PRELIMINARY DRAINAGE REPORT

Residential Healthcare Facility

90th Street and Raintree Drive
Scottsdale, AZ 85260

Prepared For:

GREYSTAR™
The Global Leader in Rental Housing

3200 E. Camelback Road, Suite 225
Phoenix, AZ 85018

Plan # 4-DR-2021
Case # _____
Q-S # _____
X Accepted
____ Corrections
03/04/2021
Reviewed By Date

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Project Number: 200626

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Case No.: 16-ZN-2020 **Plan Check No.: TBD**

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1. INTRODUCTION

This Preliminary Drainage Report represents the storm water analysis for a proposed Residential Healthcare Facility located in Scottsdale, Arizona. The purpose of this report is to provide the hydrologic and hydraulic analysis, required by the City of Scottsdale, to support the proposed site plan for said development. This report includes discussions and calculations defining the storm water management concepts for the collection and conveyance necessary to comply with the drainage requirements of the City of Scottsdale and Maricopa County. Preparation of this report has been completed in accordance with the requirements of the City of Scottsdale Design Standards & Policies Manual (DS&PM) 2018 [1], and the Drainage Design Manuals for Maricopa County, Arizona, Volumes I[2] and Volume II[3].

2. LOCATION AND PROJECT DESCRIPTION

2.1 LOCATION:

The subject property consists of land located at the northwest corner of 90th Street and Raintree Circle Drive in Scottsdale, AZ:

- A portion of the Northwest 1/4 of Section 7, Township 3 North, Range 5 East of the Gila and Salt River Base and Meridian, Maricopa County, Scottsdale, Arizona.
- Parcel ID: Parcel 217-15-033.

Refer to **FIGURE 1** - **Vicinity Map** for the project's location with respect to major cross streets.

2.2 EXISTING AND PROPOSED DEVELOPMENTS SURROUNDING THE SITE:

- South: The site is bound by Raintree Circle Drive with the following across as follows:
  Parcel 217-15-952; The Robinson Group; Zoning is I-1
  Parcel 217-15-953; Wood Trust Bank; Zoning is I-1
  Parcel 217-15-954; Epstein Schneider; Zoning is I-1
  Parcel 217-15-955; GHA Technologies, Inc; Zoning is I-1
  Parcel 217-15-944; Loanpal; Zoning is C-2
- North: Parcel 217-15-036E; Alliance Defending Freedom. 217-15-036J; Vanguard. Zoning is I-1.
- East: Directly adjacent is 90th Street. Across is a residential development; Zoning is R1-7
- West: Parcel 217-15-035A; Undeveloped; Zoning is I-1; Raintree & Pima Self Storage Partners LLC.

2.3 EXISTING SITE DESCRIPTION:

The project area includes approximately 203,311 sf. (4.67 acres) of land designated as R1-35 zoning. The proposed project will be a Residential Healthcare Facility and therefore will be rezoned to Commercial Office (C-O). The existing site consists of an undeveloped parcel. Per Topographic Survey prepared by AW Land Surveying LLC, a majority of the site slopes from northwest to southeast, while the western most portion flows from northeast to southwest at approximately 1.0%. Elevation varies from approximately 1480.66 at the northwest corner to approximately 1476.82 at the southeast corner.

Refer to **FIGURE 2** for an aerial map of the site.

2.4 PROPOSED SITE DEVELOPMENT:

The proposed development consists of a new residential healthcare facility with three and four story components, parking, and a common area with a pool. Refer to **Appendix III** - Preliminary Grading Plan for site layout.

2.5 FLOOD HAZARD ZONE:

FIRM Map Number 04013C1760L dated October 16, 2013 indicates the site is designated as Zone "X-Shaded", corresponding to 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.

Refer to **FIGURE 3** for the current FIRM map.

3. EXISTING DRAINAGE CONDITIONS

3.1 OFF-SITE DRAINAGE PATTERNS

The topographic survey and city quarter section maps, **FIGURES 4 and 5**, provide the following information for offsite drainage:

- **North:**
  - Parcels 217-15-036E and 217-15-036J are developed sites that retain their onsite runoff. The existing curb and gutter along the northwest portion of the property line and the existing retention basin along the northeast portion of the property boundary maintain runoff from northern parcels and do not affect the proposed site.
  - There is an existing 24" RGRCP storm pipe discharging onto the northeast corner of the site via a headwall (EX HW-1). This system conveys runoff from 90th Street and restricted discharge for a retention basin from the Raintree Corporate Center approximately 650' north. The flow discharging to the site is currently unknown. According to the Scottsdale Corporate Center, Phase 2 Grading Plan, CASE #86-DR-87, the existing 24" pipe has a slope of 0.005 ft/ft, assuming full capacity of the pipe, the maximum flow discharging to the site is 16 cfs.
- **West:**
  - There is a ridgeline within the west portion of the subject property that directs flows northeast to southwest prohibiting runoff from the western adjacent parcel from entering the site.
- **South:**
  - There is an elevation difference of +/- 3 feet from north to south throughout the site, as such, offsite drainage from the southern parcel does not affect the site.
- **East:**
  - There is an existing catch basin at 90th Street that drains to the property, approximately 60' north of the southeast corner of the site. A second catch basin is located on the northbound side of 90th Street. According to the Storm QS map 34-49, both basins are connected by a pipe of unknown size and material and discharge onsite though the existing headwall, EX HW-2. The calculated runoff from 90th Street was determined using the rational method based on the estimated drainage area. Refer to **Appendix II** for Existing Conditions Drainage Area Map.
  -

Table 1: Offsite Flows Summary		
Headwall ID	Description	Flow (CF)
EX-HW-1	24" RCP capturing runoff from north parcels	16.00
EX-HW-2	24" RCP capturing runoff from 90th Street	6.20
	TOTAL:	**22.20**

The offsite runoff from the north and from 90th Street exit the site through a headwall located near the southeast corner of the site, EX HW-3. Considering runoff from the offsite flows specified above and including an additional flow of 3.4 cfs from drainage area EX-1, the estimated flow, $Q_{out,}$ leaving EX. HW-3 is 25.60 cfs. Refer to **Appendix II** for Offsite Existing Conditions Drainage Area Map.

3.2 ON-SITE DRAINAGE PATTERNS

The site is currently undeveloped and slopes from northwest to southeast at approximately 0.5%. Elevation varies from approximately 1480.66 at the northwest corner to approximately 1476.82 at the southeast corner. All existing on-site runoff is assumed to sheet flow following the natural slope of the land. Existing drainage area EX-3 at the west of the site drains to HO-3 located exactly at the southwest corner of the property, where the corresponding flow of 3.1 cfs exits the site. EX-2 ultimately drains to HO-2 at the south boundary of the site with a flow of 9.6 cfs. As described above, drainage for EX-1 is provided by HO-1, where an estimated 25.60 cfs leave the site through existent headwall EX-HW-3 that connects to the public storm drain system.

4. PROPOSED STORM WATER MANAGEMENT

4.1 DESIGN INTENT:

On-site run-off from the east will be captured by catch basins directing flows to two above-ground retention basins. On-site runoff from the west will be directed to an underground CMP storage system located in the northeastern portion of the site. Three proposed drywells will treat and discharge captured stormwater runoff within 36 hours.

Refer to **Appendix II** for **Proposed Conditions Drainage Area Map.**

The site will be self-retaining for the 100-year, 2-hr storm event. Existing offsite drainage patterns will remain unchanged. Flows from Existing Headwall 1 (EX-HW-1) and Existing Headwall 2 (EX-HW-2) will be rerouted to the existing storm drain manhole (EX-MH-2) on the northwest corner of 90th Street and Raintree Circle Drive via a 24" storm pipe. Pipe hydraulic calculations were performed to size and design the required slopes for the pipes rerouting offsite flows.

Refer to **Appendix II** for **Offsite pipe hydraulic calculations**

Refer to **Appendix III** for **Preliminary Grading and Drainage Plan.**

4.2 DESIGN STORM REQUIREMENTS:

In accordance with The City of Scottsdale requirements, stormwater storage for a 100-year 2-hour storm event is required.

4.3 LAND CHARACTERISTICS:

The proposed development consists of a multi-story commercial building with a main drive and minor landscape areas along the perimeter. Based on the DS&PM, the weighted runoff coefficient for a 100-year storm event used is as follows:

- C=0.95 for paved streets, parking lots (concrete or asphalt), roofs, driveways, etc.
- C=0.45 for undisturbed natural desert or desert landscaping (no impervious weed barrier).

HYDROLOGIC ANALYSIS: The hydrologic analysis is determined using the procedures in The City of Scottsdale Design Standards & Policies Manual and the Drainage Design Manual for Maricopa County, Arizona, Volume I. The Rational Method was utilized to compute the on-site peak discharges. The Rational Method equation is displayed as shown below:

$Q=C_{wt}IA$

Where: C_{wt} = The runoff coefficient relating runoff to rainfall
I = Average rainfall intensity in inches/hour, lasting for Tc
Tc = The time of concentration (Using Five minutes for the developed areas)
A = The contributing drainage area in acres
Q= Estimated peak discharge at inlet point, cfs.

Refer to the **Proposed Conditions Drainage Area Map** and Calculations in **Appendix II**.

4.4 STORMWATER RETENTION:

Based on a topographic survey there is no retention provided in existing conditions. Per the above equation, the proposed development storage requirements for the 100-yr, 2-hr storm event are shown below. A combination of underground stormwater storage tanks and open retention basins will be employed to retain the required stormwater volume. In the case of the open retention basins, an equalizer pipe will be installed between both basins to combine their retention capacity.

4.4.1 STORAGE REQUIRED:

Stormwater storage required for the 100-year, 2-hour event is calculated in accordance with The City of Scottsdale - DS&PM. Required Retention (Acre-Feet) $V_R = (P/12)*A*C$

Where: P = 100-yr, 2-hr precipitation in inches (Ref: Isopluvial from DS&PM, Appendix 4-1D, pg.11 and NOAA Atlas 14 table). According to this reference, P = 2.27 in for the site location. Refer to **Appendix I** for rainfall data.

Based on the weighted runoff coefficient (Cwt) identified in Section 4.3, the following retention is required:

Basin A (Open Retention): 1.42 ac @ Cwt= 0.73

- 100-yr 2-hr.:

  V_R = 2.27/12 * 1.42 * 0.73 = **0.19 ac.ft. (8,637 c.f.) REQUIRED STORAGE**

Basin B (Underground Storage): 3.28 ac @ Cwt= 0.86

- 100-yr 2-hr.:

  V_R = 2.27/12 * 3.28 * 0.87 = **0.53 ac.ft. (23,160 c.f.) REQUIRED STORAGE**

4.4.2 STORAGE PROVIDED:

The proposed retention consists of two open retention basins (Retention Basin A) and two connected 10-ft diameter corrugated metal pipes (Retention Basin B).

Retention A is proposed as an equalized hydraulic system, connecting both open retention basins with an 18" HDPE pipe at an elevation of 77.50', one-foot above the bottom of basin. The system discharges to a drywell with rims located abive the bottom elevation of Basin A1. Equalizing the open retention basins provides additional retention volume to basin A2 that would otherwise not have sufficient storage capacity as an independent system.

- The proposed volume for the open retention was calculated using the area-sum method based on design contours.
- Storage volume of underground piping is calculated using $V_P = \pi(R^2) * L$. Table 2 summarizes the calculated volume provided and volume required and verifies that proposed basins are adequate to store the required volume for the 100-yr, 2-hr storm event.
  Refer to **Appendix II** for **Provided Storage Calculations**.

Table 2:

Proposed Retention Basin Summary

Basin		TYPE	Vp	Vp total	Vr
(ID)		(--)	(CF)	(CF)	(CF)
Basin A	Basin A1	OPEN	6,192	10,182	8,637
	Basin A2	OPEN	3,990		
Basin B		UG	25,133	25,133	23,160
			TOTAL	35,314	31,797

4.4.3 STORMWATER DISCHARGE:

For Basins with no direct bleed-off available, drywells are proposed for the on-site storage facilities to empty all basins within thirty-six (36) hours. The calculation is as follows:

- Minimum percolating rate of a drywell (for planning purposes) = 0.1 cfs
- Volume to be drained in 36 hours = 0.1 cfs * 36 hours * 3600 sec/hour = 12,960 cf = 0.298 acre-feet.

- Basin A retention provided = 10,702 cf
  Therefore, 10,702 cf / 12,960 cf per drywell = 0.83= 1 drywell required.
  Basin B retention provided
  Therefore, 25,133 cf / 12,960 cf per drywell = 1.93= 2 drywells required.
- The drywells are to be installed according to FCDMC guidelines.
- The number of drywells may be reduced if geotechnical testing for percolation rates determine adequate infiltration is available in the native soils at lower depths. If the percolation rate of the drywells is less than 0.1 cfs the number of drywells may have to be increased.

4.5 STORM DRAIN INLET CALCULATIONS

MAG 535 type "F" catch basins are proposed in the parking lot areas to capture on-site storm run-off. Nyloplast 2'x3' Steel Bar/MAG Grate and Nyloplast 18" will be used to capture flows from the curb openings at the southwest of the site.

- A MAG 535 catch basin can convey a flow of 4.95 cfs, while considering a clogging factor of 0.50. The proposed catch basin inlets can adequately convey runoff for the maximum 100-year, 5-min event, Q_{100} = **3.04 cfs (CB-3)**.
- The Nyloplast 2'x3' Steel Bar/MAG Grate Nyloplast catch basin can convey a flow of 6.75 cfs, while considering a clogging factor of 0.50. The proposed catch basin inlets can adequately convey runoff for the maximum 100-year, 5-min event, Q_{100} = **5.69 (CB-5)**.
- The 18" Nyloplast catch basin can convey a flow of 1.35 cfs, while considering a clogging factor of 0.50. The proposed catch basin inlets can adequately convey runoff for the maximum 100-year, 5-min event, Q_{100} = **0.96 (CB-4)**.

Table 3:

100-yr Runoff Calculation Summary

P=100-yr, 5-min=7.72 in/hr

Drainage Area ID	Area (acres)	C_w (-)	Intensity (in/hr)	Q (cfs)	Qtotal (cfs)	Structure ID	Structure Type	Capacity (cfs)
DA-1	0.40	0.84	7.72	2.59	2.59	CB-1A	MAG 535	4.95
DA-2	0.36	0.84	7.72	2.31	2.31	CB-1	MAG 535	4.95
DA-3	0.21	0.85	7.72	1.40	1.40	CO-1	Curb opening	-
DA-4	0.08	0.88	7.72	0.51	0.51	CO-2	Curb opening	-
DA-5	0.24	0.45	7.72	0.84	0.84	N/A	N/A	-
DA-6	0.21	0.87	7.72	1.41	1.41	CO-3	Curb opening	-
DA-7	0.16	0.45	7.72	0.54	0.54	N/A	N/A	-
DA-8	0.52	0.84	7.72	3.38	3.38	CO-4	Curb opening	-
DA-9	0.32	0.84	7.72	2.05	5.69	CB-6A	2' x 3' Nyloplast Steel Bar	6.75
DA-12	0.61	0.77	7.72	3.63				
DA-10	0.15	0.82	7.72	0.96	0.96	CB-5A	18" Nyloplast	1.35
DA-11	0.47	0.84	7.72	3.04	3.04	CB-4A	MAG 535	4.95
DA-13	0.97	0.95	7.72	7.11	7.11	R-1	Roof drain	-

4.6 STREET CAPACITY CALCULATIONS

Street capacity was verified using *Hydraflow Express Extension for Autodesk Civil 3D to* obtain the stormwater spread and depth at the edge of curb, ensuring at ultimate conditions, run-off will not overflow the street. CB-5 with the greatest flow of 6.16 cfs has a depth of 5.4" at the edge of curb under 100-yr, 2-hr ultimate conditions. All proposed inlets have a depth of less than 6" (curb height) evaluated at 100-yr, 2-hr ultimate conditions.

Refer to **Appendix II** for street capacity calculations for proposed inlets.

Table 4:

100-yr STREET CAPACITY SUMMARY									
P=100-yr, 5-min=7.72 in/hr									
Drainage Area ID	Area (acres)	C_w (-)	Intensity (in/hr)	Q (cfs)	Qtotal (cfs)	Structure ID	Structure Type	Depth at curb (in)	Spread (ft)
DA-1	0.40	0.84	7.72	2.59	2.59	CB-1A	MAG 535	3.5	8.53
DA-2	0.36	0.84	7.72	2.31	2.31	CB-1	MAG 535	3.2	14.51
DA-11	0.47	0.84	7.72	3.04	3.04	CB-4A	MAG 535	3.8	12.74

4.7 ADEQ WATER QUALITY REQUIREMENTS

The total disturbed area of this site is approximately 4.67 acres. The Arizona Department of Environmental Quality requires that any site disturbance over one acre is required to submit an NOI. An NOI will be submitted to ADEQ for this site prior to approval of construction documents as site disturbance for this project exceeds one acre.

5. FLOOD SAFETY FOR DWELLINGS

5.1 FINISHED FLOOR ELEVATIONS

This project lies in an "X-Shaded" Flood Zone. The ultimate outfall elevation for the site is 1479.72 and is located at the southeast corner of the site. Therefore, the proposed building finished floor elevations will be set a minimum of 12 inches above the 100-year high-water elevation of any adjacent streets and drainage paths and 14" above ultimate lot outfall. This will ensure that finished floor elevations will be set sufficiently above the 100-year water level so as to not be in danger of flooding during a 100 yr-2hr storm event.

6. CONCLUSIONS

6.1 OVERALL PROJECT:

1. The finish floor elevations will be designed a minimum of 12 inches above the 100-year water surface in adjacent streets and drainage paths and a minimum of 14 inches above the low top of curb of the lot.
2. All on-site storm water will be retained on-site and is provided for the 100-yr, 2-hr storm event with discharge within 36-hours. A combination of equalized underground tanks and open retention basins will be used to store the required stormwater volume.

6.2 PROJECT PHASING:

This project will be constructed in a single phase.

7. WARNING AND DISCLAIMER OF LIABILITY

GRADING & DRAINAGE

APPENDIX 4-1C

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.

Plan Check # _____ Owner _____ Date _____

From City of Scottsdale DPSM-2018. Page 219

8. REFERENCES

1. *Design Standards & Policies Manual, City of Scottsdale – January 2018*
2. *Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology, Flood Control District of Maricopa County, Fourth Edition, December 14, 2018*
3. *Drainage Design Manual for Maricopa County, Arizona, Volume II, Hydraulics, Flood Control District of Maricopa County, December 14, 2018*

FIGURE 1 – Vicinity Map

FIGURE 2 - Aerial

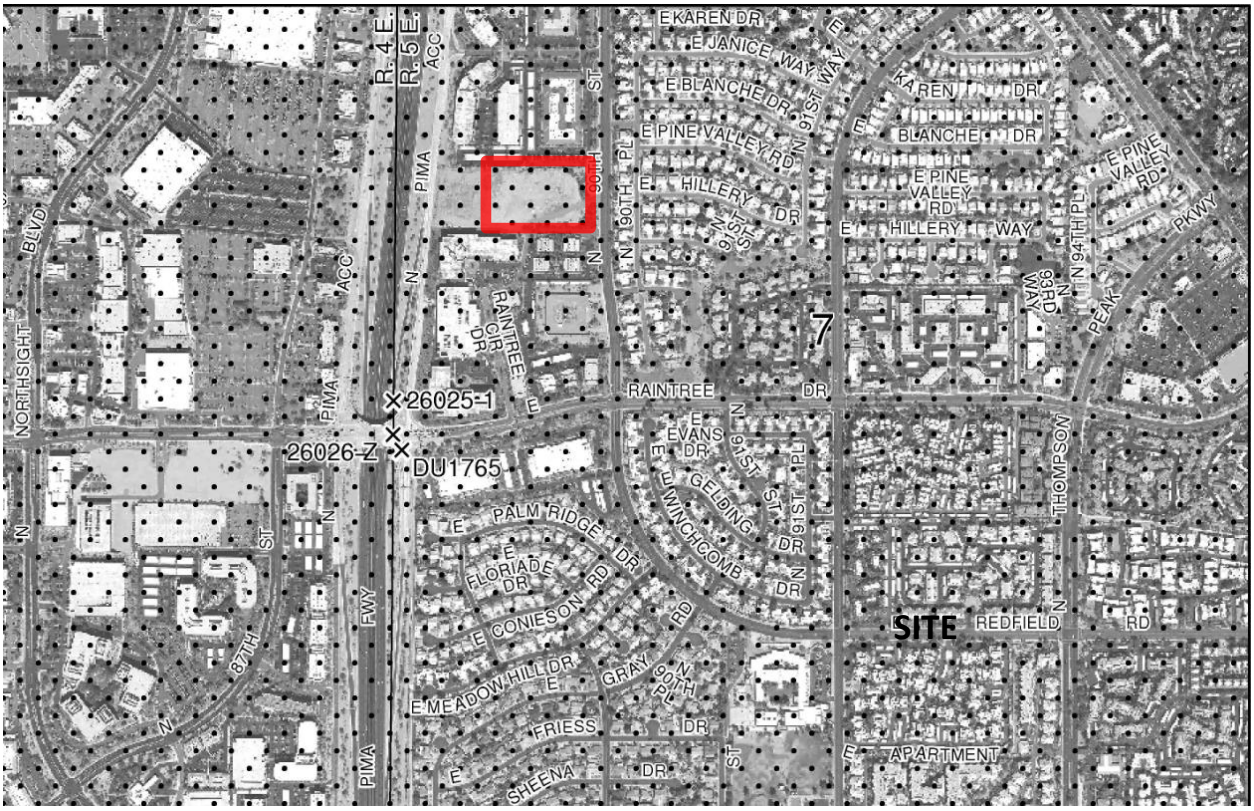


FIGURE 3 – FEMA FIRM

Excerpt from 04013C1760L

35-49

GENERAL NOTES:

- THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.
- THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER, 1991. BEARINGS ARE NAD 83 GRID AND DISTANCES ARE FLATTENED TO GROUND. WHERE NO CORNER WAS FOUND THE DIMENSIONS ARE GIVEN TO CALCULATED SECTION CORNERS AND ARE NOTED AS 'CALCULATED' ON THE MAP.

