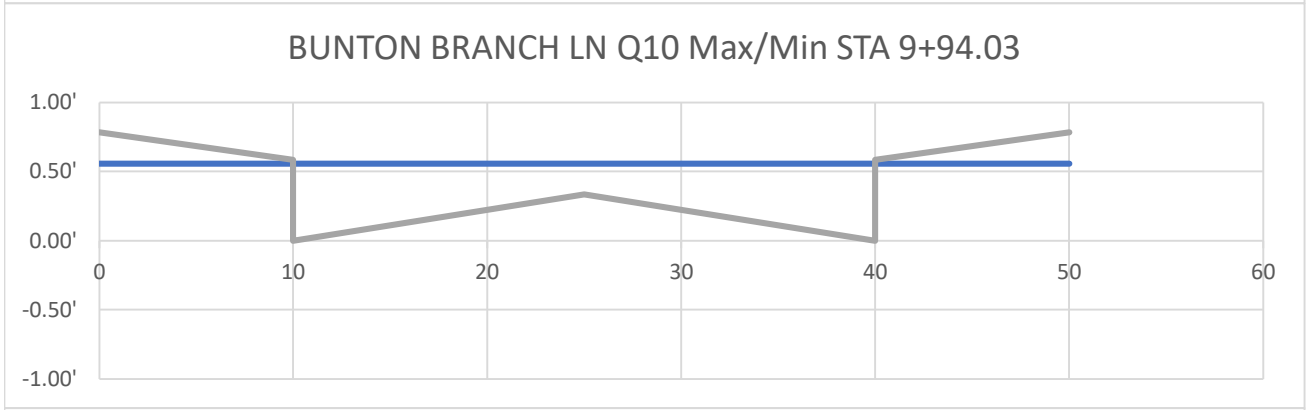
-0.50'
-1.00'
0
10
20
30
40
50
60


BUNTON BRANCH LN Q10 Max/Min STA 9+94.03
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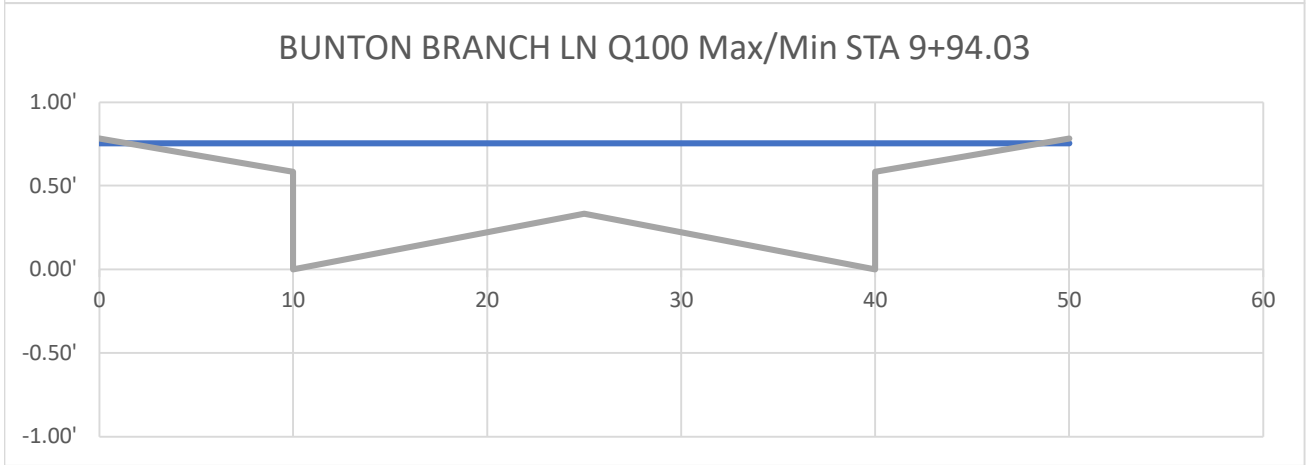
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60


BUNTON BRANCH LN Q100 Max/Min STA 9+94.03
1.00'
0.50'
0.00'
-0.50'
-1.00'
0
10
20
30
40
50
60

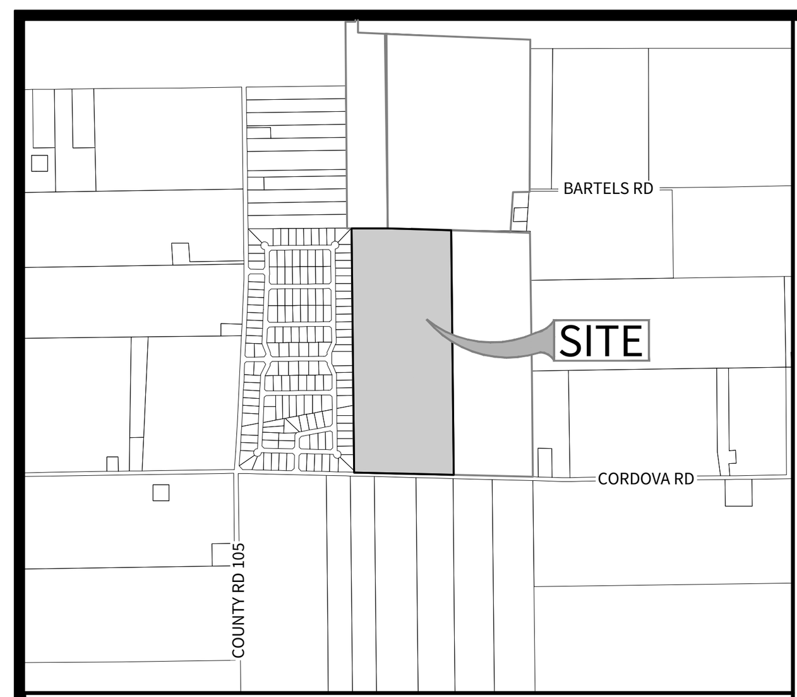
DRAINAGE CAPACITY ANALYSIS

CUDE ENGINEERS

4122 POND HILL ROAD, STE 101
SAN ANTONIO, TEXAS 78231

PHONE: (210) 681-2951
CUDEENGINEERS.COM

TBPE NO. 455
TBPLS NO. 10048500



LOCATION MAP
N.T.S.

OWNER/DEVELOPER:
ASHTON WOODS HOMES
CONTACT PERSON: KYLE LENTS
17319 SAN PEDRO, SUITE 140
SAN ANTONIO,TX 78232
TEL: (210) 632-0753

CIVIL ENGINEER:
M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: DAVID CUPIT, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

SCALE: 1" =300'

LEGEND

SITE BOUNDARY

APPROVED FOR CONSTRUCTION
SEGUIN TEXAS
01/14/2022

CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORDOVA TRAILS SUBDIVISION UNIT 1

DRAINAGE CROSS SECTION LOCATIONS

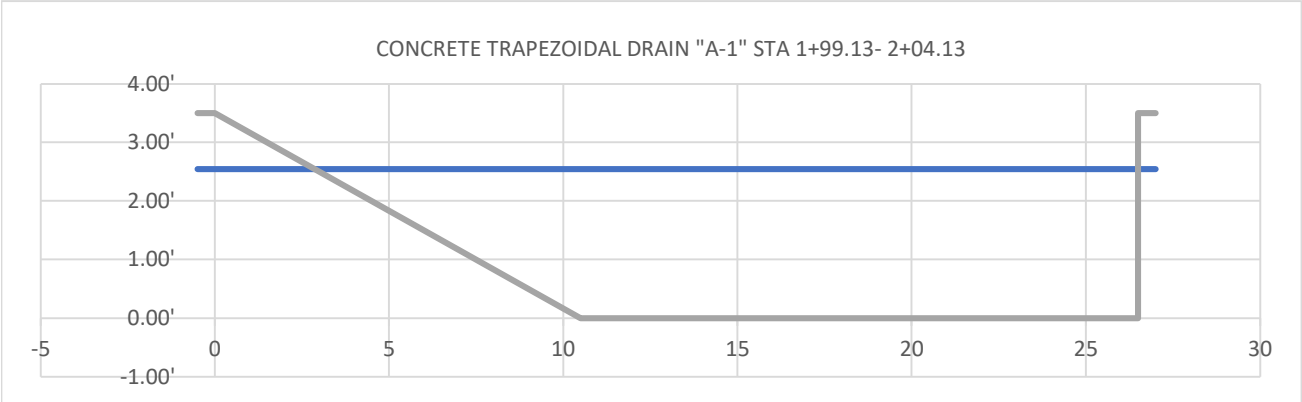
DATE	09/23/2021
PROJECT NO.	03480.002
DRAWN BY	AC
CHECKED BY	DDC/JC

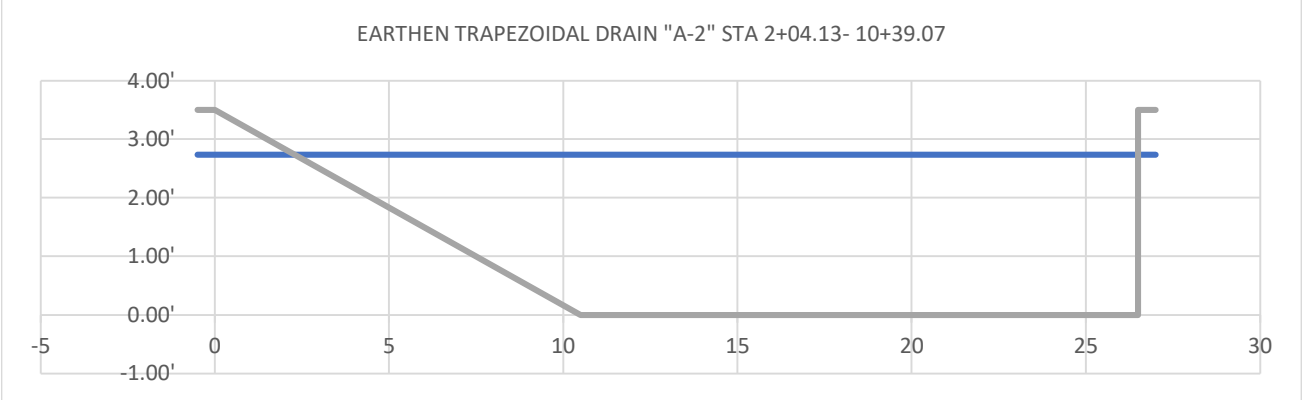
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.

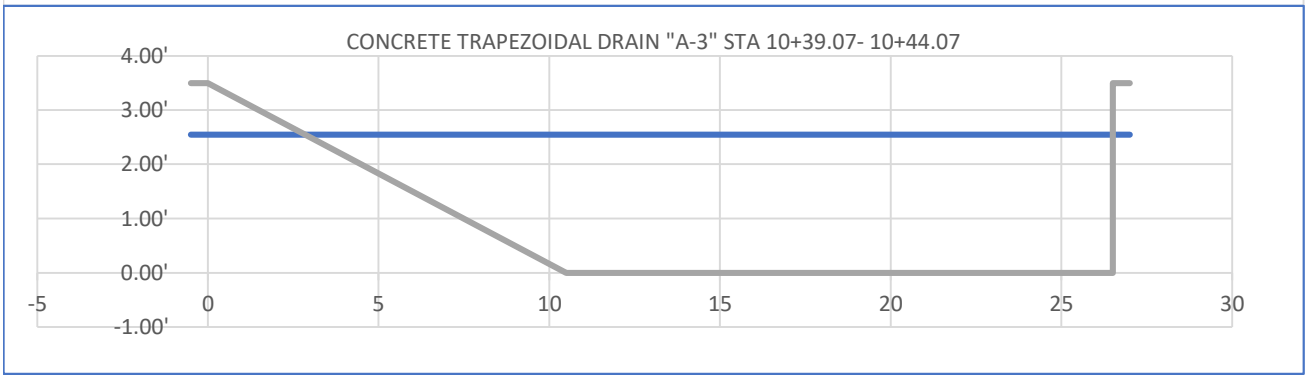
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

EXH

Name	"A-1"	"A-2"	"A-3"
BEGIN STA	1+99.13	2+04.13	10+39.07
END STA	2+04.13	10+39.07	10+44.07
Q_{100} (cfs)	203.24	203.24	203.24
h (ft)	3.50'	3.50'	3.50'
b_w (ft)	16.00'	16.00'	16.00'
z (_):1 left	3	3	3
z (_):1 right	0	0	0
t_w (ft)	27	27	27
n	0.015	0.017	0.015
Slope (%)	0.07%	0.07%	0.07%
d_n (ft)	2.55'	2.74'	2.55'
V (fps)	4.03	3.69	4.03
Channel Type	Channel	Channel	Channel
Min Esm't (ft)	43.50	43.50	43.50







Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Feb 23 2021

Drain "A" - Labatt Street Crossing

Invert Elev Dn (ft)	=	592.54
Pipe Length (ft)	=	91.23
Slope (%)	=	0.08
Invert Elev Up (ft)	=	592.61
Rise (in)	=	24.0
Shape	=	Box
Span (in)	=	72.0
No. Barrels	=	2
n-Value	=	0.013
Culvert Type	=	Flared Wingwalls
Culvert Entrance	=	30D to 75D wingwall flares
Coeff. K,M,c,Y,k	=	0.026, 1, 0.0347, 0.81, 0.4

Embankment

Top Elevation (ft)	=	596.48
Top Width (ft)	=	31.52
Crest Width (ft)	=	14.50

Calculations

Qmin (cfs)	=	136.96
Qmax (cfs)	=	136.96
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	136.96
Qpipe (cfs)	=	136.96
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	6.35
Veloc Up (ft/s)	=	5.71
HGL Dn (ft)	=	594.34
HGL Up (ft)	=	594.75
Hw Elev (ft)	=	595.36
Hw/D (ft)	=	1.37
Flow Regime	=	Inlet Control

Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Jul 26 2021

Drain "A" - Yale Street Crossing

Invert Elev Dn (ft)	=	591.91
Pipe Length (ft)	=	85.74
Slope (%)	=	0.07
Invert Elev Up (ft)	=	591.97
Rise (in)	=	24.0
Shape	=	Box
Span (in)	=	72.0
No. Barrels	=	2
n-Value	=	0.013
Culvert Type	=	Flared Wingwalls
Culvert Entrance	=	30D to 75D wingwall flares
Coeff. K,M,c,Y,k	=	0.026, 1, 0.0347, 0.81, 0.4

Embankment

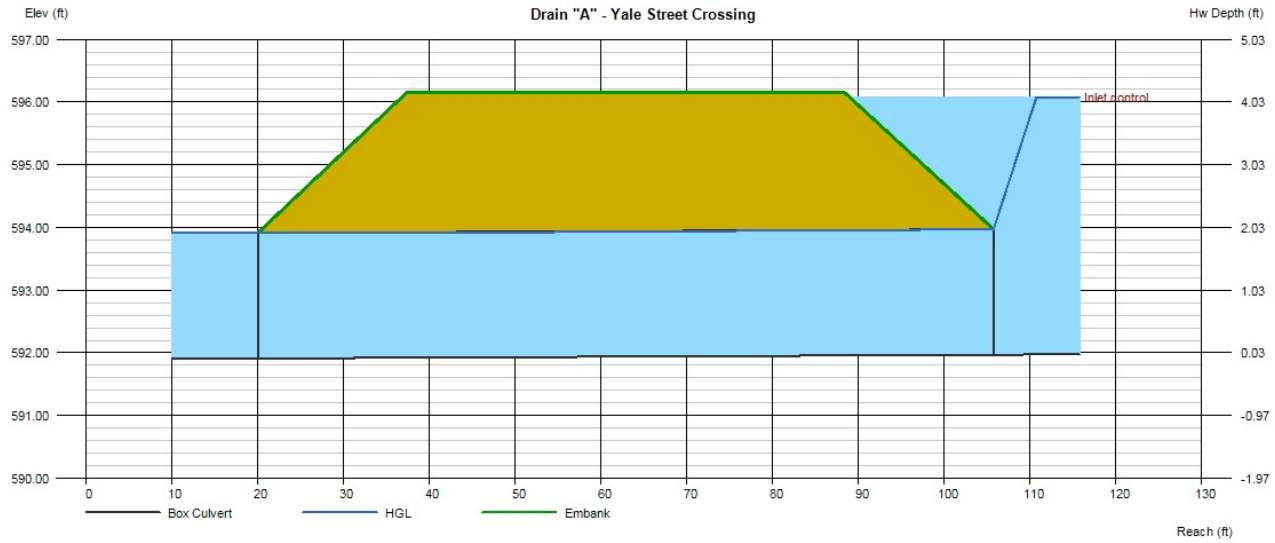
Top Elevation (ft)	=	596.15
Top Width (ft)	=	51.03
Crest Width (ft)	=	14.50

