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RENEGADE CLUBHOUSE

FINAL DRAINAGE REPORT PREPARED FOR:
DESERT MOUNTAIN CLUB INC.
38580 N DESERT MOUNTAIN PARKWAY
SCOTTSDALE, AZ 85262

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PROJECT # 65993

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Table of Contents

Table of Figures

Table of Tables

List of Appendices

1.0 Introduction

Desert Mountain is in the process of developing a new golf clubhouse for their Renegade golf course. The proposed location for the new clubhouse is 38580 N. Desert Mountain Parkway, Scottsdale, AZ 85262. The site is accessed via Desert Mountain Parkway, which is the primary circulation route throughout the community. The overall site development will consist of demolition of the existing site amenities (including the existing clubhouse building and restaurant), construction of a new 21,083 square foot (sq. ft.) building, and realignment of Galloway Wash. Additionally, the access road, driveway, parking lot, cart path, and site trails will be modified and improved as necessary to accommodate the overall development. The vicinity map, Figure 1 below shows the Project Site location.

The portion of Galloway Wash to be realigned was initially realigned in the 1980s during the initial development of Desert Mountain and the Renegade golf course. The proposed development will re-establish the historic alignment of the wash.

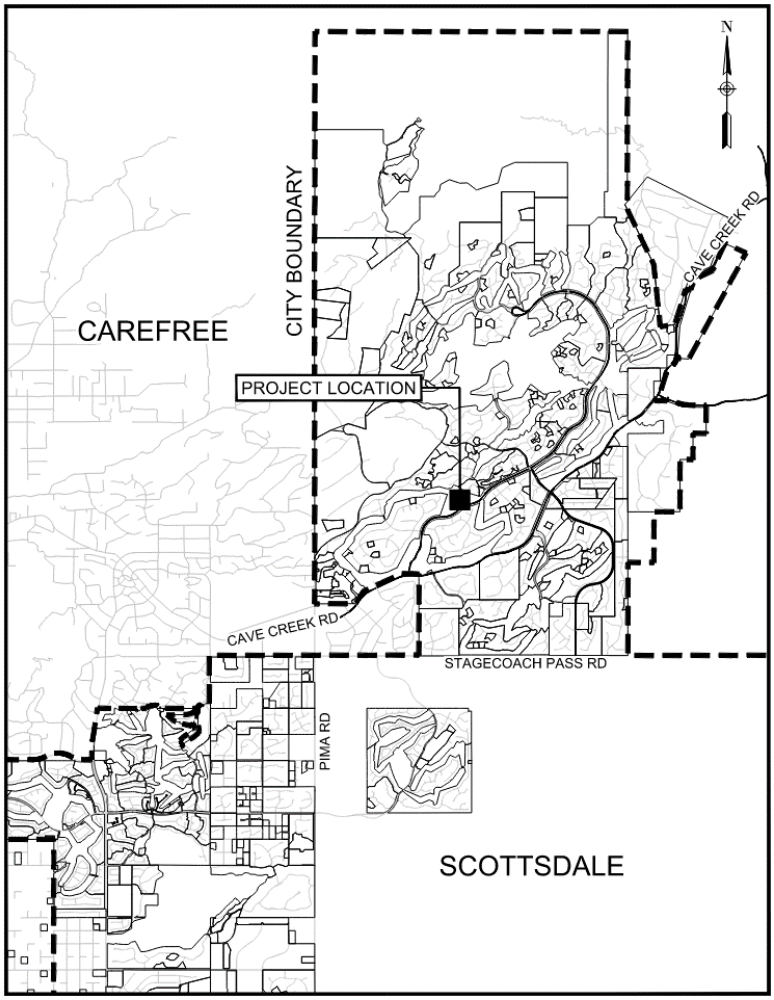


Figure 1: Vicinity Map

1.1 Purpose and Objective

The purpose of this drainage report is to illustrate the design approach and rationale utilized to design and analyze the wash realignment and stormwater management system for the Renegade Clubhouse. This drainage report summarizes the hydrologic and hydraulic analyses performed for the site, provides recommendations for drainage improvements, and is based on the currently applicable City of Scottsdale and Maricopa County codes, regulations, and design guidelines.

1.2 Previous Studies

Gannett Fleming has reviewed previous studies and reports which evaluated drainage in the general vicinity of the project along with the associated improvement plans. These studies and plans include:

1. Master Drainage Report for Desert Mountain Development
   May 1992
   By A-N West, Inc. Consulting Engineers
2. Detailed Drainage Design Report for Desert Mountain Properties
   Proposed Detention Basin No. S-1
   March 1996
   By A-N West, Inc. Consulting Engineers
3. Drainage Report for Desert Mountain
   Renegade Golf Course Golf Instruction Center
   August 2011
   By Gannett Fleming, Inc.
   Approved by City of Scottsdale via COS Plan Check Number 3796-11-1, dated 10/19/2011.

1.3 Review of Historic Aerial Imagery

Historic aerial imagery dating back to the 1990s was reviewed within Google Earth to understand the degree to which the wash has changed over the past 30 years. Figure 2 through Figure 6 show the evolution of this stretch of wash with yellow dashed lines delineating the approximate banks of the wash in 1992.

Desert Mountain performs a significant amount of maintenance on this wash as a part of their overall operations and maintenance for Renegade golf course. Reviewing the aerial imagery speaks to both the ongoing maintenance performed by Desert Mountain and the performance of the wash during rain events. Galloway wash has seen significant flow events over the last 30 years and the imagery shows only minimal changes in both wash alignment and extents. Minor

improvements to the driving range performance center on the south end of the wash can be seen in the 2007 and 2014 aerials.

Figure 2: 1992 Aerial Photo

Figure 3: 2003 Aerial Photo

Figure 4: 2007 Aerial Photo

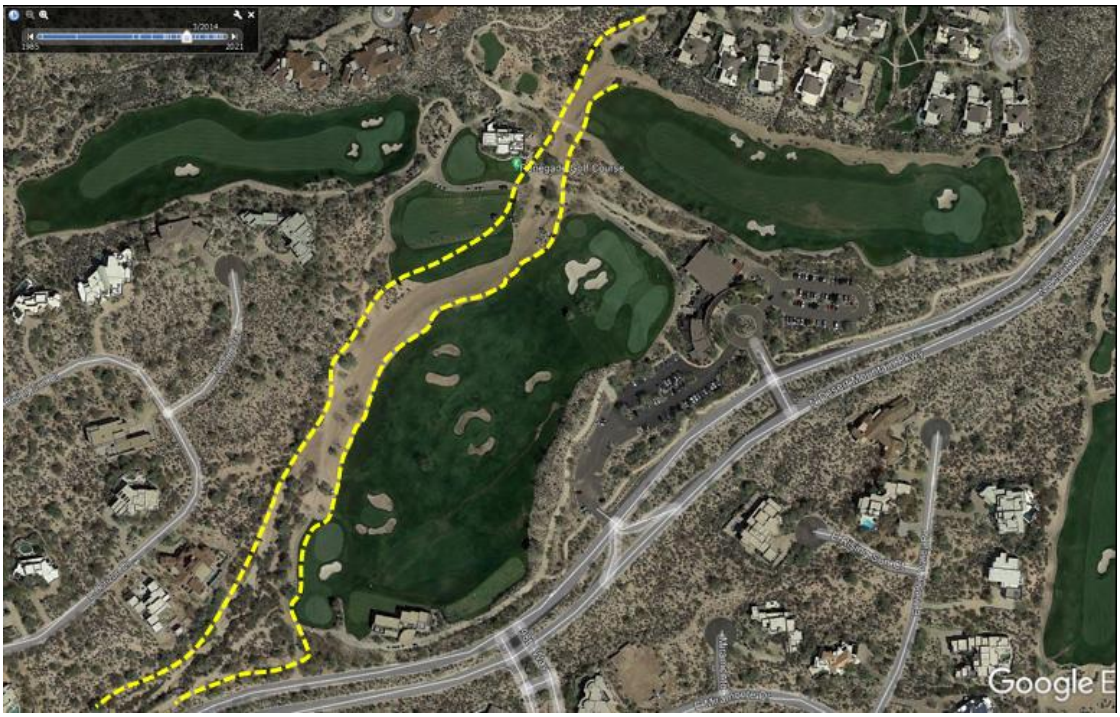


Figure 5: 2014 Aerial Photo

Figure 6: 2021 Aerial Photo

1.4 Vista Wash Corridor and ESLO Compatibility

Maintaining existing wash conditions and aesthetics is a critical element to this project. Both the City of Scottsdale Environmentally Sensitive Lands Ordinance (ESLO) and Vista Corridor guidelines were considered as part of the wash design and erosion protection methods.

1.5 Summary of Approach

According to the hydraulic calculations documented within this report, the wash currently experiences high velocities, and because the proposed design does not significantly alter the hydraulic characteristics of the wash, the proposed channel configuration is expected to experience similarly high velocities. Many channel lining alternatives (sourced from City of Scottsdale and Maricopa County documents) were evaluated in order to protect the realigned channel against erosion. These alternatives are presented in Figure 7 along with a high-level scoring and weighting. Based on this alternatives evaluation, an articulated concrete block (ACB) mattress system has been selected to protect the channel against erosion. The ACBs are proposed to be buried beneath 18" (+/-) of vegetative cover, which will allow for vegetation growth consistent with a desert wash and will allow the wash to maintain a natural aesthetic within ESLO guidelines. Figure 8 shows a rendering of the proposed wash and erosion protection after installation and vegetation.

Channel Alternatives	Cost	ESLO Compatability / Aesthetics	O & M	Level of Scour Protection	Compatable with Max Velocity of 16 fps	Compatable with existing HGL (sediment transport)	Weighted Summation	Unweighted Summation	Notes
Grouted Rip Rap lined	1	1	3	3	3	3	23	14	Prevents vegetation growth. Maximum recommended velocity 15 fps per MCFCD and side slopes 2:1.
Soil Cement lined	1	1	3	3	2	2	19	12	Increased velocities through channel section, leading to potential adverse downstream impacts. Maximum recommended velocity 15 fps per MCFCD and side slopes 3:1.
Loose rip rap lined	3	1	2	3	3	2	22	14	Can be sized accordingly, however preliminary calcs indicate excessively large rip rap size (d50 = 36"). Maximum recommended side slopesper MCFCD is 2:1.
Unlined (vegetated)	4	4	1	0	0	3	15	12	Existing wash condition is unlined. Regular wash maintenance required to restore erosion (maintain channel section). Maximum recommended side slopesper MCFCD is 4:1.
Concrete lined	1	1	3	3	3	2	21	13	Increased velocities through channel section, leading to potential adverse downstream impacts. Maximum recommended velocity 15 fps per MCFCD and side slopes 3:1.
Gabion Mattress Lined	2	2	3	3	2	3	23	15	Ideal for subcritical flow. Gabion mattress wires could be subject to damage from high debris flows. Maximum recommended velocity 9 fps per MCFCD.
Closed Conduit (Culvert)	1	3	2	3	3	2	22	14	Increased velocities through culverts /closed conduits, leading to potential adverse downstream impacts.
Unlined, Flattened Slope with Drop	1	2	1	2	2	1	14	9	
Buried Articulated Concrete Block (ACB) Mattress	1	3	2	3	3	3	24	15	Maximum permissible velocity of 19 fps for unvegetated applications, greater velocities for vegetated application
ArmorMax and ScourLock Lining (bank and scour depth protection only)	2	3	2	2	0	3	17	12	Recommended for turf applications. Maximum permissible velocity for unvegetated conditions is 13 fps and 25 fps for vegetated conditions.
ArmorMax 75 High Performance Turf Reinforcement Mat Lined	3	2	2	3	0	3	19	13	Recommended for turf/vegetated applications. Maximum permissible velocity for unvegetated conditions is 13 fps and 25 fps for vegetated conditions.
Unlined with Grade Control Structures	3	3	1	2	1	2	17	12	

Rating Guide	
Fatal Flaw (not viable)	0
	1
Not enough information/lower rating than neutral	2
Neutral (meets requirement/consideration)	3
	4
Exceeds requirement/consideration	5

Figure 7: Channel Alternatives Selection and Rating Guide

Figure 8: Wash Rendering and Future Vegetation

2.0 Existing Drainage Conditions

The Project Site's existing conditions include the Renegade Clubhouse, Renegade Hideout restaurant, golf course driving range, and a section of Galloway Wash that flows to the south of the existing restaurant between holes 1 and 18. The Site is located within the mountainous terrain of North Scottsdale with varying slopes ranging from 3% to 12%. On-site drainage primarily drains to the west via overland flow through the parking lot and driving range. Site runoff concentrates in the southwest corner of the driving range and discharges into Galloway Wash via a combination of 24-inch diameter culverts and small channels running parallel to Desert Mountain Parkway for approximately 200 feet. The off-site watershed areas consist of the golf course and landscape natural areas. Figure 9 shows the existing site's current drainage patterns.

The site is located in Zone D according to the Flood Insurance Rate Map (FIRM) #04013C0903L prepared by the Federal Emergency Management Agency (FEMA) dated September 30, 2005. Zone D is defined as areas in which flood hazards are undetermined but possible. See Appendix B for a FEMA-FIRMette map of the area.

Exhibits for the pre-development drainage conditions and runoff coefficients by land use are provided in Appendix C. The exhibits delineate the site drainage areas and tabulate their respective 2-, 10-, 100-year flows and runoff coefficient (C) values.

Figure 9: Existing Site Conditions

3.0 Proposed Drainage Conditions

The proposed clubhouse seeks to minimize disturbance to existing offsite flows, maintain the natural terrain, and convey new on-site flows mainly as overland runoff through the site access roads and the north and east parking lots. Approximately 70% of the runoff from the project site will concentrate at three main locations within the golf driving range and leave the site at the historical outfall, denoted by concentration point CP-4. Figure 10 shows the proposed site drainage patterns.

First flush treatment of runoff from impervious surfaces will be accomplished mainly by two stormwater harvesting ponds and routing runoff through the driving range. Additionally, this project site is within the Desert Mountain South Watershed, which drains to detention basin S-1. The detention basin S-1 was established as part of the Desert Mountain 1992 Master Drainage Plan to attenuate the stormwater runoff and to eliminate the need for on-site storage to be provided throughout much of Desert Mountain.

An approximately 900-foot portion of Galloway Wash within the project boundary will be realigned to its historical location. In addition to restoring the historical alignment of the wash, the proposed alignment will improve the safety conditions of the site during rain events or flash floods. Currently, the access drive to the existing Renegade Hideout restaurant is a wet crossing

where traffic must drive across the bottom of the wash. The realignment and new clubhouse construction will eliminate this condition and prevent potentially dangerous crossings of an inundated access drive.

The historic drainage path and downstream storage capacity will not be adversely affected based on the post-development conditions.

Figure 10: Proposed Site Conditions

Exhibits for the post-development drainage conditions and runoff coefficients by land use are provided in Appendix C. The exhibits delineate the site drainage areas and tabulate their respective 2-, 10-, 100-year flows and runoff coefficient (C) values.

4.0 Wash Relocation and Section 404 Compliance

Desert Mountain is proposing to modify the alignment of Galloway Wash within the Renegade Golf Course as a part of the reconfiguration of the adjacent golf facilities and the construction of a new clubhouse and associated parking and access routes. The specific section of wash to be realigned is approximately 900 feet long and passes between the 1st and 18th holes on the south of the existing Renegade Hideout restaurant. The proposed alignment of the wash will reroute it north of the proposed clubhouse before rejoining the existing wash alignment. The existing alignment of the wash was established during the construction of the golf course, which opened

in 1987. The intent of this realignment is to restore the wash to its original (historic) alignment. This is supported by the drainage reports prepared around that same time and by historic USGS maps which only recently have been updated to reflect the current alignment of the wash (see Appendix A).

The construction and re-alignment of Galloway Wash to its historical location was approved by the U.S. Army Corps of Engineers under Nationwide Permit No. 3 (correspondence dated February 4, 2020).

A copy of the City of Scottsdale's Section 404 Certification form is included in Appendix G.

5.0 Stormwater Storage

Stormwater storage for the Desert Mountain South watershed is provided by the existing detention basin, S1 west of the project site (see Appendix A). Additionally, the proposed development does not significantly increase the site's overall runoff or modify the historical outflow locations. No new stormwater storage is required.

6.0 Finished Floor Elevation

The proposed building has a finished floor elevation of 2827.00 and a lowest floor elevation of 2813.00 with an elevator shaft extending below the lowest floor to elevation 2809.00. The 100-year water surface elevation within the adjacent wash will be approximately at elevation 2822.0. The building and surrounding site are being designed to provide positive drainage away from the building at all locations. Due to these conditions, a sub-surface drainage system (along with waterproofing) is recommended (sub-surface drainage system to be designed by others).

See Appendix D for civil site sections and Appendix F for hydraulic analysis sections.

7.0 Hydrologic Analysis

A rational method analysis was performed on the Project Site using the Flood Control District of Maricopa County (FCDMC), Drainage Design Management System (DDMSW, Version 5.6). The runoff coefficients within DDMSW were modified to match the values outlined in the City of Scottsdale's Design Standards & Policies Manual, 2018 (DSPM) [1].

7.1 Methodology

For this project, the rational method as outlined in the FCDMC Hydrology Design Manual (December 2018) [2] was used and the site drainage areas were based on site plans, topographic contours, and aerial photography and were delineated using Autodesk Civil 3D software.

The City of Scottsdale allows for use of the rational method for estimating peak flow discharge for watersheds that are regularly shaped, uniformly contoured, and less than 160 acres. Additionally, the use of DDMSW for hydrology calculations is also permitted and was utilized as part of this analysis.

The parameters outlined below were established and used as input for the rational method. An areally-weighted runoff coefficient, C, was computed for each drainage area for both the existing and proposed site conditions according to the Section 4-1.504 of the City of Scottsdale's DSPM. See Table 1 for the summary of runoff coefficients used in this analysis.

Table 1 Runoff Coefficient – 'C' Value (DSPM 2018)

Land Use	Storm Frequency		
	2-25 Years	50 Years	100 Years
Pavement / Roofs	0.90	0.93	0.95
Desert Landscape	0.63	0.73	0.83
Golf Course	0.20	0.25	0.30

The Rainfall Intensity, i, for the project site was calculated using DDMSW and rainfall data was validated using NOAA 14 downloaded data. NOAA 14 data can be found in Appendix E. Time of Concentration was calculated using DDMSW.

7.2 Results

The Peak Flow Rate, Q, was calculated using DDMSW with C, i, and A as input parameters for all the drainage areas for both pre-development and post-development conditions. Table 2 summarizes the 100-year peak flow results.

Table 2: Pre and Post Development 100-year Peak Flow

	Pre-Development		Post-Development	
Drainage Area ID	Area (acres)	Q_{100} (cfs)	Area (acres)	Q_{100} (cfs)
DA-1	7.3	24.0	7.9	27.2
DA-2	2.0	9.4	-	-
DA-3	-	-	4.6	25.5
DA-3A	4.4	24.5	-	-
DA-3B	1.4	8.1	-	-
DA-4	4.5	26.6	3.8	22.5
DA-5	4.5	19.8	-	-
DA-5A	-	-	2.1	8.1
DA-5B	-	-	2.2	12.5
DA-6	10.2	22.2	14.4	39.0
DA-7	2.0	10.6	2.4	10.6

8.0 Hydraulic Analysis and Results

The hydraulic analyses presented herein were completed using HEC-RAS version 5.0.7. A detailed breakdown of the analyses is provided below.

8.1 HEC-RAS Geometry Development

Existing and proposed condition surfaces were constructed using Autodesk Civil 3D software and were based on a recent survey and proposed grading plans. These surfaces were exported into GeoTIFF format for importing into HEC-RAS. The terrains within HEC-RAS were created with a 0.2-foot cell size to preserve the detail of the vertical walls.

Cross sections were cut along the length of the existing and proposed washes at a spacing of approximately 60 feet. Care was taken to ensure the beginning and the end cross-sections and conditions were the same between the existing and proposed conditions.

8.2 Flow Rate

A 100-year flow rate of 2,255 cfs was determined from the Desert Mountain Area Drainage Master Study FLO-2D model [3]. Due to the nature of and stability within the upstream watershed (particularly with respect to flow patterns), a 30% uncertainty factor has not been applied to the FLO-2D model results. See Appendix F for FLO-2D model data.

8.3 Roughness

Manning's roughness values were calculated based on guidance within Chapter 7.6 of the FCDMC Hydraulics Design Manual (December 2018) [4]. A roughness value of 0.034 was applied to the channel portion and a roughness value of 0.042 was applied to the overbanks within the entire model. Table 3 shows the selected roughness values how the values were computed.

Table 3: Manning's Roughness Values

Component	Condition	Min	Max	Avg.	Main Channel Section	Overbank Selection
Base Roughness	Coarse Sand (D_{50}=1.5mm)	0.026	0.035	0.031	0.031	0.031
Irregularity	Smooth to Minor	0.000	0.005	0.003	0.000	0.004
Variation	Gradual	0.000	0.000	0.000	0.000	0.000
Obstruction	Negligible	0.000	0.004	0.002	0.002	0.002
Vegetation	Negligible to Small	0.000	0.010	0.005	0.001	0.005
Total					**0.034**	**0.042**

8.4 Boundary Conditions

HEC-RAS models were run in both the subcritical and mixed regimes in order to evaluate the worst-case conditions for both depth of flooding and velocity. The upstream and downstream boundary conditions were set to critical depth at the upstream and normal depth based on a slope of 0.02 feet/foot at the downstream.

8.5 HEC-RAS Results

Comparison of the existing and proposed conditions shows small differences in the overall flow characteristics. The proposed improvements do not reduce the capacity of the wash to convey the 100-year flows. The inundation boundaries for the existing and proposed conditions are shown in Figure 11 and Figure 12.

It should be noted that HEC-RAS determined the flow within the wash to be supercritical; however, the model was run in subcritical mode to produce greater flow depths and consequently conservative results to the extent of inundation. Table 4 and Table 5 present summaries of channel depths and velocities for the existing and proposed conditions, respectively. See Appendix F for HEC-RAS output data.

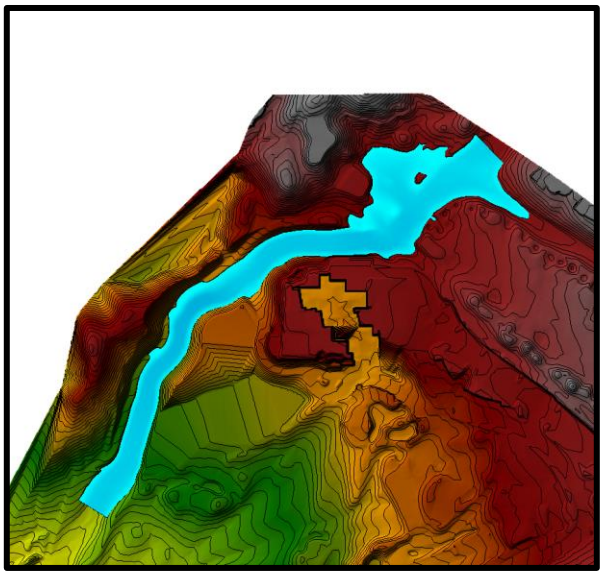


Figure 11: HEC-RAS Proposed Conditions

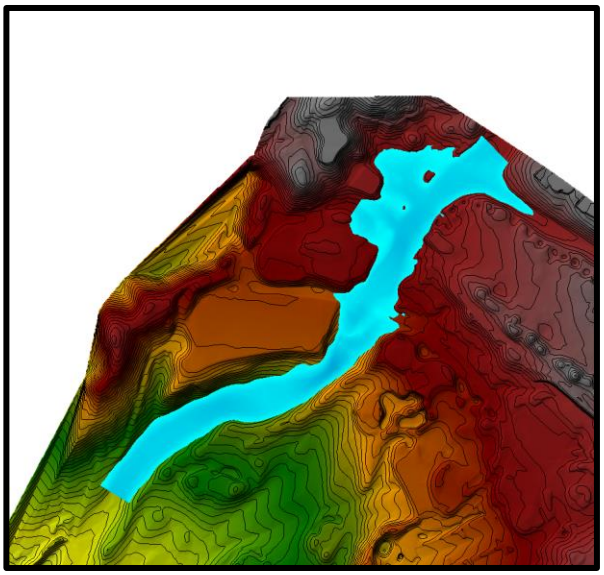


Figure 12: HEC-RAS Existing Conditions

Table 4: Existing Flow Conditions (100-year event)

Reach Station	Max Channel Depth (ft)	Velocity (fps)
1896	3.8	9.0
1836	2.4	13.8
1778	3.4	11.5
1725	3.3	12.1
1672	4.3	10.0
1614	4.1	11.6
1565	3.1	13.5
1520	2.8	13.3
1454	3.8	7.3
1370	2.7	19.2
1322	5.8	11.3
1275	4.3	15.3
1211	2.5	17.5
1164	2.4	13.6
1078	4.4	9.9
990	2.9	14.6
892	3.1	12.6
771	3.6	12.2

Table 5: Proposed Flow Conditions (100-year event)

Reach Station	Max Channel Depth (ft)	Velocity (fps)	Required Freeboard (ft)
1928	3.8	9.0	1.5
1868	2.4	13.8	1.5
1810	3.3	11.4	1.4
1757	3.5	11.7	1.4
1704	4.4	7.2	1.4
1605	4.4	12.5	1.7
1546	3.6	15.1	1.8
1462	3.9	14.5	1.8
1391	3.6	15.1	1.8
1341	3.5	14.5	1.7
1302	4.4	11.7	1.7
1263	5.6	10.4	1.8
1218	4.9	13.8	2.0
1137	4.4	16.0	2.1
1045	4.1	16.3	2.1
913	3.5	16.2	1.9
771	3.4	13.2	1.5

Velocities within the proposed conditions model are comparable to existing conditions and in fact the proposed condition velocities are reduced along much of the project reach.

The freeboard calculations shown in Table 5 are discussed in Section 8.6, below.

8.6 Freeboard Calculations

Minimum required freeboard for the realigned wash was computed according to Equation 6.25 in the FCDMC Hydraulics Design Manual [4]. Per the Manual, the freeboard shall be the larger of 2 feet or the results of Equation 6.25. All locations along the realigned wash will have the required freeboard within the channel section.

8.7 Lateral Erosion

Due to the anticipated high velocities within this portion of Galloway Wash, the potential for lateral erosion and migration of the channel needs to be evaluated and understood. The FCDMC provides guidance for estimating lateral erosion potential within Section 11.9 of the Hydraulics Design Manual [4]. However, the district's guidance is applicable only to natural channels, which does not apply to this portion of channel, either in its existing or proposed alignment.

Following guidance provided by FCDMC, Arizona State Standard 5-96, Watercourse System Sediment Balance, was reviewed. Guideline 1 of this document provides procedures for estimating the setback distances to be provided along watercourses where lateral erosion is a concern. Following this procedure, a Level 1 analysis was performed which is a high-level evaluation, and consequently provides conservative results. The more detailed Level 2 and Level 3 evaluations cannot be performed at this time due to insufficient information about the subsurface conditions within the proposed alignment.

The Level 1 analysis requires only the 100-year flow rate as input. This value was determined as documented in Section 8.2 and was input into the following equation to estimate the recommended setback distance for "straight channel reaches or reaches with minor curvature":

$$setback = 1.0 * {Q_{100}}^{0.5}$$

"Minor curvature" is defined within the State Standard as a channel centerline where the radius of curvature is greater than 5 times the channel top width. Within this portion of the realigned wash, HEC-RAS reports an average top width of approximately 72 feet, and the overall radius of the realignment was measured within AutoCAD to be approximately 400 feet. Therefore, this reach may be considered to have "minor" curvature, and a setback distance of 48 feet is computed by this Level 1 analysis. It is important to note that this calculation represents the potential lateral erosion from a single flow event.

Two primary locations of concern with respect to lateral erosion were identified by both City of Scottsdale and FCDMC personnel: the proposed clubhouse to the south of the proposed wash alignment and residential structures to the west of the proposed wash alignment (see Figure 13). The proposed design includes protection of both areas of concern.

A 50-foot golf course easement exists on the eastern property boundary of the properties to the west of the proposed wash realignment, as shown on Figure 13. When the potential lateral setback is plotted, it extends into the private property but not beyond the bounds of the golf course easement. The golf course easement grants Desert Mountain the ability to perform "construction, maintenance and repair of the Golf Club Facilities and related improvements." Consistent with this easement and with their current practices, Desert Mountain staff will maintain the wash and repair and restore any lateral migration of the wash that may have occurred during a significant flow event. However, erosion protection measures are included with the design to prevent significant scouring and lateral erosion from occurring.

The proposed design includes lining the entirety of the realigned channel with articulated concrete blocks (ACBs), and also constructing mechanically stabilized earth (MSE) walls between the proposed clubhouse and the realigned wash. The MSE walls will be constructed down to the

computed scour depths. Additional discussion related to the ACBs and MSE walls is included in Section 9.1 and Section 9.2, respectively.

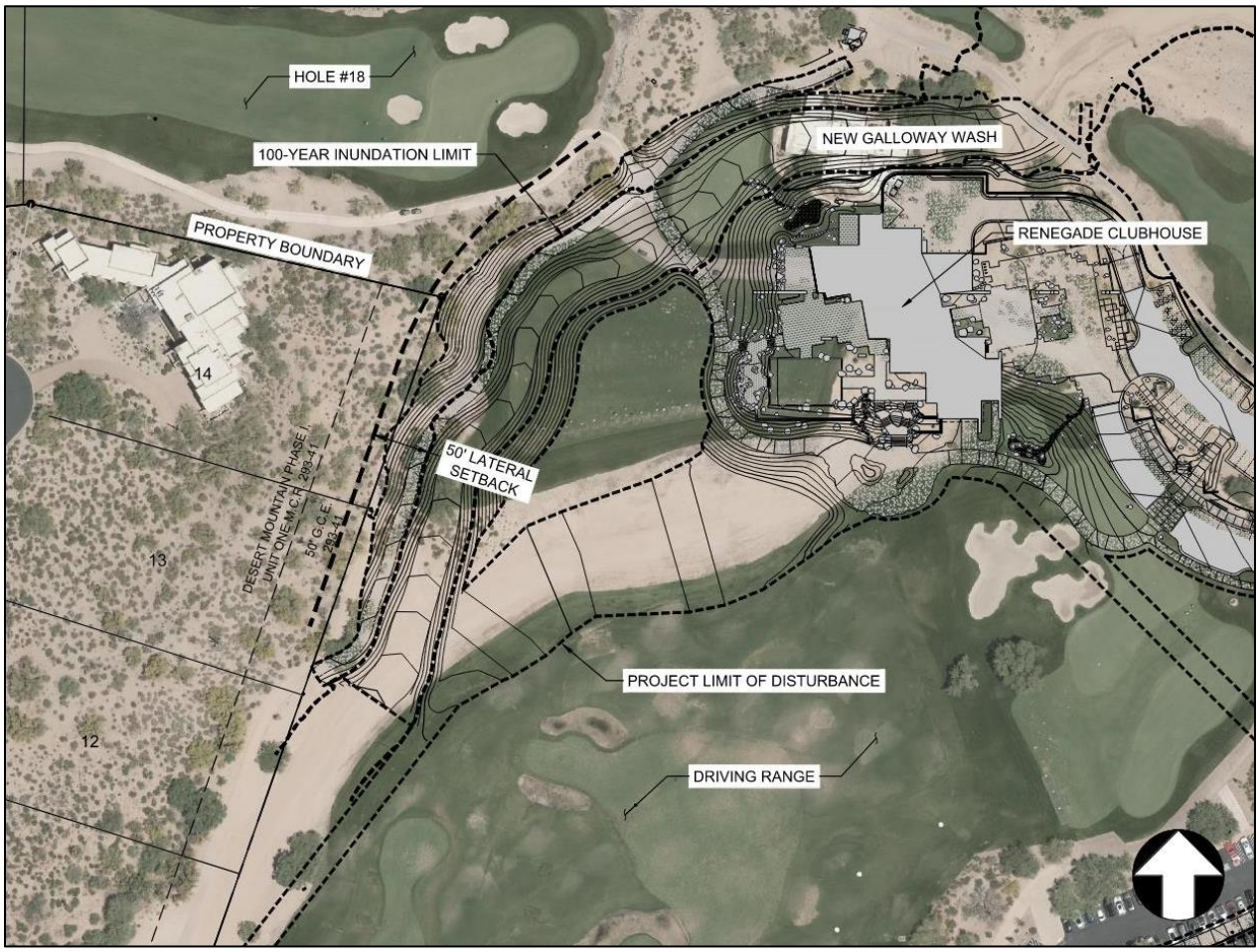


Figure 13: Depiction of Lateral Erosion Setback

8.8 Scour

A scour analysis for the proposed alignment of Galloway Wash was completed using DDMSW. HEC-RAS analysis results were imported into DDMSW and were used to calculate general, bedform, and low flow scour for the 100-year storm. Long-term scour was not considered due to Desert Mountain's proactive approach of maintaining the wash and restoring the channel following any erosion or flow events.

Scour depths ranging from 7.8 feet to 10.5 feet are calculated for the proposed alignment and geometry of Galloway Wash. These values and the individual scour components are summarized in Table 6.

Table 6: Summary of Calculated Scour Depths

Reach Station	General Scour (ft)	Bedform Scour (ft)	Low-Flow Scour (ft)	Total Scour (ft)
1704	3.1	1.3	3.4	7.8
1604	3.1	2.8	3.4	9.3
1545	3.1	4.0	3.4	10.5
1462	3.1	3.7	3.4	10.2
1390	3.1	4.0	3.4	10.5
1341	3.1	3.7	3.4	10.3
1301	3.1	2.5	3.4	9.0
1263	3.1	2.0	3.4	8.6
1218	3.1	3.5	3.4	10.1
1137	1.6	4.6	3.4	9.6
1045	1.6	4.7	3.4	9.7
913	1.6	4.6	3.4	9.6
771	1.6	3.1	3.4	8.1

8.9 Sediment Transport

High-level sediment transport calculations were performed as part of the wash relocation design to understand the channel bed material discharge characteristics for both the existing and proposed wash alignments within the project limits. Assuming an equilibrium condition, the total bed material discharge rate was calculated in accordance with Section 11.7.3.3 and the Zeller-Fullerton equation (Equation 11.44) within the FCDMC Hydraulics Design Manual [4]. Results from the HEC-RAS models were used as the basis for these calculations.

Based on review of the historic aerial imagery and Desert Mountain's experience maintaining this wash over the past 30 years, it is assumed that Galloway Wash and its watershed are in equilibrium condition with respect to sediment load. It is also expected that an equilibrium state will be re-established shortly after the completion of the wash realignment. Figure 14 shows a graph of the total bed material load for both the existing and proposed conditions. The results of these calculations show that the total bed load for the realigned reach is not expected to increase the transport of material, and in fact the calculations show the proposed configuration to have a slightly decreased bed load carrying capacity. It is not expected that the realignment of the wash will result in increased sediment load being transported and deposited within the wash downstream. To assist with soil stabilization within the reach, 18'' vegetative cover is proposed to help alleviate sediment transport within the improvements. The cover depth was designed in conjunction with the ACB manufacturer with aesthetics and sediment transport requirements in mind.

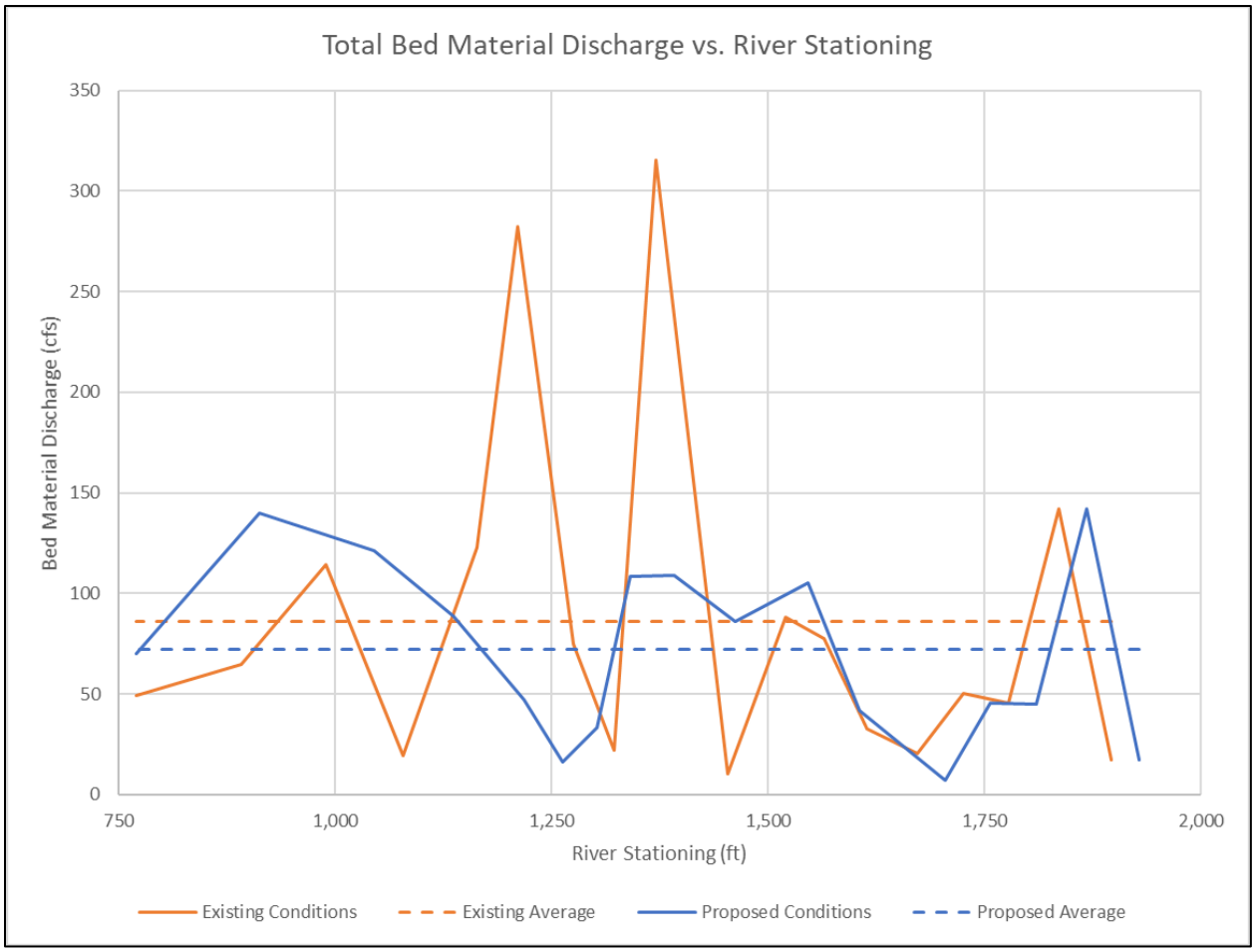


Figure 14: Total Bed Load for Existing and Proposed Conditions

9.0 Scour and Erosion Protection Measures

Various forms of protection from erosion and scour are documented within the sections below.

9.1 Articulated Concrete Blocks (ACBs)

Due to the potential erosion and high velocities generated by the mountainous terrain present in North Scottsdale, an articulated concrete block mattress and supporting geotextile fabric has been selected to protect the wash bottom and side slopes from significant scour and erosion. The ACB mattress system consists of formed concrete blocks laced together with stainless steel or synthetic high strength cabling. Each mattress is placed on a geotextile fabric and will be covered by approximately 18" (+/-) of vegetation stabilized soil cover. The vegetative cover will allow for native desert vegetation to establish and will maintain the natural aesthetic of the Galloway Wash. City of Scottsdale ESLO regulations were considered as part of this design. In conjunction with the design architect and ACB manufacturer, 18'' of cover was selected to aid in soil stabilization as much as practicable. Adjacent mattresses are "stitched" together after

placement in order to provide additional stability to the ACB system as a whole. A detail showing the typical configuration of the ACB mattresses is shown in Figure 15. Consistent with their current practice, Desert Mountain personnel will inspect the wash after any flow event. If necessary, the wash will be raked and repaired to re-establish the vegetative cover over the ACBs and maintain stabilized soil as much as practicable.