LEGEND:

FIGURE 4

VICINITY MAP

SCALE: 1" = 100'

0 50 100 200

The map scale of 1" = 100' is based on a full size print of 30" x 36"

STORM WATER

QUARTER SECTION MAP

34-49

NW 1/4 SEC. 7 T3N R5E

FIGURE 4

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

05-JUL-20

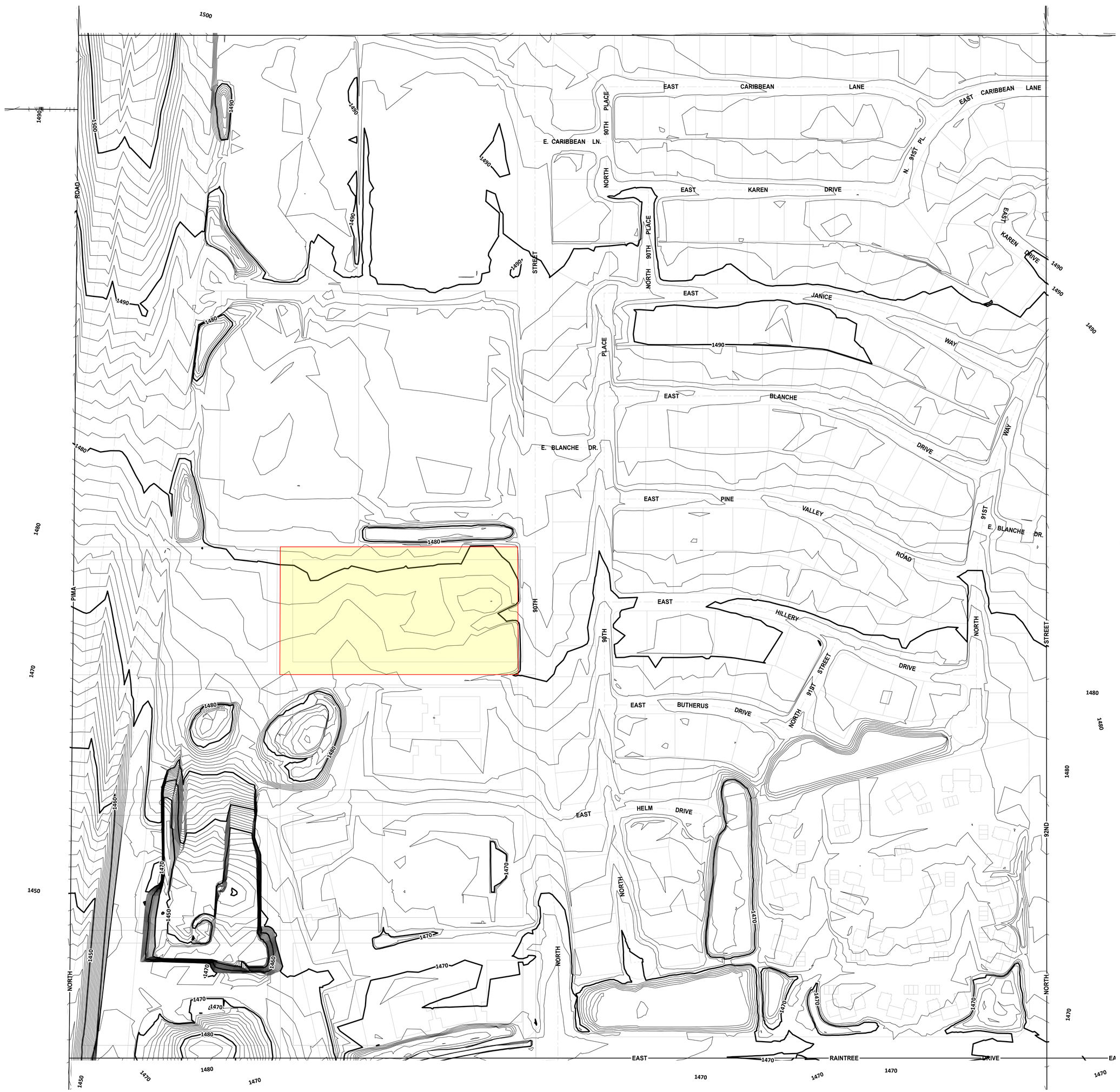
4-DR-2021
2/8/2021

35-49

34-48

34-50

33-49



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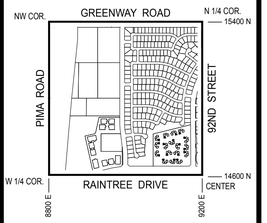
LEGEND:

VICINITY MAP



NORTH

SCALE: 1" = 100'

0 50 100 200

The map scale of 1" = 100' is based on a full size print of 30" x 36"

CONTOUR

QUARTER SECTION MAP

34-49

NW 1/4 SEC. 7 T3N R5E

FIGURE 5

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

28-APR-14

4-DR-2021
2/8/2021

APPENDIX I

Rainfall Data

NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.622°, Longitude: -111.888°
Elevation: 1481.65 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	**0.194** (0.161-0.238)	**0.253** (0.212-0.310)	**0.341** (0.283-0.417)	**0.410** (0.338-0.498)	**0.501** (0.406-0.607)	**0.571** (0.458-0.686)	**0.643** (0.506-0.772)	**0.714** (0.554-0.856)	**0.811** (0.613-0.974)	**0.885** (0.655-1.06)
10-min	**0.295** (0.245-0.362)	**0.385** (0.322-0.472)	**0.520** (0.431-0.634)	**0.623** (0.514-0.758)	**0.762** (0.618-0.924)	**0.868** (0.696-1.05)	**0.978** (0.771-1.18)	**1.09** (0.842-1.30)	**1.24** (0.933-1.48)	**1.35** (0.997-1.62)
15-min	**0.366** (0.304-0.448)	**0.478** (0.399-0.585)	**0.644** (0.533-0.786)	**0.772** (0.637-0.940)	**0.945** (0.766-1.15)	**1.08** (0.863-1.30)	**1.21** (0.955-1.46)	**1.35** (1.04-1.62)	**1.53** (1.16-1.84)	**1.67** (1.24-2.01)
30-min	**0.492** (0.409-0.603)	**0.643** (0.538-0.788)	**0.868** (0.718-1.06)	**1.04** (0.858-1.27)	**1.27** (1.03-1.54)	**1.45** (1.16-1.74)	**1.63** (1.29-1.96)	**1.81** (1.41-2.18)	**2.06** (1.56-2.48)	**2.25** (1.67-2.70)
60-min	**0.609** (0.506-0.746)	**0.796** (0.665-0.976)	**1.07** (0.889-1.31)	**1.29** (1.06-1.57)	**1.57** (1.28-1.91)	**1.79** (1.44-2.16)	**2.02** (1.59-2.43)	**2.25** (1.74-2.69)	**2.55** (1.93-3.06)	**2.78** (2.06-3.35)
2-hr	**0.713** (0.600-0.853)	**0.923** (0.780-1.11)	**1.23** (1.03-1.46)	**1.46** (1.21-1.74)	**1.78** (1.47-2.11)	**2.02** (1.64-2.39)	**2.27** (1.81-2.67)	**2.52** (1.98-2.97)	**2.86** (2.19-3.36)	**3.12** (2.34-3.69)
3-hr	**0.790** (0.666-0.969)	**1.01** (0.855-1.25)	**1.32** (1.11-1.62)	**1.57** (1.30-1.91)	**1.91** (1.56-2.31)	**2.19** (1.77-2.63)	**2.47** (1.96-2.96)	**2.77** (2.16-3.31)	**3.17** (2.40-3.80)	**3.50** (2.59-4.20)
6-hr	**0.953** (0.818-1.13)	**1.20** (1.03-1.43)	**1.53** (1.31-1.82)	**1.80** (1.52-2.12)	**2.16** (1.80-2.54)	**2.44** (2.00-2.85)	**2.73** (2.21-3.18)	**3.03** (2.41-3.54)	**3.43** (2.66-4.01)	**3.75** (2.84-4.39)
12-hr	**1.07** (0.922-1.26)	**1.35** (1.16-1.59)	**1.70** (1.46-2.00)	**1.98** (1.68-2.32)	**2.35** (1.98-2.75)	**2.64** (2.20-3.07)	**2.94** (2.41-3.41)	**3.24** (2.62-3.76)	**3.63** (2.87-4.24)	**3.94** (3.06-4.63)
24-hr	**1.25** (1.10-1.44)	**1.59** (1.40-1.83)	**2.05** (1.79-2.36)	**2.41** (2.11-2.78)	**2.93** (2.54-3.36)	**3.33** (2.86-3.82)	**3.75** (3.19-4.31)	**4.19** (3.53-4.81)	**4.80** (3.97-5.52)	**5.29** (4.31-6.10)
2-day	**1.35** (1.18-1.56)	**1.72** (1.50-1.99)	**2.26** (1.96-2.60)	**2.68** (2.33-3.08)	**3.27** (2.82-3.76)	**3.74** (3.19-4.29)	**4.23** (3.58-4.87)	**4.75** (3.98-5.47)	**5.46** (4.51-6.31)	**6.04** (4.91-7.01)
3-day	**1.45** (1.28-1.67)	**1.86** (1.63-2.13)	**2.45** (2.14-2.80)	**2.92** (2.55-3.34)	**3.59** (3.11-4.10)	**4.13** (3.55-4.71)	**4.70** (4.01-5.38)	**5.31** (4.48-6.09)	**6.16** (5.12-7.08)	**6.85** (5.63-7.91)
4-day	**1.56** (1.38-1.78)	**1.99** (1.76-2.27)	**2.64** (2.32-3.00)	**3.17** (2.78-3.60)	**3.91** (3.41-4.45)	**4.52** (3.92-5.14)	**5.17** (4.44-5.89)	**5.87** (4.99-6.70)	**6.85** (5.74-7.84)	**7.66** (6.34-8.81)
7-day	**1.76** (1.54-2.02)	**2.25** (1.97-2.58)	**2.98** (2.61-3.41)	**3.58** (3.12-4.09)	**4.43** (3.84-5.06)	**5.12** (4.41-5.85)	**5.86** (5.01-6.71)	**6.66** (5.63-7.64)	**7.78** (6.48-8.96)	**8.70** (7.16-10.1)
10-day	**1.91** (1.68-2.18)	**2.45** (2.15-2.79)	**3.24** (2.84-3.69)	**3.88** (3.39-4.41)	**4.79** (4.16-5.44)	**5.52** (4.76-6.27)	**6.30** (5.40-7.17)	**7.13** (6.05-8.13)	**8.30** (6.94-9.50)	**9.25** (7.64-10.6)
20-day	**2.36** (2.09-2.69)	**3.05** (2.69-3.46)	**4.03** (3.55-4.57)	**4.78** (4.19-5.42)	**5.79** (5.06-6.57)	**6.58** (5.72-7.47)	**7.39** (6.39-8.41)	**8.22** (7.06-9.38)	**9.34** (7.94-10.7)	**10.2** (8.61-11.8)
30-day	**2.78** (2.44-3.15)	**3.57** (3.15-4.06)	**4.72** (4.16-5.35)	**5.60** (4.92-6.33)	**6.78** (5.93-7.67)	**7.70** (6.70-8.71)	**8.64** (7.48-9.78)	**9.61** (8.26-10.9)	**10.9** (9.29-12.4)	**11.9** (10.1-13.6)
45-day	**3.24** (2.87-3.67)	**4.18** (3.70-4.73)	**5.52** (4.88-6.24)	**6.52** (5.75-7.37)	**7.85** (6.89-8.87)	**8.86** (7.75-10.0)	**9.90** (8.60-11.2)	**10.9** (9.45-12.4)	**12.3** (10.5-14.1)	**13.4** (11.4-15.4)
60-day	**3.60** (3.20-4.07)	**4.66** (4.13-5.25)	**6.14** (5.44-6.91)	**7.22** (6.38-8.14)	**8.64** (7.61-9.74)	**9.71** (8.51-11.0)	**10.8** (9.40-12.2)	**11.9** (10.3-13.4)	**13.3** (11.4-15.1)	**14.3** (12.2-16.4)

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

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

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

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PDS-based depth-duration-frequency (DDF) curves
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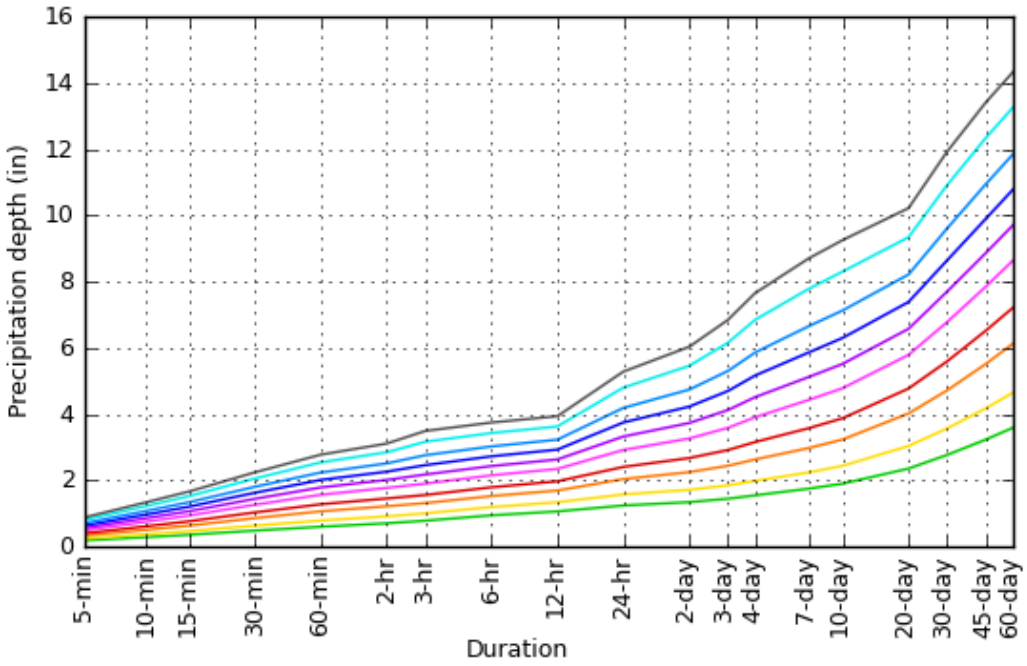

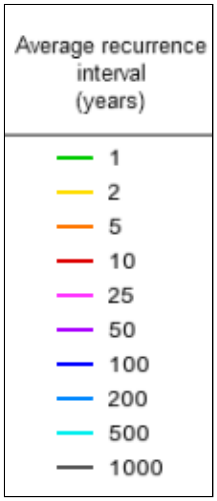

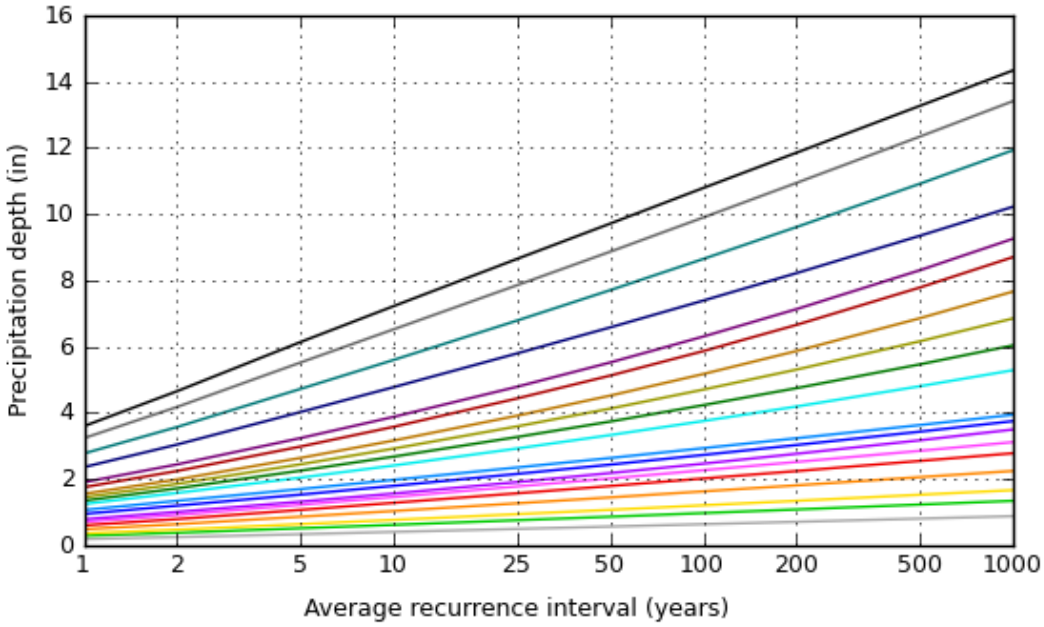

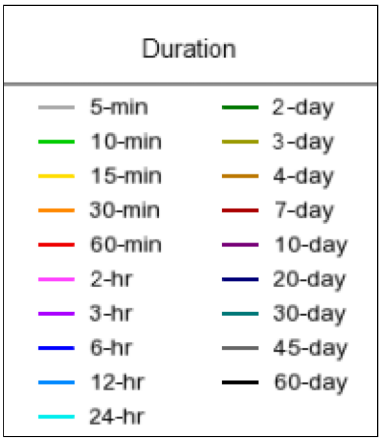

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NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.622°, Longitude: -111.888°
Elevation: 1481.65 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**2.33** (1.93-2.86)	**3.04** (2.54-3.72)	**4.09** (3.40-5.00)	**4.92** (4.06-5.98)	**6.01** (4.87-7.28)	**6.85** (5.50-8.23)	**7.72** (6.07-9.26)	**8.57** (6.65-10.3)	**9.73** (7.36-11.7)	**10.6** (7.86-12.8)
10-min	**1.77** (1.47-2.17)	**2.31** (1.93-2.83)	**3.12** (2.59-3.80)	**3.74** (3.08-4.55)	**4.57** (3.71-5.54)	**5.21** (4.18-6.27)	**5.87** (4.63-7.05)	**6.52** (5.05-7.82)	**7.41** (5.60-8.90)	**8.08** (5.98-9.72)
15-min	**1.46** (1.22-1.79)	**1.91** (1.60-2.34)	**2.58** (2.13-3.14)	**3.09** (2.55-3.76)	**3.78** (3.06-4.58)	**4.30** (3.45-5.18)	**4.85** (3.82-5.83)	**5.39** (4.18-6.46)	**6.12** (4.62-7.35)	**6.68** (4.94-8.03)
30-min	**0.984** (0.818-1.21)	**1.29** (1.08-1.58)	**1.74** (1.44-2.12)	**2.08** (1.72-2.53)	**2.54** (2.06-3.09)	**2.90** (2.33-3.49)	**3.27** (2.57-3.92)	**3.63** (2.81-4.35)	**4.12** (3.11-4.95)	**4.50** (3.33-5.41)
60-min	**0.609** (0.506-0.746)	**0.796** (0.665-0.976)	**1.07** (0.889-1.31)	**1.29** (1.06-1.57)	**1.57** (1.28-1.91)	**1.79** (1.44-2.16)	**2.02** (1.59-2.43)	**2.25** (1.74-2.69)	**2.55** (1.93-3.06)	**2.78** (2.06-3.35)
2-hr	**0.356** (0.300-0.426)	**0.462** (0.390-0.553)	**0.614** (0.516-0.732)	**0.730** (0.607-0.870)	**0.890** (0.733-1.05)	**1.01** (0.820-1.19)	**1.14** (0.906-1.34)	**1.26** (0.990-1.48)	**1.43** (1.10-1.68)	**1.56** (1.17-1.84)
3-hr	**0.263** (0.222-0.323)	**0.337** (0.285-0.415)	**0.440** (0.370-0.539)	**0.522** (0.434-0.635)	**0.636** (0.521-0.769)	**0.728** (0.588-0.874)	**0.822** (0.652-0.987)	**0.921** (0.718-1.10)	**1.06** (0.799-1.26)	**1.17** (0.861-1.40)
6-hr	**0.159** (0.137-0.189)	**0.201** (0.172-0.239)	**0.256** (0.218-0.303)	**0.300** (0.254-0.354)	**0.361** (0.301-0.423)	**0.407** (0.334-0.476)	**0.456** (0.369-0.532)	**0.506** (0.402-0.592)	**0.573** (0.444-0.669)	**0.627** (0.474-0.733)
12-hr	**0.089** (0.077-0.105)	**0.112** (0.096-0.132)	**0.141** (0.121-0.166)	**0.164** (0.140-0.192)	**0.195** (0.164-0.228)	**0.219** (0.182-0.255)	**0.244** (0.200-0.283)	**0.269** (0.217-0.312)	**0.302** (0.238-0.352)	**0.327** (0.254-0.385)
24-hr	**0.052** (0.046-0.060)	**0.066** (0.058-0.076)	**0.085** (0.075-0.099)	**0.101** (0.088-0.116)	**0.122** (0.106-0.140)	**0.139** (0.119-0.159)	**0.156** (0.133-0.180)	**0.175** (0.147-0.201)	**0.200** (0.166-0.230)	**0.220** (0.180-0.254)
2-day	**0.028** (0.025-0.032)	**0.036** (0.031-0.041)	**0.047** (0.041-0.054)	**0.056** (0.048-0.064)	**0.068** (0.059-0.078)	**0.078** (0.066-0.089)	**0.088** (0.075-0.101)	**0.099** (0.083-0.114)	**0.114** (0.094-0.132)	**0.126** (0.102-0.146)
3-day	**0.020** (0.018-0.023)	**0.026** (0.023-0.030)	**0.034** (0.030-0.039)	**0.041** (0.035-0.046)	**0.050** (0.043-0.057)	**0.057** (0.049-0.065)	**0.065** (0.056-0.075)	**0.074** (0.062-0.085)	**0.086** (0.071-0.098)	**0.095** (0.078-0.110)
4-day	**0.016** (0.014-0.019)	**0.021** (0.018-0.024)	**0.028** (0.024-0.031)	**0.033** (0.029-0.037)	**0.041** (0.036-0.046)	**0.047** (0.041-0.054)	**0.054** (0.046-0.061)	**0.061** (0.052-0.070)	**0.071** (0.060-0.082)	**0.080** (0.066-0.092)
7-day	**0.010** (0.009-0.012)	**0.013** (0.012-0.015)	**0.018** (0.016-0.020)	**0.021** (0.019-0.024)	**0.026** (0.023-0.030)	**0.030** (0.026-0.035)	**0.035** (0.030-0.040)	**0.040** (0.033-0.045)	**0.046** (0.039-0.053)	**0.052** (0.043-0.060)
10-day	**0.008** (0.007-0.009)	**0.010** (0.009-0.012)	**0.013** (0.012-0.015)	**0.016** (0.014-0.018)	**0.020** (0.017-0.023)	**0.023** (0.020-0.026)	**0.026** (0.022-0.030)	**0.030** (0.025-0.034)	**0.035** (0.029-0.040)	**0.039** (0.032-0.044)
20-day	**0.005** (0.004-0.006)	**0.006** (0.006-0.007)	**0.008** (0.007-0.010)	**0.010** (0.009-0.011)	**0.012** (0.011-0.014)	**0.014** (0.012-0.016)	**0.015** (0.013-0.018)	**0.017** (0.015-0.020)	**0.019** (0.017-0.022)	**0.021** (0.018-0.024)
30-day	**0.004** (0.003-0.004)	**0.005** (0.004-0.006)	**0.007** (0.006-0.007)	**0.008** (0.007-0.009)	**0.009** (0.008-0.011)	**0.011** (0.009-0.012)	**0.012** (0.010-0.014)	**0.013** (0.011-0.015)	**0.015** (0.013-0.017)	**0.017** (0.014-0.019)
45-day	**0.003** (0.003-0.003)	**0.004** (0.003-0.004)	**0.005** (0.005-0.006)	**0.006** (0.005-0.007)	**0.007** (0.006-0.008)	**0.008** (0.007-0.009)	**0.009** (0.008-0.010)	**0.010** (0.009-0.012)	**0.011** (0.010-0.013)	**0.012** (0.011-0.014)
60-day	**0.002** (0.002-0.003)	**0.003** (0.003-0.004)	**0.004** (0.004-0.005)	**0.005** (0.004-0.006)	**0.006** (0.005-0.007)	**0.007** (0.006-0.008)	**0.007** (0.007-0.008)	**0.008** (0.007-0.009)	**0.009** (0.008-0.010)	**0.010** (0.008-0.011)