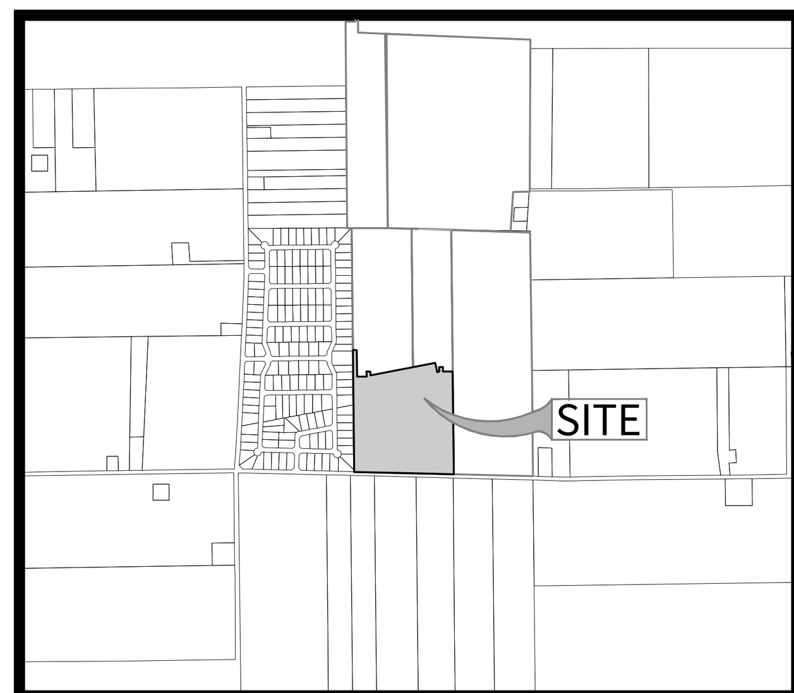
Calculations

Qmin (cfs)	=	203.24
Qmax (cfs)	=	203.24
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	203.24
Qpipe (cfs)	=	203.24
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	8.47
Veloc Up (ft/s)	=	8.47
HGL Dn (ft)	=	593.91
HGL Up (ft)	=	593.97
Hw Elev (ft)	=	596.08
Hw/D (ft)	=	2.05
Flow Regime	=	Inlet Control





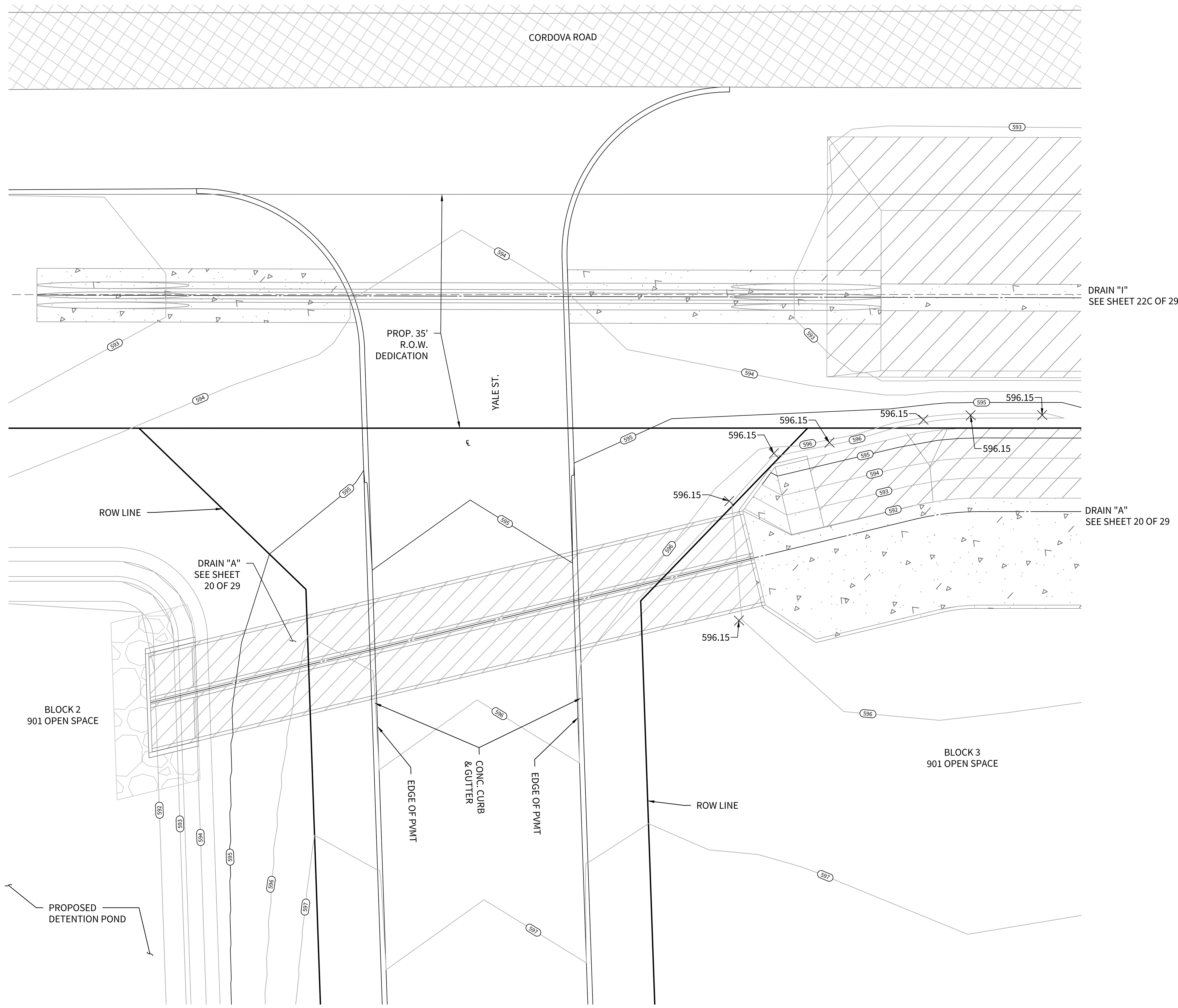
LOCATION MAP
N.T.S.

OWNER/DEVELOPER:
ASHTON WOODS HOMES
CONTACT PERSON: KYLE LENTS
17319 SAN PEDRO, SUITE 140
SAN ANTONIO,TX 78232
TEL: (210) 632-0753

CIVIL ENGINEER:
M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: DAVID CUPIT, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

LEGEND

- PROPOSED BOX CULVERT
- PROPOSED CONCRETE RIP-RAP
- PROPOSED EARTHEN DRAIN WITH TURF REINFORCEMENT
- EXISTING PAVEMENT
- PROPOSED PROPOSED PAVEMENT
- PROPOSED ROCK GABBION MATTRESS
- ELEV — PROPOSED CONTOUR
- × PROPOSED GROUND SPOT ELEVATION



SCALE: 1"=10'
0 10 20

APPROVED FOR CONSTRUCTION SEGUIN TEXAS
01/14/2022

CUDEENGINEERS.COM
CUDE EST. 1980 ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORDOVA TRAILS SUBDIVISION UNIT 1

DRAIN "A" & "I" GRADING EXHIBIT

DATE
09/23/2021

PROJECT NO.
03480.002

DRAWN BY
AC

CHECKED BY
DDC/JC

REVISIONS
1.
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3.
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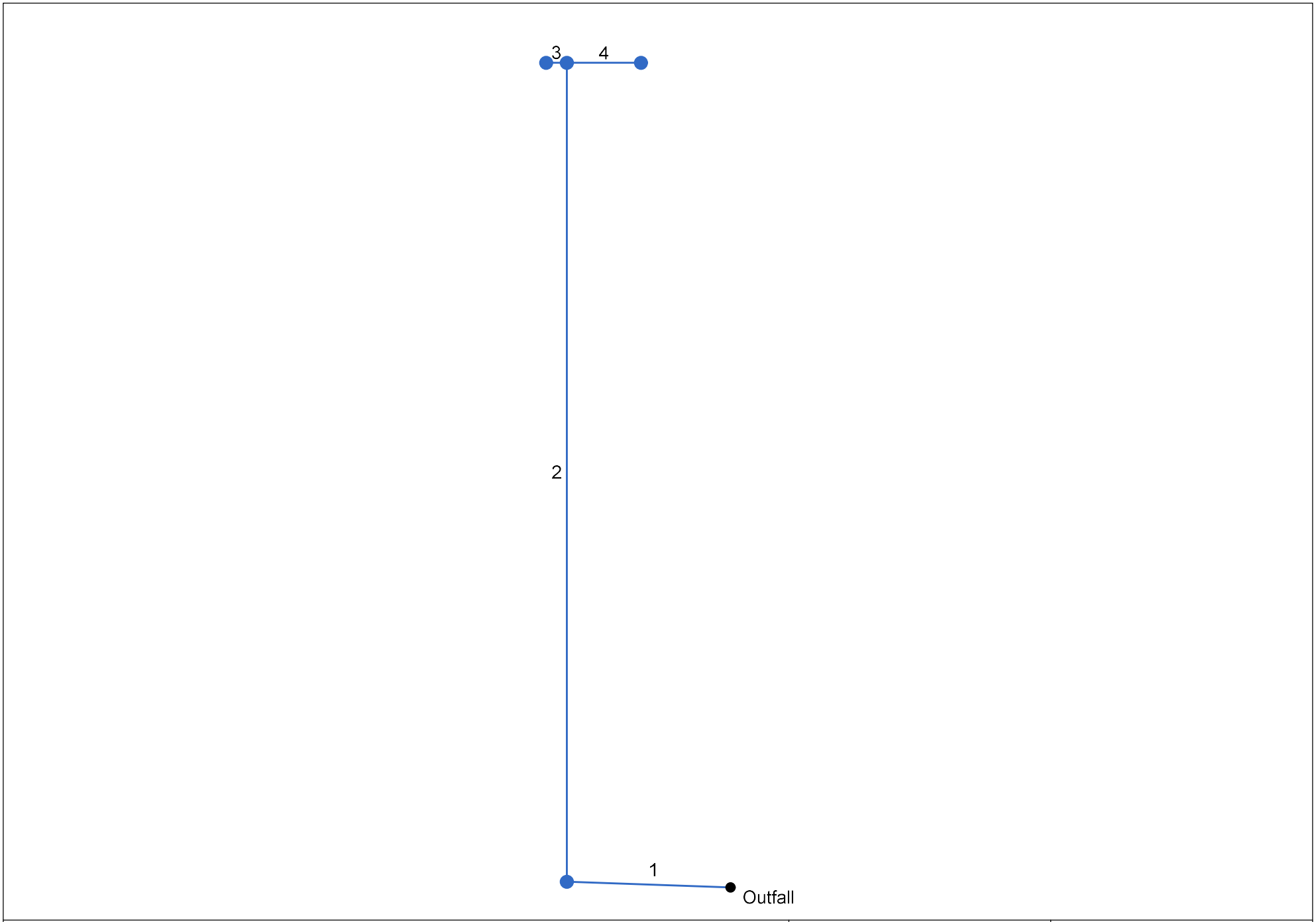
9.

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

EXH

FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CPJENGR 2022-01-14

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



Project File: Drain C & CA.stm	Number of lines: 4	Date: 9/20/2021

FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	54.120	-178.000	MH	0.00	0.00	0.00	0.0	592.54	0.17	592.63	24X60	Box	0.013	1.00	596.61	DRN "C" - ONE 2'
2	1	271.570	88.000	MH	0.00	0.00	0.00	0.0	592.63	0.15	593.04	24X72	Box	0.013	1.00	597.21	DRN "C" - ONE 2'
3	2	6.840	-90.000	Curb	27.81	0.00	0.00	0.0	593.04	0.15	593.05	24X60	Box	0.013	1.00	596.76	DRN "C" - ONE 2'
4	2	24.500	90.000	Curb	27.81	0.00	0.00	0.0	593.04	0.04	593.05	24X60	Box	0.013	1.00	596.76	DRN "CA" - ONE 2

Project File: Drain C & CA.stm

Number of lines: 4

Date: 9/20/2021

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	JB1	Manhole	596.61	Cir	4.00	4.00	24x60	Box	592.63	24x72	Box	592.63
2	JB2	Manhole	597.21	Cir	4.00	4.00	24x72	Box	593.04	24x60 24x60	Box Box	593.04 593.04
3	25' CURB INLET	Curb-Horiz	596.76	Cir	4.00	4.00	24x60	Box	593.05			
4	25' CURB INLET	Curb-Horiz	596.76	Cir	4.00	4.00	24x60	Box	593.05			

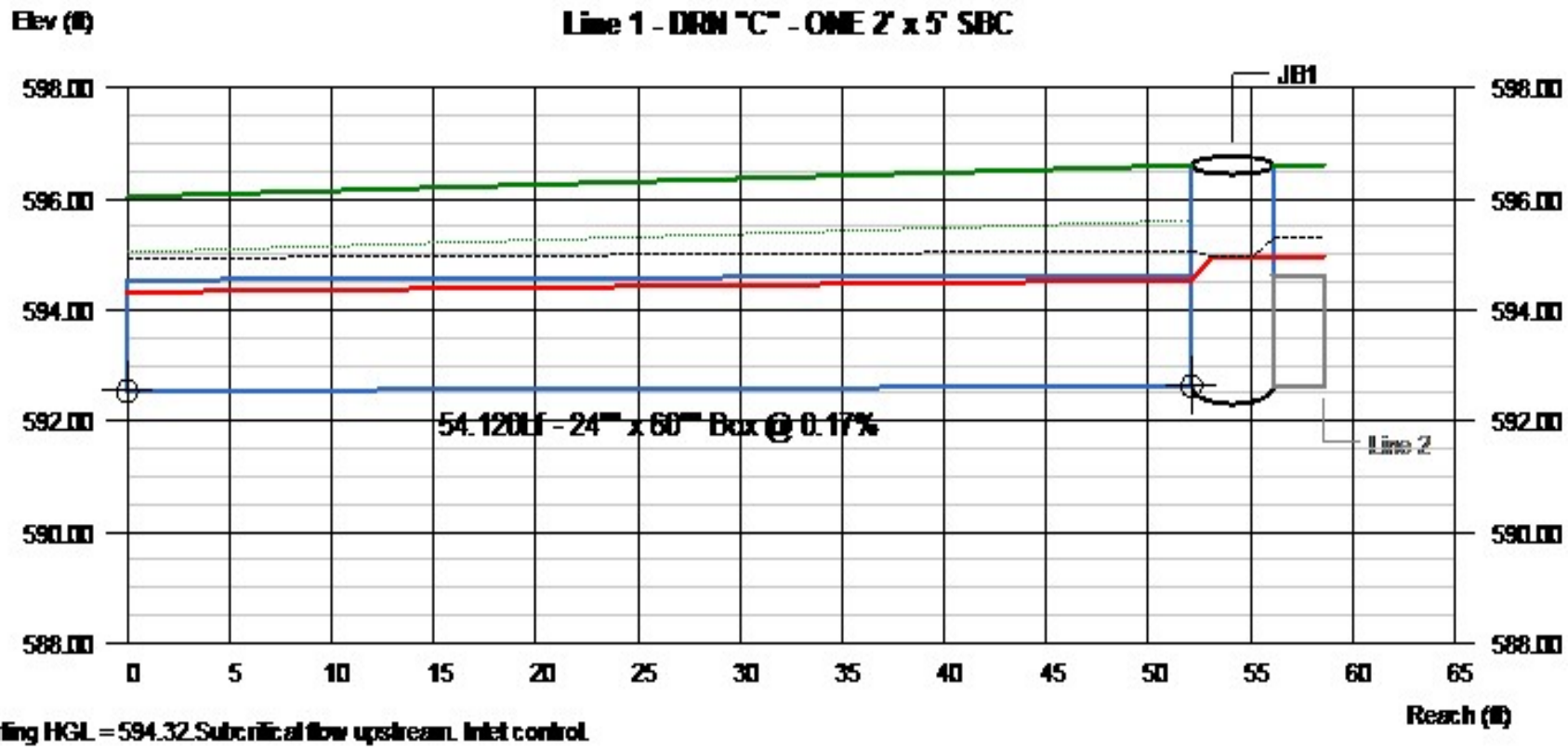
Project File: Drain C & CA.stm | Number of Structures: 4 | Run Date: 9/20/2021

