Colliers Engineering & Design

HAWES CROSSING VILLAGE 4
PRELIMINARY DRAINAGE REPORT
MESA, AZ

Prepared For:

Landsea Homes
7600 E. Doubletree Ranch Road, Suite 240
Scottsdale, AZ 85258
Contact: Drew Huseth
Phone: (480) 221-0388
Email: dhuseth@landseahomes.com

LANDSEA HOMES
Live in your element®

Prepared By:

Colliers Engineering & Design
2141 E. Highland Avenue, Suite 250
Phoenix, AZ 85016
Phone: (602) 490-0535
Contact: Zach Hilgart, PE
Email: zach.hilgart@collierseng.com

December 2024
Project No. 1833.17

Colliers Engineering & Design

PRELIMINARY DRAINAGE REPORT
HAWES CROSSING VILLAGE 4

Table of Contents

Colliers Engineering & Design

PRELIMINARY DRAINAGE REPORT
HAWES CROSSING VILLAGE 4

APPENDICES

A. Figures
B. Retention and Dewatering Calculations
C. Excerpts from Previous Drainage Studies

FIGURES

Colliers Engineering & Design

1.0 INTRODUCTION

1.1 Project Location

Hawes Crossing Village 4 (the Project) is a proposed 39-acre single-family residential development located at the southwest corner of Hawes Road and Warner Road in the City of Mesa, Arizona (City). The Project is located within the Hawes Crossing Planned Area Development (PAD) in the northeast quarter of Section 20, Township 1 South, Range 7 East of the Gila and Salt River Baseline and Meridian. The site is bounded by Warner Road to the north, the Hawes Road alignment to the east, the Sebring Avenue alignment to the south, and an existing industrial warehouse and storage site to the west. The Loop 202 freeway is located approximately 800 feet south of the Project.

Figure 1 in Appendix A provides a vicinity map for the Project.

1.2 General Description

The Project is proposed to consist of 260 single-family lots and an amenity area. The site generally slopes to the west and southwest at approximately 0.5 percent. The site was historically used for dairy farming with various private residences located along the south side of Warner Road. All existing residences will be removed as part of Project improvements except for one parcel located near the northwestern corner of the Project. The Project is planned to be developed around this residence.

Project improvements will include offsite frontage improvements to Warner Road. The offsite improvements for the frontage along Sebring Avenue (southern boundary of Project) and Hawes Road (eastern boundary of Project) were designed by HILGARTWILSON for East Group Properties for the development south of the Project called Gateway Interchange. For the purpose of this preliminary design report, it is assumed that the offsite Sebring Avenue and Hawes Road improvements will be completed at the time of Project construction.

1.3 Purpose of Report

The purpose of this Preliminary Drainage Report is to describe the drainage design methodology and provide preliminary 100-year hydrologic and hydraulic calculations for the drainage-related infrastructure for the Project. This report identifies stormwater retention facilities intended to store the 100-year, 2-hour storm event and outlines drainage guidelines and design parameters that will be used as the Project proceeds to final design. This report is being submitted in support of the pre-plat and preliminary grading and drainage plan. The report has been prepared in conformance with Chapter 8 of the City of Mesa *Engineering and Design Standards* (EDS, 2022) as well as the Flood Control District of Maricopa County (FCDMC) current

versions of the *Drainage Policies and Standards Manual* (DPSM) (FCDMC, 2018a), *Drainage Design Manuals for Maricopa County* (DDM) – *Hydrology* (FCDMC, 2018b) and – *Hydraulics* (FCDMC, 2018c).

1.4 FEMA Floodplain Designation

The property is located entirely within the Federal Emergency Management Agency's (FEMA) Zone X (Shaded) as delineated on the FEMA Flood Insurance Rate Map (FIRM) panel numbers 04013C2760L, dated October 16, 2013. The portion of the FIRM panels corresponding to the Project location is presented on Figure 2 of Appendix A (FEMA Flood Map)**.** Zone X (Shaded) is defined below.

Zone X (Shaded):

> The flood insurance rate zone that corresponds to areas outside the 100-year floodplains, areas of 100-year sheet flow flooding where average depths are less than 1 foot, areas of 100-year stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

2.0 PREVIOUS STUDIES

In October 2019, HILGARTWILSON prepared the *Master Drainage Report for Hawes Crossing* (HILGARTWILSON, 2019). The purpose of the report was to provide conceptual hydrologic and hydraulic analyses of the Hawes Crossing property and to identify overall drainage management concepts as individual Villages with the Hawes Crossing PAD were developed and establish design guidelines for future improvements.