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

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

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

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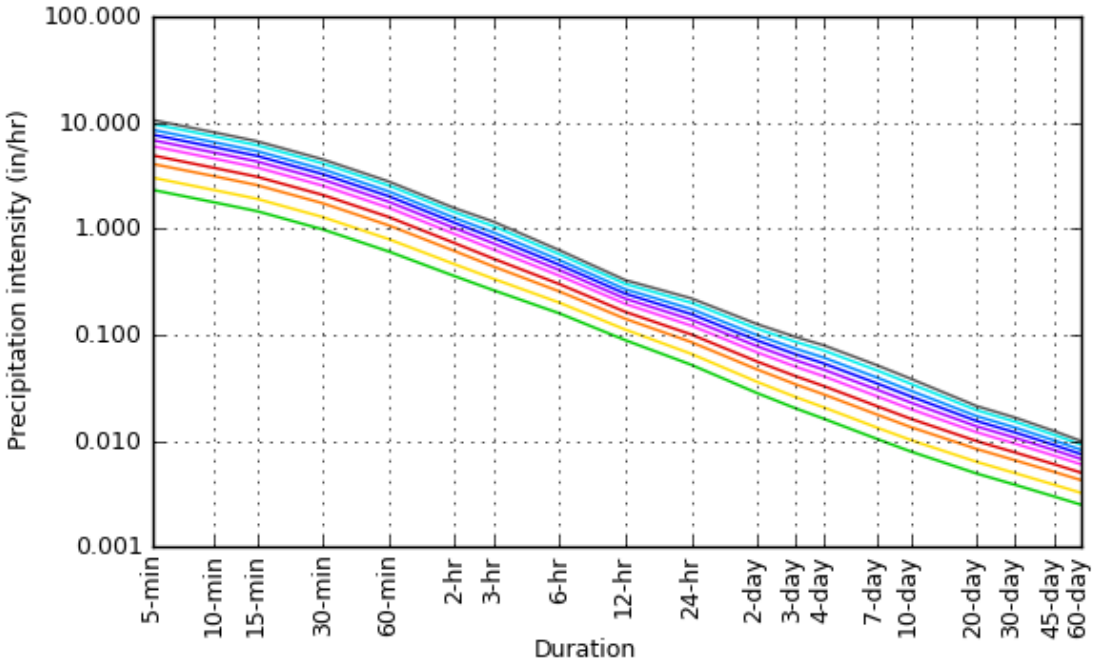
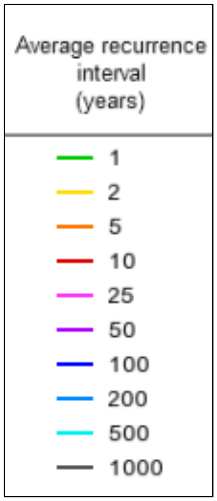
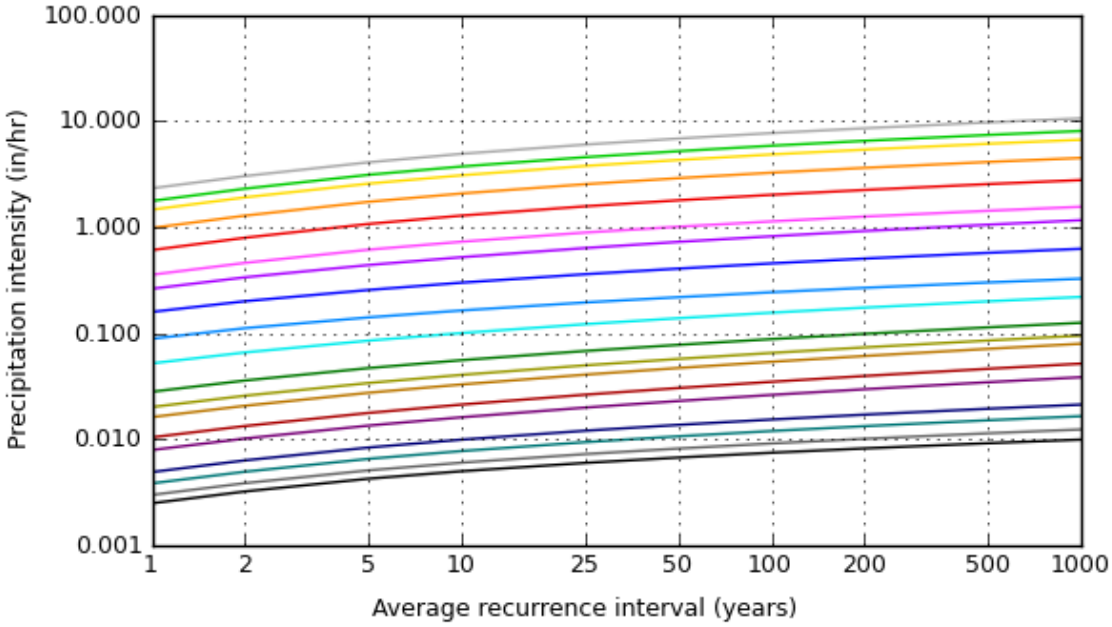
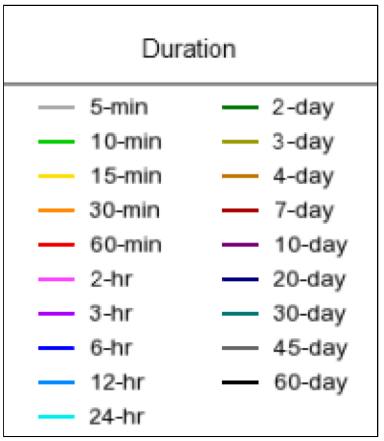
PDS-based intensity-duration-frequency (IDF) curves
Latitude: 33.6220°, Longitude: -111.8880°









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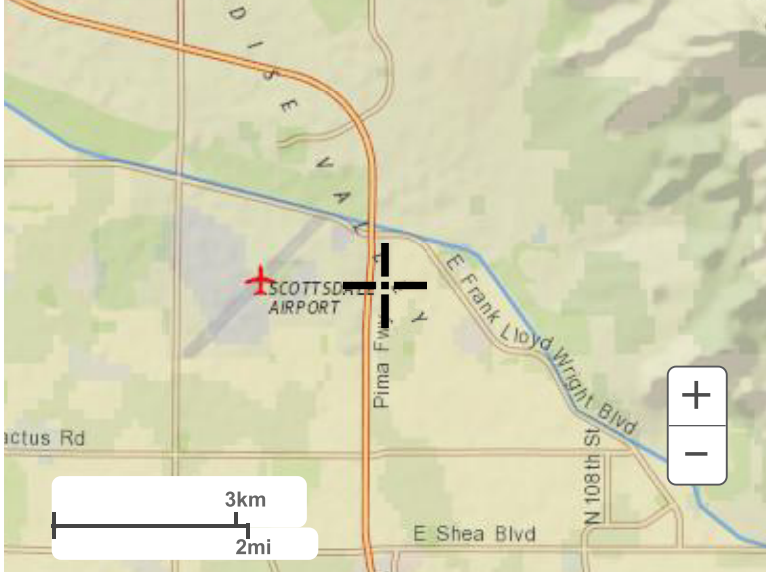
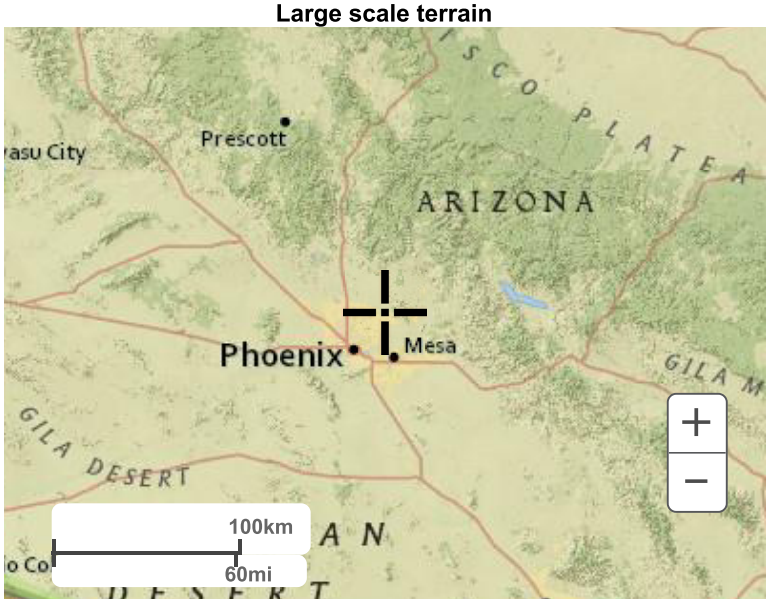
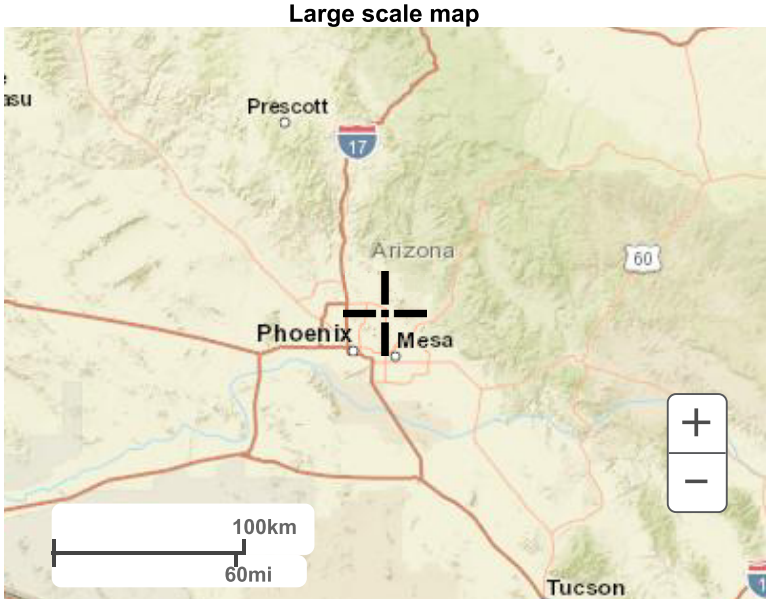


Large scale terrain



Large scale map



Large scale aerial

APPENDIX II

Calculations

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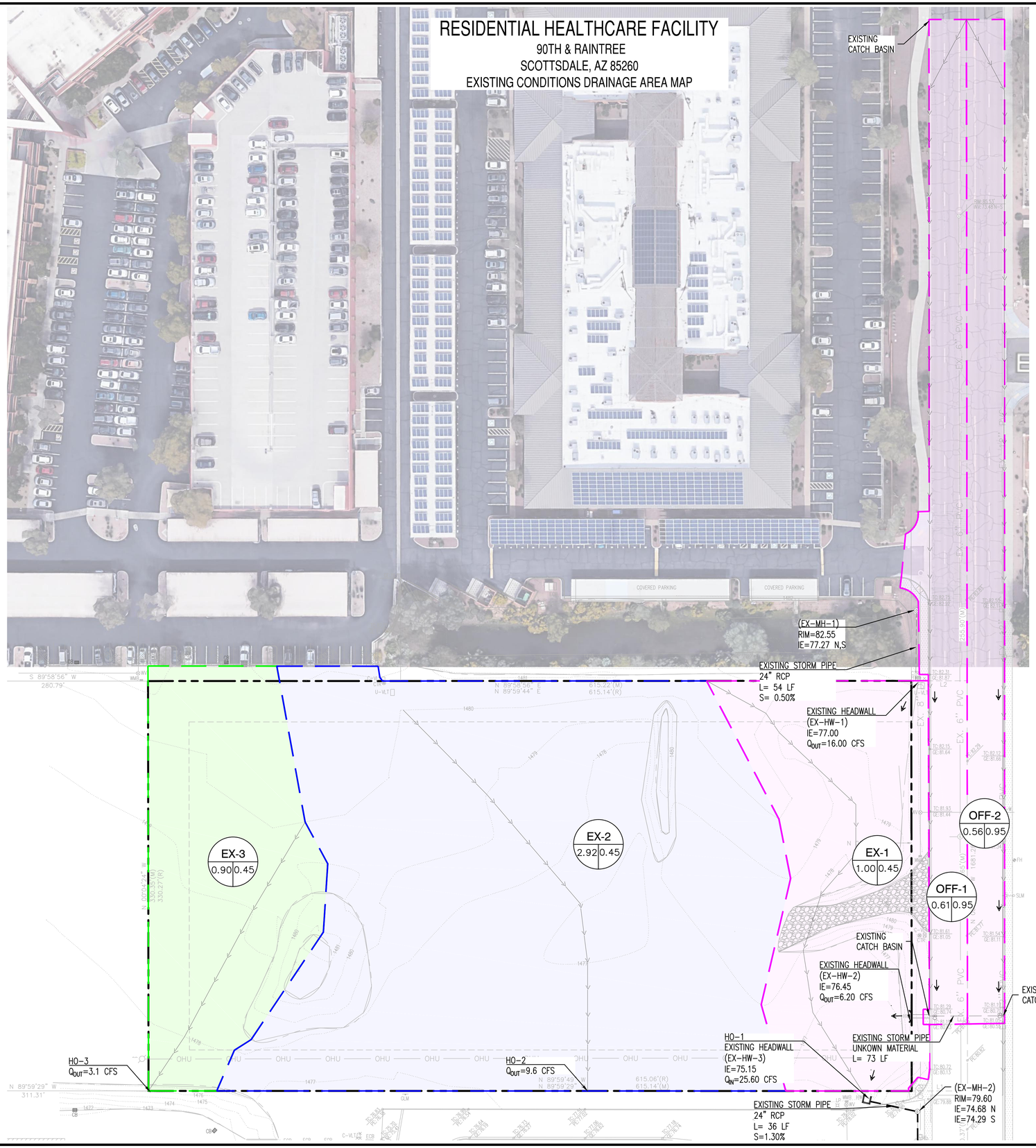
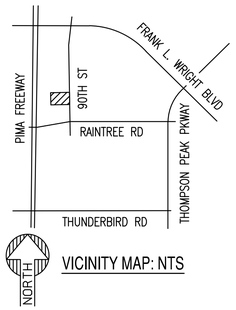
RESIDENTIAL HEALTHCARE FACILITY

90TH & RAINTREE
SCOTTSDALE, AZ 85260
EXISTING CONDITIONS DRAINAGE AREA MAP

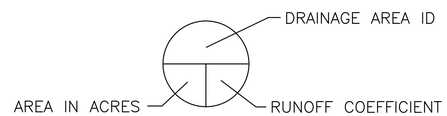




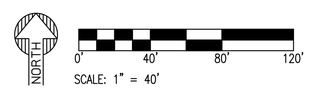
VICINITY MAP: NTS

LEGEND

- PROPERTY LINE
- DRAINAGE AREAS CONTRIBUTING TO HO-1
- DRAINAGE AREAS CONTRIBUTING TO HO-2
- DRAINAGE AREAS CONTRIBUTING TO HO-3
- FLOW ARROW
- EXISTING STORM MANHOLE
- EXISTING HEADWALL
- EXSTING STORM DRAIN PIPE



DRAINAGE AREA KEY



SCALE: 1" = 40'

NOTE: STORM DRAIN MANHOLE RIM AND INVERTS OBTAINED FROM C.O.S. QS #34-49 AND SCOTTSDALE CORPORATE CENTER PHASE II GRADING PLAN #36286

PRELIMINARY
NOT FOR
CONSTRUCTION

SEG SUSTAINABILITY ENGINEERING GROUP
8280 E. GELDING DRIVE SUITE 101, SCOTTSDALE, ARIZONA 85260
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.259.3534

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 Call 811 or visit Arizona811.com

PROJECT	RESIDENTIAL HEALTH CARE FACILITY
LOCATION	N 90TH ST. & RAINTREE CIRCLE DR. SCOTTSDALE, ARIZONA 85260

DRAWN	RM	01/28/2021
DESIGNED	RM	01/28/2021
QC		
QA		
PROJ. MGR.	AF	01/28/2021

DATE: 1/28/2021
ISSUED FOR: DRB

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 200626

SHEET TITLE: EXISTING CONDITIONS DRAINAGE AREA MAP

PAGE NO.: SHEET NO.:

LOCATION: Z:\SHARED\PROJECTS\GREYSTAR\RESIDENTIAL HEALTHCARE-90TH ST & RAINTREE-SCOTTSDALE-200626\11 CAD (SEG)\11.3 CD'S\EX-DAM.DWG SAVED BY: LAPTOP02 DATE: 1/28/2021

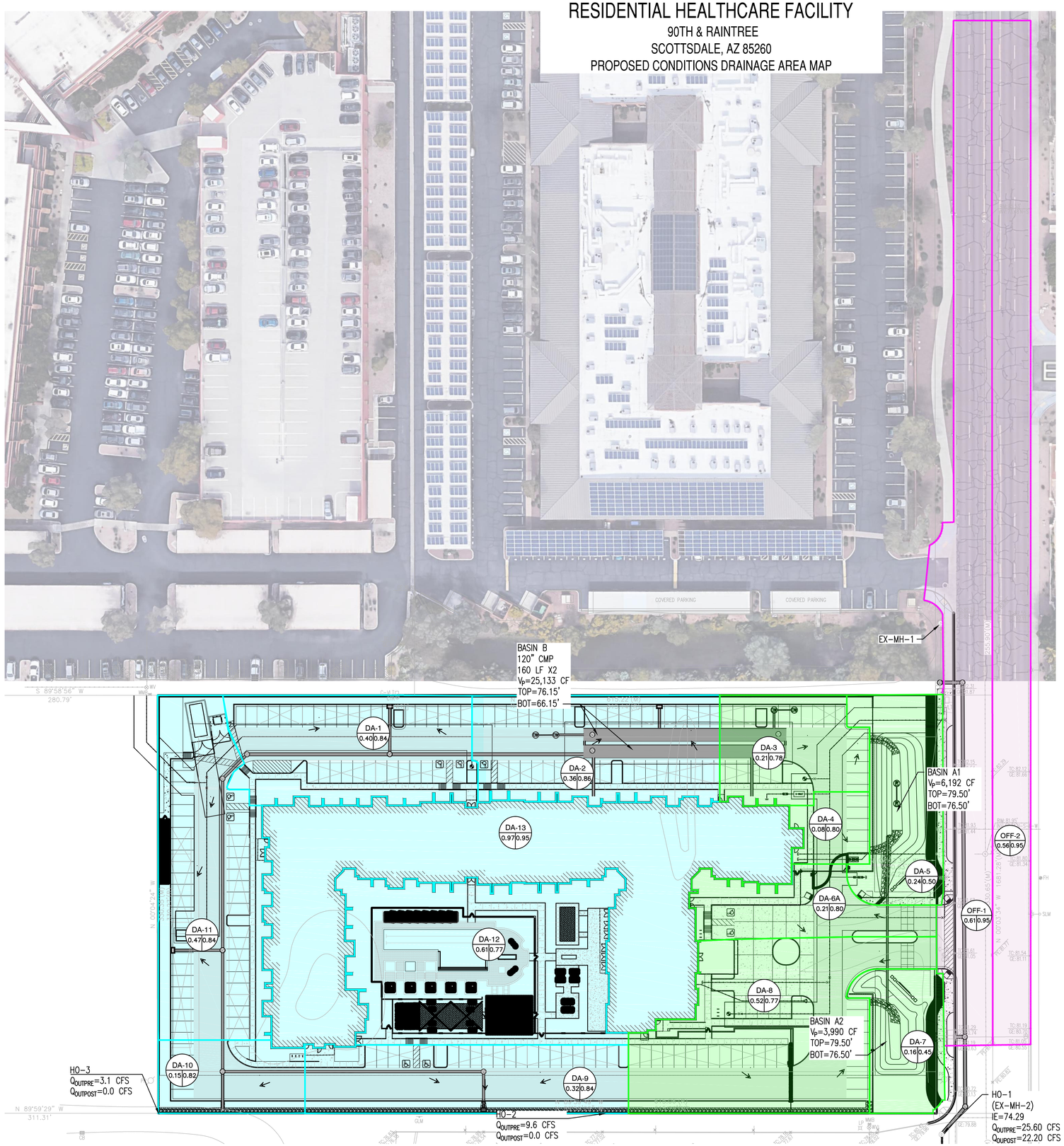
4-DR-2021
2/8/2021

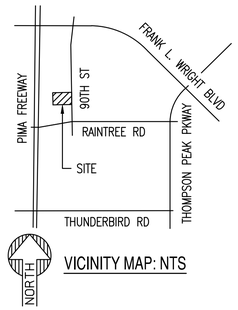
ID	Sub Basin Data							Sub Basin Hydrology Summary					
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Major Basin ID: 01													
OFF-1	0.6	798	0.00	0.00	21.0	0.042	Q (cfs)	1.0	1.4	1.8	2.3	2.7	3.1
							C	0.95	0.95	0.95	0.95	0.95	0.95
							CA (ac)	0.53	0.53	0.53	0.53	0.53	0.53
							Volume (ac-ft)	0 0285	0.0348	0.0410	0.0478	0.0526	0.0570
							Tc (min)	16	14	12	11	11	10
							i (in/hr)	1.86	2.70	3.38	4.32	5.07	5.84
OFF-2	0.6	798	0.00	0.00	21.0	0.042	Q (cfs)	1.0	1.4	1.8	2.3	2.7	3.1
							C	0.95	0.95	0.95	0.95	0.95	0.95
							CA (ac)	0.53	0.53	0.53	0.53	0.53	0.53
							Volume (ac-ft)	0 0285	0.0348	0.0410	0.0478	0.0526	0.0570
							Tc (min)	16	14	12	11	11	10
							i (in/hr)	1.86	2.70	3.38	4.32	5.07	5.84
EX-1	1.0	334	0.00	0.00	29.2	0.040	Q (cfs)	1.0	1.4	1.7	2.1	2.8	3.4
							C	0.37	0.37	0.37	0.37	0.42	0.45
							CA (ac)	0.37	0.37	0.37	0.37	0.42	0.45
							Volume (ac-ft)	0 0143	0.0175	0.0197	0.0220	0.0278	0.0319
							Tc (min)	8	7	6	6	5	5
							i (in/hr)	2.57	3.68	4.54	5.74	6.67	7.64
EX-2	2.9	490	1,480.00	1,477.00	32.3	0.037	Q (cfs)	2.6	3.7	4.6	5.9	7.8	9.6
							C	0.37	0.37	0.37	0.37	0.42	0.45
							CA (ac)	1.08	1.08	1.08	1.08	1.23	1.31
							Volume (ac-ft)	0 0435	0.0537	0.0617	0.0716	0.0889	0.1042
							Tc (min)	9	8	7	7	6	6
							i (in/hr)	2.40	3.46	4.30	5.47	6.38	7.31
EX-3	0.9	344	1,481.00	1,478.00	46.0	0.040	Q (cfs)	0.9	1.3	1.6	2.0	2.6	3.1
							C	0.37	0.37	0.37	0.37	0.42	0.45