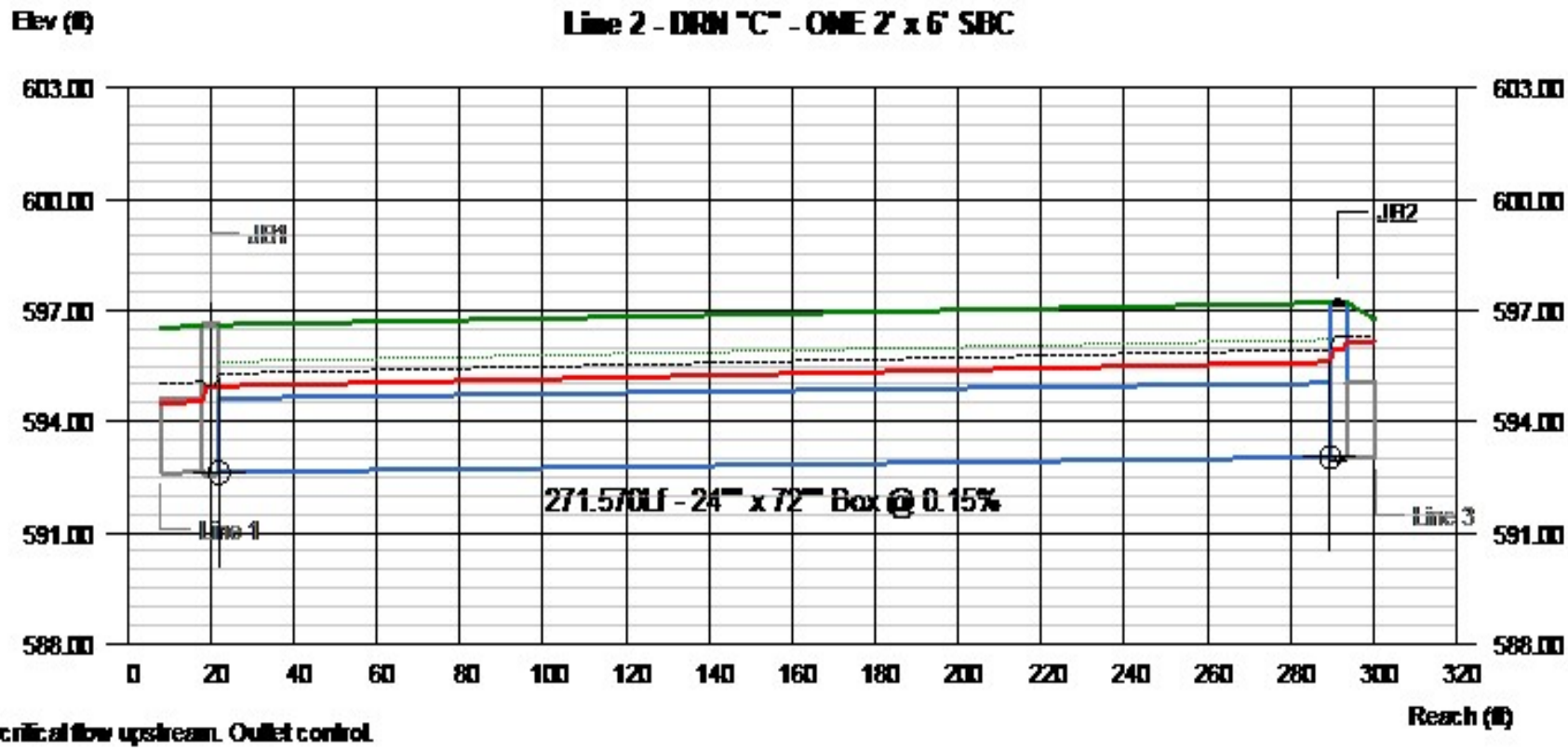
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	24 60 B	55.62	592.54	594.32	1.78	8.90	6.25	0.61	594.93	n/a	54.120	592.63	594.54	1.91	9.56	5.82	0.53	595.07i	n/a	n/a	-0.386	1.00	n/a
2	24 72 B	55.62	592.63	594.96	2.00	12.00	4.64	0.33	595.29	0.241	271.570	593.04	595.61	2.00	12.00	4.64	0.33	595.95	0.241	0.241	0.655	1.00	0.33
3	24 60 B	27.81	593.04	596.16	2.00	10.00	2.78	0.12	596.28	0.093	6.840	593.05	596.17	2.00	10.00	2.78	0.12	596.29	0.093	0.093	0.006	1.00	0.12
4	24 60 B	27.81	593.04	596.16	2.00	10.00	2.78	0.12	596.28	0.093	24.500	593.05	596.18	2.00	10.00	2.78	0.12	596.30	0.093	0.093	0.023	1.00	0.12

Project File: Drain C & CA.stm | Number of lines: 4 | Run Date: 9/20/2021

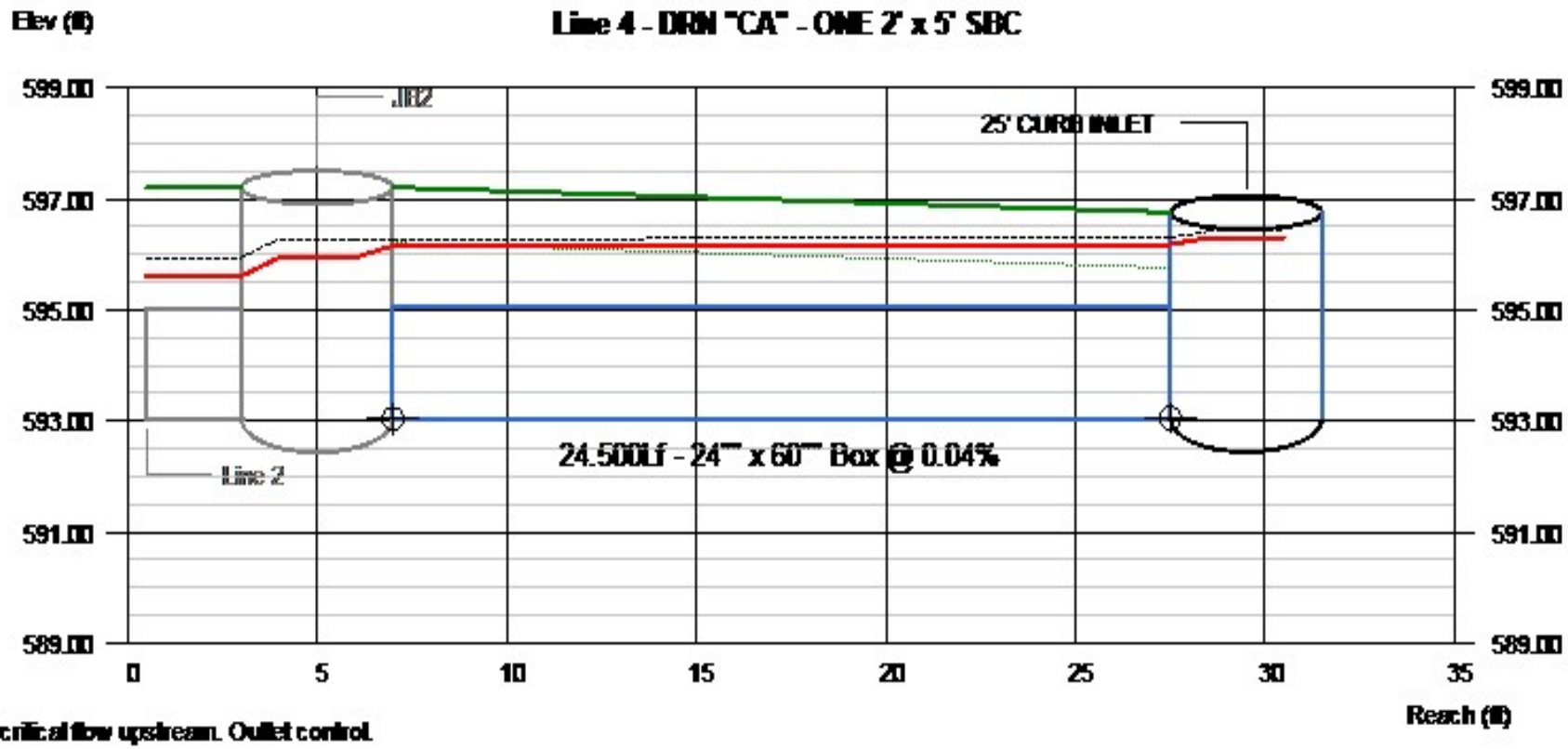
; c = cir e = ellip b = box


Line 1 - DRN "C" - ONE 2' x 5' SBC
Elev (ft)
JB1
598.00
596.00
594.00
592.00
590.00
588.00
54.12@1.17% - 24" x 60" Box
Line 2
0
5
10
15
20
25
30
35
40
45
50
55
60
65
Reach (ft)
Starting HGL = 594.32. Subcritical flow upstream. Inlet control.



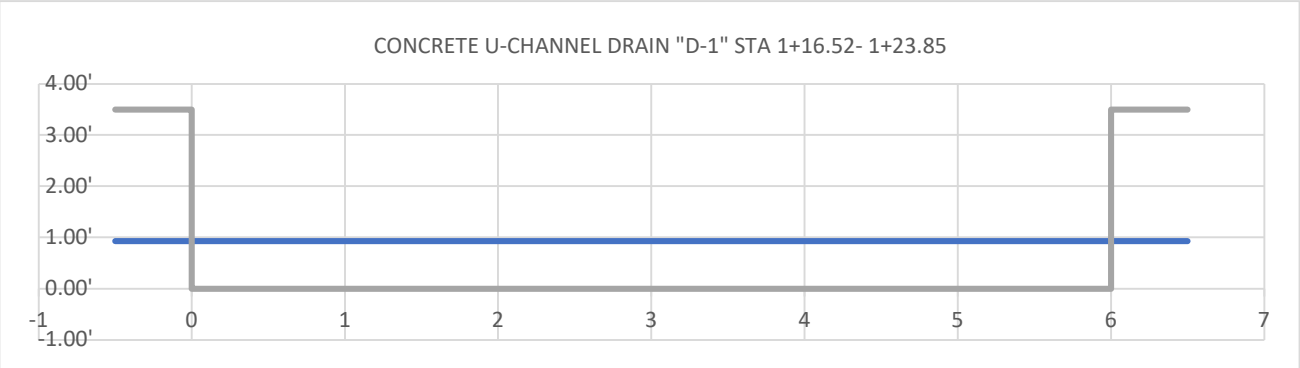
Subcritical flow upstream. Outlet control.


Elev (ft)
Line 3 - DRN "C" - ONE 2' x 5' SBC
599.00
597.00
595.00
593.00
591.00
589.00
JCT2
25' CURB INLET
24" x 60" Box @ 0.46%
Line 2
0
5
10
15
20
25
30
Reach (ft)
Subcritical flow upstream. Outlet control


Elev (ft)
Line 4 - DRN "CA" - ONE 2' x 5' SBC
599.00
597.00
595.00
593.00
591.00
589.00
JB2
25' CURB INLET
Line 2
24.500Lf - 24" x 60" Box @ 0.04%
0
5
10
15
20
25
30
35
Reach (ft)
Subcritical flow upstream. Outlet control.

Cordova Trails, Unit 1

Name	"D-1"
BEGIN STA	1+16.52
END STA	1+23.85
Q_{100} (cfs)	31.28
h (ft)	3.50'
b_w (ft)	6.00'
z (_):1 left	0
z (_):1 right	0
t_w (ft)	6
n	0.015
Slope (%)	0.50%
d_n (ft)	0.93'
V (fps)	5.60
Channel Type	Channel
Min Esm't (ft)	23.00



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

Project File: Drain D.stm	Number of lines: 2	Date: 9/21/2021

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	5.170	0.000	Curb	15.64	0.00	0.00	0.0	593.78	0.58	593.81	24X60	Box	0.013	0.50	596.39	DRN "D" - ONE 5'
2	1	35.500	0.000	Curb	15.64	0.00	0.00	0.0	593.81	0.82	594.10	18	Cir(3b)	0.018	1.00	596.39	DRN "D" - ONE 18

Project File: Drain D.stm | Number of lines: 2 | Date: 9/21/2021

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	15' CURB INLET	Curb-Horiz	596.39	Cir	4.00	4.00	24x60	Box	593.81	18	Cir (3b)	593.81
2	15' CURB INLET	Curb-Horiz	596.39	Cir	4.00	4.00	18	Cir (3b)	594.10			

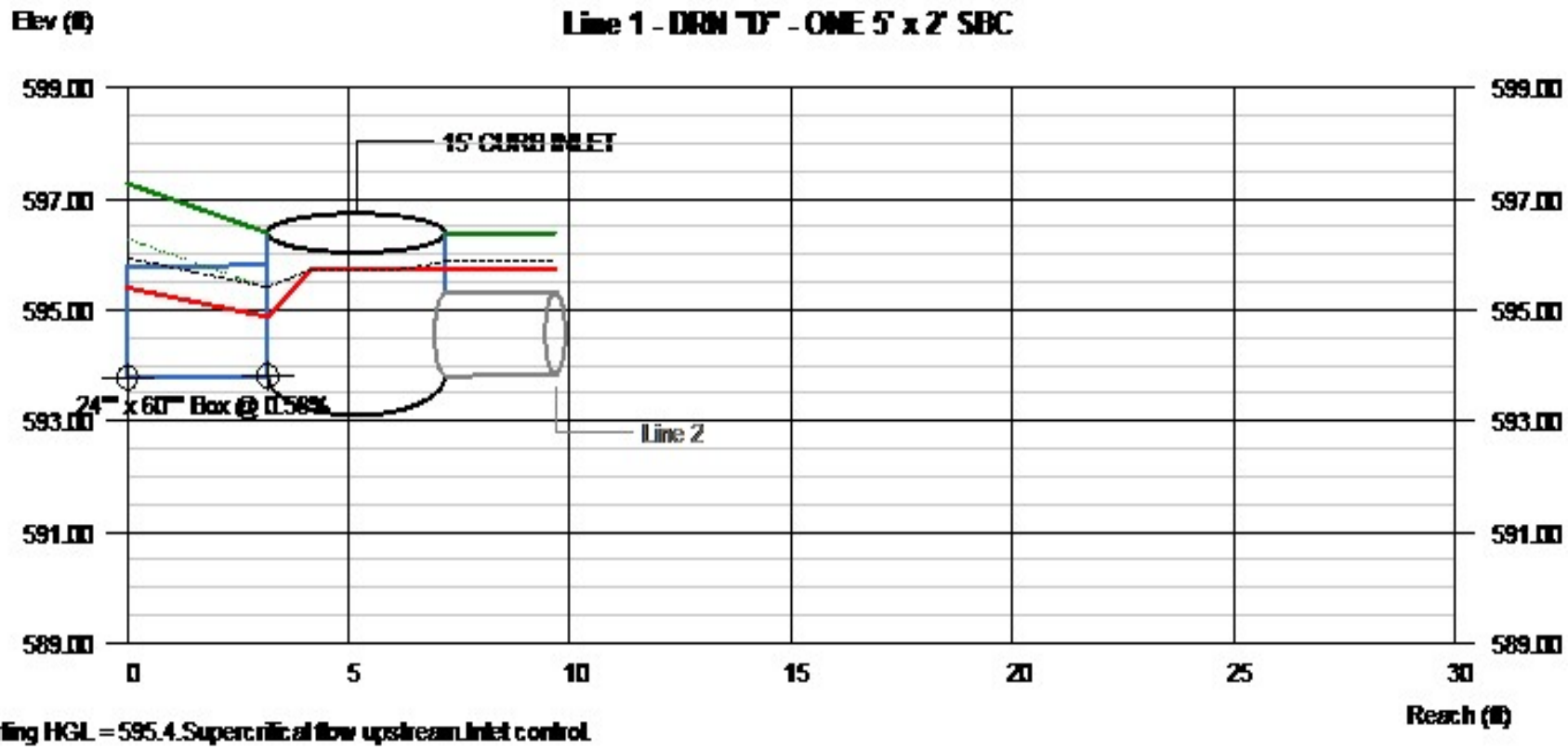
Project File: Drain D.stm | Number of Structures: 2 | Run Date: 9/21/2021

