PRELIMINARY DRAINAGE REPORT
YAM HANGARS AT SDL

14930 N. 78TH Way
Scottsdale, Arizona 85260

Prepared For:

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EXPIRATION DATE: 12-31-2027

Project Number: 240103

Submittal Date: August 8, 2024
Submittal Date: April 17, 2025

DRAINAGE REPORT
APPROVED
BY THE CITY OF SCOTTSDALE PLAN REVIEW DEPARTMENT

10-DR-2024	JLL	08/05/2025
CASE NUMBER	STAFF INITIALS	DATE

CONSTRUCTION AND INSTALLATION SHALL BE IN ACCORDANCE WITH THIS PLAN AND ANY AND ALL DEVIATIONS WILL REQUIRE REAPPROVAL

Case No.: 10-DR-2024 **Plan Check No.: TBD**

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1. INTRODUCTION

This Preliminary Drainage Report represents the storm water analysis for the development of four aircraft hangar buildings with peripheral parking and taxiway connectors proposed in the City of Scottsdale adjacent to the Municipal Airport. The purpose of this report is to provide the hydrologic and hydraulic analysis, required by the City of Scottsdale, to support the proposed improvement plans 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 done 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, Volume I[2] and Volume II[3].

2. LOCATION AND PROJECT DESCRIPTION

2.1 LOCATION:

The subject property consists of land located in a portion of the Northeast Quarter of Section 11, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County Arizona:

- Parcel ID: 215-56-421B and 215-56-247B.
- Address: 14930 N. 78TH Way Scottsdale, AZ 85260.

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:

- North:
  - Parcel 215-56-413E; City of Scottsdale Municipal Airport.
- South: Across N. 78rd Way
  - Parcel 215-56-245A; Storage building.
  - Parcel 215-56-246A; Storage building.
  - Parcel 215-55-023A; Commercial building.
- East: Across N. 78th Way
  - Parcel 215-56-224A; Office building.
  - Parcel 215-56-413E; City of Scottsdale Municipal Airport.
- West:
  - Parcel 215-56-428A; Commercial building.

2.3 EXISTING SITE DESCRIPTION:

The project area includes two parcels of approximately 8.27 and 0.58 acres of land and are designated with zoning I-1. Per Topographic Survey by AW Land Surveying, Inc., the site topography slopes from the north to south at a 1.00% slope.

There are not any recorded existing open retention basins on-site, however there was a natural retention area located on the southwesterly side of the site where the water was generally retained.

Refer to **FIGURE 2** attached to an aerial of the site.

2.4 PROPOSED SITE DEVELOPMENT:

Site development includes the construction of two drive entrances, four hangar buildings, office space, parking, plane maneuvering, drive aisles, and landscape areas. The project will also include an off-site connection to the airport taxiway.

Refer to **APPENDIX III** –Grading and Drainage Plans 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". As such, it is defined as areas determined to be an area of 0.2% annual chance flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance.

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

3. EXISTING DRAINAGE CONDITIONS

3.1 OFF-SITE DRAINAGE PATTERNS

The topographic survey provides the following information for offsite drainage:

- *North*: Half of the runoff from the airport runway flows towards the site, where it is collected in an aggregate lined channel and travels southwest away from the site. No flows from the north affect the site.
- *East*: Runoff from the parcel east flows toward the N 78TH Way and is conveyed via curb and gutter southwesterly to an existing catch basin. No flows from the east affect the site.
- *West*: Runoff from the parcel west of the site is directed overland into an open retention basin located in the southeast of the parcel. No flows from the west affect the site.
- *South*: Half of the runoff from N 78TH Way flows toward the site where it is conveyed southwesterly via curb and gutter away from the site to an existing catch basin. No flows from the south affect the site.

3.2 ON-SITE DRAINAGE

Based on the topographic information all existing runoff is directed to a depression area located on the southwest side of the site.

Refer to **APPENDIX II** for **Existing Conditions Drainage Area Map** and **Existing Site Discharges Calculations**.

Table 1 below is a summary of existing conditions runoff calculations:

TABLE 1: EXISTING SITE DISCHARGES

EXISTING SITE DISCHARGES									
	Total Area	Cwt	Intensity 10 yr	Q 10	Intensity 100 yr	Q 100	Control Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	10.19	0.52	-	-	-	-	-	20.64	35.46
EX-A1	8.86	0.46	3.99	16.27	6.86	27.97	CP-1	16.27	27.97
EX-OFF-1	1.17	0.90	3.53	3.73	6.14	6.49	EX-CB-1	3.73	6.49
EX-OFF-2	0.16	0.83	4.84	0.64	7.61	1.01	EX-CB-2	0.64	1.01

Overall project area includes **10.19 Acres at C_{wt}= 0.52** (Existing conditions).

Refer to **TC Calculations, Existing Cwt Exhibit and Existing Conditions Drainage Area Map** in **APPENDIX II.**

4. PROPOSED STORM WATER MANAGEMENT

4.1 DESIGN INTENT:

Given that the site has not been previously developed, on-site retention shall be calculated per City of Scottsdale DSPM 4-1.201. The site's runoff will be directed to two proposed underground retention basins and two open retention basins. Retention will be provided for the 100-year 2-hour storm event for the proposed development:

- Flows from drainage areas DA-A1 to DA-A5 and DA-AR1 through DA-AR8 will be directed into underground retention Basin A.
- Flows from drainage areas DA-B1 to DA-B5 and DA-BR1 through DA-BR12 will be directed into combined retention system (Basin B), consisting of underground retention Basin B1 and open retention Basin B2. Open retention Basin B2 will direct stormwater to Basin B1 via a CMP riser prior to filling up.
- Flows from drainage area DA-C1 will be retained into open retention Basin C.
- Flows from drainage area DA-D1 will be directed overland into EX-CB-2.
- Runoff from the offsite drainage area OFF-1 discharges into an existing catch basin (EX-CB-1).
- Runoff from the offsite drainage area OFF-2 discharges into an existing catch basin (EX-CB-2).

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

4.2 DESIGN STORM REQUIREMENTS:

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

4.3 LAND CHARACTERISTICS:

The proposed project site consists of a hangar space, office space, parking, plane maneuvering area, drive aisles, and landscape areas. Based on the DS&PM, runoff coefficients for the 100-year storm event used are as follows:

- C=0.95 for building or concrete
- C=0.95 for paved surface
- C=0.45 for undisturbed natural desert or desert landscape

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.

Table 2 below is a summary of proposed conditions runoff calculations:

TABLE 2: PROPOSED SITE DISCHARGES

PROPOSED SITE DISCHARGES									
	TOTAL AREA	Cwt	Intensity 10 yr 5-min	Q 10	Intensity 100 yr 5-min	Q 100	Concentration Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	10.19	0.89	4.84	-	7.61	-	-	32.26	50.73
DA-A1	1.53	0.93	4.84	6.86	7.61	10.79	CB-4	6.86	10.79
DA-A2	0.98	0.95	4.84	4.51	7.61	7.09	CB-5	4.51	7.09
DA-A3	0.52	0.88	4.84	2.20	7.61	3.45	CB-6C	2.20	3.45
DA-A4	0.48	0.95	4.84	2.19	7.61	3.45	CB-7	2.19	3.45
DA-A5	0.45	0.95	4.84	2.08	7.61	3.27	CB-8	2.08	3.27
DA-AR1	0.17	0.95	4.84	0.79	7.61	1.24	RD-A1	0.79	1.24
DA-AR2	0.16	0.95	4.84	0.74	7.61	1.16	RD-A2	0.74	1.16
DA-AR3	0.16	0.95	4.84	0.74	7.61	1.16	RD-A3	0.74	1.16
DA-AR4	0.16	0.95	4.84	0.74	7.61	1.16	RD-A4	0.74	1.16
DA-AR5	0.04	0.95	4.84	0.20	7.61	0.32	RD-A5	0.20	0.32
DA-AR6	0.24	0.95	4.84	1.12	7.61	1.76	RD-A6	1.12	1.76
DA-AR7	0.21	0.95	4.84	0.96	7.61	1.50	RD-A7	0.96	1.50
DA-AR8	0.21	0.95	4.84	0.95	7.61	1.50	RD-A8	0.95	1.50
DA-B1	0.40	0.89	4.84	1.72	7.61	2.71	CB-18	1.72	2.71
DA-B2	0.05	0.50	4.84	0.13	7.61	0.20	CB-16	0.13	0.20
DA-B3	0.24	0.92	4.84	1.06	7.61	1.66	CB-14	1.06	1.66
DA-B4	0.21	0.90	4.84	0.90	7.61	1.42	CB-13	0.90	1.42
DA-B5	0.41	0.46	4.84	0.92	7.61	1.44	BASIN B2	0.92	1.44
DA-BR1	0.15	0.95	4.84	0.68	7.61	1.07	RD-B1	0.68	1.07
DA-BR2	0.15	0.95	4.84	0.71	7.61	1.12	RD-B2	0.71	1.12
DA-BR3	0.15	0.95	4.84	0.68	7.61	1.07	RD-B3	0.68	1.07
DA-BR4	0.15	0.95	4.84	0.68	7.61	1.07	RD-B4	0.68	1.07
DA-BR5	0.15	0.95	4.84	0.71	7.61	1.12	RD-B5	0.71	1.12
DA-BR6	0.15	0.95	4.84	0.68	7.61	1.07	RD-B6	0.68	1.07
DA-BR7	0.15	0.95	4.84	0.68	7.61	1.07	RD-B7	0.68	1.07
DA-BR8	0.15	0.95	4.84	0.71	7.61	1.12	RD-B8	0.71	1.12
DA-BR9	0.15	0.95	4.84	0.67	7.61	1.06	RD-B9	0.67	1.06
DA-BR10	0.15	0.95	4.84	0.69	7.61	1.08	RD-B10	0.69	1.08
DA-BR11	0.15	0.95	4.84	0.71	7.61	1.12	RD-B11	0.71	1.12
DA-BR12	0.15	0.95	4.84	0.68	7.61	1.07	RD-B12	0.68	1.07
DA-D1	0.21	0.59	4.84	0.61	7.61	0.97	EX-CB-2	1.28	2.01
OFF-2	0.16	0.86	4.84	0.66	7.61	1.04			
OFF-1	1.17	0.90	3.44	3.62	6.23	6.55	EX-CB-1	3.62	6.55
DA-C1	0.22	0.46	4.84	0.49	7.61	0.77	BASIN C	0.49	0.77

Overall project area includes **10.19 Acres at C_{wt} = 0.89** (Proposed conditions)
Refer to the **Proposed Conditions Cwt and Proposed Conditions Drainage Area Map** in **APPENDIX II**.

4.4 STORMWATER RETENTION:

100-YR, 2-HR STORM: Per City of Scottsdale DSPM 4-1.201, development storage requirements for the 100-yr, 2-hr storm event are calculated as follows:

$$V_r = C\left(\frac{R}{12}\right)A$$

where:
V_r = Required storage (cf)
R = Precipitation amount =2.24 in per NOAA Atlas 14 Precipitation Frequency Estimates
A = Total area of site
C = Runoff coefficient

Basin A:

TABLE 3: BASIN A REQUIRED STORAGE VOLUME CALCULATIONS

Required Storage Volume Calculations					
					Vr=1*(P/12)*Cw*A
					P=100-yr,2-hr= 2.24in.
Drainage Area ID	Area (acres)	C (-)	Depth (in)	Volume Req. (acre-ft)	Volume Req. (CF)
ON-SITE RETENTION - BASIN A - UG Retention					
DA-A1	1.53	0.93	2.24	0.265	11,528.19
DA-A2	0.98	0.95	2.24	0.174	7,576.34
DA-A3	0.52	0.88	2.24	0.085	3,688.26
DA-A4	0.48	0.95	2.24	0.085	3,686.61
DA-A5	0.45	0.95	2.24	0.080	3,491.34
DA-AR1	0.17	0.95	2.24	0.030	1,327.46
DA-AR2	0.16	0.95	2.24	0.028	1,235.28
DA-AR3	0.16	0.95	2.24	0.028	1,235.28
DA-AR4	0.16	0.95	2.24	0.028	1,235.55
DA-AR5	0.04	0.95	2.24	0.008	339.51
DA-AR6	0.24	0.95	2.24	0.043	1,875.84
DA-AR7	0.21	0.95	2.24	0.037	1,607.71
DA-AR8	0.21	0.95	2.24	0.037	1,604.26
Basin A Total	**5.31**	**0.94**	**2.24**	**0.928**	**40,431.64**

Basin B:

TABLE 4: BASIN B REQUIRED STORAGE VOLUME CALCULATIONS

Required Storage Volume Calculations					
					Vr=1*(P/12)*Cw*A
					P=100-yr,2-hr= 2.24in.
Drainage	Area	C	Depth	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in)	(acre-ft)	(CF)
ON-SITE RETENTION - BASIN B - UG Retention					
DA-B1	0.40	0.89	2.24	0.066	2,893.59
DA-B2	0.05	0.50	2.24	0.005	216.05
DA-B3	0.24	0.92	2.24	0.041	1,773.87
DA-B4	0.21	0.90	2.24	0.035	1,518.84
DA-B5	0.41	0.46	2.24	0.035	1,539.84
DA-BR1	0.15	0.95	2.24	0.026	1,145.71
DA-BR2	0.15	0.95	2.24	0.027	1,195.31
DA-BR3	0.15	0.95	2.24	0.026	1,145.70
DA-BR4	0.15	0.95	2.24	0.026	1,145.47
DA-BR5	0.15	0.95	2.24	0.027	1,195.50
DA-BR6	0.15	0.95	2.24	0.026	1,145.85
DA-BR7	0.15	0.95	2.24	0.026	1,142.14
DA-BR8	0.15	0.95	2.24	0.027	1,191.58
DA-BR9	0.15	0.95	2.24	0.026	1,131.79
DA-BR10	0.15	0.95	2.24	0.026	1,152.24
DA-BR11	0.15	0.95	2.24	0.027	1,191.77
DA-BR12	0.15	0.95	2.24	0.026	1,142.28
Basin B Total	**3.12**	**0.86**	**2.24**	**0.502**	**21,867.53**

Basin C:

TABLE 5: BASIN REQUIRED STORAGE VOLUME CALCULATIONS

Required Existing Storage Volume Calculations					
					Vr=1*(P/12)*Cw*A
					P=100-yr,24-hr= 2.24in.
Drainage	Area	C	Depth	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in)	(acre-ft)	(CF)
ON-SITE RETENTION - BASIN C - Open Retention					
DA-C1	0.22	0.46	2.24	0.019	823.42
Basin C Total	**0.22**	**0.46**	**2.260**	**0.019**	**823.42**

Retention shall be provided for the 100-yr, 2-hr event therefore on-site retention will be designed to store the required 40,432 cf for Basin A, 21,277 cf for Basin B and 823 cf for Basin C. Provided storage for proposed conditions is calculated below:

Basin A provided storage:
Basin A will consist of a 520' x 10' x 8' concrete chamber.
V_P = Length* Width * Height
V_P = 520 ft x 10 ft x 8 ft = 41,600 cf.

Basin B1 provided storage:
Basin B1 will consist of a 10' diameter corrugated metal pipe and will have a length of 280 LF.

$V_P = \pi$* Pipe radius^2 * Pipe length
$V_P = (\pi * 5^2)*(280) = 21{,}991$ cf.

Basin B2 provided storage:

BASIN B2					
ELEV.	AREA	DEPTH	AVG VOLUME	SUM VOLUME	COMMENT
(FT)	(SF)	(FT)	(CF)	(CF)	
1457.0	3,024			0.00	Bottom
		1.00	3,878.61		
1458.0	4,733			3,878.61	**Volume Provided**

Basin C provided storage:

BASIN C					
ELEV.	AREA	DEPTH	AVG VOLUME	SUM VOLUME	COMMENT
(FT)	(SF)	(FT)	(CF)	(CF)	
1460.8	1,347			0.00	Bottom
		0.50	839.84		
1461.3	**2,012**			839.84	**Volume Provided**

***TABLE 6*: PROPOSED RETENTION BASIN SUMMARY**

Proposed Retention Basin Summary					
Basin		TYPE	Vp	Vptotal	Vr
(ID)		(--)	(CF)	(CF)	(CF)
Basin A	BASIN A	UG	41,600	41,600	40,432
Basin B	BASIN B1	UG	21,991	25,870	21,868
	BASIN B2	OPEN	3,879		
Basin C	BASIN C	OPEN	840	840	823
Total:				**68,310**	**63,123**

The proposed basins have enough capacity to store the required additional volume generated from the 100-yr, 2-hr event.

FIRST FLUSH: First Flush storage required is calculated in accordance with City of Scottsdale DSPM 4-1.201. Only the areas where runoff could be affected by vehicular contact are considered in the first flush calculation. The roof drainage is considered to be free of heavy traffic pollutants, therefore, on-site driveway areas and sidewalks will be considered for the calculation. As shown in the Proposed Conditions Cwt Exhibit, the first flush area is calculated as the total project area (386,053 sf) minus roof area (161,432 sf) and landscape areas (61,913 sf), equating to 162,708 sf.

$$FF_r = C\left(\frac{P}{12}\right)A$$

where:

FF_r = First Flush required storage volume (cf)

P = Precipitation amount = 0.5 in per C.O.S. DSPM

A = the applicable contributing area of the proposed development (sf)

C = The weighted average runoff coefficient = 0.95

$$FF_r = (0.95)\left(\frac{0.5}{12}\right)161{,}878 = 6{,}408\ cf$$

Since retention will be provided for the 100-yr, 2-hr event, the first flush requirement is automatically satisfied. Environmental structures will be provided as required to treat runoff prior to discharge.

4.4.1 CMP UNDERGROUND RETENTION TANK DESIGN (75-YR DESIGN LIFE)

Per the Geotechnical Investigation Report prepared by Vann Engineering, Inc dated June 20, 2024, it is suggested to design the CMP material type for how corrosive the soil is in contact with the pipe. Therefore, per Table 12 of the referred report above, the minimum gage for 120" Ø CMP and maximum cover ranging from 5.0 to 15.0 feet is 14 gage galvanized pipe.

4.5 STORMWATER DISCHARGE

For Basins with no direct bleed-off available, Drywells are proposed in the on-site storage facilities to dispose of the stormwater 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.
- The number of drywells will be reduced if geotechnical testing for percolation rates determines 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.

Basin A:
Total provided storage = **41,600** CF
41,600 CF / 12,960 CF per drywell = 3.21 = 4 drywells required.

Basin B:
Total provided storage = **25,870**CF
25,870 CF / 12,960 CF per drywell = 2.00 = 2 drywells required.

Pre vs post discharges

Proposed conditions will ultimately increase site flow contributions to the existing public storm drain system.
Table 7 below summarizes the project discharges per outfall for the 10-year and 100-year storm events, providing the differences between existing and proposed peak flows for each case.

TABLE 7: PRE VS POST SITE DISCHARGES

	Q10 (cfs)			Q100 (cfs)		
Outfall	Existing	Proposed	Δ	Existing	Proposed	Δ
EX-CB-1	3.73	3.62	-0.11	6.49	6.55	0.06
EX-CB-2	0.64	1.28	0.63	1.01	2.01	1.00

During the 100-year storm event, discharges to the overall public storm drain system will be increased by 1.00 cfs.

Refer to **Existing Conditions Drainage Area Map, Existing Conditions Cwt Exhibit, Existing Site Discharges Calculations** and **Proposed Conditions Drainage Area Map** in **APPENDIX II**.

4.6 PIPE CAPACITY CALCULATIONS

The proposed drainage system consists of HDPE and Class IV RCP pipes conveying runoff flows from proposed catch basins and roof drains to the underground storage tanks. Capacity of the storm system was evaluated for the 100-yr event scenario using Autodesk Civil 3D Gravity Network Analysis, verifying that the Hydraulic Grade line does not exceed six-inch depth in the parking lot.

Refer to **Appendix II** for **Pipe Capacity Calculations and Hydraulic Grade Profiles**.

4.7 STORM DRAIN INLET CALCULATIONS

Two (2) double 2'x3' concrete catch basin, six (6) 2'x3' Nyloplast catch basins and one (1) 24" Nyloplast catch basin are proposed to convey runoff to proposed retention. Two existing MAG 532 catch basins are along N. 78th Way, which capture off-site runoff.

- A double 2'x3' concrete catch basin can convey a flow of 13.50 cfs, while considering a clogging factor of 0.50 (27 cfs no clogging). The proposed catch basin inlets can adequately convey runoff for the maximum 100-year, 5-min event Q_{100} = 10.79 cfs (DA-A1).
- A 2'x3' Nyloplast catch basin can convey a flow of 6.75 cfs, while considering a clogging factor of 0.50 (13.50 cfs no clogging). The proposed catch basin inlets can adequately convey runoff for the maximum 100-year, 5-min event Q_{100} = 3.45 cfs (DA-A3).
- A 24" Nyloplast catch basin can convey a flow of 2.29 cfs, while considering a clogging factor 0.50 (4.58 cfs no clogging). The proposed catch basin inlets can adequately convey runoff for the maximum 100-year, 5-min event Q_{100} = 1.31 cfs (DA-B2).
- A MAG 532 can convey a flow of 7.00 while considering a clogging factor of 0.2 (80% passing). The existing catch basin inlet can adequately convey runoff for the maximum 100-year, 5-min event Q_{100} = 6.55 cfs (OFF-1).

Refer to **APPENDIX II** for Inlet Calculation Summary and **APPENDIX IV** for Inlet Capacity Charts.

4.8 ADEQ WATER QUALITY REQUIREMENTS

The total disturbed area of this site is approximately 8.86 acres. The Arizona Department of Environmental Quality requires that any site disturbance over an acre is required to submit an NOI. A NOI will be submitted to ADEQ for this site as this site disturbance is over 1 acre.

5. FLOOD SAFETY FOR DWELLINGS

5.1 FINISHED FLOOR ELEVATIONS

This project lies in an "X-Shaded" Flood Zone. Therefore, the proposed building finished floor elevation will be set a minimum of 14 inches above the lot ultimate outfall, located at the southwest corner of the site at an elevation of 1456.92, and 12" above adjacent high-water elevations.

6. CONCLUSIONS

6.1 OVERALL PROJECT:

1. The finished floor elevations will be designed a minimum of 14 inches above the low top of curb of the lot.
2. The historical outfalls will be affected at proposed conditions and overall discharge to the public storm drain system will be increased.
3. On-site storage facilities will be provided to account for the 100-yr 2-hr storm event volume.

6.2 PROJECT PHASING:

This project will be constructed in a single phase.

7. WARNING AND DISCLAIMER OF LIABILITY

RE: following page.