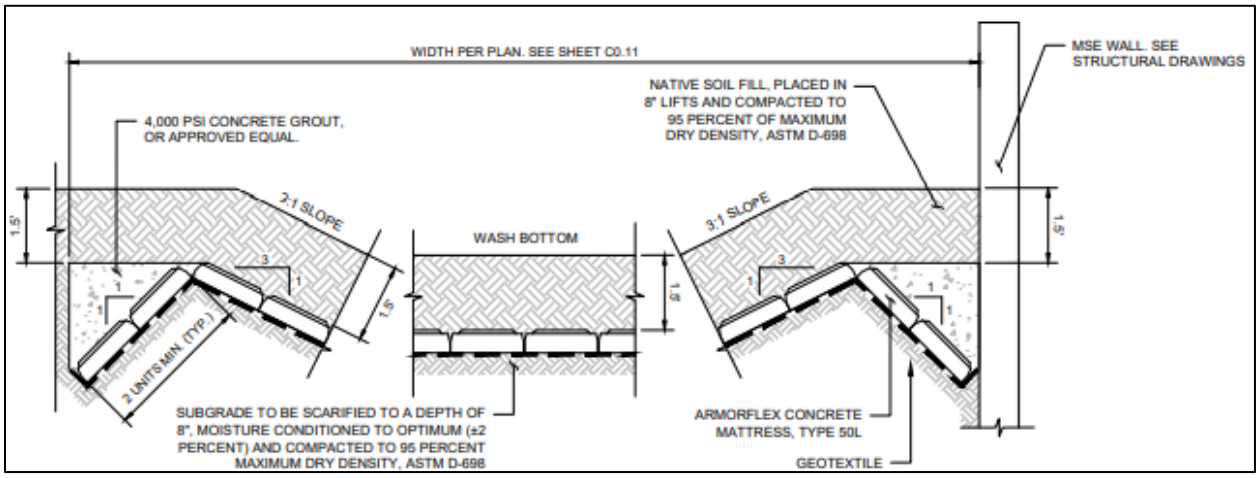


Figure 15: ACB Wash Section

9.2 MSE Walls and Clubhouse Protection

Two mechanically stabilized earth (MSE) walls, approximately 280 feet in length, are proposed adjacent to the clubhouse and will be utilized to mitigate the scour and lateral erosion potential of the wash during a flood event, where high velocities could impact the short-term stability of the wash side slopes and channel bottom. Figure 16 below shows a section view of the MSE walls and freestanding walls proposed just north of the clubhouse. The MSE walls will be constructed down to the computed 100-year scour depth. The combination of MSE walls and ACB mattress system will provide the proposed clubhouse with significantly more protection when compared to the existing restaurant under the current configuration.

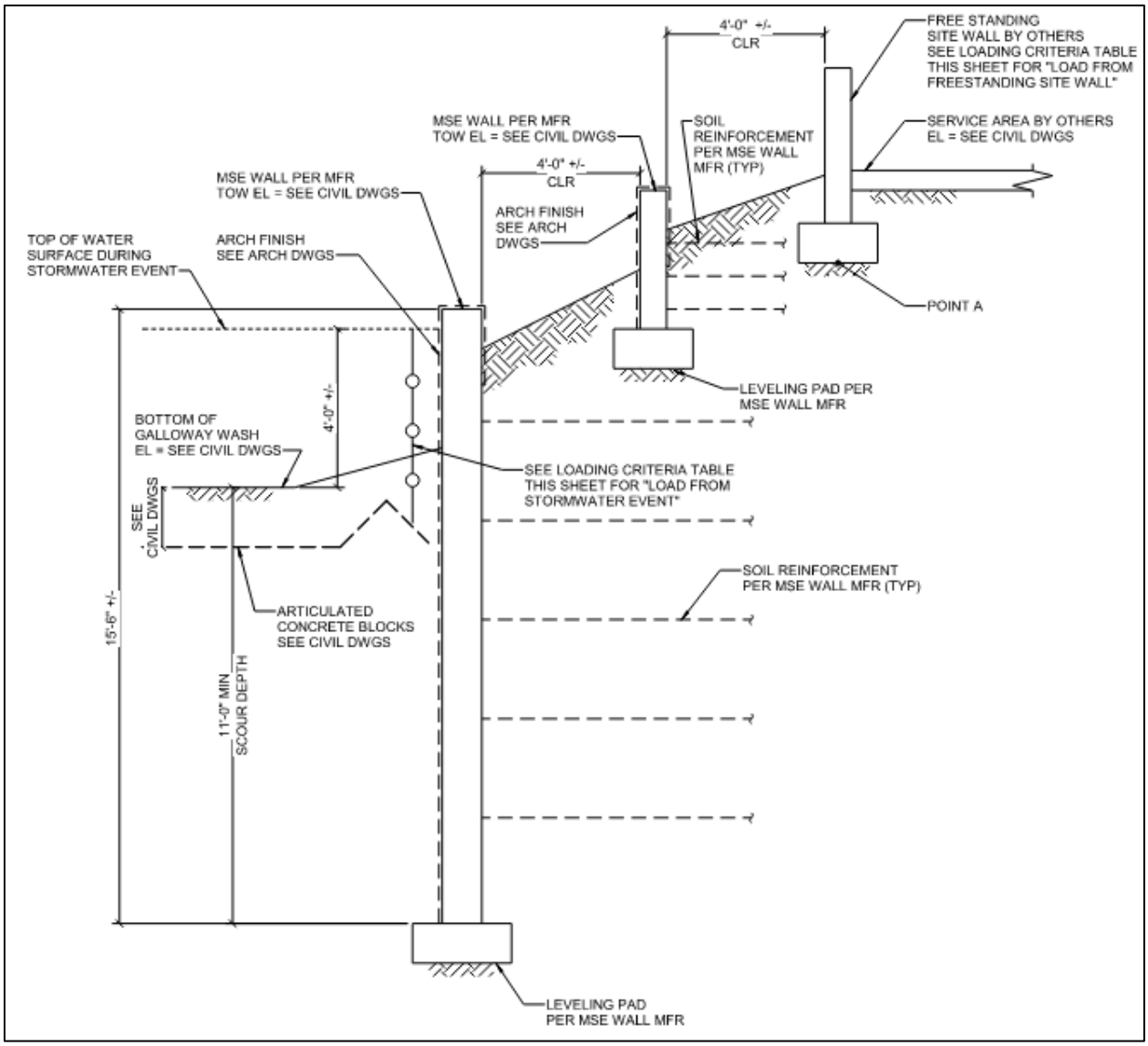


Figure 16: MSE Wall Section

9.3 Utility Protection

Three existing utility lines (sewer, electric and gas) currently cross Galloway Wash within the project limits. The existing sanitary sewer crossing will be removed and realigned out of the wash. The proposed sewer realignment removes the wash crossing and also increases the cover depth on the sewer line, a significant improvement on the existing conditions. The existing electric line servicing the small starter shack will be relocated and buried to scour depth while the existing gas line will be capped, have its service disconnected and will be abandoned in place. See Appendix D for civil site plans depicting the utility relocation and starter shack location.

10.0 References

[1] City of Scottsdale, *Design Standards & Policies Manual,* 2018.

[2] Flood Control District of Maricopa County, *Drainage Design Manual for Maricopa County, Arizona - Hydrology,* 2018.

[3] Flood Control District of Maricopa County, "FLO-2D Map," 13 June 2019. [Online]. Available: https://gis.maricopa.gov/FLO-2DModels/map.html.

[4] Flood Control District of Maricopa County, *Drainage Design Manual for Maricopa County, Arizona - Hydraulics,* 2018.

Appendix A Exhibits

Exhibit A-1 - Aerial Image

Exhibit A-2 – S 1 Detention Basin Location

Exhibit A-3 – On Site Drainage Map from 1985 Preliminary Hydrology Report for Gambel Rezoning at the Ranch at Carefree overlaid on recent Bing® aerial image

Exhibit A-4 – Existing Conditions Drainage Map from 1985 Preliminary Hydrology Report for Gambel Rezoning at the Ranch at Carefree overlaid on recent Bing® aerial image

Exhibit A-5 – Figure 2 from 1996 Detailed Drainage Design Report for Desert Mountain Properties Proposed Detention Basin No. S 1 overlaid on recent Bing® aerial image1965 USGS map overlaid on recent Bing® aerial image

Exhibit A-6 – 1965 USGS map overlaid on recent Bing® aerial image

Exhibit A-7 – 2004 USGS map overlaid on recent Bing® aerial image

Exhibit A-8 – 2018 USGS map overlaid on recent Bing® aerial image

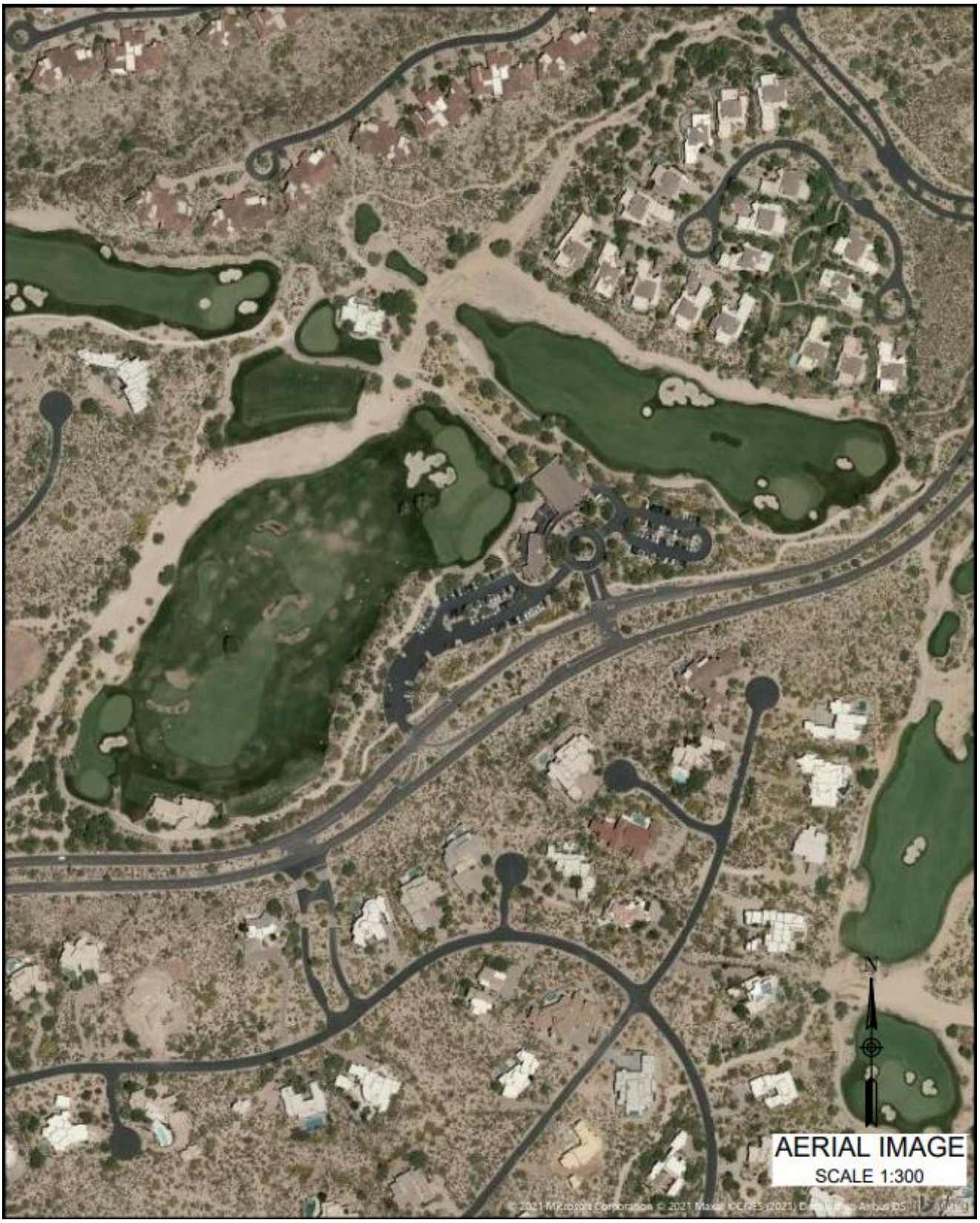


Exhibit A-1 – Aerial Image

Exhibit A-2 – S-1 Detention Basin Location

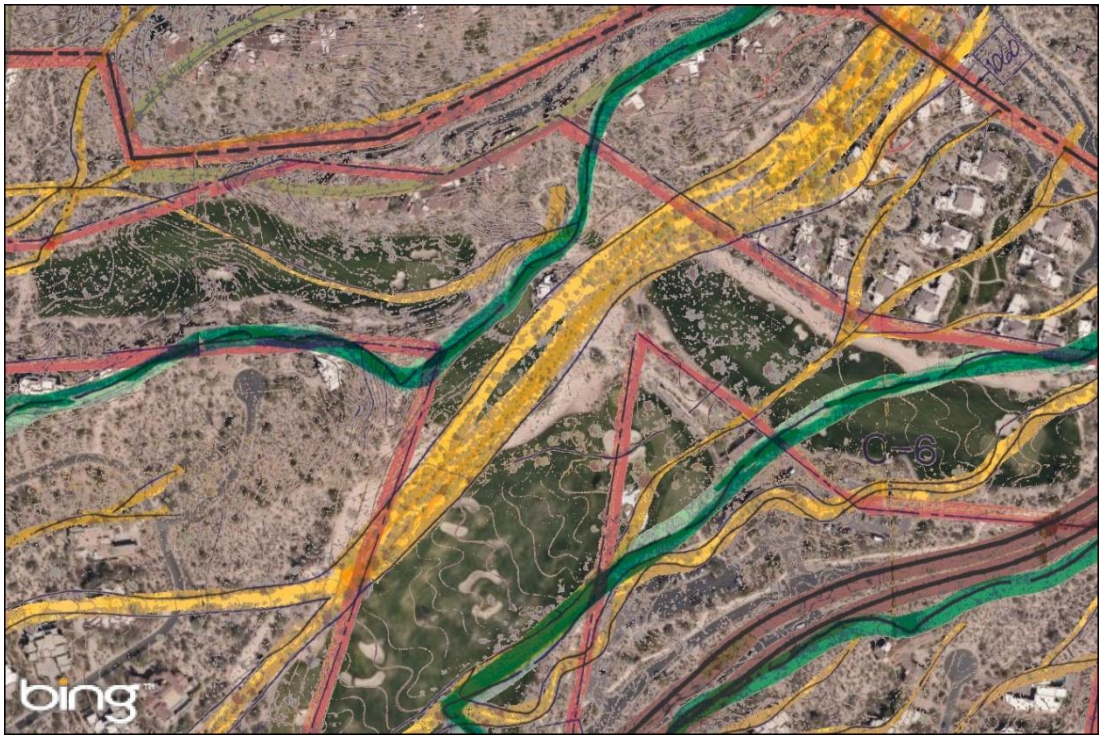


Exhibit A-3 – On Site Drainage Map from 1985 Preliminary Hydrology Report for Gambel Rezoning at the Ranch at Carefree overlaid on recent Bing® aerial image

Exhibit A-4 – Existing Conditions Drainage Map from 1985 Preliminary Hydrology Report for Gambel Rezoning at the Ranch at Carefree overlaid on recent Bing® aerial image

Exhibit A-5 – Figure 2 from 1996 Detailed Drainage Design Report for Desert Mountain Properties Proposed Detention Basin No. S-1 overlaid on recent Bing® aerial image

Exhibit A-6 – 1965 USGS map overlaid on recent Bing® aerial image

Exhibit A-7 – 2004 USGS map overlaid on recent Bing® aerial image

Exhibit A-8 – 2018 USGS map overlaid on recent Bing® aerial image

Appendix B FEMA FIRMette

MAP SCALE 1" = 500'

250 0 500 1000 FEE

150 0 150 30

NFIP

PANEL 0903L

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA

AND INCORPORATED AREAS

PANEL 903 OF 4425

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CAREFREE, TOWN OF	040126	0903	L
SCOTTSDALE, CITY OF	045012	0903	L

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

MAP NUMBER
04013C0903L

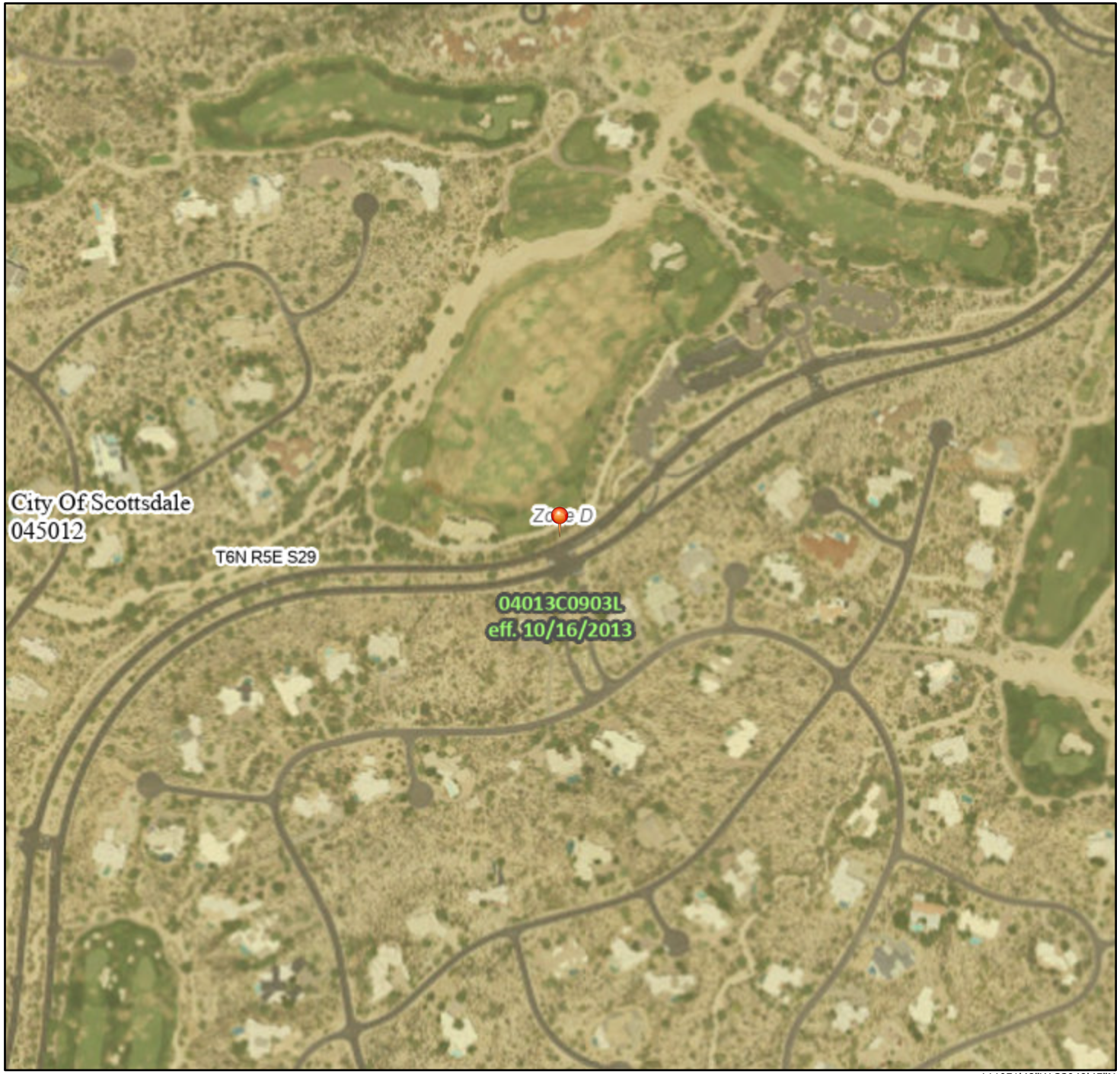
MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

National Flood Hazard Layer FIRMette

FEMA

111°52'25"W 33°50'15"N



111°51'48"W 33°49'45"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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

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

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

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

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

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

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

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/6/2021 at 5:31 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Appendix C Pre- and Post-Development Rational Method Exhibits

Q_{100} = 2255 cfs

EXIST.GALLOWAY WASH ALIGNMENT

DA−5		
Q_2	Q_{10}	Q_{100}
6.2	10.0	19.8

DA−2		
Q_2	Q_{10}	Q_{100}
3.0	4.8	9.4

DA−1		
Q_2	Q_{10}	Q_{100}
7.1	11.4	24.0

DA−3A		
Q_2	Q_{10}	Q_{100}
8.2	13.2	24.5

CP−1		
Q_2	Q_{10}	Q_{100}
11.1	17.9	32.6

DA−3B		
Q_2	Q_{10}	Q_{100}
2.9	4.7	8.1

DA−6		
Q_2	Q_{10}	Q_{100}
5.9	9.5	22.2

DA−4		
Q_2	Q_{10}	Q_{100}
9.1	14.6	26.6

CP−2		
Q_2	Q_{10}	Q_{100}
9.1	14.6	26.6

CP−3		
Q_2	Q_{10}	Q_{100}
26.1	42.0	81.4

DA−7		
Q_2	Q_{10}	Q_{100}
3.6	5.7	10.6

CP−4		
Q_2	Q_{10}	Q_{100}
29.7	47.7	92.0

LEGEND

- PROPERTY BOUNDARY
- DRAINAGE BOUNDARY (DA)
- EXISTING CULVERT
- WASH FLOW DIRECTION
- RUNOFF DIRECTION
- CONCENTRATION POINT (CP)

NOTE: ALL FLOWS IN CUBIC FEET PER SECOND

N

GRAPHIC SCALE

100 0 50 100 200

SCALE: 1" = 75'

DESERT MOUNTAIN

RENEGADE CLUBHOUSE

PRE-DEVELOPMENT DRAINAGE MAP

EXHIBIT #1

DA–5 'C'		
2–25 Year	50 Year	100 Year
0.52	0.59	0.66

DA–2 'C'		
2–25 Year	50 Year	100 Year
0.57	0.65	0.72

DA–1 'C'		
2–25 Year	50 Year	100 Year
0.37	0.43	0.50

DA–3A 'C'		
2–25 Year	50 Year	100 Year
0.70	0.78	0.84

DA–3B 'C'		
2–25 Year	50 Year	100 Year
0.82	0.87	0.91

DA–4 'C'		
2–25 Year	50 Year	100 Year
0.76	0.82	0.89

DA–6 'C'		
2–25 Year	50 Year	100 Year
0.22	0.27	0.33

DA–7 'C'		
2–25 Year	50 Year	100 Year
0.66	0.73	0.79

EXIST.GALLOWAY WASH ALIGNMENT

LEGEND

- PROPERTY BOUNDARY
- DRAINAGE BOUNDARY (DA)
- EXISTING CULVERT
- GOLF COURSE, LAWN, & PARK
- DESERT LANDSCAPE WITH IMPERVIOUS WEED LAYER
- PAVEMENT, ROOFS, DRIVEWAYS

NOTE: LAND USE VALUES AS PER COS DSPM 2018.

N

GRAPHIC SCALE

100 0 50 100 200

SCALE: 1" = 75'

DESERT MOUNTAIN

RENEGADE CLUBHOUSE

PRE-DEVELOPMENT
RUNOFF COEFFICIENTS BY LAND USE
EXHIBIT #2

Q_{100}= 2255 cfs

DA–5B		
Q_2	Q_{10}	Q_{100}
4.0	6.4	12.5

DA–5A		
Q_2	Q_{10}	Q_{100}
2.5	4.0	8.1

DA–1		
Q_2	Q_{10}	Q_{100}
7.9	12.8	27.2

DA–3		
Q_2	Q_{10}	Q_{100}
8.5	13.7	25.5

CP–1		
Q_2	Q_{10}	Q_{100}
8.5	13.7	25.5

DA–6		
Q_2	Q_{10}	Q_{100}
11.8	19.0	39.0

DA–4		
Q_2	Q_{10}	Q_{100}
7.7	12.4	22.5

CP–2		
Q_2	Q_{10}	Q_{100}
7.7	12.4	22.5

CP–3		
Q_2	Q_{10}	Q_{100}
28	45.1	87

DA–7		
Q_2	Q_{10}	Q_{100}
3.6	5.7	10.6

CP–4		
Q_2	Q_{10}	Q_{100}
31.6	50.8	97.6

NEW GALLOWAY WASH ALIGNMENT

LEGEND

- PROPERTY BOUNDARY
- DRAINAGE BOUNDARY (DA)
- CULVERTS
- WASH FLOW DIRECTION
- RUNOFF DIRECTION
- CONCENTRATION POINT (CP)

NOTE: ALL FLOWS IN CUBIC FEET PER SECOND

N

GRAPHIC SCALE

100 0 50 100 200

SCALE: 1" = 75'

DESERT MOUNTAIN

RENEGADE CLUBHOUSE

POST-DEVELOPMENT DRAINAGE MAP

EXHIBIT #3

DA–5B 'C'		
2–25 Year	50 Year	100 Year
0.67	0.76	0.85

DA–5A 'C'		
2–25 Year	50 Year	100 Year
0.45	0.52	0.59

DA–1 'C'		
2–25 Year	50 Year	100 Year
0.38	0.45	0.52

DA–3 'C'		
2–25 Year	50 Year	100 Year
0.71	0.79	0.85

DA–6 'C'		
2–25 Year	50 Year	100 Year
0.31	0.36	0.41

DA–4 'C'		
2–25 Year	50 Year	100 Year
0.76	0.83	0.89

DA–7 'C'		
2–25 Year	50 Year	100 Year
0.66	0.73	0.79

NEW GALLOWAY

WASH ALIGNMENT

N

LEGEND

- PROPERTY BOUNDARY
- DRAINAGE BOUNDARY (DA)
- EXISTING CULVERT
- GOLF COURSE, LAWN, & PARK
- DESERT LANDSCAPE WITH IMPERVIOUS WEED LAYER
- PAVEMENT, ROOFS, DRIVEWAYS

NOTE: LAND USE VALUES AS PER COS DSPM 2018.

GRAPHIC SCALE

100 0 50 100 200

SCALE: 1" = 75'

DESERT MOUNTAIN

RENEGADE CLUBHOUSE

POST-DEVELOPMENT

RUNOFF COEFFICIENTS BY LAND USE

EXHIBIT #4

Appendix D Civil Grading Plans

GRADING AND DRAINAGE PLAN

RENEGADE CLUBHOUSE

SCOTTSDALE, AZ

SHEET INDEX:

OWNER

DESERT MOUNTAIN CLUB, INC.
37700 N DESERT MOUNTAIN PARKWAY
SCOTTSDALE, AZ 85262
PHONE: (480) 595-4090 EXT 1970
CONTACT NAME: TODD BRUEN

ARCHITECT

DTJ DESIGN
3101 IRIS AVENUE, SUITE 130
BOULDER, CO 80303
PHONE: (303) 443-7533
CONTACT NAME: DAVID POPPLETON

CIVIL ENGINEER

GANNETT FLEMING, INC.
1900 - 3838 N CENTRAL AVENUE
PHOENIX, AZ 85012
PHONE: (602) 553-8817
CONTACT NAME: BYRON DIXON

ADDRESS

37700 N DESERT MOUNTAIN PARKWAY
SCOTTSDALE, AZ 85262

APN

219-11-938F, 219-11-664P, 219-11-664B,
& 219-11-663C

ZONING

OS ESL (HD) (OPEN SPACE)

QS

64-51

LANDFORM

UPPER DESERT

BENCHMARK

CP1: BRASS CAP FLUSH AT THE CENTER OF CUL-DE-SAC OF RISING SUN DRIVE IN DESERT MOUNTAIN PHASE 1, UNIT THREE
N= 1031845.998, E= 716764.180, Z=2878.21 NAVD'88

CP2: BRASS CAP FLUSH AT THE CENTERLINE OF INTERSECTION OF BAJADA DRIVE & 92ND/ PLACE IN DESERT MOUNTAIN PHASE 1, UNIT ONE
N= 1028666.538, E= 710529.601, Z= 2762.60 NAVD'88

CP3: BRASS CAP FLUSH AT CENTER OF CUL-DE-SAC OF SKYLINE COURT IN DESERT MOUNTAIN PHASE 2, UNIT TWO
N= 1030075.366, E= 713454.109, Z= 2776.22 NAVD'88

BENCHMARK CERTIFICATION:

I HEREBY CERTIFY THAT ALL ELEVATIONS REPRESENTED ON THIS PLAN ARE BASED ON NAVD 1988 AND MEET THE FEMA BENCHMARK MAINTENANCE (BMM) CRITERIA.

LEGAL DESCRIPTION

THAT CERTAIN PORTION OF PARCEL NO. 1, (HOLES 1, 16, 17, 18 AND CLUBHOUSE ENVELOPE) OF RENEGADE GOLF COURSE AT DESERT MOUNTAIN DESCRIBED IN SPECIAL WARRANTY DEED RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF MARICOPA COUNTY, ARIZONA AS INSTRUMENT NUMBER 2011-0000703 AND BEING LOCATED IN SECTION 29 OF TOWNSHIP 6 NORTH, RANGE 5 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE EASTERN MOST CORNER OF LOT 14 OF DESERT MOUNTAIN PHASE I, UNIT ONE, A SUBDIVISION ACCORDING TO THE PLAT OF RECORD FOUND IN THE OFFICE OF THE COUNTY RECORDER OF MARICOPA COUNTY, ARIZONA IN BOOK 293 OF MAPS, PAGE 41;

THENCE ALONG THE NORTHERLY BOUNDARY OF SAID UNIT ONE, ALSO BEING THE NORTHERLY BOUNDARY OF SAID LOT 14, NORTH 77 DEGREES 13 MINUTES 30 SECONDS WEST A DISTANCE OF 174.11 FEET;

THENCE LEAVING SAID NORTHERLY BOUNDARY, NORTH 35 DEGREES 55 MINUTES 20 SECONDS EAST A DISTANCE OF 295.69 FEET TO AN ANGLE POINT ON THESOUTHERLY BOUNDARY OF LOT 13 OF DESERT MOUNTAIN PHASE II, UNIT TWENTY-EIGHT, (THE VILLAGE OF LOOKOUT RIDGE), A SUBDIVISION ACCORDING TO THE PLAT OF RECORD FOUND IN THE OFFICE OF THE COUNTY RECORDER OF MARICOPA COUNTY, ARIZONA IN BOOK 482 OF MAPS, PAGE 27;

THENCE ALONG THE SOUTHERLY BOUNDARY OF SAID UNIT TWENTY-EIGHT, ALSO BEING THE SOUTHERLY BOUNDARY OF SAID LOT 13 AND THEREAFTER LOT 12, TRACT D, LOTS 11 AND 10, TRACT C, LOTS 9 AND 8 AND TRACT B RESPECTIVELY THEREOF, TRAVERSING THE FOLLOWING COURSES AND DISTANCES:

NORTH 75 DEGREES 32 MINUTES 51 SECONDS EAST, 223.85 FEET;

NORTH 32 DEGREES 02 MINUTES 58 SECONDS EAST, 178.98 FEET;

SOUTH 67 DEGREES 12 MINUTES 58 SECONDS EAST, 235.37 FEET TO THE WESTERN MOST CORNER OF DESERT MOUNTAIN PHASE II, UNIT TWENTY-FIVE, (THE VILLAGE OF RENEGADE TRAIL), A SUBDIVISION ACCORDING TO THE PLAT OF RECORD FOUND IN THE OFFICE OF THE COUNTY RECORDER OF MARICOPA COUNTY, ARIZONA IN BOOK 450 OF MAPS, PAGE 32;

THENCE ALONG THE SOUTHWESTERLY BOUNDARY OF SAID UNIT TWENTY-FIVE, ALSO BEING THE SOUTHWESTERLY BOUNDARY OF TRACT G, LOTS 6, 7 AND 8, TRACT F, LOTS 9 AND 10, TRACT E, LOTS 16, 17 AND 18 AND TRACT D RESPECTIVELY THEREOF, TRAVERSING THE FOLLOWING COURSES AND DISTANCES:

SOUTH 56 DEGREES 02 MINUTES 35 SECONDS EAST, 365.86 FEET;

SOUTH 63 DEGREES 36 MINUTES 32 SECONDS EAST, 204.46 FEET;

SOUTH 68 DEGREES 12 MINUTES 57 SECONDS EAST, 87.23 FEET;

SOUTH 71 DEGREES 18 MINUTES 50 SECONDS EAST, 314.72 FEET;

SOUTH 76 DEGREES 08 MINUTES 15 SECONDS EAST, 287.67 FEET TO A POINT OF INTERSECTION WITH THE NORTHWESTERLY RIGHT OF WAY LINE OF DESERT MOUNTAIN PARKWAY, A PRIVATE ACCESS-WAY ACCORDING TO THE DESERT MOUNTAIN PHASE I MAP OF DEDICATION, FOUND IN THE OFFICE OF THE COUNTY RECORDER OF MARICOPA COUNTY, ARIZONA IN BOOK 299 OF MAPS, PAGE 46;

THENCE ALONG SAID NORTHWESTERLY RIGHT OF WAY, SOUTH 30 DEGREES 24 MINUTES 29 SECONDS WEST A DISTANCE OF 93.02 FEET TO THE BEGINNING OF A NON-TANGENT CURVE, CONCAVE NORTHWESTERLY AND HAVING A RADIUS POINT WHICH BEARS NORTH 83 DEGREES 53 MINUTES 01 SECONDS WEST AT A DISTANCE OF 240.00 FEET; THENCE OUTHWESTERLY ALONG THE ARC OF SAID CURVE AND CONTINUING ALONG SAID NORTHWESTERLY RIGHT OF WAY, THROUGH A CENTRAL ANGLE OF 89 DEGREES 41 MINUTES 28 SECONDS, A DISTANCE OF 375.70 FEET TO A POINT;

THENCE CONTINUING ALONG SAID NORTHWESTERLY RIGHT OF WAY, ON A LINE NOT TANGENT TO THE LAST MENTIONED CURVE, NORTH 79 DEGREES 00 MINUTES 59 SECONDS WEST, A DISTANCE OF 71.91 FEET;

THENCE CONTINUING ALONG SAID NORTHWESTERLY RIGHT OF WAY THE FOLLOWING TWO COURSES:

NORTH 81 DEGREES 07 MINUTES 10 SECONDS WEST, 77.87 FEET;

SOUTH 73 DEGREES 34 MINUTES 05 SECONDS WEST, 194.83 FEET TO THE BEGINNING OF A TANGENT CURVE, CONCAVE SOUTHEASTERLY AND HAVING A RADIUS OF 1336.78 FEET;

THENCE SOUTHWESTERLY ALONG THE ARC OF SAID CURVE AND CONTINUING ALONG SAID NORTHWESTERLY RIGHT OF WAY, THROUGH A CENTRAL ANGLE OF 22 DEGREES 15 MINUTES 38 SECONDS A DISTANCE OF 519.37 FEET;

THENCE ON A LINE TANGENT TO SAID CURVE AND CONTINUING ALONG SAID NORTHWESTERLY RIGHT OF WAY, SOUTH 51 DEGREES 18 MINUTES 26 SECONDS WEST, A DISTANCE OF 274.41 FEET TO THE BEGINNING OF A TANGENT CURVE, CONCAVE NORTHWESTERLY AND HAVING A RADIUS OF 884.19 FEET;

THENCE SOUTHWESTERLY ALONG THE ARC OF SAID CURVE AND CONTINUING ALONG SAID NORTHWESTERLY RIGHT OF WAY, THROUGH A CENTRAL ANGLE OF 11 DEGREES 59 MINUTES 42 SECONDS, A DISTANCE OF 185.11 FEET TO A POINT; THENCE LEAVING SAID CURVE ON A NON-TANGENT LINE, CONTINUING ALONG SAID NORTHWESTERLY RIGHT OF WAY, TRAVERSING THE FOLLOWING COURSES AND DISTANCES:

SOUTH 49 DEGREES 15 MINUTES 21 SECONDS WEST, 155.21 FEET;

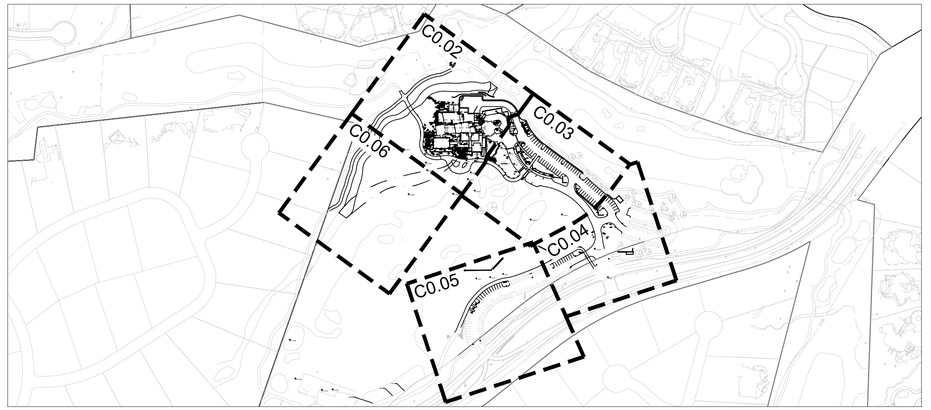
SOUTH 82 DEGREES 11 MINUTES 54 SECONDS WEST, 212.01 FEET;

NORTH 79 DEGREES 36 MINUTES 02 SECONDS WEST, 159.16 FEET;

SOUTH 86 DEGREES 27 MINUTES 03 SECONDS WEST, 87.66 FEET TO A POINT OF INTERSECTION WITH THE EASTERLY BOUNDARY OF SAID DESERT MOUNTAIN PHASE I, UNIT ONE;

THENCE ALONG SAID EASTERLY BOUNDARY, ALSO BEING THE EASTERLY BOUNDARY OF LOTS 9 THROUGH 14 RESPECTIVELY THEREOF, NORTH 19 DEGREES 19 MINUTES 58 SECONDS EAST A DISTANCE OF 1105.06 FEET TO THE POINT OF BEGINNING.

CONTAINING 1,504,290.82 SQUARE FEET OR 34.534 ACRES MORE OR LESS.