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) 0.33	0.33	0.33	0.33	0.38	0.41
							Volume (ac-ft) 0.0113	0.0141	0.0159	0.0184	0.0239	0.0285
							Tc (min) 7	6	5	5	5	5
							i (in/hr) 2.72	3.86	4.77	5.96	6.82	7.68

RESIDENTIAL HEALTHCARE FACILITY

90TH & RAINTREE
SCOTTSDALE, AZ 85260
PROPOSED CONDITIONS DRAINAGE AREA MAP



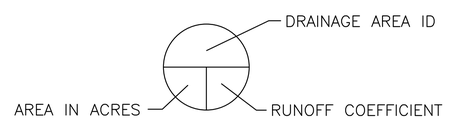


VICINITY MAP: NTS

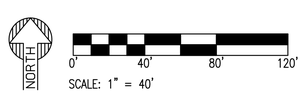
Proposed Retention Basin Summary					
Basin		TYPE	Vp	Vp total	Vr
(ID)		(--)	(CF)	(CF)	(CF)
Basin A	Basin A1	OPEN	6,192	10,182	8,637
	Basin A2	OPEN	3,990		
Basin B		UG	25,133	25,133	23,160
			TOTAL	35,314	31,797

LEGEND

- PROPERTY LINE
- DRAINAGE AREAS CONTRIBUTING TO HO-1
- DRAINAGE AREAS CONTRIBUTING TO BASIN A
- DRAINAGE AREAS CONTRIBUTING TO BASIN B
- FLOW ARROW
- EXISTING STORM MANHOLE
- EXISTING HEADWALL
- EXSTING STORM DRAIN PIPE



DRAINAGE AREA KEY



SCALE: 1" = 40'

NOTE: STORM DRAIN MANHOLE RIM AND INVERTS OBTAINED FROM C.O.S. QS #34-49 AND SCOTTSDALE CORPORATE CENTER PHASE II GRADING PLAN #36286

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ARIZONA811 Arizona Blue Stake, Inc.
Call 811 or 602.263.1100

PROJECT	LOCATION
RESIDENTIAL HEALTH CARE FACILITY	N 90TH ST. & RAINTREE CIRCLE DR. SCOTTSDALE, ARIZONA 85260

DRAWN	RM	01/28/2021
DESIGNED	RM	01/28/2021
QC		
QA		
PROJ. MGR.	AF	01/28/2021

DATE: 1/28/2021

ISSUED FOR: DRB

REVISION NO.:	DATE:
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JOB NO.: 200626

SHEET TITLE: PROPOSED CONDITIONS DRAINAGE AREA MAP

PAGE NO.: SHEET NO.:

4-DR-2021
2/8/2021

LOCATION: Z:\SHARED\PROJECTS\GREYSTAR\RESIDENTIAL HEALTHCARE- 90TH ST & RAINTREE- SCOTTSDALE- 200626\11 CAD (SEG)\11.3 CD'S\P-DAM.DWG SAVED BY: LAPTOP02 DATE: 1/28/2021

Weighted Runoff Coefficient-Calculations (Cw)				
EXISTING OVERALL SITE C_w				
	BUILDING or CONCRETE/ PAVEMENT	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	0.00	4.82	**4.82**	**0.45**
EX-1	0.00	1.00	1.00	0.45
EX-2	0.00	2.92	2.92	0.45
EX-3	0.00	0.90	0.90	0.45
OFFSITE				
	1.17	0.00	**1.17**	0.95
OFF-1	0.61	0.00	0.61	0.95
OFF-2	0.56	0.00	0.56	0.95

Weighted Runoff Coefficient Calculations (Cw)

PROPOSED OVERALL SITE C_w				
	BUILDING or CONCRETE/ PAVEMENT	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	3.49	1.21	4.70	**0.82**
DA-1	0.31	0.09	0.40	0.84
DA-2	0.28	0.08	0.36	0.84
DA-3	0.17	0.04	0.21	0.85
DA-4	0.07	0.01	0.08	0.88
DA-5	0.00	0.24	0.24	0.45
DA-6	0.18	0.03	0.21	0.87
DA-7	0.00	0.16	0.16	0.45
DA-8	0.41	0.12	0.52	0.84
DA-9	0.25	0.07	0.32	0.84
DA-10	0.11	0.04	0.15	0.82
DA-11	0.36	0.11	0.47	0.84
DA-12	0.39	0.22	0.61	0.77
DA-13	0.97	0.00	0.97	0.95

OFFSITE				
	1.23	0.00	**1.23**	0.95
OFF-1	0.67	0.00	0.67	0.95
OFF-2	0.56	0.00	0.56	0.95

Required Storage Volume Calculations

Rational & Proposed Required Storage Volume Calculations							
							Vr=1*(P/12)*Cw*A
							P=100-yr, 2-hr=2.27 in.
Drainage	Area	C_w	intensity	Precipitation	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(in)	(cfs)	(acre-ft)	(CF)
BASIN A1							
DA-3	0.21	0.85	7.72	2.27	1.40	0.03	1494.14
DA-4	0.08	0.88	7.72	2.27	0.51	0.01	549.10
DA-5	0.24	0.45	7.72	2.27	0.84	0.02	899.27
DA-6	0.21	0.87	7.72	2.27	1.41	0.03	1500.87
BASIN A2							
DA-7	0.16	0.45	7.72	2.27	0.54	0.01	581.12
DA-8	0.52	0.84	7.72	2.27	3.38	0.08	3612.92
BASIN B							
DA-1	0.40	0.84	7.72	2.27	2.59	0.06	2768.67
DA-2	0.36	0.84	7.72	2.27	2.31	0.06	2461.45
DA-9	0.32	0.84	7.72	2.27	2.05	0.05	2192.70
DA-10	0.15	0.82	7.72	2.27	0.96	0.02	1020.70
DA-11	0.47	0.84	7.72	2.27	3.04	0.07	3246.11
DA-12	0.61	0.77	7.72	2.27	3.63	0.09	3877.77
DA-13	0.97	0.95	7.72	2.27	7.11	0.17	7592.22
Totals:	**4.70**	**0.82**			**29.79**	**0.73**	**31,797.05**

4-DR-2021
2/8/2021

Provided Storage Calculations

BASIN A1					
ELEV.	AREA	DEPTH	AVG V	SUM V	COMMENT
(FT)	(SF)	(FT)	(CF)	(CF)	
76.5	519			0.00	Bottom
		1.00	970.57		
77.5	1,422			970.57	
		1.00	1,976.22		
78.5	2,530			2,946.79	
		1.00	3,244.89		
79.5	3,959			6,191.68	Top

BASIN A2					
ELEV.	AREA	DEPTH	AVG V	SUM V	COMMENT
(FT)	(SF)	(FT)	(CF)	(CF)	
76.50	251			0.00	Bottom
		1.00	519.50		
77.50	788			519.50	
		1.00	1,232.00		
78.50	1,676			1,751.50	
		1.00	2,238.50		
79.50	2,801			3,990.00	Top

UG Storage ID	Diameter (FT)	Length (FT)	Volume (CF)
B1	10	160	12,566
B2	10	160	12,566

Existing 24in RGRCP

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.005 ft/ft
Normal Depth	24.0 in
Diameter	24.0 in

Results	
Discharge	16.00 cfs
Flow Area	3.1 ft²
Wetted Perimeter	6.3 ft
Hydraulic Radius	6.0 in
Top Width	0.00 ft
Critical Depth	17.3 in
Percent Full	100.0 %
Critical Slope	0.007 ft/ft
Velocity	5.09 ft/s
Velocity Head	0.40 ft
Specific Energy	2.40 ft
Froude Number	(N/A)
Maximum Discharge	17.21 cfs
Discharge Full	16.00 cfs
Slope Full	0.005 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	50.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	24.0 in
Critical Depth	17.3 in
Channel Slope	0.005 ft/ft
Critical Slope	0.007 ft/ft

100-yr Runoff Calculation Summary

P=100-yr, 5-min=7.72 in/hr

Drainage Area ID	Area (acres)	C_w (-)	Intensity (in/hr)	Q (cfs)	Qtotal (cfs)	Structure ID	Structure Type	Capacity (cfs)
DA-1	0.40	0.84	7.72	2.59	2.59	CB-2	MAG 535	4.95
DA-2	0.36	0.836531	7.72	2.31	2.31	CB-1	MAG 535	4.95
DA-3	0.21	0.85	7.72	1.40	1.40	CO-1	Curb opening	-
DA-4	0.08	0.88	7.72	0.51	0.51	CO-2	Curb opening	-
DA-5	0.24	0.45	7.72	0.84	0.84	CB-6	18" Nyloplast	1.35
DA-6	0.21	0.87	7.72	1.41	1.41	CO-3	Curb opening	-
DA-7	0.16	0.45	7.72	0.54	0.54	N/A	N/A	-
DA-8	0.52	0.84	7.72	3.38	3.38	CO-4	Curb opening	-
DA-9	0.32	0.84	7.72	2.05	5.69	CB-5	2' x 3' Nyloplast Steel Bar	6.75
DA-12	0.61	0.77	7.72	3.63				
DA-10	0.15	0.822887	7.72	0.96	0.96	CB-4	18" Nyloplast	1.35
DA-11	0.47	0.837418	7.72	3.04	3.04	CB-3	MAG 535	4.95
DA-13	0.97	0.95	7.72	7.11	7.11	R-1	Roof drain	-

10-yr Runoff Calculation Summary

P=10-yr, 5-min=4.92 in/hr

Drainage Area ID	Area (acres)	C_w (-)	Intensity (in/hr)	Q (cfs)	Qtotal (cfs)	Structure ID	Structure Type
DA-1	0.40	0.84	4.92	1.65	1.65	CB-2	MAG 535
DA-2	0.36	0.836531	4.92	1.47	1.47	CB-1	MAG 535
DA-3	0.21	0.85065	4.92	0.89	0.89	CO-1	Curb opening
DA-4	0.08	0.882224	4.92	0.33	0.33	CO-2	Curb opening
DA-5	0.24	0.45	4.92	0.54	0.54	CB-6	18" Nyloplast
DA-6	0.21	0.871283	4.92	0.90	0.90	CO-3	Curb opening
DA-7	0.16	0.45	4.92	0.35	0.35	N/A	N/A
DA-8	0.52	0.838347	4.92	2.16	2.16	CO-4	Curb opening
DA-9	0.32	0.840123	4.92	1.31	3.62	CB-5	2' x 3' Nyloplast Steel
DA-12	0.61	0.770458	4.92	2.32			
DA-10	0.15	0.822887	4.92	0.61	0.61	CB-4	18" Nyloplast
DA-11	0.47	0.837418	4.92	1.94	1.94	CB-3	MAG 535
DA-13	0.97	0.95	4.92	4.53	4.53	R-1	Roof drain

Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jan 28 2021

CB-1 100 YR

Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 3.46
Grate Width (ft)	= 2.50
Grate Length (ft)	= 3.48

Gutter

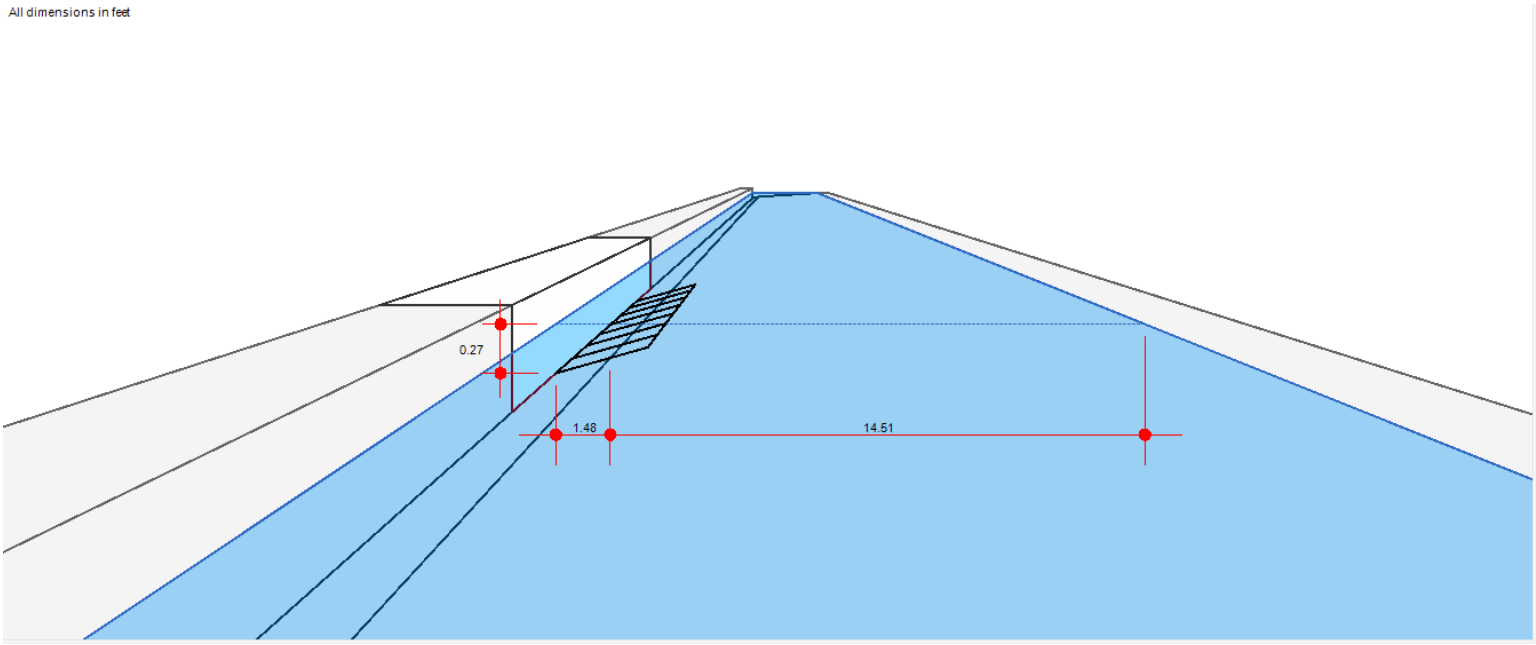
Slope, Sw (ft/ft)	= 0.058
Slope, Sx (ft/ft)	= 0.013
Local Depr (in)	= -0-
Gutter Width (ft)	= 1.48
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 2.31

Highlighted

Q Total (cfs)	= 2.31
Q Capt (cfs)	= 2.31
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 3.29
Efficiency (%)	= 100
Gutter Spread (ft)	= 15.99
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



4-DR-2021
2/8/2021

Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jan 28 2021

CB-1A 100 YR

Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 3.46
Grate Width (ft)	= 2.50
Grate Length (ft)	= 3.48

Gutter

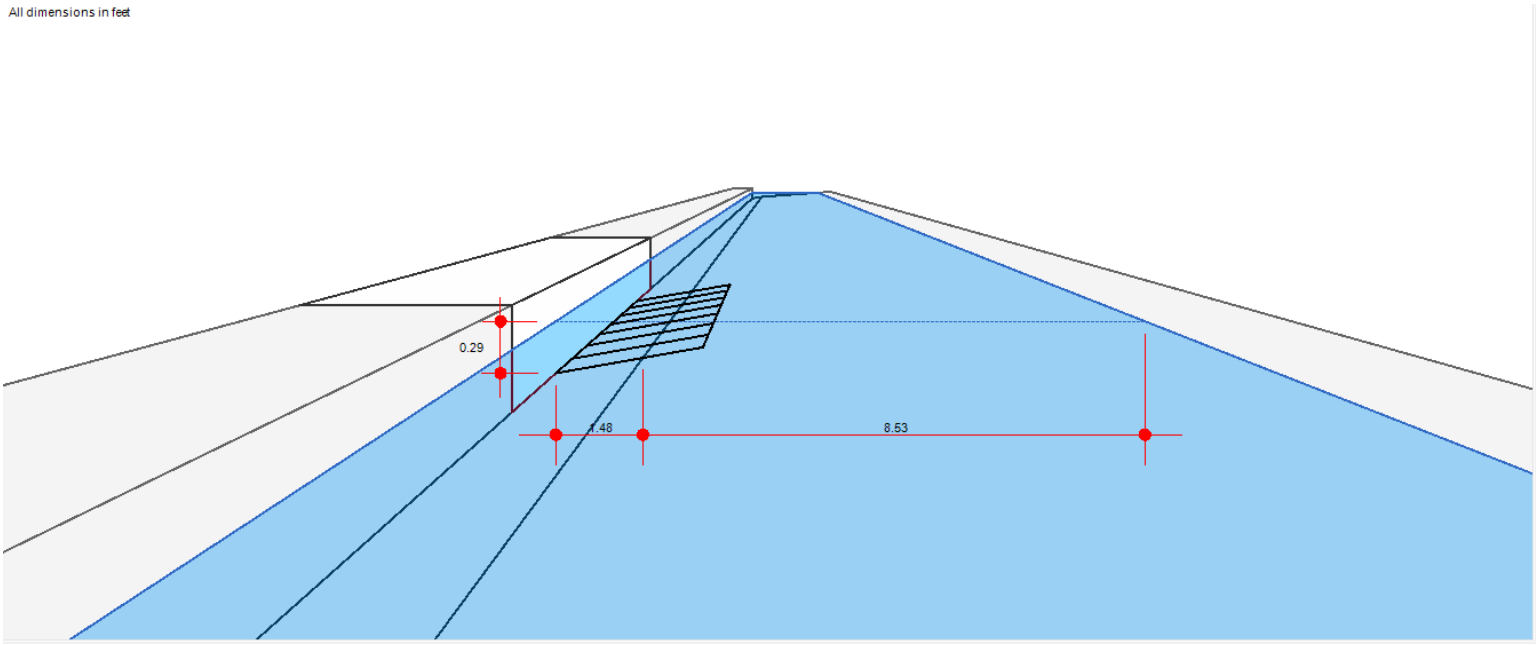
Slope, Sw (ft/ft)	= 0.058
Slope, Sx (ft/ft)	= 0.024
Local Depr (in)	= -0-
Gutter Width (ft)	= 1.48
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 2.59

Highlighted

Q Total (cfs)	= 2.59
Q Capt (cfs)	= 2.59
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 3.49
Efficiency (%)	= 100
Gutter Spread (ft)	= 10.01
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



4-DR-2021
2/8/2021

Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jan 28 2021

CB-4A Capacity

Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 3.46
Grate Width (ft)	= 2.50
Grate Length (ft)	= 3.48

Gutter

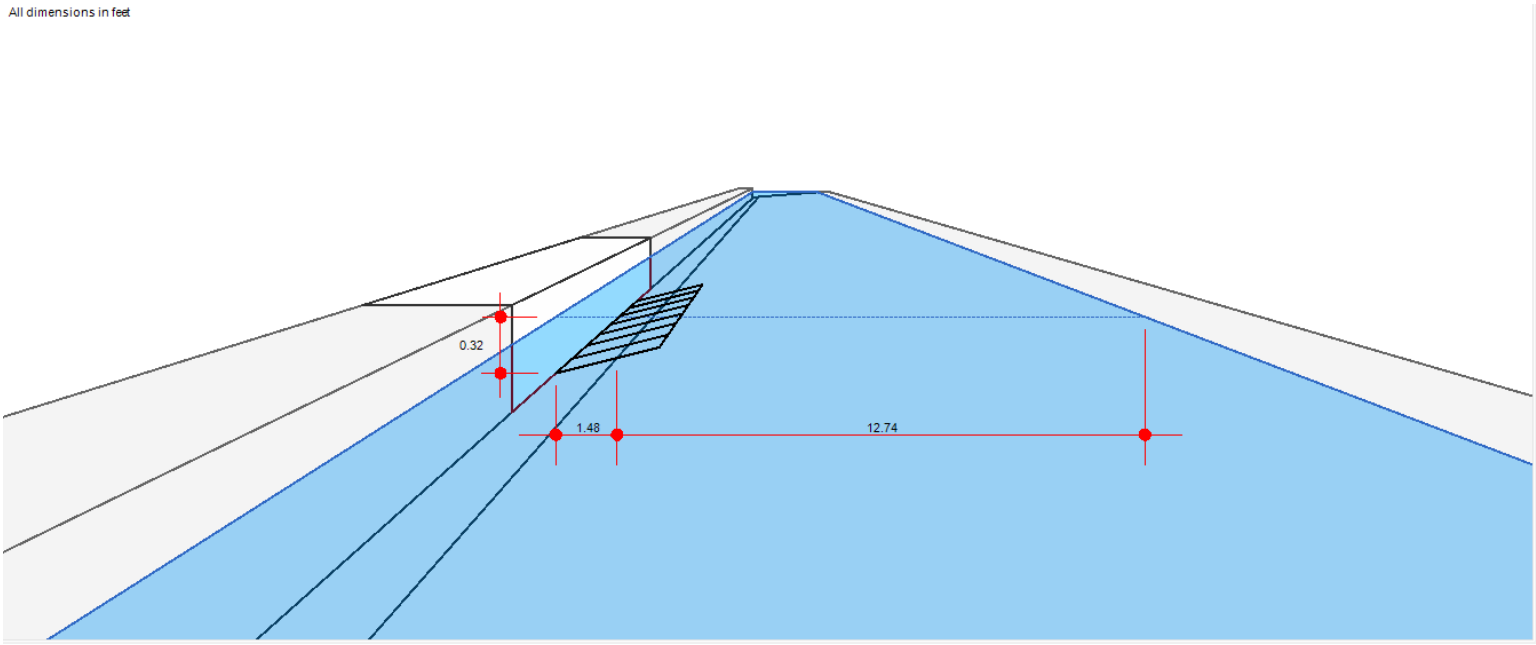
Slope, Sw (ft/ft)	= 0.058
Slope, Sx (ft/ft)	= 0.018
Local Depr (in)	= -0-
Gutter Width (ft)	= 1.48
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 3.04