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*

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

APPENDIX I

RAINFALL DATA

NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.6204°, Longitude: -111.9103°
Elevation: 1460 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	0.191 (0.159-0.233)	0.250 (0.209-0.305)	0.336 (0.279-0.409)	0.403 (0.334-0.489)	0.494 (0.401-0.596)	0.562 (0.452-0.674)	0.634 (0.501-0.759)	0.704 (0.547-0.841)	0.801 (0.606-0.957)	0.873 (0.648-1.04)
10-min	0.291 (0.242-0.355)	0.380 (0.319-0.464)	0.512 (0.425-0.622)	0.614 (0.507-0.744)	0.751 (0.610-0.907)	0.856 (0.688-1.02)	0.965 (0.762-1.15)	1.07 (0.832-1.28)	1.22 (0.922-1.46)	1.33 (0.986-1.59)
15-min	0.361 (0.299-0.440)	0.471 (0.395-0.575)	0.634 (0.526-0.771)	0.761 (0.629-0.923)	0.931 (0.757-1.12)	1.06 (0.853-1.27)	1.20 (0.944-1.43)	1.33 (1.03-1.59)	1.51 (1.14-1.81)	1.65 (1.22-1.97)
30-min	0.486 (0.403-0.593)	0.635 (0.532-0.774)	0.854 (0.709-1.04)	1.02 (0.847-1.24)	1.25 (1.02-1.52)	1.43 (1.15-1.71)	1.61 (1.27-1.93)	1.79 (1.39-2.14)	2.03 (1.54-2.43)	2.22 (1.65-2.66)
60-min	0.602 (0.499-0.734)	0.786 (0.659-0.958)	1.06 (0.877-1.29)	1.27 (1.05-1.54)	1.55 (1.26-1.88)	1.77 (1.42-2.12)	1.99 (1.57-2.38)	2.21 (1.72-2.64)	2.52 (1.90-3.01)	2.75 (2.04-3.29)
2-hr	0.703 (0.591-0.837)	0.909 (0.770-1.08)	1.21 (1.02-1.43)	1.44 (1.20-1.70)	1.76 (1.45-2.07)	1.99 (1.62-2.34)	2.24 (1.79-2.61)	2.48 (1.96-2.90)	2.82 (2.17-3.30)	3.07 (2.31-3.61)
3-hr	0.783 (0.660-0.959)	1.00 (0.849-1.24)	1.31 (1.10-1.60)	1.55 (1.29-1.88)	1.89 (1.55-2.28)	2.16 (1.75-2.59)	2.44 (1.94-2.93)	2.74 (2.14-3.27)	3.14 (2.38-3.75)	3.47 (2.57-4.14)
6-hr	0.945 (0.811-1.12)	1.19 (1.02-1.42)	1.52 (1.29-1.80)	1.78 (1.50-2.10)	2.14 (1.78-2.51)	2.42 (1.98-2.82)	2.70 (2.19-3.15)	3.00 (2.39-3.50)	3.40 (2.63-3.96)	3.72 (2.81-4.34)
12-hr	1.05 (0.904-1.25)	1.33 (1.14-1.57)	1.67 (1.43-1.97)	1.94 (1.65-2.29)	2.31 (1.94-2.71)	2.59 (2.15-3.03)	2.88 (2.35-3.36)	3.18 (2.56-3.70)	3.57 (2.81-4.18)	3.87 (2.99-4.56)
24-hr	1.24 (1.08-1.44)	1.56 (1.37-1.82)	2.01 (1.75-2.34)	2.37 (2.05-2.75)	2.87 (2.46-3.32)	3.26 (2.78-3.76)	3.67 (3.10-4.24)	4.09 (3.41-4.72)	4.68 (3.83-5.40)	5.15 (4.14-5.96)
2-day	1.32 (1.14-1.53)	1.67 (1.45-1.95)	2.18 (1.88-2.54)	2.59 (2.22-3.00)	3.15 (2.68-3.64)	3.59 (3.02-4.14)	4.05 (3.39-4.69)	4.53 (3.75-5.26)	5.20 (4.23-6.04)	5.73 (4.59-6.69)
3-day	1.41 (1.23-1.63)	1.80 (1.58-2.08)	2.37 (2.06-2.72)	2.82 (2.45-3.24)	3.46 (2.98-3.97)	3.97 (3.40-4.55)	4.52 (3.83-5.19)	5.09 (4.27-5.86)	5.89 (4.87-6.80)	6.54 (5.34-7.58)
4-day	1.51 (1.33-1.73)	1.93 (1.70-2.21)	2.55 (2.24-2.91)	3.06 (2.68-3.48)	3.77 (3.29-4.30)	4.36 (3.77-4.96)	4.98 (4.27-5.68)	5.64 (4.79-6.46)	6.58 (5.51-7.55)	7.35 (6.08-8.47)
7-day	1.70 (1.49-1.96)	2.18 (1.91-2.50)	2.88 (2.52-3.30)	3.45 (3.01-3.96)	4.27 (3.70-4.88)	4.93 (4.24-5.64)	5.64 (4.81-6.45)	6.39 (5.40-7.34)	7.46 (6.21-8.59)	8.32 (6.85-9.63)
10-day	1.84 (1.62-2.11)	2.36 (2.07-2.70)	3.12 (2.73-3.56)	3.74 (3.26-4.26)	4.60 (3.99-5.23)	5.30 (4.57-6.03)	6.04 (5.16-6.89)	6.83 (5.79-7.80)	7.94 (6.64-9.10)	8.84 (7.30-10.2)
20-day	2.28 (2.01-2.60)	2.93 (2.59-3.34)	3.88 (3.41-4.41)	4.59 (4.03-5.22)	5.56 (4.86-6.32)	6.31 (5.49-7.17)	7.08 (6.12-8.07)	7.87 (6.76-8.99)	8.94 (7.60-10.2)	9.76 (8.23-11.2)
30-day	2.67 (2.35-3.04)	3.44 (3.03-3.91)	4.54 (3.99-5.15)	5.38 (4.72-6.09)	6.51 (5.68-7.37)	7.38 (6.41-8.36)	8.28 (7.15-9.37)	9.19 (7.89-10.4)	10.4 (8.87-11.9)	11.4 (9.60-13.0)
45-day	3.10 (2.74-3.52)	4.00 (3.54-4.53)	5.27 (4.66-5.96)	6.22 (5.48-7.04)	7.48 (6.56-8.46)	8.43 (7.36-9.54)	9.40 (8.16-10.6)	10.4 (8.96-11.8)	11.7 (9.98-13.3)	12.6 (10.7-14.5)
60-day	3.43 (3.05-3.88)	4.44 (3.94-5.00)	5.84 (5.17-6.58)	6.86 (6.06-7.73)	8.20 (7.22-9.24)	9.20 (8.07-10.4)	10.2 (8.90-11.5)	11.2 (9.72-12.7)	12.5 (10.8-14.2)	13.5 (11.5-15.4)

[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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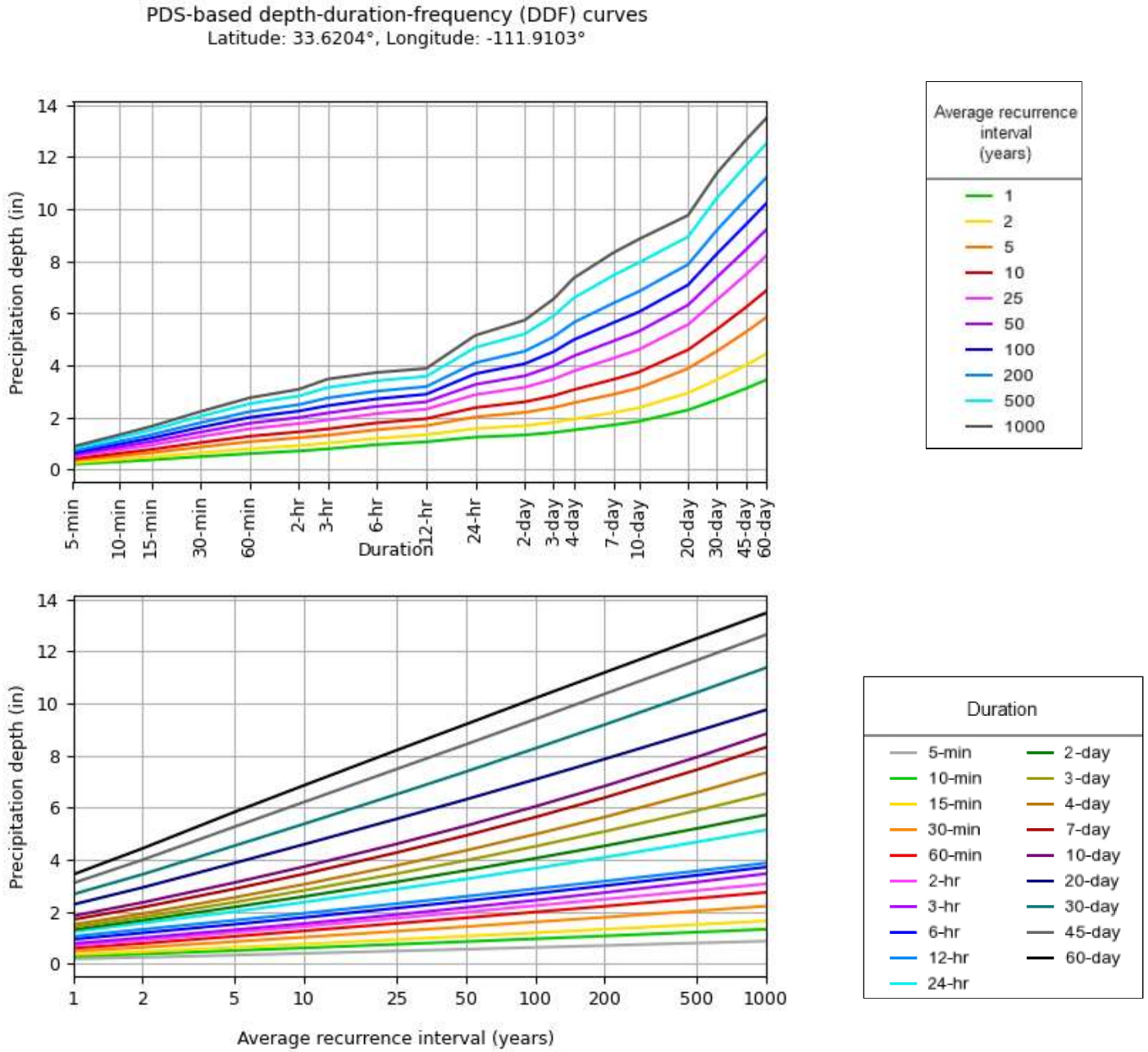
PF graphical



NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Mon Feb 19 16:53:56 2024

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Maps & aerials

Small scale terrain

NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.6204°, Longitude: -111.9103°
Elevation: 1460 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	2.29 (1.91-2.80)	3.00 (2.51-3.66)	4.03 (3.35-4.91)	4.84 (4.01-5.87)	5.93 (4.81-7.15)	6.74 (5.42-8.09)	7.61 (6.01-9.11)	8.45 (6.56-10.1)	9.61 (7.27-11.5)	10.5 (7.78-12.5)
10-min	1.75 (1.45-2.13)	2.28 (1.91-2.78)	3.07 (2.55-3.73)	3.68 (3.04-4.46)	4.51 (3.66-5.44)	5.14 (4.13-6.15)	5.79 (4.57-6.92)	6.43 (4.99-7.67)	7.31 (5.53-8.74)	7.97 (5.92-9.55)
15-min	1.44 (1.20-1.76)	1.88 (1.58-2.30)	2.54 (2.10-3.08)	3.04 (2.52-3.69)	3.72 (3.03-4.50)	4.24 (3.41-5.08)	4.78 (3.78-5.72)	5.31 (4.13-6.34)	6.04 (4.57-7.22)	6.59 (4.89-7.89)
30-min	0.972 (0.806-1.19)	1.27 (1.06-1.55)	1.71 (1.42-2.08)	2.05 (1.69-2.48)	2.51 (2.04-3.03)	2.86 (2.30-3.42)	3.22 (2.54-3.85)	3.58 (2.78-4.27)	4.07 (3.08-4.86)	4.44 (3.29-5.31)
60-min	0.602 (0.499-0.734)	0.786 (0.659-0.958)	1.06 (0.877-1.29)	1.27 (1.05-1.54)	1.55 (1.26-1.88)	1.77 (1.42-2.12)	1.99 (1.57-2.38)	2.21 (1.72-2.64)	2.52 (1.90-3.01)	2.75 (2.04-3.29)
2-hr	0.351 (0.295-0.418)	0.454 (0.385-0.542)	0.604 (0.508-0.716)	0.719 (0.598-0.851)	0.877 (0.724-1.03)	0.994 (0.810-1.17)	1.12 (0.893-1.31)	1.24 (0.977-1.45)	1.41 (1.08-1.65)	1.54 (1.16-1.80)
3-hr	0.260 (0.219-0.319)	0.333 (0.282-0.411)	0.435 (0.366-0.532)	0.515 (0.429-0.627)	0.629 (0.516-0.759)	0.720 (0.583-0.863)	0.813 (0.646-0.974)	0.912 (0.712-1.09)	1.05 (0.792-1.25)	1.15 (0.854-1.38)
6-hr	0.157 (0.135-0.187)	0.198 (0.170-0.236)	0.253 (0.216-0.299)	0.297 (0.251-0.350)	0.357 (0.297-0.419)	0.403 (0.330-0.471)	0.451 (0.365-0.525)	0.501 (0.398-0.585)	0.568 (0.439-0.661)	0.621 (0.469-0.725)
12-hr	0.087 (0.075-0.103)	0.110 (0.094-0.130)	0.138 (0.118-0.163)	0.161 (0.137-0.189)	0.191 (0.160-0.224)	0.215 (0.178-0.251)	0.239 (0.195-0.278)	0.263 (0.212-0.306)	0.296 (0.232-0.346)	0.321 (0.248-0.378)
24-hr	0.051 (0.044-0.059)	0.065 (0.057-0.075)	0.083 (0.072-0.097)	0.098 (0.085-0.114)	0.119 (0.102-0.138)	0.135 (0.115-0.156)	0.152 (0.128-0.176)	0.170 (0.141-0.196)	0.195 (0.159-0.225)	0.214 (0.172-0.248)
2-day	0.027 (0.023-0.031)	0.034 (0.030-0.040)	0.045 (0.039-0.052)	0.053 (0.046-0.062)	0.065 (0.055-0.075)	0.074 (0.062-0.086)	0.084 (0.070-0.097)	0.094 (0.078-0.109)	0.108 (0.088-0.125)	0.119 (0.095-0.139)
3-day	0.019 (0.017-0.022)	0.025 (0.021-0.028)	0.032 (0.028-0.037)	0.039 (0.034-0.044)	0.048 (0.041-0.055)	0.055 (0.047-0.063)	0.062 (0.053-0.072)	0.070 (0.059-0.081)	0.081 (0.067-0.094)	0.090 (0.074-0.105)
4-day	0.015 (0.013-0.018)	0.020 (0.017-0.022)	0.026 (0.023-0.030)	0.031 (0.027-0.036)	0.039 (0.034-0.044)	0.045 (0.039-0.051)	0.051 (0.044-0.059)	0.058 (0.049-0.067)	0.068 (0.057-0.078)	0.076 (0.063-0.088)
7-day	0.010 (0.008-0.011)	0.012 (0.011-0.014)	0.017 (0.014-0.019)	0.020 (0.017-0.023)	0.025 (0.021-0.029)	0.029 (0.025-0.033)	0.033 (0.028-0.038)	0.038 (0.032-0.043)	0.044 (0.036-0.051)	0.049 (0.040-0.057)
10-day	0.007 (0.006-0.008)	0.009 (0.008-0.011)	0.013 (0.011-0.014)	0.015 (0.013-0.017)	0.019 (0.016-0.021)	0.022 (0.019-0.025)	0.025 (0.021-0.028)	0.028 (0.024-0.032)	0.033 (0.027-0.037)	0.036 (0.030-0.042)
20-day	0.004 (0.004-0.005)	0.006 (0.005-0.006)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.011 (0.010-0.013)	0.013 (0.011-0.014)	0.014 (0.012-0.016)	0.016 (0.014-0.018)	0.018 (0.015-0.021)	0.020 (0.017-0.023)
30-day	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.006 (0.005-0.007)	0.007 (0.006-0.008)	0.009 (0.007-0.010)	0.010 (0.008-0.011)	0.011 (0.009-0.013)	0.012 (0.010-0.014)	0.014 (0.012-0.016)	0.015 (0.013-0.018)
45-day	0.002 (0.002-0.003)	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.006-0.007)	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 (0.009-0.013)
60-day	0.002 (0.002-0.002)	0.003 (0.002-0.003)	0.004 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.005-0.007)	0.007 (0.006-0.008)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)

[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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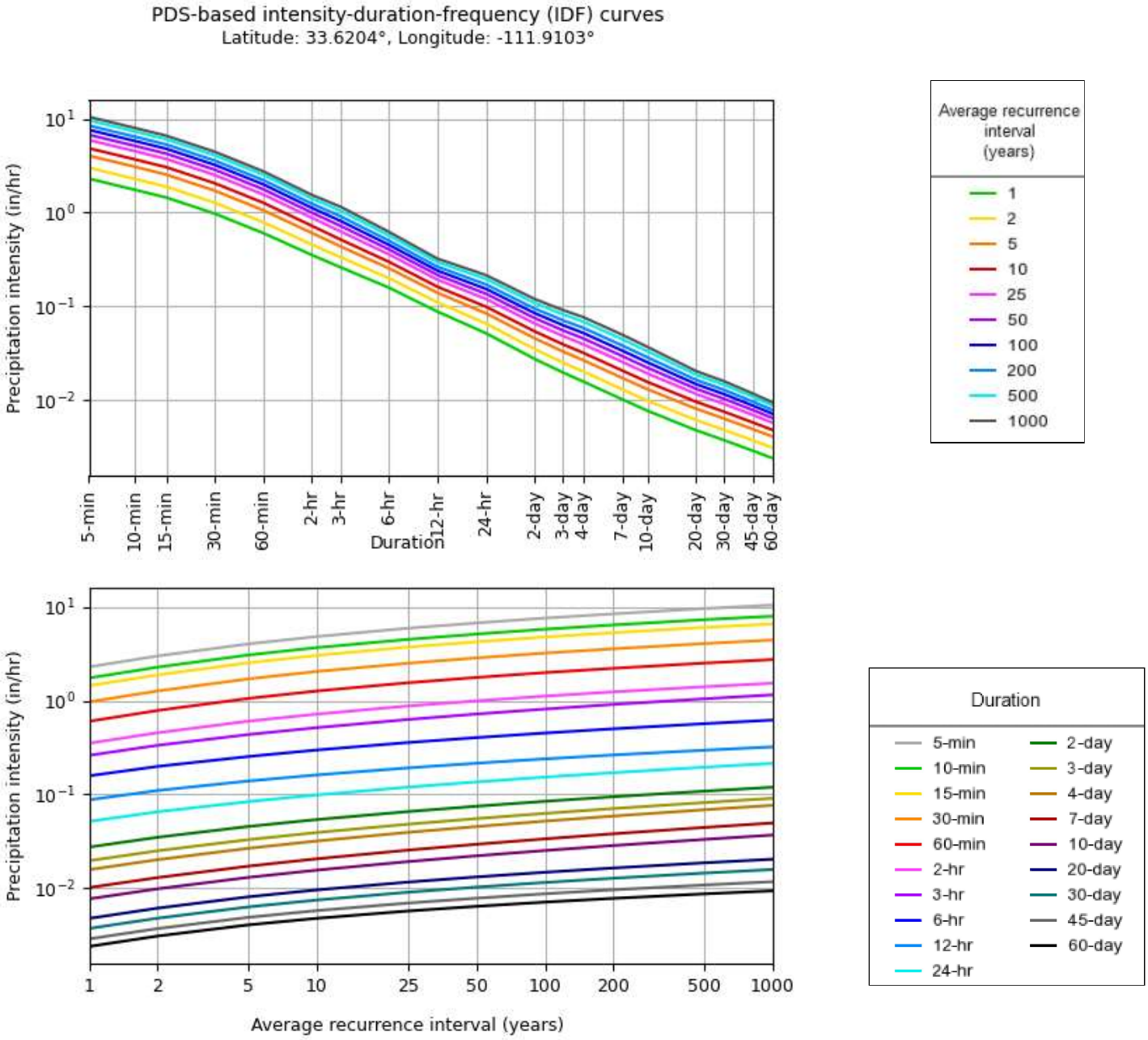
PF graphical



NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Mon Feb 19 16:55:47 2024

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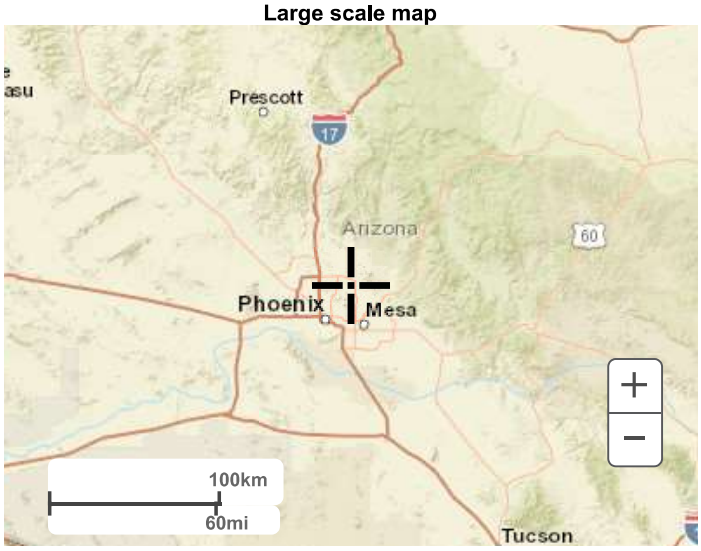
Maps & aerials

Small scale terrain

Large scale terrain

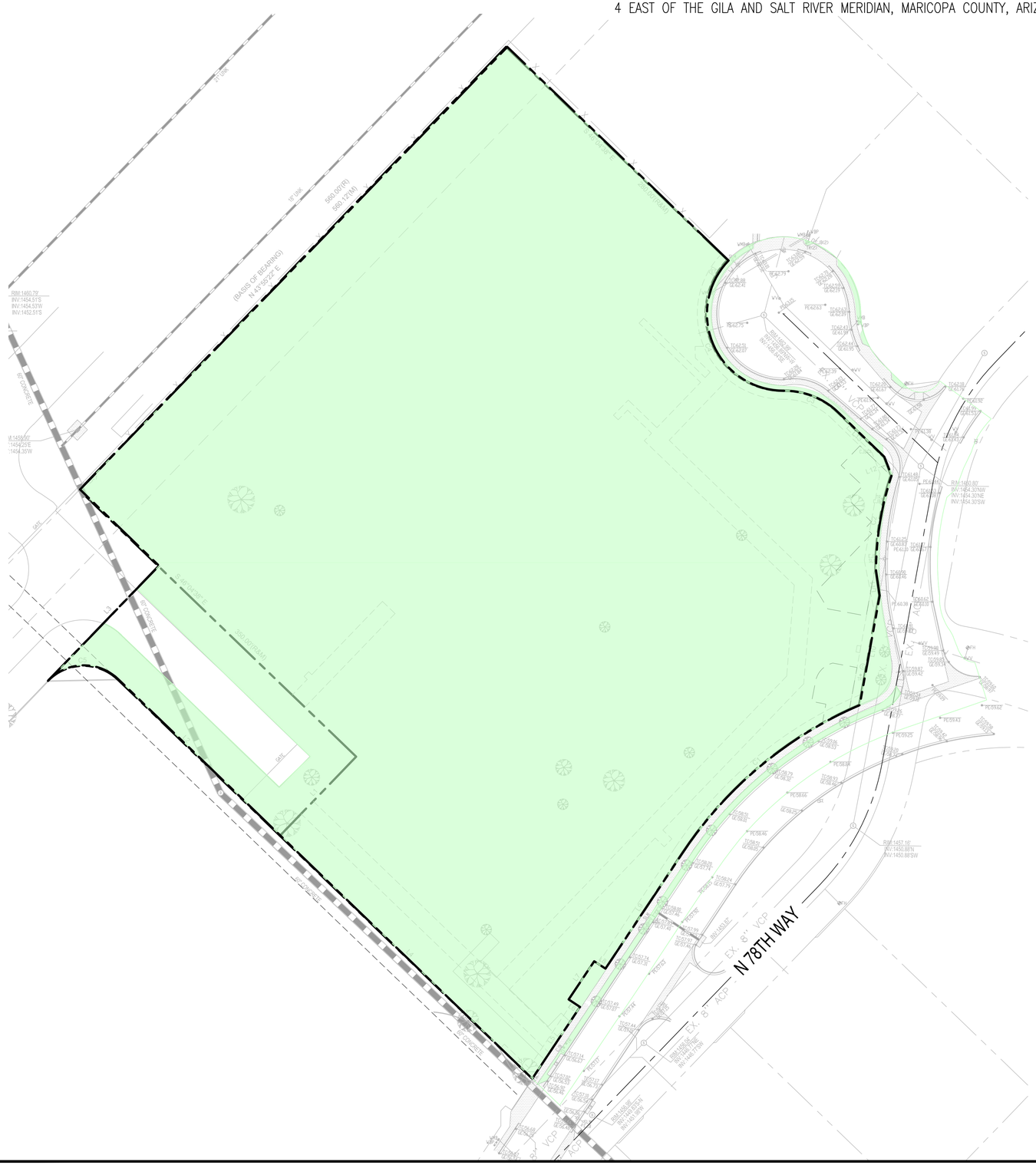
Large scale map



Large scale aerial

APPENDIX II

CALCULATIONS



YAM HANGARS AT SDL

EXISTING CONDITIONS C_{WT} EXHIBIT

14930 N. 78TH WAY, SCOTTSDALE, AZ 85260
A PORTION OF THE NORTHEAST QUARTER OF SECTION 11, TOWNSHIP 3 NORTH, RANGE
4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.