SITE MAP
1" = 250'

GENERAL NOTES

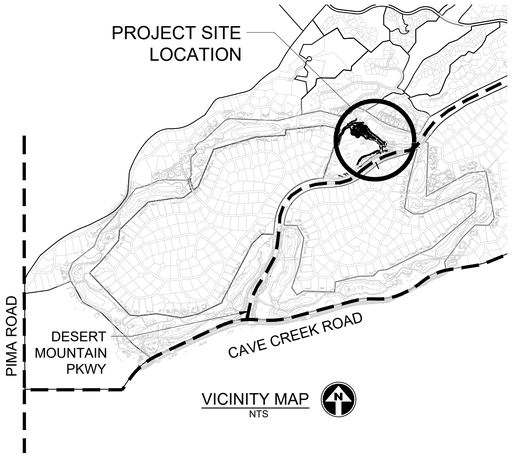
1. EXCAVATING, GRADING, AND FILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 1804 OF THE 2018 INTERNATIONAL BUILDING CODE (IBC). ALL OTHER CONSTRUCTION SHALL BE IN ACCORDANCE WITH MOST RECENT M.A.G. STANDARD DETAILS AND SPECIFICATIONS.
2. CUT AND FILL SLOPES SHALL HAVE ROUNDED GRADES TO BLEND INTO EXISTING NATURAL TERRAIN.
3. ALL EXPOSED RIP-RAP SHALL BE NATIVE STONE, INDIGENOUS TO THIS SITE.
4. SALVAGE OF NATIVE PLANTS IS BY OTHERS.
5. 5 PERCENT MINIMUM SLOPE AWAY FROM THE BUILDING FOR A MINIMUM OF 10 FEET UNLESS OTHERWISE NOTED.
6. UNLESS NOTED OTHERWISE WITH SPOT GRADES OR PROPOSED CONTOURS, ADJACENT GRADES TO IMPROVEMENTS SHALL BE REGRADED TO PRE-DEVELOPMENT CHARACTERISTICS.
7. PROVIDE SPLASH PADS AT ALL ROOF DRAINS.
8. GEOTECHNICAL ENGINEER TO REVIEW SLOPES STEEPER THAN 2:1 AND PROVIDE RECOMMENDATIONS FOR STABILIZATION IF NECESSARY.
9. COORDINATE WATER AND SEWER BUILDING CONNECTION WITH ARCHITECT'S PLANS. TWO-WAY CLEANOUT REQUIRED ON SANITARY SEWER OUTSIDE OF STRUCTURE.
10. EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE ONLY AND ARE BASED ON UTILITY-PROVIDED QUARTER SECTION MAPS. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR TO CONTACT PRIVATE UTILITIES FOR EXISTING UTILITY LOCATIONS. IF A PROPOSED IMPROVEMENT CANNOT BE CONSTRUCTED PER PLAN BECAUSE OF CONFLICTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
11. RETAINING/SCREEN WALLS ARE DESIGNED BY OTHERS. WALLS TO INCLUDE WATERPROOFING AS WELL AS SUBSURFACE DRAINAGE CONSIDERATION OF RETAINED SOILS.
12. FLOOD PROOFING REQUIRED PER ARCHITECT'S SPECIFICATIONS WHEREVER FINISH FLOOR IS BELOW ADJACENT GROUND.
13. ALL SITE CONCRETE, INCLUDING ALL HEADWALLS & DRAINAGE STRUCTURES, SHALL BE INTEGRALLY COLORED TO BLEND WITH THE SURROUNDING NATURAL DESERT PER DESERT MOUNTAIN'S MASTER ENVIRONMENTAL CONCEPT PLAN (MEDCP) AMENDMENT. COLORS TO BE APPROVED BY DESERT MOUNTAIN PROPERTIES PRIOR TO INSTALLATION.
14. THIS PLAN DOES NOT INCLUDE TRAFFIC CONTROL AND SAFETY MEASURES. THE ENGINEER RECOMMENDS THAT THE OWNER PERFORM AN ANALYSIS OF TRAFFIC AND SAFETY MEASURES FOR IMPLEMENTATION PRIOR TO USE OF THE FACILITIES.
15. SLOPE ALL CONCRETE WALKWAYS AND PATIOS 1.5% AWAY FROM STRUCTURES OR WITH A CROSS-SLOPE FOR POSITIVE DRAINAGE. COORDINATE ALL SLOPES WITH THE ARCHITECT AND/OR STRUCTURE DESIGNER.
16. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE, VERIFY AND ACCEPT ALL CONSTRUCTION STAKES AND GRADES PRIOR TO STARTING CONSTRUCTION.
17. ALL RAMPS MUST MEET ADA ACCESSIBILITY GUIDELINES (ADAAG) STANDARDS, 2% MAX CROSS SLOPES AND 12:1 MAX LONGITUDINAL SLOPES. TRUNCATED DOMES AS DETECTABLE WARNINGS ARE REQUIRED ON ALL ON-SITE RAMPS PER ADAAG SECTION 4.7.7. TRUNCATED DOMES AS DETECTABLE WARNINGS ARE REQUIRED ON ALL ON-SITE SIDEWALKS THAT CROSS OR ADJOIN A VEHICULAR WAY PER ADAAG SECTION 4.29.5. SURFACE MATERIAL SHALL MEET ADAAG STANDARDS. THIS PLAN DOES NOT INCLUDE ADA SIGNAGE AND RAILINGS.
18. PRIOR TO PLACING FINAL ADA SURFACE MATERIAL (E.G., CONCRETE, ASPHALT CONCRETE, ETC.) CONTRACTOR SHALL CHECK AND VERIFY ALL FORMS AND/OR SUBGRADES FOR CONFORMANCE WITH ADA STANDARDS (GRADES, SLOPES, DIMENSIONS, ETC.).
19. ALL PRIVATE ON-SITE WATER AND SEWER FACILITIES SHALL BE INSTALLED IN ACCORDANCE WITH THE 2018 INTERNATIONAL PLUMBING CODE (IPC). ALL OTHER CONSTRUCTION SHALL BE IN ACCORDANCE WITH MOST RECENT M.A.G. STANDARD DETAILS AND SPECIFICATIONS.

NATURAL AREA OPEN SPACE (NAOS) AND LIMITS-OF-CONSTRUCTION (LOC) PROTECTION PROGRAM

1. NO BUILDING, GRADING, OR CONSTRUCTION ACTIVITY SHALL ENCROACH INTO AREAS DESIGNATED AS NAOS, OR OUTSIDE THE DESIGNATED CONSTRUCTION ENVELOPE.
2. ALL NAOS AND AREA OUTSIDE OF THE LOC SHALL BE PROTECTED FROM DAMAGE PRIOR TO, AND DURING CONSTRUCTION BY THE FOLLOW METHODS:
   A. A REGISTERED LAND SURVEYOR SHALL STAKE ALL NAOS AND LOC DISTURBANCE BASED ON THIS EXHIBIT.
   B. ± THREE (3) FOOT TALL STEEL REBAR, OR CITY OF SCOTTSDALE INSPECTION SERVICES APPROVED SIMILAR, SHALL BE SET ALONG THE NAOS AND LOC, AND CONNECTED WITH GOLD ROPING BY THE CONTRACTOR PRIOR TO ANY CLEARING OR GRADING.
   C. ALL CACTUS SUBJECT TO THE CITY OF SCOTTSDALE'S NATIVE PLANT ORDINANCE DIRECTLY ADJACENT, WITHIN TWO FEET, OF THE NAOS AND LOC LINE SHALL BE FENCED WITH WIRE FENCING TO PREVENT DAMAGE.
   D. THE STAKING, ROPING, AND FENCING SHALL BE MAINTAINED INTACT BY THE CONTRACTOR DURING THE DURATION OF THE CONSTRUCTION ACTIVITY.
3. THE CONTRACTOR SHALL REMOVE STAKING, ROPING, AND FENCING AFTER RECEIPT OF THE LETTER OF ACCEPTANCE FROM THE CITY OF SCOTTSDALE FOR ALL CONSTRUCTION WORK.

CITY OF SCOTTSDALE GENERAL NOTES

1. ALL CONSTRUCTION IN THE PUBLIC RIGHT-OF WAY OR IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO THE LATEST MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION AS AMENDED BY THE LATEST VERSION OF THE CITY OF SCOTTSDALE SUPPLEMENTAL STANDARD SPECIFICATIONS AND SUPPLEMENTAL STANDARD DETAILS. IF THERE IS A CONFLICT, THE CITY'S SUPPLEMENTAL STANDARD DETAILS WILL GOVERN.
2. THE CITY ONLY APPROVES THE SCOPE, NOT THE DETAIL, OF ENGINEERING DESIGNS; THEREFORE, IF CONSTRUCTION QUANTITIES ARE SHOWN ON THESE PLANS, THEY ARE NOT VERIFIED BY THE CITY.
3. THE APPROVAL OF PLANS IS VALID FOR SIX (6) MONTHS. IF A RIGHT-OF-WAY PERMIT FOR THE CONSTRUCTION HAS NOT BEEN ISSUED WITHIN SIX MONTHS, THE PLANS MUST BE RESUBMITTED TO THE CITY FOR REAPPROVAL.
4. A PUBLIC WORKS INSPECTOR WILL INSPECT ALL WORKS WITHIN THE CITY OF SCOTTSDALE RIGHT-OF-WAY AND IN EASEMENTS. NOTIFY INSPECTION SERVICES 24 HOURS PRIOR TO BEGINNING CONSTRUCTION BY CALLING 480-312-5750.
5. WHENEVER EXCAVATION IS NECESSARY, CALL THE BLUE STAKE CENTER, 811, TWO WORKING DAYS BEFORE EXCAVATION BEGINS. THE CENTER WILL SEE THAT THE LOCATION OF THE UNDERGROUND UTILITY LINES IS IDENTIFIED FOR THE PROJECT.
6. RIGHT-OF-WAY PERMITS ARE REQUIRED FOR ALL WORK IN PUBLIC RIGHT-OF -WAY AND EASEMENTS GRANTED FOR PUBLIC PURPOSES. A RIGHT-OF-WAY PERMIT WILL BE ISSUED BY THE CITY ONLY AFTER THE REGISTRANT HAS PAID A BASE FEE PLUS A FEE FOR INSPECTION SERVICES. COPIES OF ALL PERMITS MUST BE RETAINED ON-SITE AND BE AVAILABLE FOR INSPECTION AT ALL TIMES. FAILURE TO PRODUCE THE REQUIRED PERMITS WILL RESULT IN IMMEDIATE SUSPENSION OF ALL WORK UNTIL THE PROPER PERMIT DOCUMENTATION IS OBTAINED.
7. ALL EXCAVATION AND GRADING THAT IS NOT IN THE PUBLIC RIGHTS-OF-WAY OR NOT IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO APPENDIX J, GRADING, OF THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE. A PERMIT FOR THIS GRADING MUST BE SECURED FROM THE CITY FOR A FEE ESTABLISHED BY CITY.



VICINITY MAP
NTS

LEGEND

- RIGHT OF WAY/PROPERTY BOUNDARY
- LIMIT OF CONSTRUCTION
- EASEMENT LINE
- NATURAL OPEN SPACE AREA (NAOS)
- CONTOUR - MAJOR
- CONTOUR - MINOR
- W — PROPOSED WATER
- FL — PROPOSED FIRE LINE
- SS — PROPOSED FIRE LINE
- PROPOSED STORM DRAIN
- FIRE LANE
- EXIST. CONTOUR - MAJOR
- EXIST. CONTOUR - MINOR
- SS — EXIST. SANITARY SEWER LINE
- W — EXIST. WATER LINE
- FL — EXIST. FIRE LINE
- G — EXIST. GAS
- FO — EXIST. FIBER
- E — EXIST. ELECTRIC
- EXIST. STORM DRAIN

ABBREVIATIONS

BC	BACK OF CURB
BW	BOTTOM OF EXPOSED WALL
C	CONCRETE SURFACE
DIA	DIAMETER
EP	EXISTING PAVEMENT
EX.	EXISTING
FC	FACE OF CURB
FG	FINISHED GROUND SURFACE
FL	FIRE LINE
INV	INVERT
LP	LOW POINT
NAOS	NATURAL AREA OPEN SPACE
OF	OVERFLOW
P	PAVEMENT
SE	SLOPE EASEMENT
SLE	SEWER LINE EASEMENT
TC	TOP OF CURB
TF	TOP OF FOOTING
TG	TOP OF GRADE
TW	TOP OF WALL
UGE	UNDERGROUND ELECTRIC
FFE	FINISHED FLOOR ELEVATION
WSE	WATER SURFACE ELEVATION

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CIVIL APPROVAL

REVIEW AND RECOMMENDED APPROVAL BY:

PAVING		TRAFFIC	
G & D		PLANNING	
W & S		FIRE	
RET. WALLS			

ENGINEERING COORDINATION MGR. (OR DESIGNEE) — DATE

MAINTENANCE NOTE

THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING ALL DRAINAGE IMPROVEMENTS. REGULAR INSPECTION SHOULD BE PERFORMED IN ADDITION TO INSPECTING ALL DRAINAGE IMPROVEMENTS AFTER EACH STORM EVENT. THE PROPERTY OWNER IS TO CLEAN OUT OR REPAIR ANY DAMAGED IMPROVEMENTS PROMPTLY.

FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

COMMUNITY NUMBER	PANEL NO. / PANEL DATE	SUFFIX	DATE OF FIRM (INDEX DATE)	FIRM ZONE	BASE FLOOD ELEV.
045012	0903	L	10/16/2013	D	N.A.

ENGINEERS CERTIFICATION

THE LOWEST FLOOR ELEVATION(S) AND/OR FLOOD PROOFING ELEVATION(S) ON THIS PLAN ARE SUFFICIENTLY HIGH TO PROVIDE PROTECTION FROM FLOODING CAUSED BY A 100-YEAR STORM, AND ARE IN ACCORDANCE WITH SCOTTSDALE REVISED CODE, CHAPTER 37 - FLOODPLAIN AND STORMWATER REGULATIONS.

NO CONFLICT SIGNATURE BLOCK

UTILITY	UTILITY COMPANY	NAME OF COMPANY REPRESENTATIVE	TELEPHONE NUMBER	DATE SIGNED
WATER	SCOTTSDALE			
SANITARY SEWER	SCOTTSDALE			
ELECTRIC	APS			
TELEPHONE	CENTURY LINK			
NATURAL GAS	SOUTHWEST GAS			
CABLE TV	COX COMM.			

ENGINEER'S CERTIFICATION

I, BYRON DIXON, AS THE ENGINEER-OF-RECORD FOR DEVELOPMENT, HEREBY CERTIFY THAT ALL UTILITY COMPANIES LISTED ABOVE HAVE BEEN PROVIDED FINAL IMPROVEMENT PLANS FOR REVIEW, AND THAT ALL CONFLICTS IDENTIFIED BY THE UTILITIES HAVE BEEN RESOLVED. IN ADDITION, "NO CONFLICT" FORMS HAVE BEEN OBTAINED FROM EACH UTILITY COMPANY AND ARE INCLUDED IN THIS SUBMITTAL.

SIGNATURE — DATE

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3101 Iris Avenue, Suite 130
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DESERT MOUNTAIN
RENEGADE CLUBHOUSE

38580 N DESERT MOUNTAIN PARKWAY, SCOTTSDALE, AZ 85262
DEVELOPMENT REVIEW BOARD SUBMITTAL

Registered Professional Engineer
CERTIFICATE NO.
36372
BYRON L. DIXON
12.03.2021
Date Signed
ARIZONA, U.S.A.

15-DR-2021_V3

DRAWN BY: R. REVILLARD
CHECKED BY: B. DIXON
PROJECT NO.: 2019001.20
ISSUE DATE: 12/03/2021
REVISIONS:

SHEET TITLE:
CIVIL COVER SHEET AND NOTES

SHEET NUMBER:
C0.00

CONSTRUCTION NOTES

1. WATER LINE TO BE REMOVED.
2. WATERMETER AND BACKFLOW ASSEMBLY TO BE REMOVED. THIS WORK MUST BE COORDINATED WITH THE CITY PRIOR TO CONSTRUCTION.
3. HYDRANT TO BE RELOCATED.
10. SEWER LINE TO BE REMOVED OR CAPPED AND ABANDONED IN PLACE.
11. SEWER MANHOLE TO BE REMOVED.
20. SAWCUT EXISTING ASPHALT TO A NEAT EDGE.
21. SAWCUT EXISTING CONCRETE TO A NEAT EDGE.
22. BUILDING TO BE DEMOLISHED.
23. CURB TO BE REMOVED.
24. WALL TO BE REMOVED.
25. SIGN, POST AND FOOTING TO BE REMOVED.
26. CATCH BASIN TO BE REMOVED. STORM PIPES TO BE LINKED TOGETHER AFTER CATCH BASIN REMOVAL.
27. EXISTING STORM PIPE TO REMOVED.

LEGEND

- BUILDING DEMOLITION
- CONCRETE REMOVAL
- ASPHALT REMOVAL
- SECTION OF WASH TO BE RELOCATED TO ITS HISTORICAL LOCATION
- LANDSCAPE TO BE CLEARED AND GRUBBED
- GRASS TO BE REMOVED AND TOPSOIL STOCKPILED

SHEET NOTES

SALVAGE PLANT MATERIAL PER PROJECT NATIVE PLANT INVENTORY PLAN .

EXIST. SEWER, PROTECT IN PLACE
EXIST. SEWER, PROTECT IN PLACE
DESERT MOUNTAIN PHASE II, UNIT TWENTY-FIVE M.C.R. 450-32
EXIST. CART PATH TO REMAIN
DESERT MOUNTAIN PHASE I, UNIT ONE M.C.R. 293-41
50' G.C.E. 293-41
EXIST. CART PATH TO REMAIN
EXIST. SEWER, PROTECT IN PLACE
EXIST. PARKING TO REMAIN
EXIST. ELECTRICAL, PROTECT IN PLACE
EXIST. STORM, PROTECT IN PLACE
EXIST. SIDEWALK
EXIST. PARKING TO REMAIN
EXIST. GAS.
EXIST. ELECTRICAL, FIBER AND TELEPHONE.
EXIST. SIDEWALK
EXIST. STORM, PROTECT IN PLACE
EXIST. CART PATH TO REMAIN
DESERT MOUNTAIN PKWY
DESERT MOUNTAIN PKWY
EXIST. CART PATH TO REMAIN

COORDINATE DEMOLITION AND/OR RELOCATION OF ALL SHALLOW UTILITIES (GAS, TELEPHONE, FIBER, ELECTRIC) WITH LOCAL UTILITY COMPANIES SERVICING THIS PROJECT PRIOR TO CONSTRUCTION

0' 50' 100'

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DEVELOPMENT REVIEW BOARD SUBMITTAL

Registered Professional Engineer
CERTIFICATE NO.
36372
BYRON L. DIXON
12.03.2021
Date Signed
ARIZONA, U.S.A.

15-DR-2021_V3

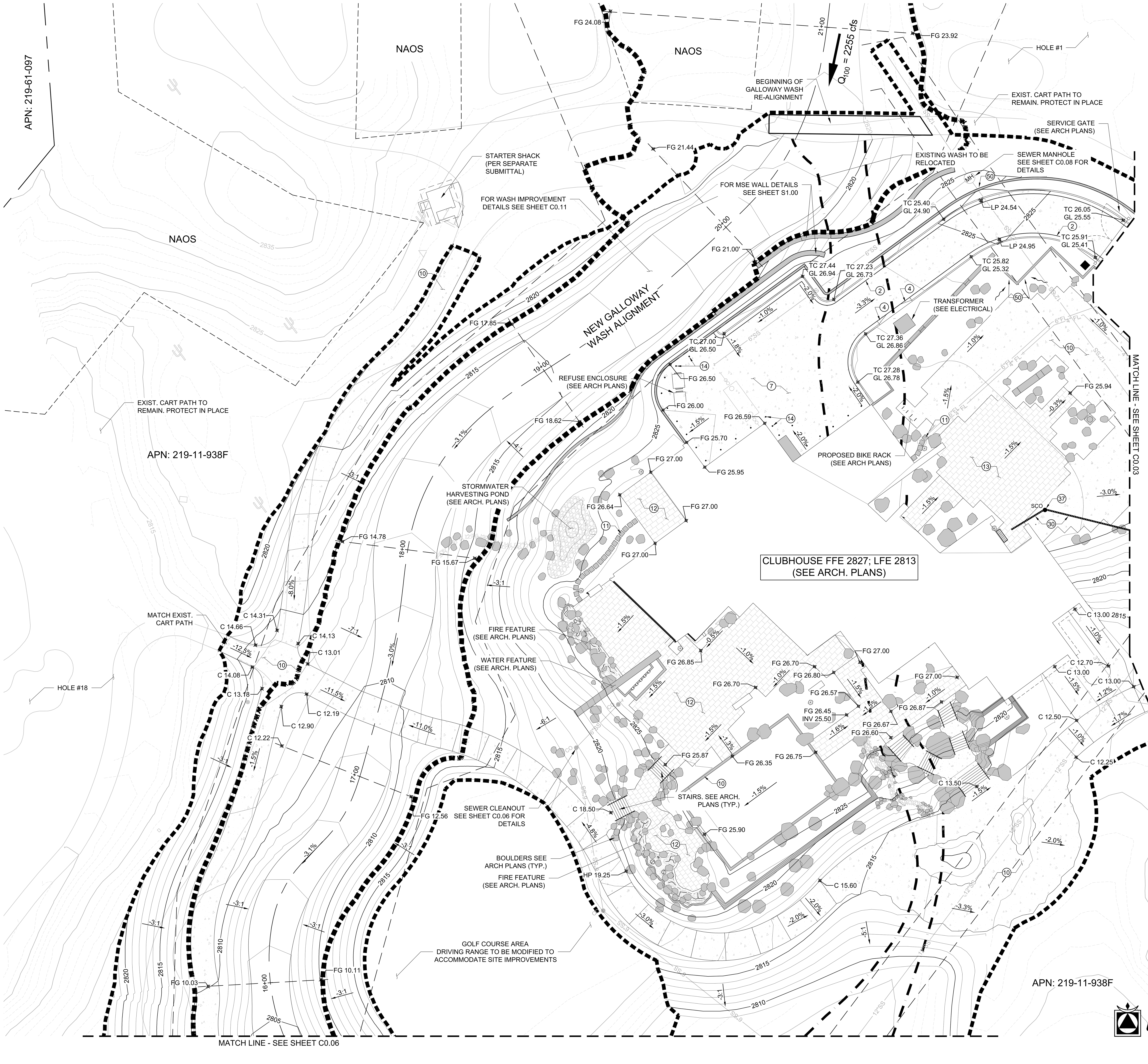
DRAWN BY:	R. REVILLARD
CHECKED BY:	B. DIXON
PROJECT NO.:	2019001.20
ISSUE DATE:	12/03/2021
REVISIONS:	

SHEET TITLE:

DEMOLITION PLAN

SHEET NUMBER:

C0.01



CONSTRUCTION NOTES

1. CONSTRUCT ROLL CURB AND GUTTER AS PER MAG DETAIL 220-1, TYPE D.
2. CONSTRUCT VERTICAL CURB AND GUTTER PER COS DETAIL 2220, TYPE A.
3. CONSTRUCT RIBBON CURB AS PER DETAIL 2220, TYPE B.
4. CONSTRUCT VERTICAL CURB TO ROLL CURB TRANSITION AS PER DETAIL 7 ON SHEET C0.10.
5. STRIPE ADA SPACE AND AISLES WITH 4" WIDE WHITE LEAD FREE LATEX TRAFFIC MARKING PAINT. INSTALL AS PER MANUFACTURER'S SPECIFICATIONS. SPACES AND AISLE DIMENSIONS PER PLAN. SLOPES NOT TO EXCEED 2.0% IN ANY DIRECTION. CONTRACTOR SHALL CHECK GRADES BEFORE PLACING FINAL PAVING MATERIAL.
6. INSTALL 4" DIAMETER X 1/2" HIGH WHITE CIRCULAR PLASTIC PAVEMENT MARKERS AS PER DIMENSIONS ON PLAN. MARKER ADHESION PER MANUFACTURER'S SPECIFICATIONS.
7. INSTALL CONCRETE PAVEMENT AS PER DETAIL 1 ON SHEET C0.10.
8. INSTALL DRIVEWAY ASPHALT AS PER DETAIL 2 ON SHEET C0.10.
9. INSTALL PARKING ASPHALT AS PER DETAIL 4 ON SHEET C0.10.
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11. INSTALL STONE STEPPERS AS PER DETAIL 7 ON SHEET L201
12. INSTALL PEDESTRIAN PAVER AS PER DETAIL 9 ON SHEET L201
13. INSTALL VEHICULAR PAVER AS PER DETAIL 10 ON SHEET L201
14. INSTALL PERMANENT BOLLARD AS PER MAG DETAIL 150, TYPE '1'.
15. INSTALL FIRE LANE SIGN (ONE-DIRECTIONAL) AS PER COS DETAIL 2365
16. INSTALL SIGN POST AS PER COS DETAIL 2131
17. INSTALL ACCESSIBLE SIGNAGE AS PER COS DETAIL 2124
30. INSTALL 6" HDPE STORM PIPE, TYPE S AS PER MAG SECTION 738.
31. INSTALL 18" HDPE STORM PIPE, TYPE S AS PER MAG SECTION 738.
32. INSTALL 18"x18"x18" N12 HDPE WYE.
33. INSTALL 3'-6" CURB OPENING CATCH BASIN AS PER MAG DETAIL 530, TYPE A.
34. INSTALL CATCH BASIN TYPE 'E' AS PER MAG DETAIL 534-1.
35. REMOVE CATCH BASIN AND REPAIR HDPE PIPE AS REQUIRED TO MAINTAIN EXIST. STORM DRAIN GRADE.
36. EXIST. STORM DRAIN. PROTECT IN PLACE DURING FACILITY DEMOLITION.
37. INSTALL 6" STORM CLEANOUT (SCO). INSTALLATION PROCEDURE AS PER MAG DETAIL 441, 'CLEANOUT INSTALLATION'.
50. CONSTRUCT 2 - 1' X 1' WALL OPENING FOR DRAINAGE

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RENEGADE CLUBHOUSE
38580 N DESERT MOUNTAIN PARKWAY, SCOTTSDALE, AZ 85262
BID PACKAGE

Registered Professional Engineer (Civil) Certificate No. 36372 BYRON L. DIXON Date Signed 12.03.2021 ARIZONA, U.S.A.

15-DR-2021_V3

DRAWN BY:	R. REVILLARD
CHECKED BY:	B. DIXON
PROJECT NO.:	2019001.20
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SHEET TITLE:
CIVIL GRADING PLAN

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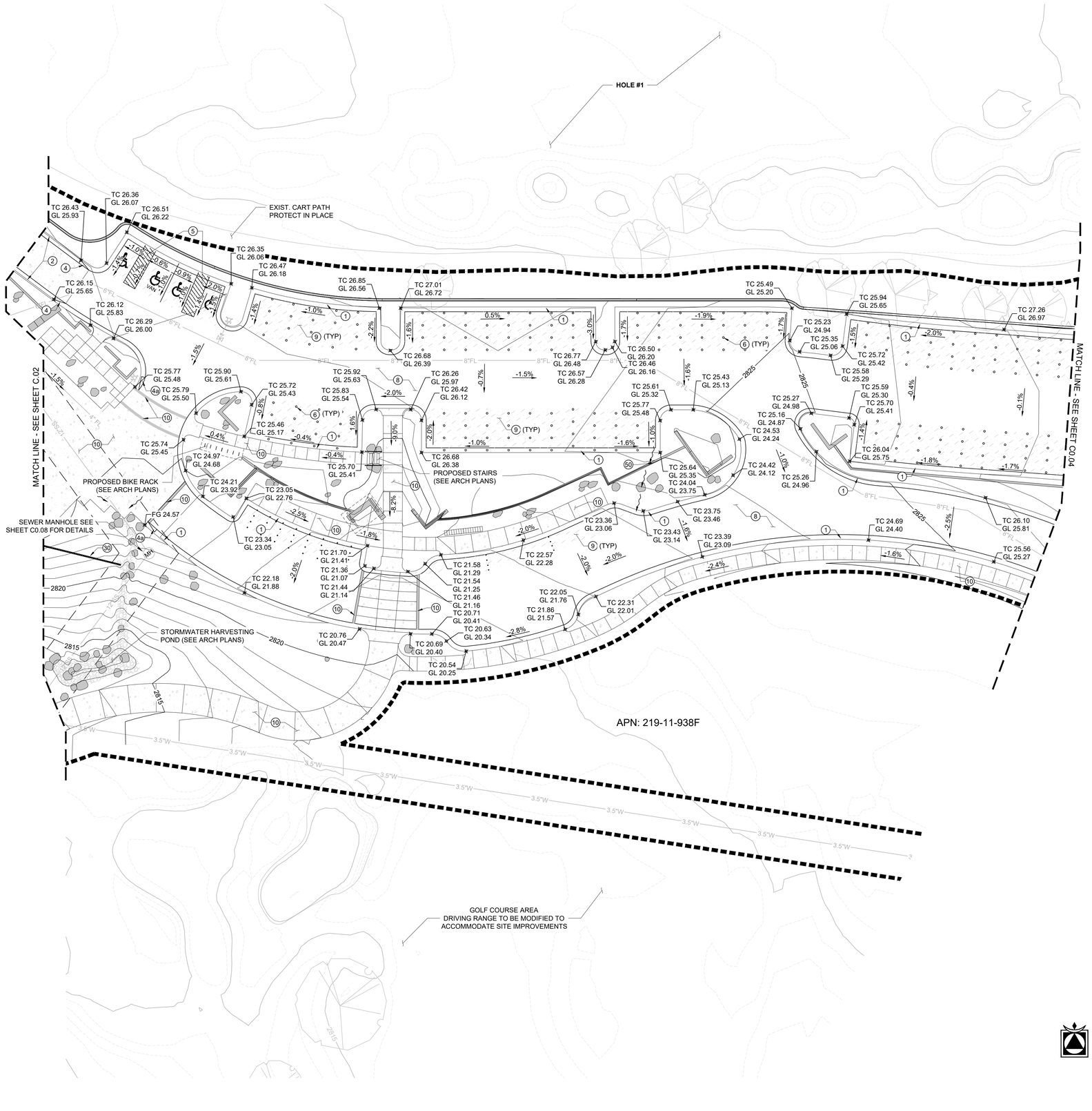

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CHECKED BY:	B. DIXON
PROJECT NO.:	2019001.20
ISSUE DATE:	12/03/2021
REVISIONS:	

SHEET TITLE:

CIVIL GRADING PLAN

SHEET NUMBER:

C0.03

Drawing: C:\Users\rrevillard\ACCDocs\GANNETT FLEMING INC\000000-Phx Facilities_Civil - Site Projects\Project Files\65993_DM_RCE\CADD\Sheets\065993-GD_PLANS_1to5.dwg
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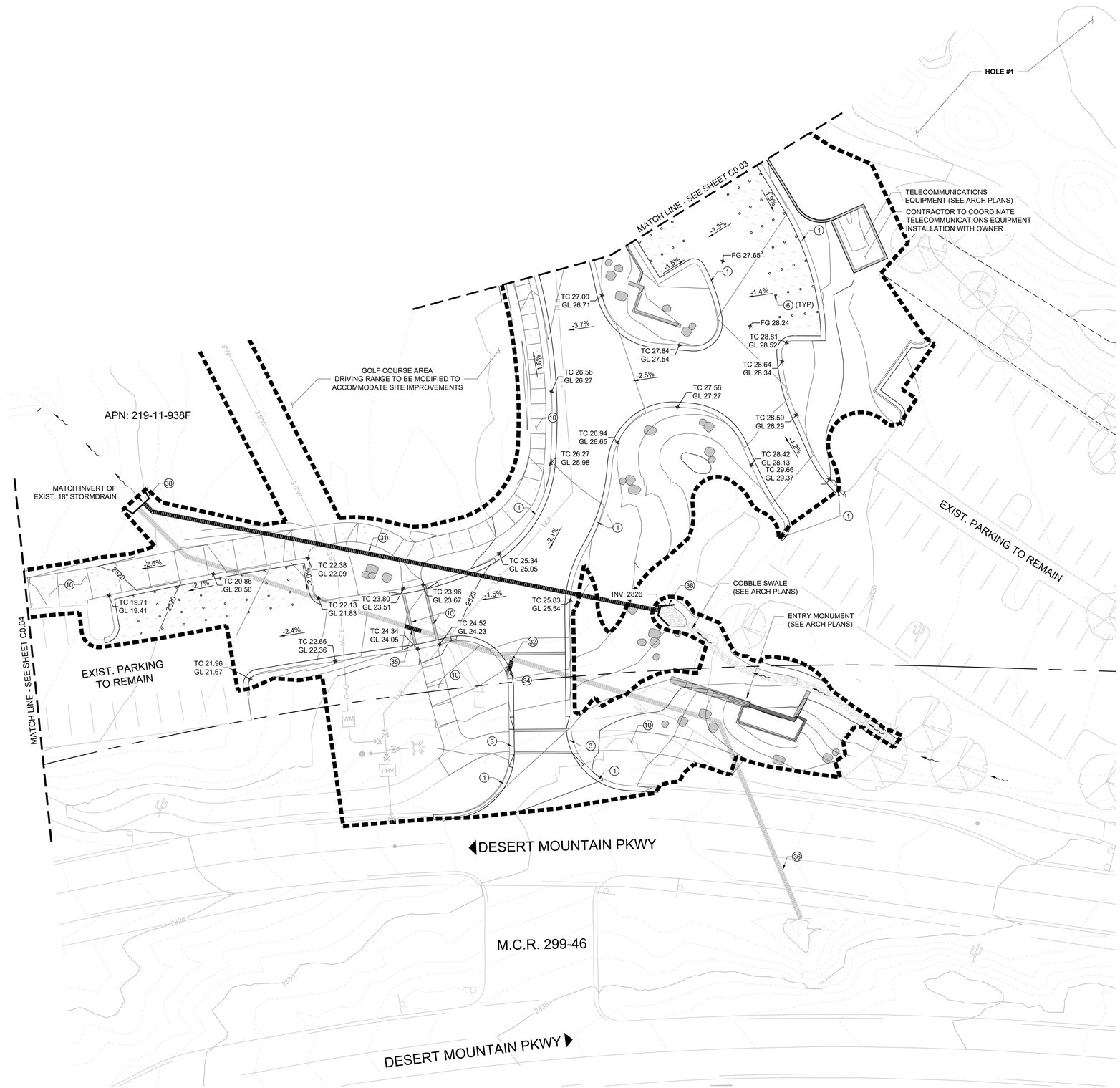
Last Plotted: 12/2/21 3:14 PM



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0' 20' 40'

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DESERT MOUNTAIN
RENEGADE CLUBHOUSE

38580 N DESERT MOUNTAIN PARKWAY, SCOTTSDALE, AZ 85262
BID PACKAGE

Registered Professional Engineer
CERTIFICATE NO.
36372
BYRON L. DIXON
12.03.2021
Date Signed
ARIZONA, U.S.A.

15-DR-2021_V3

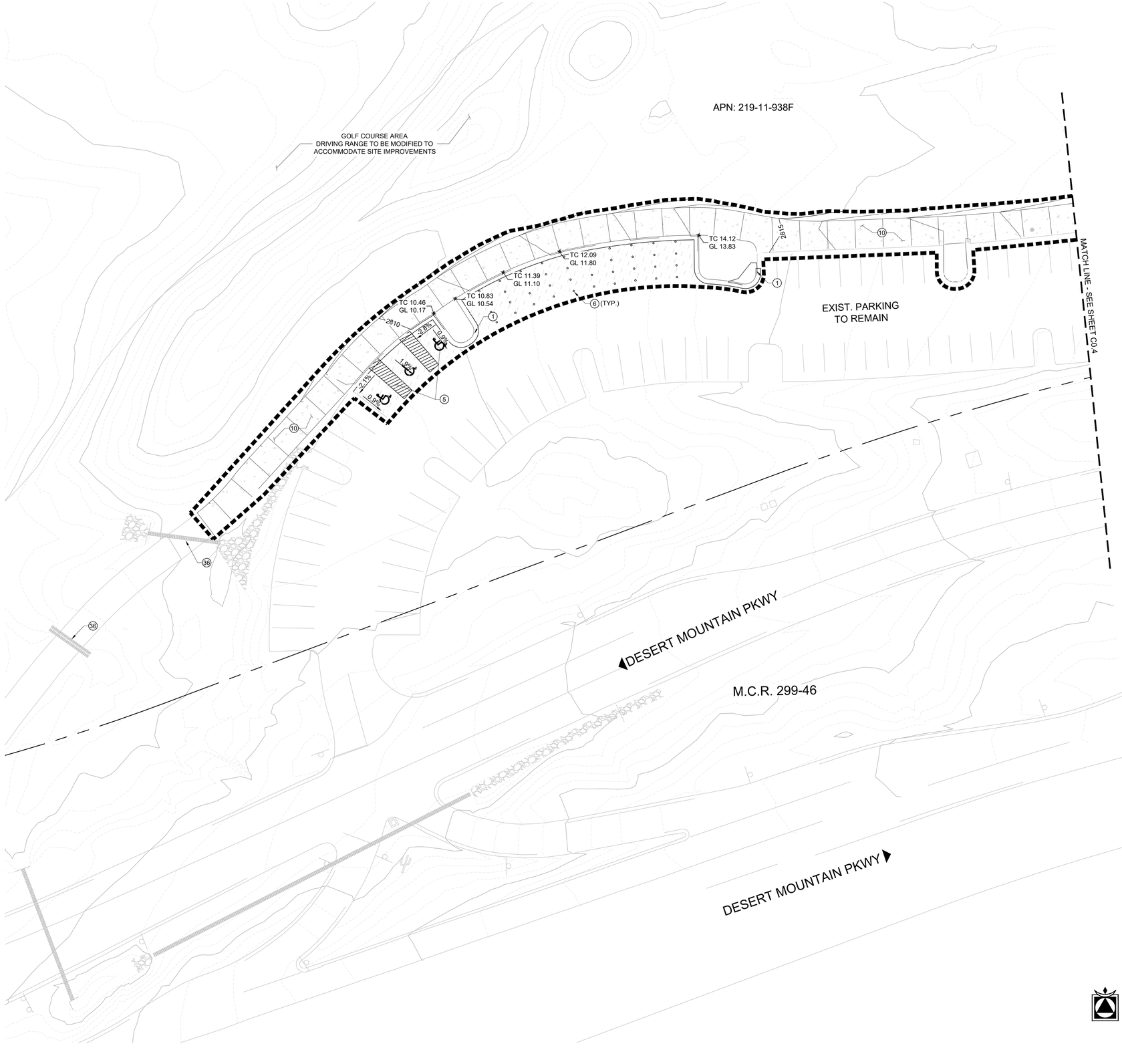
DRAWN BY:	R. REVILLARD
CHECKED BY:	B. DIXON
PROJECT NO.:	2019001.20
ISSUE DATE:	12/03/2021
REVISIONS:	

SHEET TITLE:

CIVIL GRADING PLAN

SHEET NUMBER:

C0.04



CONSTRUCTION NOTES

1. CONSTRUCT ROLL CURB AND GUTTER AS PER MAG DETAIL 220-1, TYPE D.
2. CONSTRUCT VERTICAL CURB AND GUTTER PER COS DETAIL 2220, TYPE A.
3. CONSTRUCT RIBBON CURB AS PER DETAIL 2220, TYPE B.
4. CONSTRUCT VERTICAL CURB TO ROLL CURB TRANSITION AS PER DETAIL 7 ON SHEET C0.10.
5. STRIPE ADA SPACE AND AISLES WITH 4" WIDE WHITE LEAD FREE LATEX TRAFFIC MARKING PAINT. INSTALL AS PER MANUFACTURER'S SPECIFICATIONS. SPACES AND AISLE DIMENSIONS PER PLAN. SLOPES NOT TO EXCEED 2.0% IN ANY DIRECTION. CONTRACTOR SHALL CHECK GRADES BEFORE PLACING FINAL PAVING MATERIAL.
6. INSTALL 4" DIAMETER X 1/2" HIGH WHITE CIRCULAR PLASTIC PAVEMENT MARKERS AS PER DIMENSIONS ON PLAN. MARKER ADHESION PER MANUFACTURER'S SPECIFICATIONS.
7. INSTALL CONCRETE PAVEMENT AS PER DETAIL 1 ON SHEET C0.10.
8. INSTALL DRIVEWAY ASPHALT AS PER DETAIL 2 ON SHEET C0.10.
9. INSTALL PARKING ASPHALT AS PER DETAIL 4 ON SHEET C0.10.
10. INSTALL CONCRETE PAVEMENT AS PER DETAIL 1 ON SHEET L201
11. INSTALL STONE STEPPERS AS PER DETAIL 7 ON SHEET L201
12. INSTALL PEDESTRIAN PAVER AS PER DETAIL 9 ON SHEET L201
13. INSTALL VEHICULAR PAVER AS PER DETAIL 10 ON SHEET L201
14. INSTALL PERMANENT BOLLARD AS PER MAG DETAIL 150, TYPE '1'.
15. INSTALL FIRE LANE SIGN (ONE-DIRECTIONAL) AS PER COS DETAIL 2365
16. INSTALL SIGN POST AS PER COS DETAIL 2131
17. INSTALL ACCESSIBLE SIGNAGE AS PER COS DETAIL 2124
30. INSTALL 6" HDPE STORM PIPE, TYPE S AS PER MAG SECTION 738.
31. INSTALL 18" HDPE STORM PIPE, TYPE S AS PER MAG SECTION 738.
32. INSTALL 18"x18"x18" N12 HDPE WYE.
33. INSTALL 3'-6" CURB OPENING CATCH BASIN AS PER MAG DETAIL 530, TYPE A.
34. INSTALL CATCH BASIN TYPE 'E' AS PER MAG DETAIL 534-1.
35. REMOVE CATCH BASIN AND REPAIR HDPE PIPE AS REQUIRED TO MAINTAIN EXIST. STORM DRAIN GRADE.
36. EXIST. STORM DRAIN. PROTECT IN PLACE DURING FACILITY DEMOLITION.
37. INSTALL 6" STORM CLEANOUT (SCO). INSTALLATION PROCEDURE AS PER MAG DETAIL 441, 'CLEANOUT INSTALLATION'.
50. CONSTRUCT 2 - 1' X 1' WALL OPENING FOR DRAINAGE