Hydraulic Grade Line Computations

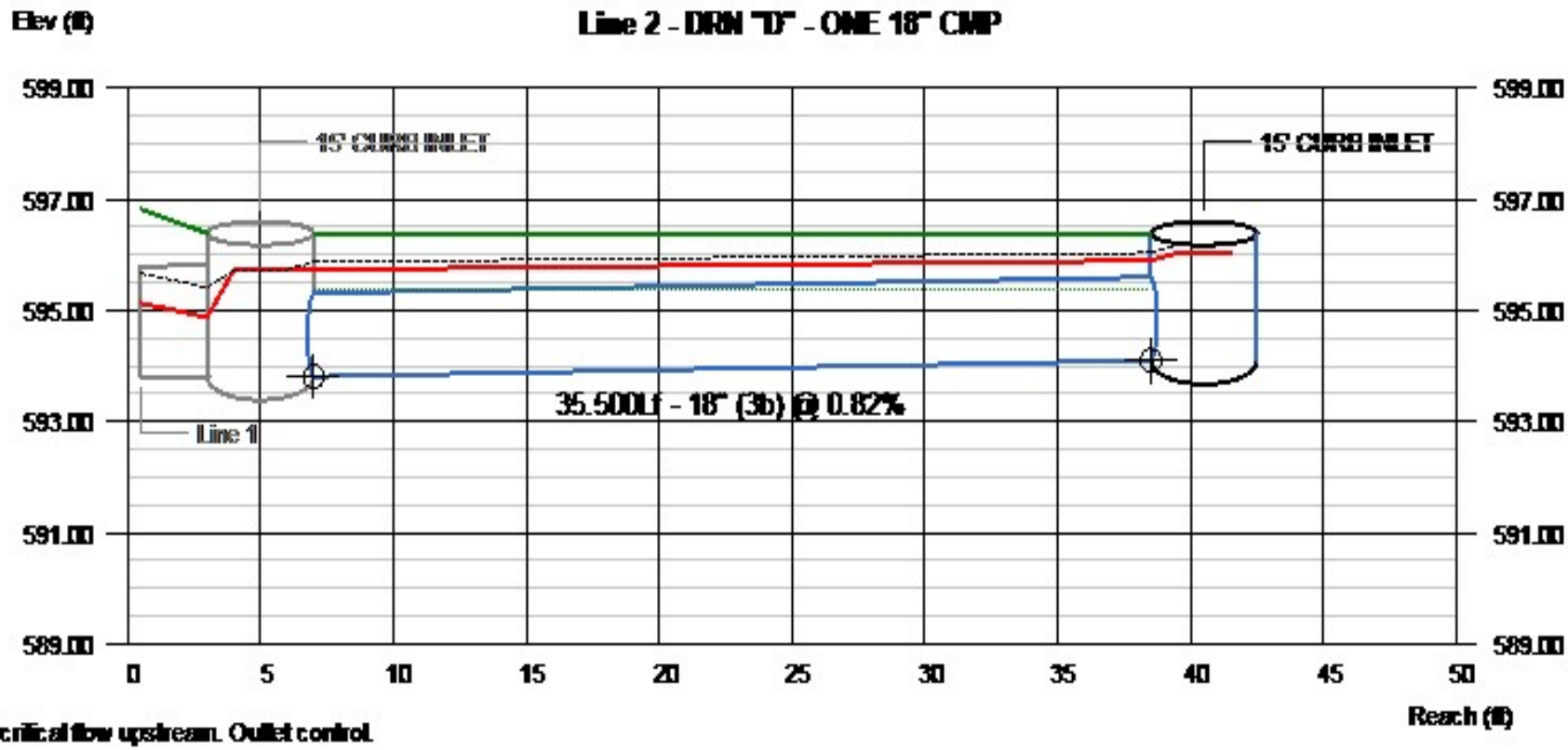
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	24 60 B	31.28	593.78	595.40	1.62	8.10	3.86	0.53	595.93	n/a	5.170	593.81	594.88	1.07**	5.34	5.86	0.53	595.41i	n/a	n/a	n/a	0.50	n/a
2	18(3b)	15.64	593.81	595.73	1.50	5.30	2.95	0.14	595.87	0.473	35.500	594.10	595.90	1.50	5.30	2.95	0.14	596.04	0.473	0.473	0.168	1.00	0.14

Project File: Drain D.stm | Number of lines: 2 | Run Date: 9/21/2021

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



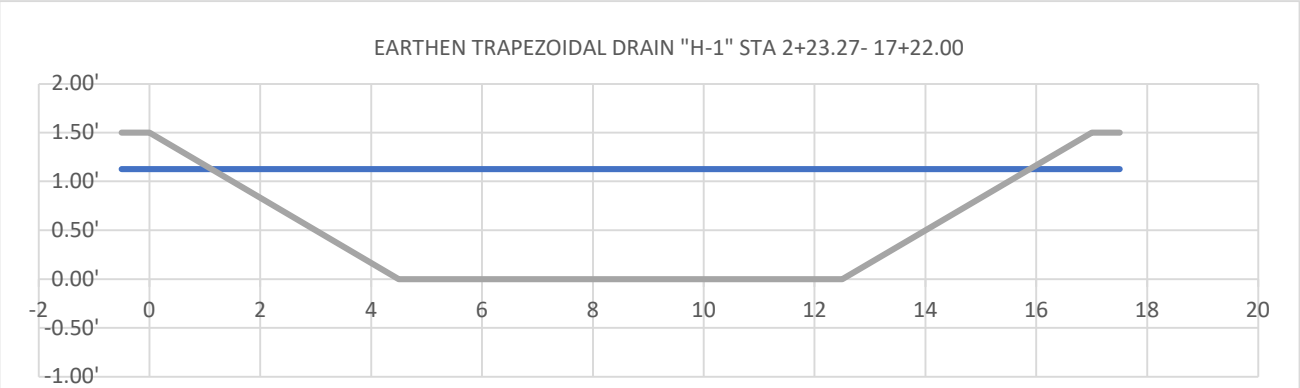
Starting HGL = 595.4. Supercritical flow upstream. Inlet control.

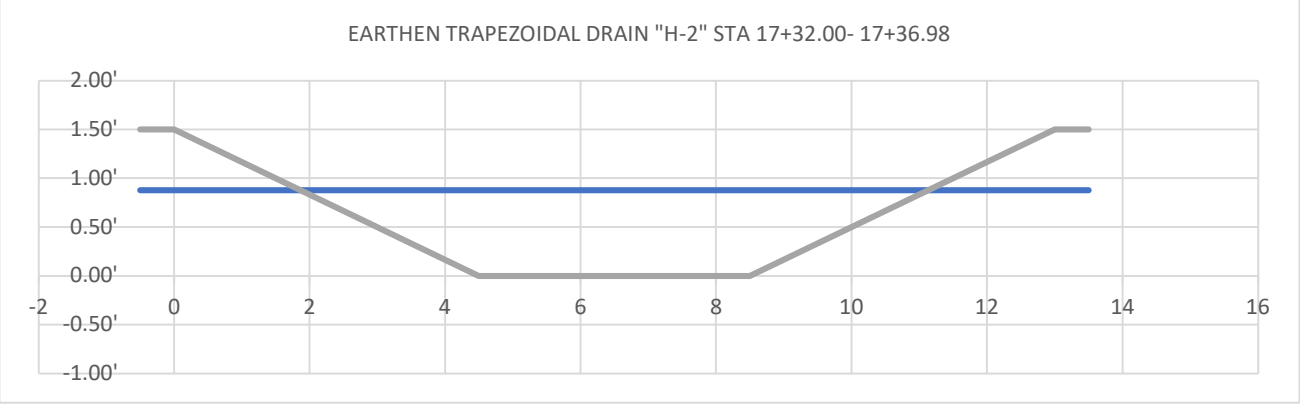


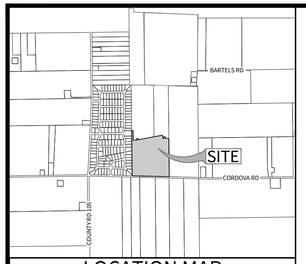
Subcritical flow upstream. Outlet control.

Cordova Trails

Name	"H-1"	"H-2"
BEGIN STA	2+23.27	17+32.00
END STA	17+22.00	17+36.98
Q_{100} (cfs)	24.50	8.93
h (ft)	1.50'	1.50'
b_w (ft)	8.00'	4.00'
z (_):1 left	3	3
z (_):1 right	3	3
t_w (ft)	17	13
n	0.035	0.035
Slope (%)	0.25%	0.25%
d_n (ft)	1.13'	0.88'
V (fps)	1.91	1.53
Channel Type	Channel	Channel
Min Esm't (ft)	34.00	30.00







LOCATION MAP
N.T.S.

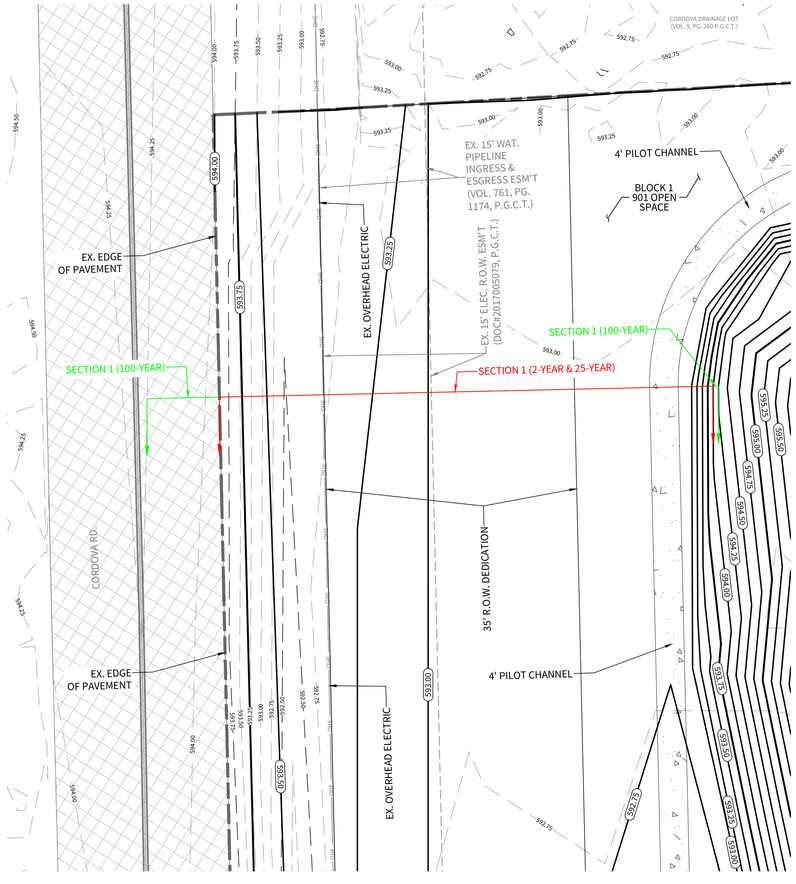
SCALE: 1"=10'
0 10 20

OWNER/DEVELOPER:
ASHTON WOODS HOMES
CONTACT PERSON: KYLE LENTS
17319 SAN PEDRO, SUITE 140
SAN ANTONIO,TX 78232
TEL: (210) 632-0753

CIVIL ENGINEER:
M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: DAVID CUPIT, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

LEGEND:

EXISTING ROW LINE	
PROPOSED ROW LINE	
EXISTING OVERHEAD ELECTRIC	OHE
EXISTING FIBER OPTIC MANHOLE	
EXISTING GUY WIRE	
EXISTING POWER POLE	
EXISTING SIGN	
EXISTING PAVEMENT	
PROPOSED PAVEMENT	
PROPOSED CONCRETE RIP-RAP	
LIMITS OF GRADING	
DIRECTION OF FLOW	
PROPOSED EDGE OF PAVEMENT	



CAUTION!!
THE CONTRACTOR SHALL BE AWARE THAT A 4" & 8" WATER EXISTS ALONG CORDOVA ROAD, ALONG WITH EXISTING OVERHEAD ELECTRIC UTILITIES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

APPROVED FOR CONSTRUCTION
01/14/2022
SEGUIN TEXAS

FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14

CUDEENGINEERS.COM
EST. 1980 CUDE ENGINEERS
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San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORDOVA TRAILS SUBDIVISION UNIT 1

DRAIN "H" OUTFALL CROSS SECTION LOCATIONS

DATE
09/24/2021

PROJECT NO.
03480.002

DRAWN BY
AC

CHECKED BY
DDC/JC

REVISIONS
1.
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CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

EXH

P:\03480\2022\2-Drawings\Exhibits\SK Pond\Outfall Locations.dwg 2021/09/24 3:57pm arubillo

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Jul 28 2021

Drain H Outfall Section 1 (2-Year)

User-defined

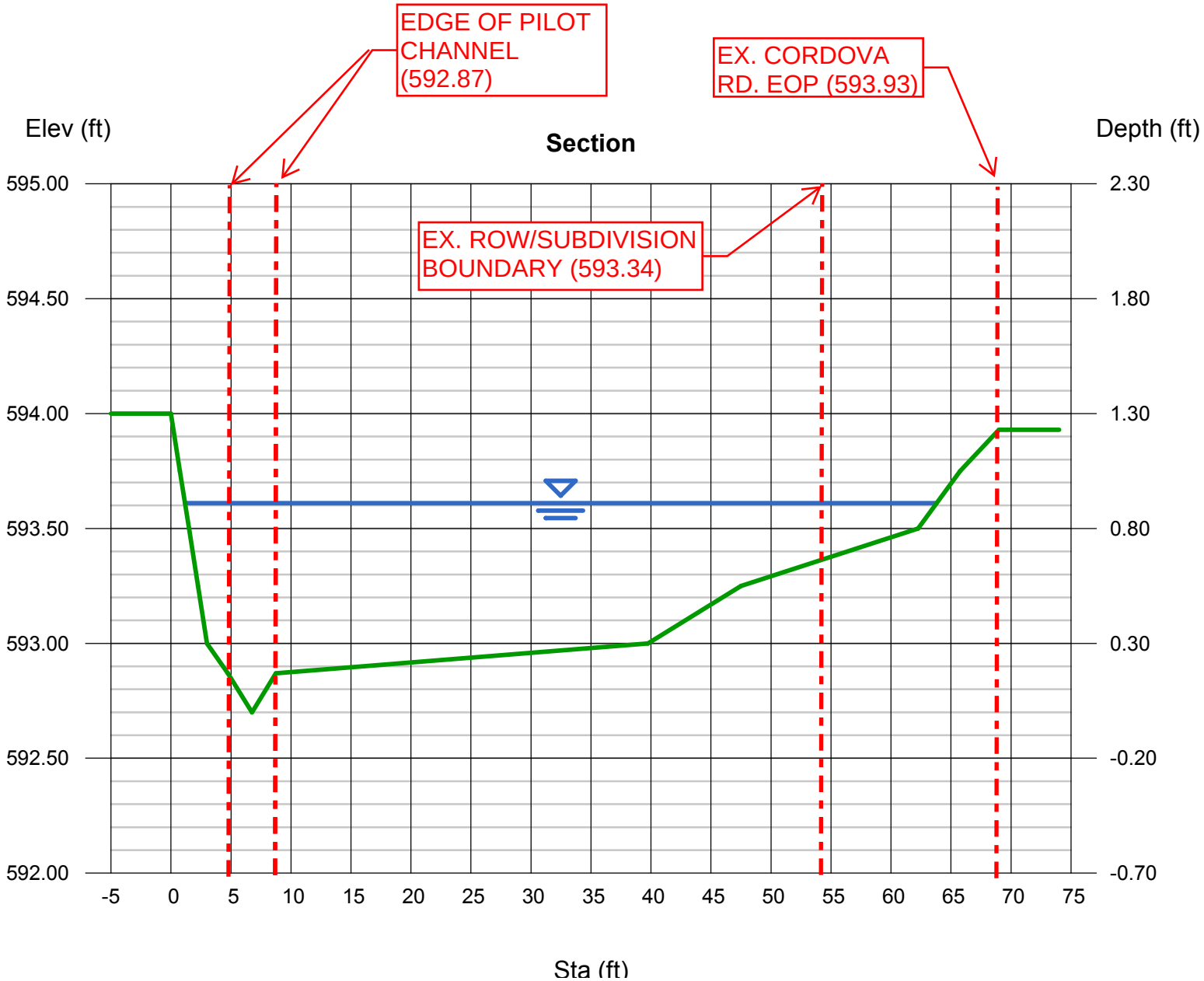
Invert Elev (ft)	= 592.70
Slope (%)	= 0.30
N-Value	= 0.034