VICINITY MAP
NE 11 T3N R4E
NTS

NORTH

ON-SITE

▬ ▬ ▬	PROPERTY LINE		
☐	BUILDING/PAVED SURFACE =	8,787 SF (0.20 AC)	@ CWT=0.95
🟩	NATURAL DESERT/LANDSCAPE =	377,266 (8.66 AC)	@ CWT=0.45
	TOTAL ON-SITE CWT =	386,053 SF (8.86 AC)	@ CWT=0.46

OFF-SITE

☐	BUILDING/PAVED SURFACE =	51,491 SF (1.18 AC)	@ CWT=0.95
🟩	NATURAL DESERT/LANDSCAPE =	6,412 SF (0.15 AC)	@ CWT=0.45
	TOTAL ON-SITE CWT =	57,903 SF (1.33 AC)	@ CWT=0.89

NORTH

0' 50' 100' 150'
SCALE: 1" = 50'

45621
ALI SAMIH FAKIH
Date Signed 04-17-2025
EXPIRATION DATE: 12-31-2027

SUSTAINABILITY
ENGINEERING
GROUP

SEG

5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW. AZSEG.COM TEL. 480.588.7226 FAX 480.259.3534

YAM HOLDINGS

PROJECT
YAM HANGARS AT SDL

LOCATION
14930 N. 78TH WAY,
SCOTTSDALE, AZ 85260

DRAWN		FF/JL	04/17/2025
DESIGNED		AG/DJ	04/17/2025
CHECKED		SC	04/15/2025
FINAL QC		SC	04/17/2025
PROJ. MGR.		SC	04/17/2025

DATE:
04/17/2025

ISSUED FOR:
DRB

REVISION NO.:		DATE:
1		
2		
3		
4		

JOB NO.:
240103

SHEET TITLE:

EXISTING CONDITIONS C_{WT} EXHIBIT

PAGE NO.:
1 OF 1

SHEET NO.:
EX-C_{WT}

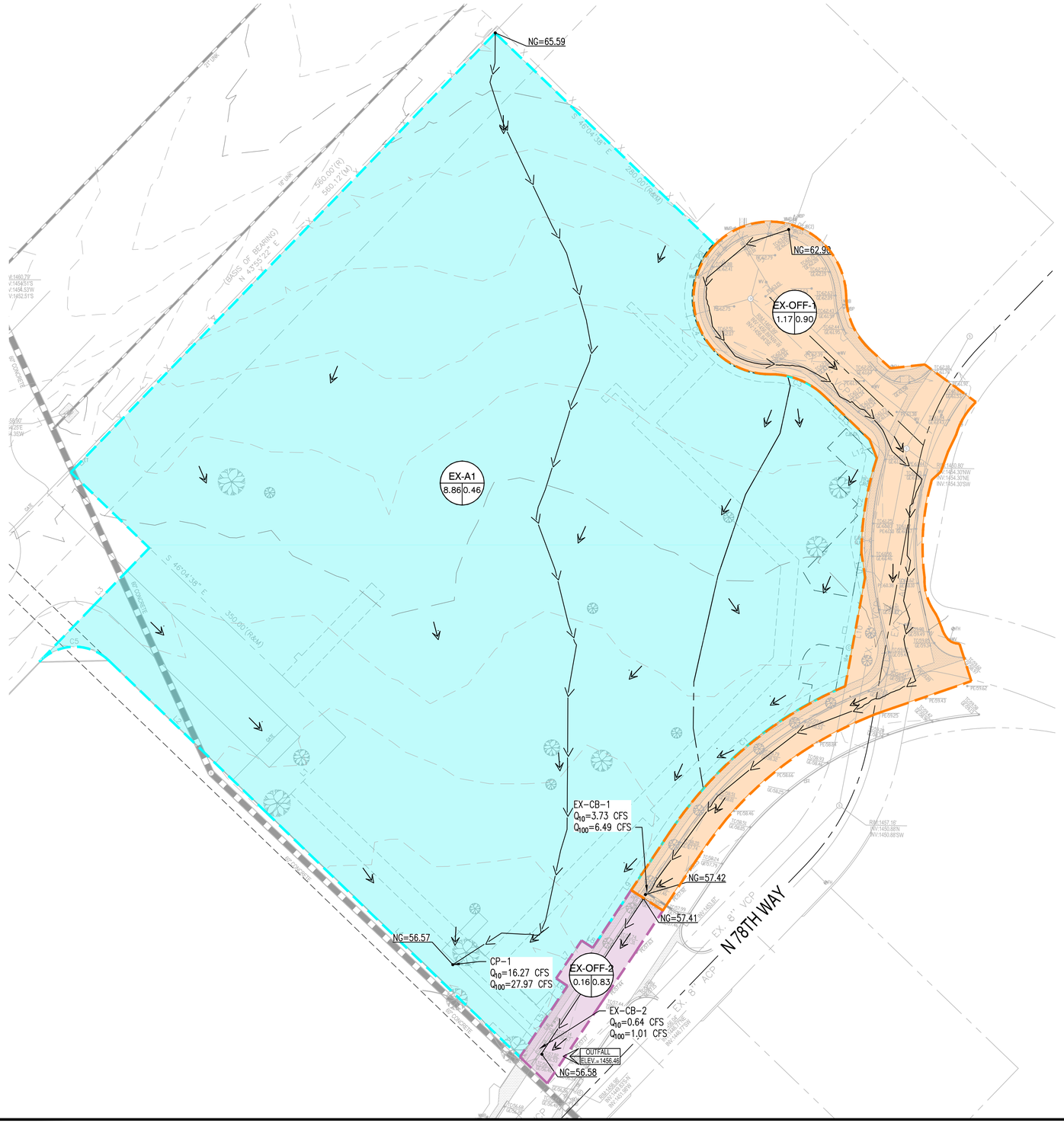
CASE FILE: 10-DR-2024

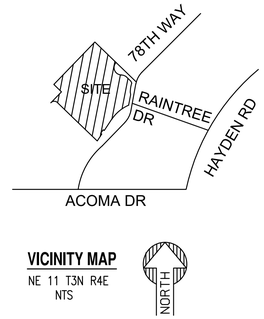
YAM HANGARS AT SDL

EXISTING CONDITIONS DRAINAGE AREA MAP

14930 N. 78TH WAY, SCOTTSDALE, AZ 85260

A PORTION OF THE NORTHEAST QUARTER OF SECTION 11, TOWNSHIP 3 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.

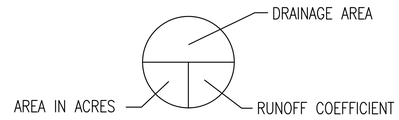




VICINITY MAP
NE 11 T3N R4E
NTS

EXISTING LEGEND

- DRAINAGE AREAS DISCHARGING TO EX-CP-1
- DRAINAGE AREAS DISCHARGING TO EX-CB-1
- DRAINAGE AREAS DISCHARGING TO EX-CB-2
- FLOW ARROW



DRAINAGE AREA KEY

EXISTING SITE DISCHARGES

	Total Area	Cwt	Intensity 10 yr	Q 10	Intensity 100 yr	Q 100	Control Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	10.19	0.52	-	-	-	-	-	20.64	35.46
EX-A1	8.86	0.46	3.99	16.27	6.86	27.97	CP-1	16.27	27.97
EX-OFF-1	1.17	0.90	3.53	3.73	6.14	6.49	EX-CB-1	3.73	6.49
EX-OFF-2	0.16	0.83	4.84	0.64	7.61	1.01	EX-CB-2	0.64	1.01

NORTH

0' 50' 100' 150'

SCALE: 1" = 50'

Registered Professional Engineer (Civil)
CERTIFICATE NO.
45621
ALI SAMIH FAKIH
Date Signed 04-17-2025
ARIZONA, U.S.A.
EXPIRATION DATE: 12-31-2027

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.259.3534

YAM HOLDINGS

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

PROJECT
YAM HANGARS AT SDL

LOCATION
14930 N. 78TH WAY,
SCOTTSDALE, AZ 85260

DRAWN	FF/JL	04/17/2025
DESIGNED	AG/DJ	04/17/2025
CHECKED	SC	04/15/2025
FINAL QC	SC	04/17/2025
PROJ. MGR.	SC	04/17/2025

DATE: 04/17/2025

ISSUED FOR: DRB

REVISION NO.:	DATE:
1	
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JOB NO.: 240103

SHEET TITLE:
EXISTING CONDITIONS DRAINAGE AREA MAP

PAGE NO.: 1 OF 1

SHEET NO.: **EX-DAM**

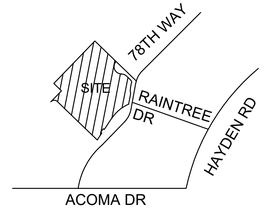
CASE FILE: 10-DR-2024

YAM HANGARS AT SDL

PROPOSED CONDITIONS C_{WT} EXHIBIT

14930 N. 78TH WAY, SCOTTSDALE, AZ 85260

A PORTION OF THE NORTHEAST QUARTER OF SECTION 11, TOWNSHIP 3 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.



VICINITY MAP
NE 11 T3N R4E
NTS

NORTH

ON-SITE

PROPERTY LINE

BUILDING/PAVED SURFACE =	339,921 SF (7.80 AC)	@ CWT=0.95
NATURAL DESERT/LANDSCAPE =	46,132 SF (1.06 AC)	@ CWT=0.45
TOTAL ON-SITE CWT =	386,053 SF (8.86 AC)	@ CWT=0.89

OFF-SITE

BUILDING/PAVED SURFACE =	51,501 SF (1.18 AC)	@ CWT=0.95
NATURAL DESERT/LANDSCAPE =	6,402 SF (0.15 AC)	@ CWT=0.45
TOTAL OFF-SITE CWT =	57,903 SF (1.33 AC)	@ CWT=0.89

ROOF AREA = 137,516 SF (3.16 AC) @ CWT=0.95

NORTH

0' 50' 100' 150'
SCALE: 1" = 50'

Registered Professional Engineer
CERTIFICATE NO.
45621
ALI SAMIH FAKIH
Date Signed 04-30-25
ARIZONA, U.S.A.
EXPIRATION DATE: 12-31-2027

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
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YAM HOLDINGS

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ARIZONA811
Call 811 or click Arizona811.com

PROJECT	LOCATION
YAM HANGARS AT SDL	14930 N. 78TH WAY, SCOTTSDALE, AZ 85260

DRAWN	FF/JL	04/17/2025
DESIGNED	AG/DJ	04/17/2025
CHECKED	SC	04/15/2025
FINAL QC	SC	04/17/2025
PROJ. MGR.	SC	04/17/2025

DATE: 04/17/2025

ISSUED FOR: DRB

REVISION NO.:	DATE:
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JOB NO.: 240103

SHEET TITLE: **PROPOSED CONDITIONS C_{WT} EXHIBIT**

PAGE NO.:	SHEET NO.:
1 OF 1	**P-Cwt**

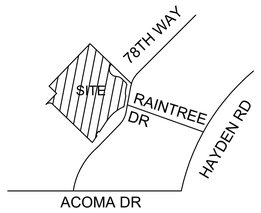
CASE FILE: 1-DR-2024

YAM HANGARS AT SDL

PROPOSED CONDITIONS DRAINAGE AREA EXHIBIT

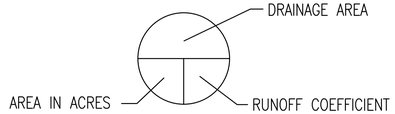
14930 N. 78TH WAY, SCOTTSDALE, AZ 85260

A PORTION OF THE NORTHEAST QUARTER OF SECTION 11, TOWNSHIP 3 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.



VICINITY MAP
NE 11 T3N R4E
NTS

NORTH



DRAINAGE AREA KEY

PROPOSED LEGEND

- DRAINAGE AREAS DISCHARGING TO EX-CB-1
- DRAINAGE AREAS DISCHARGING TO EX-CB-2
- DRAINAGE AREAS DISCHARGING TO BASIN A
- DRAINAGE AREAS DISCHARGING TO BASIN B
- DRAINAGE AREAS DISCHARGING TO BASIN C
- FLOW ARROW

Proposed Retention Basin Summary

Basin (ID)		TYPE (--)	Vp (CF)	Vptotal (CF)	Vr (CF)
Basin A	BASIN A	UG	41,600	41,600	40,432
Basin B	BASIN B1	UG	21,991	25,870	21,868
	BASIN B2	OPEN	3,879		
Basin C	BASIN C	OPEN	840	840	823
Total:				**68,310**	**63,123**

PROPOSED SITE DISCHARGES

	TOTAL AREA	Cwt	Intensity 10 yr 5-min	Q 10	Intensity 100 yr 5-min	Q 100	Concentration Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	10.19	0.89	4.84	-	7.61	-	-	32.26	50.73
DA-A1	1.53	0.93	4.84	6.86	7.61	10.79	CB-4	6.86	10.79
DA-A2	0.98	0.95	4.84	4.51	7.61	7.09	CB-5	4.51	7.09
DA-A3	0.52	0.88	4.84	2.20	7.61	3.45	CB-6C	2.20	3.45
DA-A4	0.48	0.95	4.84	2.19	7.61	3.45	CB-7	2.19	3.45
DA-A5	0.45	0.95	4.84	2.08	7.61	3.27	CB-8	2.08	3.27
DA-AR1	0.17	0.95	4.84	0.79	7.61	1.24	RD-A1	0.79	1.24
DA-AR2	0.16	0.95	4.84	0.74	7.61	1.16	RD-A2	0.74	1.16
DA-AR3	0.16	0.95	4.84	0.74	7.61	1.16	RD-A3	0.74	1.16
DA-AR4	0.16	0.95	4.84	0.74	7.61	1.16	RD-A4	0.74	1.16
DA-AR5	0.04	0.95	4.84	0.20	7.61	0.32	RD-A5	0.20	0.32
DA-AR6	0.24	0.95	4.84	1.12	7.61	1.76	RD-A6	1.12	1.76
DA-AR7	0.21	0.95	4.84	0.96	7.61	1.50	RD-A7	0.96	1.50
DA-AR8	0.21	0.95	4.84	0.95	7.61	1.50	RD-A8	0.95	1.50
DA-B1	0.40	0.89	4.84	1.72	7.61	2.71	CB-18	1.72	2.71
DA-B2	0.05	0.50	4.84	0.13	7.61	0.20	CB-16	0.13	0.20
DA-B3	0.24	0.92	4.84	1.06	7.61	1.66	CB-14	1.06	1.66
DA-B4	0.21	0.90	4.84	0.90	7.61	1.42	CB-13	0.90	1.42
DA-B5	0.41	0.46	4.84	0.92	7.61	1.44	BASIN B2	0.92	1.44
DA-BR1	0.15	0.95	4.84	0.68	7.61	1.07	RD-B1	0.68	1.07
DA-BR2	0.15	0.95	4.84	0.71	7.61	1.12	RD-B2	0.71	1.12
DA-BR3	0.15	0.95	4.84	0.68	7.61	1.07	RD-B3	0.68	1.07
DA-BR4	0.15	0.95	4.84	0.68	7.61	1.07	RD-B4	0.68	1.07
DA-BR5	0.15	0.95	4.84	0.71	7.61	1.12	RD-B5	0.71	1.12
DA-BR6	0.15	0.95	4.84	0.68	7.61	1.07	RD-B6	0.68	1.07
DA-BR7	0.15	0.95	4.84	0.68	7.61	1.07	RD-B7	0.68	1.07
DA-BR8	0.15	0.95	4.84	0.71	7.61	1.12	RD-B8	0.71	1.12
DA-BR9	0.15	0.95	4.84	0.67	7.61	1.06	RD-B9	0.67	1.06
DA-BR10	0.15	0.95	4.84	0.69	7.61	1.08	RD-B10	0.69	1.08
DA-BR11	0.15	0.95	4.84	0.71	7.61	1.12	RD-B11	0.71	1.12
DA-BR12	0.15	0.95	4.84	0.68	7.61	1.07	RD-B12	0.68	1.07
DA-D1	0.21	0.59	4.84	0.61	7.61	0.97	EX-CB-2	1.28	2.01
OFF-2	0.16	0.86	4.84	0.66	7.61	1.04			
OFF-1	1.17	0.90	3.44	3.62	6.23	6.55	EX-CB-1	3.62	6.55
DA-C1	0.22	0.46	4.84	0.49	7.61	0.77	BASIN C	0.49	0.77

Registered Professional Engineer
CERTIFICATE NO.
45621
ALI SAMIH FAKIH
Date Signed 04-17-2025
ARIZONA, U.S.A.
EXPIRATION DATE: 12-31-2027

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YAM HOLDINGS

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PROJECT: YAM HANGARS AT SDL
LOCATION: 14930 N. 78TH WAY, SCOTTSDALE, AZ 85260

DRAWN	FF/JL	04/17/2025
DESIGNED	AG/DJ	04/17/2025
CHECKED	SC	04/15/2025
FINAL QC	SC	04/17/2025
PROJ. MGR.	SC	04/17/2025

DATE: 04/16/2025
ISSUED FOR: DRB

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 240103

SHEET TITLE: **PROPOSED CONDITIONS DRAINAGE AREA MAP**

PAGE NO.: 1 OF 1
SHEET NO.: **P-DAM**

CASE FILE: 10-DR-2024

EXISTING OVERALL SITE C_w				
	Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	0.20	8.66	**8.86**	0.46
EX-A1	0.20	8.66	8.86	0.46

EXISTING OFFSITE SITE C_w				
	Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	1.18	0.15	**1.33**	**0.89**
EX-OFF-1	1.06	0.11	1.17	0.90
EX-OFF-2	0.12	0.04	0.16	0.83

EXISTING SITE DISCHARGES									
	Total Area	Cwt	Intensity 10 yr	Q 10	Intensity 100 yr	Q 100	Control Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	10.19	0.52	-	-	-	-	-	20.64	35.46
EX-A1	8.86	0.46	3.99	16.27	6.86	27.97	CP-1	16.27	27.97
EX-OFF-1	1.17	0.90	3.53	3.73	6.14	6.49	EX-CB-1	3.73	6.49
EX-OFF-2	0.16	0.83	4.84	0.64	7.61	1.01	EX-CB-2	0.64	1.01

TC FOR EX-A1, 100 YR STORM

EX-A1

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.118 Hours**	**7.06 Min.**
L=	0.18 MILES	
K_b=	0.0341	$m \log_{10}A+b=$
S=	52.62 FT/MILE	
i=	6.860 IN/HR	From NOAA
m =	-0.00625	n Table 3.1 of FCDMC Hydrology Manual (Typ
b=	0.04	n Table 3.1 of FCDMC Hydrology Manual (Typ
A=	8.86 ACRES	

Q=CiA	**27.97 CFS**
C=	0.46
i=	6.860 IN/HR
A=	8.86 ACRES

Elevations		
High point'	Outfall'	Diff
1566.5	1557	9.5

100 YR INTENSITY INTERPOLATION (NOAA)

X1	DESIRED TC	X3	Y1	Y3	I adjusted
5	6.79	10	7.61	5.79	6.96
5	7.02	10	7.61	5.79	6.87
5	7.06	10	7.61	5.79	6.86
5	7.06	10	7.61	5.79	6.86

TC FOR EX-A1, 10 YR STORM

EX-A1

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.145 Hours**	**8.68 Min.**
L=	0.18 MILES	
K_b=	0.0341	$m \log_{10}A+b=$
S=	52.62 FT/MILE	
i=	3.990 IN/HR	From NOAA
m =	-0.00625	n Table 3.1 of FCDMC Hydrology Manual (Typ
b=	0.04	n Table 3.1 of FCDMC Hydrology Manual (Typ
A=	8.86 ACRES	

Q=CiA	**16.27 CFS**
C=	0.46
i=	3.990 IN/HR
A=	8.86 ACRES

Elevations		
High point'	Outfall'	Diff
1566.5	1557	9.5

10 YR INTENSITY INTERPOLATION (NOAA)

X1	DESIRED TC	X3	Y1	Y3	I adjusted
5	8.06	10	4.84	3.68	4.13
5	8.56	10	4.84	3.68	4.01
5	8.66	10	4.84	3.68	3.99
5	8.68	10	4.84	3.68	3.99

TC FOR EX-OFF-1, 100 YR STORM

EX-OFF-1

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.151 Hours**	**9.05 Min.**
L=	0.17 MILES	
K_b=	0.0396	$m \log_{10}A+b=$
S=	31.83 FT/MILE	
i=	6.140 IN/HR	From NOAA
m =	-0.00625	n Table 3.1 of FCDMC Hydrology Manual (Typ
b=	0.04	n Table 3.1 of FCDMC Hydrology Manual (Typ
A=	1.17 ACRES	

Q=CiA	**6.49 CFS**
C=	0.90
i=	6.140 IN/HR
A=	1.17 ACRES

Elevations		
High point'	Outfall'	Diff
1562.9	1557.46	5.44

100 YR INTENSITY INTERPOLATION (NOAA)

X1	DESIRED TC	X3	Y1	Y3	I adjusted
5	8.34	10	7.61	5.79	6.39
5	8.91	10	7.61	5.79	6.19
5	9.02	10	7.61	5.79	6.15
5	9.04	10	7.61	5.79	6.14
5	9.05	10	7.61	5.79	6.14

TC FOR EX-OFF-1, 10 YR STORM

EX-OFF-1

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.186 Hours**	**11.17 Min.**
L=	0.17 MILES	
K_b=	0.0396	$m \log_{10}A+b=$
S=	31.83 FT/MILE	
i=	3.530 IN/HR	From NOAA
m =	-0.00625	n Table 3.1 of FCDMC Hydrology Manual (Typ
b=	0.04	n Table 3.1 of FCDMC Hydrology Manual (Typ
A=	1.17 ACRES	

Q=CiA	**3.73 CFS**
C=	0.90
i=	3.530 IN/HR
A=	1.17 ACRES

Elevations		
High point'	Outfall'	Diff
1562.9	1557.46	5.44

10 YR INTENSITY INTERPOLATION (NOAA)

X1	DESIRED TC	X3	Y1	Y3	I adjusted
5	9.91	10	4.84	3.68	3.70
10	10.97	15	3.68	3.04	3.56
10	11.13	15	3.68	3.04	3.54
10	11.16	15	3.68	3.04	3.53
10	11.17	15	3.68	3.04	3.53