Gannett Fleming
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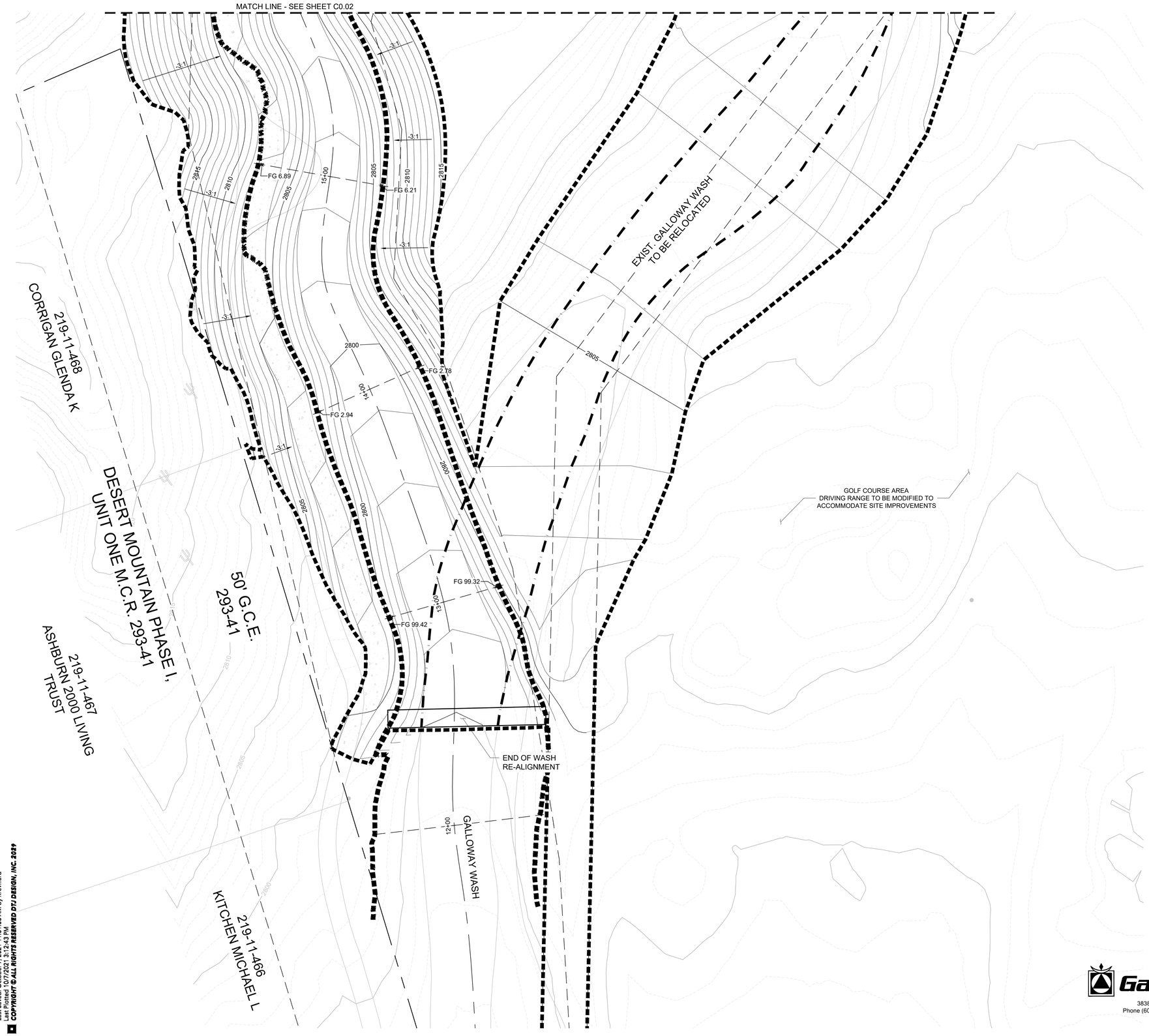

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50. CONSTRUCT 2 - 1' X 1' WALL OPENING FOR DRAINAGE

0' 20' 40'

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SHEET TITLE:
CIVIL GRADING PLAN

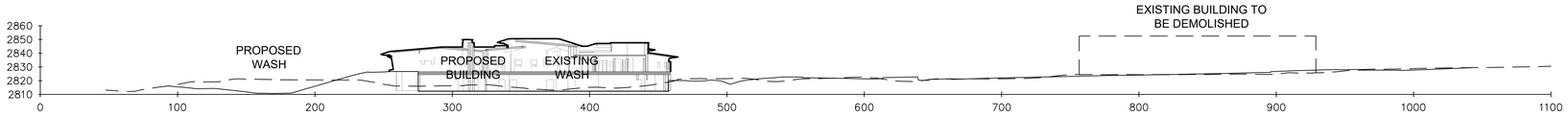
SHEET NUMBER:
C0.06

LEGEND

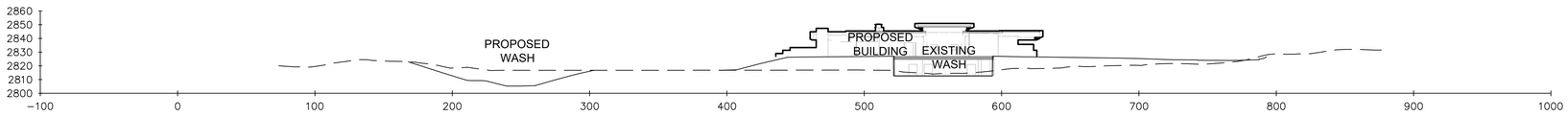
PROPOSED FINISHED GRADE

EXISTING GRADE

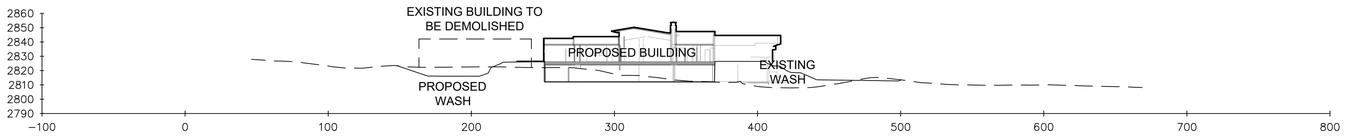
NORTHWEST/ SOUTH EAST - SECTION 1



WEST/ EAST - SECTION 2



NORTH/ SOUTH - SECTION 3



WATERPROOFING AND SUBSURFACE DRAINAGE NOTES:

1. IN ADDITION TO STEM WALL WATERPROOFING BELOW GRADE, CONTRACTOR TO WATERPROOF EXTERIOR WALL SURFACES 2' ABOVE FINISH ADJACENT GRADE AND PROVIDE A SUB-DRAIN COLLECTION SYSTEM WHEREVER THE ADJACENT GROUND IS ABOVE THE LOWEST FLOOR ELEVATION OF THE STRUCTURE. SEE ARCHITECT/STRUCTURAL PLANS FOR WATERPROOFING AND SUB-DRAIN COLLECTION DETAILS (BY OTHERS).

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SHEET TITLE:

SITE CROSS SECTIONS

SHEET NUMBER:

C0.07

LEGEND

- RIGHT OF WAY/PROPERTY BOUNDARY
- LIMIT OF CONSTRUCTION
- EASEMENT LINE
- NATURAL OPEN SPACE AREA (NAOS)
- CONTOUR - MAJOR
- CONTOUR - MINOR
- W — PROPOSED WATER
- FL — PROPOSED FIRE LINE
- SS — PROPOSED FIRE LINE
- PROPOSED STORM DRAIN
- FIRE LANE
- 100-YR STORM INUNDATION LIMITS
- 12"SS — SEWER REMOVAL
- SEWER EASEMENT TO BE ABANDONED
- EXIST. CONTOUR - MAJOR
- SS — EXIST. CONTOUR - MINOR
- W — EXIST. SANITARY SEWER LINE
- FL — EXIST. WATER LINE
- G — EXIST. FIRE LINE
- FO — EXIST. GAS
- E — EXIST. FIBER
- EXIST. ELECTRIC
- EXIST. STORM DRAIN

STARTER SHACK (PER SEPARATE SUBMITTAL)

HOLE #18 GREEN

EXIST. SEWER TO REMAIN. PROTECT IN PLACE

EXIST. 8" SEWER TO REMAIN. PROTECT IN PLACE

BEGINNING OF WASH RE-ALIGNMENT

TIE-IN TO EXIST. MANHOLE

MH-1

EXIST. SEWER EASEMENT TO BE ABANDONED

HOLE #1

NEW GALLOWAY WASH ALIGNMENT

GREASE, OIL AND SAND SEPARATOR

MH-2

WATER FEATURE DISCHARGE CONNECTION. SEE PLUMBING PLANS

CLUBHOUSE FFE 2813 (SEE ARCH. DWGS.

FIRE DEPARTMENT CONNECTION (FDC)

(PRIVATE)

EXIST. SEWER SYSTEM TO BE REMOVED (TYP.)

MH-3

DESERT MOUNTAIN PHASE I, UNIT ONE M.C.R. 293-41

50' G.C.E. 293-41

MH-4

END OF WASH RE-ALIGNMENT

EXIST. SEWER EASEMENT TO BE ABANDONED

GALLOWAY WASH

GOLF COURSE AREA
DRIVING RANGE TO BE MODIFIED TO ACCOMMODATE SITE IMPROVEMENTS

MH-5

TIE-IN TO EXIST. 12" SEWER PIPE

EXIST. 12" SEWER TO REMAIN. PROTECT IN PLACE

EXIST. PARKING

EXIST. STORM SYSTEM. PROTECT IN PLACE

(PUBLIC)

PROPERTY LINE

DESERT MOUNTAIN PKWY
M.C.R 299-46

EXIST. PARKING

0' 40' 80'

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TEMPORARY SEWER BYPASS NOTES:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE EXISTING SEWER MAIN IN SERVICE DURING CONSTRUCTION AND SHALL SUBMIT A TEMPORARY BYPASS PLAN FOR APPROVAL BEFORE CONSTRUCTION. THE TEMPORARY BYPASS PLAN SHALL INCLUDE:

1. A DETAILED PLAN AND DESCRIPTION OF A PROPOSED PUMPING SYSTEM. INDICATE NUMBER, SIZE, MATERIAL, LOCATION, AND METHOD OF INSTALLATION OF SUCTION AND DISCHARGE PIPING, SIZE OF PIPELINE OR CONVEYANCE SYSTEM TO BE BYPASSED, STAGING AREA FOR PUMPS, SITE ACCESS POINT, AND EXPECTED FLOW.
2. SIZE AND LOCATION OF MANHOLE OR ACCESS POINTS FOR SUCTION AND DISCHARGE HOSE OR PIPING.
3. SECTIONS SHOWING SUCTION AND DISCHARGE PIPE DEPTH, EMBEDMENT, SELECT FILL, AND SPECIAL BACKFILL, IF BURIED.
4. TEMPORARY PIPE SUPPORTS AND ANCHORING REQUIRED.
5. THRUST AND RESTRAINT BLOCK SIZES AND LOCATIONS.
6. SEWER PLUGGING METHOD AND TYPE OF PLUGS.
7. BYPASS PUMP SIZES, CAPACITY, NUMBER OF EACH SIZE TO BE ON-SITE, AND POWER REQUIREMENTS.
8. BACKUP PUMP, POWER, AND PIPING EQUIPMENT.
9. CALCULATIONS OF STATIC LIFT, FRICTION LOSSES, AND FLOW VELOCITY. PUMP CURVES SHOWING PUMP OPERATING RANGE.
10. DESIGN PLANS AND COMPUTATION FOR ACCESS TO BYPASS PUMPING LOCATIONS INDICATED ON DRAWINGS.
11. CALCULATIONS FOR SELECTION OF BYPASS PUMPING PIPE SIZE.
12. METHOD OF NOISE CONTROL FOR EACH PUMP AND/OR GENERATOR.
13. METHOD OF PROTECTING DISCHARGE MANHOLES OR STRUCTURES FROM EROSION AND DAMAGE.
14. SCHEDULE FOR INSTALLATION AND MAINTENANCE OF BYPASS PUMPING LINES.
15. PROCEDURES TO MONITOR UPSTREAM MAINS FOR BACKUP IMPACTS.
16. PROCEDURES FOR SETUP AND BREAKDOWN OF PUMPING OPERATIONS.
17. AN EMERGENCY PLAN DETAILING PROCEDURES TO BE FOLLOWED IN EVENT OF PUMP FAILURES, SEWER OVERFLOWS, SERVICE BACKUPS, AND SEWAGE SPILLAGE. A COPY OF THE EMERGENCY PLAN ON-SITE FOR THE DURATION OF THE PROJECT.

CONSTRUCTION NOTES

10. INSTALL 3.5" WATER SERVICE LINE, SCH 80 PVC C/W ALL REQUIRED FITTINGS AND RESTRAINS, WITH A MINIMUM OF 3' COVER AND SEPARATION FROM OTHER UTILITIES AS PER COS DETAIL 2372.
11. INSTALL 8" PRIVATE FIRE LINE DIP, CLASS 350 C/W ALL REQUIRED FITTINGS, RESTRAINS, WITH A MINIMUM 4' COVER AND SEPARATION FROM OTHER UTILITIES AS PER COS DETAIL 2372.
12. INSTALL 6" PRIVATE FIRE LINE DIP, CLASS 350 C/W ALL REQUIRED FITTINGS, RESTRAINS, WITH A MINIMUM 4' COVER AND SEPARATION FROM OTHER UTILITIES AS PER COS DETAIL 2372.
13. INSTALL TAPPING SLEEVE AND 8" VALVE AS PER MAG DETAIL 340.
14. INSTALL FIRE HYDRANT AS PER MAG DETAIL 360-1.
15. INSTALL FIRE LINE CONNECTION AS PER COS DETAIL 2362-2.
16. INSTALL FIRE HYDRANT PAVEMENT MARKER AS PER COS DETAIL 2363.
17. INSTALL 2" WATER METER. COORDINATE INSTALLATION WITH THE CITY PRIOR TO CONSTRUCTION.
17a. INSTALL 3.5" SERVICE CONNECTION FROM 8" LINE TO METER PER COS DETAIL 2330. USE TYPE 'K' CONTINUOUS COPPER.
18. INSTALL 3" REDUCE PRESSURE PRINCIPLE BACKFLOW PREVENTER AS PER COS DETAIL 2353.
19. INSTALL WATER QUALITY SAMPLING STATION AS PER COS DETAIL 2349.
20. INSTALL 8" GATE VALVE AS PER MAG DETAIL 390-1, TYPE 'A'.
21. INSTALL 8" GATE VALVE AS PER MAG DETAIL 390-1, TYPE 'C'.
22. INSTALL 4" PRIVATE FIRE LINE DIP, CLASS 350 C/W ALL REQUIRED FITTINGS, RESTRAINS, WITH A MINIMUM 4' COVER AND SEPARATION FROM OTHER UTILITIES AS PER COS DETAIL 2372.
23. INSTALL PRIVATE REMOTE FIRE DEPARTMENT CONNECTION (FDC) AS PER COS DETAIL 2367.
24. INSTALL 8"X3" PRESSURE REDUCING VALVE (PRV) AS PER COS DETAIL 2342-1
30. INSTALL 48" CONCRETE SANITARY SEWER MANHOLE AS PER MAG DETAIL 420-1, TYPE 'A' TOP, 24" MANHOLE COVER PER COS DETAIL 2421.
31. INSTALL 6" PVC SDR 35 SEWER PIPE.
32. INSTALL 12" PVC SDR 35 SEWER PIPE.
33. INSTALL 6" PVC SEWER CLEANOUT. INSTALLATION AS PER MAG DETAIL 441.
40. REMOVE EXISTING 8-INCH LATERAL CONNECTION, TEE, WATER METERS, BFPs AND VALVES. REPAIR EXISTING 16" LINE, 3' SECTION OF 16" LINE TO BE REMOVED WITH NO LESS THAN 6' REMAINING TO THE NEAREST JOINT. REPLACE WITH 16" DIP.
1. REFER TO PLUMBING DRAWINGS FOR PIPE CONTINUATION.

SHEET NOTES

COORDINATE ALL SHALLOW UTILITIES AND CONDUIT ROUTING WITH ELECTRICAL, IRRIGATION AND LOCAL UTILITY COMPANIES SERVICING THIS PROJECT PRIOR TO CONSTRUCTION.

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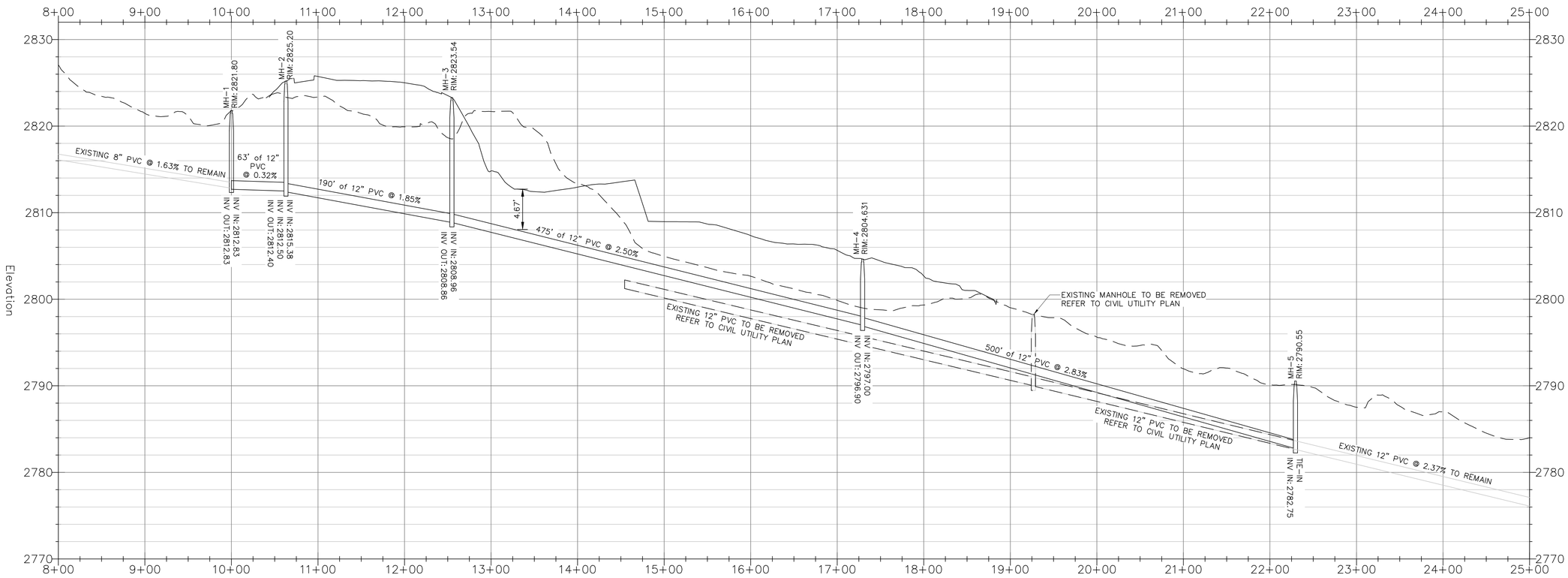
WATER AND SEWER PLAN

SHEET NUMBER:

C0.08

PR–Sewer–12 in PROFILE



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Registered Professional Engineer Certificate No. 36372 BYRON L. DIXON 12.03.2021 Date Signed ARIZONA, U.S.A.

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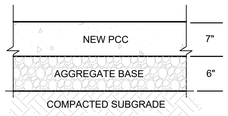
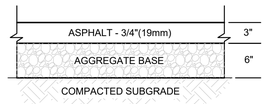
SEWER PROFILE

SHEET NUMBER:

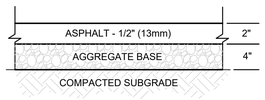
C0.09



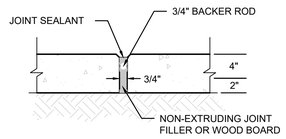
1 CONCRETE DRIVEWAY SECTION
NTS



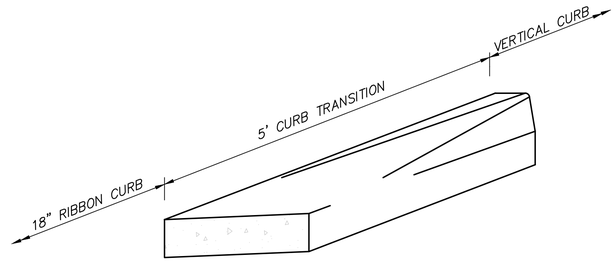
2 ASPHALT DRIVEWAY SECTION
NTS



4 ASPHALT PARKING SECTION
NTS



6 EXPANSION JOINT DETAIL
NTS



7 5' CURB TRANSITION
(VERTICAL TO RIBBON)

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CIVIL DETAILS

SHEET NUMBER:

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LEGEND

- RIGHT OF WAY/PROPERTY BOUNDARY
- LIMIT OF CONSTRUCTION
- EASEMENT LINE
- NATURAL OPEN SPACE AREA (NAOS)
- CONTOUR - MAJOR
- CONTOUR - MINOR
- 100-YR STORM INUNDATION LIMITS
- DRAINAGE EASEMENT
- EXISTING WASH ALIGNMENT (TO BE RELOCATED)
- PROPOSED ACB'S (TO BE COORDINATED WITH MANUFACTURER)

NAOS

NAOS

DRAINAGE EASEMENT

BEGINNING OF GALLOWAY WASH RE-ALIGNMENT

Q_{100} = 2255 cfs

DRAINAGE EASEMENT

HOLE #1

EXIST. CART PATH TO REMAIN. PROTECT IN PLACE

STARTER SHACK (PER SEPARATE SUBMITTAL)

HOLE #18

APN: 219-11-938F

219-11-488

DESERT MOUNTAIN PHASE I, UNIT ONE M.C.R. 293-41

50' G.C.E. 293-41

219-11-467

APN: 219-11-938F

GOLF COURSE AREA
DRIVING RANGE TO BE MODIFIED TO ACCOMMODATE SITE IMPROVEMENTS

CONSTRUCTION NOTES

60 INSTALL WASH GRADE CONTROL STRUCTURE PER DETAIL 1 ON SHEET C0.19.
61 INSTALL WASH GRADE CONTROL STRUCTURE PER DETAIL 2 ON SHEET C0.19.
62 INSTALL ARMORFLEX, TYPE 50L. BURIED AT DEPTH OF 1.5' FROM FINISHED GRADE. REFER TO SHEETS C0.19, C0.20 AND C0.21 FOR DETAIL. INSTALLATION AS PER MANUFACTURE RECOMMENDATIONS.

0' 40' 80'

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DESERT MOUNTAIN
RENEGADE CLUBHOUSE

38580 N DESERT MOUNTAIN PARKWAY, SCOTTSDALE, AZ 85262
DEVELOPMENT REVIEW BOARD SUBMITTAL

Registered Professional Engineer (Civil)
CERTIFICATE NO.
36372
BYRON L. DIXON
12.03.2021
Date Signed
ARIZONA, U.S.A.

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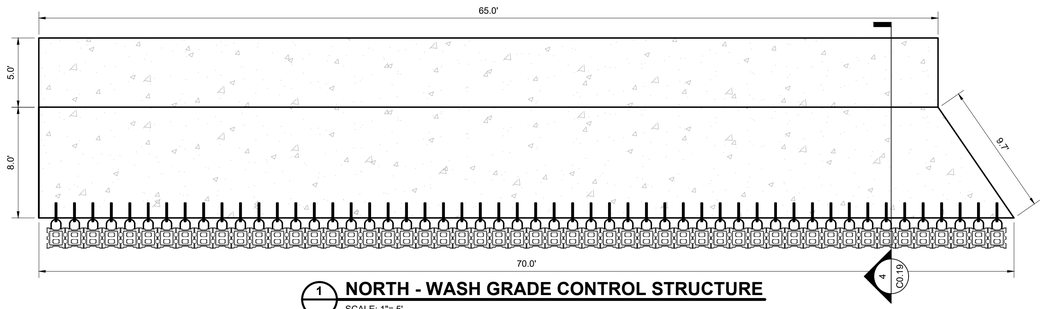
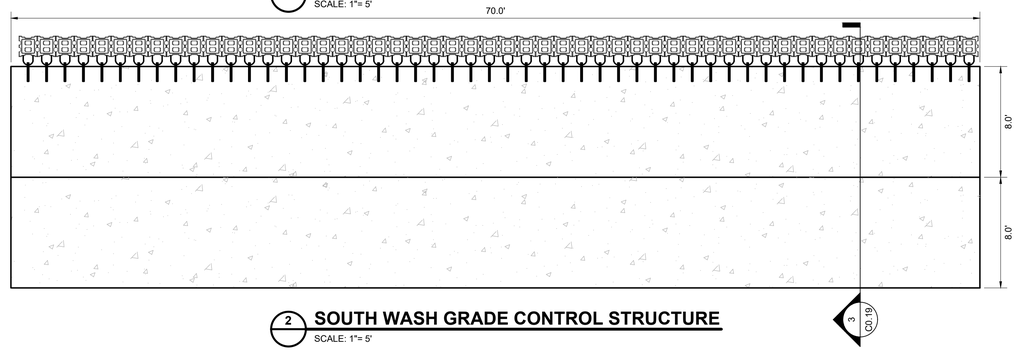
WASH IMPROVEMENTS PLAN

SHEET NUMBER:
C0.11



1 NORTH - WASH GRADE CONTROL STRUCTURE
SCALE: 1"= 5'



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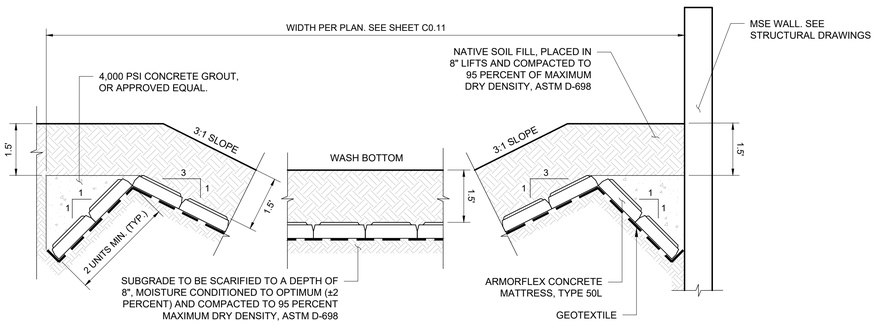
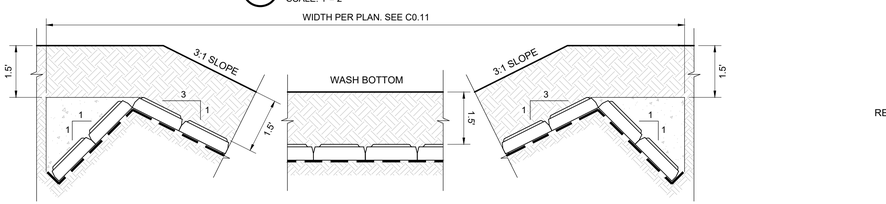
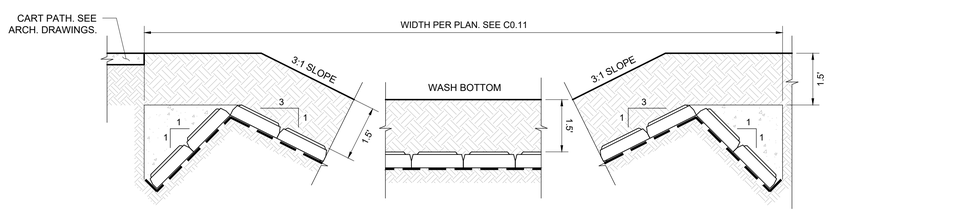


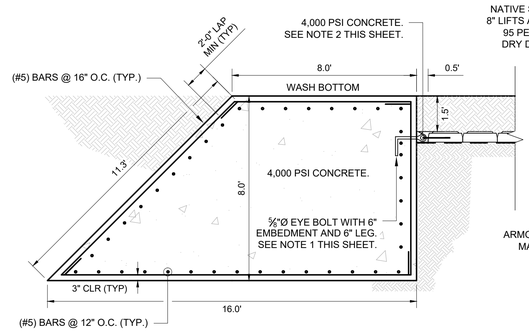
5 WASH CROSS-SECTION
SCALE: 1"= 2'



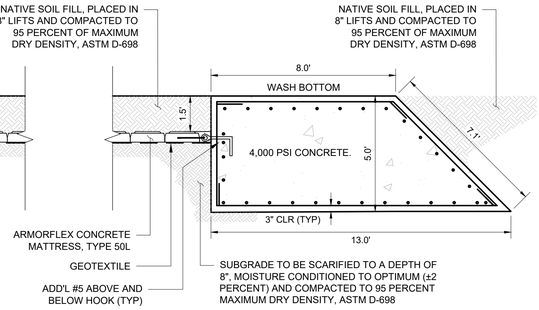
6 WASH CROSS-SECTION
SCALE: 1"= 2'



7 WASH CROSS-SECTION
SCALE: 1"= 2'



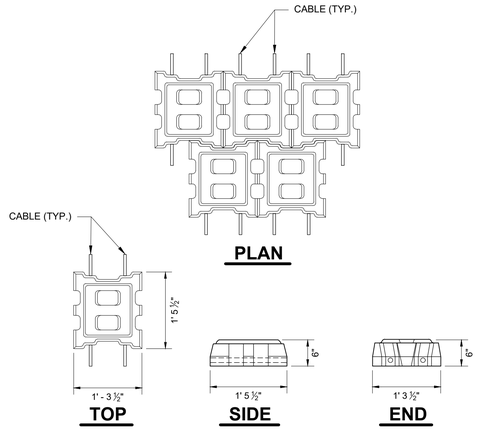
3 GRADE CONTROL SECTION
SCALE: 1"= 3'



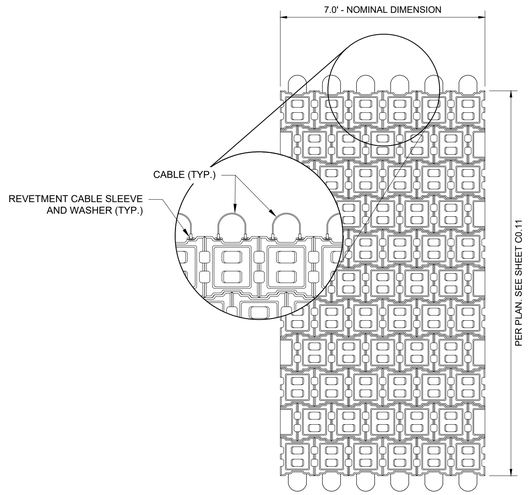
4 GRADE CONTROL SECTION
SCALE: 1"= 3'

GRADE CONTROL STRUCTURES NOTES:
1. WHERE ACB SYSTEMS INTERSECTS WITH THE GRADE CONTROL STRUCTURES, CAST ⅝"Ø GALVANIZED EYE BOLTS TO CONNECT ACB CABLES, NO MORE THAN 1' 3 ½" O.C.
2. BACKFILL THE AREA BETWEEN THE GRADE CONTROL STRUCTURE AND THE ACB BLOCK WITH 4,000 PSI CONCRETE. VIBRATE CONCRETE TO ENSURE A COMPLETE ENCASEMENT OF THE EYE BOLTS AND ACB CABLES.

MASS CONCRETE:
1. GENERAL:
   1.1. THE GRADE CONTROL STRUCTURE ARE CONSIDERED MASS CONCRETE AND ARE SUBJECT TO TEMPERATURE CONTROL MEASURES AS DESCRIBED BELOW.
2. CONCRETE MATERIAL:
   2.1. CONCRETE MATERIAL AS PER MAG SPECIFICATIONS.
3. TEMPERATURE CONTROL:
   3.1. FOLLOW HOT WEATHER REQUIREMENTS DESCRIBED IN ACI 305. THE REQUIREMENTS INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING.
      i. DEPOSITING OF CONCRETE SHALL NOT ALLOW LOST OF SLUMP TO THE POINT OF IMPROPER VIBRATION AND CONSOLIDATION, FLASH SET, OR UNINTENDED COLD JOINTS.
      ii. CONTROL TEMPERATURE OF STEEL REINFORCEMENT, EMBED, AND FORMWORK BELOW 120°F.
   3.2. PROVIDE TEMPERATURE CONTROL MEASURES TO ACHIEVE THE RECOMMENDATIONS FOUND IN ACI 301 FOR CONCRETE CORE TEMPERATURE. SUBMIT PLAN FOR CONCRETE MIX SUPPLIED, CONCRETE PLACEMENT, TEMPERATURE CONTROL AND MONITORING, AND CURING AND FORM REMOVAL FOR APPROVAL.
4. MOISTURE RETENTION:
   4.1. ON UNFORMED SURFACES, FOR CURING CONCRETE USE WATER-RETENTION SHEETING MATERIAL OR MEMBRANE-FORMING CURING COMPOUNDS. FOR FORMED SURFACES, KEEP FORMS IN PLACE UNTIL THE CONCRETE CORE TEMPERATURE AND THE AVERAGE AMBIENT AIR TEMPERATURE ARE WITHIN 35° OF EACH OTHER.



8 ARMORFLEX, TYPE 50L
SCALE: NTS



9 ARMORFLEX, TYPE 50L - TYPICAL MAT
SCALE: NTS

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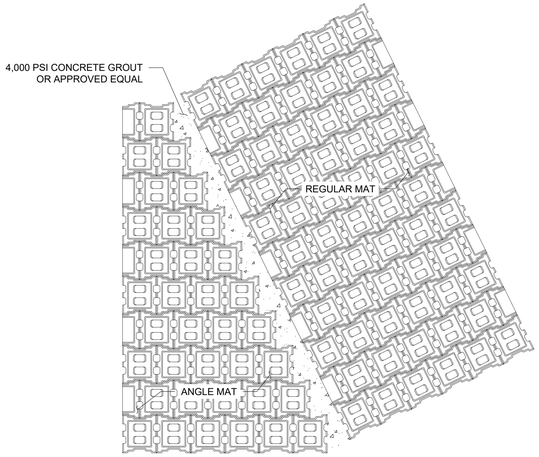
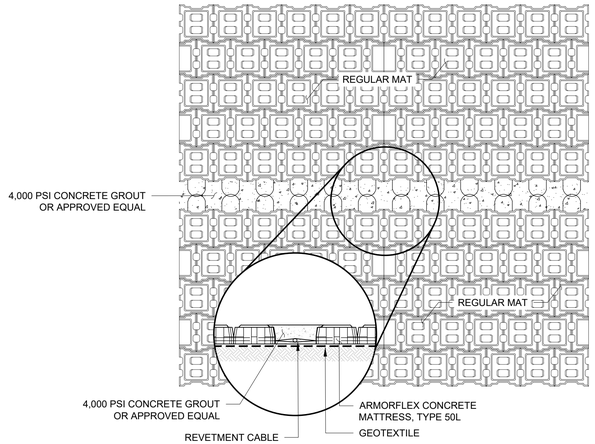


NOTE:
ANGLE MATS WILL BE CONSTRUCTED BY OMITTING THE REQUIRED UNITS TO MATCH PLAN LAYOUT CONFIGURATION. CONTRACTOR TO SUBMIT LAYOUT FOR APPROVAL PRIOR TO CONSTRUCTION.

1 ARMORFLEX, TYPE 50L - TYPICAL ANGLE MAT
SCALE: NTS



2 ARMORFLEX, TYPE 50L - TYPICAL MAT TO MAT
SCALE: NTS

ARTICULATED CONCRETE BLOCK (ACB) NOTES:

1. ACB INSTALLATION AND MATERIALS SHALL CONFORM TO SPECIFICATION SECTION: "ARTICULATED CONCRETE BLOCK SYSTEMS".
2. PRIMARY REQUIREMENTS ARE OF THE ACB UNITS, AS DETAILED IN THE SPECIFICATIONS, ARE AS FOLLOWS: INTERLOCKING, TAPERED, OPEN CELL, DRY CAST, AND CABLED (POLYESTER).
3. PREPARATION OF THE SUBGRADE IS CRITICAL TO THE SUCCESSFUL PERFORMANCE OF THE ACB SYSTEM, MATERIALS TESTING AND INSTALLATION REQUIREMENTS ARE DETAILED IN THE SPECIFICATIONS.
4. MANUFACTURER TO PROVIDED ON-SITE CONSULTING DURING CONSTRUCTION AS INDICATED IN THE SPECIFICATIONS.
5. CONTRACTOR TO SUBMIT MANUFACTURER' SPECIFICATIONS AND INSTALLATION PROCEDURES / RECOMMENDATIONS TO THE ENGINEER FOR APPROVAL.
6. MANUFACTURER TO CERTIFY THAT INSTALLATION WAS PERFORMED IN ACCORDANCE WITH MANUFACTURER'S PROCEDURES / RECOMMENDATIONS.
7. ALL SUBGRADE PREPARATION SHALL BE PERFORMED IN ACCORDANCE WITH ASTM D 6884, STANDARD PRACTICE FOR INSTALLATION OF ARTICULATING CONCRETE BLOCK (ACB) REVETMENT SYSTEMS, AS UPDATED AND AMENDED.