The Gateway Interchange Phase 1 Final Drainage Report was prepared by HILGARTWILSON for East Group Properties in February 2023. This report addressed the drainage design for Gateway Interchange Phase 1, a proposed industrial development located along the southern boundary of the Project. It also included drainage design for the offsite improvements along Sebring Avenue and Hawes Road. The drainage design information in this report has been considered as part of the drainage management for the adjacent half-streets of Sebring Avenue and Hawes Road. As mentioned in Section 1.2, it is assumed that the Sebring Avenue and Hawes Road improvements will be completed at the time of Project construction. Relevant excerpts from this report have been included in Appendix E.

Colliers Engineering & Design

3.0 EXISTING DRAINAGE CONDITIONS

In existing conditions, the Project site and surrounding area generally is generally flat at a slope of 0.5% and drains to the west and southwest via sheet flow. Offsite runoff from undeveloped land north of Warner Road is intercepted by an existing drainage ditch that runs along the north side of Warner Road. This offsite flow is conveyed west in the roadside ditch away from the Project. Runoff generated from the agricultural land east of the Project is generally retained within its property limits and ultimately outfalls at the intersection of Hawes Road and Sebring Avenue. Runoff generated from the industrial and warehouse development west of the Project drains west away from the site. Runoff generated south of the Project will be retained within the Gateway Interchange development that is assumed to be completed at time of Project construction. Considering these conditions, offsite runoff does not impact the Project.

4.0 PROPOSED DRAINAGE CONDITIONS

Onsite rainfall runoff from the Project has been designed to be routed via street flow to concentration points throughout the Project where inlets and storm drain will be designed to capture and discharge runoff to onsite surface retention basins. The preliminary drainage areas, flow patterns, and retention areas for the Project are included on Figure 3 of Appendix A.

4.1 Retention Requirements

Retention basins will be designed to retain the tributary runoff generated from the 100-year, 2-hour storm event (2.20 inches) as stated from the City of Mesa Storm Water Management Plan (Mesa, 2024). This includes adjacent half-streets of Warner Road, Hawes Road and Sebring Avenue. The retention volumes have been calculated as explained in the following equation:

$$V_R = C*(P/12)*A$$

where:

V_R = Required Retention Volume (ac-ft)
C = Area-Weighted Runoff Coefficient
P = 100-year, 2-hour Precipitation Depth (in) = 2.20 inches
A = Drainage Area (ac)

Runoff coefficients for drainage areas were referenced from Table 6.3 of the DPSM and Table 8.1 of the EDS.

Retention basin volumes and locations are shown on Figure 3 (Preliminary Drainage Exhibit) of Appendix A with supporting calculations included in Appendix B.

4.2 Dissipation of Stored Runoff

Stormwater retention basins will be designed such that retained water is discharged within 36 hours of the storm event in accordance with the City of Mesa standards and FCDMC DDM. Outlet facilities consist of natural infiltration through the basin bottom and drywells. The Project is not located adjacent to a regional storm drain system so drywells will be utilized for dewatering as opposed to bleed-off. In accordance with FCDMC standards, the design disposal rate utilized for drywells is 0.1 cfs. The preliminary number of drywells needed to dewater each basin within 36 hours is based on drywell discharge rate only. Preliminary dewatering calculations have been included in Appendix B.

4.3 Lot Drainage

The home product used for this Project has a garage that will front the street and a front porch on the opposite side of the lot that fronts open space (paseo) where there will be connecting sidewalk. Lots will generally be graded to drain approximately half of the lot to the fronting street and half the lot to the open space. Open space will drain to the streets and runoff in the streets will drain to a series of concentration points where inlets and storm drain will be designed to remove runoff and discharge to the corresponding retention basins.

4.4 Street Conveyance

Street flows will be designed to be directed to concentration points throughout the Project where inlets will be placed to remove flow from the street and discharge to surface retention basins. The Rational Method will be used to calculate the 10-year and 100-year flows for pavement drainage design. The onsite system will be designed to convey the peak 10-year flow between curbs without overtopping and to contain the 100-year flow within the street right-of-way. Where possible, this will be accomplished with the use of 4-inch roll curb. 6-inch vertical curb will be constructed where 4-inch curb cannot meet the above requirements.