PROPOSED OVERALL SITE C_w				
	Building/ Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	7.80	1.06	**8.86**	**0.89**
DA-A1	1.46	0.08	1.53	0.93
DA-A2	0.98	0.00	0.98	0.95
DA-A3	0.44	0.08	0.52	0.88
DA-A4	0.48	0.00	0.48	0.95
DA-A5	0.45	0.00	0.45	0.95
DA-AR1	0.17	0.00	0.17	0.95
DA-AR2	0.16	0.00	0.16	0.95
DA-AR3	0.16	0.00	0.16	0.95
DA-AR4	0.16	0.00	0.16	0.95
DA-AR5	0.04	0.00	0.04	0.95
DA-AR6	0.24	0.00	0.24	0.95
DA-AR7	0.21	0.00	0.21	0.95
DA-AR8	0.21	0.00	0.21	0.95
DA-B1	0.35	0.05	0.40	0.89
DA-B2	0.01	0.05	0.05	0.50
DA-B3	0.22	0.02	0.24	0.92
DA-B4	0.19	0.02	0.21	0.90
DA-B5	0.01	0.40	0.41	0.46
DA-BR1	0.15	0.00	0.15	0.95
DA-BR2	0.15	0.00	0.15	0.95
DA-BR3	0.15	0.00	0.15	0.95
DA-BR4	0.15	0.00	0.15	0.95
DA-BR5	0.15	0.00	0.15	0.95
DA-BR6	0.15	0.00	0.15	0.95
DA-BR7	0.15	0.00	0.15	0.95
DA-BR8	0.15	0.00	0.15	0.95
DA-BR9	0.15	0.00	0.15	0.95
DA-BR10	0.15	0.00	0.15	0.95
DA-BR11	0.15	0.00	0.15	0.95
DA-BR12	0.15	0.00	0.15	0.95
DA-D1	0.06	0.15	0.21	0.59
DA-C1	0.01	0.21	0.22	0.46

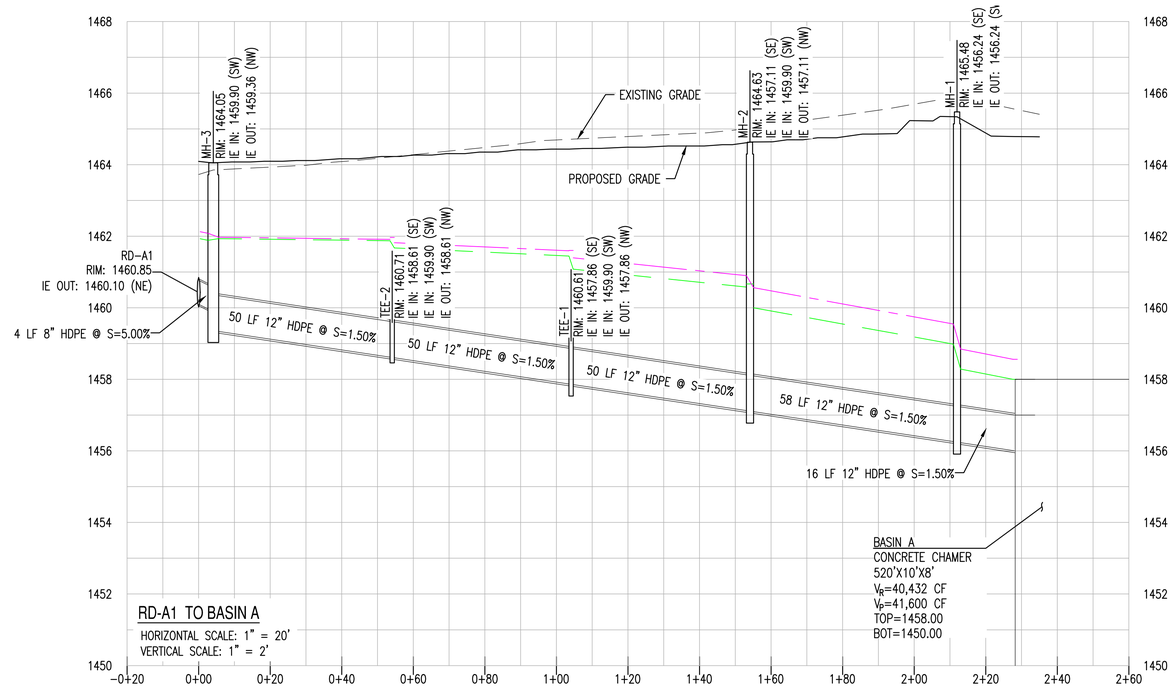
PROPOSED OFFSITE SITE C_w				
	Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	1.18	0.15	**1.33**	**0.89**
OFF-1	1.05	0.12	1.17	0.90
OFF-2	0.13	0.03	0.16	0.86

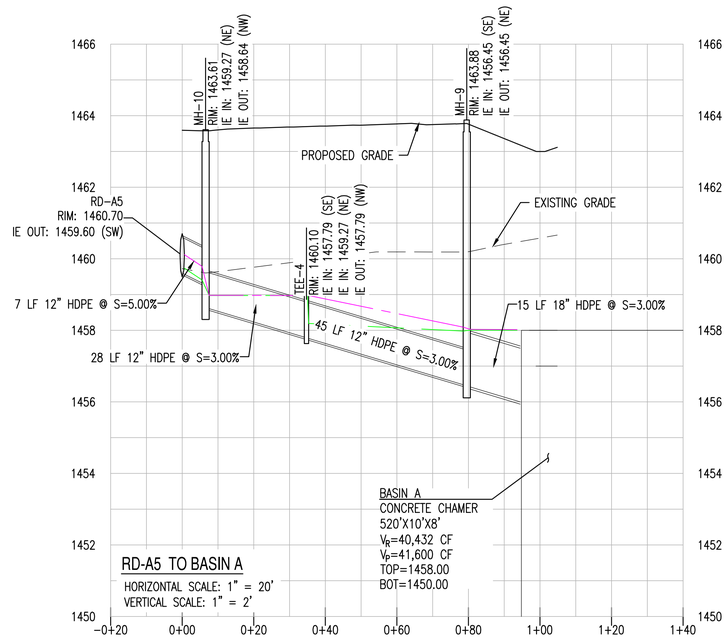
Inlet Calculation Summary

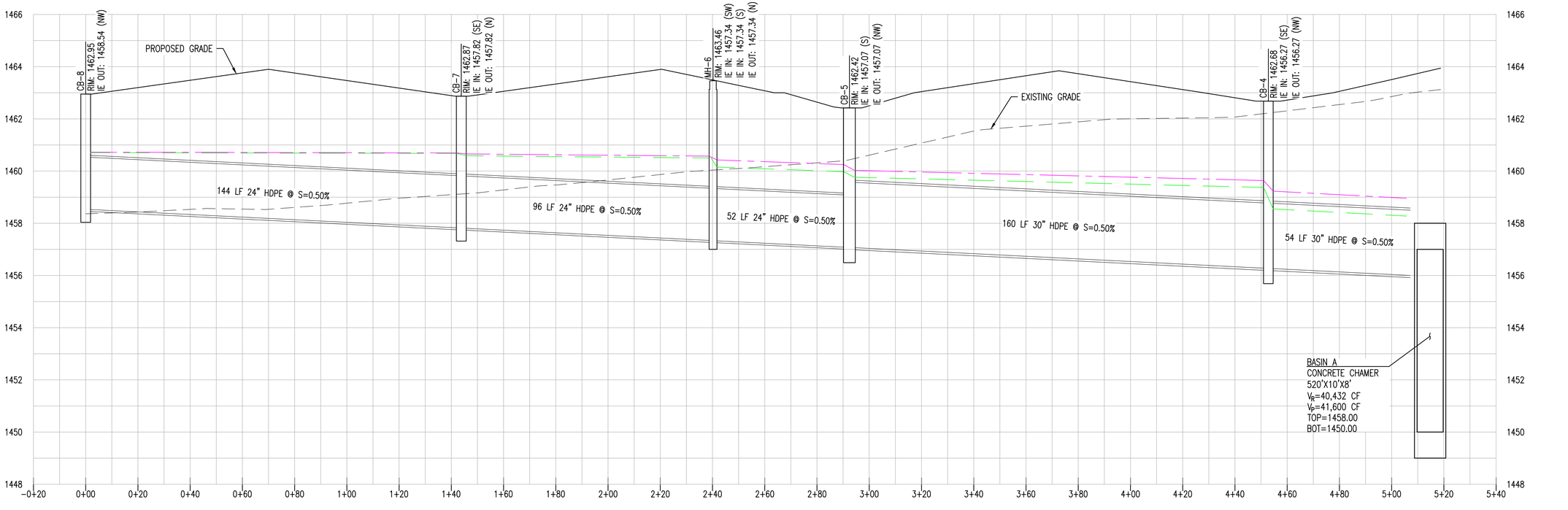
P=100-yr, 5min = 7.61 in/hr.

P=10-yr, 5min = 4.84 in/hr.

Drainage Area ID	CB ID	Q10 TOT	Q100 TOT (cfs)	Q Capacity (cfs)	Catch Basin Type
DA-A1	CB-4	6.86	10.79	13.5	Double 2'x3' Nyloplast
DA-A2	CB-5	4.51	7.09	13.5	Double 2'x3' Nyloplast
DA-A3	CB-6C	2.20	3.45	6.75	2'x3' Nyloplast
DA-A4	CB-7	2.19	3.45	6.75	2'x3' Nyloplast
DA-A5	CB-8	2.08	3.27	6.75	2'x3' Nyloplast
DA-AR1	RD-A1	0.79	1.24	N/A	Roof Drain
DA-AR2	RD-A2	0.74	1.16	N/A	Roof Drain
DA-AR3	RD-A3	0.74	1.16	N/A	Roof Drain
DA-AR4	RD-A4	0.74	1.16	N/A	Roof Drain
DA-AR5	RD-A5	0.20	0.32	N/A	Roof Drain
DA-AR6	RD-A6	1.12	1.76	N/A	Roof Drain
DA-AR7	RD-A7	0.96	1.50	N/A	Roof Drain
DA-AR8	RD-A8	0.95	1.50	N/A	Roof Drain
DA-B1	CB-18	1.72	2.71	6.75	2'x3' Nyloplast
DA-B2	CB-16	0.13	0.20	2.29	24" Nyloplast
DA-B3	CB-14	1.06	1.66	6.75	2'x3' Nyloplast
DA-B4	CB-13	0.90	1.42	6.75	2'x3' Nyloplast
DA-BR1	RD-B1	0.68	1.07	N/A	Roof Drain
DA-BR2	RD-B2	0.71	1.12	N/A	Roof Drain
DA-BR3	RD-B3	0.68	1.07	N/A	Roof Drain
DA-BR4	RD-B4	0.68	1.07	N/A	Roof Drain
DA-BR5	RD-B5	0.71	1.12	N/A	Roof Drain
DA-BR6	RD-B6	0.68	1.07	N/A	Roof Drain
DA-BR7	RD-B7	0.68	1.07	N/A	Roof Drain
DA-BR8	RD-B8	0.71	1.12	N/A	Roof Drain
DA-BR9	RD-B9	0.67	1.06	N/A	Roof Drain
DA-BR10	RD-B10	0.69	1.08	N/A	Roof Drain
DA-BR11	RD-B11	0.71	1.12	N/A	Roof Drain
DA-BR12	RD-B12	0.68	1.07	N/A	Roof Drain
DA-D1	EX-CB-2	1.28	2.01	7.00	MAG 532
OFF-2					
OFF-1	EX-CB-1	3.62	6.55	7.00	MAG 532







Registered Professional Engineer
CERTIFICATE NO.
45621
ALI SAMIH FAKIH
Date Signed 04-30-25
ARIZONA, U.S.A.
EXPIRATION DATE: 12-31-2027

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.259.3534

YAM HOLDINGS

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

PROJECT
YAM HANGARS AT SDL

LOCATION
14930 N. 78TH WAY,
SCOTTSDALE, AZ 85260

DRAWN	FF/JL	04/17/2025
DESIGNED	AG/DJ	04/17/2025
CHECKED	SC	04/15/2025
FINAL QC	SC	04/17/2025
PROJ. MGR.	SC	04/17/2025

DATE: 04/17/2025

ISSUED FOR: DRB

REVISION NO.:	DATE:
1	
2	
3	
4	

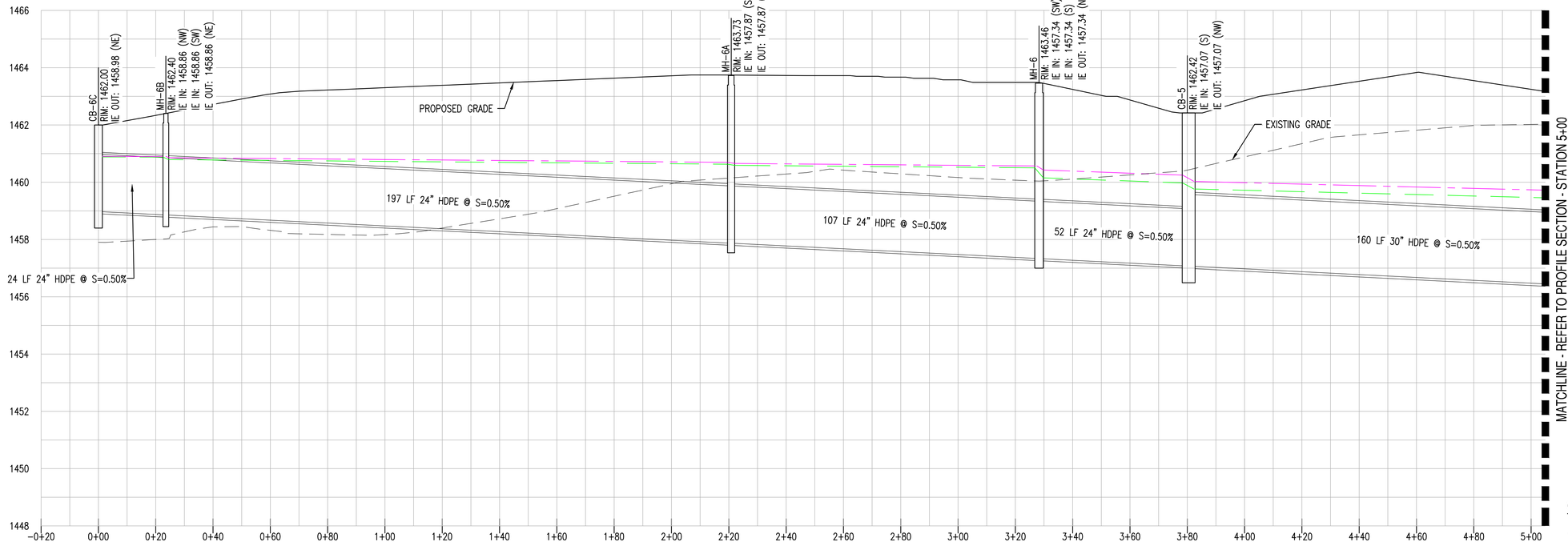
JOB NO.: 240103

SHEET TITLE:
100-YR HYDRAULIC GRADE LINE

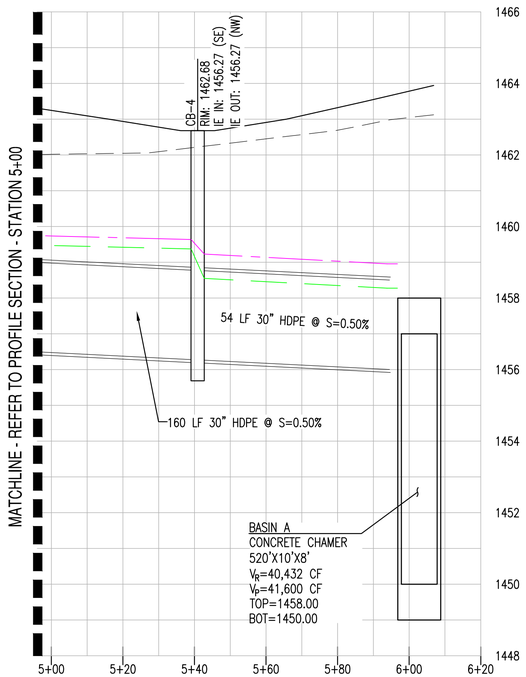
PAGE NO.: 1 OF 3

SHEET NO.: **HGL**

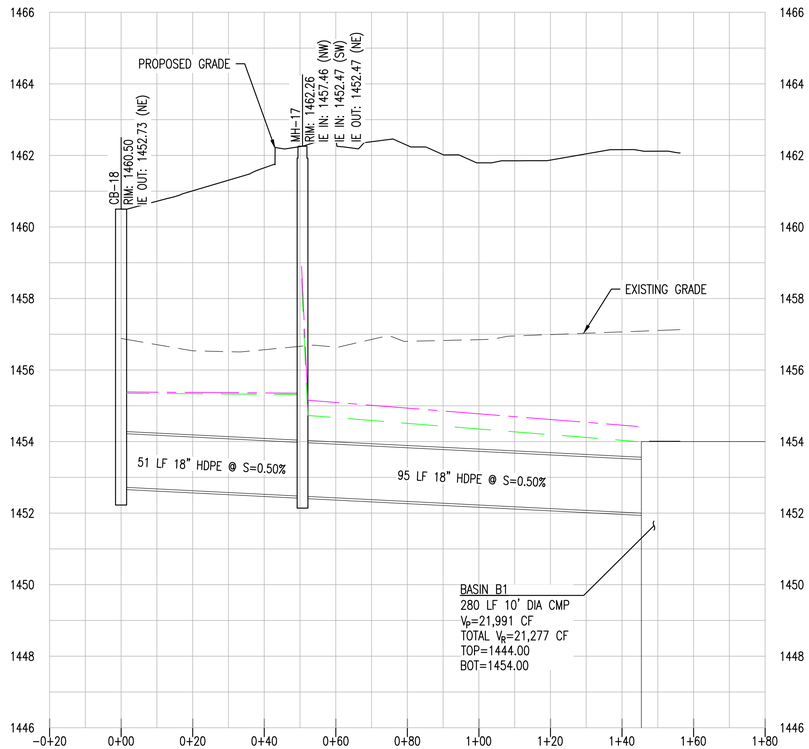
CASE FILE: 10-DR-2024



CB-6C TO BASIN A
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



CB-6C TO BASIN A
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



CB-18 TO BASIN B1
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

ENERGY GRADE LINE

HYDRAULIC GRADE LINE

Registered Professional Engineer
CERTIFICATE NO.
45621
ALI SAMIH FAKIH
Date Signed 04-11-2025
ARIZONA, U.S.A.

EXPIRATION DATE: 12-31-2027

SEG SUSTAINABILITY ENGINEERING GROUP

5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
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Dial 811 or visit azbluestake.com

PROJECT
YAM HANGARS AT SDL

LOCATION
14930 N. 78TH WAY,
SCOTTSDALE, AZ 85260

DRAWN	FF/JL	04/17/2025
DESIGNED	AG/DJ	04/17/2025
CHECKED	SC	04/15/2025
FINAL QC	SC	04/17/2025
PROJ. MGR.	SC	04/17/2025

DATE:
04/17/2025

ISSUED FOR:
DRB

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1	
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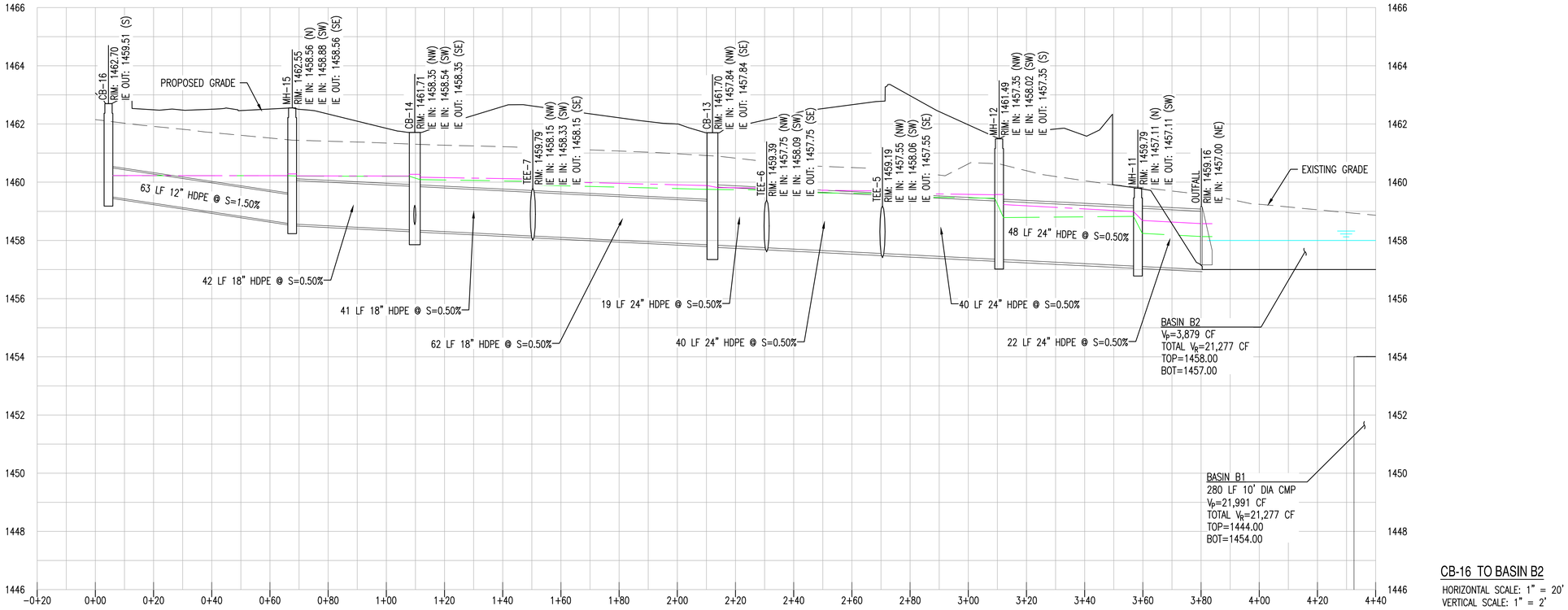
JOB NO.:
240103

SHEET TITLE:
100-YR HYDRAULIC GRADE LINE

PAGE NO.: 2 OF 3

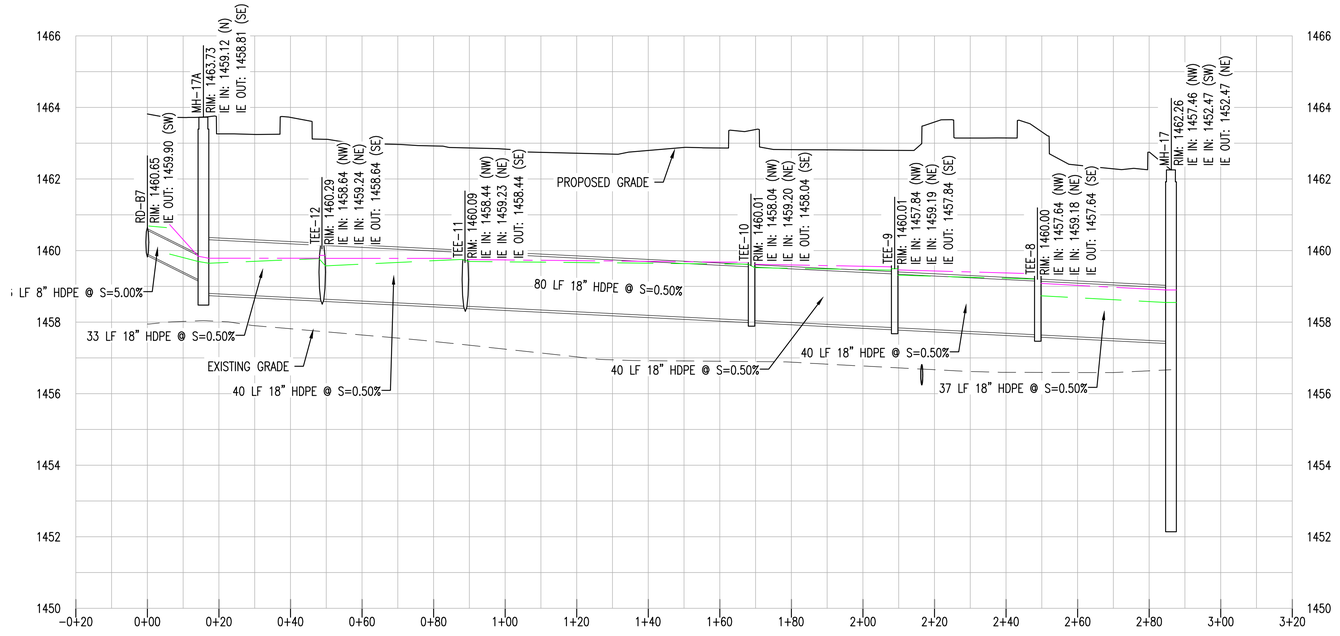
SHEET NO.: **HGL**

CASE FILE: 10-DR-2024



CB-16 TO BASIN B2

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



RD-B7 TO MH-17

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

ENERGY GRADE LINE

HYDRAULIC GRADE LINE

45621
ALI SAMIH FAKIH
Registered Professional Engineer (Civil)
Date Signed 04-17-2025
ARIZONA, U.S.A.

EXPIRATION DATE: 12-31-2027

SUSTAINABILITY ENGINEERING GROUP
SEG
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
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YAM HOLDINGS