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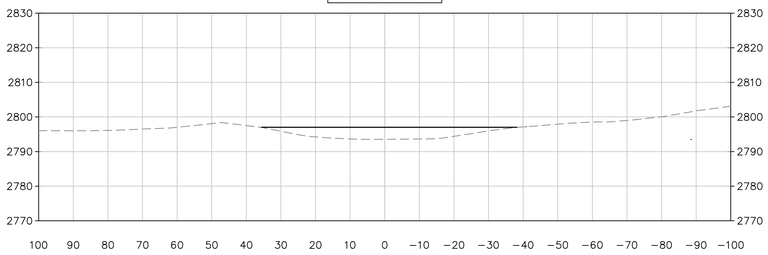
8+00.00



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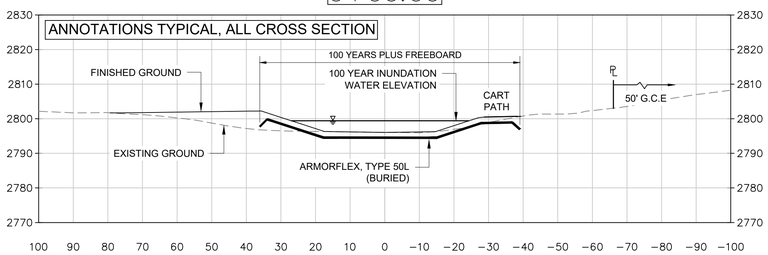

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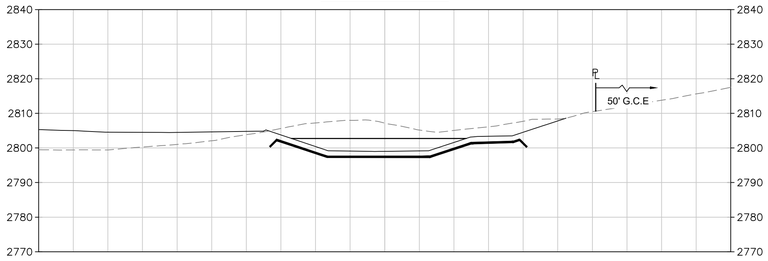

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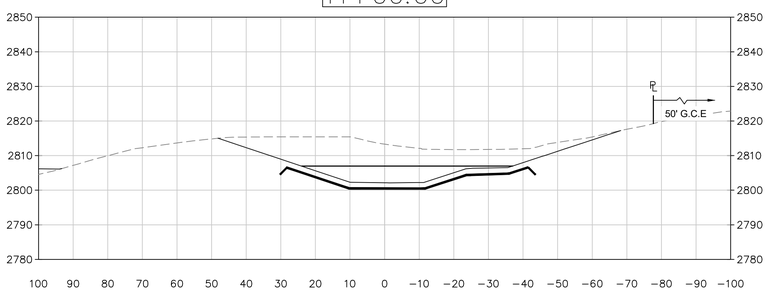

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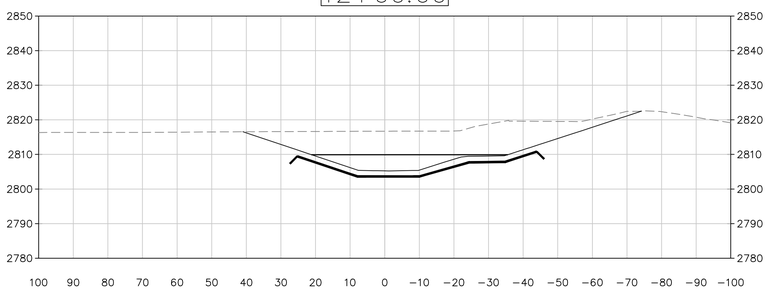

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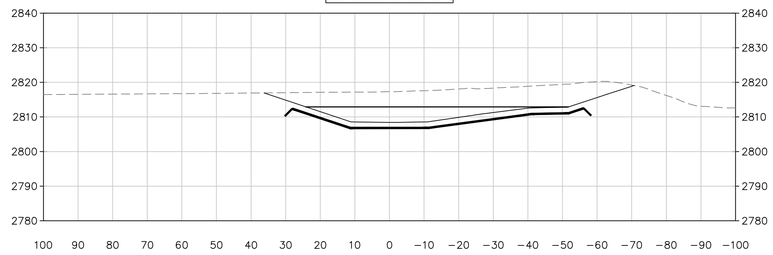

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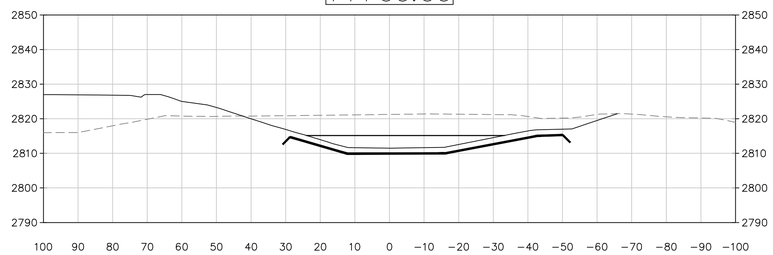

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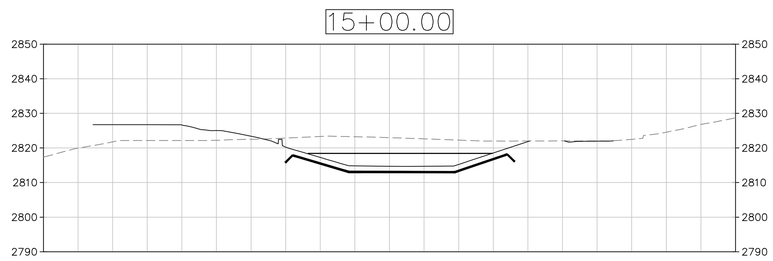

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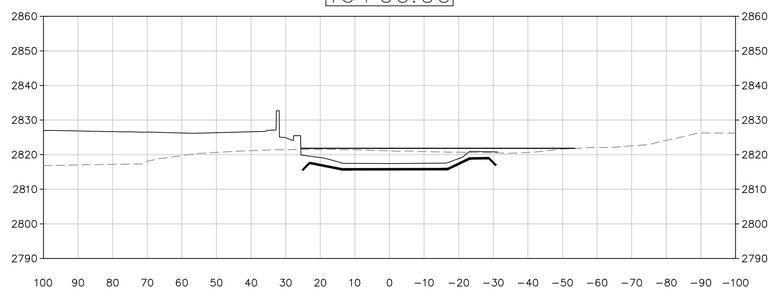

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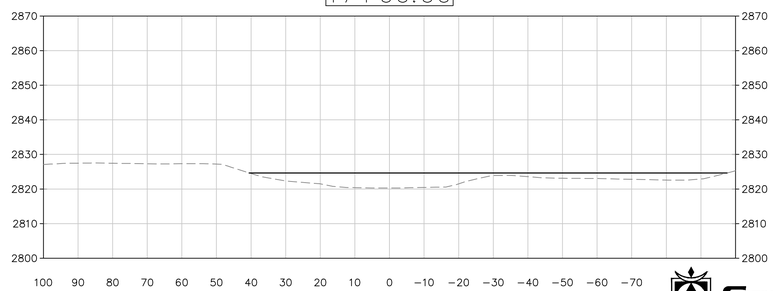

NOTES:
1. SECTIONS DESIGN VELOCITY OF 16.5 fps.
2. MAXIMUM PERMISSIBLE VELOCITY OF 19 fps FOR UNVEGETATED APPLICATIONS, GREATER PERMISSIBLE VELOCITIES FOR VEGETADED APPLICATIONS.

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GENERAL STRUCTURAL NOTES

1.01 GENERAL:
- A. THE STRUCTURAL DRAWINGS SHOW THE COMPLETED PROJECT. THEY DO NOT INCLUDE COMPONENTS THAT MAY BE NECESSARY FOR CONSTRUCTION SAFETY. THE CONTRACTOR IS RESPONSIBLE FOR SAFETY IN AND AROUND THE JOB SITE DURING CONSTRUCTION.
- B. GENERAL NOTES, SECTIONS AND TYPICAL DETAILS APPLY EVEN THOUGH NOT SPECIFICALLY REFERENCED ON STRUCTURAL DRAWINGS.

1.02 COORDINATION:
- A. VERIFY ALL SITE DIMENSIONS, ELEVATIONS, AND SLOPES WITH OTHER DISCIPLINE DRAWINGS.
- B. ENGINEERING DESIGN PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW SHALL BEAR THE SEAL AND SIGNATURE OF AN INSURED PROFESSIONAL STRUCTURAL OR CIVIL ENGINEER REGISTERED IN THE STATE IN WHICH THE SUBMITTED ITEMS WILL BE INSTALLED WHO IS A RECOGNIZED EXPERT IN THE TYPE OF WORK SHOWN AND SPECIFIED.
- C. ANY CHANGES PROPOSED BY THE CONTRACTOR TO THE DESIGN OF THE STRUCTURE DURING CONSTRUCTION SHALL BE SUBMITTED FOR REVIEW TO THE STRUCTURAL ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF STRUCTURAL AND NON-STRUCTURAL ELEMENTS AFFECTED BY PROPOSED CHANGES. THE COST OF DESIGN EFFORT NECESSITATED BY PROPOSED CHANGES SHALL BE BORNE BY THE CONTRACTOR.
- D. THE COST OF DESIGN EFFORT RESULTING FROM ERRORS OR OMISSIONS IN CONSTRUCTION SHALL BE BORNE BY THE CONTRACTOR.
- E. IN CASE OF CONFLICTS, THE MORE COSTLY REQUIREMENTS GOVERN. SUBMIT CLARIFICATION REQUEST PRIOR TO PROCEEDING WITH WORK.
- F. VERIFY NEW AND EXISTING DIMENSIONS AND CONDITIONS PRIOR TO STARTING WORK. NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR INCONSISTENCIES.

2.01 FIELD EXECUTION:
- A. STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL LOADS ON THE COMPLETED STRUCTURES. THE CONTRACTOR SHALL PROVIDE TEMPORARY BRACING, SHORING, GUYING AND OTHER MEANS TO AVOID EXCESSIVE STRESSES AND HOLD STRUCTURAL ELEMENTS IN PLACE DURING CONSTRUCTION.
- B. CONTRACTOR SHALL EXERCISE EXTREME CARE TO AVOID DAMAGE TO EXISTING STRUCTURES. CONTRACTOR IS RESPONSIBLE FOR ALL MEANS AND METHODS REQUIRED TO FACILITATE CONSTRUCTION OF THE WORK AND FOR ENSURING THE SAFETY, STABILITY AND INTEGRITY OF ADJACENT STRUCTURES AND FACILITIES.
- C. WHEN ANCHORING, SHOOTING, DRILLING, CHIPPING OR CORING INTO CONCRETE THE AREA SHALL BE SCANNED USING GROUND PENETRATING RADAR (GPR) PRIOR TO START OF WORK. DO NOT CUT OR NICK EXISTING REINFORCING.
- D. EDGE OF DRILL HOLES AND OPENINGS SHALL BE NO LESS THAN 4" FROM EXISTING REINFORCEMENT.

STRUCTURAL DESIGN PARAMETERS

1.01 GENERAL:
- A. CONSTRUCTION SHALL COMPLY WITH THE BUILDING CODE AND OTHER APPLICABLE CODES AND STANDARDS.
- B. BUILDING CODE: INTERNATIONAL BUILDING CODE (IBC 2018) AS ADOPTED AND AMENDED BY CITY OF SCOTTSDALE.

2.01 DESIGN CRITERIA:
- A. REFERENCE STANDARDS: MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE 7-16.
- B. DEAD LOADS
  1. MATERIAL WEIGHT OF STRUCTURE
- C. LIVE LOADS:
  1. FLOOR LIVE LOADS:
     - i. UNIFORM DISTRIBUTED LOAD = XX PSF
- D. WIND LOAD PARAMETERS:
  1. EXPOSURE CATEGORY = C
  1. BASIC WIND SPEED = 100 MPH
- E. SEISMIC LOAD PARAMETERS:
  1. STRUCTURAL RISK CATEGORY = II
  2. SITE CLASS C
  3. SEISMIC DESIGN CATEGORY = B
  4. S(DS) = 0.189g
  1. S(D1) = 0.081g
  2. S(1) = 0.071g
  3. S(s) = 0.237g
  8. I(e)= 1.0
  1. ANALYSIS PROCEDURE USED: STRUCTURAL WALLS AND THEIR ANCHORAGE

SUBMITTALS

1.01 GENERAL:
- A. THE STRUCTURAL ENGINEER WILL REVIEW SUBMITTALS FOR COMPLIANCE WITH THE GENERAL DESIGN INTENT OF THE STRUCTURE AND REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- B. IF A SUBMITTAL CONTAINS VARIATIONS FROM THE CONTRACT DRAWINGS, NOTIFY THE STRUCTUAL ENGINEER IN WRITING DESCRIBING THE EXTENT AND REASON FOR THE VARIATION, AND CLEARLY IDENTIFY ALL ITEMS INVOLVED.
- C. RE-SUBMITTED SHEETS SHALL CLEARLY IDENTIFY ADDED OR CORRECTED INFORMATION AND THE ITEMS INVOLVED BY CLOUDING AROUND ADDED OR CHANGED INFORMATION.
- D. BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW, THE CONTRACTOR SHALL REVIEW, APPROVE, AND SO STAMP EACH SUBMISSION FOR CONFORMANCE WITH MEANS, METHODS, TECHNIQUES, SEQUENCES, AND OPERATIONS OF CONSTRUCTION, AND WITH SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO, ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- E. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK SHOP DRAWINGS, AND COORDINATE SUBMITTAL INFORMATION AND CONTRACT INTERFACES PRIOR TO SUBMITTING FOR REVIEW.
- F. SUBMITTALS WILL BE RETURNED WITHOUT REVIEW IF CURSORY EXAMINATION REVEALS MAJOR ERRORS WHICH SHOULD HAVE BEEN FOUND BY THE CONTRACTOR'S CHECKING. MATERIAL NOT CALLED FOR OR WHICH HAS NOT BEEN APPROVED BY THE CONTRACTOR AND BEAR THEIR STAMP WILL BE RETURNED WITHOUT REVIEW.
- G. WORK DONE PRIOR TO OR WITHOUT SUBMITTAL REVIEW AND APPROVAL BY THE ENGINEER IS PERFORMED AT THE CONTRACTOR'S OWN RISK AND RESPONSIBILITY.
- H. DIMENSION CHECKING AND CHECKING OF DESIGN CHANGES PROPOSED BY THE CONTRACTOR WITHOUT PRIOR CONSULTATION WITH THE ENGINEER SHALL BE CHECKED ONLY IF THE CONTRACTOR WISHES THEM TO BE CHECKED AT THEIR OWN COST.
- I. ENGINEERING SUBMITTED FOR REVIEW SHALL BE APPROPRIATELY SEALED. FULL RESPONSIBILITY FOR SUCH ENGINEERING RESTS WITH THE PERSON SEALING THE DESIGN.

DEFERRED SUBMITTALS

1.01 GENERAL:
- A. DEFERRED SUBMITTALS ARE THOSE PORTIONS OF THE DESIGN THAT ARE NOT SUBMITTED AT THE TIME OF PERMIT APPLICATION BUT WILL BE SUBMITTED TO THE BUILDING OFFICIAL WITHIN A SPECIFIC TIME. DEFERRAL OF ANY SUBMITTAL ITEMS IS SUBJECT TO APPROVAL BY THE BUILDING OFFICIAL.
- B. THE CONTRACTOR SHALL INCLUDE IN THEIR COST ALL TIME AND EFFORT REQUIRED TO OBTAIN A BUILDING DEPARTMENT REVIEW AND SHALL ALSO INCLUDE ALL TIME AND EFFORT TO SECURE CALCULATIONS AND DRAWINGS APPROPRIATELY SEALED BY AN ENGINEER FOR DEFERRED ITEMS REQUIRING DESIGN.
- C. DOCUMENTS FOR DEFERRED SUBMITTALS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW PRIOR TO BEING FORWARDED TO THE BUILDING OFFICIAL. THE ENGINEER WILL REVIEW THE SUBMITTAL DOCUMENTS FOR GENERAL CONFORMANCE WITH THE DESIGN INTENT FOR THE STRUCTURE.
- D. SUBMITTALS OF ENGINEERING DESIGN PROVIDED BY OTHERS SHALL HAVE DRAWINGS AND CALCULATIONS APPROPRIATELY SIGNED AND SEALED BY A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE STATE IN WHICH THE SUBMITTED ITEMS WILL BE INSTALLED
- E. STRUCTURAL COMPONENTS SHALL BE DESIGNED AND MANUFACTURED BY A FABRICATOR APPROVED BY THE GOVERNING BODY HAVING JURISDICTION.
- F. SUBMITTALS SHALL INCLUDE KEY PLANS, SECTIONS, AND DETAILS NECESSARY FOR CONSTRUCTION.
- G. THE FOLLOWING ITEMS ARE DEFERRED SUBMITTAL ITEMS.
  1. MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL

2.01 FIELD EXECUTION:
- A. FIELD INSTALLATION OF DEFERRED STRUCTURAL ITEMS IS SUBJECT TO SPECIAL STRUCTURAL INSPECTION.
- B. SHOP FABRICATION OF DEFERRED STRUCTURAL ITEMS MAY ALSO BE SUBJECT TO SPECIAL STRUCTURAL INSPECTION, UNLESS NOTED OTHERWISE.

FOUNDATIONS

1.01 GENERAL:
- A. PERFORM WORK IN ACCORDANCE WITH THE GEOTECHNICAL REPORT BY SPEEDIE AND ASSOCIATES, DATED FEBRUARY 7, 2020.
- B. FOUNDATION DESIGN IS BASED ON THE FOLLOWING SOIL PROPERTIES.
  1. SOIL CLASSIFICATION = CLASS C
  2. VERTICAL (GRAVITY) NET BEARING PRESSURE = 2500 PSF AT 2 FT BELOW NATURAL GRADE
  3. LATERAL AT-REST PRESSURES = 60 PSF/FT
  4. LATERAL ACTIVE PRESSURES = 35 PSF/FT
  5. LATERAL PASSIVE PRESSURES = 300 PSF/FT
  6. BASE FRICTION COEFFICIENT = 0.35
- C. UNLESS OTHERWISE SHOWN, ON ALL STRUCTURAL DRAWINGS THE FINISH GRADE AROUND STRUCTURES IS SHOWN THUS, INDICATING GROUND OR PAVEMENT. FOR DETAILS OF FINISH SURFACES, SEE CIVIL DRAWINGS.
- D. CONTRACTOR SHALL SUBMIT SHORING SHOP DRAWINGS AND CALCULATIONS TO THE ENGINEER FOR REVIEW, FOR SHORING REQUIRED TO PROTECT EXISTING STRUCTURES. SHOP DRAWINGS AND CALCULATIONS SHALL BEAR THE SEAL OF A GEOTECHNICAL ENGINEER REGISTERED IN THE STATE IN WHICH CONSTRUCTION WILL BE DONE.

3.01 PLACEMENT:
- A. PLACE FOUNDATION CONCRETE ONLY ON CLEAN, FIRM BEARING MATERIAL AT LEAST 2'-0" BELOW THE LOWEST ADJACENT FINISH OR NATURAL GRADE, WHICHEVER IS LOWER. VERIFY THE SUITABILITY OF THE BEARING MATERIAL WITH THE GEOTECHNICAL ENGINEER BEFORE PLACING FOUNDATIONS.
- B. PLACE DOWELS AND ANCHORS BEFORE PLACING CONCRETE. USE TEMPLATES TO ENSURE PROPER PLACEMENT.
- C. CENTER FOUNDATIONS UNDER COLUMNS AND WALLS UNLESS NOTED OTHERWISE. GROUT ALL COLUMN BASE PLATES BEFORE INSTALLING FRAMING ABOVE.

3.02 BACKFILL REQUIREMENTS
- A. BACKFILL MAY BE PLACED AGAINST A WALL WITHOUT THE TOP SLAB IN PLACE UP TO THE ELEVATION SPECIFICALLY NOTED ON THE DRAWINGS BUT ONLY AFTER THE WALL CONCRETE HAS REACHED 4000 PSI STRENGTH. IF ELEVATION/DEPTH IS NOT NOTED ON THE DRAWINGS, CONTACT THE STRUCTURAL ENGINEER.
- B. REMAINDER OF BACKFILL (ABOVE THE ELEVATION NOTED) MAY BE PLACED AGAINST THE WALL ONLY AFTER THE TOP SLAB IS IN PLACE AND THE CONCRETE IN THE TOP SLAB HAS REACHED THE STRENGTH EQUAL TO 75% OF THE SPECIFIED STRENGTH OR 3000 PSI, WHICHEVER IS LESS.
- C. HEAVY EQUIPMENT IS PROHIBITED WITHIN A DISTANCE EQUAL TO THE DEPTH OF BACKFILL PLACED, OR 10'-0", WHICHEVER IS LESS.
- D. COMPACTION EQUIPMENT ALLOWED WITHIN DEPTH OF BACKFILL OR 10'-0", WHICHEVER IS LESS, IS LIMITED TO JUMPING JACKS AND/OR WALK-BEHIND COMPACTORS. A BOBCAT MAY BE USED TO PLACE AND LEVEL BACKFILL.
- E. DEGREE OF COMPACTION (AS PERCENTAGE PROCTOR DENSITY) SHALL BE TESTED AS REQUIRED BY THE GEOTECHNICAL ENGINEER.
- F. FOR WALLS HAVING FILL ON EACH SIDE, PROCEED WITH BACKFILLING OPERATIONS IN UNIFORM LIFTS. DIFFERENTIAL ELEVATION OF TOP OF LIFTS SHALL NOT EXCEED 24 INCHES.

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DESERT MOUNTAIN
RENEGADE CLUBHOUSE

38580 N DESERT MOUNTAIN PARKWAY, SCOTTSDALE, AZ 85262
DEVELOPMENT REVIEW BOARD SUBMITTAL

Registered Professional Engineer (Civil)
CERTIFICATE NO.
36372
BYRON L. DIXON
12.03.2021
Date Signed
ARIZONA, U.S.A.

15-DR-2021_V3

DRAWN BY:	TK
CHECKED BY:	GP
PROJECT NO.:	2019001.20
ISSUE DATE:	12/03/2021
REVISIONS:	

SHEET TITLE:
GENERAL STRUCTURAL NOTES

SHEET NUMBER:
S0.01

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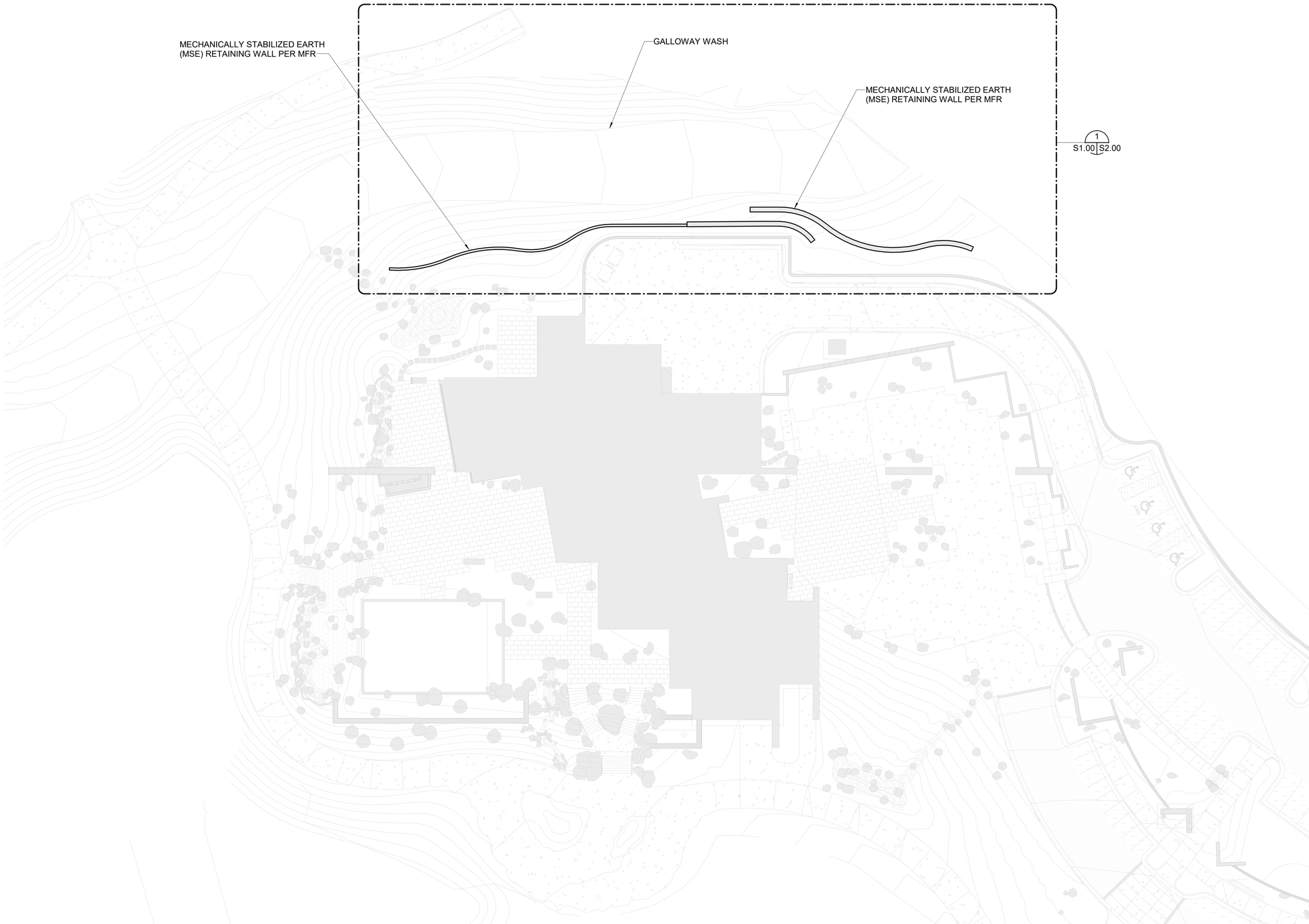

1 S1.00 **OVERALL SITE PLAN**
SCALE: 1" = 20'-0"

0' 20' 40'

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DEVELOPMENT REVIEW BOARD SUBMITTAL

Registered Professional Engineer CERTIFICATE NO. 36372 BYRON L. DIXON Date Signed 12.03.2021 ARIZONA, U.S.A.

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CHECKED BY:	GP
PROJECT NO.:	2019001.20
ISSUE DATE:	12/03/2021
REVISIONS:	

SHEET TITLE:

OVERALL SITE PLAN

SHEET NUMBER:

S1.00

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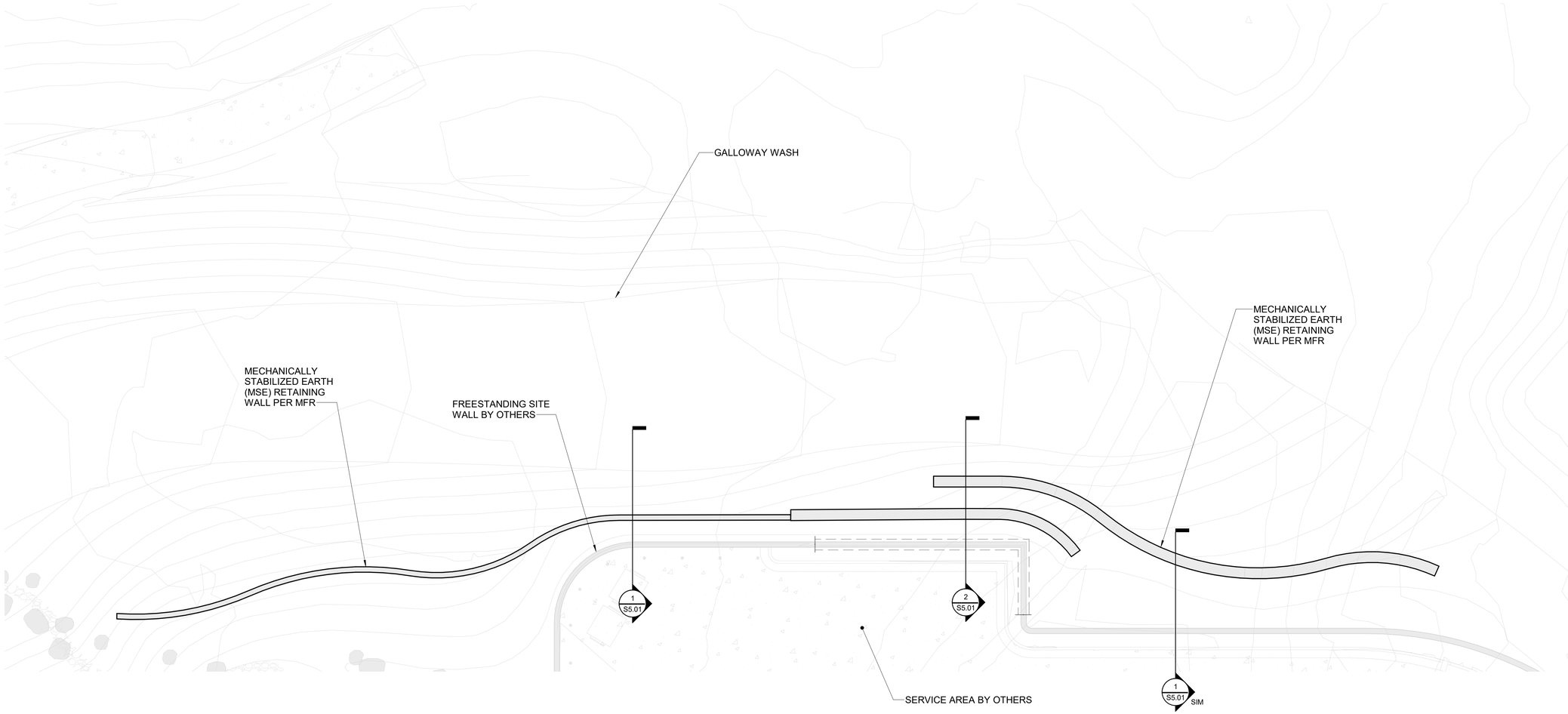

1 S2.00 **ENLARGED STRUCTURAL PLAN**
SCALE: 1" = 10'-0"

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BYRON L. DIXON
12.03.2021
Date Signed
ARIZONA, U.S.A.

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SHEET TITLE:
ENLARGED STRUCTURAL PLAN

SHEET NUMBER:
S2.00

0' 10' 20'

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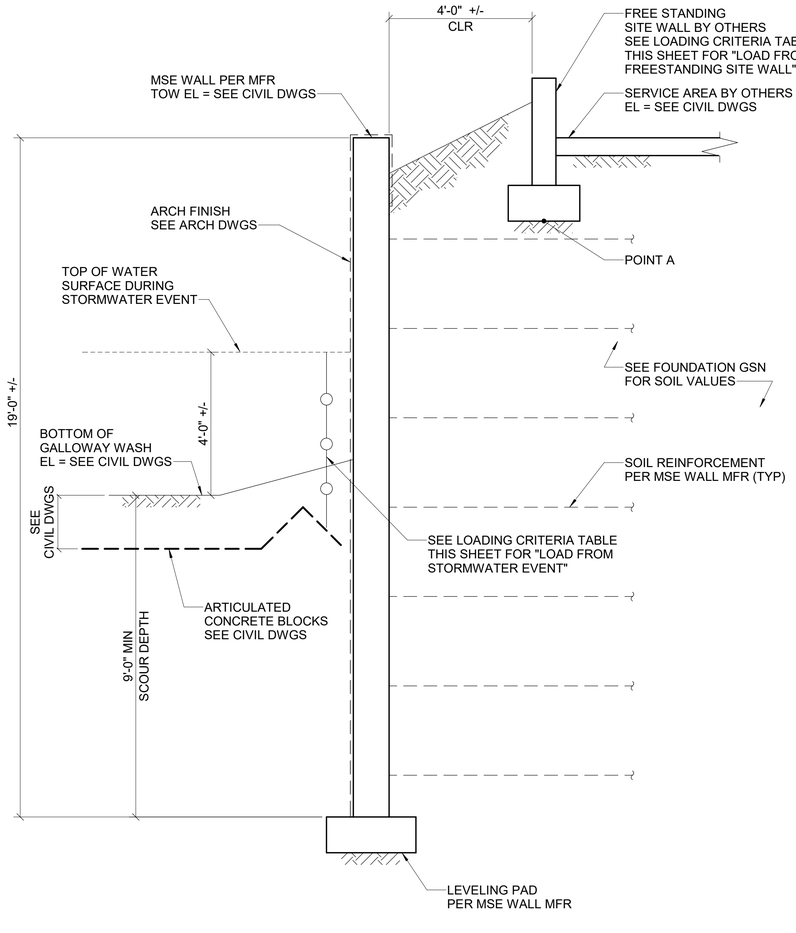
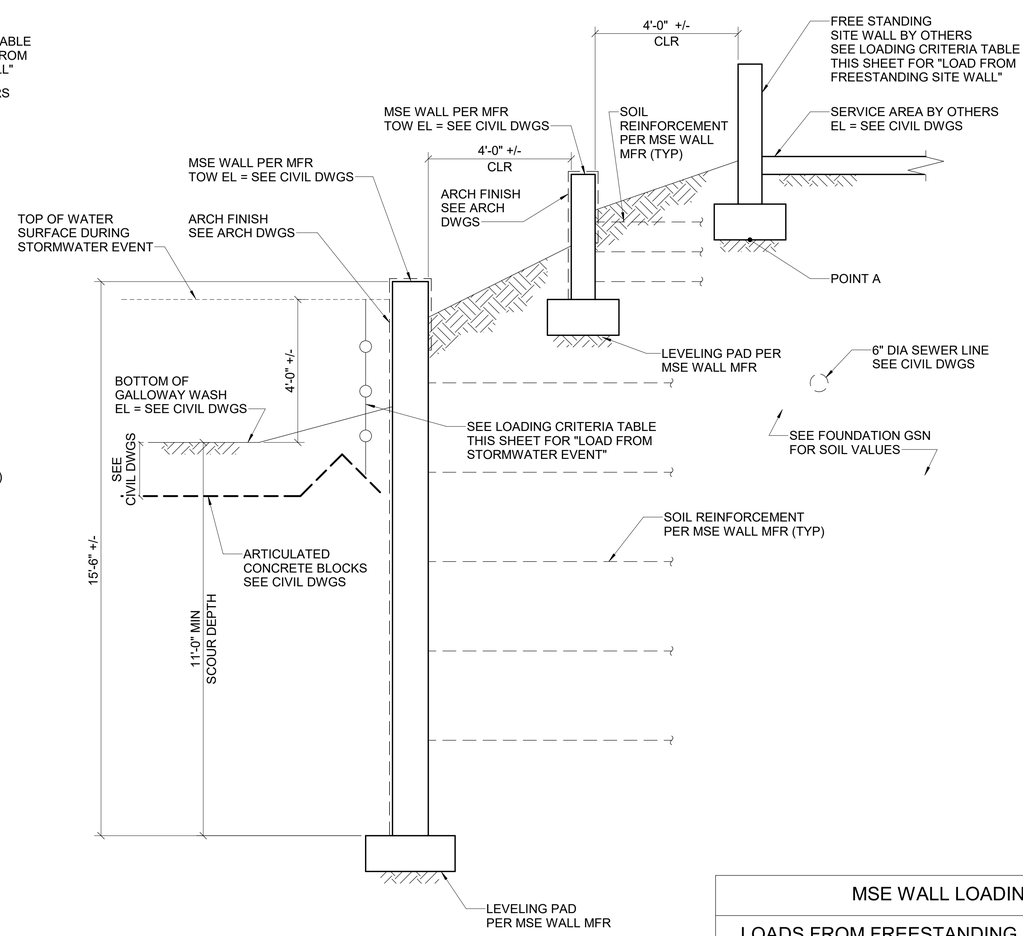


1 S2.00 **MSE WALL SECTION**
SCALE: 1/2" = 1'-0"



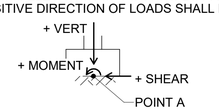
2 S2.00 **MSE WALL SECTION**
SCALE: 1/2" = 1'-0"

MSE WALL GENERAL NOTES

1. MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS ARE TO BE DESIGNED BY THE MSE WALL MANUFACTURER & CONSTRUCTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS & PROJECT SPECIFICATIONS.
2. THE MSE WALL MANUFACTURER IS RESPONSIBLE FOR DESIGNING THE MSE WALLS TO ACCOMODATE OBSTRUCTIONS LOCATED WITHIN THE REINFORCED BACKFILL ZONE. THESE OBSTRUCTIONS INCLUDE WALL FOUNDATION, SEWER LINE, & OTHER ITEMS AS SHOWN ON THE PROJECT PLANS.
3. SEE THIS SHEET AND CIVIL DRAWINGS FOR TOP OF LEVELING PAD ELEVATIONS. THE LEVELING PAD SIZE SHALL BE DETERMINED BY THE MSE WALL MANUFACTURER'S REQUIREMENTS (6" DEEP X 12" WIDE MINIMUM).

MSE WALL LOADING CRITERIA			
LOADS FROM FREESTANDING SITE WALL AT POINT A *			
SERVICE LOAD / LOAD TYPE	DEAD LOAD (PLF)	WIND LOAD (PLF)	VEHICLE LOAD (PLF)
VERTICAL LOAD	TBD	TBD	TBD
SHEAR LOAD	TBD	TBD	TBD
MOMENT	TBD	TBD	TBD
LOADS FROM STORMWATER EVENT **			
SERVICE LOAD / LOAD TYPE	HYDRAULIC LOAD (PLF)		
SHEAR LOAD			

NOTE:
1. POINT A IS INTERSECTION OF CENTERLINE OF FREESTANDING WALL AND FOOTING BOTTOM. ELEVATION OF FOOTING BOTTOM SHALL BE SUPPLIED BY WALL ENGINEER.
2. * POSITIVE DIRECTION OF LOADS SHALL BE AS SHOWN BELOW.



3. ** POSITIVE DIRECTION OF LOAD SHALL BE TANGENTIAL TO FACE OF MSE WALL AND SHALL BE POINTED DOWNSTREAM.

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DEVELOPMENT REVIEW BOARD SUBMITTAL

Registered Professional Engineer CERTIFICATE NO. 36372 BYRON L. DIXON Date Signed 12.03.2021 ARIZONA, U.S.A.