4.5 Inlet Sizing

Inlets will be designed in accordance with the City of Mesa guidelines. Inlets will be designed to capture the 10-year storm event without exceeding a depth of 6 inches. The inlets will provide adequate capacity to capture the 100-year storm event without exceeding a depth of 12 inches and allow flows to overtop the curb and surface flow to retention basins when possible.

Colliers Engineering & Design

4.6 Storm Drain Conveyance

An underground storm drain network will be incorporated where the 10-year and 100-year flows cannot be contained using 6-inch vertical curb and/or where runoff is to be removed from the street and discharged to retention basins. The storm drain pipes will be sized to accept and convey the 10-year peak design discharges at each inlet while maintaining a freeboard of 12 inches.

4.7 Erosion Protection

Erosion protection will be designed at all concentrated points of discharge. Riprap aprons will be designed downstream of all storm drain pipe outlets to protect against scour, provide uniform spreading of flows, and decrease flow velocities.

5.0 ULTIMATE OUTFALL

The ultimate outfall for the majority of the Project will be at the southwestern corner of the site. The northwestern corner of the site will outfall to Warner Road. This is consistent with historic flow patterns for the site. No adverse impacts are anticipated to downstream drainage facilities as a result of the proposed development.

6.0 FINISHED FLOORS

Finished floor elevations within the Project will be set a minimum of 14 inches above the lowest outfall elevation and a minimum of 12 inches above the high adjacent 100-year water surface elevation in retention basins.

7.0 SUMMARY & CONCLUSIONS

The drainage infrastructure will be designed in compliance with City of Mesa and Maricopa County design criteria and other required drainage laws. No adverse drainage impacts are expected to either downstream existing properties or drainage ways from the site. The study has determined that:

- Streets will be designed to adequately convey the onsite 10-year peak flow between curbs without overtopping and the 100-year peak flow within the right-of-way.
- Lots will be graded to ultimately drain into the street.

- Onsite flows will be conveyed to retention basins near low points in the site via surface flow and when necessary, storm drain pipes.
- Riprap aprons will be placed downstream of all points of concentrated discharge including storm drain, overflow weirs, and emergency spillways to protect against scour.
- Onsite retention basins will provide a storage volume equivalent to the 100-year, 2-hour runoff.
- Retention basins will be drained within 36 hours. The dewatering of the retention volume will be accomplished by a combination of drywells and natural infiltration.

8.0 REFERENCES

Flood Control District of Maricopa County (2018a). *Drainage Policies and Standards for Maricopa County, Arizona.* August 2018. Phoenix, Arizona.

Flood Control District of Maricopa County (2018b). *Drainage Design Manual for Maricopa County, Arizona, - Hydrology*. December 2018. Phoenix, Arizona.

Flood Control District of Maricopa County (2018c). *Drainage Design Manual for Maricopa County, Arizona, - Hydraulics*. December 2018. Phoenix, Arizona.