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PROJECT
YAM HANGARS AT SDL

LOCATION
14930 N. 78TH WAY,
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DRAWN	FF/JL	04/17/2025
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FINAL QC	SC	04/17/2025
PROJ. MGR.	SC	04/17/2025

DATE: 04/17/2025

ISSUED FOR: DRB

REVISION NO.:	DATE:
1	
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3	
4	

JOB NO.: 240103

SHEET TITLE:
100-YR HYDRAULIC GRADE LINE

PAGE NO.: 3 OF 3

SHEET NO.: **HGL**

CASE FILE: 10-DR-2024

CB-8 TO BASIN A PIPE HYDRAULICS 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	Pipe - (107)	CB-4	RCT-CONNECTION-3	54.387	0	0	0	0	0	0	0	0	0	10.79	31.05	2.5	29.031	5.914	6.614	0.137	1456.272	1456	N/A	0.50%
2	Pipe - (106)	CB-5	CB-4	160.399	0	0	0	0	0	0	0	0	0	7.09	20.26	2.5	29.031	5.914	6.39	0.418	1457.074	1456.272	N/A	0.50%
3	Pipe - (105)	MH-6	CB-5	52.216	0	0	0	0	0	0	0	0	0	0	13.17	2	16.012	5.097	5.686	0.153	1457.335	1457.074	N/A	0.50%
4	Pipe - (102)	MH-6A	MH-6	107.465	0	0	0	0	0	0	0	0	0	0	6.45	2	16.012	5.097	4.818	0.372	1457.872	1457.335	N/A	0.50%
5	Pipe - (61)	MH-6B	MH-6A	197.253	0	0	0	0	0	0	0	0	0	0	6.45	2	16.012	5.097	4.818	0.682	1458.858	1457.872	N/A	0.50%
6	Pipe - (84)	TEE-3	MH-6B	36.118	0	0	0	0	0	0	0	0	0	0	3	1.5	7.435	4.207	3.979	0.151	1459.039	1458.858	N/A	0.50%
7	Pipe - (39) (1) (2) (1) (1) (1)	RD-A8	TEE-3	29.595	0	0	0	0	0	0	0	0	0	1.5	1.5	0.667	1.665	4.771	5.396	0.091	1459.6	1459.039	N/A	1.90%
8	Pipe - (83)	MH-6B.1	TEE-3	41.698	0	0	0	0	0	0	0	0	0	0	1.5	1.5	7.435	4.207	3.291	0.211	1459.247	1459.039	N/A	0.50%
9	Pipe - (39) (1) (2) (1) (1)	RD-A7	MH-6B.1	30.205	0	0	0	0	0	0	0	0	0	1.5	1.5	0.667	1.308	3.746	4.297	0.117	1459.6	1459.247	N/A	1.17%
10	Pipe - (85)	CB-6C	MH-6B	23.555	0	0	0	0	0	0	0	0	0	3.45	3.45	2	16.012	5.097	4.061	0.097	1458.976	1458.858	N/A	0.50%
11	Pipe - (104)	CB-7	MH-6	96.376	0	0	0	0	0	0	0	0	0	3.45	6.72	2	16.012	5.097	4.87	0.33	1457.817	1457.335	N/A	0.50%
12	Pipe - (103)	CB-8	CB-7	143.813	0	0	0	0	0	0	0	0	0	3.27	3.27	2	16.012	5.097	4	0.599	1458.536	1457.817	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	RCT-CONNECTION-3								1458	1458							1458.5	1458.717			
1	CB-4	2.5	31.05	54.387	6.614	2.278	1.899	0.68	1458.958	1458.278	0.005	0.272	1459.23	1458.55	3.26	1459.532	1458.772	1462.68	N/A	Case C	Case B
2	CB-5	2.5	20.26	160.399	4.127	2.5	n/a	0.265	1459.638	1459.373	0.002	0.391	1460.029	1459.764	3.066	1460.14	1459.074	1462.42	Case B	N/A	Case A
3	MH-6	2	13.17	52.216	4.192	2	n/a	0.273	1460.25	1459.976	0.003	0.177	1460.427	1460.153	3.208	1460.543	1459.335	1463.461	Case B	N/A	Case A
4	MH-6A	2	6.45	107.465	2.053	2	n/a	0.066	1460.569	1460.504	0.001	0.087	1460.657	1460.591	2.798	1460.67	1459.872	1463.727	Case B	N/A	Case A
5	MH-6B	2	6.45	197.253	2.053	0.884	0.9	0.066	1460.696	1460.631	0.001	0.16	1460.856	1460.791	2.032	1460.891	1460.358	1462.404	Case B	N/A	Case B
6	TEE-3	1.5	3	36.118	1.698	1.5	n/a	0.045	1460.909	1460.864	0.001	0.029	1460.938	1460.893	1.924	1460.963	1459.706	1460.683	Case B	N/A	Case A
7	RD-A8	0.667	1.5	29.595	4.297	0.667	n/a	0.287	1461.077	1460.79	0.015	0.456	1461.533	1461.246	1.991	1461.591	---	1460.348	Case B	N/A	Case A
8	MH-6B.1	1.5	1.5	41.698	0.849	1.5	n/a	0.011	1460.967	1460.956	0	0.009	1460.976	1460.964	1.737	1460.985	1459.914	1461.643	Case B	N/A	Case A
9	RD-A7	0.667	1.5	30.205	4.297	0.667	n/a	0.287	1461.1	1460.813	0.015	0.465	1461.565	1461.278	2.023	1461.623	---	1460.348	Case B	N/A	Case A
10	CB-6C	2	3.45	23.555	1.098	0.631	0.65	0.019	1460.898	1460.879	0	0.005	1460.904	1460.885	1.934	1460.909	---	1462	Case B	N/A	Case B
11	CB-7	2	6.72	96.376	2.139	2	n/a	0.071	1460.572	1460.5	0.001	0.085	1460.657	1460.586	2.87	1460.687	1459.817	1462.87	Case B	N/A	Case A
12	CB-8	2	3.27	143.813	1.041	2	n/a	0.017	1460.693	1460.677	0	0.03	1460.724	1460.707	2.195	1460.731	---	1462.95	Case B	N/A	Case A

· Hydraulic Engineering Circular No.22 Third Edition

#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	RCT-CONNECTION-3																
1	CB-4	0.68	0.272	0	0	0	0	0.272	2.958	2.278	0.705	3.166	0	0.001	0.451	0.094	3.26
2	CB-5	0.106	0.391	0	0	0	0	0.391	2.955	2.69	0.46	3.008	0	0.772	0.327	0.058	3.066
3	MH-6	0.109	0.177	0	0	0	0	0.177	3.092	2.818	0.523	3.146	0	1.132	0	0.062	3.208
4	MH-6A	0.026	0.087	0	0	0	0	0.087	2.784	2.719	0.256	2.798	0	0.001	0	0	2.798
5	MH-6B	0.026	0.16	0	0	0	0	0.16	1.998	1.933	0.256	2.011	0	1.609	0	0.021	2.032
6	TEE-3	0.018	0.029	0	0	0	0	0.029	1.899	1.855	0.244	1.908	0	1.737	0	0.016	1.924
7	RD-A8	0.115	0.456	0	0	0	0	0.456	1.933	1.646	0.928	1.991	0	0	0	0	1.991
8	MH-6B.1	0.004	0.009	0	0	0	0	0.009	1.728	1.717	0.122	1.73	0	3.206	0	0.007	1.737
9	RD-A7	0.115	0.465	0	0	0	0	0.465	1.965	1.678	0.928	2.023	0	0	0	0	2.023
10	CB-6C	0.007	0.005	0	0	0	0	0.005	1.928	1.909	0.137	1.932	0	0	0.546	0.002	1.934
11	CB-7	0.028	0.085	0	0	0	0	0.085	2.84	2.769	0.267	2.854	0	0.552	0.565	0.016	2.87
12	CB-8	0.007	0.03	0	0	0	0	0.03	2.187	2.171	0.13	2.191	0	0	1.112	0.004	2.195

CB-16 TO BASIN B2 PIPE HYDRAULICS 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	Pipe - (5)	MH-11	OUTFALL	22.097	0	0	0	0	0	0	0	0	0	0	9.8	2	16.012	5.097	5.348	0.069	1457.11	1457	N/A	0.50%
2	Pipe - (4)	MH-12	MH-11	47.714	0	0	0	0	0	0	0	0	0	0	9.8	2	16.012	5.097	5.348	0.149	1457.349	1457.11	N/A	0.50%
3	Pipe - (3) (1) (1) (1) (1)	TEE-5	MH-12	40.093	0	0	0	0	0	0	0	0	0	0	8.73	2	16.012	5.097	5.203	0.128	1457.549	1457.349	N/A	0.50%
4	Pipe - (3) (1) (1) (1)	TEE-6	TEE-5	39.808	0	0	0	0	0	0	0	0	0	0	7.61	2	15.651	4.982	4.943	0.134	1457.748	1457.549	N/A	0.50%
5	Pipe - (3) (1) (1) (2)	CB-13	TEE-6	18.603	0	0	0	0	0	0	0	0	0	1.42	6.54	2	16.012	5.097	4.836	0.064	1457.841	1457.748	N/A	0.50%
6	Pipe - (3) (1) (1)	TEE-7	CB-13	61.739	0	0	0	0	0	0	0	0	0	0	5.12	1.5	7.435	4.207	4.533	0.227	1458.15	1457.841	N/A	0.50%
7	Pipe - (3) (1)	CB-14	TEE-7	40.579	0	0	0	0	0	0	0	0	0	1.66	4.05	1.5	7.435	4.207	4.294	0.157	1458.353	1458.15	N/A	0.50%
8	Pipe - (3)	MH-15	CB-14	42.127	0	0	0	0	0	0	0	0	0	0	1.27	1.5	7.435	4.207	3.139	0.224	1458.564	1458.353	N/A	0.50%
9	Pipe - (1)	CB-16	MH-15	63.132	0	0	0	0	0	0	0	0	0	0.2	0.2	1	4.368	5.561	2.822	0.373	1459.511	1458.564	N/A	1.50%
10	Pipe - (96)	RD-B1	MH-15	34.503	0	0	0	0	0	0	0	0	0	1.07	1.07	0.667	2.085	5.972	6.007	0.096	1459.9	1458.876	N/A	2.97%
11	Pipe - (97)	RD-B2	CB-14	33.981	0	0	0	0	0	0	0	0	0	1.12	1.12	0.667	2.419	6.93	6.792	0.083	1459.9	1458.542	N/A	4.00%
12	Pipe - (98)	RD-B3	TEE-7	34.98	0	0	0	0	0	0	0	0	0	1.07	1.07	0.667	2.566	7.351	7.012	0.083	1459.9	1458.327	N/A	4.50%
13	Pipe - (99)	RD-B4	TEE-6	36.294	0	0	0	0	0	0	0	0	0	1.07	1.07	0.667	2.705	7.748	7.291	0.083	1459.9	1458.088	N/A	5.00%
14	Pipe - (100)	RD-B5	TEE-5	36.934	0	0	0	0	0	0	0	0	0	1.12	1.12	0.667	2.705	7.748	7.379	0.083	1459.9	1458.056	N/A	5.00%
15	Pipe - (101)	RD-B6	MH-12	37.585	0	0	0	0	0	0	0	0	0	1.07	1.07	0.667	2.705	7.748	7.291	0.086	1459.9	1458.023	N/A	5.00%

#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	OUTFALL								1458	1458							1459	1459.158			
1	MH-11	2	9.8	22.097	5.348	1.131	1.12	0.445	1458.576	1458.131	0.005	0.11	1458.686	1458.242	1.815	1458.925	1459.11	1459.794	N/A	Case B	Case B
2	MH-12	2	9.8	47.714	5.348	1.131	1.12	0.445	1458.992	1458.825	0.005	0.239	1459.23	1458.785	2.171	1459.52	1459.349	1461.492	N/A	Case F	Case B
3	TEE-5	2	8.73	40.093	2.779	1.054	1.054	0.12	1459.568	1459.448	0.001	0.06	1459.628	1459.508	2.113	1459.662	1459.549	1459.193	Case B	N/A	Case B
4	TEE-6	2	7.61	39.808	2.422	0.984	0.981	0.091	1459.699	1459.608	0.001	0.047	1459.746	1459.655	2.026	1459.774	1458.754	1459.392	Case B	N/A	Case B
5	CB-13	2	6.54	18.603	2.082	0.891	0.906	0.067	1459.801	1459.733	0.001	0.016	1459.816	1459.749	1.992	1459.833	1459.341	1461.7	Case B	N/A	Case B
6	TEE-7	1.5	5.12	61.739	2.897	1.5	n/a	0.131	1459.885	1459.755	0.002	0.147	1460.032	1459.901	1.927	1460.077	1459.65	1459.794	Case B	N/A	Case A
7	CB-14	1.5	4.05	40.579	2.292	1.5	n/a	0.082	1460.11	1460.028	0.001	0.06	1460.17	1460.088	1.856	1460.209	1459.853	1461.71	Case B	N/A	Case A
8	MH-15	1.5	1.27	42.127	0.719	1.5	n/a	0.008	1460.212	1460.204	0	0.006	1460.218	1460.21	1.661	1460.225	1459.564	1462.554	Case B	N/A	Case A
9	CB-16	1	0.2	63.132	0.255	0.146	0.183	0.001	1460.225	1460.224	0	0.002	1460.227	1460.226	0.717	1460.228	---	1462.7	Case B	N/A	Case B
10	RD-B1	0.667	1.07	34.503	3.065	0.339	0.491	0.146	1460.283	1460.137	0.008	0.271	1460.554	1460.408	0.809	1460.709	---	1460.648	Case B	N/A	Case B
11	RD-B2	0.667	1.12	33.981	3.209	0.319	0.502	0.16	1460.273	1460.113	0.009	0.292	1460.565	1460.405	0.834	1460.734	---	1460.648	Case B	N/A	Case B
12	RD-B3	0.667	1.07	34.98	7.012	0.3	0.491	0.765	1460.135	1459.989	0.008	0	1460.965	1460.2	1.065	1460.965	---	1460.648	Case B	N/A	Case D
13	RD-B4	0.667	1.07	36.294	7.291	0.292	0.491	0.826	1459.832	1459.686	0.008	0	1461.018	1460.192	1.118	1461.018	---	1460.648	Case B	N/A	Case D
14	RD-B5	0.667	1.12	36.934	7.379	0.299	0.502	0.846	1459.726	1459.566	0.009	0	1461.046	1460.199	1.146	1461.046	---	1460.648	Case B	N/A	Case D
15	RD-B6	0.667	1.07	37.585	7.291	0.292	0.491	0.826	1459.578	1459.432	0.008	0	1461.018	1460.192	1.118	1461.018	---	1460.648	Case B	N/A	Case D

· Hydraulic Engineering Circular No.22 Third Edition

#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	OUTFALL																
1	MH-11	0	0.11	0	0	0	0	0.11	1.576	1.131	0.389	1.7	0	0.927	0	0.115	1.815
2	MH-12	0.067	0.239	0	0	0	0	0.239	1.882	1.437	0.389	1.971	0	2.258	0	0.201	2.171
3	TEE-5	0.048	0.06	0	0	0	0	0.06	2.078	1.958	0.346	2.102	0	0.444	0	0.011	2.113
4	TEE-6	0.036	0.047	0	0	0	0	0.047	1.998	1.907	0.302	2.016	0	0.518	0	0.009	2.026
5	CB-13	0.027	0.016	0	0	0	0	0.016	1.975	1.908	0.26	1.989	0	0.04	0.203	0.003	1.992
6	TEE-7	0.052	0.147	0	0	0	0	0.147	1.882	1.752	0.417	1.908	0	0.735	0	0.019	1.927
7	CB-14	0.033	0.06	0	0	0	0	0.06	1.817	1.735	0.33	1.833	0	0.968	0.416	0.023	1.856
8	MH-15	0.003	0.006	0	0	0	0	0.006	1.655	1.647	0.103	1.656	0	3.116	0	0.005	1.661
9	CB-16	0	0.002	0	0	0	0	0.002	0.716	0.715	0.045	0.717	0	0	2.472	0	0.717
10	RD-B1	0.058	0.271	0	0	0	0	0.271	0.654	0.508	0.662	0.809	0	0	0	0	0.809
11	RD-B2	0.064	0.292	0	0	0	0	0.292	0.665	0.505	0.693	0.834	0	0	0	0	0.834
12	RD-B3	0.058	0	0	0	0	0	0	1.065	0.3	0.662	0.809	0	0	0	0	1.065
13	RD-B4	0.058	0	0	0	0	0	0	1.118	0.292	0.662	0.809	0	0	0	0	1.118
14	RD-B5	0.064	0	0	0	0	0	0	1.146	0.299	0.693	0.834	0	0	0	0	1.146
15	RD-B6	0.058	0	0	0	0	0	0	1.118	0.292	0.662	0.809	0	0	0	0	1.118

CB-18 TO BASIN B1 PIPE HYDRAULICS 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	Pipe - (9)	MH-17	CMP-CONNECTION-1	94.658	0	0	0	0	0	0	0	0	0	0	9.23	1.5	7.435	4.207	5.223	0.302	1452.473	1452	N/A	0.50%
2	Pipe - (109) (1) (1) (1) (1)	TEE-8	MH-17	37.22	0	0	0	0	0	0	0	0	0	0	6.52	1.5	7.435	4.207	4.741	0.131	1457.644	1457.458	N/A	0.50%
3	Pipe - (109) (1) (1) (1) (1)	TEE-9	TEE-8	39.997	0	0	0	0	0	0	0	0	0	0	5.45	1.5	7.435	4.207	4.593	0.145	1457.844	1457.644	N/A	0.50%
4	Pipe - (109) (1) (1) (1)	TEE-10	TEE-9	39.997	0	0	0	0	0	0	0	0	0	0	4.33	1.5	7.435	4.207	4.364	0.153	1458.044	1457.844	N/A	0.50%
5	Pipe - (109) (1) (1)	TEE-11	TEE-10	79.995	0	0	0	0	0	0	0	0	0	0	3.25	1.5	7.435	4.207	4.063	0.328	1458.444	1458.044	N/A	0.50%
6	Pipe - (109) (1)	TEE-12	TEE-11	39.997	0	0	0	0	0	0	0	0	0	0	2.19	1.5	7.435	4.207	3.657	0.182	1458.644	1458.444	N/A	0.50%
7	Pipe - (109)	MH-17A	TEE-12	33.212	0	0	0	0	0	0	0	0	0	0	1.07	1.5	7.435	4.207	2.988	0.185	1458.81	1458.644	N/A	0.50%
8	Pipe - (121)	ructure - (19	MH-17A	9.892	0	0	0	0	0	0	0	0	0	0	1.07	0.667	2.705	7.748	7.291	0.023	1459.611	1459.117	N/A	5.00%
9	Pipe - (108)	RD-B7	Structure - (195)	5.789	0	0	0	0	0	0	0	0	0	1.07	1.07	0.667	2.705	7.748	7.291	0.013	1459.9	1459.611	N/A	5.00%
10	Pipe - (110)	RD-B8	TEE-12	13.179	0	0	0	0	0	0	0	0	0	1.12	1.12	0.667	2.705	7.748	7.379	0.03	1459.9	1459.242	N/A	5.00%
11	Pipe - (111)	RD-B9	TEE-11	13.43	0	0	0	0	0	0	0	0	0	1.06	1.06	0.667	2.705	7.748	7.272	0.031	1459.9	1459.229	N/A	5.00%
12	Pipe - (112)	RD-B10	TEE-10	13.933	0	0	0	0	0	0	0	0	0	1.08	1.08	0.667	2.705	7.748	7.308	0.032	1459.9	1459.204	N/A	5.00%
13	Pipe - (113)	RD-B11	TEE-9	14.184	0	0	0	0	0	0	0	0	0	1.12	1.12	0.667	2.705	7.748	7.379	0.032	1459.9	1459.192	N/A	5.00%
14	Pipe - (114)	RD-B12	TEE-8	14.435	0	0	0	0	0	0	0	0	0	1.07	1.07	0.667	2.705	7.748	7.291	0.033	1459.9	1459.179	N/A	5.00%
15	Pipe - (115)	CB-18	MH-17	50.693	0	0	0	0	0	0	0	0	0	2.71	2.71	1.5	7.435	4.207	3.874	0.218	1452.726	1452.473	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	CMP-CONNECTION-1								1454	1454							1453.5	1453.644			
1	MH-17	1.5	9.23	94.658	5.223	1.5	n/a	0.424	1454.424	1454	0.008	0.731	1455.155	1454.731	2.865	1455.339	1458.958	1462.256	Case A	N/A	Case A
2	TEE-8	1.5	6.52	37.22	4.741	1.09	0.988	0.349	1458.897	1458.548	0.005	0.186	1459.083	1458.734	1.647	1459.291	1459.144	1460.005	N/A	Case A	Case B
3	TEE-9	1.5	5.45	39.997	3.084	0.955	0.9	0.148	1459.351	1459.203	0.003	0.108	1459.458	1459.31	1.665	1459.509	1459.344	1460.008	Case B	N/A	Case B
4	TEE-10	1.5	4.33	39.997	2.45	0.823	0.798	0.093	1459.547	1459.453	0.002	0.068	1459.615	1459.521	1.606	1459.65	1459.544	1460.011	Case B	N/A	Case B
5	TEE-11	1.5	3.25	79.995	1.839	0.694	0.687	0.053	1459.671	1459.618	0.001	0.077	1459.747	1459.695	1.326	1459.77	1459.944	1460.088	Case B	N/A	Case B
6	TEE-12	1.5	2.19	39.997	3.657	0.558	0.559	0.208	1459.781	1459.754	0	0	1459.781	1459.573	1.137	1459.781	1460.144	1460.288	N/A	Case F	N/A
7	MH-17A	1.5	1.07	33.212	2.988	0.385	0.386	0.139	1459.784	1459.776	0	0	1459.784	1459.645	0.974	1459.784	1459.784	1463.727	N/A	Case F	N/A
8	Structure - (195)	0.667	1.07	9.892	7.291	0.292	0.491	0.826	1459.843	1459.697	0.008	0	1460.729	1459.903	1.118	1460.729	1460.278	1460.359	Case B	N/A	Case D
9	RD-B7	0.667	1.07	5.789	3.065	0.667	n/a	0.146	1460.787	1460.641	0.008	0.045	1460.833	1460.687	0.962	1460.862	---	1460.648	Case B	N/A	Case A
10	RD-B8	0.667	1.12	13.179	7.379	0.299	0.502	0.846	1459.866	1459.653	0	0	1461.046	1460.199	1.146	1461.046	---	1460.648	N/A	Case F	N/A
11	RD-B9	0.667	1.06	13.43	7.272	0.29	0.489	0.822	1459.846	1459.656	0	0	1461.012	1460.19	1.112	1461.012	---	1460.648	N/A	Case F	N/A
12	RD-B10	0.667	1.08	13.933	7.308	0.293	0.493	0.83	1460.328	1459.497	0	0	1461.023	1460.193	1.123	1461.023	---	1460.648	N/A	Case B	N/A
13	RD-B11	0.667	1.12	14.184	7.379	0.299	0.502	0.846	1460.337	1459.491	0	0	1461.046	1460.199	1.146	1461.046	---	1460.648	N/A	Case B	N/A
14	RD-B12	0.667	1.07	14.435	7.291	0.292	0.491	0.826	1460.297	1459.471	0	0	1461.018	1460.192	1.118	1461.018	---	1460.648	N/A	Case B	N/A
15	CB-18	1.5	2.71	50.693	1.534	1.5	n/a	0.037	1455.353	1455.317	0.001	0.034	1455.387	1455.351	2.693	1455.419	---	1460.5	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	CMP-CONNECTION-1																
1	MH-17	0.424	0.731	0	0	0	0	0.731	2.682	2.258	0.752	2.767	0	0.121	1.045	0.099	2.865
2	TEE-8	0	0.186	0	0	0	0	0.186	1.439	1.09	0.531	1.571	0	0.582	0	0.077	1.647
3	TEE-9	0.059	0.108	0	0	0	0	0.108	1.614	1.466	0.444	1.644	0	0.727	0	0.021	1.665
4	TEE-10	0.037	0.068	0	0	0	0	0.068	1.571	1.477	0.353	1.589	0	0.88	0	0.016	1.606
5	TEE-11	0.021	0.077	0	0	0	0	0.077	1.303	1.251	0.265	1.314	0	1.146	0	0.012	1.326
6	TEE-12	0.011	0	0	0	0	0	0	1.137	0.929	0.178	0.756	0	1.769	0	0	1.137
7	MH-17A	0.003	0	0	0	0	0	0	0.974	0.835	0.087	0.468	0	1.773	0	0	0.974
8	Structure - (195)	0.058	0	0	0	0	0	0	1.118	0.292	0.662	0.809	0	1.722	0	0	1.118
9	RD-B7	0.058	0.045	0	0	0	0	0.045	0.933	0.787	0.662	0.962	0	0	0	0	0.962
10	RD-B8	0.085	0	0	0	0	0	0	1.146	0.299	0.693	0.834	0	0	0	0	1.146
11	RD-B9	0.076	0	0	0	0	0	0	1.112	0.29	0.656	0.804	0	0	0	0	1.112
12	RD-B10	0	0	0	0	0	0	0	1.123	0.293	0.668	0.814	0	0	0	0	1.123
13	RD-B11	0	0	0	0	0	0	0	1.146	0.299	0.693	0.834	0	0	0	0	1.146
14	RD-B12	0	0	0	0	0	0	0	1.118	0.292	0.662	0.809	0	0	0	0	1.118
15	CB-18	0.015	0.034	0	0	0	0	0.034	2.661	2.624	0.221	2.668	0	0	3.404	0.025	2.693