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SECTIONS AND DETAILS

SHEET NUMBER:
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Central File: BIM360_S_central_R20.rvt
Project Number: 065933
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Appendix E On-Site Hydrology

NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.8366°, Longitude: -111.8679°
Elevation: 2819.97 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.252** (0.210-0.308)	**0.328** (0.274-0.401)	**0.442** (0.365-0.537)	**0.527** (0.434-0.639)	**0.641** (0.521-0.774)	**0.727** (0.584-0.873)	**0.814** (0.644-0.975)	**0.902** (0.705-1.08)	**1.02** (0.779-1.22)	**1.11** (0.834-1.34)
10-min	**0.383** (0.319-0.468)	**0.499** (0.417-0.610)	**0.672** (0.556-0.818)	**0.802** (0.661-0.973)	**0.976** (0.793-1.18)	**1.11** (0.889-1.33)	**1.24** (0.981-1.48)	**1.37** (1.07-1.64)	**1.55** (1.19-1.86)	**1.69** (1.27-2.04)
15-min	**0.475** (0.396-0.580)	**0.619** (0.517-0.756)	**0.833** (0.689-1.01)	**0.995** (0.819-1.21)	**1.21** (0.983-1.46)	**1.37** (1.10-1.65)	**1.54** (1.22-1.84)	**1.70** (1.33-2.04)	**1.92** (1.47-2.31)	**2.10** (1.57-2.53)
30-min	**0.640** (0.534-0.781)	**0.833** (0.696-1.02)	**1.12** (0.928-1.37)	**1.34** (1.10-1.62)	**1.63** (1.32-1.97)	**1.85** (1.48-2.22)	**2.07** (1.64-2.48)	**2.29** (1.79-2.75)	**2.59** (1.98-3.11)	**2.83** (2.12-3.41)
60-min	**0.792** (0.660-0.967)	**1.03** (0.862-1.26)	**1.39** (1.15-1.69)	**1.66** (1.37-2.01)	**2.02** (1.64-2.43)	**2.29** (1.84-2.75)	**2.56** (2.03-3.07)	**2.84** (2.22-3.40)	**3.21** (2.45-3.85)	**3.50** (2.62-4.22)
2-hr	**0.922** (0.781-1.10)	**1.19** (1.01-1.43)	**1.57** (1.33-1.88)	**1.87** (1.56-2.24)	**2.28** (1.88-2.71)	**2.58** (2.11-3.06)	**2.90** (2.34-3.43)	**3.22** (2.55-3.80)	**3.65** (2.84-4.31)	**3.98** (3.04-4.74)
3-hr	**0.990** (0.839-1.19)	**1.26** (1.08-1.53)	**1.64** (1.39-1.99)	**1.95** (1.63-2.34)	**2.37** (1.96-2.83)	**2.70** (2.21-3.22)	**3.05** (2.45-3.62)	**3.41** (2.70-4.05)	**3.90** (3.02-4.64)	**4.31** (3.25-5.13)
6-hr	**1.17** (1.02-1.37)	**1.47** (1.29-1.73)	**1.87** (1.62-2.18)	**2.18** (1.87-2.54)	**2.62** (2.22-3.03)	**2.96** (2.47-3.41)	**3.31** (2.73-3.82)	**3.67** (2.98-4.24)	**4.15** (3.29-4.80)	**4.53** (3.51-5.24)
12-hr	**1.42** (1.24-1.64)	**1.78** (1.56-2.07)	**2.23** (1.94-2.58)	**2.59** (2.24-2.99)	**3.08** (2.63-3.55)	**3.45** (2.92-3.97)	**3.84** (3.21-4.41)	**4.23** (3.49-4.86)	**4.74** (3.83-5.47)	**5.13** (4.08-5.96)
24-hr	**1.63** (1.45-1.86)	**2.07** (1.84-2.36)	**2.72** (2.40-3.09)	**3.24** (2.85-3.69)	**4.00** (3.47-4.56)	**4.62** (3.95-5.29)	**5.29** (4.44-6.13)	**6.00** (4.93-7.03)	**7.02** (5.61-8.38)	**7.86** (6.13-9.53)
2-day	**1.91** (1.68-2.19)	**2.44** (2.14-2.80)	**3.22** (2.81-3.68)	**3.86** (3.35-4.40)	**4.76** (4.09-5.45)	**5.50** (4.66-6.34)	**6.29** (5.25-7.32)	**7.13** (5.85-8.41)	**8.32** (6.63-9.98)	**9.28** (7.24-11.3)
3-day	**2.02** (1.78-2.32)	**2.59** (2.28-2.97)	**3.45** (3.02-3.93)	**4.15** (3.62-4.72)	**5.17** (4.45-5.90)	**6.01** (5.10-6.92)	**6.92** (5.78-8.06)	**7.90** (6.47-9.33)	**9.32** (7.41-11.2)	**10.5** (8.15-12.8)
4-day	**2.13** (1.88-2.45)	**2.74** (2.41-3.14)	**3.67** (3.22-4.18)	**4.44** (3.88-5.04)	**5.58** (4.80-6.36)	**6.52** (5.54-7.50)	**7.55** (6.31-8.80)	**8.67** (7.10-10.3)	**10.3** (8.20-12.4)	**11.7** (9.06-14.4)
7-day	**2.48** (2.17-2.86)	**3.17** (2.77-3.64)	**4.25** (3.71-4.87)	**5.16** (4.47-5.90)	**6.50** (5.56-7.45)	**7.62** (6.43-8.82)	**8.86** (7.35-10.4)	**10.2** (8.32-12.2)	**12.2** (9.65-14.9)	**13.9** (10.7-17.3)
10-day	**2.73** (2.40-3.12)	**3.49** (3.07-4.00)	**4.66** (4.08-5.33)	**5.64** (4.90-6.42)	**7.08** (6.07-8.10)	**8.28** (7.01-9.56)	**9.60** (7.99-11.2)	**11.0** (9.02-13.1)	**13.1** (10.4-15.9)	**14.9** (11.5-18.4)
20-day	**3.52** (3.10-4.03)	**4.53** (3.99-5.17)	**6.00** (5.26-6.83)	**7.18** (6.25-8.16)	**8.84** (7.63-10.1)	**10.2** (8.68-11.7)	**11.6** (9.78-13.5)	**13.1** (10.9-15.5)	**15.3** (12.3-18.4)	**17.0** (13.5-20.8)
30-day	**4.21** (3.70-4.81)	**5.42** (4.77-6.17)	**7.18** (6.29-8.14)	**8.56** (7.47-9.69)	**10.5** (9.07-11.9)	**12.0** (10.3-13.7)	**13.6** (11.5-15.6)	**15.2** (12.7-17.7)	**17.5** (14.3-20.9)	**19.4** (15.5-23.4)
45-day	**5.03** (4.44-5.71)	**6.48** (5.72-7.36)	**8.57** (7.55-9.70)	**10.2** (8.95-11.6)	**12.5** (10.8-14.2)	**14.2** (12.3-16.3)	**16.1** (13.7-18.6)	**18.1** (15.1-21.1)	**20.8** (17.0-24.8)	**23.0** (18.5-27.8)
60-day	**5.64** (4.99-6.39)	**7.27** (6.43-8.22)	**9.57** (8.45-10.8)	**11.3** (9.96-12.8)	**13.7** (12.0-15.6)	**15.6** (13.5-17.8)	**17.5** (14.9-20.1)	**19.5** (16.4-22.7)	**22.2** (18.4-26.4)	**24.4** (19.8-29.5)

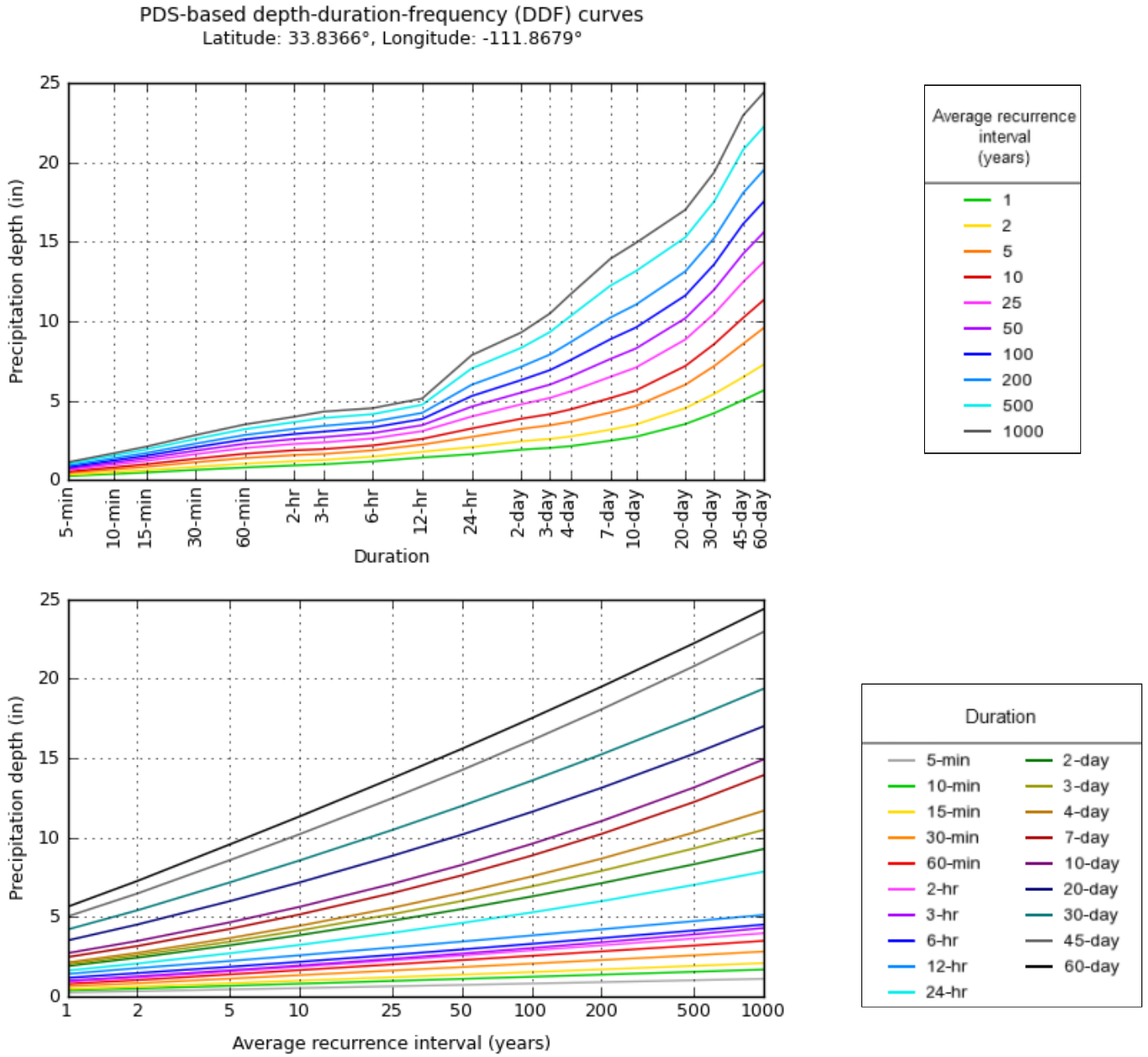
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



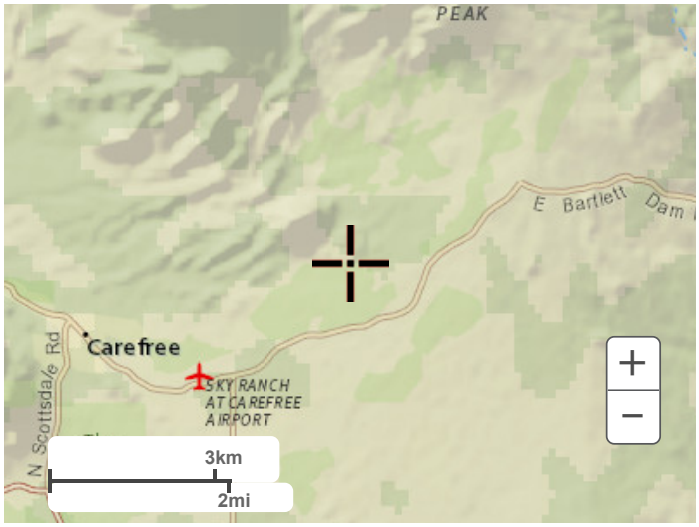
NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Mon Feb 15 14:57:19 2021

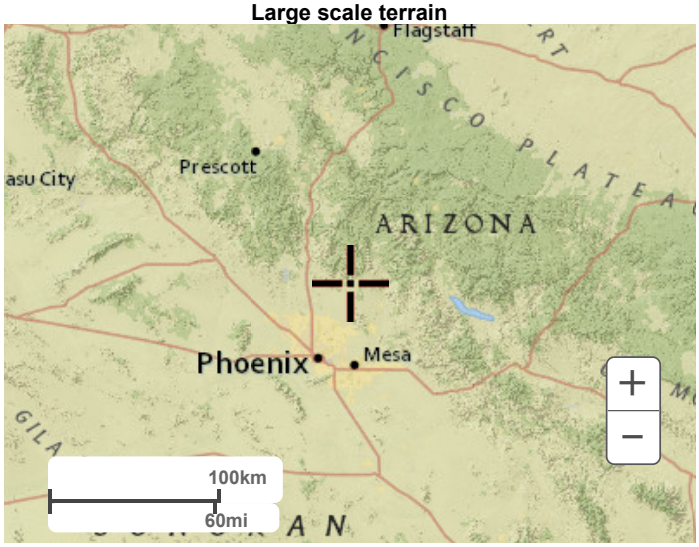
Back to Top

Maps & aerials

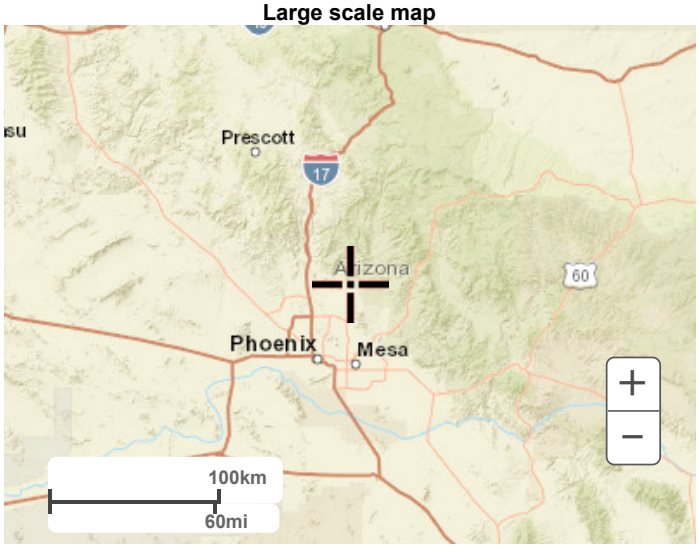
Small scale terrain



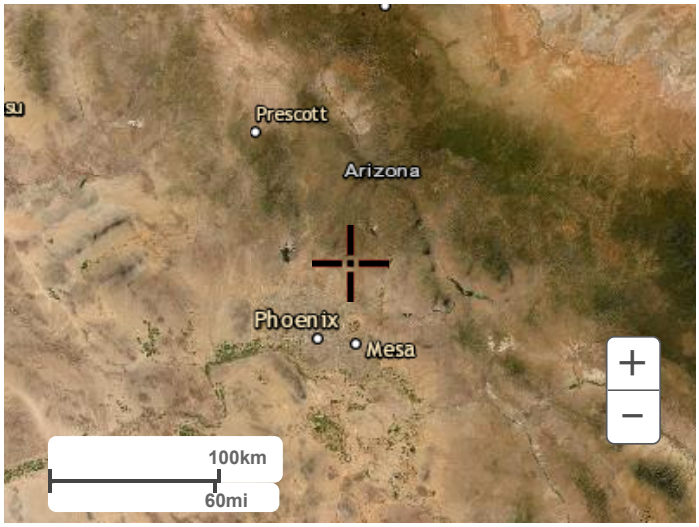
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: RCLUBHOUSE PRE

ID	Sub Basin Data							Sub Basin Hydrology Summary					
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Major Basin ID: 01													
DA-1	7.3	1,110	2,852.00	2,818.00	161.7	0.035	Q (cfs)	7.1	9.6	11.4	13.9	18.4	24.0
							C	0.37	0.37	0.37	0.37	0.43	0.50
							CA (ac)	2.69	2.69	2.69	2.69	3.13	3.64
							Volume (ac-ft)	0.1306	0.1765	0.2096	0.2556	0.3383	0.4413
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-2	2.0	625	2,839.00	2,818.00	177.4	0.038	Q (cfs)	3.0	4.0	4.8	5.8	7.5	9.4
							C	0.57	0.57	0.57	0.57	0.65	0.72
							CA (ac)	1.12	1.12	1.12	1.12	1.28	1.42
							Volume (ac-ft)	0.0552	0.0736	0.0883	0.1067	0.1379	0.1729
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-3A	4.4	946	2,870.00	2,827.00	240.0	0.036	Q (cfs)	8.2	11.0	13.2	16.1	20.3	24.5
							C	0.70	0.70	0.70	0.70	0.78	0.84
							CA (ac)	3.10	3.10	3.10	3.10	3.46	3.72
							Volume (ac-ft)	0.1508	0.2023	0.2427	0.2961	0.3733	0.4505
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-3B	1.4	527	2,830.00	2,810.00	200.4	0.039	Q (cfs)	2.9	4.0	4.7	5.7	6.9	8.1
							C	0.82	0.82	0.82	0.82	0.87	0.91
							CA (ac)	1.11	1.11	1.11	1.11	1.17	1.23
							Volume (ac-ft)	0.0533	0.0736	0.0864	0.1048	0.1269	0.1489
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-4	4.5	580	2,841.00	2,806.00	318.6	0.036	Q (cfs)	9.1	12.2	14.6	17.8	21.8	26.6
							C	0.76	0.76	0.76	0.76	0.82	0.89

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: RCLUBHOUSE PRE

ID	Sub Basin Data							Sub Basin Hydrology Summary					
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Major Basin ID: 01													
							CA (ac)	3.44	3.44	3.44	3.44	3.71	4.03
							Volume (ac-ft)	0.1673	0.2243	0.2685	0.3273	0.4009	0.4891
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-5	4.5	660	2,838.00	2,810.00	224.0	0.036	Q (cfs)	6.2	8.4	10.0	12.2	15.8	19.8
							C	0.52	0.52	0.52	0.52	0.59	0.66
							CA (ac)	2.36	2.36	2.36	2.36	2.68	3.00
							Volume (ac-ft)	0.1140	0.1545	0.1839	0.2243	0.2905	0.3641
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-6	10.2	1,157	2,823.00	2,784.00	178.0	0.034	Q (cfs)	5.9	8.0	9.5	11.6	16.2	22.2
							C	0.22	0.22	0.22	0.22	0.27	0.33
							CA (ac)	2.24	2.24	2.24	2.24	2.75	3.37
							Volume (ac-ft)	0.1085	0.1471	0.1747	0.2133	0.2979	0.4082
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-7	2.0	730	2,812.00	2,775.00	267.6	0.038	Q (cfs)	3.6	4.8	5.7	7.0	8.8	10.6
							C	0.66	0.66	0.66	0.66	0.73	0.79
							CA (ac)	1.35	1.35	1.35	1.35	1.49	1.61
							Volume (ac-ft)	0.0662	0.0883	0.1048	0.1287	0.1618	0.1949
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: RCLUBHOUSE PRE

Sub Basin	Land Use Code	Area (acres)	Area (%)	Kb	Runoff Coefficient C						Description
					2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	
Major Basin ID: 01											
DA-1	720	7.27	100.0	0.035	0.37*	0.37*	0.37*	0.37*	0.43*	0.50*	
		7.270	**100.0**								
DA-2	720	1.97	100.0	0.038	0.57*	0.57*	0.57*	0.57*	0.65*	0.72*	
		1.970	**100.0**								
DA-3A	720	4.43	100.0	0.036	0.70*	0.70*	0.70*	0.70*	0.78*	0.84*	
		4.430	**100.0**								
DA-3B	720	1.35	100.0	0.039	0.82*	0.82*	0.82*	0.82*	0.87*	0.91*	
		1.350	**100.0**								
DA-4	720	4.53	100.0	0.036	0.76*	0.76*	0.76*	0.76*	0.82*	0.89*	
		4.530	**100.0**								
DA-5	720	4.54	100.0	0.036	0.52*	0.52*	0.52*	0.52*	0.59*	0.66*	
		4.540	**100.0**								
DA-6	720	10.20	100.0	0.034	0.22*	0.22*	0.22*	0.22*	0.27*	0.33*	
		10.200	**100.0**								
DA-7	720	2.04	100.0	0.038	0.66*	0.66*	0.66*	0.66*	0.73*	0.79*	
		2.040	**100.0**								

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: RCLUBHOUSE POST

ID	Sub Basin Data						Sub Basin Hydrology Summary					
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Major Basin ID: 01													
DA-1	7.9	1,110	2,852.00	2,820.00	152.2	0.034	Q (cfs)	7.9	10.7	12.8	15.6	20.9	27.2
							C	0.38	0.38	0.38	0.38	0.45	0.52
							CA (ac)	3.01	3.01	3.01	3.01	3.56	4.12
							Volume (ac-ft)	0.1453	0.1968	0.2354	0.2869	0.3843	0.5002
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-3	4.6	946	2,870.00	2,827.00	240.0	0.036	Q (cfs)	8.5	11.5	13.7	16.7	21.1	25.5
							C	0.71	0.71	0.71	0.71	0.79	0.85
							CA (ac)	3.23	3.23	3.23	3.23	3.59	3.87
							Volume (ac-ft)	0.1563	0.2115	0.2519	0.3071	0.3880	0.4689
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-4	3.8	800	2,829.00	2,806.00	151.8	0.036	Q (cfs)	7.7	10.4	12.4	15.1	18.8	22.5
							C	0.76	0.76	0.76	0.76	0.83	0.89
							CA (ac)	2.92	2.92	2.92	2.92	3.19	3.42
							Volume (ac-ft)	0.1416	0.1912	0.2280	0.2777	0.3457	0.4137
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-5A	2.1	540	2,827.00	2,800.00	264.0	0.038	Q (cfs)	2.5	3.3	4.0	4.9	6.4	8.1
							C	0.45	0.45	0.45	0.45	0.52	0.59
							CA (ac)	0.94	0.94	0.94	0.94	1.08	1.23
							Volume (ac-ft)	0.0460	0.0607	0.0736	0.0901	0.1177	0.1489
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-5B	2.2	1,021	2,833.00	2,791.00	217.2	0.038	Q (cfs)	4.0	5.3	6.4	7.8	10.0	12.5
							C	0.67	0.67	0.67	0.67	0.76	0.85

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: RCLUBHOUSE POST

ID	Sub Basin Data							Sub Basin Hydrology Summary					
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Major Basin ID: 01													
							CA (ac)	1.50	1.50	1.50	1.50	1.70	1.90
							Volume (ac-ft)	0.0736	0.0975	0.1177	0.1434	0.1839	0.2299
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-6	14.4	1,715	2,829.00	2,784.00	138.5	0.033	Q (cfs)	11.8	15.9	19.0	23.2	30.5	39.0
							C	0.31	0.31	0.31	0.31	0.36	0.41
							CA (ac)	4.47	4.47	4.47	4.47	5.19	5.92
							Volume (ac-ft)	0.2170	0.2924	0.3494	0.4266	0.5608	0.7171
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59
DA-7	2.0	730	2,812.00	2,775.00	267.6	0.038	Q (cfs)	3.6	4.8	5.7	7.0	8.8	10.6
							C	0.66	0.66	0.66	0.66	0.73	0.79
							CA (ac)	1.35	1.35	1.35	1.35	1.49	1.61
							Volume (ac-ft)	0.0662	0.0883	0.1048	0.1287	0.1618	0.1949
							Tc (min)	10	10	10	10	10	10
							i (in/hr)	2.64	3.56	4.25	5.18	5.88	6.59

* Non default value

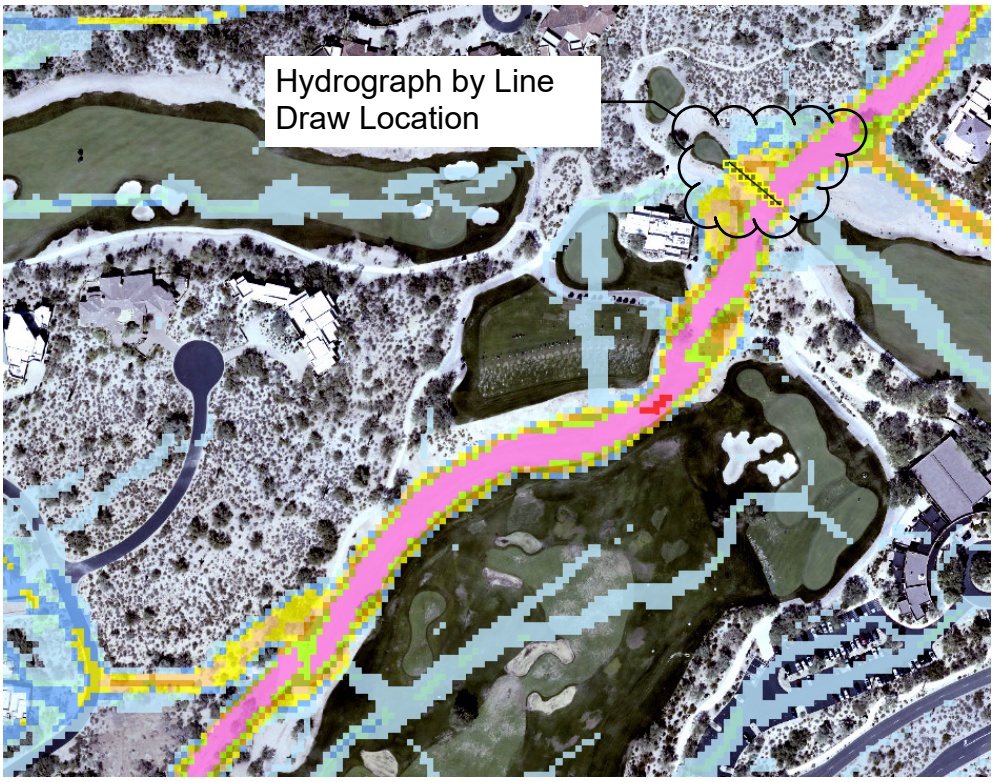
Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: RCLUBHOUSE POST

Sub Basin	Land Use Code	Area (acres)	Area (%)	Kb	Runoff Coefficient C						Description
					2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	
Major Basin ID: 01											
DA-1	720	7.92	100.0	0.034	0.38*	0.38*	0.38*	0.38*	0.45*	0.52*	
		7.920	**100.0**								
DA-3	720	4.55	100.0	0.036	0.71*	0.71*	0.71*	0.71*	0.79*	0.85*	
		4.550	**100.0**								
DA-4	720	3.84	100.0	0.036	0.76*	0.76*	0.76*	0.76*	0.83*	0.89*	
		3.840	**100.0**								
DA-5A	720	2.08	100.0	0.038	0.45*	0.45*	0.45*	0.45*	0.52*	0.59*	
		2.080	**100.0**								
DA-5B	720	2.24	100.0	0.038	0.67*	0.67*	0.67*	0.67*	0.76*	0.85*	
		2.240	**100.0**								
DA-6	720	14.43	100.0	0.033	0.31*	0.31*	0.31*	0.31*	0.36*	0.41*	
		14.430	**100.0**								
DA-7	720	2.04	100.0	0.038	0.66*	0.66*	0.66*	0.66*	0.73*	0.79*	
		2.040	**100.0**								

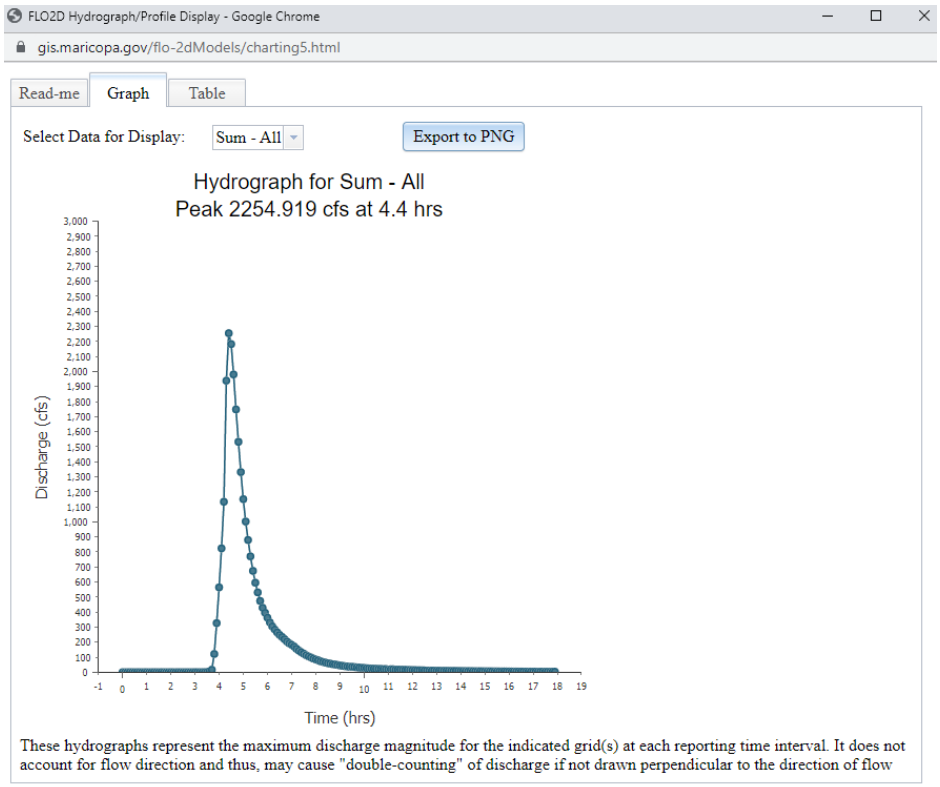
* Non default value

Appendix F Hydraulic Analysis Supporting Data

Flo-2D Data

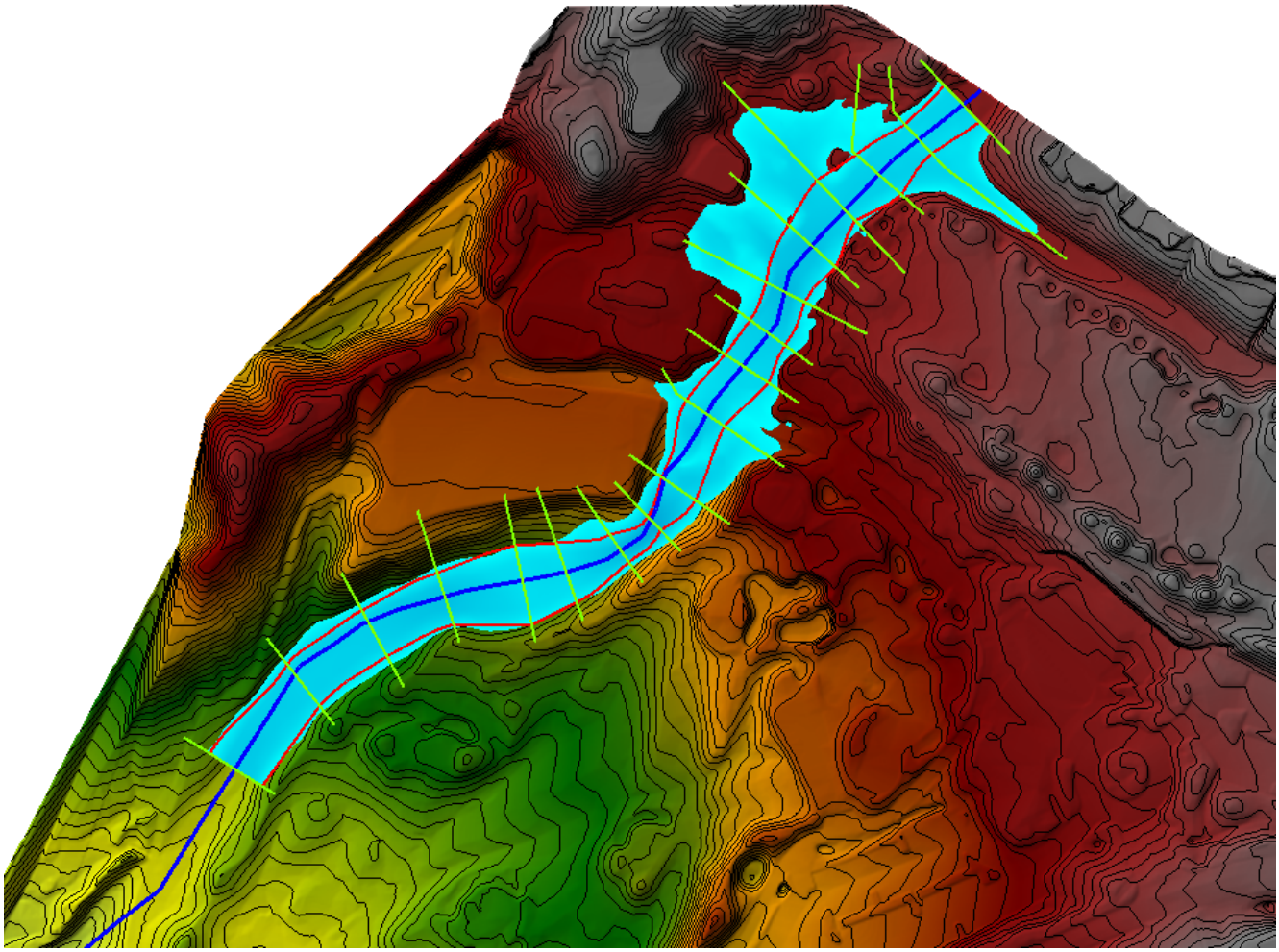


Flo-2D Plan



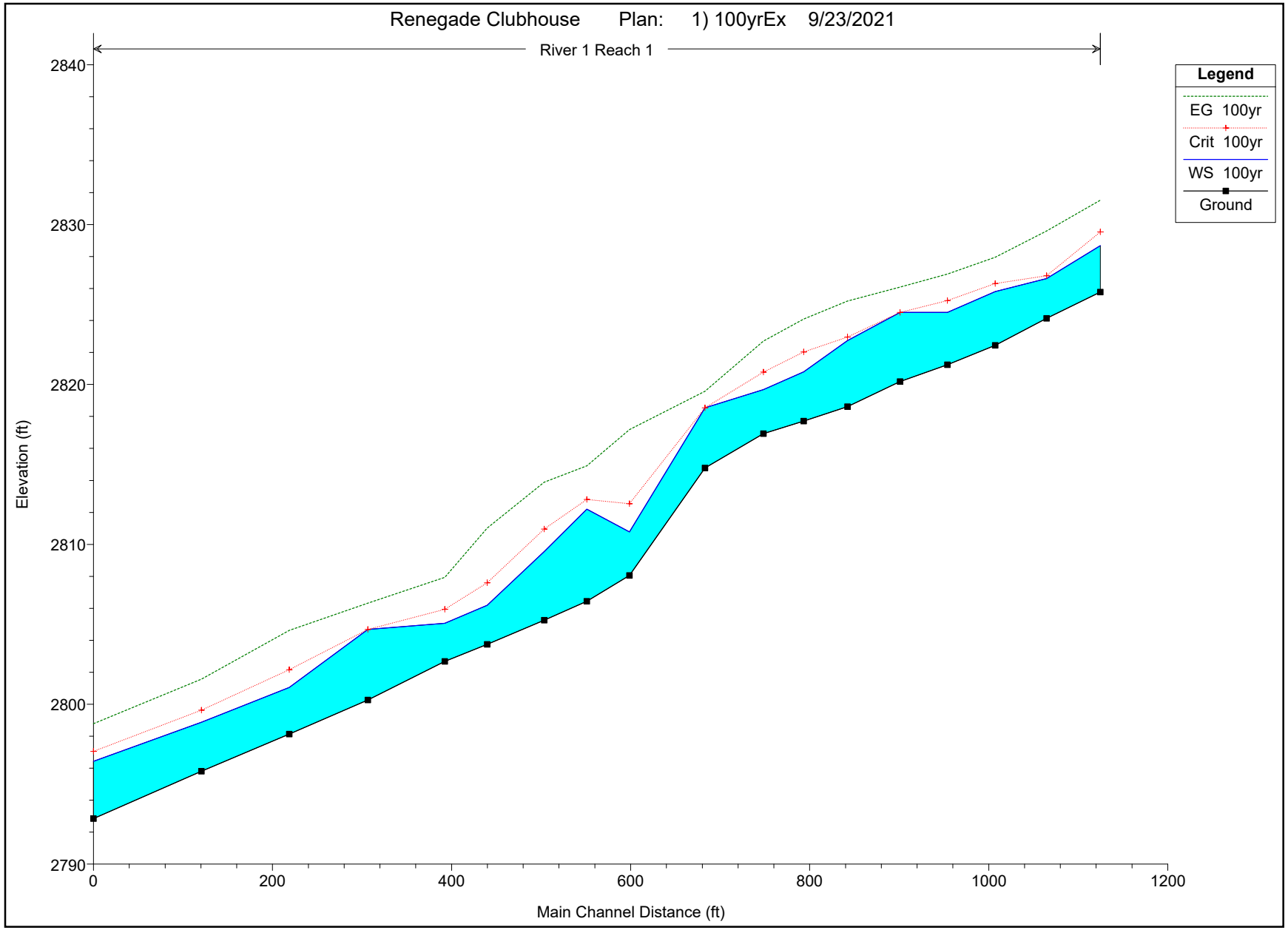
Flo-2D Hydrograph

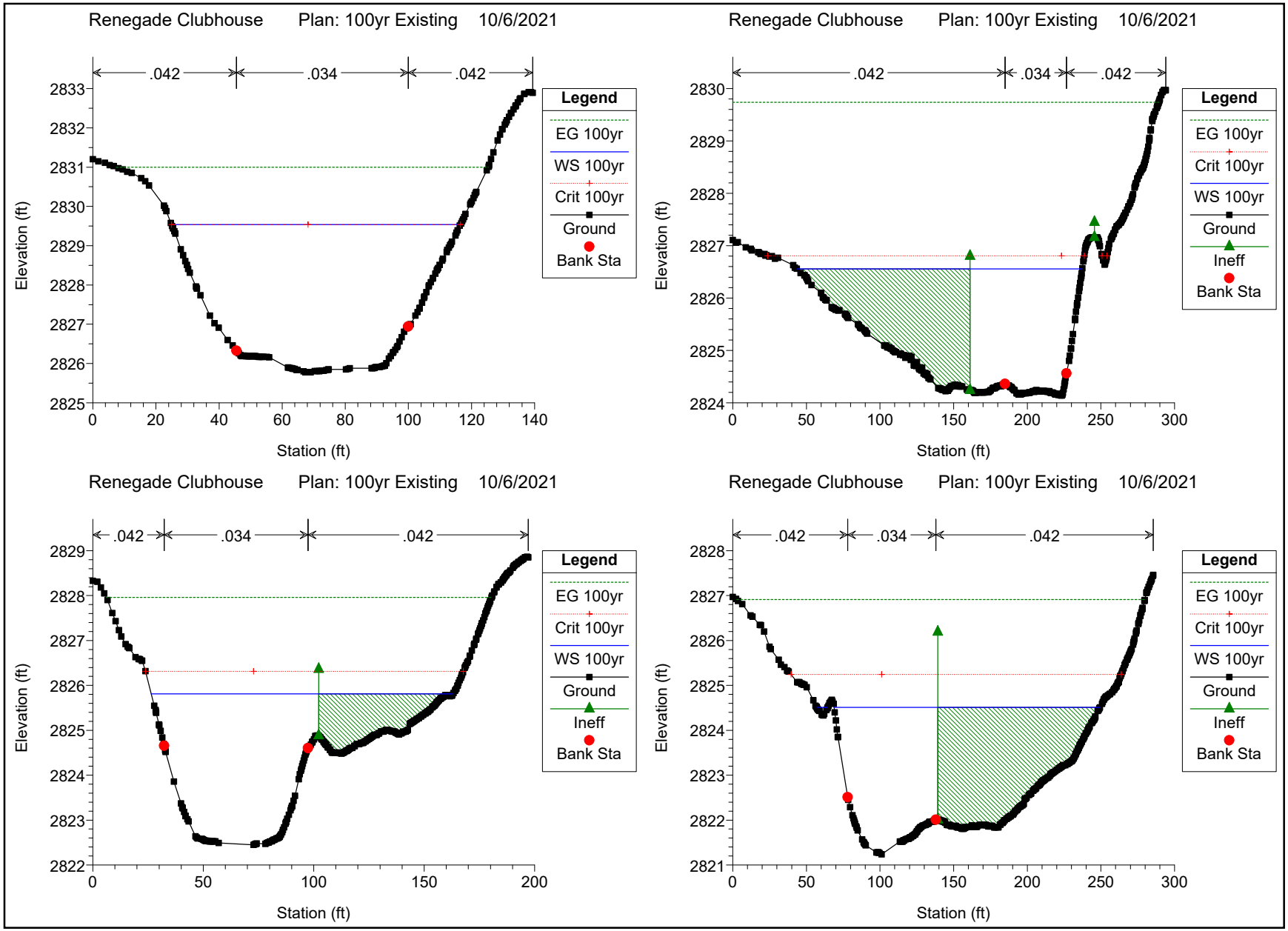
HEC-RAS PLAN & CROSS SECTIONS
(EXISTING)



HEC-RAS Plan: 100yrEx River: River 1 Reach: Reach 1 Profile: 100yr

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	1896	100yr	2255.00	2825.78	2829.54	2829.54	2831.00	0.010228	10.21	251.63	91.56	0.96
Reach 1	1836	100yr	2255.00	2824.14	2826.56	2826.81	2829.74	0.040076	15.38	163.39	193.69	1.78
Reach 1	1778	100yr	2255.00	2822.45	2825.81	2826.31	2827.96	0.018017	11.84	195.87	136.61	1.23
Reach 1	1725	100yr	2255.00	2821.24	2824.51	2825.25	2826.91	0.020283	12.60	186.34	187.83	1.31
Reach 1	1672	100yr	2255.00	2820.19	2824.52	2824.52	2826.09	0.010947	10.08	226.51	135.10	0.98
Reach 1	1614	100yr	2255.00	2818.61	2822.75	2822.97	2825.22	0.016579	12.94	193.84	152.11	1.22
Reach 1	1565	100yr	2255.00	2817.71	2820.80	2822.03	2824.10	0.028308	15.08	167.65	76.67	1.55
Reach 1	1520	100yr	2255.00	2816.93	2819.68	2820.78	2822.71	0.029708	14.31	170.03	77.95	1.56
Reach 1	1454	100yr	2255.00	2814.78	2818.53	2818.53	2819.58	0.010544	9.49	309.10	142.28	0.95
Reach 1	1370	100yr	2255.00	2808.06	2810.79	2812.54	2817.18	0.073836	20.82	117.50	61.44	2.41
Reach 1	1322	100yr	2255.00	2806.44	2812.19	2812.81	2814.93	0.012094	14.88	199.22	57.78	1.12
Reach 1	1275	100yr	2255.00	2805.25	2809.55	2810.95	2813.90	0.030519	17.18	147.88	66.50	1.63
Reach 1	1211	100yr	2255.00	2803.74	2806.19	2807.60	2811.02	0.071175	17.65	128.73	73.95	2.28
Reach 1	1164	100yr	2255.00	2802.68	2805.06	2805.93	2807.94	0.040795	13.62	165.78	88.61	1.73
Reach 1	1078	100yr	2255.00	2800.27	2804.68	2804.68	2806.33	0.010254	10.41	227.06	74.86	0.96
Reach 1	990	100yr	2255.00	2798.13	2801.05	2802.16	2804.61	0.035478	15.34	155.00	73.18	1.69
Reach 1	892	100yr	2255.00	2795.80	2798.87	2799.63	2801.57	0.023202	13.43	178.90	73.76	1.40
Reach 1	771	100yr	2255.00	2792.84	2796.43	2797.05	2798.78	0.021435	12.34	185.42	78.00	1.32


Renegade Clubhouse Plan: 1) 100yrEx 9/23/2021
River 1 Reach 1
Legend
EG 100yr
Crit 100yr
WS 100yr
Ground
Elevation (ft)
2840
2830
2820
2810
2800
2790
0
200
400
600
800
1000
1200
Main Channel Distance (ft)