Calculations

Compute by:	Known Q
Known Q (cfs)	= 51.37

Highlighted

Depth (ft)	= 0.91
Q (cfs)	= 51.37
Area (sqft)	= 33.27
Velocity (ft/s)	= 1.54
Wetted Perim (ft)	= 62.75
Crit Depth, Yc (ft)	= 0.61
Top Width (ft)	= 62.62
EGL (ft)	= 0.95



FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Sep 23 2021

Drain H Outfall Section 1 (25-Year)

User-defined

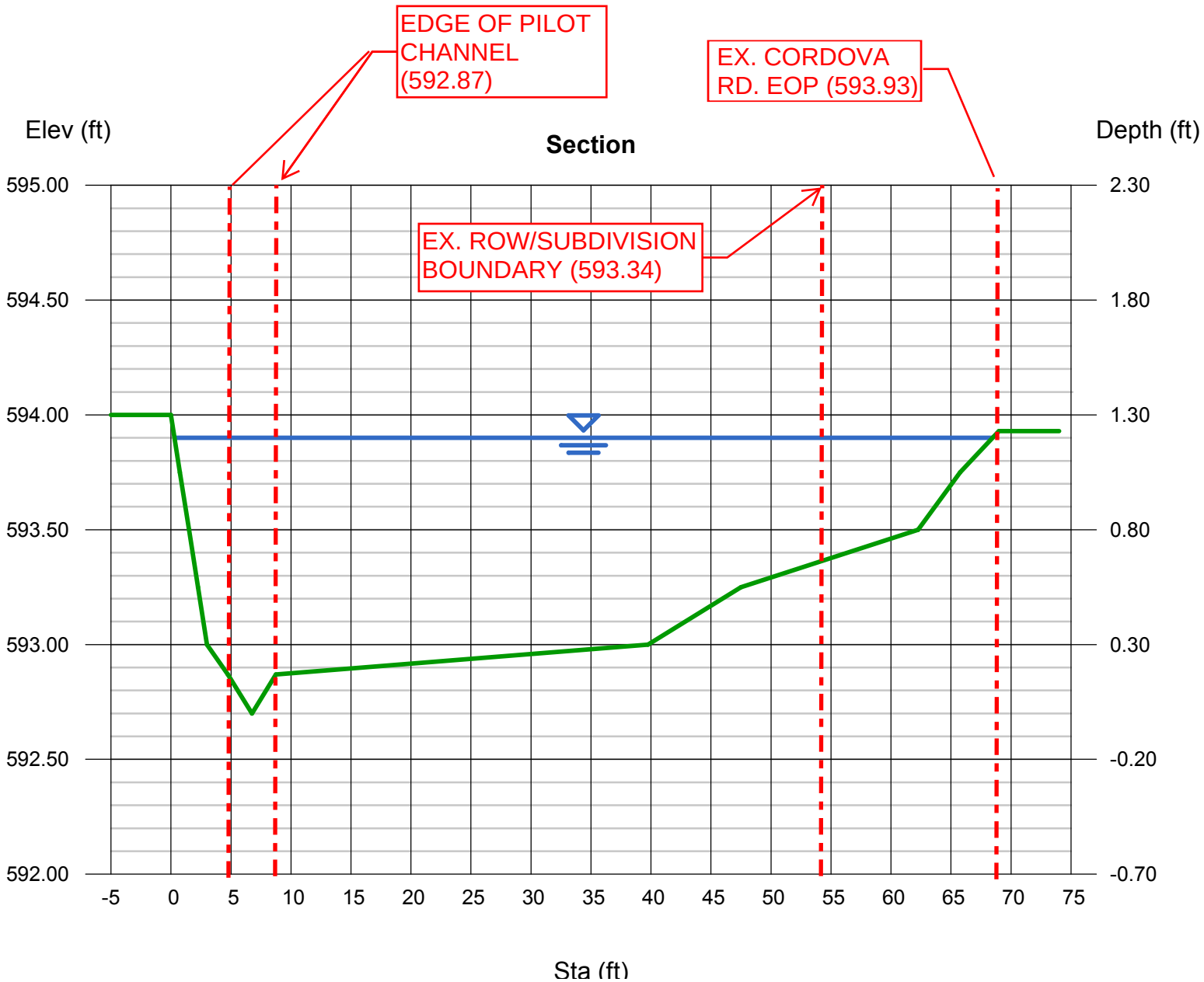
Invert Elev (ft)	= 592.70
Slope (%)	= 0.30
N-Value	= 0.034

Calculations

Compute by:	Known Q
Known Q (cfs)	= 103.97

Highlighted

Depth (ft)	= 1.20
Q (cfs)	= 103.97
Area (sqft)	= 52.20
Velocity (ft/s)	= 1.99
Wetted Perim (ft)	= 68.34
Crit Depth, Yc (ft)	= 0.82
Top Width (ft)	= 68.16
EGL (ft)	= 1.26



FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Jul 28 2021

Drain H Outfall Section 1 (100-Year)

User-defined

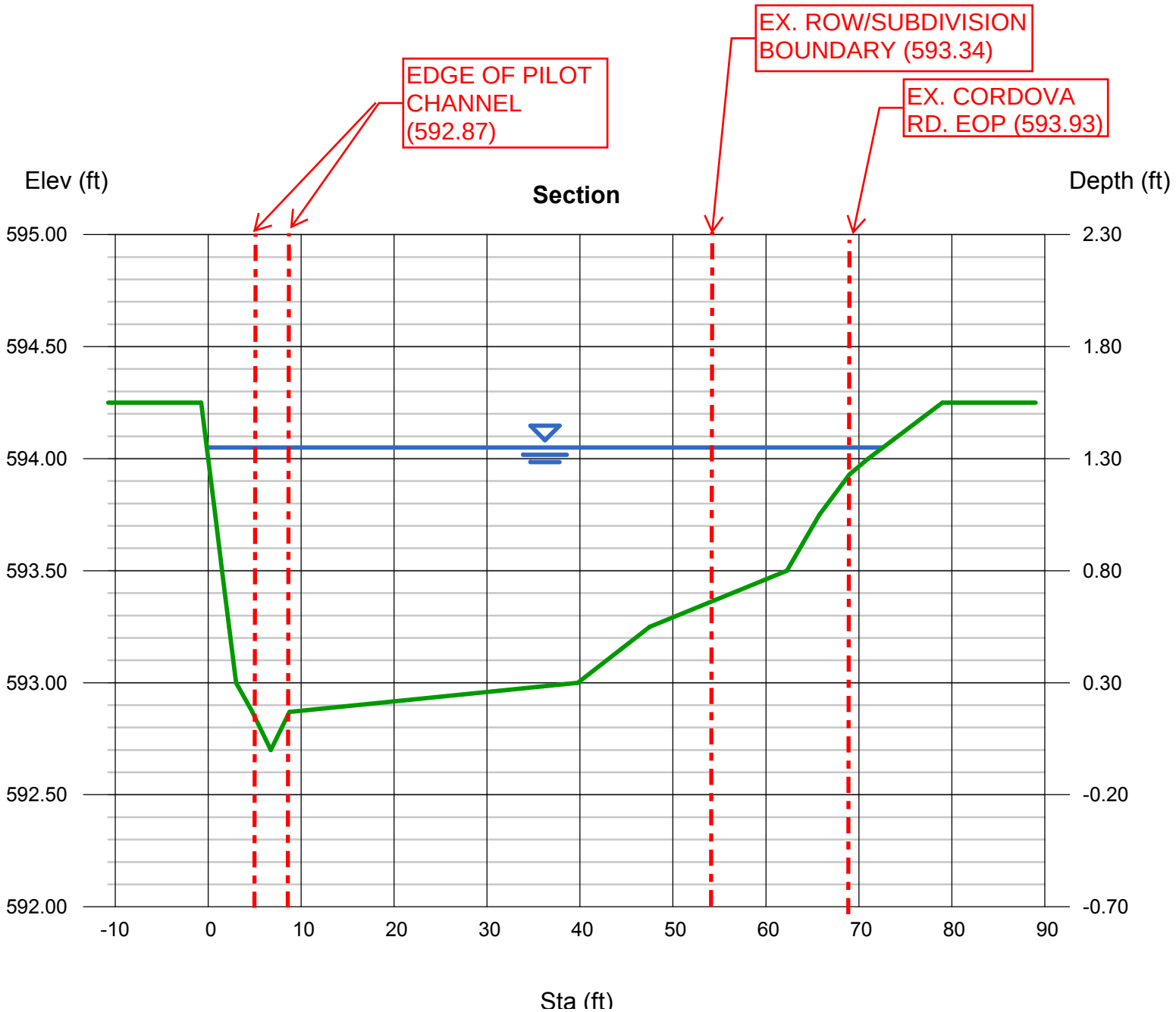
Invert Elev (ft)	= 592.70
Slope (%)	= 0.30
N-Value	= 0.033

Calculations

Compute by:	Known Q
Known Q (cfs)	= 136.96

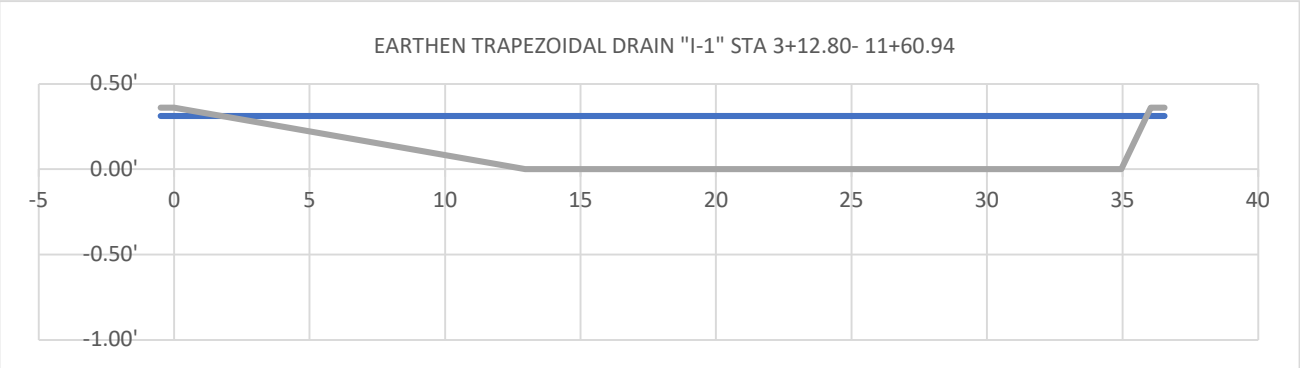
Highlighted

Depth (ft)	= 1.35
Q (cfs)	= 136.96
Area (sqft)	= 62.73
Velocity (ft/s)	= 2.18
Wetted Perim (ft)	= 72.96
Crit Depth, Yc (ft)	= 0.91
Top Width (ft)	= 72.75
EGL (ft)	= 1.42



Cordova Trails

Name	"I-1"
BEGIN STA	3+12.80
END STA	11+60.94
Q_{100} (cfs)	5.18
h (ft)	0.36'
b_w (ft)	22.00'
z (_):1 left	36
z (_):1 right	3
t_w (ft)	36
n	0.035
Slope (%)	0.12%
d_n (ft)	0.31'
V (fps)	0.59
Channel Type	Channel
Min Esm't (ft)	53.04



Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Jul 28 2021

Drain "I" - Yale Street Crossing

Invert Elev Dn (ft)	=	592.30
Pipe Length (ft)	=	81.19
Slope (%)	=	0.12
Invert Elev Up (ft)	=	592.40
Rise (in)	=	12.0
Shape	=	Circular
Span (in)	=	12.0
No. Barrels	=	3
n-Value	=	0.018
Culvert Type	=	Circular Corrugate Metal Pipe
Culvert Entrance	=	Mitered to slope (C)
Coeff. K,M,c,Y,k	=	0.021, 1.33, 0.0463, 0.75, 0.7

Embankment

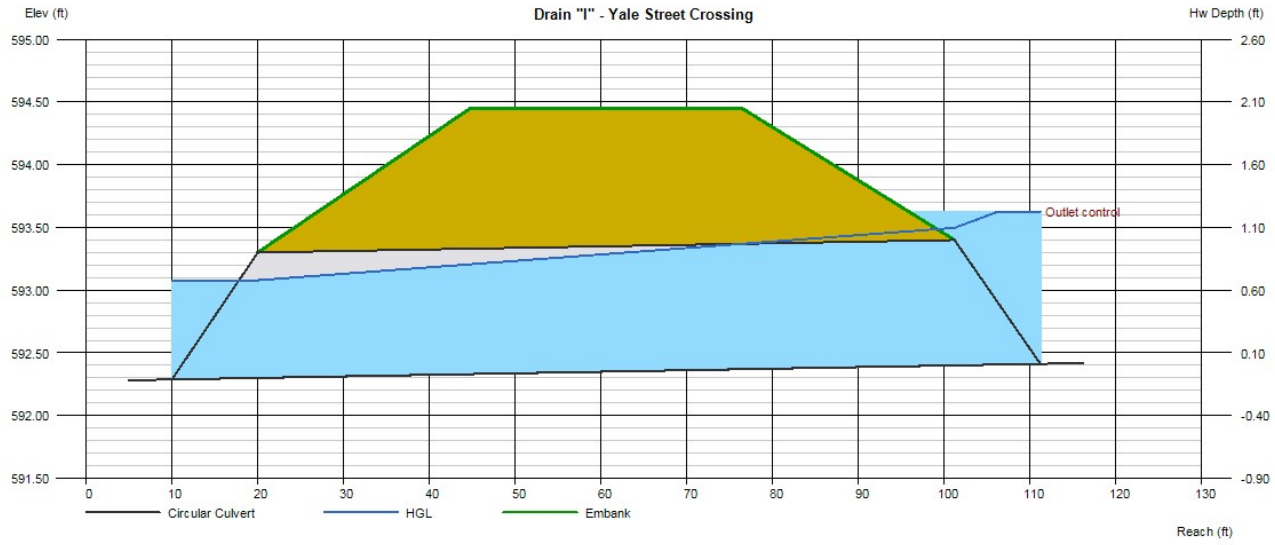
Top Elevation (ft)	=	594.45
Top Width (ft)	=	31.65
Crest Width (ft)	=	2.50

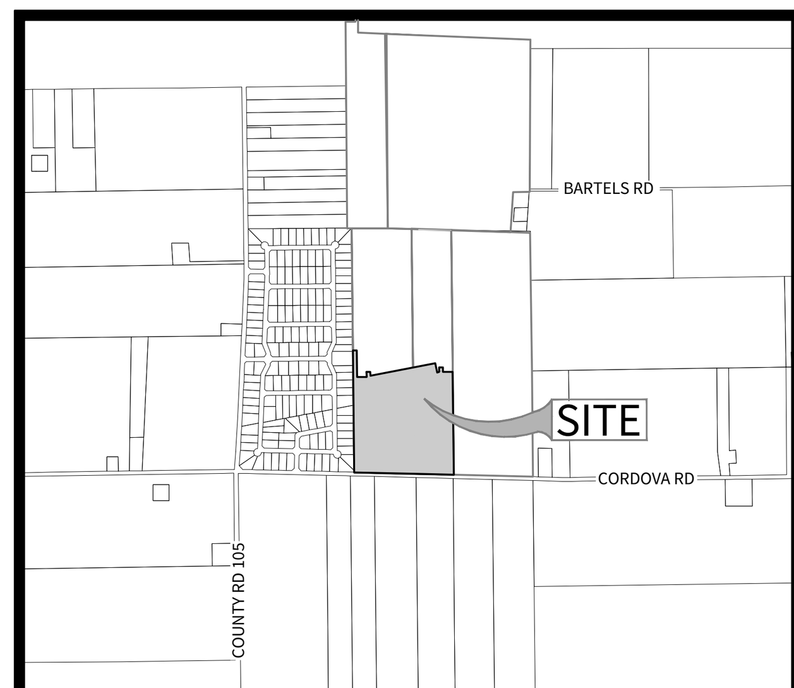
Calculations

Qmin (cfs)	=	5.18
Qmax (cfs)	=	5.18
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	5.18
Qpipe (cfs)	=	5.18
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	2.63
Veloc Up (ft/s)	=	2.20
HGL Dn (ft)	=	593.08
HGL Up (ft)	=	593.50
Hw Elev (ft)	=	593.62
Hw/D (ft)	=	1.22
Flow Regime	=	Outlet Control





LOCATION MAP

N.T.S.