Highlighted

Q Total (cfs)	= 3.04
Q Capt (cfs)	= 3.04
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 3.78
Efficiency (%)	= 100
Gutter Spread (ft)	= 14.22
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



4-DR-2021
2/8/2021

OFF-1 @ 1.80%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.018 ft/ft
Diameter	24.0 in
Discharge	16.00 cfs

Results	
Normal Depth	12.4 in
Flow Area	1.6 ft²
Wetted Perimeter	3.2 ft
Hydraulic Radius	6.1 in
Top Width	2.00 ft
Critical Depth	17.3 in
Percent Full	51.6 %
Critical Slope	0.007 ft/ft
Velocity	9.79 ft/s
Velocity Head	1.49 ft
Specific Energy	2.52 ft
Froude Number	1.909
Maximum Discharge	32.65 cfs
Discharge Full	30.35 cfs
Slope Full	0.005 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	51.6 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	12.4 in
Critical Depth	17.3 in
Channel Slope	0.018 ft/ft
Critical Slope	0.007 ft/ft

OFF-2 @ 0.60%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.006 ft/ft
Diameter	24.0 in
Discharge	16.00 cfs

Results	
Normal Depth	18.0 in
Flow Area	2.5 ft²
Wetted Perimeter	4.2 ft
Hydraulic Radius	7.2 in
Top Width	1.73 ft
Critical Depth	17.3 in
Percent Full	75.1 %
Critical Slope	0.007 ft/ft
Velocity	6.32 ft/s
Velocity Head	0.62 ft
Specific Energy	2.12 ft
Froude Number	0.922
Maximum Discharge	18.85 cfs
Discharge Full	17.52 cfs
Slope Full	0.005 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	51.6 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	18.0 in
Critical Depth	17.3 in
Channel Slope	0.006 ft/ft
Critical Slope	0.007 ft/ft

OFF-3 @ 1.45%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

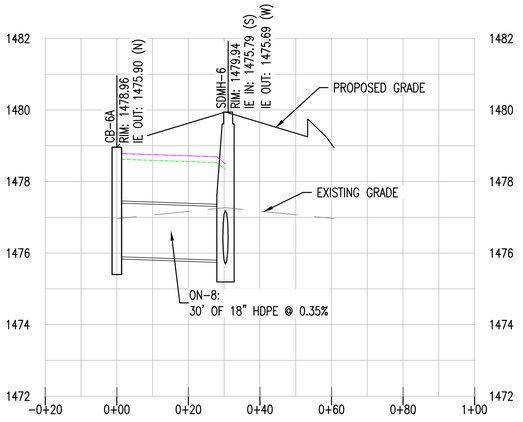
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.015 ft/ft
Diameter	24.0 in
Discharge	22.22 cfs

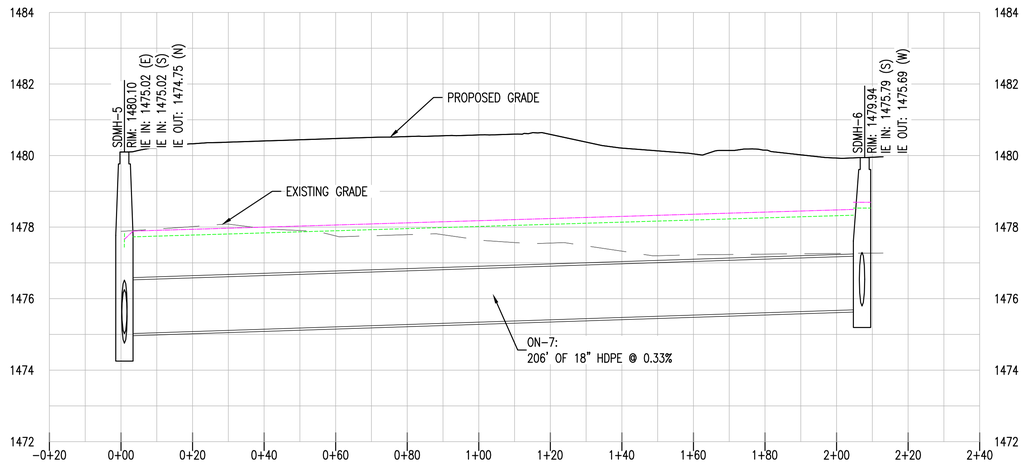
Results	
Normal Depth	16.5 in
Flow Area	2.3 ft²
Wetted Perimeter	3.9 ft
Hydraulic Radius	7.1 in
Top Width	1.86 ft
Critical Depth	20.2 in
Percent Full	68.6 %
Critical Slope	0.009 ft/ft
Velocity	9.67 ft/s
Velocity Head	1.45 ft
Specific Energy	2.82 ft
Froude Number	1.531
Maximum Discharge	29.30 cfs
Discharge Full	27.24 cfs
Slope Full	0.010 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	68.6 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	16.5 in
Critical Depth	20.2 in
Channel Slope	0.015 ft/ft
Critical Slope	0.009 ft/ft

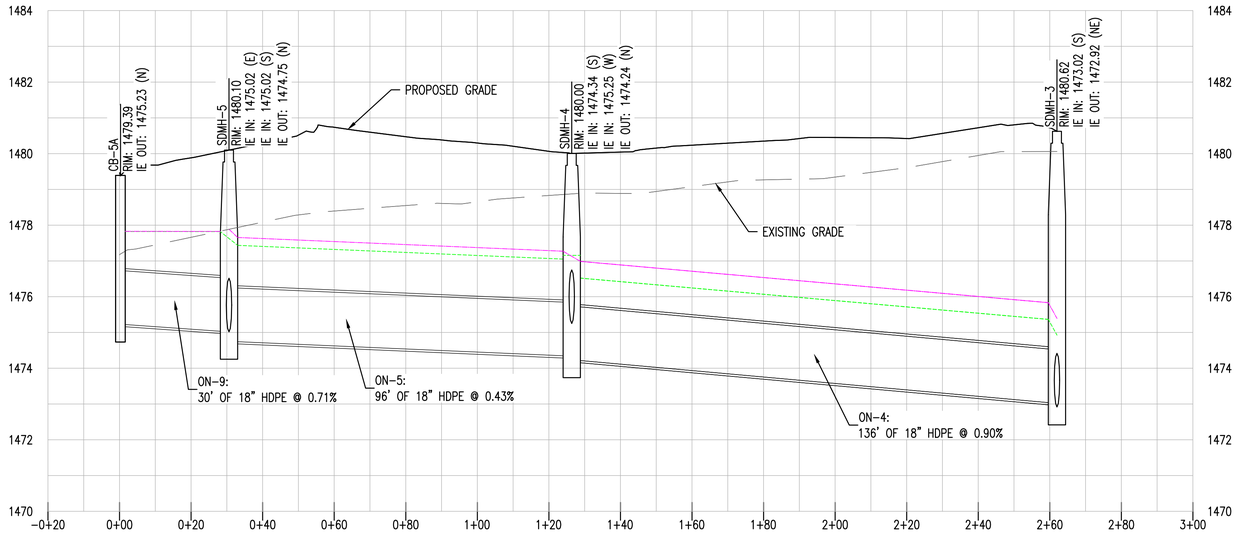
ON-SITE PIPES HYDRAULIC GRADE LINE

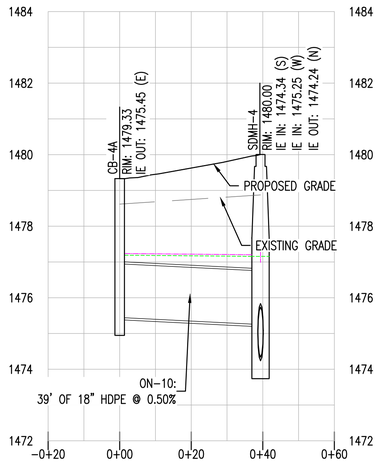




ENERGY GRADE LINE

HYDRAULIC GRADE LINE

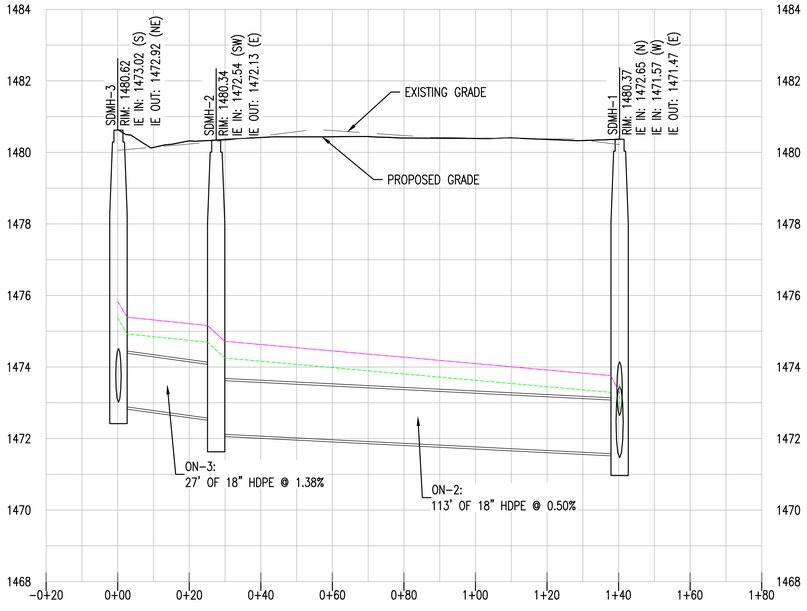


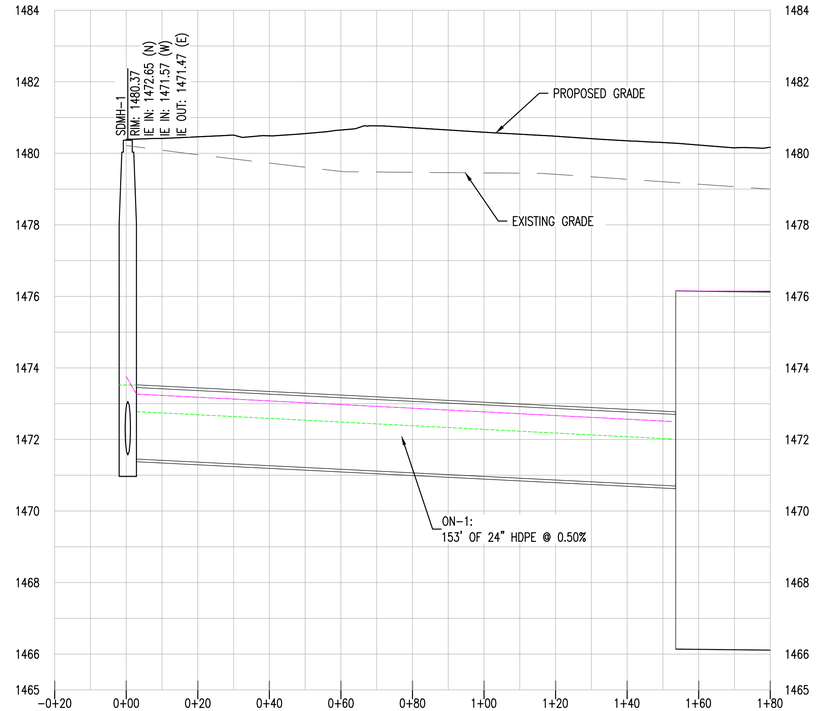


PROFILE VIEW

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

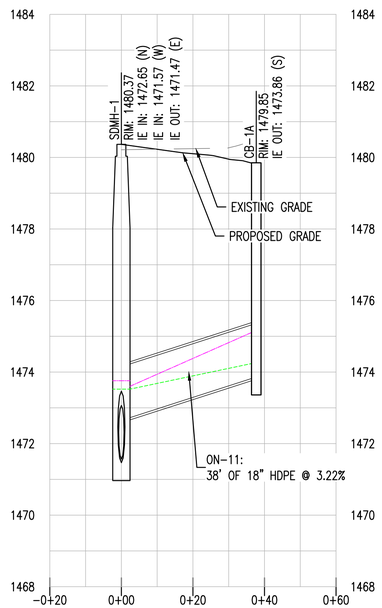
ON-SITE PIPES HYDRAULIC GRADE LINE

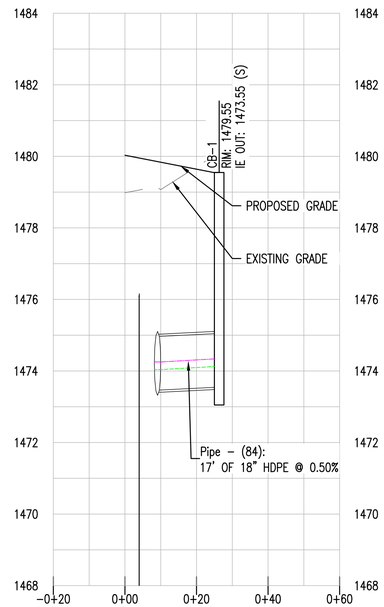




ENERGY GRADE LINE

HYDRAULIC GRADE LINE



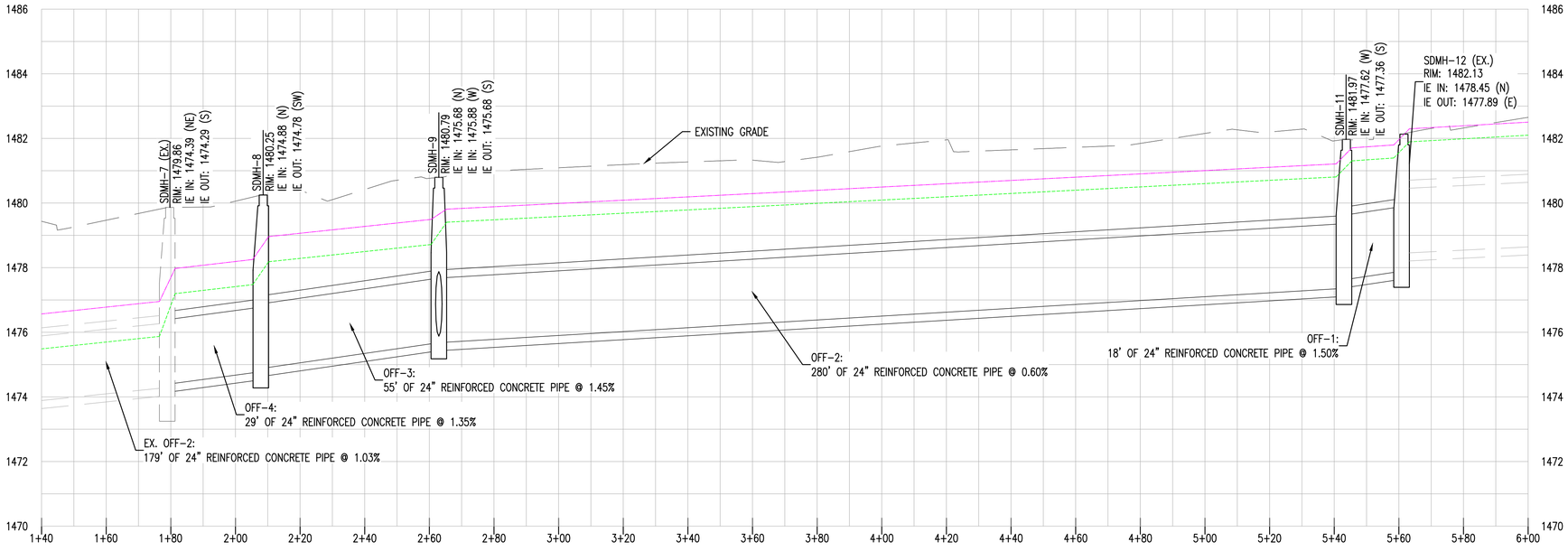


PROFILE VIEW

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

4-DR-2021
2/8/2021

OFFSITE PIPES HYDRAULIC GRADE LINE



ENERGY GRADE LINE

HYDRAULIC GRADE LINE

PROFILE VIEW

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

4-DR-2021
2/8/2021

ON SITE-PIPES HYDRAULIC CALCULATIONS

#Line	Pipe	From	To	3D Length - Center to Center	Drainage Area Inc	Drainage Area Total	Runoff Coeff "C"	Area X "C" Inc	Area X "C" Total	Time of Concentration Inlet	Time of Concentration System	Rain "I"	Runoff "Q"	Known Q	Total Q	Pipe Dia.	Full Q	Velocity Full	Velocity Design	Sec Time	Invert Elevation U/S	Invert Elevation D/S	Crown Drop	Slope
				(ft)	(sq. ft)	(sq. ft)		(sq. ft)	(sq. ft)	(min)	(min)	(inch/hr)	(cu. ft/sec)	(cu. ft/sec)	(cu. ft/sec)	(ft)	(cu. ft/sec)	(ft/s)	(ft/s)	(min)	(ft)	(ft)	(ft)	
1	ON-1	SDMH-1	ructure - (7	153.129	0	0	0	0	0	0	0	0	0	0	12.28	2	16.012	5.097	5.614	0.455	1471.466	1470.7	N/A	0.50%
2	ON-11	CB-1A	SDMH-1	37.718	0	0	0	0	0	0	0	0	0	2.59	2.59	1.5	18.868	10.677	7.481	0.084	1473.862	1472.648	N/A	3.22%
3	ON-2	SDMH-2	SDMH-1	112.766	0	0	0	0	0	0	0	0	0	0	9.69	1.5	7.435	4.207	5.483	0.343	1472.13	1471.566	N/A	0.50%
4	ON-3	SDMH-3	SDMH-2	27.303	0	0	0	0	0	0	0	0	0	0	9.69	1.5	12.339	6.983	7.725	0.059	1472.917	1472.541	N/A	1.38%
5	ON-4	SDMH-4	SDMH-3	135.625	0	0	0	0	0	0	0	0	0	0	9.69	1.5	9.975	5.645	6.426	0.352	1474.238	1473.017	N/A	0.90%
6	ON-5	SDMH-5	SDMH-4	95.803	0	0	0	0	0	0	0	0	0	0	6.65	1.5	6.92	3.916	4.456	0.358	1474.753	1474.338	N/A	0.43%
7	ON-7	SDMH-6	SDMH-5	206.152	0	0	0	0	0	0	0	0	0	0	5.69	1.5	6.021	3.407	3.872	0.887	1475.693	1475.017	N/A	0.33%
8	ON-8	CB-6A	SDMH-6	30.36	0	0	0	0	0	0	0	0	0	5.69	5.69	1.5	6.22	3.52	3.988	0.127	1475.899	1475.793	N/A	0.35%
9	ON-9	CB-5A	SDMH-5	30.351	0	0	0	0	0	0	0	0	0	0.96	0.96	1.5	8.86	5.013	3.28	0.154	1475.232	1475.017	N/A	0.71%
10	ON-10	CB-4A	SDMH-4	39.365	0	0	0	0	0	0	0	0	0	3.04	3.04	1.5	7.438	4.209	3.994	0.164	1475.447	1475.25	N/A	0.50%

#Line	Struct. ID	D	Q	L	V	d	dc	v^2/2g	EGLo	HGLo	Sf	Total Pipe Loss	EGLi	HGLi	Ea	EGLa	U/S TOC	Surface Elev.	Step4*	Step7*	Step14*
		(ft)	(cu. ft/sec)	(ft)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			
0	ructure - (7								1470.7	1470.7							1472.7	1472.883			
1	SDMH-1	2	12.28	153.129	5.611	1.314	1.26	0.489	1472.504	1472.015	0.005	0.766	1473.27	1472.78	2.106	1473.572	1473.066	1480.367	N/A	Case B	Case B
2	CB-1A	1.5	2.59	37.718	7.471	0.376	0.61	0.868	1473.604	1473.524	0	0	1475.106	1474.238	1.244	1475.106	---	1479.85	N/A	Case F	N/A
3	SDMH-2	1.5	9.69	112.766	5.483	1.5	n/a	0.467	1473.759	1473.291	0.009	0.96	1474.718	1474.251	2.843	1474.973	1474.041	1480.341	Case B	N/A	Case A
4	SDMH-3	1.5	9.69	27.303	5.483	1.5	n/a	0.467	1475.16	1474.693	0.009	0.232	1475.392	1474.925	2.73	1475.647	1474.517	1480.624	Case B	N/A	Case A
5	SDMH-4	1.5	9.69	135.625	5.483	1.5	n/a	0.467	1475.834	1475.366	0.009	1.154	1476.988	1476.52	2.946	1477.184	1475.838	1480.005	Case B	N/A	Case A
6	SDMH-5	1.5	6.65	95.803	3.763	1.5	n/a	0.22	1477.272	1477.052	0.004	0.384	1477.656	1477.436	3.071	1477.824	1476.517	1480.099	Case B	N/A	Case A
7	SDMH-5	1.5	5.69	206.152	3.22	1.5	n/a	0.161	1477.888	1477.727	0.003	0.605	1478.493	1478.332	2.935	1478.628	1477.399	1479.943	Case B	N/A	Case A
8	SDMH-6	1.5	5.69	30.36	3.22	1.5	n/a	0.161	1478.692	1478.531	0.003	0.089	1478.781	1478.62	2.917	1478.817	---	1478.959	Case B	N/A	Case A
9	CB-5A	1.5	0.96	30.351	0.543	1.5	n/a	0.005	1477.825	1477.821	0	0.003	1477.828	1477.823	2.597	1477.83	---	1479.392	Case B	N/A	Case A
10	CB-4A	1.5	3.04	39.365	1.72	1.5	n/a	0.046	1477.203	1477.156	0.001	0.033	1477.235	1477.189	1.81	1477.257	---	1479.331	Case B	N/A	Case A