Renegade Clubhouse Plan: 100yr Existing 10/6/2021
.042
.034
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Elevation (ft)
Station (ft)
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Renegade Clubhouse Plan: 100yr Existing 10/6/2021
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.042
Elevation (ft)
Station (ft)
Legend
EG 100yr
Crit 100yr
WS 100yr
Ground
Ineff
Bank Sta
Renegade Clubhouse Plan: 100yr Existing 10/6/2021
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Elevation (ft)
Station (ft)
Legend
EG 100yr
Crit 100yr
WS 100yr
Ground
Ineff
Bank Sta
Renegade Clubhouse Plan: 100yr Existing 10/6/2021
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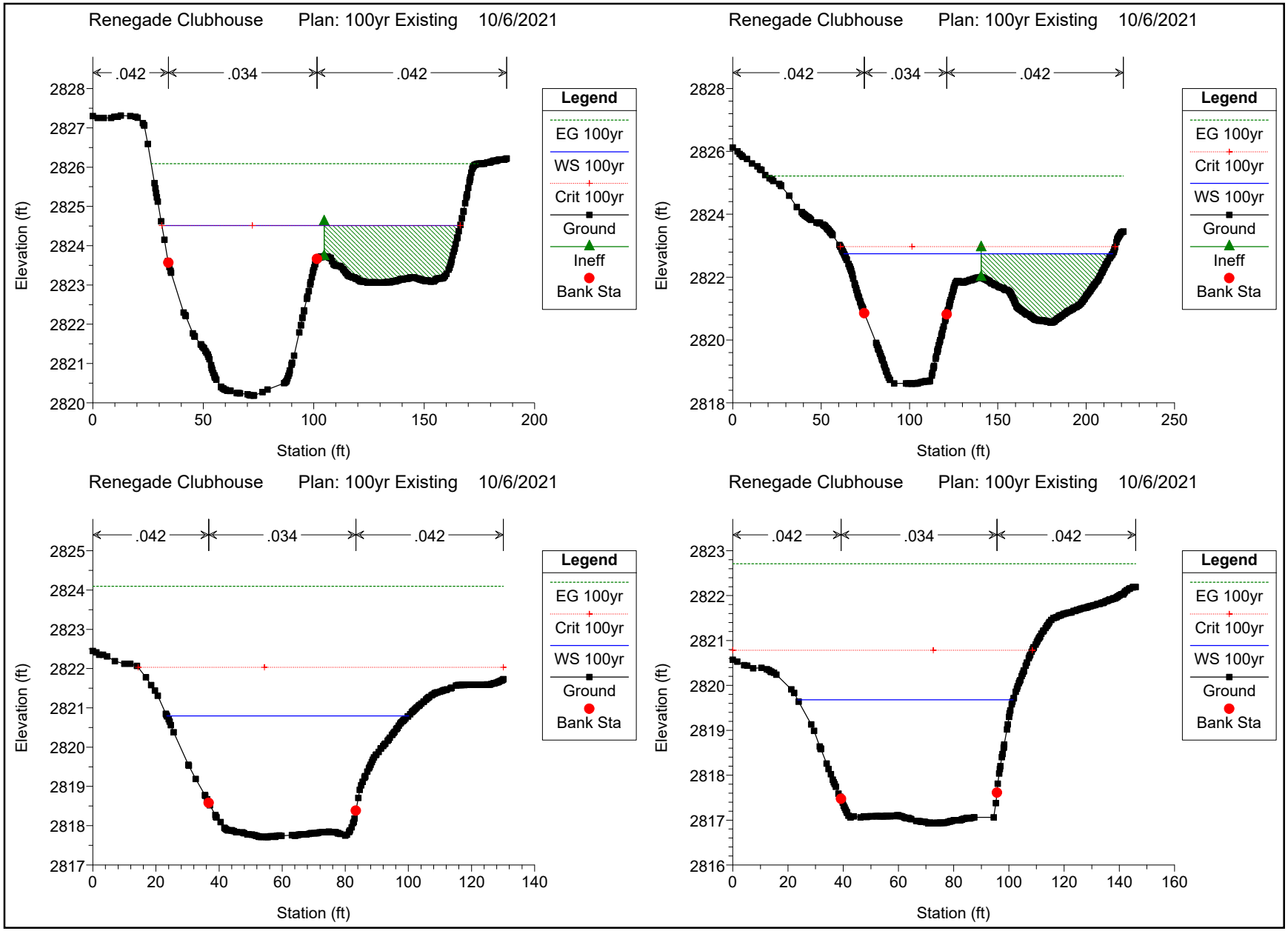
Elevation (ft)
Station (ft)
Legend
EG 100yr
Crit 100yr
WS 100yr
Ground
Ineff
Bank Sta


Renegade Clubhouse Plan: 100yr Existing 10/6/2021
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Elevation (ft)
Station (ft)
Legend
EG 100yr
WS 100yr
Crit 100yr
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Renegade Clubhouse Plan: 100yr Existing 10/6/2021
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Elevation (ft)
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Renegade Clubhouse Plan: 100yr Existing 10/6/2021
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Elevation (ft)
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EG 100yr
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Renegade Clubhouse Plan: 100yr Existing 10/6/2021
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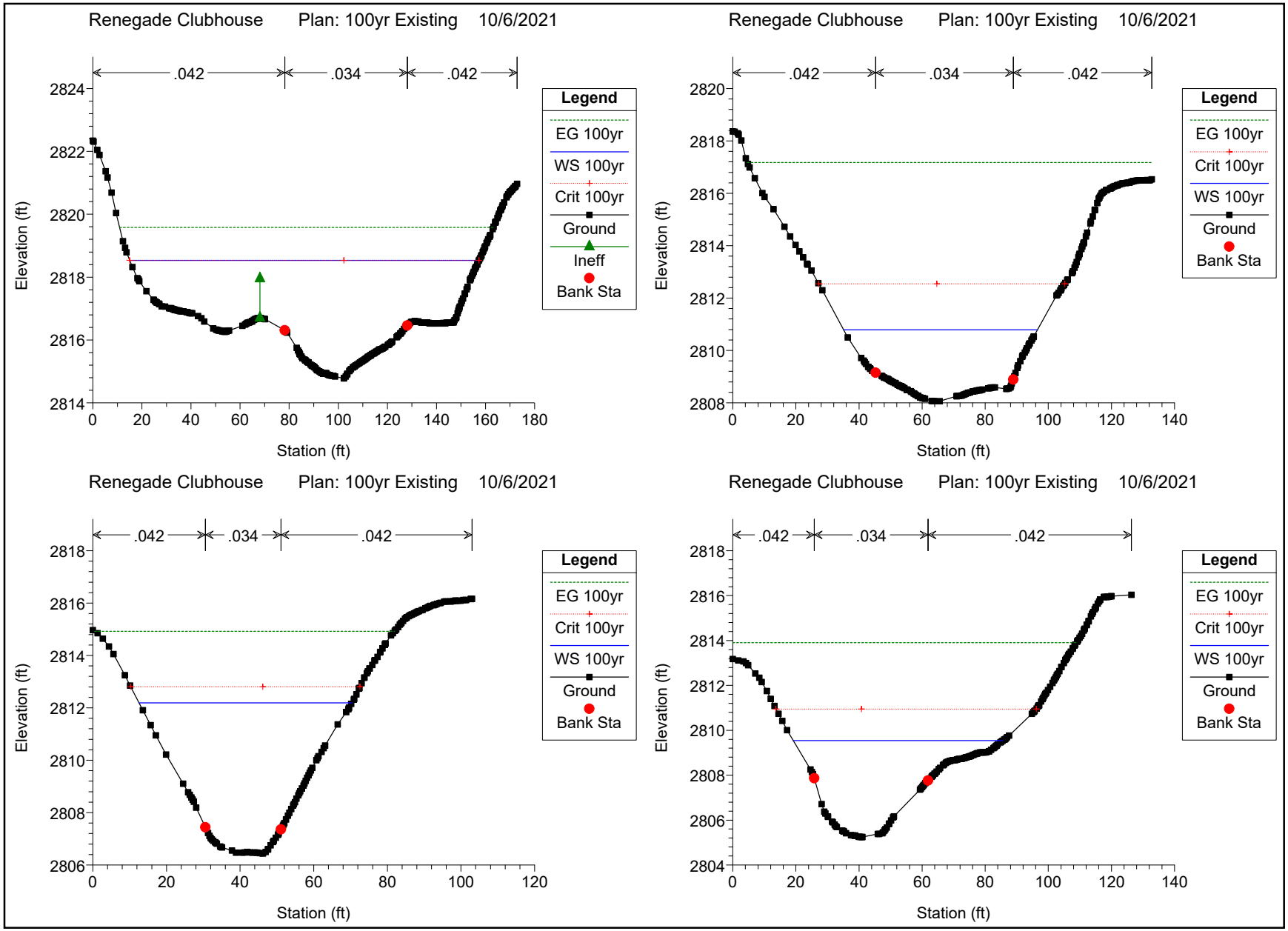
.034
.042
Elevation (ft)
Station (ft)
Legend
EG 100yr
Crit 100yr
WS 100yr
Ground
Bank Sta


Renegade Clubhouse Plan: 100yr Existing 10/6/2021
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Elevation (ft)
Station (ft)
Legend
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WS 100yr
Crit 100yr
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Renegade Clubhouse Plan: 100yr Existing 10/6/2021
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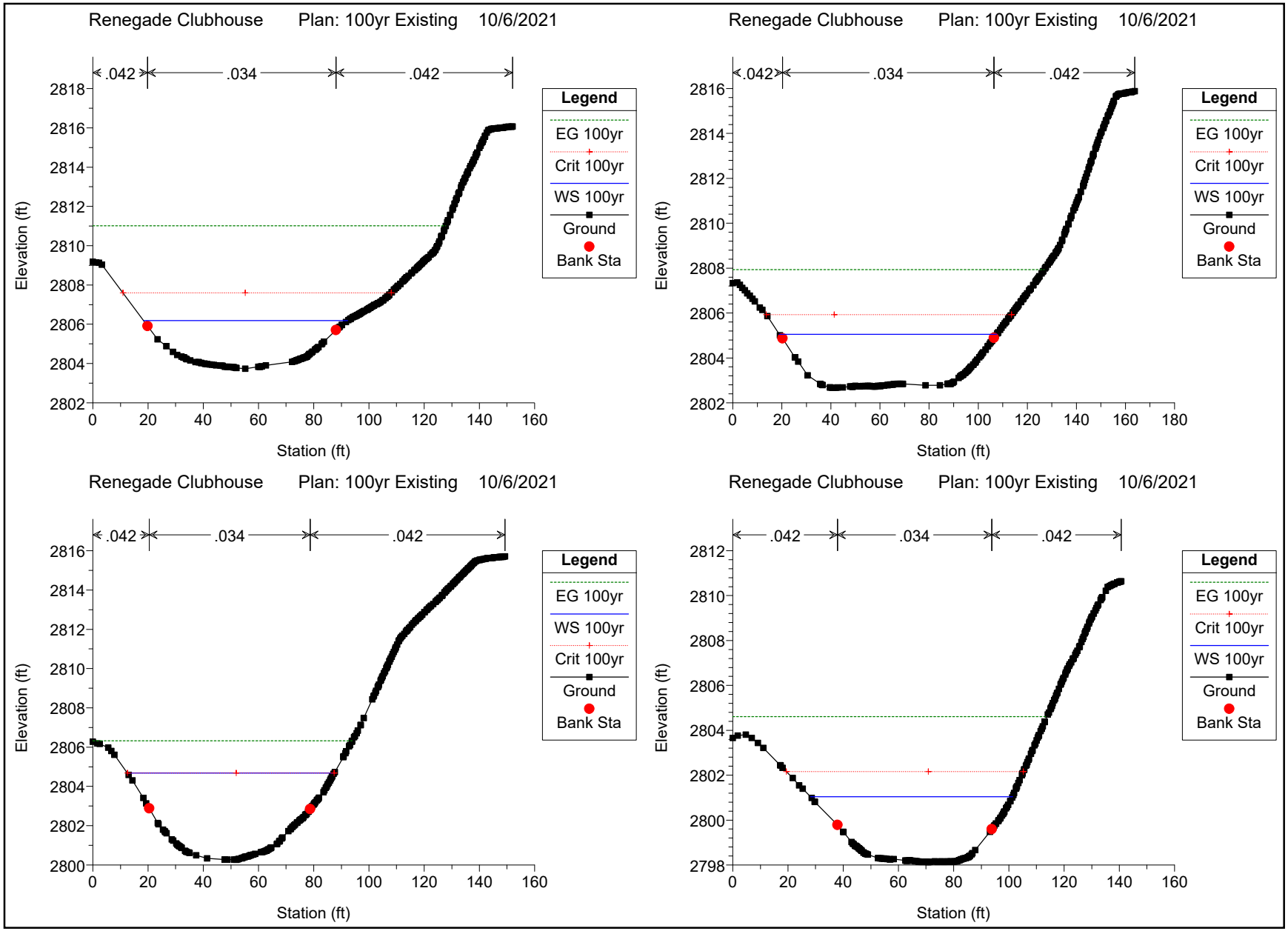
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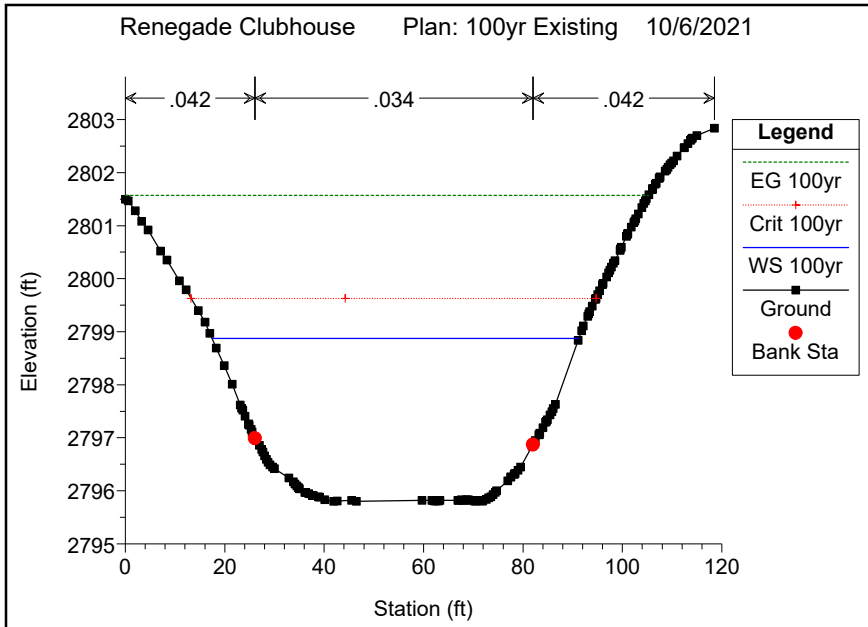
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Elevation (ft)
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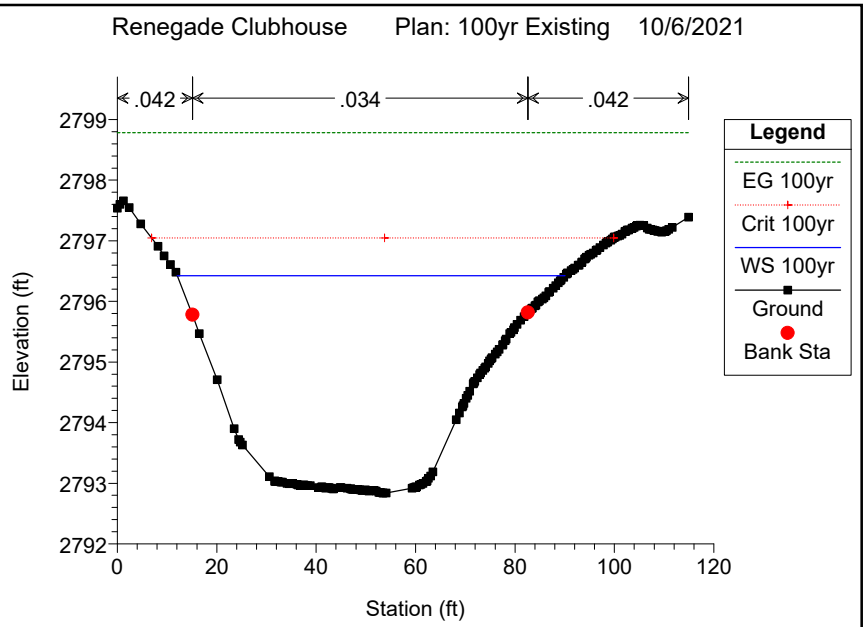
Ground
Bank Sta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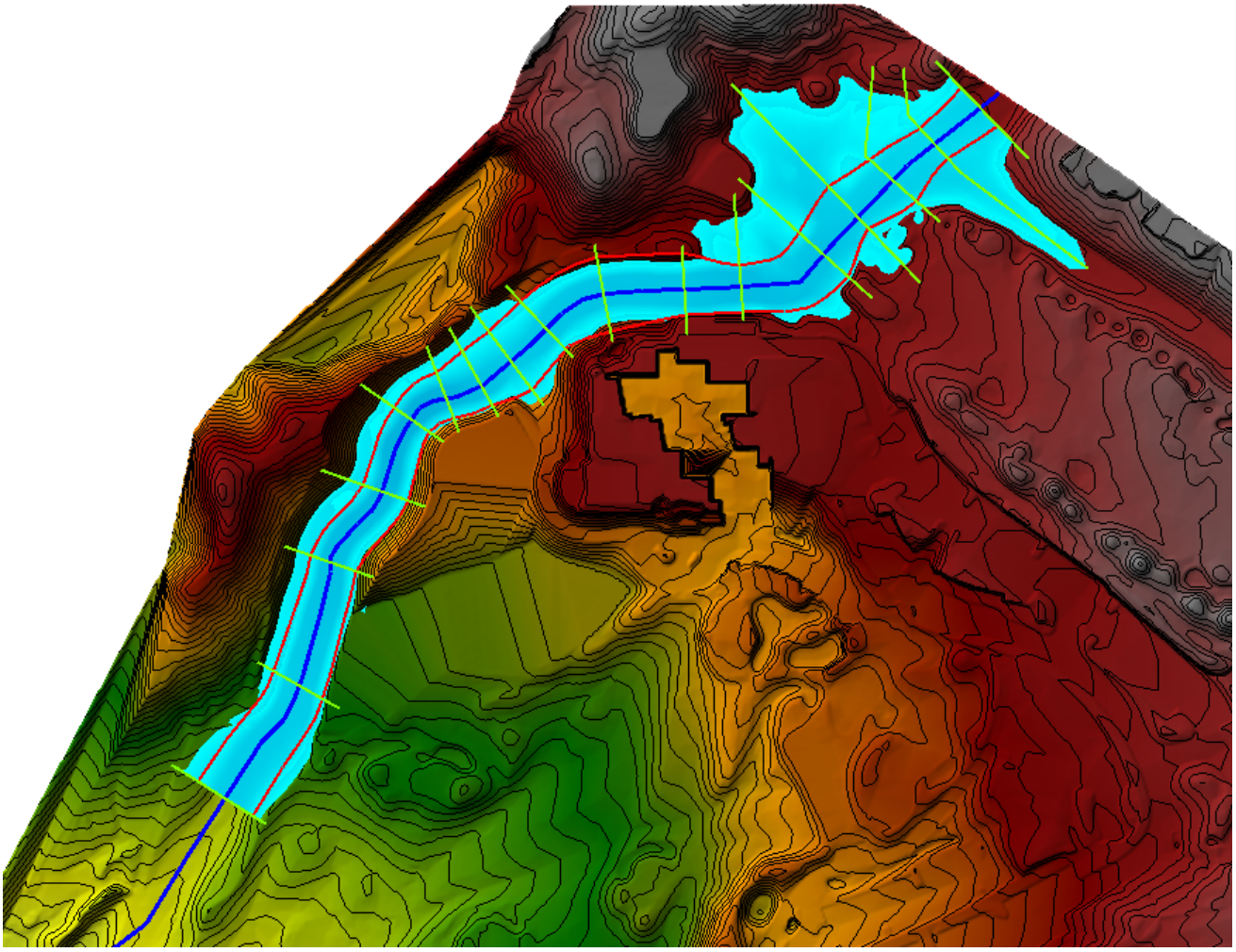
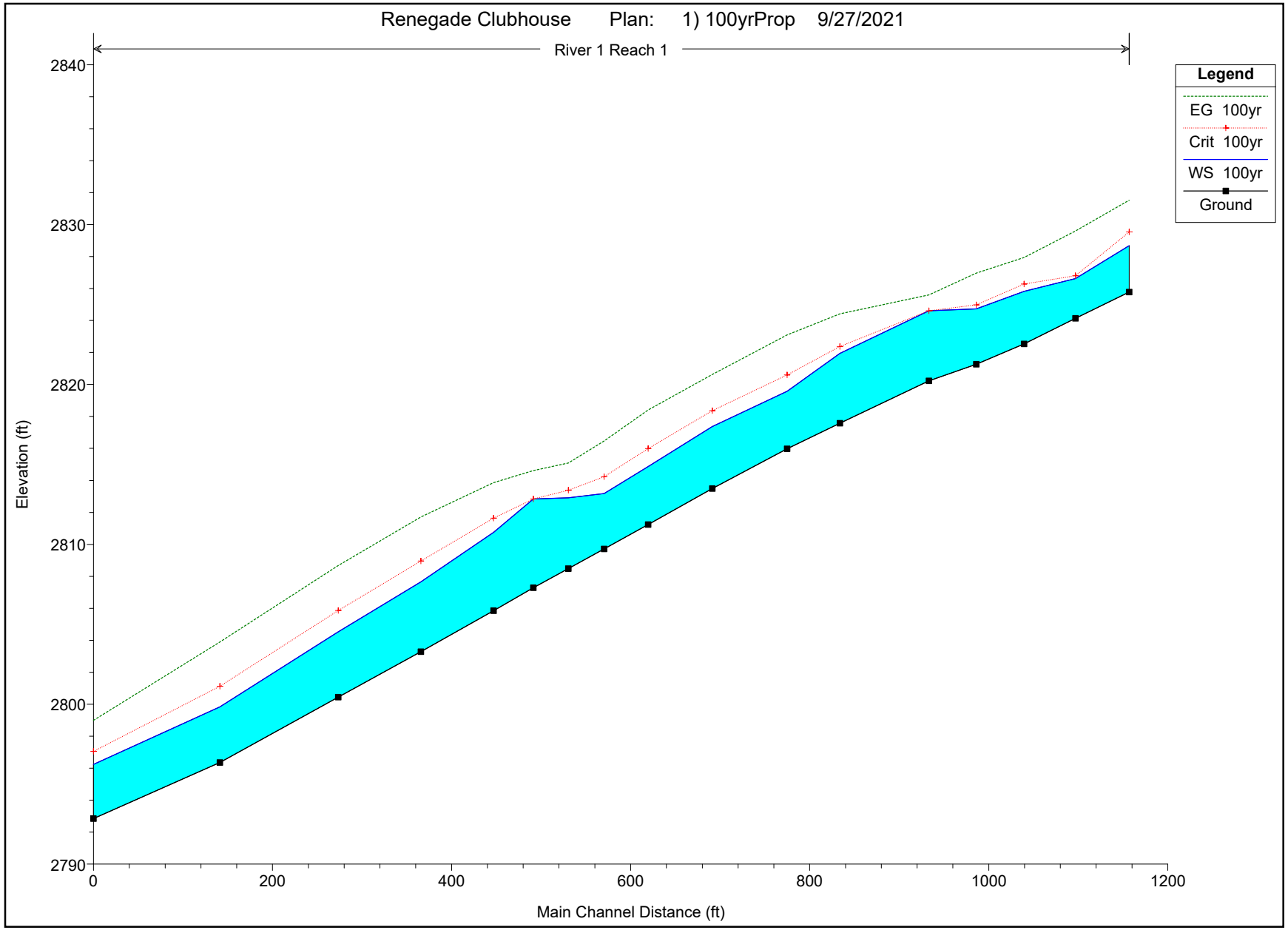
Elevation (ft)
Station (ft)
Legend
EG 100yr
Crit 100yr
WS 100yr
Ground
Bank Sta

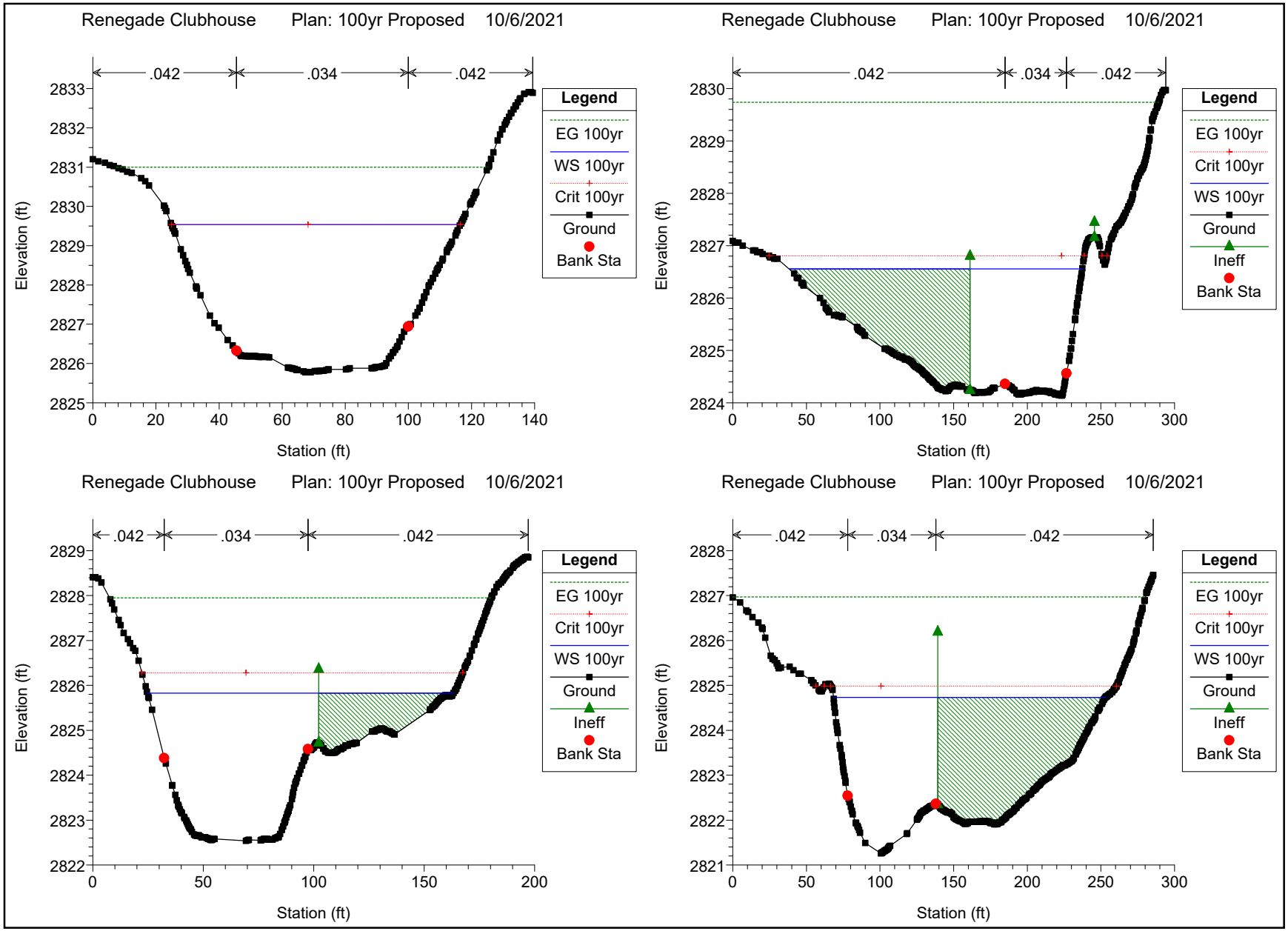
HEC-RAS PLAN & CROSS SECTIONS
(PROPOSED)



HEC-RAS Plan: 100yrProp River: River 1 Reach: Reach 1 Profile: 100yr

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	1928	100yr	2255.00	2825.78	2829.54	2829.54	2831.00	0.010228	10.21	251.63	91.56	0.96
Reach 1	1868	100yr	2255.00	2824.14	2826.56	2826.81	2829.74	0.040093	15.38	163.37	199.08	1.78
Reach 1	1810	100yr	2255.00	2822.54	2825.83	2826.28	2827.95	0.017970	11.80	197.97	138.54	1.23
Reach 1	1757	100yr	2255.00	2821.26	2824.73	2824.99	2826.97	0.018155	12.17	192.72	184.83	1.24
Reach 1	1704	100yr	2255.00	2820.23	2824.59	2824.59	2826.18	0.011100	10.13	224.24	136.43	0.98
Reach 1	1605	100yr	2255.00	2817.57	2821.65	2822.37	2824.59	0.020169	13.76	164.90	75.95	1.31
Reach 1	1546	100yr	2255.00	2815.98	2819.57	2820.61	2823.11	0.029386	15.08	149.51	50.42	1.54
Reach 1	1462	100yr	2255.00	2813.49	2817.36	2818.36	2820.63	0.027761	14.50	155.47	54.23	1.51
Reach 1	1391	100yr	2255.00	2811.24	2814.86	2815.99	2818.41	0.034117	15.11	149.29	57.47	1.65
Reach 1	1341	100yr	2255.00	2809.72	2813.18	2814.23	2816.46	0.042340	14.54	155.21	76.57	1.78
Reach 1	1302	100yr	2255.00	2808.48	2812.91	2813.38	2815.09	0.017849	11.85	192.26	75.59	1.22
Reach 1	1263	100yr	2255.00	2807.28	2812.84	2812.84	2814.62	0.009988	10.80	217.70	66.77	0.95
Reach 1	1218	100yr	2255.00	2805.84	2810.75	2811.63	2813.86	0.020691	14.18	163.03	58.07	1.34
Reach 1	1137	100yr	2255.00	2803.28	2807.66	2808.96	2811.71	0.031526	16.16	140.97	56.54	1.62
Reach 1	1045	100yr	2255.00	2800.44	2804.52	2805.86	2808.67	0.034284	16.34	138.04	46.87	1.68
Reach 1	913	100yr	2255.00	2796.35	2799.84	2801.12	2803.89	0.037587	16.15	139.66	52.06	1.74
Reach 1	771	100yr	2255.00	2792.84	2796.23	2797.05	2798.98	0.027523	13.31	170.74	74.92	1.48


Renegade Clubhouse Plan: 1) 100yrProp 9/27/2021
River 1 Reach 1
Legend
EG 100yr
Crit 100yr
WS 100yr
Ground
Elevation (ft)
2840
2830
2820
2810
2800
2790
0
200
400
600
800
1000
1200
Main Channel Distance (ft)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Elevation (ft)
Station (ft)
Legend
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WS 100yr
Crit 100yr
Ground
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Renegade Clubhouse Plan: 100yr Proposed 10/6/2021
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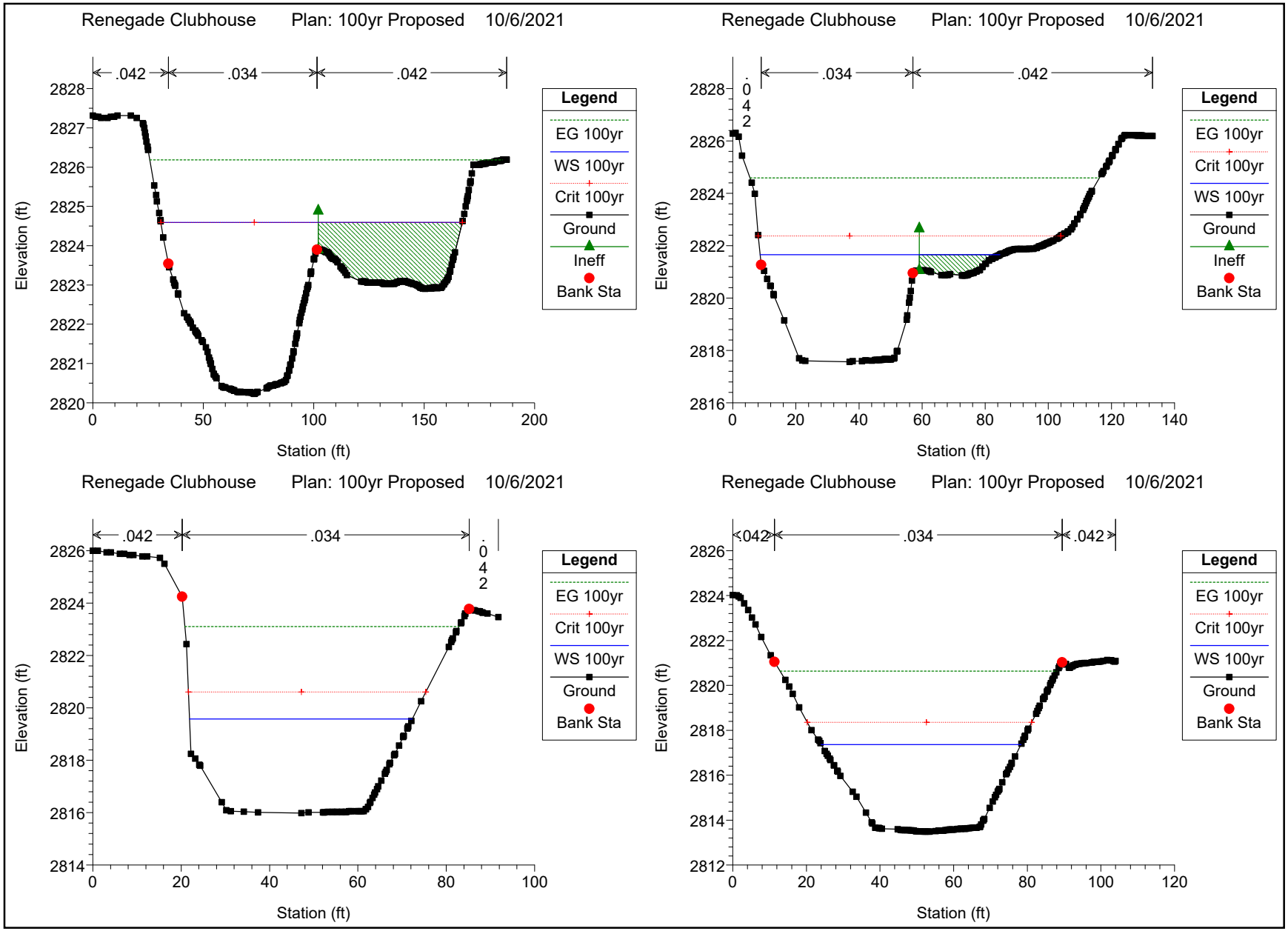
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Station (ft)
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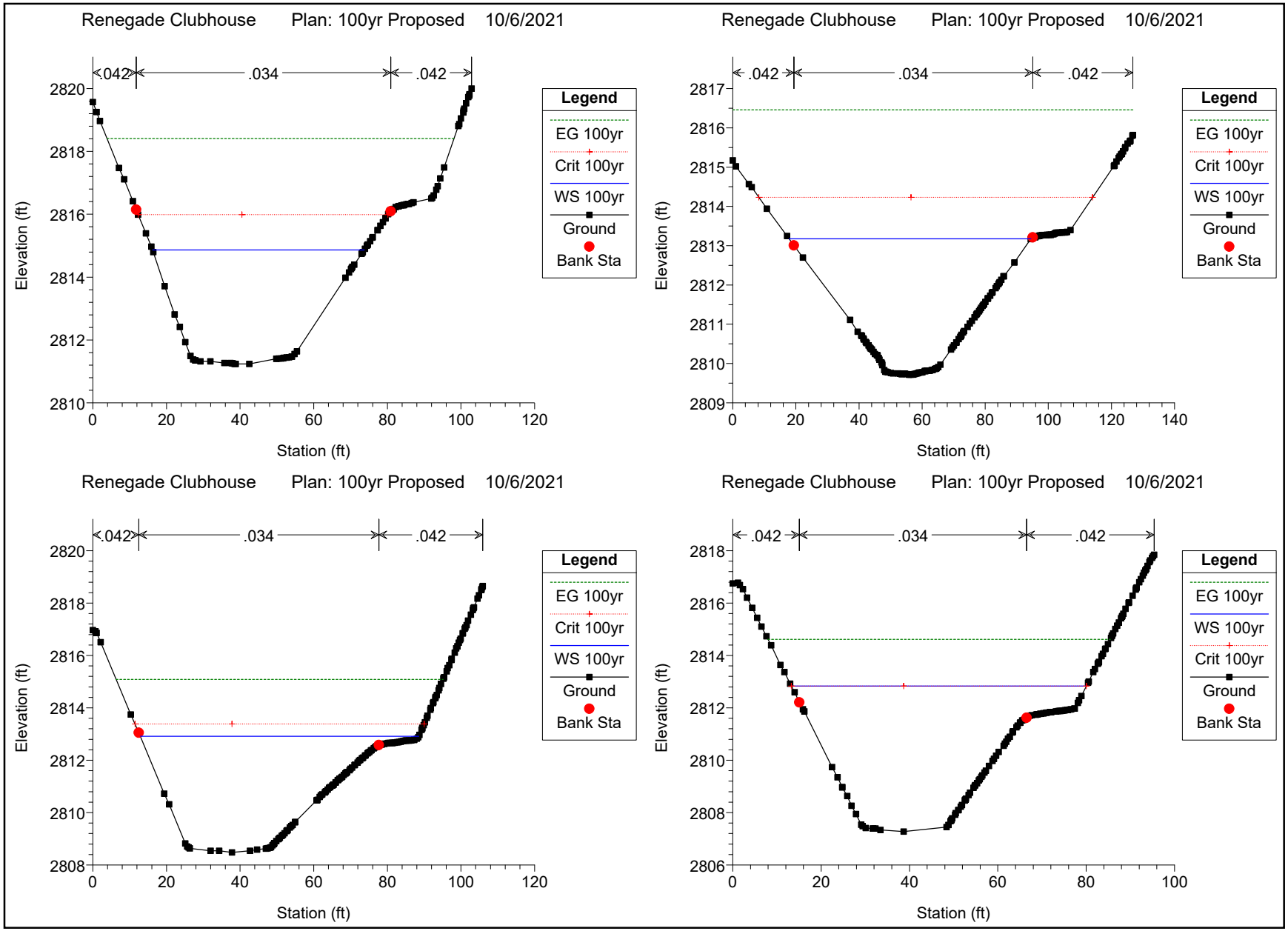
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Elevation (ft)
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Elevation (ft)
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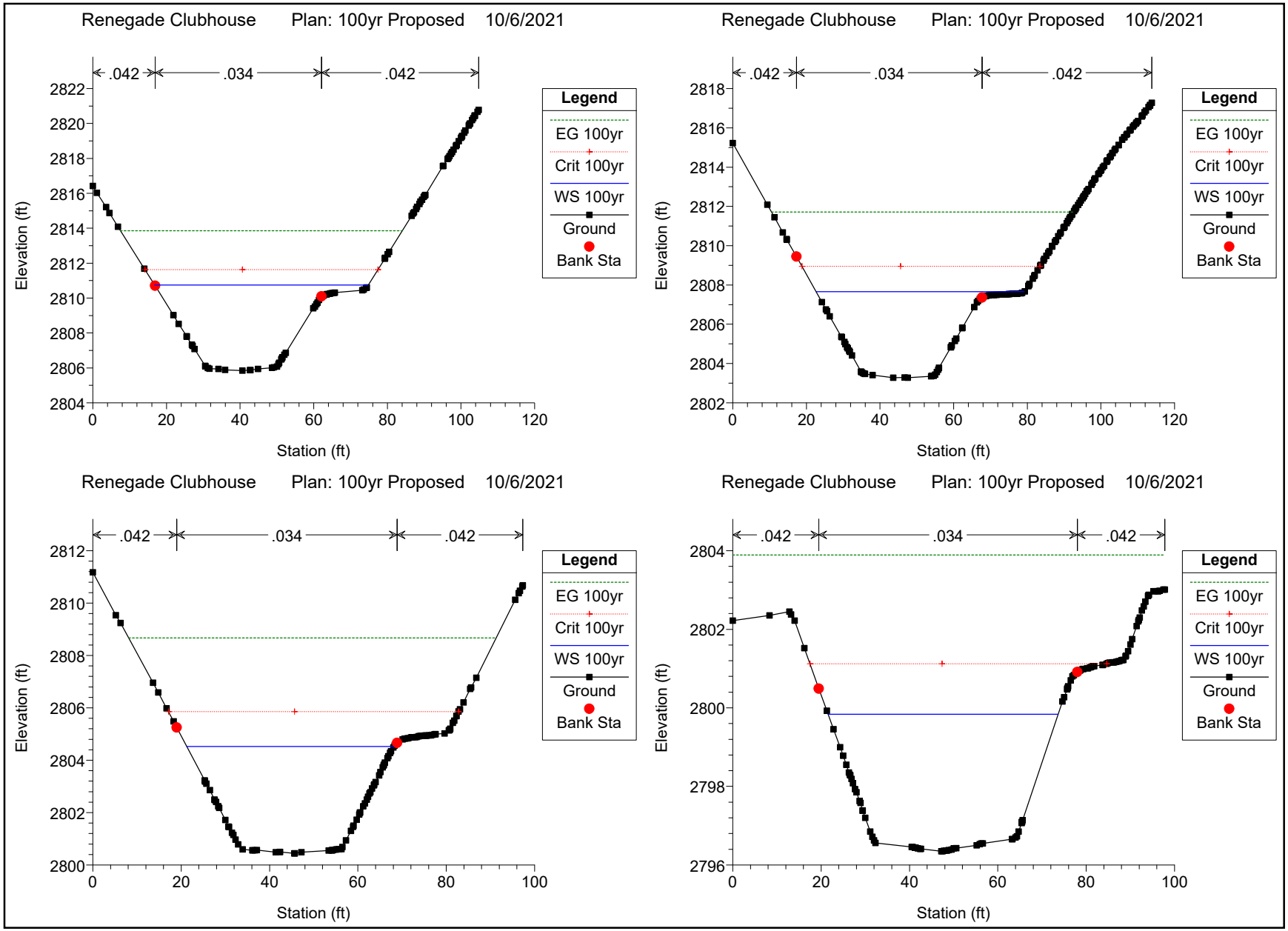
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Elevation (ft)
Station (ft)
Legend
EG 100yr
Crit 100yr
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Ground
Bank Sta
Renegade Clubhouse Plan: 100yr Proposed 10/6/2021
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Elevation (ft)
Station (ft)
Legend
EG 100yr
Crit 100yr
WS 100yr
Ground
Bank Sta
Renegade Clubhouse Plan: 100yr Proposed 10/6/2021
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Elevation (ft)
Station (ft)
Legend
EG 100yr
Crit 100yr
WS 100yr
Ground
Bank Sta
Renegade Clubhouse Plan: 100yr Proposed 10/6/2021
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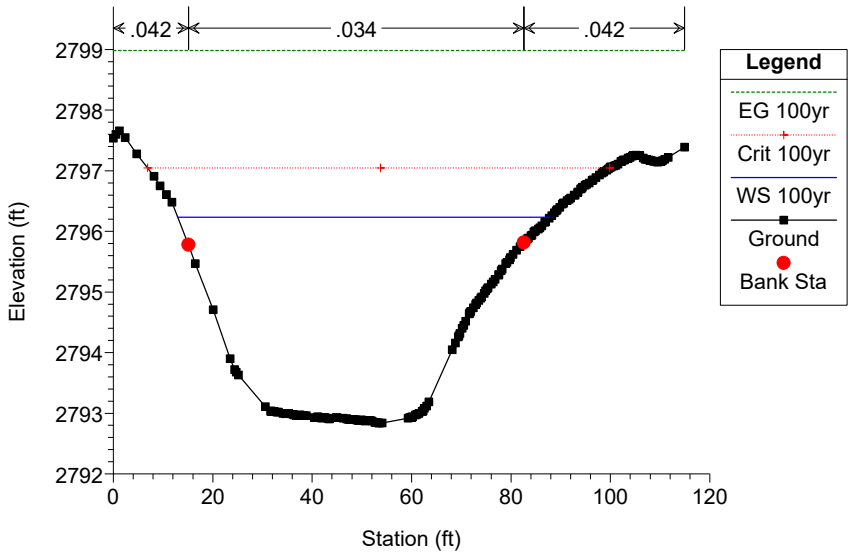
Elevation (ft)
Station (ft)
Legend
EG 100yr
Crit 100yr
WS 100yr
Ground
Bank Sta