OWNER/DEVELOPER:

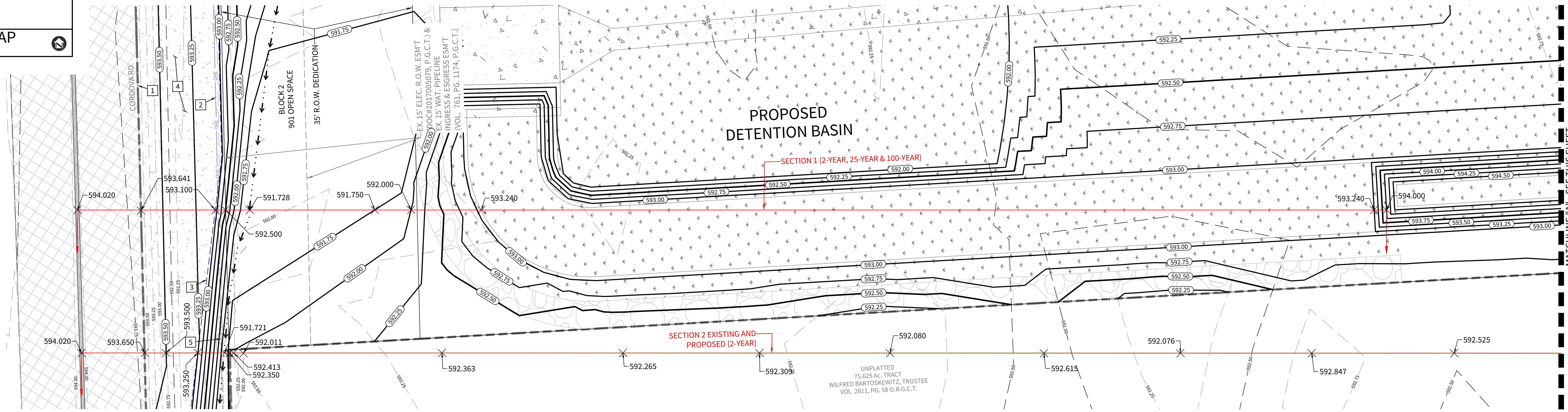
ASHTON WOODS HOMES
CONTACT PERSON: KYLE LENTS
17319 SAN PEDRO, SUITE 140
SAN ANTONIO,TX 78232
TEL: (210) 632-0753

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: DAVID CUPIT, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

KEYNOTES

1. EX. EDGE OF PAVEMENT
2. EX. OVERHEAD ELECTRIC
3. PROP. EDGE OF PAVEMENT
4. PROP. PAVEMENT WIDENING
5. EX. POWER POLE

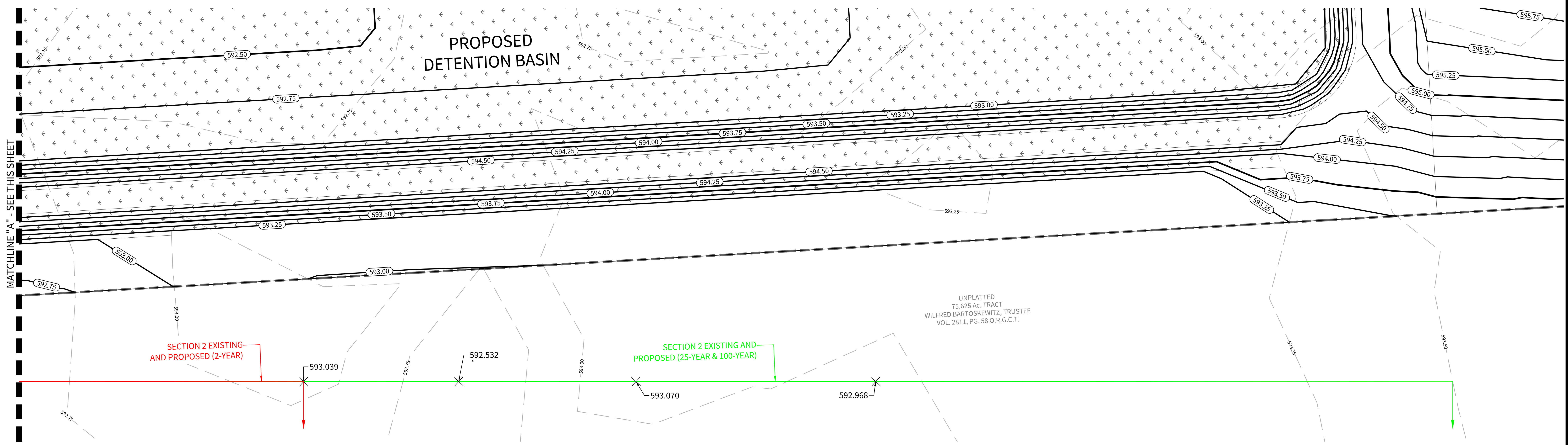


LEGEND:

- EXISTING ROW LINE
- PROPOSED ROW LINE
- EXISTING OVERHEAD ELECTRIC
- EXISTING FIBER OPTIC MANHOLE
- EXISTING GUY WIRE
- EXISTING POWER POLE
- EXISTING SIGN
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIP-RAP
- LIMITS OF GRADING
- DIRECTION OF FLOW
- PROPOSED EDGE OF PAVEMENT

SCALE: 1"=10'

0 10 20



CAUTION!!

THE CONTRACTOR SHALL BE AWARE THAT A 4" & 8" WATER EXISTS ALONG CORDOVA ROAD, ALONG WITH EXISTING OVERHEAD ELECTRIC UTILITIES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

APPROVED FOR CONSTRUCTION
SEGUIN TEXAS
01/14/2022

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CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORDOVA TRAILS SUBDIVISION UNIT 1

SOUTHEAST POND CROSS SECTION LOCATIONS

DATE 09/24/2021

PROJECT NO. 03480.002

DRAWN BY AC

CHECKED BY DDC/JC

REVISIONS
1.
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CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

EXH

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Sep 24 2021

SE Pond Outfall Section 1 (2-Year)

User-defined

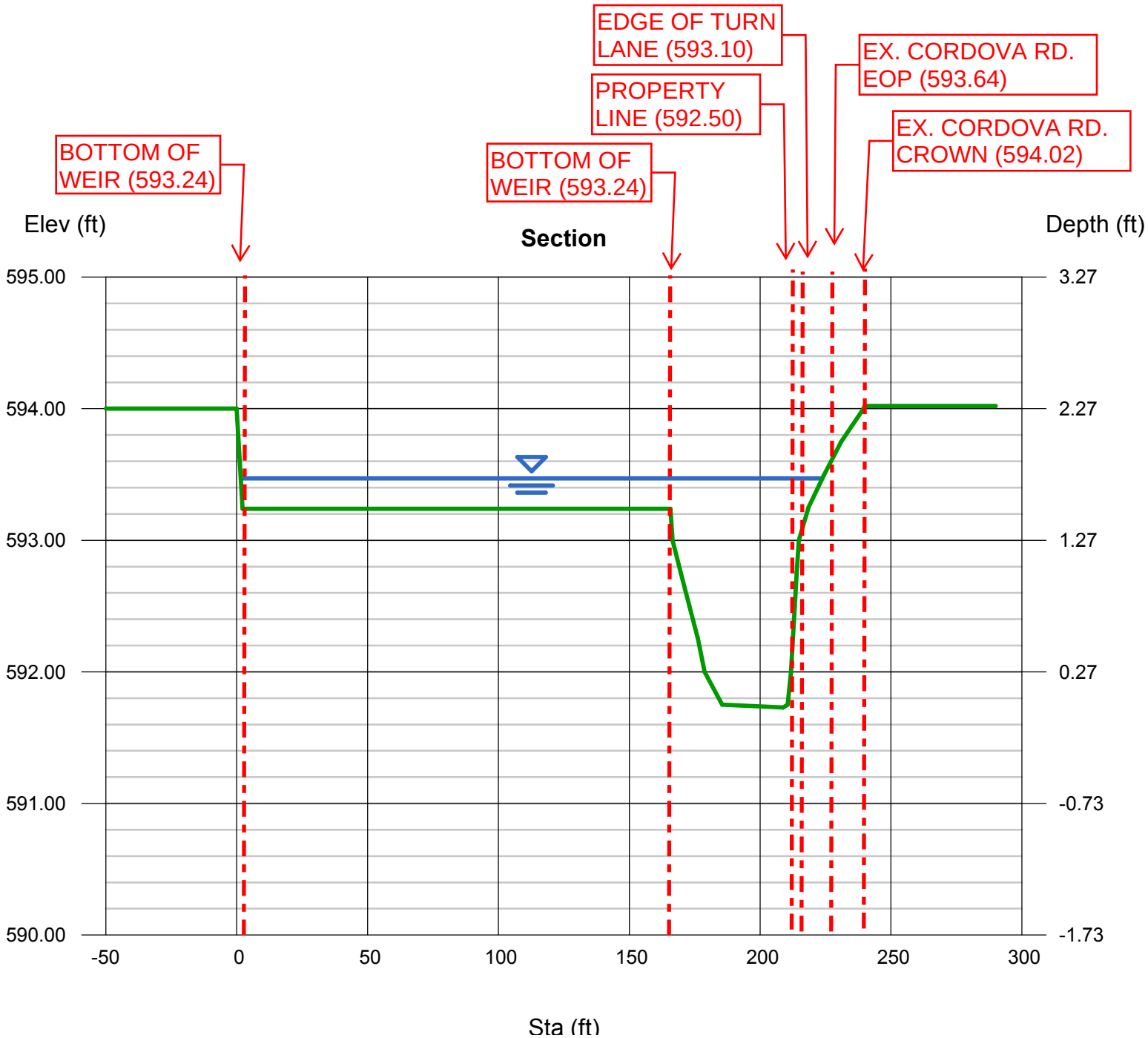
Invert Elev (ft)	= 591.73
Slope (%)	= 0.10
N-Value	= 0.034

Calculations

Compute by:	Known Q
Known Q (cfs)	= 91.70

Highlighted

Depth (ft)	= 1.74
Q (cfs)	= 91.70
Area (sqft)	= 110.34
Velocity (ft/s)	= 0.83
Wetted Perim (ft)	= 222.53
Crit Depth, Yc (ft)	= 0.67
Top Width (ft)	= 222.21
EGL (ft)	= 1.75



FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Sep 24 2021

SE Pond Outfall Section 1 (25-Year)

User-defined

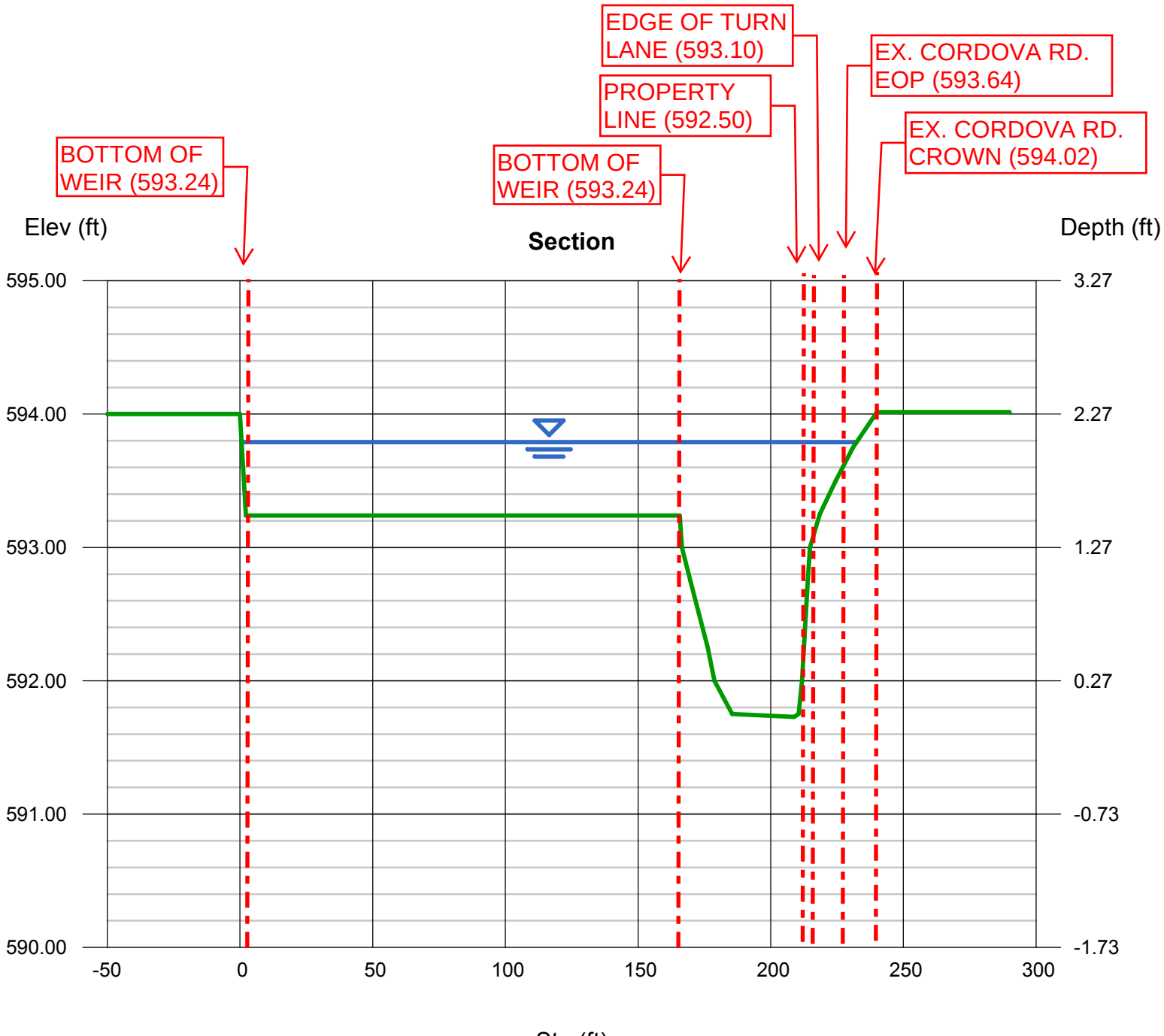
Invert Elev (ft)	= 591.73
Slope (%)	= 0.10
N-Value	= 0.034

Calculations

Compute by:	Known Q
Known Q (cfs)	= 215.00

Highlighted

Depth (ft)	= 2.06
Q (cfs)	= 215.00
Area (sqft)	= 182.92
Velocity (ft/s)	= 1.18
Wetted Perim (ft)	= 232.12
Crit Depth, Yc (ft)	= 1.12
Top Width (ft)	= 231.74
EGL (ft)	= 2.08



FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Sep 24 2021

SE Pond Outfall Section 1 (100-Year)