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#Line	Struct. ID	Exit Ho	Hf	Hb	Hc	He	Hj	Total	Ei	y+(P/gamma)	DI	Eai	CB	C-theta	Cp	Ha	Ea
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		(ft)				(ft)	(ft)
0	ructure - (7																
1	SDMH-1	0	0.766	0	0	0	0	0.766	1.804	1.314	0.487	1.977	0	0.742	0	0.129	2.106
2	CB-1A	0.032	0	0	0	0	0	0	1.244	0.376	0.211	0.846	0	0	3.428	0	1.244
3	SDMH-2	0.187	0.96	0	0	0	0	0.96	2.588	2.121	0.789	2.682	0	1.723	0	0.161	2.843
4	SDMH-3	0.187	0.232	0	0	0	0	0.232	2.475	2.008	0.789	2.569	0	1.721	0	0.161	2.73
5	SDMH-4	0.187	1.154	0	0	0	0	1.154	2.75	2.282	0.789	2.843	0	1.099	0	0.103	2.946
6	SDMH-5	0.088	0.384	0	0	0	0	0.384	2.903	2.683	0.542	2.947	0	2.801	0	0.123	3.071
7	SDMH-5	0.064	0.605	0	0	0	0	0.605	2.8	2.639	0.464	2.832	0	3.181	0	0.103	2.935
8	SDMH-6	0.064	0.089	0	0	0	0	0.089	2.882	2.721	0.464	2.914	0	0	0.097	0.003	2.917
9	CB-5A	0.002	0.003	0	0	0	0	0.003	2.595	2.591	0.078	2.596	0	0	1.042	0.001	2.597
10	CB-4A	0.018	0.033	0	0	0	0	0.033	1.788	1.742	0.248	1.798	0	0	1.391	0.013	1.81

OFFSITE PIPES HYDRAULIC CALCULATIONS

#Line	Pipe	From	To	3D Length - Center to Center	Drainage Area Inc	Drainage Area Total	Runoff Coeff "C"	Area X "C" Inc	Area X "C" Total	Time of Concentration Inlet	Time of Concentration System	Rain "I"	Runoff "Q"	Known Q	Total Q	Pipe Dia.	Full Q	Velocity Full	Velocity Design	Sec Time	Invert Elevation U/S	Invert Elevation D/S	Crown Drop	Slope
				(ft)	(sq. ft)	(sq. ft)		(sq. ft)	(sq. ft)	(min)	(min)	(inch/hr)	(cu. ft/sec)	(cu. ft/sec)	(cu. ft/sec)	(ft)	(cu. ft/sec)	(ft/s)	(ft/s)	(min)	(ft)	(ft)	(ft)	
1	EX. OFF-2	SDMH-7	ructure - (13	178.897	0	0	0	0	0	0	0	0	0	0	22.22	2	23.028	7.33	8.342	0.357	1474.29	1472.44	N/A	1.03%
2	OFF-4	SDMH-8	SDMH-7	28.863	0	0	0	0	0	0	0	0	0	0	22.22	2	26.271	8.362	9.372	0.051	1474.778	1474.39	N/A	1.35%
3	OFF-3	SDMH-9	SDMH-8	55.087	0	0	0	0	0	0	0	0	0	6.22	22.22	2	27.29	8.687	9.673	0.095	1475.678	1474.878	N/A	1.45%
4	OFF-2	SDMH-11	SDMH-9	280.082	0	0	0	0	0	0	0	0	0	0	16	2	17.542	5.584	6.324	0.738	1477.359	1475.678	N/A	0.60%
5	OFF-1	SDMH-12	SDMH-11	17.792	0	0	0	0	0	0	0	0	0	16	16	2	27.902	8.882	9.178	0.032	1477.986	1477.716	N/A	1.52%

#Line	Struct. ID	D	Q	L	V	d	dc	v^2/2g	EGLo	HGLo	Sf	Total Pipe Loss	EGLi	HGLi	Ea	EGLa	U/S TOC	Surface Elev.	Step4*	Step7*	Step14*
		(ft)	(cu. ft/sec)	(ft)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			
0	ucture - (1								1472.44	1472.44							1474.44	1474.815			
1	SDMH-7	2	22.22	178.897	8.339	1.582	1.683	1.081	1475.103	1474.022	0	0	1476.953	1475.872	3.373	1477.663	1476.39	1479.864	N/A	Case B	N/A
2	SDMH-8	2	22.22	28.863	7.073	2	n/a	0.778	1477.974	1477.196	0.01	0.278	1478.252	1477.475	3.872	1478.65	1476.878	1480.248	Case B	N/A	Case A
3	SDMH-9	2	22.22	55.087	7.073	2	n/a	0.778	1478.961	1478.184	0.01	0.531	1479.493	1478.715	3.97	1479.648	1477.678	1480.795	Case B	N/A	Case A
4	SDMH-11	2	16	280.082	5.093	2	n/a	0.403	1479.81	1479.406	0.005	1.401	1481.211	1480.808	4.188	1481.547	1479.716	1481.967	Case B	N/A	Case A
5	SDMH-12	2	16	17.792	5.093	2	n/a	0.403	1481.708	1481.305	0.005	0.089	1481.797	1481.394	3.892	1481.878	1480.68	1483.529	Case B	N/A	Case A

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#Line	Struct. ID	Exit Ho	Hf	Hb	Hc	He	Hj	Total	Ei	y+(P/gamma)	DI	Eai	CB	C-theta	Cp	Ha	Ea
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		(ft)				(ft)	(ft)
0	ructure - (1																
1	SDMH-7	0	0	0	0	0	0	0	2.663	1.582	0.882	2.942	0	1.546	0	0.431	3.373
2	SDMH-8	0.311	0.278	0	0	0	0	0.278	3.474	2.696	0.882	3.629	0	1.558	0	0.242	3.872
3	SDMH-9	0.311	0.531	0	0	0	0	0.531	3.815	3.037	0.882	3.97	0	0	0	0	3.97
4	SDMH-11	0.161	1.401	0	0	0	0	1.401	3.852	3.449	0.635	3.932	0	3.169	0	0.256	4.188
5	SDMH-12	0.161	0.089	0	0	0	0	0.089	3.811	3.408	0.635	3.892	0	0	0	0	3.892

APPENDIX III

Preliminary Grading and Drainage Plans

RESIDENTIAL HEALTHCARE FACILITY

GRADING AND DRAINAGE PLAN KEYMAP

90TH STREET AND RAINTREE
SCOTTSDALE, AZ 85260

PROJECT ADDRESS
90TH STREET & RAINTREE DRIVE, SCOTTSDALE, ARIZONA 85260.

PROJECT DESCRIPTION
NEW 151-UNIT RESIDENTIAL HEALTHCARE FACILITY WITH 3 STORIES AND 4 STORIES COMPONENTS, PARKING, AND COMMON AREA.

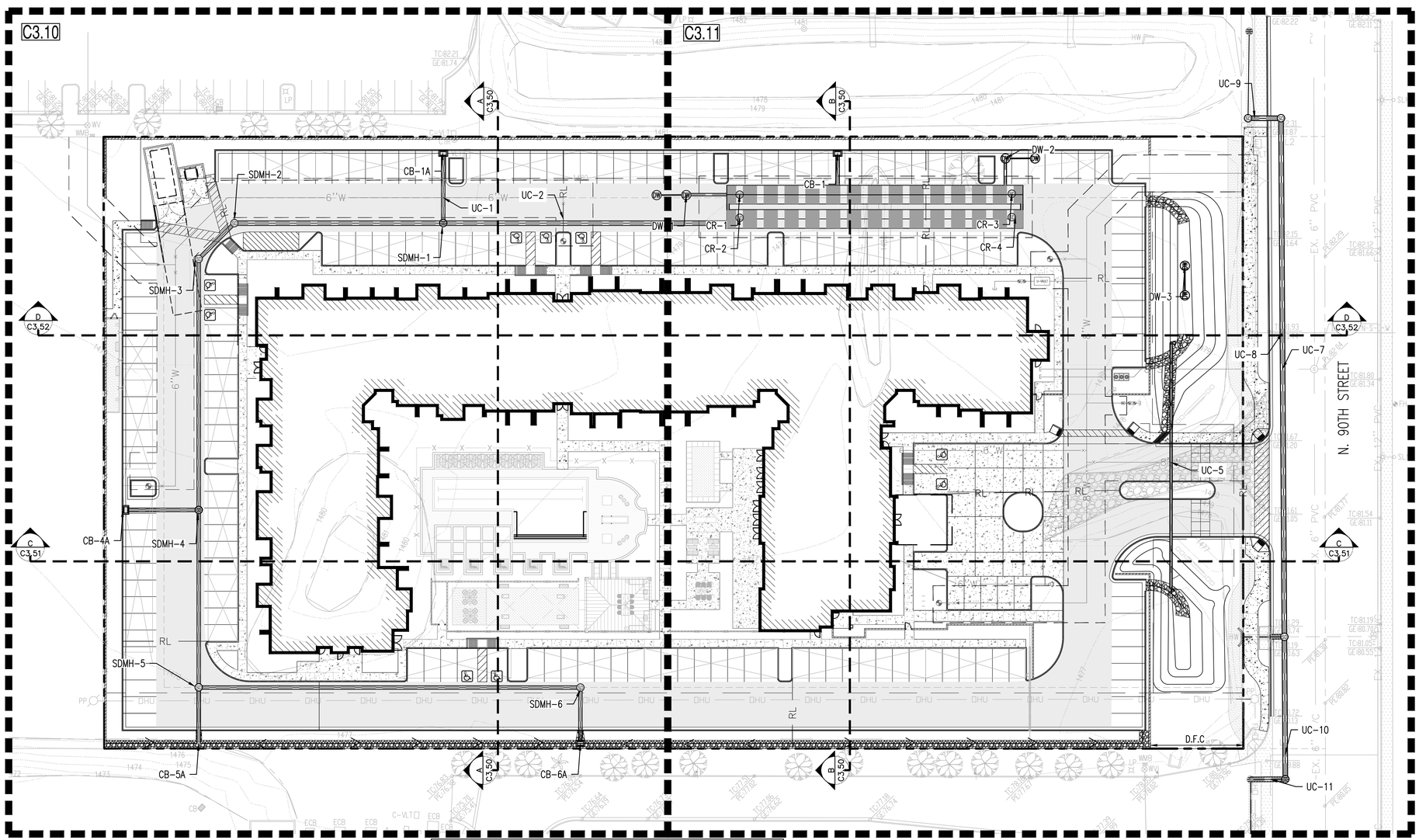
BENCHMARK:
BENCHMARK IS A BRASS CAP FLUSH, BEING THE SOUTH QUARTER CORNER OF SECTION 7, T3N, R5E.
ELEVATION: 1447.21' NAVD 88

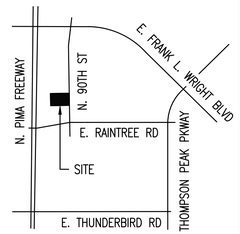
PARCEL INFORMATION:

APN:	217-15-033
ZONING:	C-O
GROSS AREA:	217,800 SF (5.00 AC)
NET AREA:	202,950 SF (4.66 AC)
FLOOD ZONE:	ZONE X IS DEFINED AS AREAS OF 0.2% ANNUAL FLOOD.

ARCHITECT:
TODD & ASSOCIATES, INC.
4019 N.44TH ST.
PHOENIX, AZ 85018
PHONE: 602-952-8280
ATTN: RUSSELL KINDER
RKINDER@TODDASSOC.COM

CIVIL ENGINEER:
SUSTAINABILITY ENGINEERING GROUP
8280 E GELDING DR., SUITE 101
SCOTTSDALE, AZ 85260
PHONE 480-237-2507
ATTN: ALI FAKIH
ALI@AZSEG.COM





SECTION 7
T3N, R5E

NORTH

VICINITY MAP:
(NTS)

PROPOSED LEGEND:

TC	TOP OF CURB
G=XX.XX	GUTTER ELEVATION, TC = G+0.5'
P=XX.XX	PAVEMENT ELEVATION
C=XX.XX	CONCRETE ELEVATION
	PROPERTY LINE
	CURB AND GUTTER
	VERTICAL CURB
RL	RIDGELINE
GB	GRADE BREAK
LOC	LIMIT OF ONSITE CONSTRUCTION
XX	MAJOR CONTOUR
XX	MINOR CONTOUR
	FLOW ARROW
	CATCH BASIN
SD	STORM MANHOLE
	STORM PIPE
DW	DRYWELL
BB	BUBBLER BOX
	CONCRETE PAVEMENT
	HEAVY DUTY PAVEMENT
	LIGHT DUTY PAVEMENT
	RIP-RAP
	WALL

LEGAL DESCRIPTION
A PORTION OF THE NORTHWEST QUARTER OF SECTION 7, TOWNSHIP 3 NORTH, RANGE 5 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA.

STORM WATER STORAGE SUMMARY:
TOTAL VOLUME REQUIRED:
V_R=33,306 CF

TOTAL 10' CMP PROVIDED: 160+160=320 LF
V_{P1}=3.14*(5')^2*320=25,133 CF

TOTAL OPEN RETENTION:
V_{P2}=6,712+3,990=10,702 CF

TOTAL BASIN PROVIDED:
V_{PTOTAL}=35,835 CF

BASIS OF BEARING:
THE BASIS OF BEARING AND ALL MONUMENTATION SHOWN HEREON IS BASED ON THE MONUMENT LINE OF 90TH STREET, USING A BEARING OF SOUTH 00 DEGREES 03 MINUTES 34 SECONDS EAST, AS SHOWN ON RECORD OF SURVEY, RECORDED IN BOOK 896, PAGE 1, MARICOPA COUNTY RECORDS.

CUT AND FILL QUANTITIES
(FOR PERMIT FEE ESTIMATION ONLY. CONTRACTOR TO PERFORM ITS OWN CALCULATIONS)

FILL	+15,069 CY
CUT	- 332 CY
NET FILL	+14,737 CY

UTILITY CROSSINGS

	UC-1	6" WATER BOT	76.65	NO EXTRA PROTECTION REQUIRED
		18" STORM TOP	74.55	
	UC-2	6" WATER BOT	76.65	NO EXTRA PROTECTION REQUIRED
		18" STORM TOP	72.77	
●	UC-5	16" STORM BOT	76.44	PROVIDE VERTICAL REALIGNMENT PER MAG STD. DET. 370.
		8" WATER TOP	74.40	
	UC-7	24" STORM BOT	76.37	NO EXTRA PROTECTION REQUIRED
		8" SEWER TOP	69.20	
●	UC-8	24" STORM BOT	76.41	PROVIDE VERTICAL REALIGNMENT PER MAG STD. DET. 370.
		8" WATER TOP	74.40	
●	UC-9	24" STORM BOT	77.67	PROVIDE VERTICAL REALIGNMENT PER MAG STD. DET. 370.
		8" WATER TOP	75.60	
●	UC-10	24" STORM BOT	74.50	PROVIDE VERTICAL REALIGNMENT PER MAG STD. DET. 370.
		12" WATER TOP	72.50	
●	UC-11	24" STORM BOT	74.24	PROVIDE VERTICAL REALIGNMENT PER MAG STD. DET. 370.
		12" WATER TOP	72.20	

● REQUIRES VERTICAL REALIGNMENT PER MAG STD. DET. 370.

NORTH

GRADING AND DRAINAGE PLAN KEYMAP

0' 30' 60' 90'

SCALE: 1" = 30'

EXISTING LEGEND:

XXXX	EX. MAJOR CONTOURS	S	SEWER MANHOLE
XXXX	EX. MINOR CONTOURS	EX. W	WATER LINE
TC:XX.XX FL:XX.XX	EX. SPOT ELEVATION	WV	WATER VALVE
LP:XX.XX	EX. PAVEMENT ELEVATION		FIRE HYDRANT
	EASEMENT LINE AS NOTED		STORM DRAIN LINE
EX. S	SEWER LINE	CB	STORM CATCH BASIN
D	STORM MANHOLE		
GAS	GAS LINE		
IRR	IRRIGATION LINE		
	SIGN		
	STREET LIGHT		

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8280 E. GELDING DRIVE SUITE 101, SCOTTSDALE, ARIZONA 85260
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PROJECT: RESIDENTIAL HEALTH CARE FACILITY

LOCATION: N 90TH ST. & RAINTREE CIRCLE DR. SCOTTSDALE, ARIZONA 85260

DRAWN	RM	02/02/2021
DESIGNED	RM	02/02/2021
QC	SC	01/25/2021
QA		
PROJ. MGR.	AF	02/02/2021

DATE: 2/2/2021

ISSUED FOR: DRB

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 200626

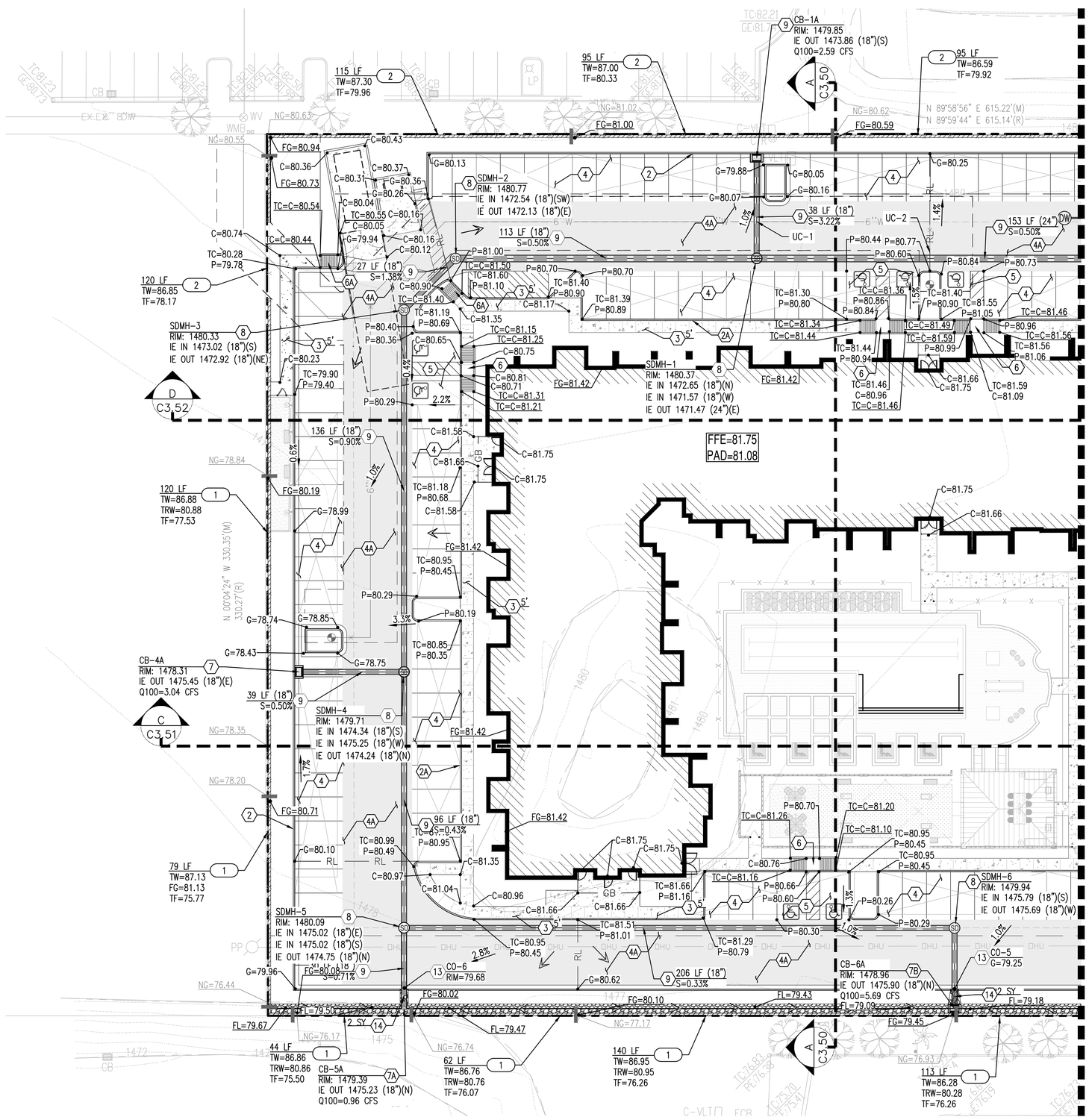
SHEET TITLE:
GRADING AND DRAINAGE PLAN KEYMAP

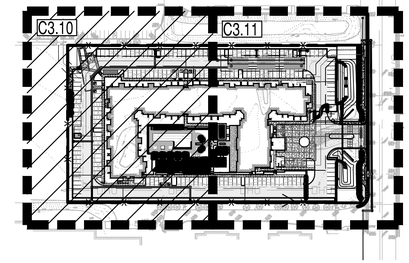
PAGE NO.: SHEET NO.: **C3.00**

CASE NO: 16-ZN-2020

4-DR-2021
2/8/2021

LOCATION: Z:\SHARED\PROJECTS\GREYSTAR\RESIDENTIAL HEALTHCARE-90TH ST & RAINTREE-SCOTTSDALE-200626\11 CAD (SEG)\11.3 CD'S\D200626-C3.00.DWG SAVED BY: LAPTOP06 DATE: 2/2/2021





KEY MAP
SCALE: 1"=150'

PROPOSED LEGEND:

- TC — TOP OF CURB
- G=XX.XX — GUTTER ELEVATION, TC = G+0.5'
- P=XX.XX — PAVEMENT ELEVATION
- C=XX.XX — CONCRETE ELEVATION
- PROPERTY LINE
- CURB AND GUTTER
- VERTICAL CURB
- RL — RIDGELINE
- GB — GRADE BREAK
- LOC — LIMIT OF ONSITE CONSTRUCTION
- XX — MAJOR CONTOUR
- XX — MINOR CONTOUR
- FLOW ARROW
- CATCH BASIN
- SD — STORM MANHOLE
- STORM PIPE
- DW — DRYWELL
- BB — BUBBLER BOX
- CONCRETE PAVEMENT
- HEAVY DUTY PAVEMENT
- LIGHT DUTY PAVEMENT
- RIP-RAP
- WALL

GRADING CONSTRUCTION KEY NOTES

1. MATCH EXISTING GRADE; CONTRACTOR TO VERIFY IN FIELD ALL GRADES PRIOR TO CONSTRUCTION ACTIVITIES AND CONTACT ENGINEER IN CASE OF ANY DISCREPANCIES.
2. CONSTRUCT 6" CONCRETE CURB AND GUTTER PER MAG STD. DET. 220-1 TYPE "A".
2A. CONSTRUCT 6" VERTICAL CURB PER MAG STD. DET. 222 TYPE "B".
3. CONSTRUCT CONCRETE SIDEWALK PER MAG STD. DET. 230. WIDTH PER PLAN.
4. CONSTRUCT 2.5" AC ON 5" ABC ON COMPACTED SUBGRADE PER MAG SPECIFICATION 301, 310, AND 321 AND DET. 4/C3.20.
4A. CONSTRUCT 3" AC ON 5" ABC ON COMPACTED SUBGRADE PER MAG SPECIFICATION 301, 310, AND 321 AND DET. 4/C3.20.
5. CONSTRUCT PAVEMENT WITH 2% MAXIMUM SLOPE IN ANY DIRECTION AT ACCESSIBLE PARKING STALLS AND 2% MAXIMUM CROSS SLOPE AT ADA ACCESSIBLE ROUTE.
6. CONSTRUCT ADA RAMP PER DET. 2/C3.20.
6A. CONSTRUCT ADA RAMP PER DET. 1/C3.20.
6B. CONSTRUCT ADA RAMP PER DET. 3/C3.20.
7. FURNISH AND INSTALL CONCRETE CATCH BASIN TYPE "F" PER MAG STD. DET. 535.
7A. FURNISH AND INSTALL 18" NYLOPLAST DRAIN BASIN WITH STANDARD H-20 GRATE. PER DET. 1/C3.21.
7B. FURNISH AND INSTALL NYLOPLAST DRAIN BASIN WITH 2'X3' STEEL BAR GRATE INLET PER DET. 2/C3.21.
8. FURNISH AND INSTALL PRECAST MANHOLE WITH 48-INCH BASE PER MAG STD. DET. 520 AND 522 WITH CONCRETE COLLAR PER MAG STD. DET. 422.; COVER PER C.O.S. STD. DET. 2520
9. FURNISH AND INSTALL HDPE DOUBLE WALL PIPE, CLASS 100; PIPE MATERIAL PER MAG SPECIFICATION 738. LENGTH, SIZE AND SLOPE PER PLAN.