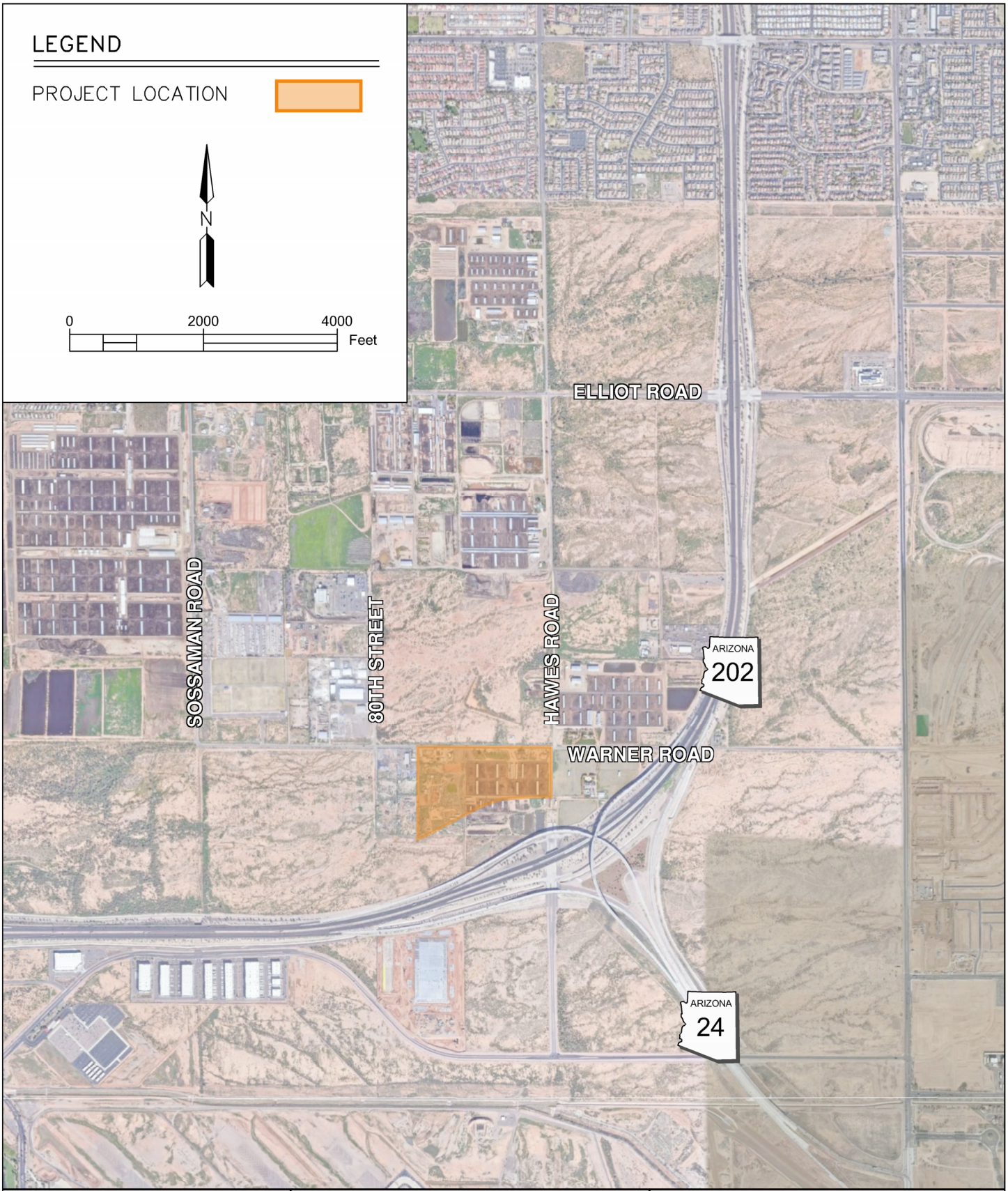
City of Mesa (2022). *Engineering & Design Standards – Chapter 8 – Stormwater Drainage and Retention*. 2022. Mesa, Arizona.

HILGARTWILSON (2019). *Master Drainage Report for Hawes Crossing.* October 2019. Phoenix, Arizona.

City of Mesa (2024). *Storm Water Management Plan*. 2024. Mesa, Arizona.