User-defined

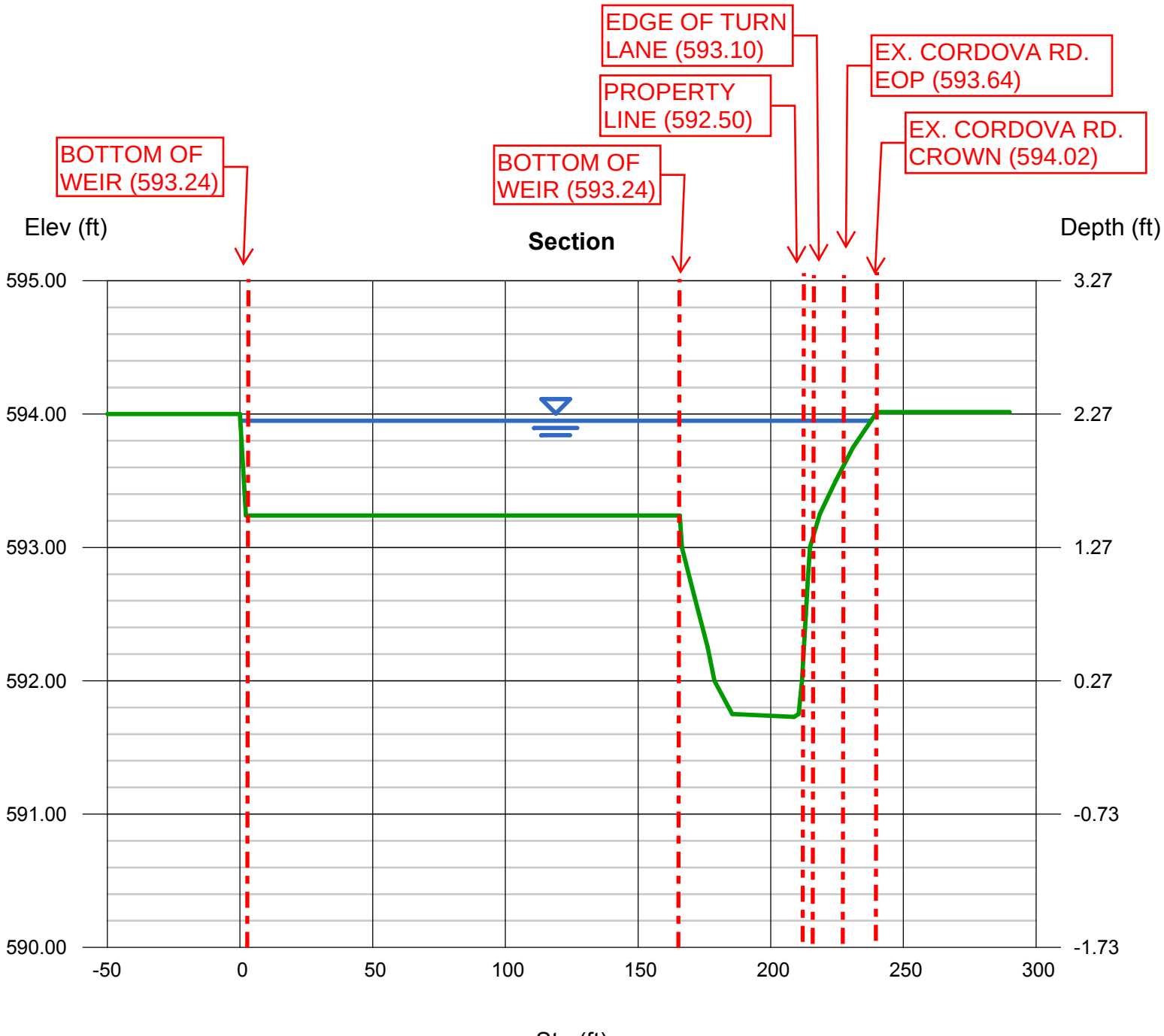
Invert Elev (ft)	= 591.73
Slope (%)	= 0.10
N-Value	= 0.033

Calculations

Compute by:	Known Q
Known Q (cfs)	= 292.90

Highlighted

Depth (ft)	= 2.22
Q (cfs)	= 292.90
Area (sqft)	= 220.46
Velocity (ft/s)	= 1.33
Wetted Perim (ft)	= 238.06
Crit Depth, Yc (ft)	= 1.34
Top Width (ft)	= 237.65
EGL (ft)	= 2.25



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Sep 24 2021

SE Pond Outfall Section 2 (2-Year Existing)

User-defined

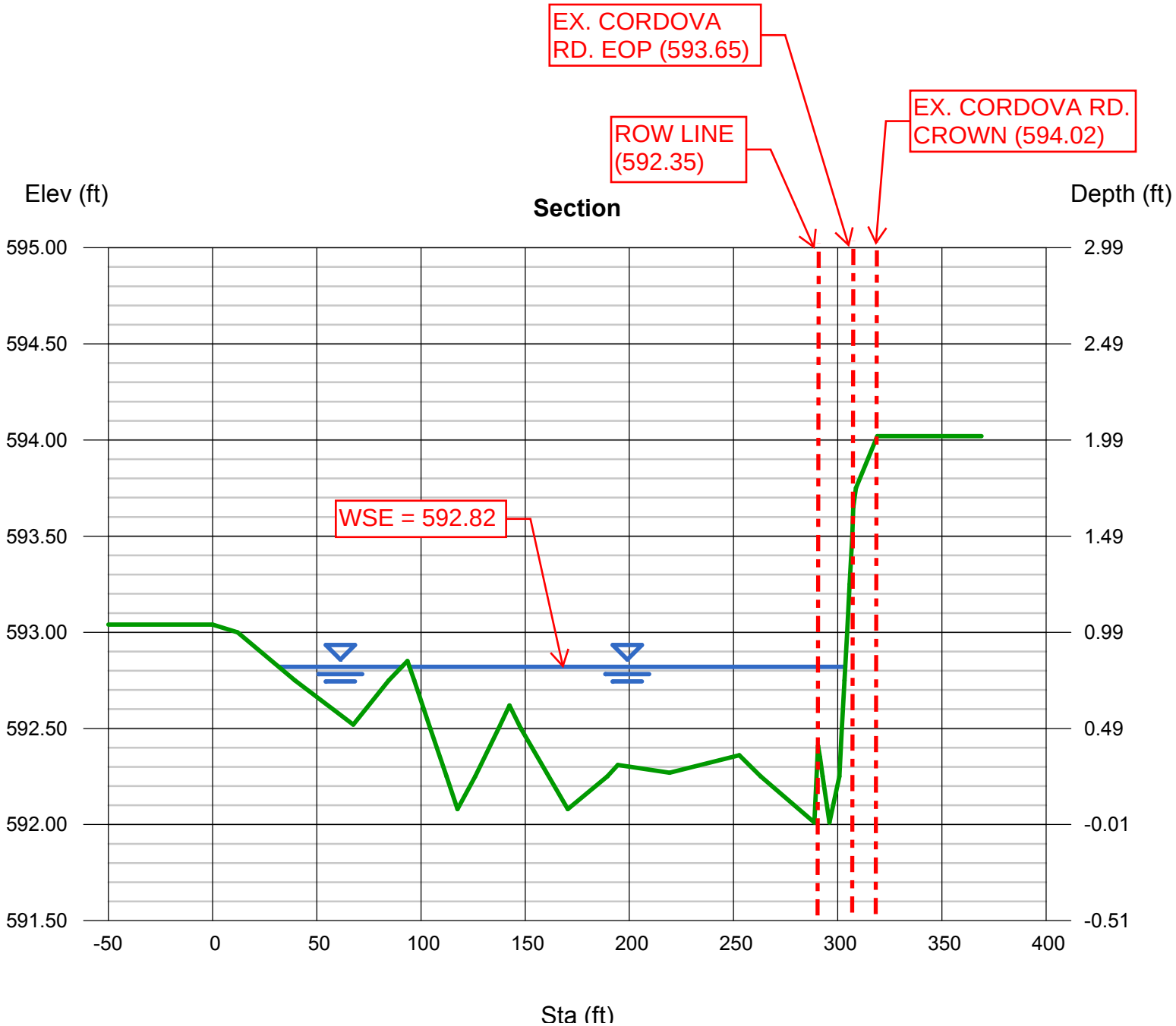
Invert Elev (ft)	= 592.01
Slope (%)	= 0.10
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 92.00

Highlighted

Depth (ft)	= 0.81
Q (cfs)	= 92.00
Area (sqft)	= 119.30
Velocity (ft/s)	= 0.77
Wetted Perim (ft)	= 268.28
Crit Depth, Yc (ft)	= 0.44
Top Width (ft)	= 268.13
EGL (ft)	= 0.82



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Sep 24 2021

SE Pond Outfall Section 2 (2-Year Proposed)

User-defined

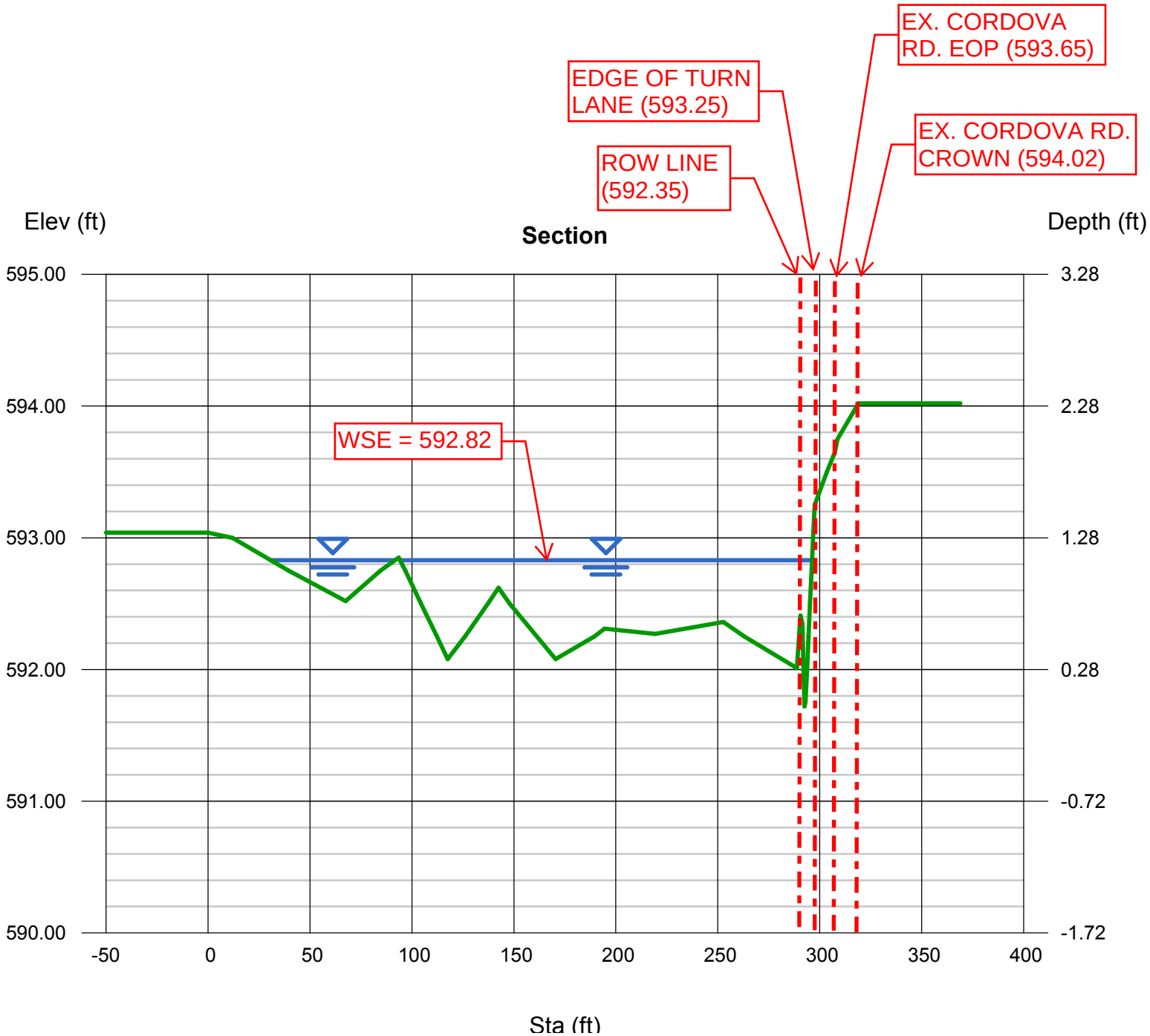
Invert Elev (ft)	= 591.72
Slope (%)	= 0.10
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 91.70

Highlighted

Depth (ft)	= 1.10
Q (cfs)	= 91.70
Area (sqft)	= 117.97
Velocity (ft/s)	= 0.77
Wetted Perim (ft)	= 263.52
Crit Depth, Yc (ft)	= 0.74
Top Width (ft)	= 263.08
EGL (ft)	= 1.12



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Sep 24 2021

SE Pond Outfall Section 2 (25-Year Existing)

User-defined

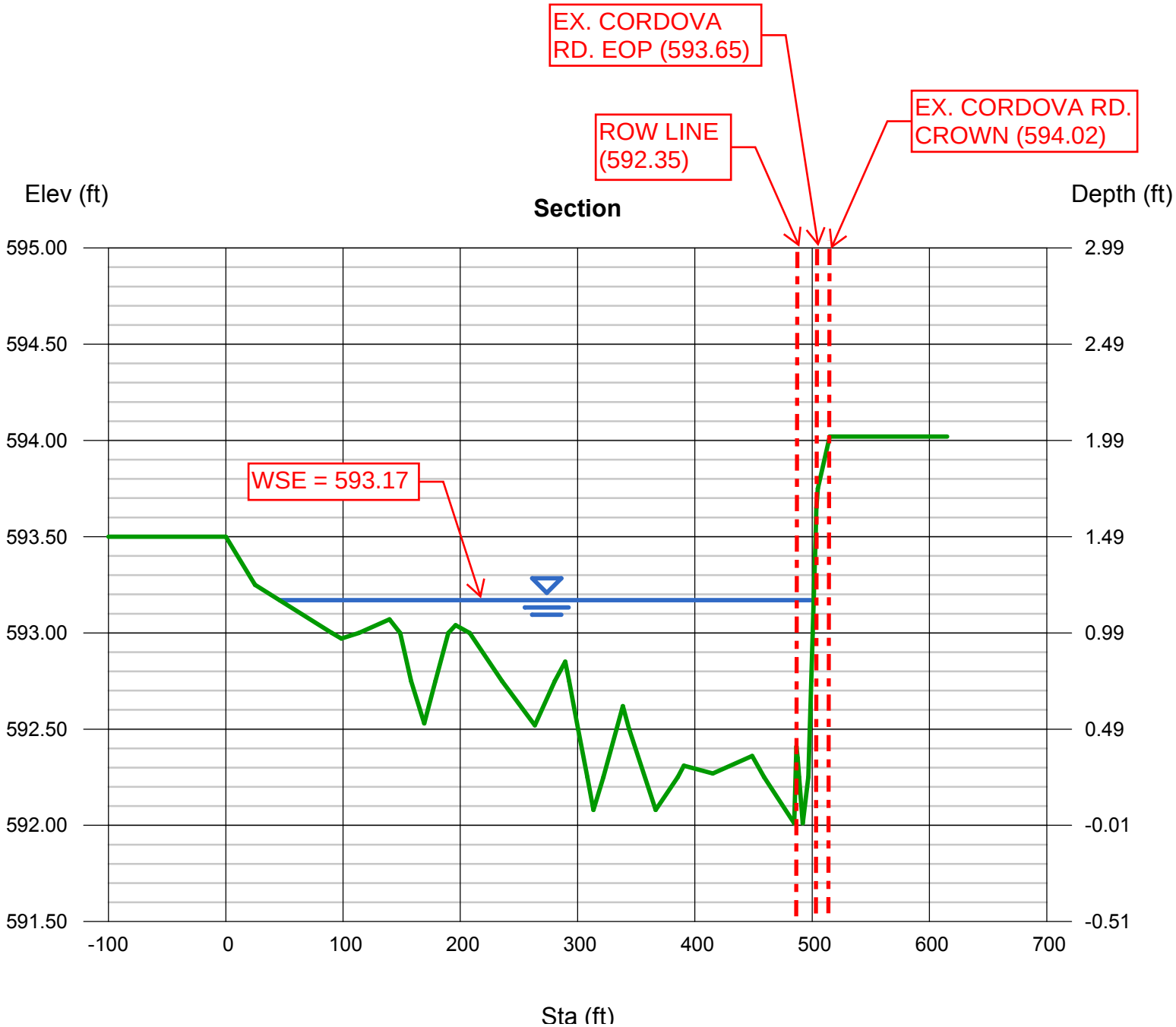
Invert Elev (ft)	= 592.01
Slope (%)	= 0.10
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 224.20

Highlighted

Depth (ft)	= 1.16
Q (cfs)	= 224.20
Area (sqft)	= 252.33
Velocity (ft/s)	= 0.89
Wetted Perim (ft)	= 455.58
Crit Depth, Yc (ft)	= 0.62
Top Width (ft)	= 455.39
EGL (ft)	= 1.17



FOR IMPROVEMENTS ASSOCIATED WITH UNIT1 & SCstP 0225-2021; Approved by CP|ENGR 2022-01-14

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Sep 24 2021

SE Pond Outfall Section 2 (25-Year Proposed)