RD-A1 TO BASIN A PIPE HYDRAULICS 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	Pipe - (89)	MH-1	RCT-CONNECTION-1	16.268	0	0	0	0	0	0	0	0	0	0	4.72	1	4.368	5.561	6.01	0.045	1456.244	1456	N/A	1.50%
2	Pipe - (88)	MH-2	MH-1	57.892	0	0	0	0	0	0	0	0	0	0	4.72	1	4.368	5.561	6.01	0.161	1457.112	1456.244	N/A	1.50%
3	Pipe - (87) (1) (1)	TEE-1	MH-2	50.006	0	0	0	0	0	0	0	0	0	0	3.56	1	4.368	5.561	6.194	0.135	1457.862	1457.112	N/A	1.50%
4	Pipe - (87) (1)	TEE-2	TEE-1	50.006	0	0	0	0	0	0	0	0	0	0	2.4	1	4.368	5.561	5.688	0.147	1458.612	1457.862	N/A	1.50%
5	Pipe - (87)	MH-3	TEE-2	50.006	0	0	0	0	0	0	0	0	0	0	1.24	1	4.368	5.561	4.785	0.174	1459.362	1458.612	N/A	1.50%
6	Pipe - (86)	RD-A1	MH-3	4.091	0	0	0	0	0	0	0	0	0	1.24	1.24	0.667	2.705	7.748	7.574	0.009	1460.1	1459.896	N/A	5.00%
7	Pipe - (92)	RD-A2	TEE-2	4.052	0	0	0	0	0	0	0	0	0	1.16	1.16	0.667	2.705	7.748	7.446	0.009	1460.1	1459.898	N/A	5.00%
8	Pipe - (93)	RD-A3	TEE-1	4.012	0	0	0	0	0	0	0	0	0	1.16	1.16	0.667	2.705	7.748	7.446	0.009	1460.1	1459.9	N/A	5.00%
9	Pipe - (94)	RD-A4	MH-2	3.973	0	0	0	0	0	0	0	0	0	1.16	1.16	0.667	2.705	7.748	7.446	0.009	1460.1	1459.902	N/A	5.00%

#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	RCT-CONNECTION-1								1458	1458							1457	1457.105			
1	MH-1	1	4.72	16.268	6.01	1	n/a	0.562	1458.562	1458	0.018	0.286	1458.847	1458.286	3.077	1459.321	1457.244	1465.475	Case A	N/A	Case A
2	MH-2	1	4.72	57.892	6.01	1	n/a	0.562	1459.545	1458.984	0.018	1.016	1460.561	1460	3.658	1460.771	1458.112	1464.628	Case B	N/A	Case A
3	TEE-1	1	3.56	50.006	4.533	1	n/a	0.319	1460.898	1460.579	0.01	0.499	1461.398	1461.078	3.672	1461.534	1458.862	1460.61	Case B	N/A	Case A
4	TEE-2	1	2.4	50.006	3.056	1	n/a	0.145	1461.592	1461.447	0.005	0.227	1461.819	1461.674	3.285	1461.897	1459.612	1460.71	Case B	N/A	Case A
5	MH-3	1	1.24	50.006	1.579	1	n/a	0.039	1461.912	1461.874	0.001	0.061	1461.973	1461.934	2.643	1462.005	1460.562	1464.051	Case B	N/A	Case A
6	RD-A1	0.667	1.24	4.091	3.552	0.667	n/a	0.196	1462.084	1461.888	0.011	0.043	1462.127	1461.931	2.066	1462.166	---	1460.848	Case B	N/A	Case A
7	RD-A2	0.667	1.16	4.052	3.323	0.667	n/a	0.172	1461.965	1461.794	0.009	0.037	1462.003	1461.831	1.937	1462.037	---	1460.848	Case B	N/A	Case A
8	RD-A3	0.667	1.16	4.012	3.323	0.667	n/a	0.172	1461.603	1461.431	0.009	0.037	1461.64	1461.468	1.574	1461.674	---	1460.848	Case B	N/A	Case A
9	RD-A4	0.667	1.16	3.973	3.323	0.305	0.511	0.172	1460.839	1460.668	0.009	0.037	1460.876	1460.704	0.854	1460.954	---	1460.848	Case B	N/A	Case B

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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	RCT-CONNECTION-1																
1	MH-1	0.562	0.286	0	0	0	0	0.286	2.603	2.042	1.06	2.715	0	3.218	0	0.361	3.077
2	MH-2	0.225	1.016	0	0	0	0	1.016	3.449	2.888	1.06	3.561	0	0.863	0	0.097	3.658
3	TEE-1	0.128	0.499	0	0	0	0	0.499	3.536	3.216	0.799	3.6	0	1.139	0	0.073	3.672
4	TEE-2	0.058	0.227	0	0	0	0	0.227	3.207	3.062	0.539	3.236	0	1.668	0	0.048	3.285
5	MH-3	0.016	0.061	0	0	0	0	0.061	2.611	2.572	0.278	2.619	0	3.182	0	0.025	2.643
6	RD-A1	0.078	0.043	0	0	0	0	0.043	2.027	1.831	0.767	2.066	0	0	0	0	2.066
7	RD-A2	0.069	0.037	0	0	0	0	0.037	1.903	1.731	0.718	1.937	0	0	0	0	1.937
8	RD-A3	0.069	0.037	0	0	0	0	0.037	1.54	1.368	0.718	1.574	0	0	0	0	1.574
9	RD-A4	0.069	0.037	0	0	0	0	0.037	0.776	0.604	0.718	0.854	0	0	0	0	0.854

RD-A5 TO BASIN A PIPE HYDRAULICS 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	Pipe - (95)	MH-9	RCT-CONNECTION-2	14.961	0	0	0	0	0	0	0	0	0	0	2.08	1.5	18.211	10.306	6.846	0.036	1456.449	1456	N/A	3.00%
2	Pipe - (80)	TEE-4	MH-9	44.794	0	0	0	0	0	0	0	0	0	0	2.08	1	6.177	7.865	7.089	0.105	1457.792	1456.449	N/A	3.00%
3	Pipe - (80) (1)	MH-10	TEE-4	28.211	0	0	0	0	0	0	0	0	0	0	0.32	1	6.177	7.865	4.14	0.114	1458.638	1457.792	N/A	3.00%
4	Pipe - (120)	RD-A5	MH-10	6.551	0	0	0	0	0	0	0	0	0	0.32	0.32	1	7.974	10.153	4.951	0.022	1459.6	1459.273	N/A	5.00%
5	Pipe - (79)	RD-A6	TEE-4	6.551	0	0	0	0	0	0	0	0	0	1.76	1.76	0.667	2.705	7.748	8.245	0.013	1459.6	1459.273	N/A	5.00%

#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	RCT-CONNECTION-2								1458	1458							1457.5	1457.644			
1	MH-9	1.5	2.08	14.961	1.177	1.5	n/a	0.022	1458.022	1458	0	0.006	1458.027	1458.006	1.597	1458.045	1457.449	1463.881	Case A	N/A	Case A
2	TEE-4	1	2.08	44.794	7.089	0.4	0.616	0.781	1458.089	1457.98	0.003	0	1458.974	1458.192	1.181	1458.974	1459.94	1460.095	Case B	N/A	Case D
3	MH-10	1	0.32	28.211	0.407	0.155	0.233	0.003	1458.975	1458.972	0	0.002	1458.977	1458.974	0.34	1458.977	1460.273	1463.611	Case B	N/A	Case B
4	RD-A5	1	0.32	6.551	4.951	0.137	0.233	0.381	1459.791	1459.41	0	0	1460.118	1459.737	0.518	1460.118	---	1460.705	N/A	Case A	N/A
5	RD-A6	0.667	1.76	6.551	8.245	0.392	0.606	1.057	1460.722	1459.665	0	0	1461.049	1459.992	1.449	1461.049	---	1460.983	N/A	Case A	N/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	RCT-CONNECTION-2																
1	MH-9	0.022	0.006	0	0	0	0	0.006	1.579	1.557	0.169	1.583	0	3.2	0	0.014	1.597
2	TEE-4	0.044	0	0	0	0	0	0	1.181	0.4	0.467	0.961	0	0	0.44	0	1.181
3	MH-10	0.001	0.002	0	0	0	0	0.002	0.339	0.336	0.072	0.339	0	0	0.296	0	0.34
4	RD-A5	0	0	0	0	0	0	0	0.518	0.137	0.072	0.274	0	0	0	0	0.518
5	RD-A6	0	0	0	0	0	0	0	1.449	0.392	1.089	1.129	0	0	0	0	1.449

APPENDIX III

PRELIMINARY GRADING & DRAINAGE PLANS

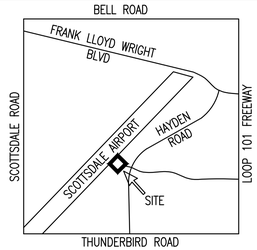
YAM HANGARS AT SDL

OVERALL GRADING AND DRAINAGE PLAN & KEY MAP

SCOTTSDALE, ARIZONA, 85260

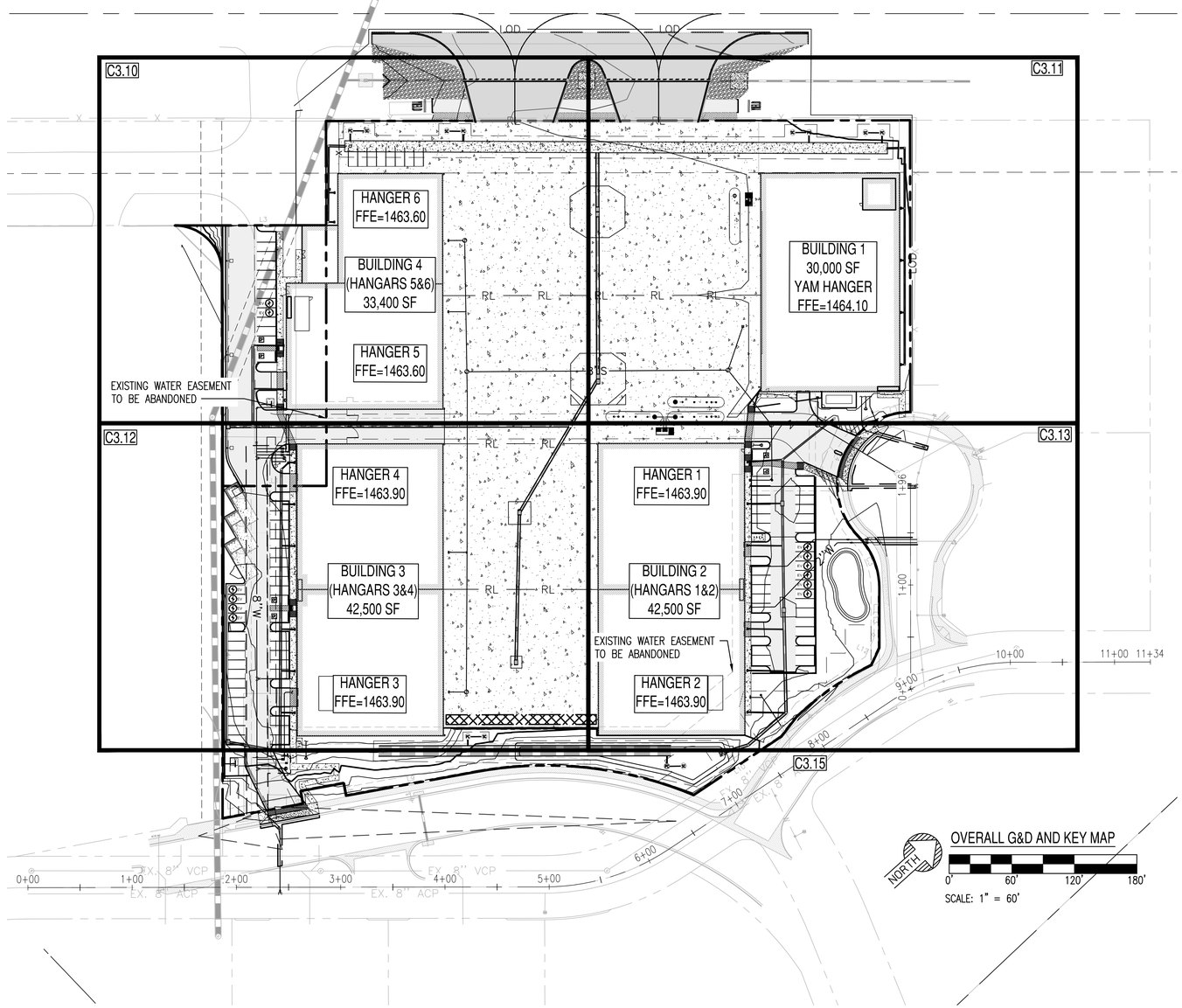
A PORTION OF THE NORTHEAST QUARTER OF SECTION 11, TOWNSHIP 3 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.

SHEET INDEX			
	SHEET NO.:	DESCRIPTION:	LATEST DATE:
1	C3.00	OVERALL GRADING AND DRAINAGE PLAN & KEY MAP	04/17/2025
2	C3.10	PRELIMINARY GRADING & DRAINAGE PLAN	04/17/2025
3	C3.11	PRELIMINARY GRADING & DRAINAGE PLAN	04/17/2025
4	C3.12	PRELIMINARY GRADING & DRAINAGE PLAN	04/17/2025
5	C3.13	PRELIMINARY GRADING & DRAINAGE PLAN	04/17/2025
6	C3.50	SITE CROSS SECTIONS	04/17/2025
7	C3.51	SITE CROSS SECTIONS	04/17/2025
8	C3.52	SITE CROSS SECTIONS	04/17/2025



VICINITY MAP
NE11 T3N R4E
N.T.S.

NORTH



OVERALL G&D AND KEY MAP

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ARIZONA811
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REGISTERED PROFESSIONAL ENGINEER
45621
ALI SAMIH FAKIH
Date Signed 04-17-2025
ARIZONA, U.S.A.
EXPIRATION DATE: 12-31-2027

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.256.3534

YAM HOLDINGS

PROJECT	YAM HANGARS AT SDL
LOCATION	14930 N. 78TH WAY, SCOTTSDALE, AZ 85260

DRAWN	FF/JL	04/17/2025
DESIGNED	AG/DJ	04/17/2025
CHECKED	SC	04/15/2025
FINAL QC	SC	04/17/2025
PROJ. MGR.	SC	04/17/2025

DATE: 04/17/2025

ISSUED FOR: DRB

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 240103

SHEET TITLE: **OVERALL GRADING AND DRAINAGE PLAN & KEYMAP**

PAGE NO.: 1 OF 8

SHEET NO.: **C3.00**

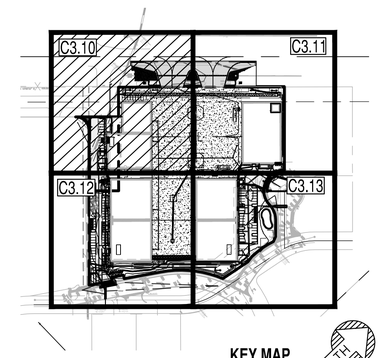
CASE FILE: 10-DR-2024

YAM HANGARS AT SDL

PRELIMINARY GRADING AND DRAINAGE PLAN

SCOTTSDALE, ARIZONA, 85260

A PORTION OF THE NORTHEAST QUARTER OF SECTION 11, TOWNSHIP 3 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.



PRELIMINARY GRADING NOTES

1. MATCH EXISTING GRADE.
2. 6" VERTICAL CURB AND GUTTER.
2A. 6" VERTICAL CURB
3. PROPOSED CONCRETE SIDEWALK. WIDTH PER PLAN.
4. LIGHT DUTY PAVEMENT.
4A. HEAVY DUTY PAVEMENT.
4B. HEAVY DUTY CONCRETE PAVEMENT
5. PAVEMENT WITH 2% MAXIMUM SLOPE IN ANY DIRECTION AT ACCESSIBLE PARKING STALLS AND 2% MAXIMUM CROSS SLOPE AT ADA ACCESSIBLE ROUTE.
6. PROPOSED ACCESSIBLE RAMP
8. NEW STORM MANHOLE.
9. PROPOSED HDPE PIPE.
9A. PROPOSED RGRCP PIPE
10A. PROPOSED UNDERGROUND CONCRETE VAULT STORMWATER STORAGE SYSTEM.
11. PROPOSED MAXWELL PLUS DRYWELL.
12. PROPOSED TEE.
19. PROPOSED STUB FOR ROOF DRAIN.
21. PROPOSED RISER WITH VENTED SOLID LID.

EXISTING LEGEND:

- XXXX — EX. MAJOR CONTOURS
- XXXX — EX. MINOR CONTOURS
- TC:XX.XX GE:XX.XX — EX. SPOT ELEVATION
- EASEMENT LINE AS NOTED
- EX. S — SEWER LINE
- SEWER MANHOLE
- EX. W — WATER LINE
- WV — WATER VALVE
- FIRE HYDRANT
- STORM DRAIN LINE
- CB — STORM CATCH BASIN
- STORM MANHOLE
- GAS — GAS LINE
- X X — FENCE
- SIGN
- STREET LIGHT
- TREE
- ROAD CENTERLINE

PROPOSED GRADING LEGEND:

- G=XX.XX — GUTTER ELEVATION, TC = G+0.5'
- P=XX.XX — PAVEMENT ELEVATION TC = P+0.5'
- C=XX.XX — CONCRETE ELEVATION
- FG=XX.XX — FINISH GRADE
- PROPERTY LINE
- RIGHT OF WAY
- CURB AND GUTTER
- RL — RIDGELINE
- SETBACK
- FLOW ARROW
- CATCH BASIN
- STORM PIPE
- END SECTION
- SD — STORM MANHOLE
- PC — SC — DRYWELL
- NYLOPLAST BASIN
- WM — WATER METER
- GATE VALVE
- FIRE HYDRANT
- S — SEWER MANHOLE
- RIP-RAP
- CONCRETE PAVEMENT
- HEAVY DUTY PAVEMENT
- LIGHT DUTY PAVEMENT
- FUEL TRUCK PARKING
- FUEL FARM LOCATION

MATCHLINE - REFER TO SHEET C3.11

MATCHLINE - REFER TO SHEET C3.12

SCALE: 1" = 20'

Registered Professional Engineer
CERTIFICATE NO.
45621
ALI SAMIH FAKIH
Date Signed 04-17-2025
ARIZONA, U.S.A.
EXPIRATION DATE: 12-31-2027

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.256.3534

YAM HOLDINGS

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

PROJECT: YAM HANGARS AT SDL
LOCATION: 14930 N. 78TH WAY, SCOTTSDALE, AZ 85260

DRAWN	FF/JL	04/17/2025
DESIGNED	AG/DJ	04/17/2025
CHECKED	SC	04/15/2025
FINAL QC	SC	04/17/2025
PROJ. MGR.	SC	04/17/2025

DATE: 04/17/2025
ISSUED FOR: DRB

REVISION NO.:	DATE:
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3	
4	

JOB NO.: 240103

SHEET TITLE: **PRELIMINARY GRADING & DRAINAGE PLAN**

PAGE NO.: 2 OF 8
SHEET NO.: **C3.10**

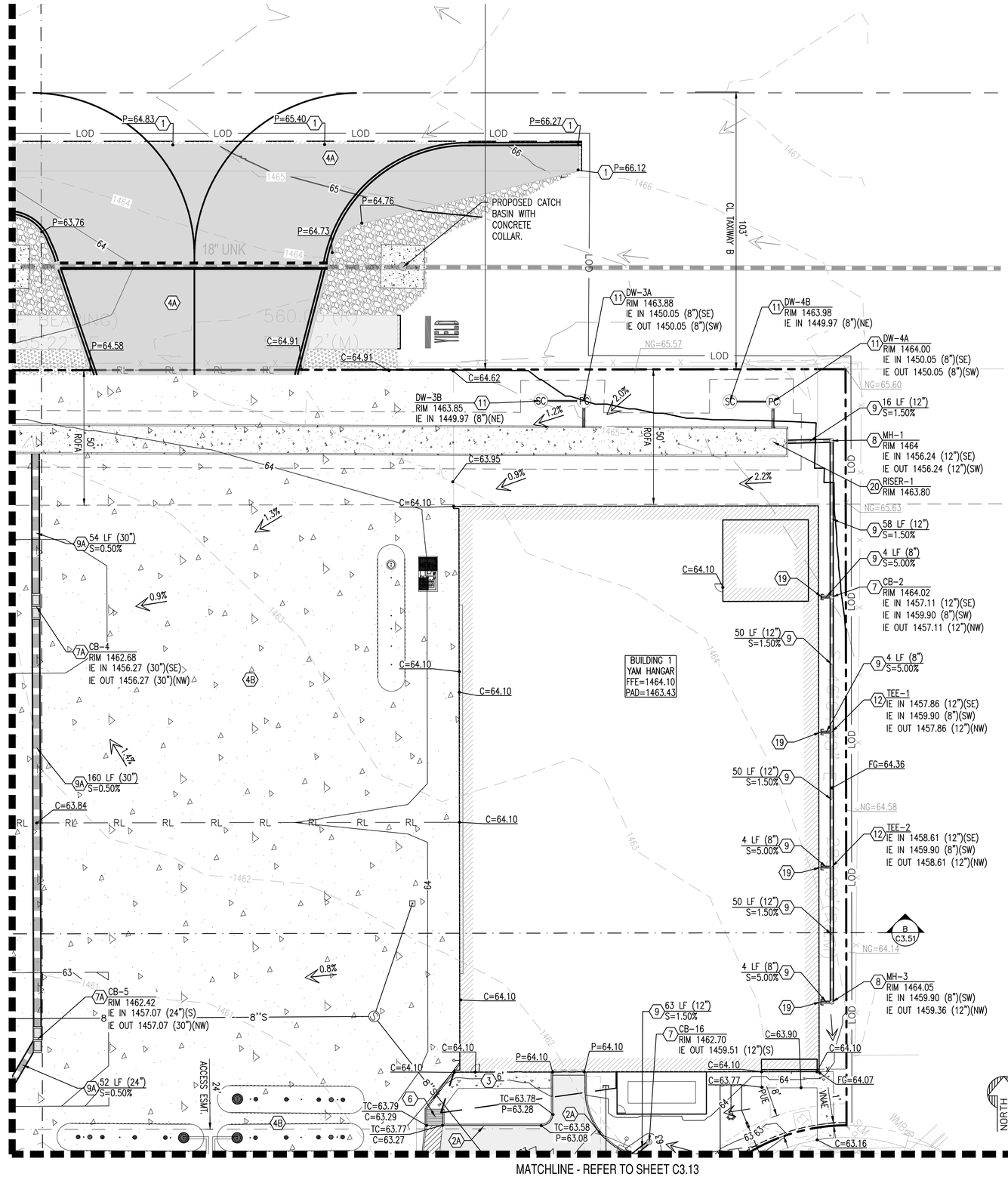
CASE FILE: 10-DR-2024

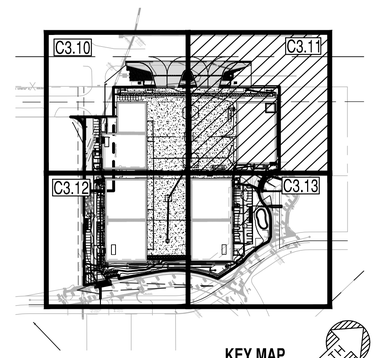
YAM HANGARS AT SDL

PRELIMINARY GRADING AND DRAINAGE PLAN

SCOTTSDALE, ARIZONA, 85260

A PORTION OF THE NORTHEAST QUARTER OF SECTION 11, TOWNSHIP 3 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.