Appendix A

Figures



PROJ.NO.:	1833
DATE:	SEPT 2024
SCALE:	1" = 2,000'
DRAWN BY:	DRF
CHECKED BY:	BR

HAWES CROSSING VILLAGE 4

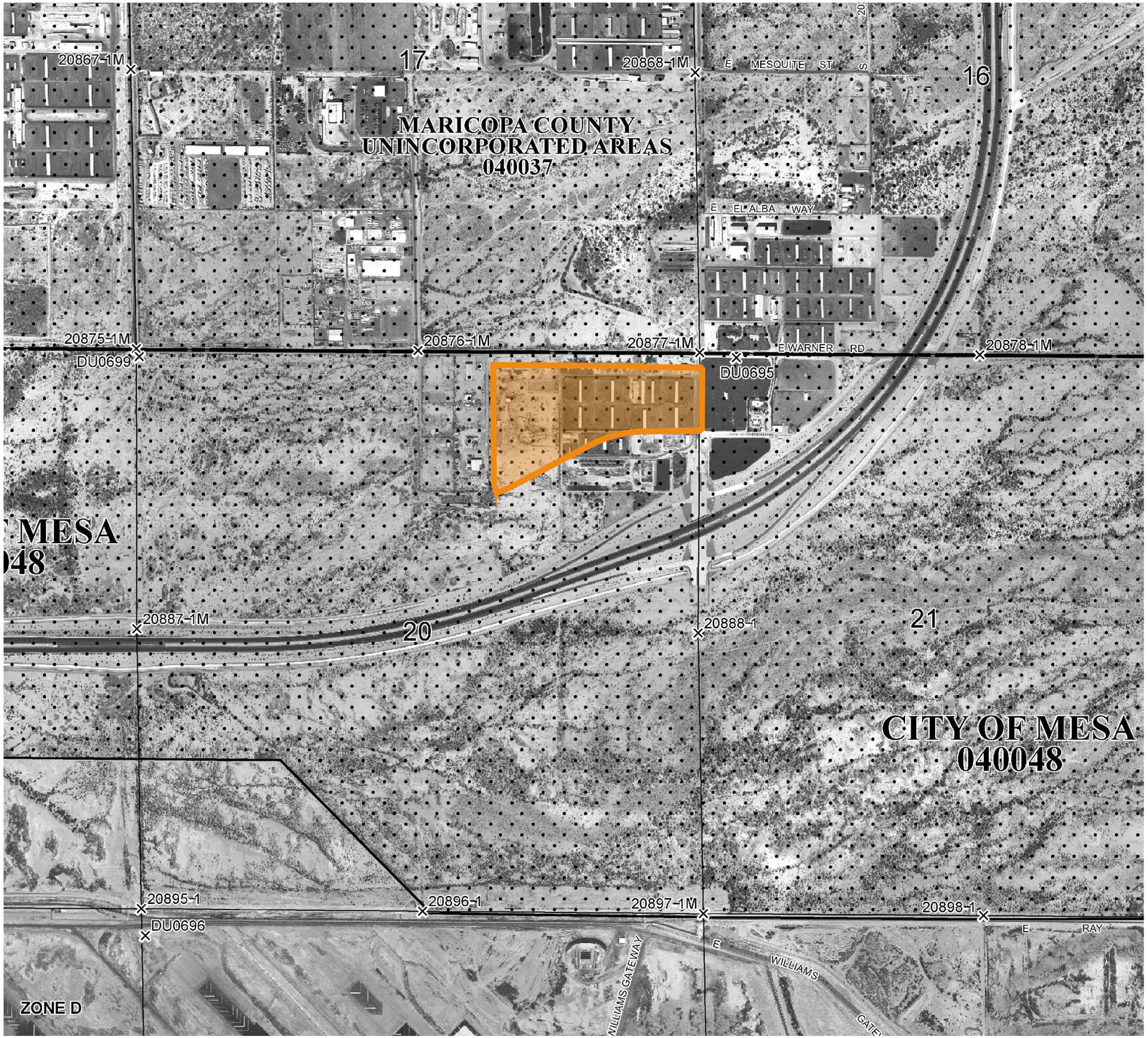
HAWES ROAD AND WARNER ROAD
CITY OF MESA, ARIZONA

FIG 1: VICINITY MAP

HILGARTWILSON
2141 E. HIGHLAND AVE., STE. 250
PHOENIX, AZ 85016
P: 602.490.0535 / F: 602.368.2436

©COPR 2024, HILGARTWILSON, LLC

H:\1833 Hawes Crossing Village 4\1833_V4_Fig1_Vicinity Map.dwg 9/17/2024 8:27 AM



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2760L

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA

AND INCORPORATED AREAS

PANEL 2760 OF 4425

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	2760	L
GILBERT, TOWN OF	040044	2760	L
MESA, CITY OF	040048	2760	L

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

MAP NUMBER
04013C2760L

MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

LEGEND

PROJECT LOCATION

N

1000 500 0 1000

SCALE FEET

HILGARTWILSON
2141 E. HIGHLAND AVE., STE. 250
PHOENIX, AZ 85016
P: 602.490.0535 / F: 602.368.2436

HAWES CROSSING – VILLAGE 4
SWC OF HAWES ROAD & WARNER ROAD
CITY OF MESA, ARIZONA

FIG 2: FEMA FLOOD MAP

PROJ. NO.:	1833.17
DATE:	SEP 2024
SCALE:	1" = 1,000'
DRAWN BY:	LG
CHECKED BY:	BR

© 2024, HILGARTWILSON, LLC

RB-5
V_{REQ}= 36,637 CF
V_{PVD}= 37,238 CF
DRYWELLS=3

RB-OFF
V_{REQ}= 8,201 CF
V_{PVD}= 10,589 CF
DRYWELLS=1

RB-1
V_{REQ}= 5,146 CF
V_{PVD}= 16,801 CF
DRYWELLS=1

RB-2
V_{REQ}= 55,814 CF
V_{PVD}= 40,304 CF
DRYWELLS=4
*OVERFLOWS TO RB-3

RB-3
V_{REQ}= 110,200 CF
V_{PVD}= 67,208 CF
DRYWELLS=6
*OVERFLOWS TO RB-4

RB-4
V_{REQ}= 107,953 CF
V_{PVD}= 130,516 CF
DRYWELLS=9

WAR-1
WAR-2
SEB-1
SEB-2
HAW-1
ON-1
ON-2
ON-3
ON-4
ON-5
RB-1
RB-2
RB-3
RB-4
RB-5
RB-OFF
TRACT A
TRACT B
TRACT C
TRACT D
TRACT E
TRACT F
TRACT G
TRACT H
TRACT I
TRACT J
TRACT K
TRACT L
SEBRING AVE
HAWES RD
GATEWAY INTERCHANGE
EAST GROUP DEVELOPMENT