RETAINING WALL CONSTRUCTION KEY NOTES

1. CMU RETAINING WALL WITH 3' SCREEN WALL, 8' MAXIMUM RETAINED HEIGHT.
2. 6' VIEW FENCE.

UTILITY CROSSINGS

	UC-1	6" WATER BOT	76.65	NO EXTRA PROTECTION REQUIRED
		18" STORM TOP	74.55	
	UC-2	6" WATER BOT	76.65	NO EXTRA PROTECTION REQUIRED
		18" STORM TOP	72.77	

● REQUIRES VERTICAL REALIGNMENT PER MAG STD. DET. 370.

NORTH

GRADING AND DRAINAGE PLAN
SCALE: 1" = 20'
0' 20' 40' 60'

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NOT FOR
CONSTRUCTION

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8280 E. GELDING DRIVE SUITE 101, SCOTTSDALE, ARIZONA 85260
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ARIZONA811 Call 811 or visit Arizona811.com

PROJECT: RESIDENTIAL HEALTH CARE FACILITY
LOCATION: N 90TH ST. & RAINTREE CIRCLE DR. SCOTTSDALE, ARIZONA 85260

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QA		
PROJ. MGR.	AF	02/02/2021

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JOB NO.: 200626

SHEET TITLE: **GRADING AND DRAINAGE PLAN**

PAGE NO.: SHEET NO.: **C3.10**

CASE NO.: 16-ZN-2020

4-DR-2021
2/8/2021

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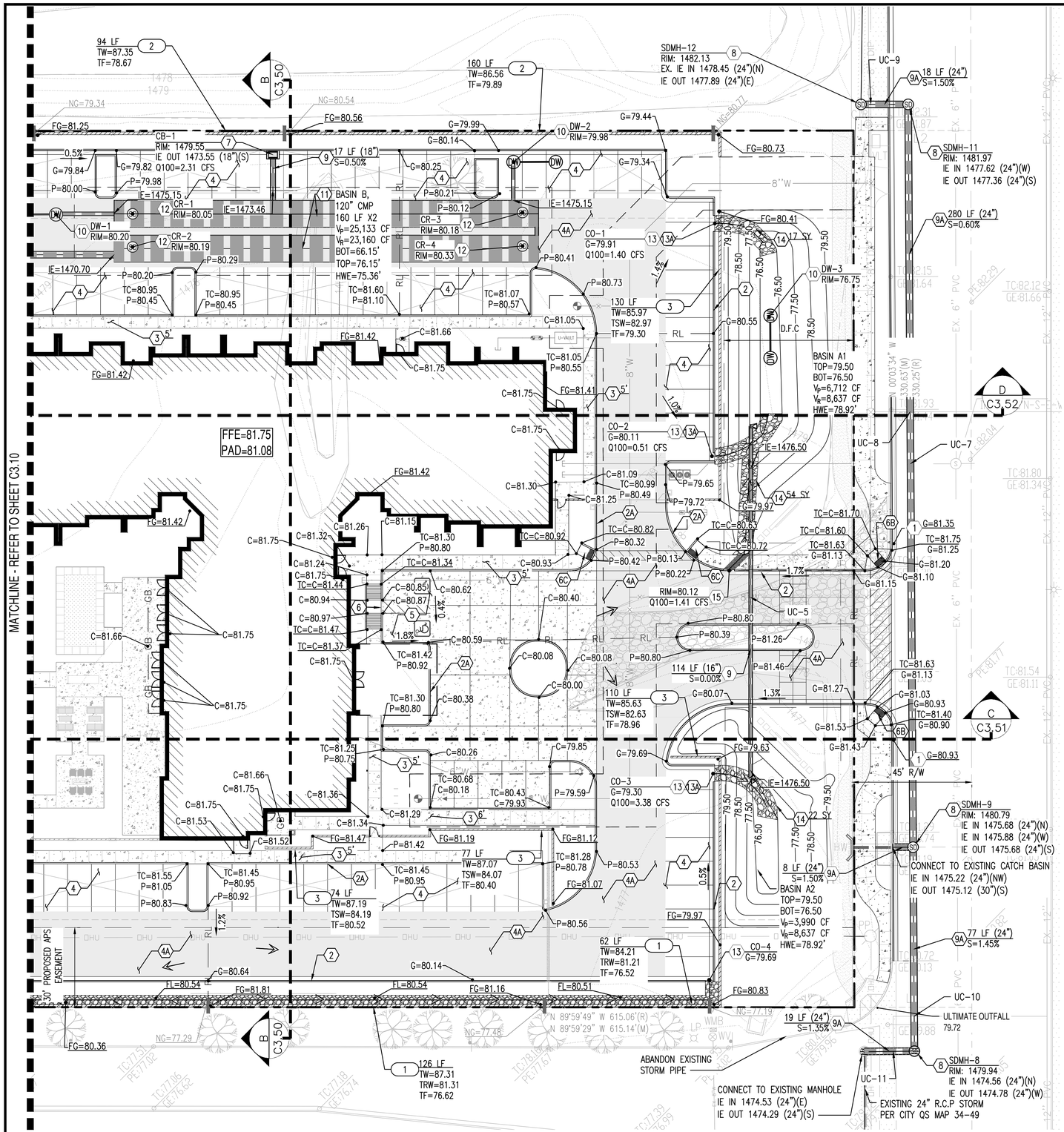
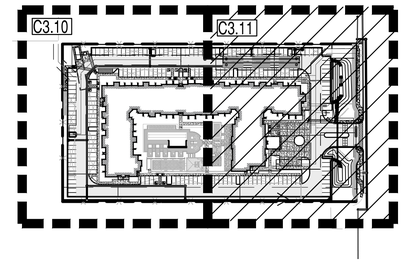


GRADING AND DRAINAGE PLAN

SCALE: 1" = 20'



KEY MAP
SCALE: 1"=150'

PROPOSED LEGEND:

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C=XX.XX	CONCRETE ELEVATION
	PROPERTY LINE
	CURB AND GUTTER
	VERTICAL CURB
RL	RIDGELINE
GB	GRADE BREAK
LOC	LIMIT OF ONSITE CONSTRUCTION
XX	MAJOR CONTOUR
XX	MINOR CONTOUR
	FLOW ARROW
	CATCH BASIN
SD	STORM MANHOLE
	STORM PIPE
DW	DRYWELL
BB	BUBBLER BOX
	CONCRETE PAVEMENT
	HEAVY DUTY PAVEMENT
	LIGHT DUTY PAVEMENT

RETAINING WALL CONSTRUCTION KEY NOTES

1. CMU RETAINING WALL WITH 3' SCREEN WALL, 8' MAXIMUM RETAINED HEIGHT.
2. 6' VIEW FENCE.
3. 3' CMU SCREEN WALL WITH 3' VIEW FENCE.

GRADING CONSTRUCTION KEY NOTES

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6. CONSTRUCT ADA RAMP PER DET. 2/C3.20.
6B. CONSTRUCT ADA RAMP PER DET. 3/C3.20.
6C. CONSTRUCT ADA RAMP PER C.O.S. STD. DET. 2233–2
7. FURNISH AND INSTALL CONCRETE CATCH BASIN TYPE "F" PER MAG STD. DET. 535.
8. FURNISH AND INSTALL PRECAST MANHOLE WITH 48–INCH BASE PER MAG STD. DET. 520 AND 522 WITH CONCRETE COLLAR PER MAG STD. DET. 422.; COVER PER C.O.S. STD. DET. 2520
9. FURNISH AND INSTALL HDPE DOUBLE WALL PIPE, CLASS 100; PIPE MATERIAL PER MAG SPECIFICATION 738. LENGTH, SIZE AND SLOPE PER PLAN.
9A. FURNISH AND INSTALL RGRCP, CLASS III; PIPE MATERIAL PER MAG SPECIFICATION 735. LENGTH, SIZE AND SLOPE PER PLAN.
10. FURNISH AND INSTALL MAXWELL PLUS DRYWELL REFER TO SHEET C3.21 FOR DETAIL. NOTE: CONTRACTOR TO HAVE A PERCOLATION TEST DONE ON FIRST CONSTRUCTED DRYWELL AND PROVIDE RESULTS TO ENGINEER FOR DETERMINATION OF ULTIMATE NUMBER OF REQUIRED DRYWELLS. PROVIDE RAISED RIM PER DET. 8/C3.20.
11. FURNISH AND INSTALL 14 GAGE POLYMER COATED 120" CMP STORMWATER STORAGE SYSTEM. PIPE MATERIAL PER MAG SPECIFICATION 621. LENGTH AND SLOPE PER PLAN. INVERT OF PIPE TO BE PAVED PER C.O.S. STD. DET. 2554. CONTRACTOR TO PROVIDE SIGNED AND SEALED SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO MANUFACTURING.
12. FURNISH AND INSTALL 24" CMP RISER WITH STANDARD SOLID LID. PER DET. ON SHEET C3.21.
13. CONSTRUCT CURB OPENING PER DETAIL 7/C3.20; LENGTH PER PLAN.
13A. CONSTRUCT WALL OPENING PER DETAIL 6/C3.20.
14. FURNISH AND INSTALL RIP–RAP; D50 = 6", 12" DEPTH. DIMENSIONS PER PLAN. REFER TO DETAIL 5/C3.20.
15. FURNISH AND INSTALL SIDEWALK SCUPPER PER MAG STD. DET. 203.

UTILITY CROSSINGS

●	UC–5	16" STORM BOT	76.44	PROVIDE VERTICAL REALIGNMENT PER MAG STD. DET. 370.
		8" WATER TOP	74.40	
	UC–7	24" STORM BOT	76.37	NO EXTRA PROTECTION REQUIRED
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JOB NO.: 200626

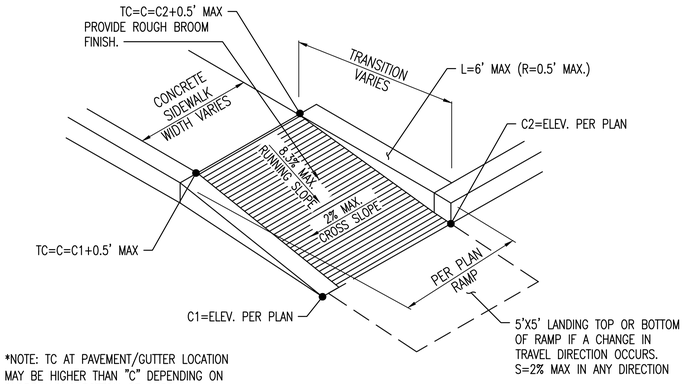
SHEET TITLE: **GRADING AND DRAINAGE PLAN**

PAGE NO.: SHEET NO.: **C3.11**

CASE NO. 16-ZN-2020

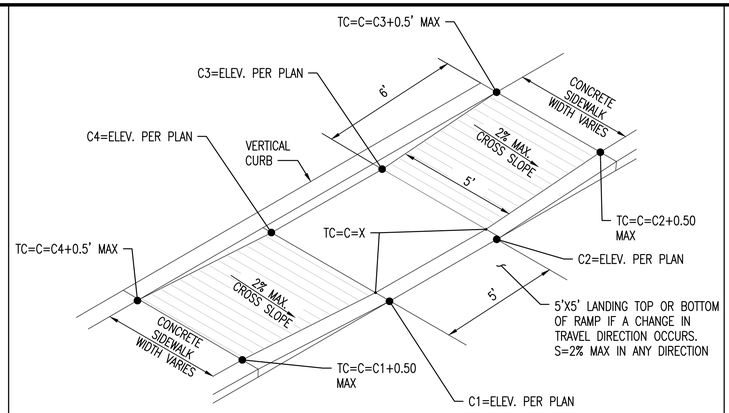
4-DR-2021
2/8/2021

LOCATION: Z:\SHARED\PROJECTS\GREYSTAR\RESIDENTIAL HEALTHCARE–90TH ST & RAINTREE–SCOTTSDALE–200626\11 CAD (SEG)\11.3 CD'S\D200626–C3.00.DWG SAVED BY: LAPTOP06 DATE: 2/2/2021

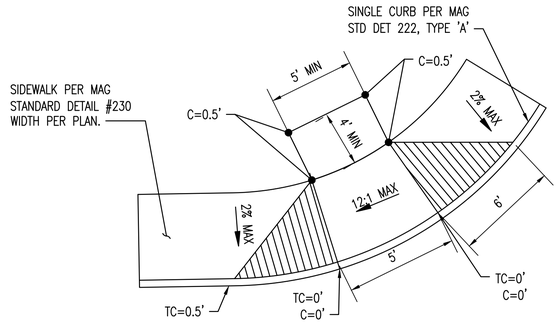


*NOTE: TC AT PAVEMENT/GUTTER LOCATION MAY BE HIGHER THAN "C" DEPENDING ON SLOPE ALONG BOTTOM OF CURB

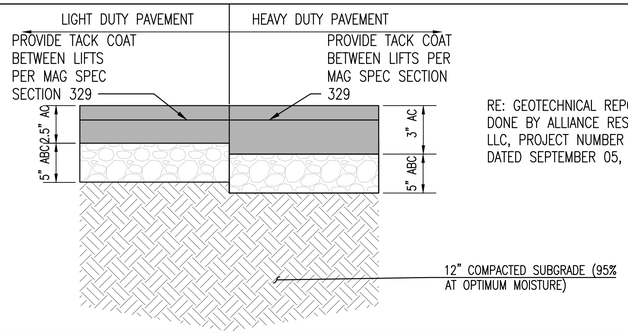
ADA ACCESSIBLE RAMP | 1



ADA ACCESSIBLE RAMP | 2

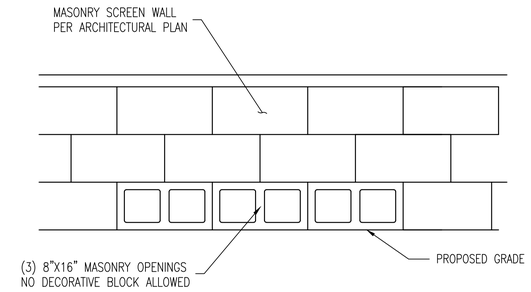


ADA ACCESSIBLE RAMP | 3

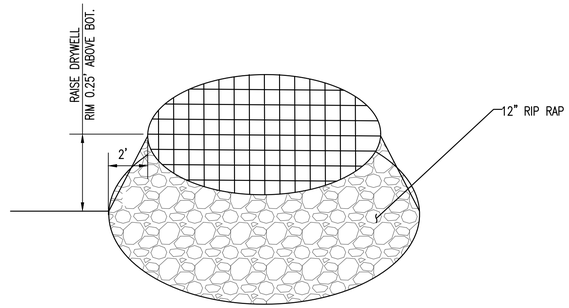


RE: GEOTECHNICAL REPORT DONE BY ALLIANCE RESIDENTIAL, LLC, PROJECT NUMBER 200626, DATED SEPTEMBER 05, 2019.

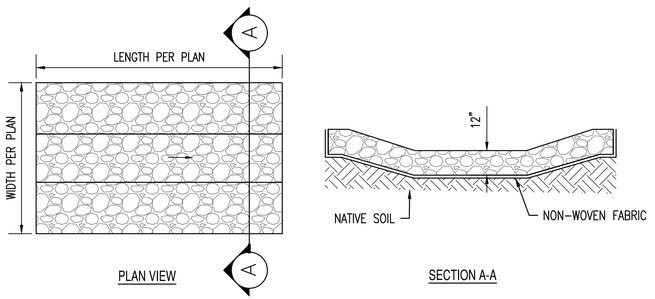
ASPHALT PAVEMENT SECTION | 4



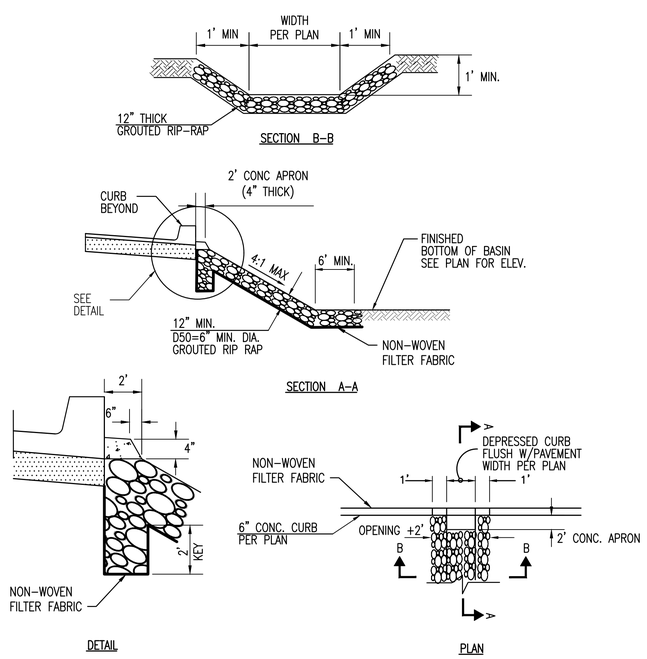
MASONRY WALL OPENING
N.T.S. | 6



RAISED DRYWELL RIM
N.T.S. | 8



TYPICAL RIP RAP PAD | 5



CURB OPENING RIPRAP | 7

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JOB NO.: 200626

SHEET TITLE: **GRADING AND DRAINAGE DETAILS**

PAGE NO.: | SHEET NO.: **C3.20**

CASE NO.:16-ZN-2020

4-DR-2021
2/8/2021

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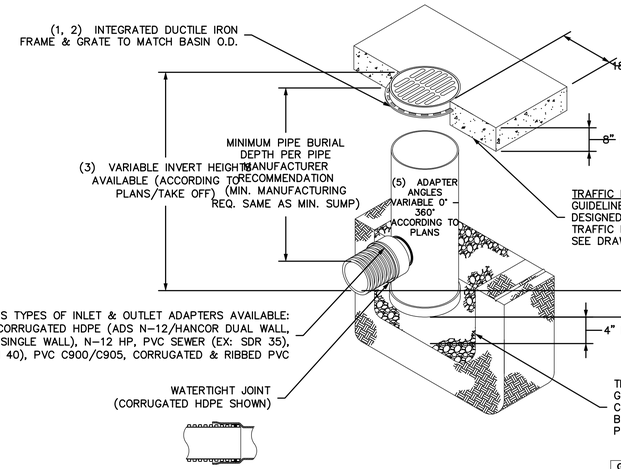
PENDING DRAWING

MAXWELL DRYWELL

9

NYLOPLAST 18" DRAIN BASIN: 2818AG _ _ X



TRAFFIC LOADS: CONCRETE SLAB DIMENSIONS ARE FOR GUIDELINE PURPOSES ONLY. ACTUAL CONCRETE SLAB MUST BE DESIGNED TAKING INTO CONSIDERATION LOCAL SOIL CONDITIONS, TRAFFIC LOADING, & OTHER APPLICABLE DESIGN FACTORS. SEE DRAWING NO. 7001-110-111 FOR NON TRAFFIC INSTALLATION.

THE BACKFILL MATERIAL SHALL BE CRUSHED STONE OR OTHER GRANULAR MATERIAL MEETING THE REQUIREMENTS OF CLASS I, CLASS II, OR CLASS III MATERIAL AS DEFINED IN ASTM D2321. BEDDING & BACKFILL FOR SURFACE DRAINAGE INLETS SHALL BE PLACED & COMPACTED UNIFORMLY IN ACCORDANCE WITH ASTM D2321.

GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN	MEETS H-10	1899CGP	7001-110-212
STANDARD	MEETS H-20	1899CGS	7001-110-213
SOLID COVER	MEETS H-20	1899CGC	7001-110-214
DOME	N/A	1899CGD	7001-110-215
DROP IN GRATE	LIGHT DUTY	1801DI	7001-110-074

1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER.
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360° TO ACCOMMODATE ANY ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-212.