KEY MAP
NTS

NORTH

0' 20' 40' 60'
SCALE: 1" = 20'

PRELIMINARY GRADING NOTES

1. MATCH EXISTING GRADE.
2A. 6" VERTICAL CURB
3. PROPOSED CONCRETE SIDEWALK. WIDTH PER PLAN.
4A. HEAVY DUTY PAVEMENT.
4B. HEAVY DUTY CONCRETE PAVEMENT
6. PROPOSED ACCESSIBLE RAMP
7. NEW CATCH BASIN.
7A. NEW AIRPORT RATED CONCRETE CATCH BASIN
8. NEW STORM MANHOLE.
9. PROPOSED HDPE PIPE.
9A. PROPOSED RGRCP PIPE
11. PROPOSED MAXWELL PLUS DRYWELL.
12. PROPOSED TEE.
19. PROPOSED STUB FOR ROOF DRAIN.
20. PROPOSED RISER WITH GRATE.

EXISTING LEGEND:

- EX. MAJOR CONTOURS
- EX. MINOR CONTOURS
- EX. SPOT ELEVATION
- EASEMENT LINE AS NOTED
- SEWER LINE
- SEWER MANHOLE
- WATER LINE
- WATER VALVE
- FIRE HYDRANT
- STORM DRAIN LINE
- STORM CATCH BASIN
- STORM MANHOLE
- GAS LINE
- FENCE
- SIGN
- STREET LIGHT
- TREE
- ROAD CENTERLINE

PROPOSED GRADING LEGEND:

- G=XX.XX — GUTTER ELEVATION, TC = G+0.5'
- P=XX.XX — PAVEMENT ELEVATION TC = P+0.5'
- C=XX.XX — CONCRETE ELEVATION
- FG=XX.XX — FINISH GRADE
- PROPERTY LINE
- RIGHT OF WAY
- CURB AND GUTTER
- RIDGELINE
- SETBACK
- FLOW ARROW
- CATCH BASIN
- STORM PIPE
- END SECTION
- STORM MANHOLE
- DRYWELL
- NYLOPLAST BASIN
- WATER METER
- GATE VALVE
- FIRE HYDRANT
- SEWER MANHOLE
- RIP-RAP
- CONCRETE PAVEMENT
- HEAVY DUTY PAVEMENT
- LIGHT DUTY PAVEMENT
- FUEL TRUCK PARKING
- FUEL FARM LOCATION

Registered Professional Engineer
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PROJECT	LOCATION
YAM HANGARS AT SDL	14930 N. 78TH WAY, SCOTTSDALE, AZ 85260

DRAWN	FF/JL	04/17/2025
DESIGNED	AG/DJ	04/17/2025
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REVISION NO.:	DATE:
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3	
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JOB NO.: 240103

SHEET TITLE: **PRELIMINARY GRADING & DRAINAGE PLAN**

PAGE NO.: 3 OF 8

SHEET NO.: **C3.11**

CASE FILE: 10-DR-2024

YAM HANGARS AT SDL

PRELIMINARY GRADING AND DRAINAGE PLAN

SCOTTSDALE, ARIZONA, 85260

A PORTION OF THE NORTHEAST QUARTER OF SECTION 11, TOWNSHIP 3 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.

MATCHLINE - REFER TO SHEET C3.10

MATCHLINE - REFER TO SHEET C3.13

PRELIMINARY GRADING NOTES

1. MATCH EXISTING GRADE.
2. 6" VERTICAL CURB AND GUTTER.
2A. 6" VERTICAL CURB
3. PROPOSED CONCRETE SIDEWALK. WIDTH PER PLAN.
4. LIGHT DUTY PAVEMENT.
4A. HEAVY DUTY PAVEMENT.
4B. HEAVY DUTY CONCRETE PAVEMENT
5. PAVEMENT WITH 2% MAXIMUM SLOPE IN ANY DIRECTION AT ACCESSIBLE PARKING STALLS AND 2% MAXIMUM CROSS SLOPE AT ADA ACCESSIBLE ROUTE.
6. PROPOSED ACCESSIBLE RAMP
7. NEW CATCH BASIN.
7A. NEW AIRPORT RATED CONCRETE CATCH BASIN
8. NEW STORM MANHOLE.
9. PROPOSED HDPE PIPE.
9A. PROPOSED RGRCP PIPE
10. PROPOSED UNDERGROUND CMP STORMWATER STORAGE SYSTEM.
12. PROPOSED TEE.
14A. DRIVE ENTRANCE PER C.O.S. STD. DET. CL-1
15. PROPOSED BLAST DEFLECTOR.
17. PROPOSED TRASH ENCLOSURE.
19. PROPOSED STUB FOR ROOF DRAIN.
20. PROPOSED RISER WITH GRATE.
23. PROPOSED 3' BLAST WALL.
26. PROPOSED VALLEY GUTTER

EXISTING LEGEND:

- XXXX — EX. MAJOR CONTOURS
- XXXX — EX. MINOR CONTOURS
- TC:XX.XX / GE:XX.XX — EX. SPOT ELEVATION
- EASEMENT LINE AS NOTED
- EX. S — SEWER LINE
- (S) SEWER MANHOLE
- EX. W — WATER LINE
- WV WATER VALVE
- FIRE HYDRANT
- STORM DRAIN LINE
- CB STORM CATCH BASIN
- (D) STORM MANHOLE
- GAS — GAS LINE
- X — X — FENCE
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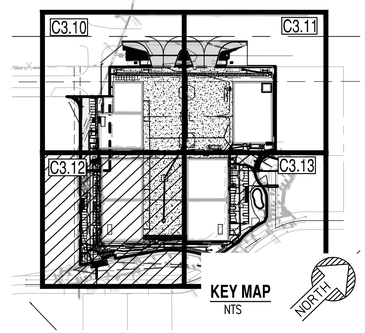
- TREE
- ROAD CENTERLINE



KEY MAP
NTS

PROPOSED GRADING LEGEND:

- G=XX.XX / TC = G+0.5' — GUTTER ELEVATION
- P=XX.XX / TC = P+0.5' — PAVEMENT ELEVATION
- C=XX.XX — CONCRETE ELEVATION
- FG=XX.XX — FINISH GRADE
- PROPERTY LINE
- RIGHT OF WAY
- CURB AND GUTTER
- RL — RIDGELINE
- SETBACK
- FLOW ARROW
- CATCH BASIN
- STORM PIPE
- END SECTION
- (SD) STORM MANHOLE
- (PC) (SC) DRYWELL
- NYLOPLAST BASIN
- WM WATER METER
- GATE VALVE
- FIRE HYDRANT
- (S) SEWER MANHOLE
- RIP-RAP
- CONCRETE PAVEMENT
- HEAVY DUTY PAVEMENT
- LIGHT DUTY PAVEMENT
- FUEL TRUCK PARKING
- FUEL FARM LOCATION

N 78TH WAY
LOCAL

SCALE: 1" = 20'

SCALE: 1" = 10'

Registered Professional Engineer
CERTIFICATE NO.
45621
ALI SAMIH FAKIH
Date Signed 04-17-2025
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EXPIRATION DATE: 12-31-2027

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PROJECT: YAM HANGARS AT SDL
LOCATION: 14930 N. 78TH WAY, SCOTTSDALE, AZ 85260

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DATE: 04/17/2025
ISSUED FOR: DRB

REVISION NO.:	DATE:
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JOB NO.: 240103

SHEET TITLE: **PRELIMINARY GRADING & DRAINAGE PLAN**

PAGE NO.: 4 OF 8
SHEET NO.: **C3.12**

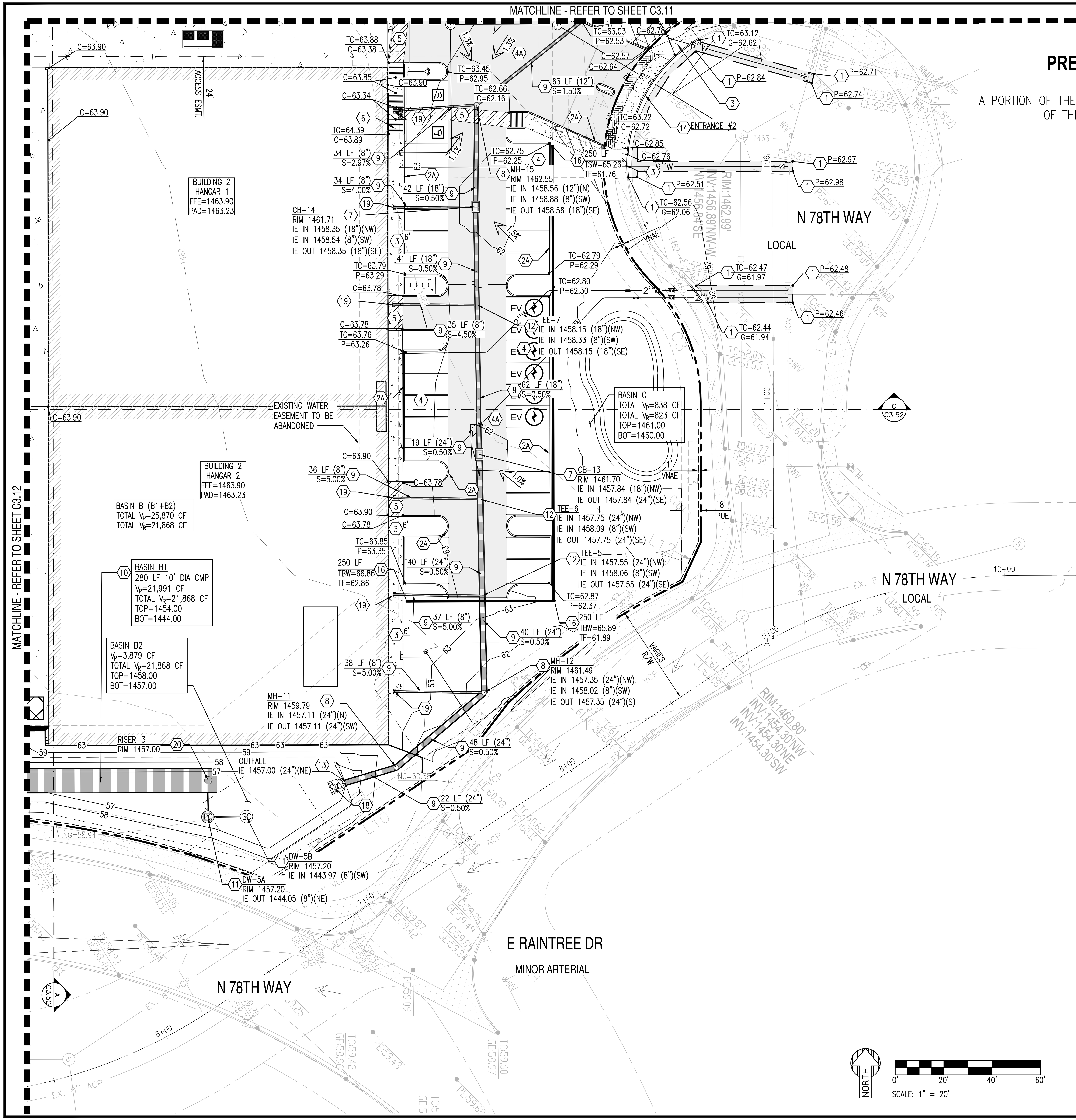
CASE FILE: 10-DR-2024

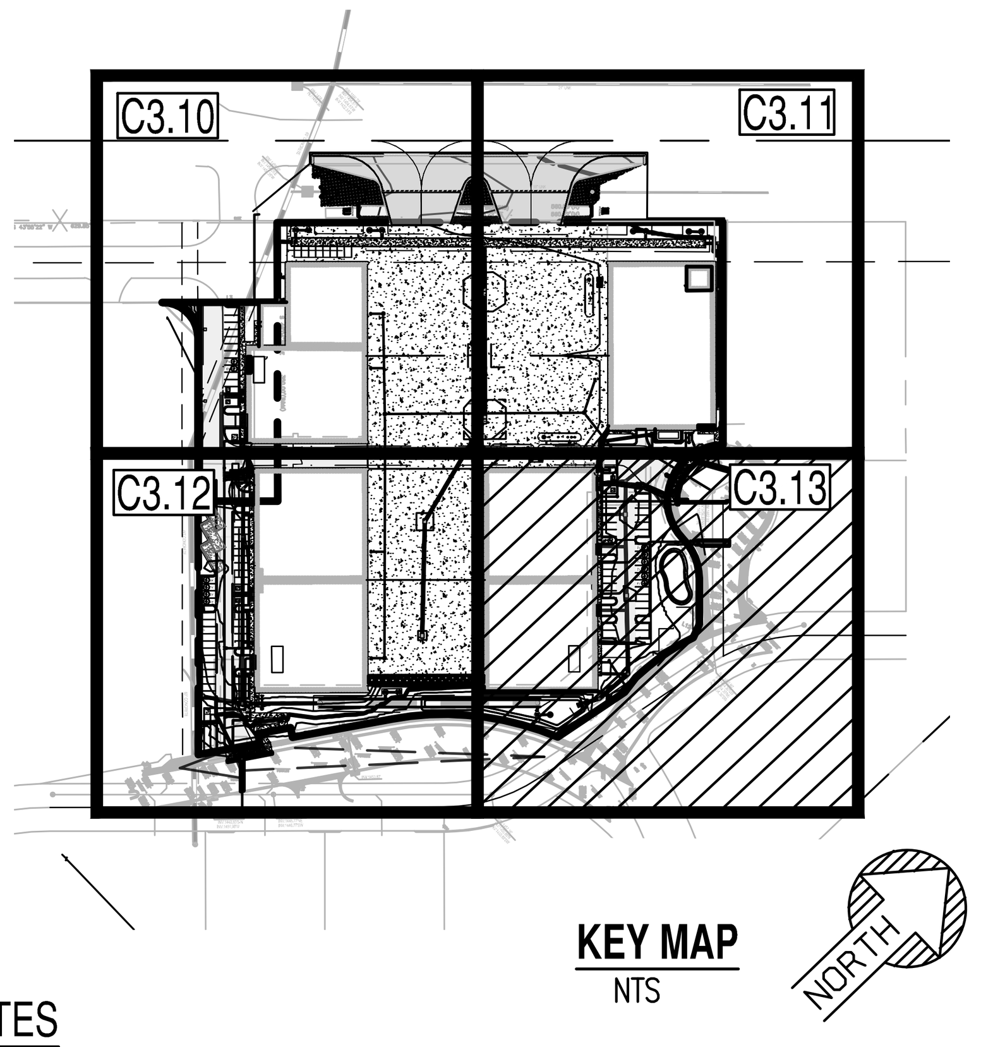
YAM HANGARS AT SDL

PRELIMINARY GRADING AND DRAINAGE PLAN

SCOTTSDALE, ARIZONA, 85260

A PORTION OF THE NORTHEAST QUARTER OF SECTION 11, TOWNSHIP 3 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.





PRELIMINARY GRADING NOTES

1. MATCH EXISTING GRADE.
2A. 6" VERTICAL CURB
3. PROPOSED CONCRETE SIDEWALK. WIDTH PER PLAN.
4. LIGHT DUTY PAVEMENT.
4A. HEAVY DUTY PAVEMENT.
4B. HEAVY DUTY CONCRETE PAVEMENT
5. PAVEMENT WITH 2% MAXIMUM SLOPE IN ANY DIRECTION AT ACCESSIBLE PARKING STALLS AND 2% MAXIMUM CROSS SLOPE AT ADA ACCESSIBLE ROUTE.
6. PROPOSED ACCESSIBLE RAMP
7. NEW CATCH BASIN.
8. NEW STORM MANHOLE.
9. PROPOSED HDPE PIPE.
10. PROPOSED UNDERGROUND CMP STORMWATER STORAGE SYSTEM.
11. PROPOSED MAXWELL PLUS DRYWELL.
12. PROPOSED TEE.
14. DRIVE ENTRANCE PER C.O.S. STD. DET. 2251-1.
16. PROPOSED 3' SCREEN WALL.
19. PROPOSED STUB FOR ROOF DRAIN.
20. PROPOSED RISER WITH GRATE.

PROPOSED GRADING LEGEND:

Symbol	Description
G=XX.XX	GUTTER ELEVATION, TC = G+0.5'
P=XX.XX	PAVEMENT ELEVATION TC = P+0.5'
C=XX.XX	CONCRETE ELEVATION
FG=XX.XX	FINISH GRADE
	PROPERTY LINE
	RIGHT OF WAY
	CURB AND GUTTER
RL	RIDGELINE
	SETBACK
	FLOW ARROW
	CATCH BASIN
	STORM PIPE
	END SECTION
SD	STORM MANHOLE
PC—SC	DRYWELL
	NYLOPLAST BASIN
WM	WATER METER
	GATE VALVE
	FIRE HYDRANT
S	SEWER MANHOLE
	RIP-RAP
	CONCRETE PAVEMENT
	HEAVY DUTY PAVEMENT
	LIGHT DUTY PAVEMENT
	FUEL TRUCK PARKING
	FUEL FARM LOCATION

EXISTING LEGEND:

Symbol	Description
XXXX	EX. MAJOR CONTOURS
XXXX	EX. MINOR CONTOURS
TC: XX.XX GE: XX.XX	EX. SPOT ELEVATION
	EASEMENT LINE AS NOTED
EX. S	SEWER LINE
S	SEWER MANHOLE
EX. W	WATER LINE
WV	WATER VALVE
	FIRE HYDRANT
	STORM DRAIN LINE
CB	STORM CATCH BASIN
D	STORM MANHOLE
GAS	GAS LINE
X X	FENCE
	SIGN
	STREET LIGHT
	TREE
	ROAD CENTERLINE

ALI SAMIH FAKIH
CERTIFICATE NO. 45621
Date Signed 04-17-2025
ARIZONA, U.S.A.
EXPIRATION DATE: 12-31-2027

SEG
SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX 480.259.3534

CASE FILE: 10-DR-2024

YAM HOLDINGS

PROJECT: YAM HANGARS AT SDL

LOCATION: 14930 N. 78TH WAY, SCOTTSDALE, AZ 85260

DRAWN	FF/JL	04/17/2025
DESIGNED	AG/DJ	04/17/2025
CHECKED	SC	04/15/2025
FINAL QC	SC	04/17/2025
PROJ. MGR.	SC	04/17/2025

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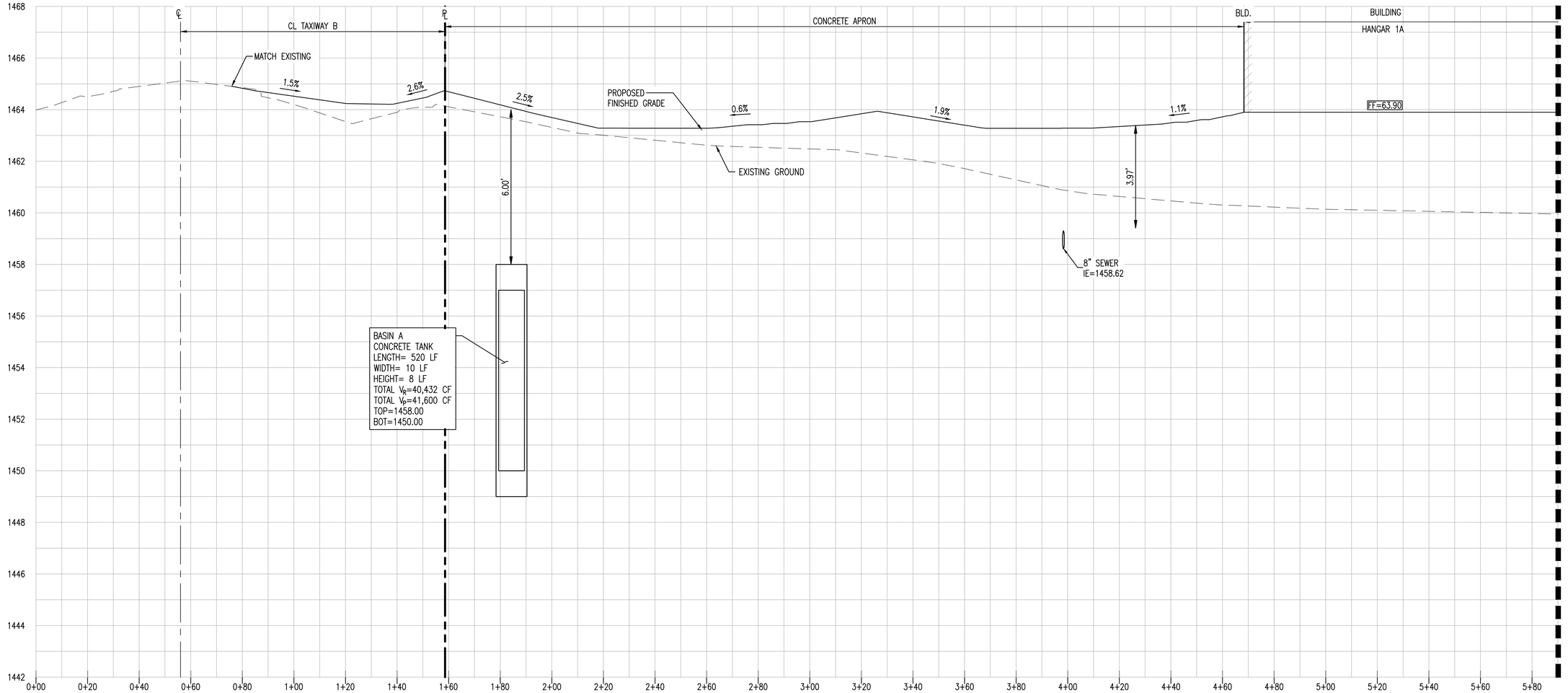