User-defined

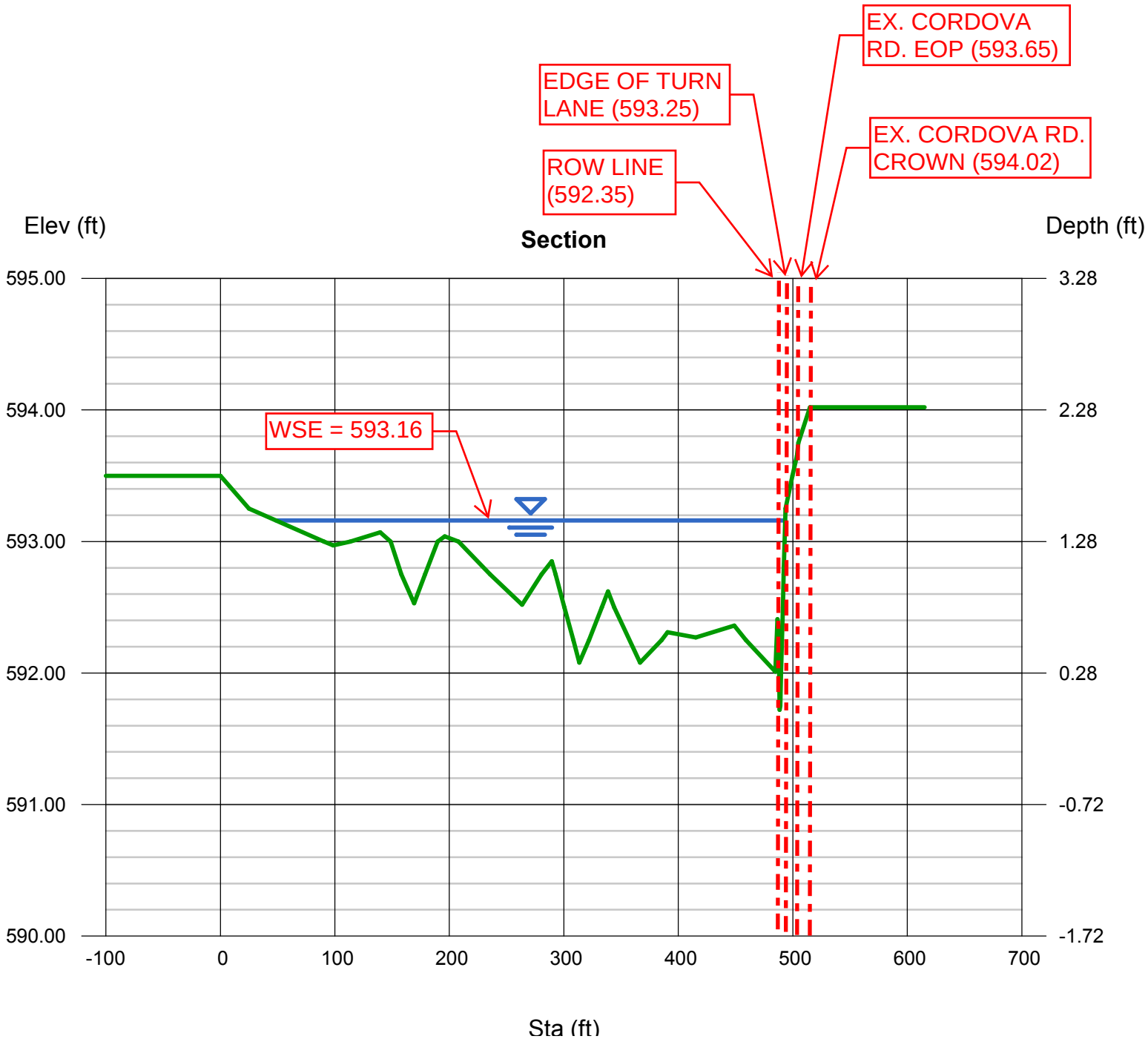
Invert Elev (ft)	= 591.72
Slope (%)	= 0.10
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 215.00

Highlighted

Depth (ft)	= 1.44
Q (cfs)	= 215.00
Area (sqft)	= 241.22
Velocity (ft/s)	= 0.89
Wetted Perim (ft)	= 445.14
Crit Depth, Yc (ft)	= 0.91
Top Width (ft)	= 444.64
EGL (ft)	= 1.45



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Sep 24 2021

SE Pond Outfall Section 2 (100-Year Existing)

User-defined

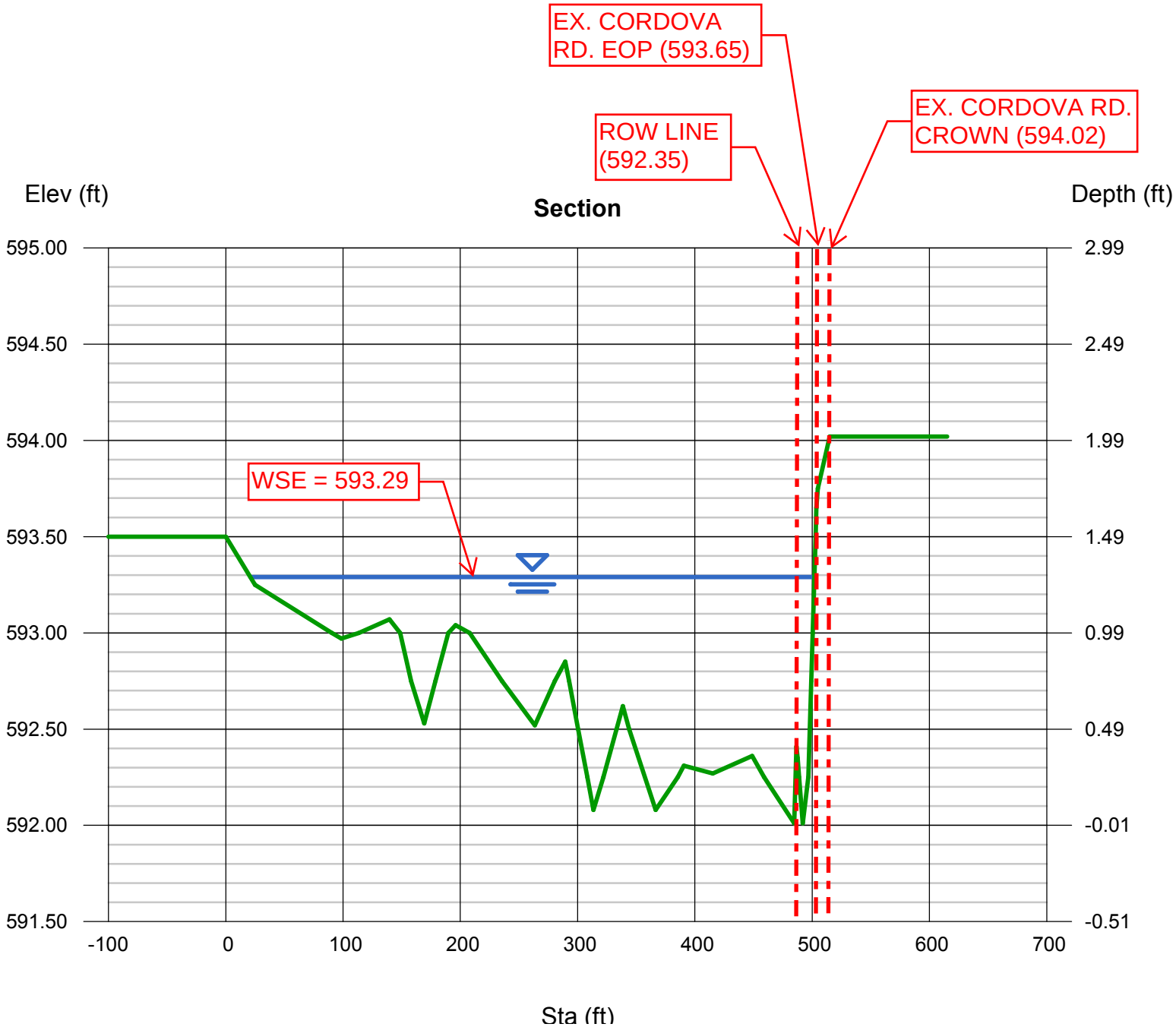
Invert Elev (ft)	= 592.01
Slope (%)	= 0.10
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 308.60

Highlighted

Depth (ft)	= 1.28
Q (cfs)	= 308.60
Area (sqft)	= 308.80
Velocity (ft/s)	= 1.00
Wetted Perim (ft)	= 481.17
Crit Depth, Yc (ft)	= 0.70
Top Width (ft)	= 480.95
EGL (ft)	= 1.30



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Sep 24 2021

SE Pond Outfall Section 2 (100-Year Proposed)

User-defined

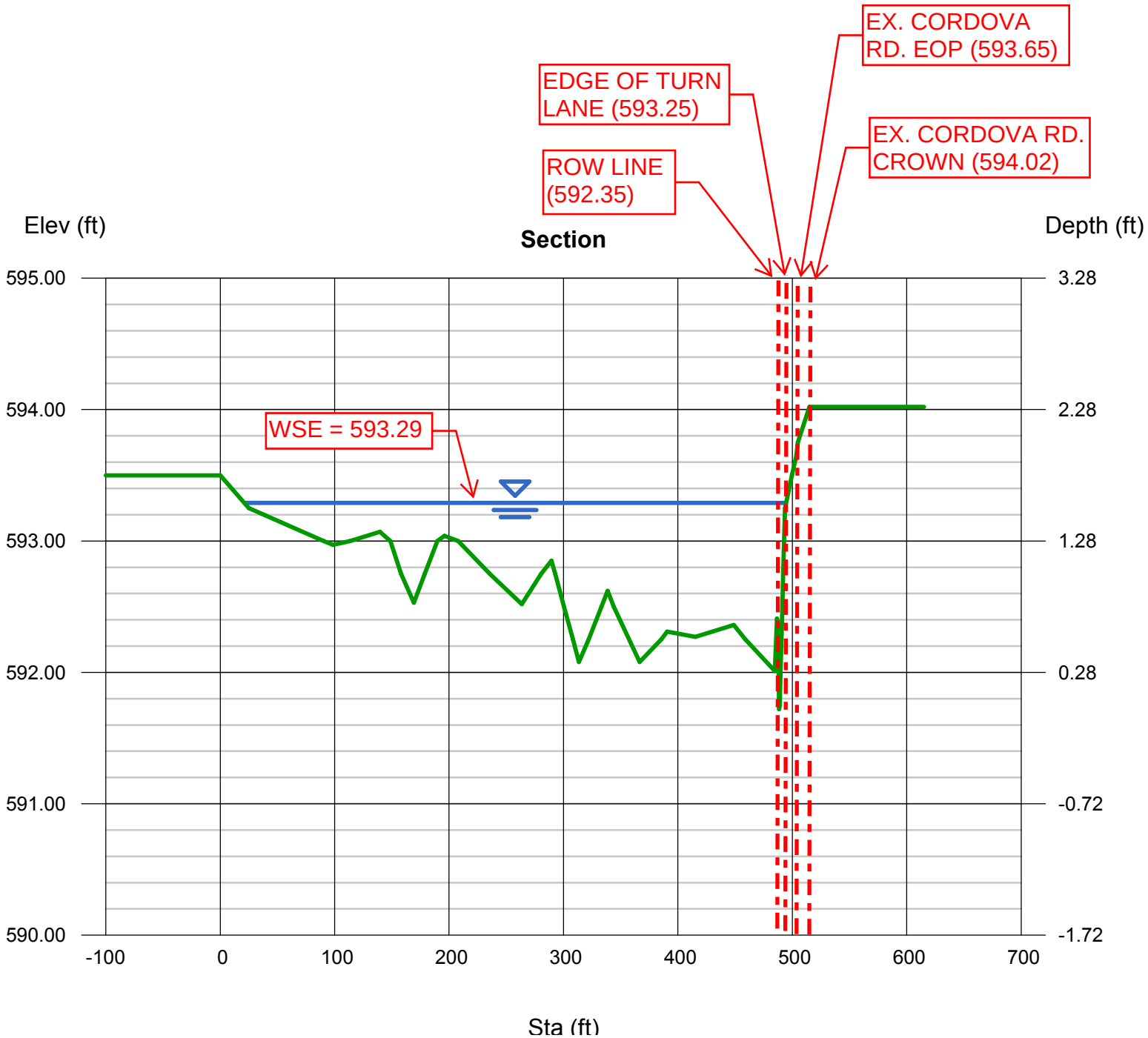
Invert Elev (ft)	= 591.72
Slope (%)	= 0.10
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 292.90

Highlighted

Depth (ft)	= 1.57
Q (cfs)	= 292.90
Area (sqft)	= 301.15
Velocity (ft/s)	= 0.97
Wetted Perim (ft)	= 473.97
Crit Depth, Yc (ft)	= 0.99
Top Width (ft)	= 473.46
EGL (ft)	= 1.58



2000' DOWNSTREAM ANALYSIS

CUDE ENGINEERS

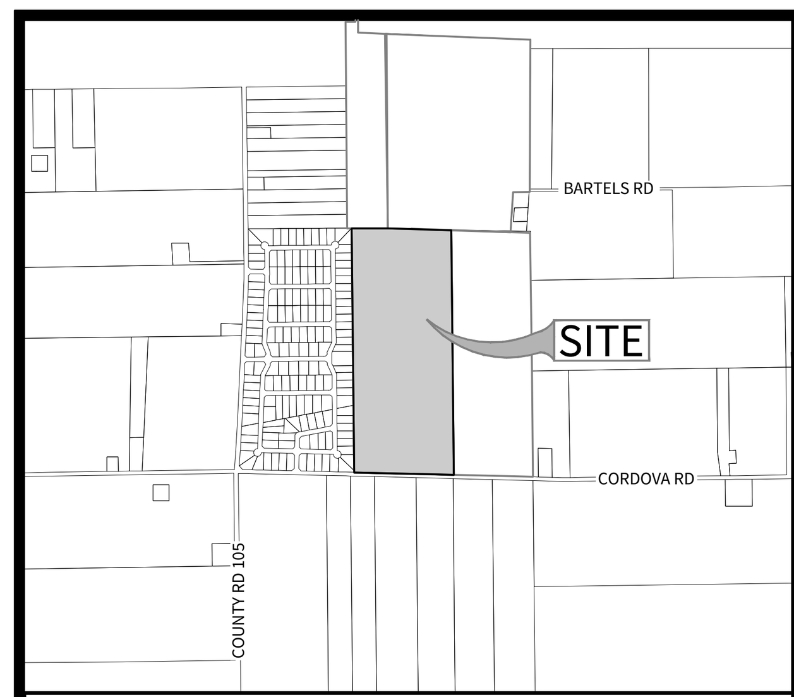
4122 POND HILL ROAD, STE 101
SAN ANTONIO, TEXAS 78231

PHONE: (210) 681-2951
CUDEENGINEERS.COM

TBPE NO. 455
TBPLS NO. 10048500

ADVERSE IMPACT STATEMENT (2,000' DOWNSTREAM ANALYSIS)

There are two points 2,000' downstream from the site that were analyzed for adverse impacts stemming from our proposed development. The first point, from the outfall of the southeast pond, corresponds to the point +/-400' east of the southeast corner of property owned by Virgil L. Vogel along Cordova Road. The second point, from the outfall of the northeast pond corresponds to the point on the property owned by the Bartoskewitz Farm Foundation, +/-2,500' north of the first point. Since detention facilities are provided for the overall Cordova Trails, the increased runoff generated from the proposed development will not produce a significant adverse impact to other properties, habitable structures or any drainage systems to a point 2,000' downstream of the proposed site.



LOCATION MAP

N.T.S.

OWNER/DEVELOPER:

ASHTON WOODS HOMES
CONTACT PERSON: KYLE LENTS
17319 SAN PEDRO, SUITE 140
SAN ANTONIO,TX 78232
TEL: (210) 632-0753

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: DAVID CUPIT, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

SCALE: 1" =300'

LEGEND

SITE BOUNDARY	
2,000' DOWNSTREAM PATH	
2,000' DOWNSTREAM POINT	XX

APPROVED FOR CONSTRUCTION

SEGUIN TEXAS

01/14/2022

CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORDOVA TRAILS SUBDIVISION UNIT 1

2,000' DOWNSTREAM ANALYSIS

DATE	09/23/2021
PROJECT NO.	03480.002
DRAWN BY	AC
CHECKED BY	DDC/JC

REVISIONS

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CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

E12