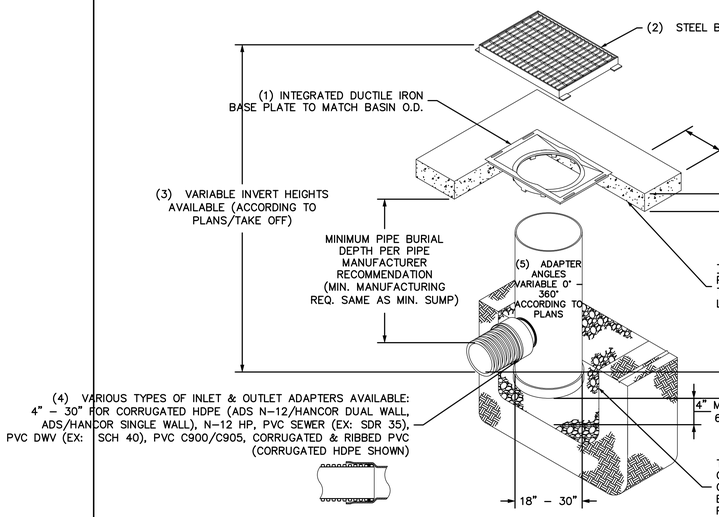
DRAWN BY	EBC	MATERIAL	
DATE	04-03-06		
REVISED BY	NMH	PROJECT NO./NAME	
DATE	03-14-16		
DWG SIZE	A	SCALE 1:30	SHEET 1 OF 1

Nyloplast
3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-7490
www.nyloplast-us.com
TITLE: 18 IN DRAIN BASIN QUICK SPEC INSTALLATION DETAIL
DWG NO. 7001-110-191 REV E

NYLOPLAST 18" DRAIN BASIN

1

NYLOPLAST DRAIN BASIN WITH 2 FT X 3 FT STEEL BAR GRATE



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1 - 18" - 30" BASE PLATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - FRAME & GRATE SHALL BE STEEL PER ASTM A36.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 24").
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360° TO ACCOMMODATE ANY MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-212.
6 - STEEL BAR GRATE SHALL MEET H-20 LOAD RATING.

DRAWN BY	EBC	MATERIAL	
DATE	03-22-10		
REVISED BY	NMH	PROJECT NO./NAME	
DATE	03-16-16		
DWG SIZE	A	SCALE 1:40	SHEET 1 OF 1

Nyloplast
3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-7490
www.nyloplast-us.com
TITLE: DRAIN BASIN WITH 2 FT X 3 FT STEEL BAR GRATE QUICK SPEC INSTALLATION DETAIL
DWG NO. 7001-110-395 REV D

NYLOPLAST DRAIN BASIN WITH 2' X 3' STEEL BAR GATE

2

PRELIMINARY
NOT FOR
CONSTRUCTION

SEG SUSTAINABILITY ENGINEERING GROUP
8280 E. GELDING DRIVE SUITE 101, SCOTTSDALE, ARIZONA 85260
WWW.AZSEG.COM TEL. 480.588.7226 FAX 480.259.3534

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 Arizona Blue Stake, Inc.
Call 811 or visit Arizona811.com

PROJECT: RESIDENTIAL HEALTH CARE FACILITY
LOCATION: N 90TH ST. & RAINTREE CIRCLE DR. SCOTTSDALE, ARIZONA 85260

DRAWN		RM	02/02/2021
DESIGNED		RM	02/02/2021
QC		SC	01/25/2021
QA			
PROJ. MGR.		AF	02/02/2021

DATE: 2/2/2021
ISSUED FOR: DRB

REVISION NO.:	DATE:
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3	
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JOB NO.: 200626

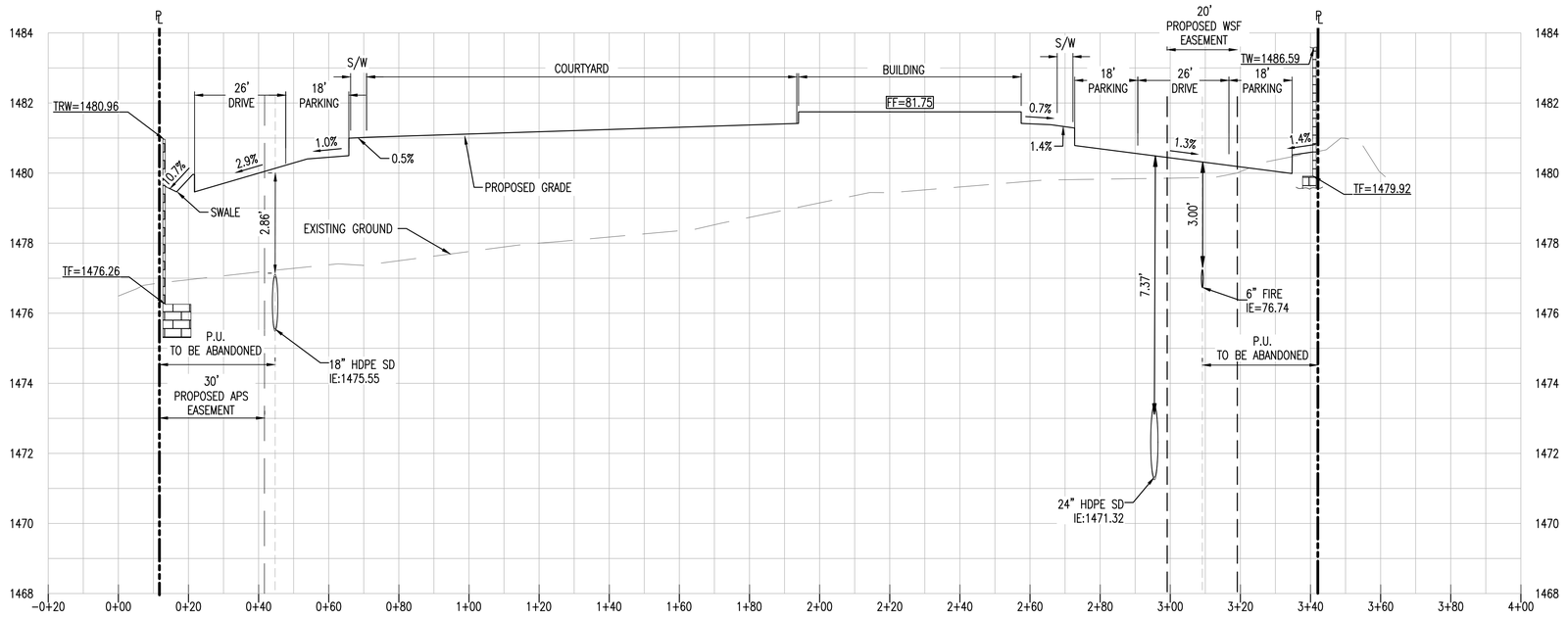
SHEET TITLE: **GRADING AND DRAINAGE DETAILS**

PAGE NO.:
SHEET NO.: **C3.21**

CASE NO.: 16-ZN-2020

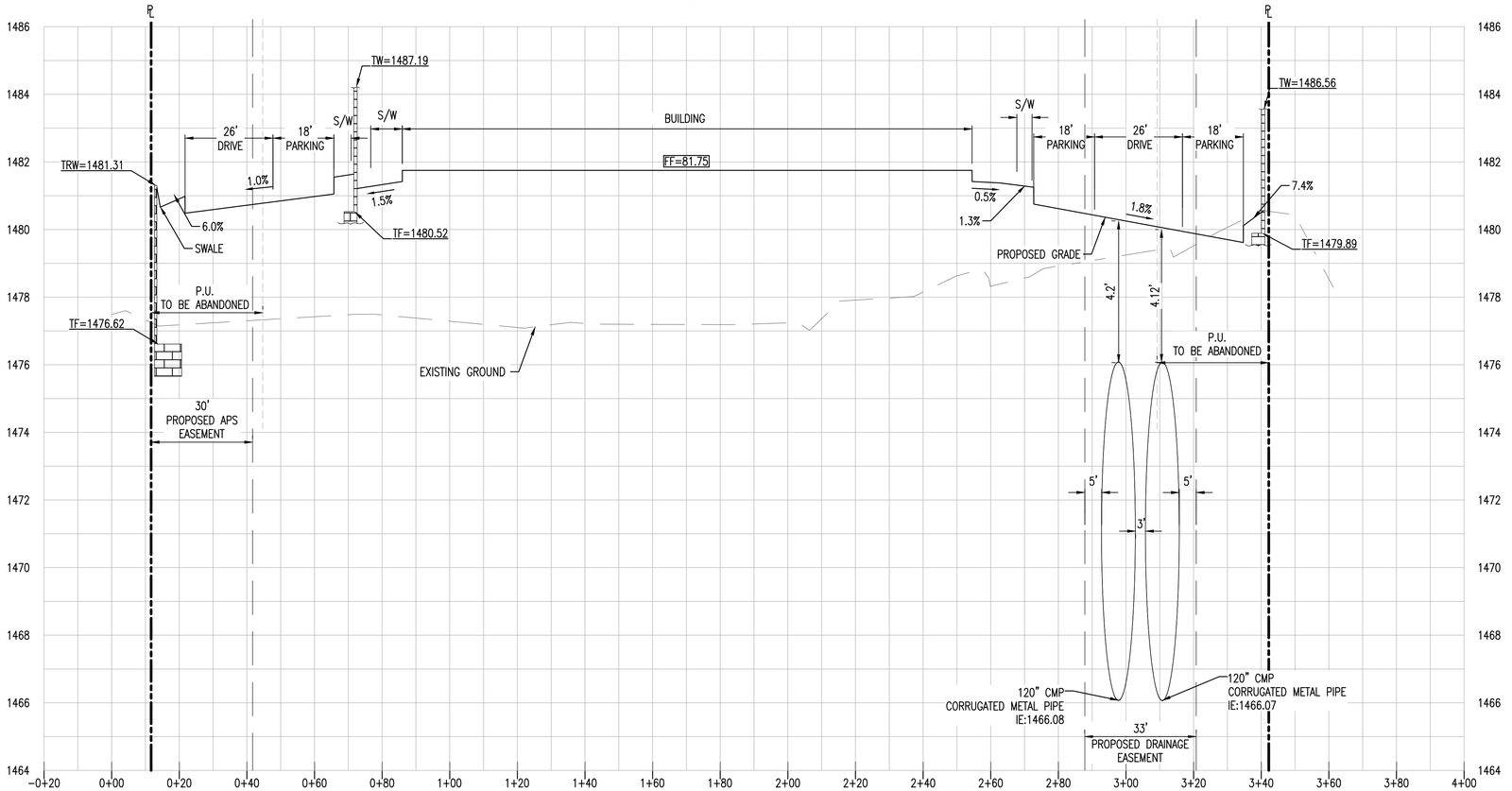
4-DR-2021
2/8/2021

LOCATION: Z:\SHARED\PROJECTS\GREYSTAR\RESIDENTIAL HEALTHCARE-90TH ST & RAINTREE-SCOTTSDALE-200626\11 CAD (SEG)\11.3 CD'S\CD200626-C3.00.DWG SAVED BY: LAPTOP06 DATE: 2/2/2021



PROFILE VIEW A-A

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



PROFILE VIEW B-B

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

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SUSTAINABILITY ENGINEERING GROUP
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Call 811 or click Arizona811.com

PROJECT
RESIDENTIAL HEALTH CARE FACILITY

LOCATION
N 90TH ST. & RAINTREE CIRCLE DR. SCOTTSDALE, ARIZONA 85260

DRAWN		RM	02/02/2021
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JOB NO.: 200626

SHEET TITLE:

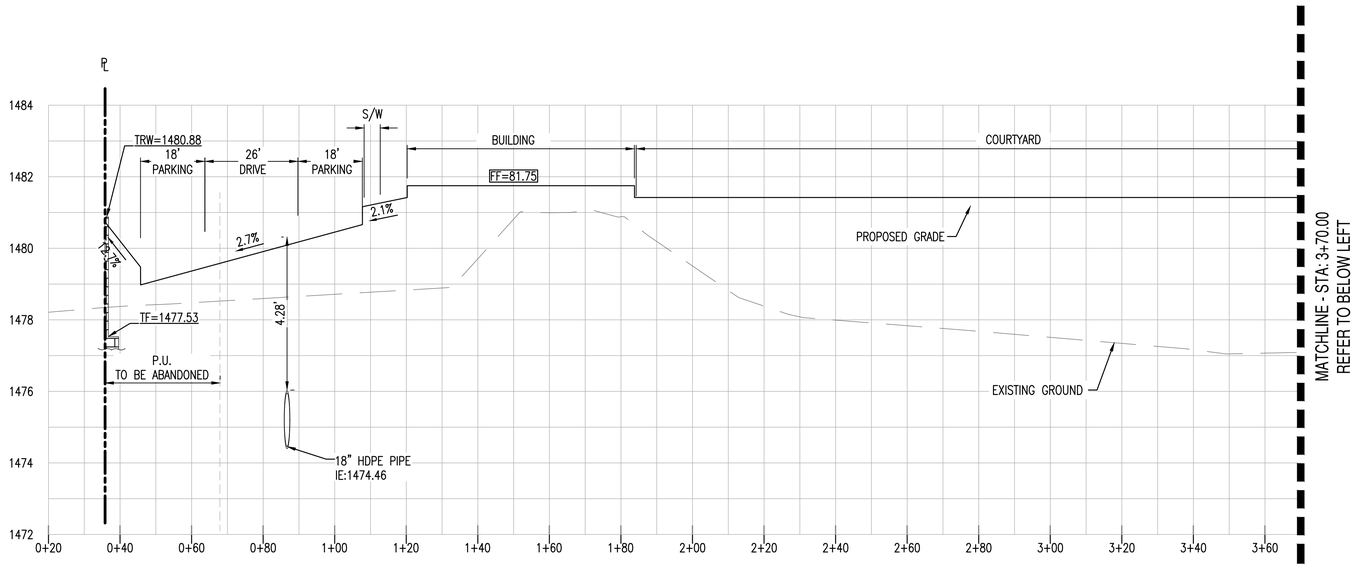
SITE CROSS-SECTIONS

PAGE NO.:

SHEET NO.: **C3.50**

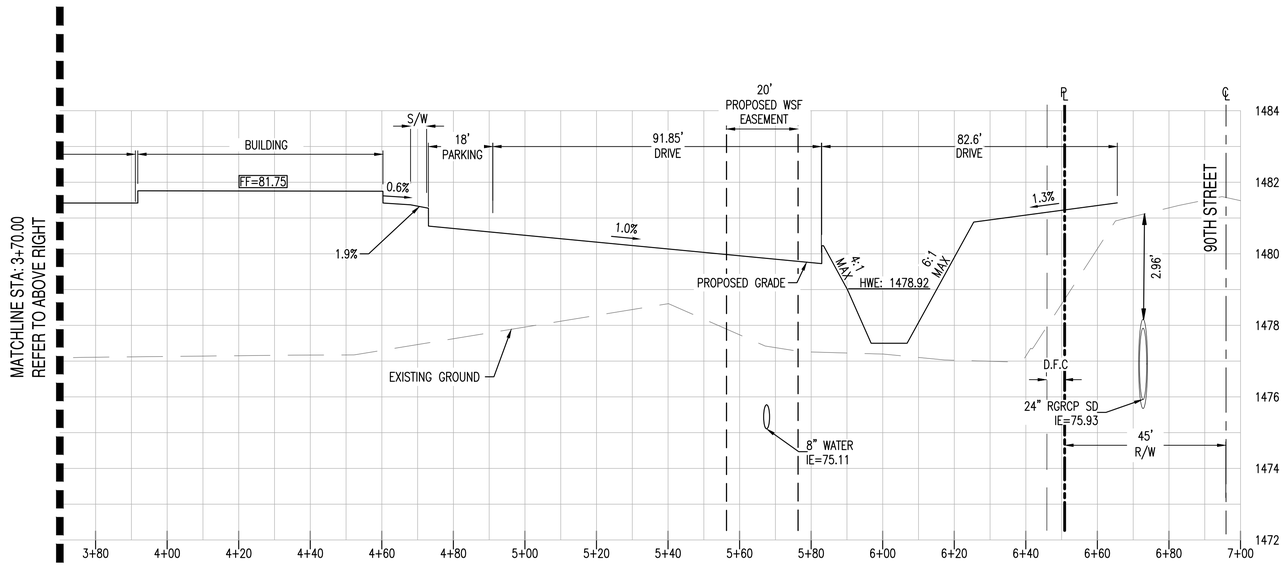
CASE NO.:16-ZN-2020

4-DR-2021
2/8/2021



PROFILE VIEW C-C

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



PROFILE VIEW C-C

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

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PROJECT
RESIDENTIAL HEALTH CARE FACILITY

LOCATION
N 90TH ST. & RAINTREE CIRCLE DR.
SCOTTSDALE, ARIZONA 85260

DRAWN	RM	02/02/2021
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JOB NO.: 200626

SHEET TITLE:

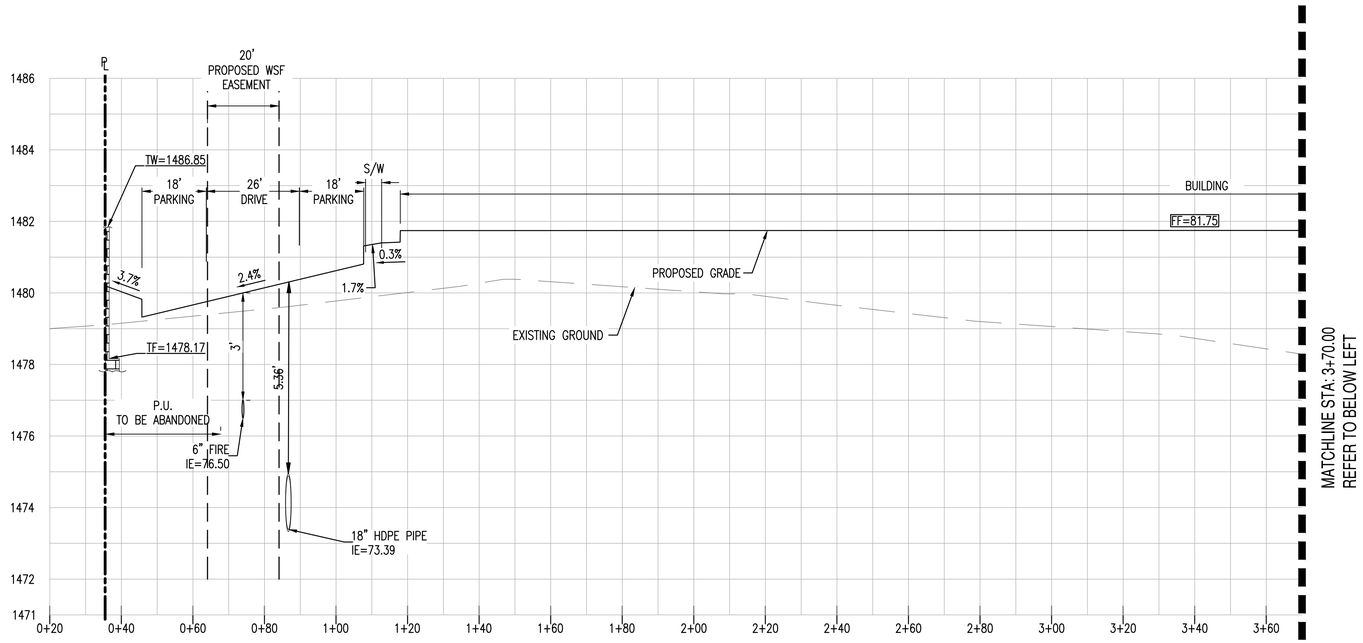
SITE CROSS-SECTIONS

PAGE NO.:

SHEET NO.: **C3.51**

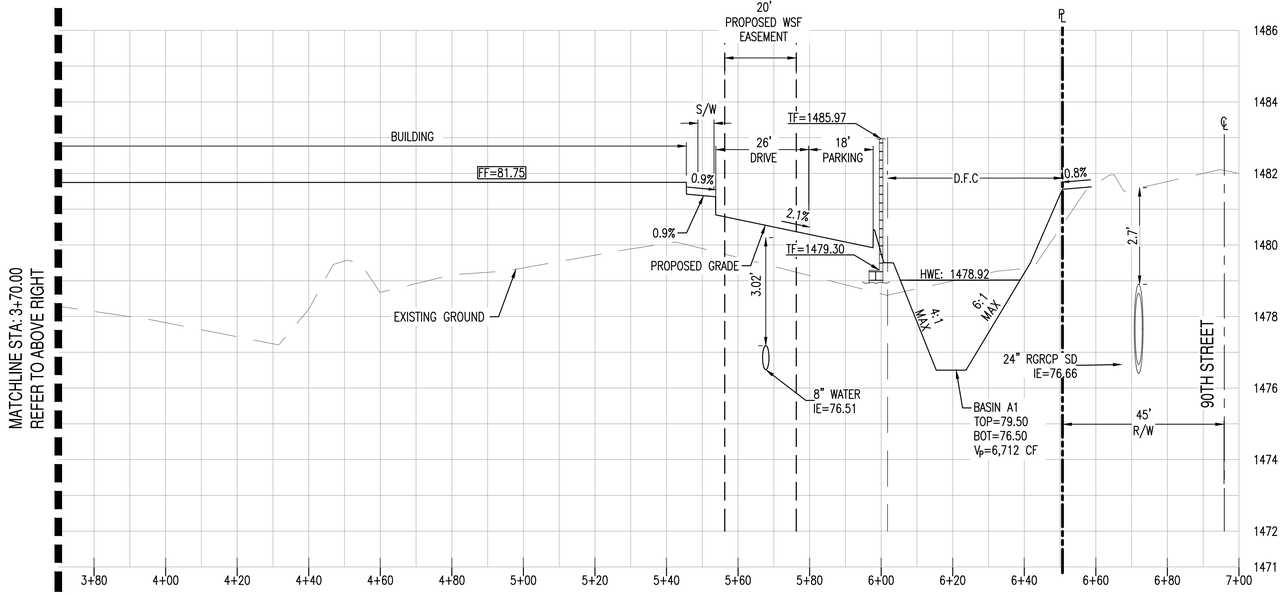
CASE NO.: 16-ZN-2020

4-DR-2021
2/8/2021



PROFILE VIEW D-D

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



PROFILE VIEW D-D

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

PRELIMINARY
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CONSTRUCTION

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PROJECT
RESIDENTIAL HEALTH
CARE FACILITY

LOCATION
N 90TH ST. & RAINTREE
CIRCLE DR.
SCOTTSDALE, ARIZONA 85260

DRAWN	RM	02/02/2021
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QA		
PROJ. MGR.	AF	02/02/2021

DATE:
2/2/2021

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DRB

REVISION NO.:	DATE:
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JOB NO.:
200626

SHEET TITLE:
SITE CROSS-SECTIONS

PAGE NO.:

SHEET NO.:
C3.52

CASE NO.:16-ZN-2020

4-DR-2021
2/8/2021