SECTION A-A

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

Registered Professional Engineer
CERTIFICATE NO. (C.O.U.)
45621
ALI SAMIH
FAKIH
Date Signed 04-17-2025
ARIZONA, U.S.A.
EXPIRATION DATE: 12-31-2027

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YAM HOLDINGS

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or 602.263.1100

PROJECT
YAM HANGARS AT SDL

LOCATION
14930 N. 78TH WAY,
SCOTTSDALE, AZ 85260

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SHEET TITLE:
SITE CROSS SECTIONS

PAGE NO.: 6 OF 8

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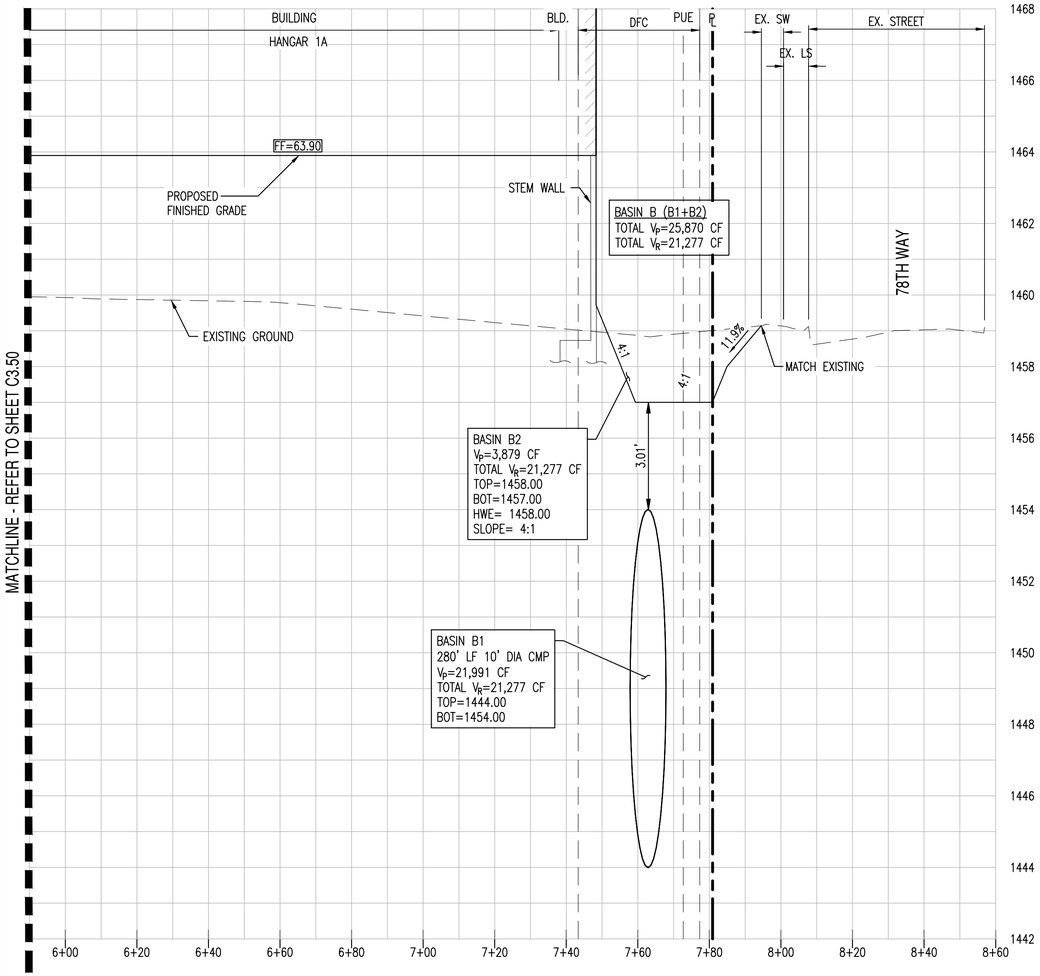
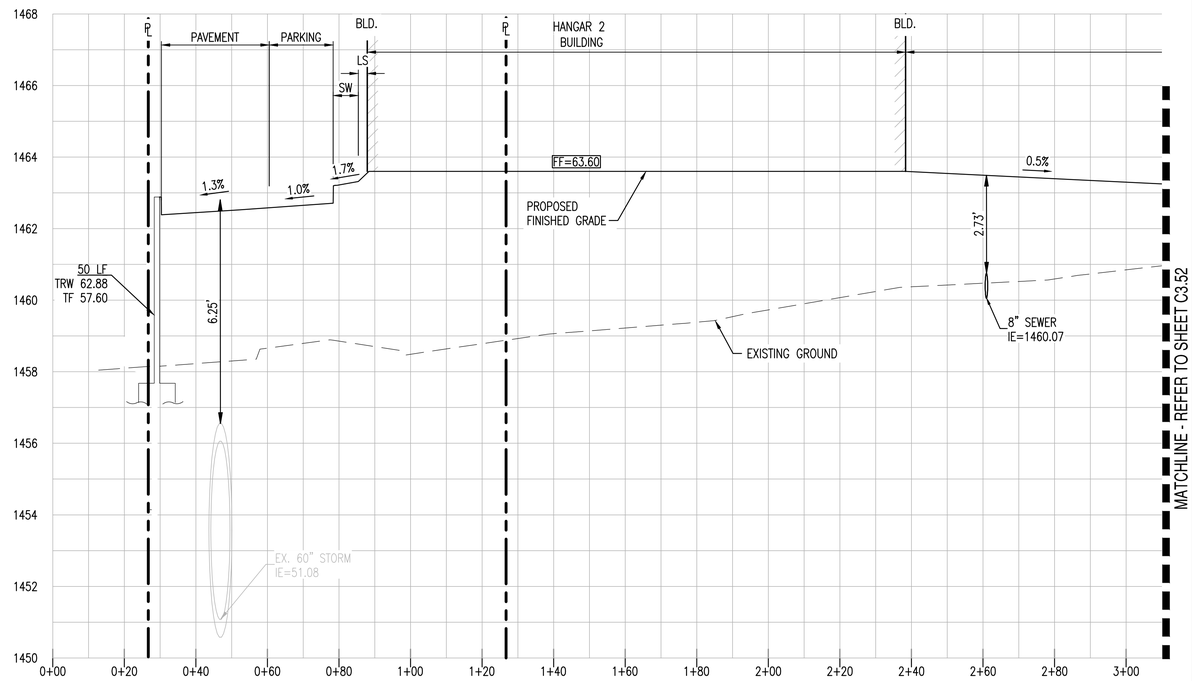
CASE FILE: 10-DR-2024



SECTION A-A

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



SECTION B-B

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

Registered Professional Engineer
CERTIFICATE NO.
45621
ALI SAMIH
FAKIH
ARIZONA, U.S.A.
Date Signed 04-30-25
EXPIRATION DATE: 12-31-2027

SUSTAINABILITY ENGINEERING GROUP
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YAM HOLDINGS

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ARIZONA811
Call 811 or visit Arizona811.com

PROJECT
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240103

SHEET TITLE:
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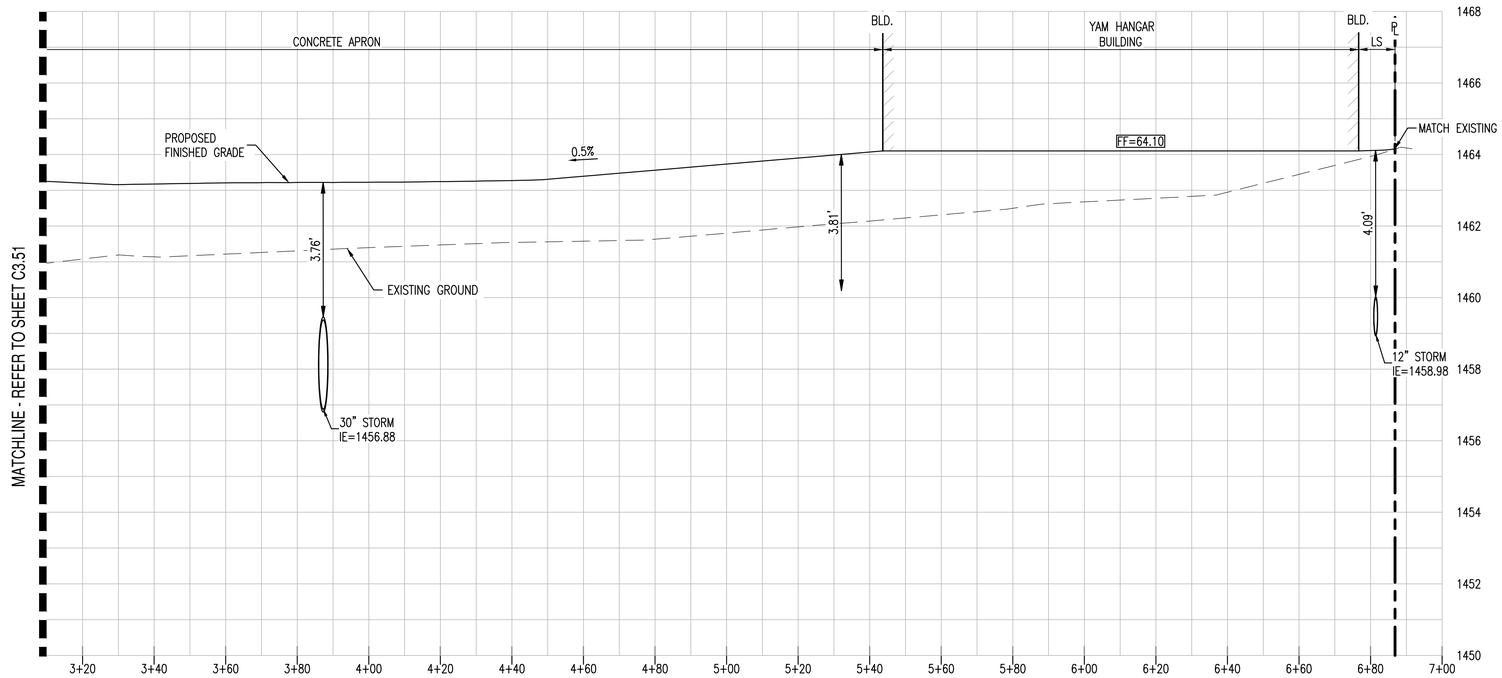
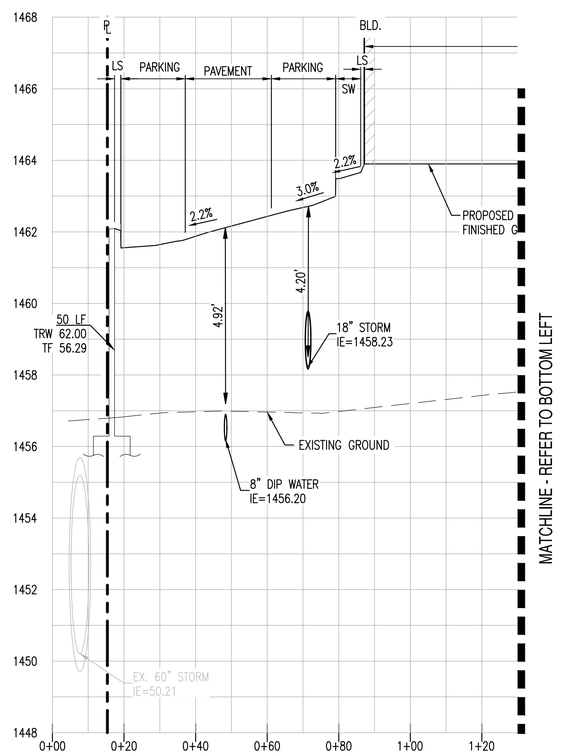


SECTION B-B
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



SECTION C-C
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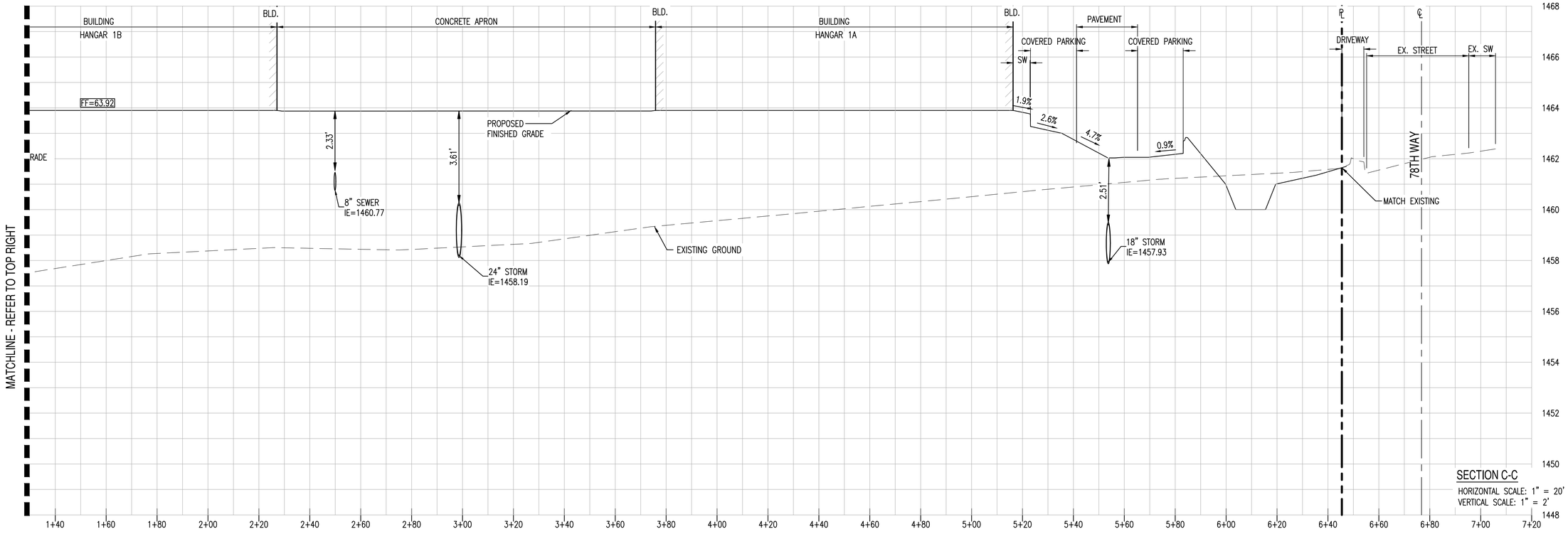
VERTICAL SCALE: 1" = 2'



SECTION C-C
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

Registered Professional Engineer
CERTIFICATE NO.
45621
ALI SAMIH
FAKIH
Date Signed 04-30-25
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SUSTAINABILITY
ENGINEERING
GROUP

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PROJECT
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SHEET TITLE:
SITE CROSS SECTIONS

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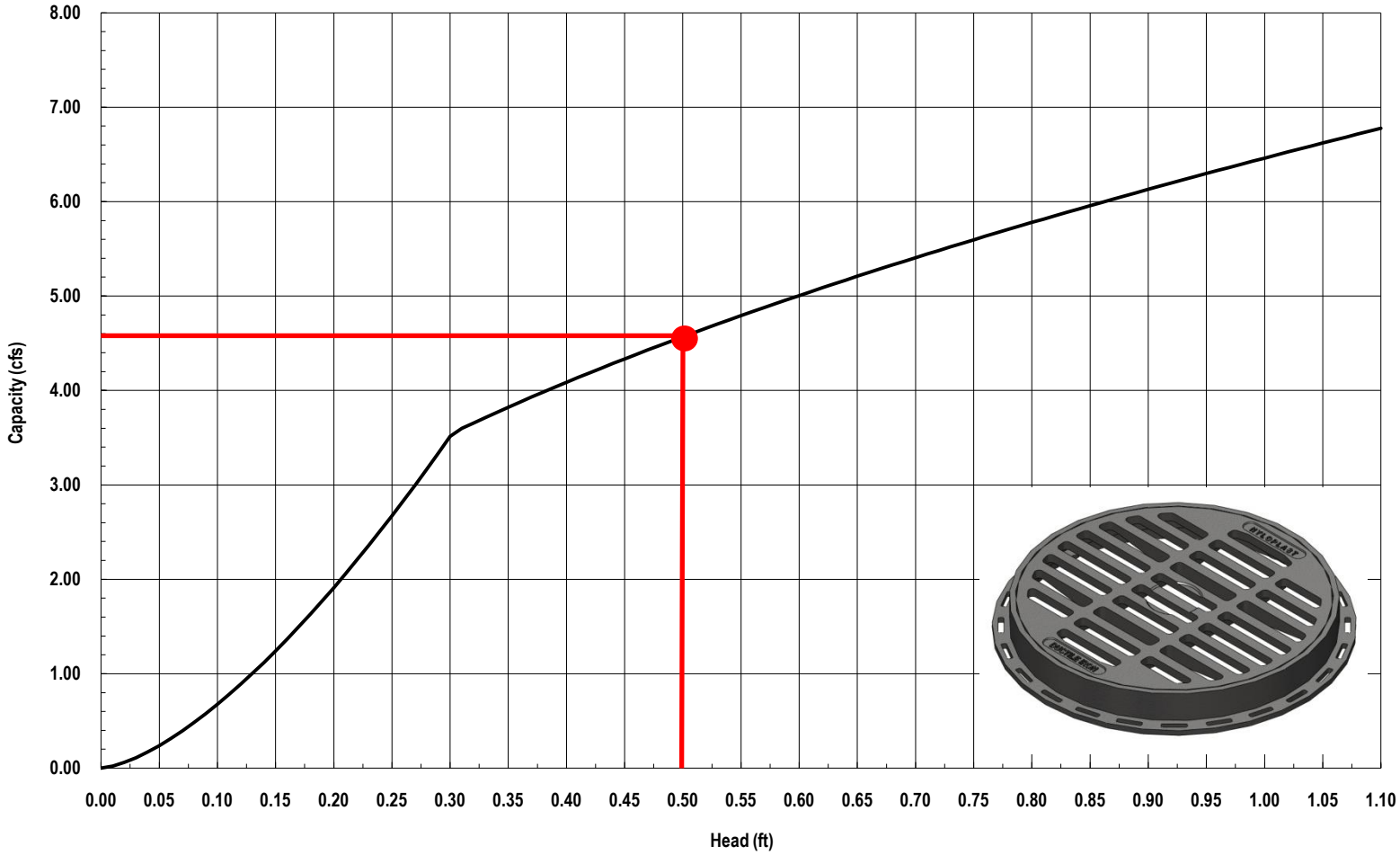
SHEET NO.: **C3.52**

CASE FILE: 10-DR-2024

APPENDIX IV

INLET CAPACITY CHARTS

Nyloplast 24" Standard Grate Inlet Capacity Chart



Inlet Capacity @ 0.50' ponding depth = 4.58 cfs
Inlet Capacity @ 0.50% Clogging factor= 2.29 cfs

Nyloplast®
3130 Verona Avenue • Buford, GA 30518
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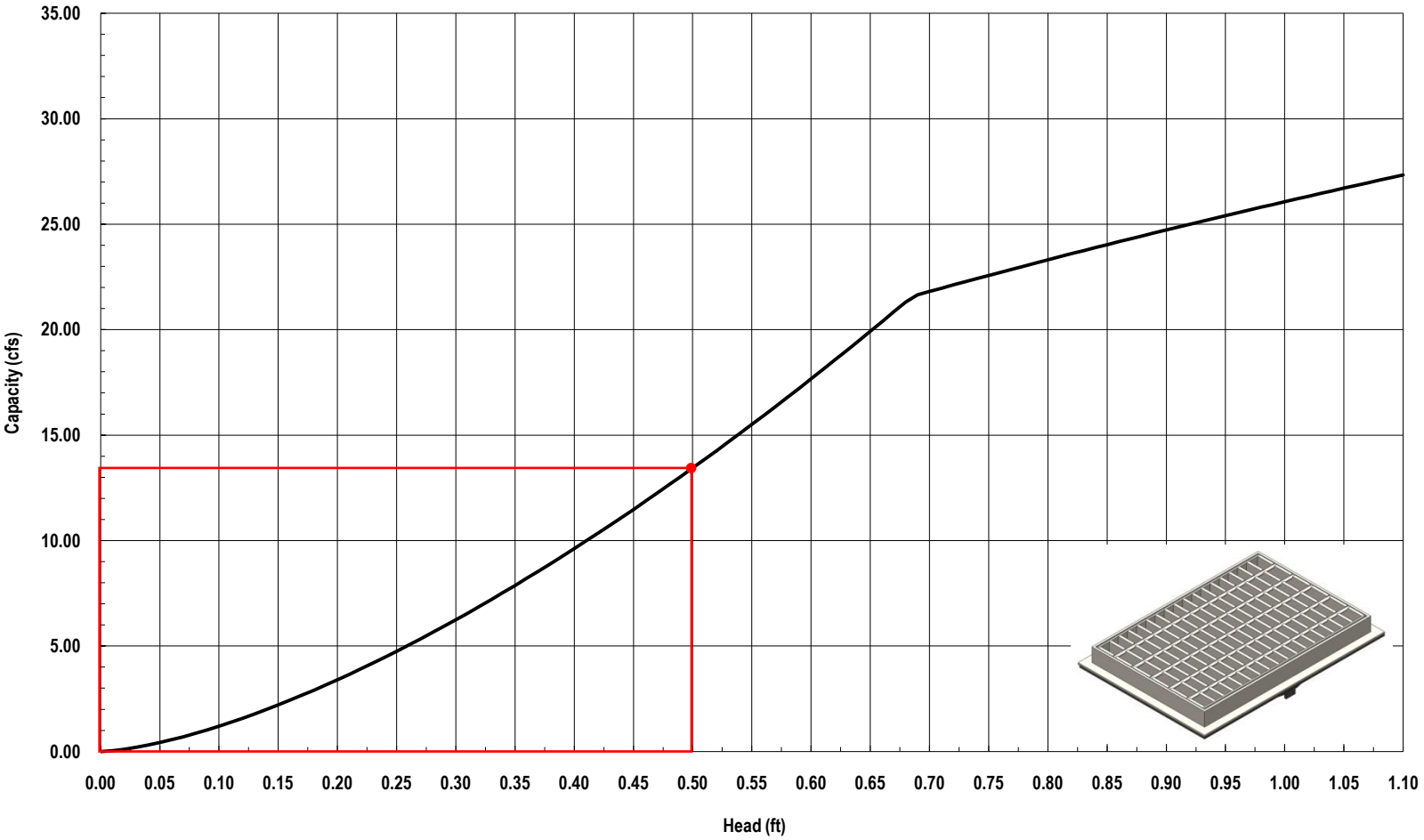
Nyloplast 2' x 3' Steel Bar / MAG Grate Inlet Capacity Chart



Inlet Capacity @ 0.50' ponding depth = 13.5 cfs
Inlet Capacity @ 50% Clogging factor= 6.75 cfs

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