Renegade Clubhouse Plan: 100yr Proposed 10/6/2021



Flood Control District of Maricopa County
Drainage Design Management System
RIVER MECHANICS - CROSS SECTION HYDRAULICS
Project Reference: RCLUBHOUSE SCOUR 1

Section ID	Flow Type	Entire Section Q (cfs)	Slope (f/f)	Man'g N Channel	Man'g N LOB	Man'g N ROB	Area (sq ft)	W.P. (ft)	Avg Width (ft)	Top Width (ft)	Hyd Depth (ft)	Max Depth (ft)	Vel (f/s)	Channel Section Hyd Depth (ft)	Vel (ft/sec)	Froude Num
RAS RESULTS-1045	Design	907	0.033168	0.034			73.55	38.13	28.84	37.36	1.97	2.55	12.33			
	Dominant	907	0.033168	0.034			73.55	38.13	28.84	37.36	1.97	2.55	12.33			
RAS RESULTS-1137	Design	907	0.033369	0.034			71.80	36.07	26.59	35.26	2.04	2.70	12.63			
	Dominant	907	0.033369	0.034			71.80	36.07	26.59	35.26	2.04	2.70	12.63			
RAS RESULTS-1218	Design	907	0.028407	0.034			75.36	36.08	26.08	35.18	2.14	2.89	12.04			
	Dominant	907	0.028407	0.034			75.36	36.08	26.08	35.18	2.14	2.89	12.04			
RAS RESULTS-1263	Design	907	0.014818	0.034			97.92	42.63	29.32	41.70	2.35	3.34	9.26			
	Dominant	907	0.014818	0.034			97.92	42.63	29.32	41.70	2.35	3.34	9.26			
RAS RESULTS-1302	Design	907	0.022986	0.034			90.47	48.60	33.63	48.02	1.88	2.69	10.03			
	Dominant	907	0.022986	0.034			90.47	48.60	33.63	48.02	1.88	2.69	10.03			
RAS RESULTS-1341	Design	907	0.031256	0.034			89.17	59.04	35.96	58.74	1.52	2.48	10.17			
	Dominant	907	0.031256	0.034			89.17	59.04	35.96	58.74	1.52	2.48	10.17			
RAS RESULTS-1391	Design	907	0.034072	0.034			78.81	46.24	34.87	45.75	1.72	2.26	11.51			
	Dominant	907	0.034072	0.034			78.81	46.24	34.87	45.75	1.72	2.26	11.51			
RAS RESULTS-1462	Design	907	0.026531	0.034			84.05	45.03	34.59	44.39	1.89	2.43	10.79			
	Dominant	907	0.026531	0.034			84.05	45.03	34.59	44.39	1.89	2.43	10.79			
RAS RESULTS-1546	Design	907	0.028562	0.034			83.20	46.40	37.65	45.76	1.82	2.21	10.90			
	Dominant	907	0.028562	0.034			83.20	46.40	37.65	45.76	1.82	2.21	10.90			
RAS RESULTS-1605	Design	907	0.031107	0.034			78.32	42.53	35.44	41.72	1.88	2.21	11.58			
	Dominant	907	0.031107	0.034			78.32	42.53	35.44	41.72	1.88	2.21	11.58			
RAS RESULTS-1704	Design	907	0.013410	0.034			116.12	60.56	42.38	71.05	1.93	2.74	7.81			
	Dominant	907	0.013410	0.034			116.12	60.56	42.38	71.05	1.93	2.74	7.81			
RAS RESULTS-1757	Design	907	0.022637	0.034	0.042	0.042	101.16	65.42	47.49	157.80	1.55	2.13	8.97			
	Dominant	907	0.022637	0.034	0.042	0.042	101.16	65.42	47.49	157.80	1.55	2.13	8.97			
RAS RESULTS-1810	Design	907	0.015084	0.034	0.042	0.042	116.29	71.56	53.10	88.65	1.63	2.19	7.80			
	Dominant	907	0.015084	0.034	0.042	0.042	116.29	71.56	53.10	88.65	1.63	2.19	7.80			
RAS RESULTS-1868	Design	907	0.037858	0.034	0.042	0.042	94.00	71.62	63.51	156.75	1.32	1.48	9.65			
	Dominant	907	0.037858	0.034	0.042	0.042	94.00	71.62	63.51	156.75	1.32	1.48	9.65			
RAS RESULTS-1928	Design	907	0.028011	0.034	0.042	0.042	96.20	70.01	52.57	69.78	1.38	1.83	9.43			
	Dominant	907	0.028011	0.034	0.042	0.042	96.20	70.01	52.57	69.78	1.38	1.83	9.43			
RAS RESULTS-771	Design	907	0.022719	0.034			97.55	58.17	42.79	57.78	1.69	2.28	9.30			
	Dominant	907	0.022719	0.034			97.55	58.17	42.79	57.78	1.69	2.28	9.30			
RAS RESULTS-913	Design	907	0.036297	0.034			76.15	44.51	35.09	43.90	1.73	2.17	11.91			
	Dominant	907	0.036297	0.034			76.15	44.51	35.09	43.90	1.73	2.17	11.91			

Major Basin: 01

ID: 771 Cross Section ID: RAS RESULTS-771

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	1.20	1.30	1.56	Lacey
Local		1.30		
Bedform	2.39	1.30	3.11	Comments
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**8.09**	

Major Basin: 01

ID: 913 Cross Section ID: RAS RESULTS-913

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	1.20	1.30	1.56	Lacey
Local		1.30		
Bedform	3.52	1.30	4.58	Comments
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**9.56**	

Major Basin: 01

ID: 1045 Cross Section ID: RAS RESULTS-1045

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	1.20	1.30	1.56	Lacey
Local		1.30		
Bedform	3.60	1.30	4.68	**Comments**
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**9.66**	

Major Basin: 01

ID: 1137 Cross Section ID: RAS RESULTS-1137

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	1.20	1.30	1.56	Lacey
Local		1.30		
Bedform	3.53	1.30	4.59	Comments
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**9.57**	

Major Basin: 01

ID: 1218 Cross Section ID: RAS RESULTS-1218

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	2.40	1.30	3.12	Lacey
Local		1.30		
Bedform	2.71	1.30	3.52	**Comments**
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**10.06**	

Major Basin: 01

ID: 1263 Cross Section ID: RAS RESULTS-1263

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	2.40	1.30	3.12	Lacey
Local		1.30		
Bedform	1.57	1.30	2.04	**Comments**
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**8.58**	

Major Basin: 01

ID: 1301 Cross Section ID: RAS RESULTS-1302

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	2.40	1.30	3.12	Lacey
Local		1.30		
Bedform	1.90	1.30	2.47	Comments
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**9.01**	

Major Basin: 01

ID: 1341 Cross Section ID: RAS RESULTS-1341

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	2.40	1.30	3.12	Lacey
Local		1.30		
Bedform	2.85	1.30	3.71	**Comments**
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**10.25**	

Major Basin: 01

ID: 1390 Cross Section ID: RAS RESULTS-1391

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	2.40	1.30	3.12	Lacey
Local		1.30		
Bedform	3.08	1.30	4.00	**Comments**
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**10.54**	

Major Basin: 01

ID: 1462 Cross Section ID: RAS RESULTS-1462

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	2.40	1.30	3.12	Lacey
Local		1.30		
Bedform	2.83	1.30	3.68	**Comments**
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**10.22**	

Major Basin: 01

ID: 1545 Cross Section ID: RAS RESULTS-1546

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	2.40	1.30	3.12	Lacey
Local		1.30		
Bedform	3.07	1.30	3.99	Comments
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**10.53**	

Major Basin: 01

ID: 1604 Cross Section ID: RAS RESULTS-1605

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	2.40	1.30	3.12	Lacey
Local		1.30		
Bedform	2.15	1.30	2.80	Comments
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**9.34**	

Major Basin: 01

ID: 1704 Cross Section ID: RAS RESULTS-1704

Type	Calc (ft)	FS	Value (ft)	Method
Long Term		1.30		
General	2.40	1.30	3.12	Lacey
Local		1.30		
Bedform	.99	1.30	1.29	Comments
Low Flow	2.63	1.30	3.42	
Pressure Flow	0.00	1.30	0.00	
Headcut	-	1.30	-	
Tailcut	-	1.30	-	
Total			**7.83**	

Total Bed Material Discharge (FCD Hydraulics Design Manual, Equation 11.44)

$D_{15.9}$	0.176
D_{50}	1.462
$D_{84.1}$	5.110
G	5.901

HEC-RAS DATA (Existing)

Reach	River Sta	Profile	Flow Area (sq ft)	Max Chl Dpth (ft)	Vel Total (ft/s)	Hydr Depth (ft)	Mann Wtd Total	Average Width, W (ft)	Q_s (cfs)
Reach 1	1896	100yr	251.63	3.76	8.96	2.75	0.033	66.92	17.30
Reach 1	1836	100yr	163.39	2.42	13.8	2.14	0.036	67.52	141.81
Reach 1	1778	100yr	195.87	3.36	11.51	2.59	0.033	58.29	45.26
Reach 1	1725	100yr	186.34	3.27	12.1	2.39	0.031	56.98	50.36
Reach 1	1672	100yr	226.51	4.33	9.96	3.08	0.033	52.31	20.64
Reach 1	1614	100yr	193.84	4.14	11.63	2.49	0.03	46.82	32.50
Reach 1	1565	100yr	167.65	3.09	13.45	2.19	0.031	54.26	77.73
Reach 1	1520	100yr	170.03	2.75	13.26	2.18	0.032	61.83	88.23
Reach 1	1454	100yr	309.1	3.75	7.3	2.17	0.035	82.43	10.48
Reach 1	1370	100yr	117.5	2.73	19.19	1.91	0.032	43.04	315.53
Reach 1	1322	100yr	199.22	5.75	11.32	3.45	0.032	34.65	21.75
Reach 1	1275	100yr	147.88	4.3	15.25	2.22	0.029	34.39	75.02
Reach 1	1211	100yr	128.73	2.45	17.52	1.74	0.033	52.54	282.27
Reach 1	1164	100yr	165.78	2.38	13.6	1.87	0.033	69.66	122.61
Reach 1	1078	100yr	227.06	4.41	9.93	3.03	0.032	51.49	19.08
Reach 1	990	100yr	155	2.91	14.55	2.12	0.032	53.26	114.47
Reach 1	892	100yr	178.9	3.07	12.6	2.43	0.032	58.27	64.56
Reach 1	771	100yr	185.42	3.59	12.16	2.38	0.032	51.65	49.39
								Average	86.06

HEC-RAS DATA (Proposed)

Reach	River Sta	Profile	Flow Area (sq ft)	Max Chl Dpth (ft)	Vel Total (ft/s)	Hydr Depth (ft)	Mann Wtd Total	Average Width, W (ft)	Q_s (cfs)
Reach 1	1928	100yr	251.63	3.76	8.96	2.75	0.033	66.92	17.30
Reach 1	1868	100yr	163.37	2.42	13.8	2.14	0.036	67.51	141.79
Reach 1	1810	100yr	197.97	3.28	11.39	2.55	0.033	60.36	45.00
Reach 1	1757	100yr	192.72	3.47	11.7	2.72	0.033	55.54	45.61
Reach 1	1704	100yr	314.26	4.38	7.18	2.3	0.032	71.75	7.12
Reach 1	1605	100yr	180.01	4.38	12.53	3.55	0.033	41.10	41.89
Reach 1	1546	100yr	149.51	3.59	15.08	2.97	0.034	41.65	105.11
Reach 1	1462	100yr	155.64	3.88	14.49	2.87	0.034	40.11	86.09
Reach 1	1391	100yr	149.3	3.62	15.1	2.6	0.034	41.24	108.95
Reach 1	1341	100yr	155.21	3.45	14.53	2.03	0.034	44.99	108.40
Reach 1	1302	100yr	192.26	4.43	11.73	2.54	0.031	43.40	32.93
Reach 1	1263	100yr	217.7	5.56	10.36	3.26	0.031	39.15	16.12
Reach 1	1218	100yr	163.03	4.91	13.83	2.81	0.03	33.20	46.98
Reach 1	1137	100yr	140.97	4.38	16	2.49	0.03	32.18	88.63
Reach 1	1045	100yr	138.04	4.08	16.34	2.95	0.034	33.83	121.02
Reach 1	913	100yr	139.66	3.49	16.15	2.68	0.034	40.02	140.06
Reach 1	771	100yr	170.74	3.39	13.21	2.28	0.032	50.37	69.77
								Average	71.93

Appendix G Section 404 Certification

Section 404 Certification Form

CITY OF SCOTTSDALE

Before the City issues development permits for a project, the developer's Engineer or the property owner must certify that it complies with or is exempt from Section 404 of the Clean Water Act of the United States. Section 404 regulates the discharge of dredged or fill material into a wetland, lake (including dry lakes), river, stream (including intermittent streams, ephemeral washes and arroyos) or other waters of the United States.

Prior to submittal of improvement plans to Project Review, this form must be completed (and submitted with the improvement plans) as evidence of compliance.

Certification of Section 404 Permit Status:

Owner's Name: Desert Mountain Phone No.: _____

Project Name/Description: Renegade Clubhouse Case No.: 1018PA2020

Project Location/Address: 38580 N Desert Mountain Parkway, Scottsdale, AZ 85262

A registered Engineer or the property owner must check the applicable condition and certify by signing below that:

1. **Section 404 does apply to the project because there will be a discharge of dredged or fill material to waters of the U.S., and:**

   ☐ A Section 404 Permit has already been obtained for this project.

   or

   ☑ This project qualifies for a "Nationwide Permit," and this project will meet all terms and conditions of the applicable nationwide permit.

2. **Section 404 <u>does not</u> apply to the project because:**

   ☐ No watercourse waters of the U.S. exist on the property.

   ☐ No jurisdictional waters of the U.S. exist on property. Attached is a copy of the COE's Jurisdictional Determination.

   ☐ Watercourses or other waters of the U.S. do exist on the property, but the project will not involve the discharge of dredged or fill material into any of these waters.

Registered Professional Engineer (Civil) CERTIFICATE NO. 36372 BYRON L. DIXON Date Signed 04/14/2021 ARIZONA, U.S.A.

I certify that the above statement is true.

Byron Dixon

Digitally signed by Byron Dixon
DN: C=US, E=bdixon@@gfnet.com, O="Gannett Fleming, Inc", OU=Construction Services, CN=Byron Dixon
Reason: I agree to the terms defined by the placement of my signature on this document
Date: 2021.04.14 11:45:41-07'00'

Engineer's Signature and Seal, or Owner's Signature

04/14/2021

Date

Title/ Company

Planning and Development Services

7447 E Indian School Road, Suite 105, Scottsdale, AZ 85251 • www.ScottsdaleAZ.gov

Appendix H Warning and Disclaimer of Liability

GRADING & DRAINAGE LANGUAGE

WARNING AND DISCLAIMER OF LIABILITY

The City's Stormwater and Floodplain Management Ordinance is intended to minimize the occurrence of losses, hazards and conditions adversely affecting the public health, safety and general welfare which might result from flooding.
The Stormwater and Floodplain Management Ordinance identifies floodplains, floodways, flood fringes and special flood hazard areas. However, a property outside these areas could be inundated by floods. Also, much of the city is a dynamic flood area; floodways, floodplains, flood fringes and special flood hazard areas may shift from one location to another, over time, due to natural processes.

WARNING AND DISCLAIMER OF LIABILITY

The flood protection provided by the Stormwater and Floodplain Management Ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Floods larger than the base flood can and will occur on rare occasions. Floodwater heights may be increased by constructed or natural causes. The Stormwater and Floodplain Management Ordinance does not create liability on the part of the city, any officer or employee thereof, or the federal, state or county government for any flood damages that result from reliance on the Ordinance or any administrative decision lawfully made thereunder.

Compliance with the Stormwater and Floodplain Management Ordinance does not ensure complete protection from flooding. Flood-related problems such as natural erosion, streambed meander, or constructed obstructions and diversions may occur and have an adverse effect in the event of a flood. You are advised to consult your own engineer or other expert regarding these considerations.

I have read and understand the above.

1018-PA-2020		4.14.21
Plan Check #	Owner	Date

Appendix I Relevant Language from Desert Mountain Golf Course Easement

86-153894

PROP RSTR (RS)

293

When recorded return to:

Fennemore, Craig, von Ammon,
Udall & Powers
1700 First Interstate Bank Plaza
100 West Washington Street
Phoenix, AZ 85003
Attention: PFS

462

DECLARATION OF COVENANTS, CONDITIONS, RESTRICTIONS

AND EASEMENTS

FOR

DESERT MOUNTAIN PHASE I

86-153894

DECLARATION
OF
COVENANTS, CONDITIONS, RESTRICTIONS AND EASEMENTS
FOR
DESERT MOUNTAIN PHASE I

TABLE OF CONTENTS

86-153894

provided, however, the easement granted in this sentence shall automatically terminate and be of no further force and effect at such time as the improvements defined by the underlying permanent easement are complete and accepted by Developer and the City or any utility company having the right of approval thereof.

4.2 Use of Common Areas. Except for the use limitations provided in Section 4.3, each Owner shall have the nonexclusive right to use the Common Areas in common with all other Owners as required for the purposes of access and ingress to and egress from (and use, occupancy and enjoyment of) any Lot owned by such Owner or Common Areas available for the use of said Owner. Such right to use the Common Areas for purposes of access and ingress and egress shall, subject to the Association Rules, extend to each Owner, Occupant and the agents, servants, tenants, family members and invitees of each Owner. This right to use the Common Areas shall be appurtenant to each respective Lot, subject to and governed by the provisions of this Declaration, the Articles, Bylaws and Association Rules and such reasonable limitations and restrictions as may from time to time be contained therein.

4.3 Exclusive Use Rights. Certain portions of the Common Areas may be reserved by the Board for the exclusive control, possession and use by the Owner of a Lot or the Owners of more than one but fewer than all Lots. If such an area serves as access to and from two or more Lots, the Owners of the affected Lots shall have joint control, possession and use of such portion of said area as reasonably serves the Lots. The exclusive use rights created herein are subject to the blanket utility easement, maintenance, and architectural and landscape control provisions contained in this Declaration and to such reasonable rules and regulations with respect to possession, control, use and maintenance as the Association may from time to time promulgate. Easements are hereby created in favor of and running with each Lot having such an area for the exclusive control and use of each such area. Each Owner, by accepting title to a Lot, and each Member shall be deemed to have further ratified the easements and rights to exclusive use created by this Section 4.3.

4.4 Wall or Fence Easement. There is hereby created an affirmative easement in favor of the Association and the Master Association, their employees and agents, upon, over and across each Lot affected for reasonable ingress, egress, installation, replacement, maintenance and repair of a perimeter wall, fence or other boundary control for the Property and/or Desert Mountain.

4.5 Golf Course Easement. There are hereby created nonexclusive easements appurtenant to the property described on Exhibit "C" hereto for the benefit of Developer or other owners thereof and individuals permitted to use the Golf Club Facilities, and any employees, agents, contractors and invitees (including without limitation tournament galleries) of Developer or other owners of said property, or any one else performing services or having obligations with respect to the operation, maintenance or administration of the Golf Club Facilities to go upon or over the areas designated on the Plat as Golf Course Easements during and in the course of play on, or other permitted use of, the Golf Club Facilities, and for the purpose of construction, maintenance and repair of the Golf Club Facilities and related improvements; provided, however, that no permanent improvements in or alterations of the Lots

within said easements shall be made or allowed other than: (a) the establishment and maintenance of "out-of-bounds" markers or signs consistent with those utilized elsewhere in connection with the Golf Club Facilities; (b) golf course improvements such as fairways, bunkers, traps, transitional areas between golf course and desert, and the like; and, (c) underground water, cable or utility lines for use in connection with the Golf Club Facilities. During tournament play, special events or other times designated by Developer or other owner of the Golf Club Facilities, temporary cables, including television and radio transmission cables and electrical service lines, and other temporary facilities or structures may be located, maintained and used by Developer or other owner of the Golf Club Facilities in areas designated as Golf Course Easements to facilitate the conduct of such events or to accommodate galleries; provided, however, that any damage to a Lot resulting from such use, unless otherwise repaired, shall be repaired by the Association at its expense. All areas of the easements within any out-of-bounds stakes or consisting of other than natural desert may be maintained by the Master Association or Developer or other owner of the Golf Club Facilities rather than the Owner at the election of Developer or other owner of the Golf Club Facilities. Nothing shall be placed, maintained or constructed in the Golf Course Easements by any Owner or which shall interfere with use thereof as a playable part of the golf course.

4.6 Developer Easement. There is hereby created an affirmative, nonexclusive easement in favor of Developer and appurtenant to portions of the Property owned by Declarant (as trustee for Developer) or Developer, the property described on Exhibit "B", and any Annexation Property, for ingress and egress over all Common Areas, including without limitation Private Streets, and for the right to go over, under and across, and to enter and remain upon all Common Areas for all purposes reasonably related to Developer's rights and obligations hereunder and to the development, operation, maintenance, advertisement and sale or rental of the portions of the Property, the property described on Exhibit "B", and any Annexation Property owned by Declarant (as trustee for Developer) or Developer. The easement created in this Section 4.6 shall continue until the day on which title to the last Lot in the Property owned by either Declarant (as trustee for Developer) or Developer is conveyed to a third party for value, other than as security for performance of an obligation.

4.7 Master Association Easement. There is hereby created an affirmative, nonexclusive easement in favor of the Master Association for ingress and egress over all the Property for the purpose of enabling the Master Association and its contractors, employees, representatives and agent to implement the provisions of the Master Declaration.

4.8 Easements Appurtenant. There is hereby created on, over and under the Private Streets easements appurtenant to the property described on Exhibits "B" and "C" hereto for ingress and egress and access to and from the various portions of said properties and for installing, constructing, replacing, repairing, maintaining and operating all utilities and utility services (whether public or private), including without limitation all those utilities and services described in Section 4.1, to and from said properties to which the easements are appurtenant.

Contech Engineered Solutions LLC
12550 W Butler Drive.
El Mirage, AZ 85355
Phone: (602)377-5347

Tyler Moore
Gannett Fleming, Inc.
3838 N. Central Ave, Suite 1900
Phoenix, AZ 85012

Dec 3, 2021

Project: Desert Mountain- Renegade Clubhouse
Armorflex -Articulating Concrete Block (ACB)

Mr. Moore,

Contech has reviewed the proposed flow conditions of the channel that will be constructed as part of this project. The maximum calculated velocity in the channel during the 100 year event is 16.3 feet/second (fps), see Table 5 below. The manufacturers recommended block for this project is class 50-L. The testing data provided for this class of Armorflex is based on the performance of 40-L which is the smallest class block available (lowest performance). Testing summary for the class 40-L is shown below and provides adequate factors of safety up to 18.6 fps. The larger class 50-L provides greater performance (greater factor of safety) than class 40-L. The full summary of the class 40-L testing is attached for reference.

Table 5: Proposed Flow Conditions (100-year event)

Reach Station	Max Channel Depth (ft)	Velocity (fps)	Required Freeboard (ft)
1928	3.8	9.0	1.5
1868	2.4	13.8	1.5
1810	3.3	11.4	1.4
1757	3.5	11.7	1.4
1704	4.4	7.2	1.4
1605	4.4	12.5	1.7
1546	3.6	15.1	1.8
1462	3.9	14.5	1.8
1391	3.6	15.1	1.8
1341	3.5	14.5	1.7
1302	4.4	11.7	1.7
1263	5.6	10.4	1.8
1218	4.9	13.8	2.0
1137	4.4	16.0	2.1
1045	4.1	16.3	2.1
913	3.5	16.2	1.9
771	3.4	13.2	1.5

Table 3.1. Summary of Hydraulic Conditions, Armorflex™, Class 40-L.

Overtop depth (ft)	1	2	3
Discharge (ft^3/s)	6.0	24.0	50.5
Bed slope (ft/ft)	0.50	0.50	0.50
Energy slope (ft/ft)	0.422	0.460	0.337
Average depth (ft)	0.15	0.34	0.89
Average velocity (ft/s)	10.3	17.7	14.2
Maximum velocity (ft/s)	16.8	18.6	15.0
Maximum Shear Stress (lb/ft^2)	3.9	9.8	16.7
Manning's n value	0.026	0.028	0.056
Darcy f	0.15	0.13	0.38
Comments	Stable	Soil loss d/s S-6	Soil loss d/s S-3

Please let me know if you have further questions that Contech may be of assistance with.
Sincerely,

John Bacigalupi
Regional Bridge Consultant
Contech Engineered Solutions, LLC

Hydraulic Stability of the Armorflex™ Class 40-L Concrete Block Revetment System in Steep-Slope, High-Velocity Flow

Prepared for:

Armortec
309 Dishman Lane
Bowling Green, Kentucky 42101

AYRES ASSOCIATES
P.O. Box 270460
Fort Collins, Colorado 80527
(970) 223-5556, FAX (970) 223-5578

Ayres Project No. 34-0705.00
AT-40L.DOC

July 2000

1. INTRODUCTION

1.1 General

Ayres Associates was contracted by Armortec to carry out a hydraulic study program involving the installation and testing of the Armorflex™ class 40-L concrete block revetment system. The testing program was conducted during September 1999 within the Overtopping Flume (a.k.a., Tarbela Flume) on a 4-foot wide, 35-foot long section of earthen test embankment located at Colorado State University's (CSU) Engineering Research Center in Fort Collins, Colorado.

The class 40-L block is a preformed, interlocking concrete block system of a rectangular, open-cell construction. Physical characteristics of the blocks are discussed in more detail in Section 2.2.

The blocks were installed over a woven polypropylene geotextile. The geotextile was installed directly on the soil embankment. The Armorflex™ system was placed by hand according to procedures outlined by Armortec.

Personnel from the Civil Engineering Department at CSU constructed the earth embankment test section, installed the class 40-L system, and collected data throughout the course of the testing. Armortec personnel also assisted with product installation to ensure that the systems were placed and filled in accordance with typical construction specifications. Ayres Associates personnel supervised all phases of the testing program. Also, Ayres Associates conducted the hydraulic analysis and interpretation of test data required to develop the hydraulic performance thresholds and design values for the system described in this report.

The preparation of the soil used for the test embankment, construction of the earth embankment section, and installation of the revetment product followed the techniques outlined in Federal Highway Administration (FHWA) Report No. FHWA-RD-88-181, Minimizing Embankment Damage During Overtopping Flow, and Report No. FHWA-RD-89-199, Hydraulic Stability of Articulated Concrete Block Revetment Systems During Overtopping Flow. The conduct of the actual hydraulic tests, including data collection techniques, data analysis, and reporting also followed the research protocol established by these documents.

Key personnel involved in the study included:

Armortec:
Mr. Derek Dice

Ayres Associates:
Mr. Paul E. Clopper, P.E.
Mr. Michael Vielleux, P.E.

Colorado State University:
Dr. Chris Thornton, P.E.
Mr. Chad Lipscomb

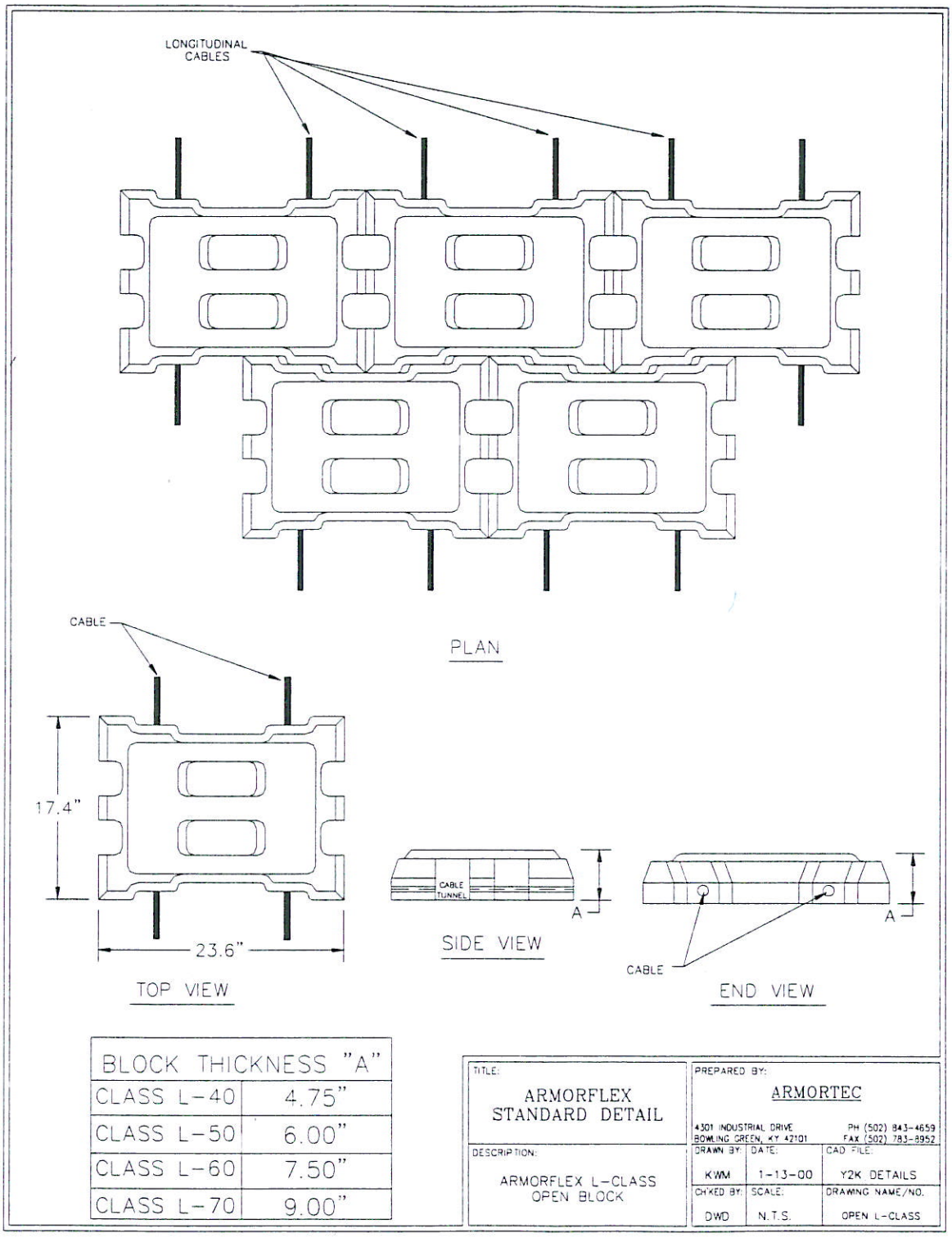


Figure 2.4. Block detail.

Table 3.1. Summary of Hydraulic Conditions, Armorflex™, Class 40-L.			
Overtop depth (ft)	1	2	3
Discharge (ft^3/s)	6.0	24.0	50.5
Bed slope (ft/ft)	0.50	0.50	0.50
Energy slope (ft/ft)	0.422	0.460	0.337
Average depth (ft)	0.15	0.34	0.89
Average velocity (ft/s)	10.3	17.7	14.2
Maximum velocity (ft/s)	16.8	18.6	15.0
Maximum Shear Stress (lb/ft^2)	3.9	9.8	16.7
Manning's n value	0.026	0.028	0.056
Darcy f	0.15	0.13	0.38
Comments	Stable	Soil loss d/s S-6	Soil loss d/s S-3

where:

Δz = height of projecting surface normal to the flow (ft)
w = width of projecting surface normal to the flow (ft)

The additional lift force due to the projecting block, F_L', is assumed equal to the additional drag force, F_D', as a conservative estimate. **Table 4.2** contains a summary of the equations used to determine the factor of safety for a projecting Armorflex™ block.

In order to solve the factor of safety equations, the following need to be known; ℓ_1, ℓ_2, ℓ_3, ℓ_4, ρ, Δz, w, V, λ, θ, τ_C, and τ_O. **Table 4.3** contains the values for the variables associated with the different classes of Armorflex™ concrete blocks.

Table 4.2. Factor of Safety Equations for Projecting Block.

$SF = \dfrac{\frac{\ell_2}{\ell_1}\cos\theta}{\sin\theta\cos\beta + \frac{\ell_2}{\ell_1}\eta' + \frac{\ell_3 F_D'}{\ell_1 W_s}\sin(\lambda+\beta) + \frac{\ell_4 F_L'}{\ell_1 W_s}}$	(4.34)
$\beta = \tan^{-1}\left[\dfrac{\cos\lambda}{\frac{M/N+1}{\eta}\frac{\ell_1}{\ell_2}\sin\theta + \sin\lambda}\right]$	(4.35)
$F_D' = 0.5\rho\Delta z w V^2$	(4.36)
$\eta = \dfrac{\tau_O}{\tau_C}$	(4.37)
$\eta' = \eta\left(\dfrac{M/N + \sin(\lambda+\beta)}{M/N+1}\right)$	(4.38)
$M/N = \dfrac{\ell_4}{\ell_3}$	(4.39)

Table 4.3. Factor of Safety Equation Variables. (1)

Block Class	Minimum Weight (lbs)	Buoyant Weight W_s (lbs)	ℓ_1 (ft)	ℓ_2 (ft)	ℓ_3 (ft)	ℓ_4 (ft)	w (ft)	τ_c at 0° (lbs/ft^2)
40-L	90	46.8	0.198	1.22	0.317	1.22	1.96	21.6 (2)
50-L	116	60.3	0.25	1.22	0.4	1.22	1.96	24.0
60-L	144	74.9	0.313	1.22	0.5	1.22	1.96	27.4
70-L	173	90.0	0.375	1.22	0.6	1.22	1.96	30.4

NOTES: (1) Block orientation assumes long axis parallel to flow, consistent with flume testing.
(2) Critical shear stress for tested block 40-L based on measured weight of 96.8 lbs.

5. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Summary

Armorflex™ class 40-L was tested under full-scale, controlled hydraulic conditions to determine the threshold hydraulic stress level for stability in high-velocity, unidirectional flow conditions. Installation and testing of the system at a nominal longitudinal bed slope of 2H:1V was conducted to investigate the stability characteristics, modes of failure, and hydraulic conditions at the stability threshold. The test embankment consisted of highly erodible, silty, clayey sand with low plasticity and a geotextile fabric installed on the embankment. In general, this testing program resulted in a determination that the system exhibited some local areas of soil erosion and loss of intimate contact during the 2' and 3' overtopping tests.

5.2 Conclusions

Specific conclusions derived from the Armorflex™ 40-L full-scale hydraulic testing program are as follows:

1. During the 3-foot overtopping test, the system successfully withstood a maximum shear stress of 16.7 lb/ft^2 with a velocity corresponding to this stress level of approximately 15 ft/s. However, a maximum velocity of 18.6 ft/s was measured during the 2-ft overtopping test.

2. The effect of high tailwater, as in the case of a submerged hydraulic jump which can occur on the downstream slope of the embankment, was not investigated.

3. As tested, stability limits derived from this testing program relate to systems placed on the bed of a steeply sloped channel or spillway. Systems placed on the side slopes of steeply sloped sections will be less stable. Although this aspect was not addressed directly in the physical testing program, quantitative analysis is readily accomplished using established and accepted hydraulic analysis procedures (the "Factor of Safety" method).

5.3 Recommendations

The following recommendations are made, based on the observations and results of the Armorflex™ hydraulic testing program and subsequent hydraulic analyses:

1. The maximum shear stress values reported herein represent stable conditions for the system tested. Heavier systems can be expected to exhibit even higher permissible stress levels for purposes of design. Performance parameters for thicker classes of the open-cell Armorflex "L" series have been estimated using a force-balance approach and have been provided in this report.

2. Maximum permissible values of shear stress and velocity should be reduced when systems are placed on a sideslope. Likewise, values should be reduced when irregular subgrade conditions, imprecise placement, or differential settlement is anticipated. The Factor of Safety design procedure provides a method for incorporating these variables to the extent that they can be predicted.