LEGEND

- PROJECT BOUNDARY
- DRAINAGE AREA
- DRAINAGE AREA ID — ON-X
- PROPOSED RETENTION BASIN
- FLOW ARROW
- OUTFALL ARROW
- CULVERT CROSSING PROPOSED
- CULVERT CROSSING EXISTING
- DRAINAGE CHANNEL PROPOSED
- DRAINAGE CHANNEL EXISTING

NOTE: THIS IS A PRELIMINARY DRAINAGE ANALYSIS AND SUBJECT TO CHANGE.

N

80 40 0 80 160
SCALE: 1" = 80'

REV.:

HILGARTWILSON
ENGINEER | PLAN | SURVEY | MANAGE
2141 E. HIGHLAND AVE., STE. 250 | P: 602.490.0535 / F: 602.368.2436
PHOENIX, AZ 85016 www.hilgartwilson.com

HAWES CROSSING - VILLAGE 4

HAWES ROAD & WARNER ROAD
CITY OF MESA, ARIZONA

FIG. 3: PRELIMINARY DRAINAGE EXHIBIT

HILGARTWILSON
PROJ NO.: 1833
DATE: Dec 2024
SCALE: 1" = 80'
DRAWN: LG
DESIGNED: NS
APPROVED: BR
DWG. NO.
HW
SHT. OF

© Copyright 2024, HILGARTWILSON, LLC - This plan document set is the sole property of HILGARTWILSON, LLC. No alterations to these plans, other than adding "as-built" information, are allowed by anyone other than authorized HILGARTWILSON, LLC employees.

Colliers
Engineering
& Design

Appendix B

Retention and Dewatering Calculations

DRAINAGE SUBAREA SUMMARY TABLE

Project: 1833 - Hawes Crossing Village 4

Prepared by: LG/BR

Date: Dec, 2024

Colliers Engineering & Design

Drainage Area ID	Land Use Category[1]			Total Area	Total Area
	Very Small Lot Density Residential [ft²]	Pavement [ft²]	Desert Landscaping [ft²]	[ft²]	[ac]
ON-1	14,492	0	28,897	43,389	1.0
ON-2	264,448	0	42,654	307,102	7.1
ON-3	501,811	0	91,778	593,589	13.6
ON-4	292,318		84,688	377,006	8.7
ON-5	43,948	30,999	30,465	105,412	2.4
WAR-1	0	34,627	17,765	52,392	1.2
WAR-2	0	58,883	32,262	91,145	2.1
HAW-1	0	31,358	6,790	38,147	0.9
SEB-1	0	33,170	9,080	42,250	1.0
SEB-2	0	30,239	11,606	41,845	1.0
RB-OFF	0	0	23,102	23,102	0.5

NOTES:

(1) From Table 6.3 of the Maricopa County Drainage Policies and Standards (DPS) Manual, 2018.

WEIGHTED RUNOFF COEFFICIENT CALCULATIONS

Project: 1833 - Hawes Crossing Village 4
Prepared by: LG/BR
Date: Dec, 2024

Colliers Engineering & Design

Land Use[1]	10-Year C Coefficient	100-Year C Coefficient
Very Small Lot Density Residential	0.75	0.94
Pavement	0.95	0.95
Desert Landscaping	0.40	0.50

(1) From Table 6.3 of the Maricopa County Drainage Policies and Standards (DPS) Manual, 2018.

Drainage Area ID(s)	Subarea Surface Types & Areas				Weighted C Coefficient	
	Very Small Lot Density Residential [ft^2]	Pavement [ft^2]	Desert Landscaping [ft^2]	Total [ft^2]	C_w - 10-Year	C_w - 100-Year
ON-1	14,492	0	28,897	43,389	0.52	0.65
ON-2	264,448	0	42,654	307,102	0.70	0.88
ON-3	501,811	0	91,778	593,589	0.70	0.87
ON-4	292,318	0	84,688	377,006	0.67	0.84
ON-5	43,948	30,999	30,465	105,412	0.71	0.82
WAR-1	0	34,627	17,765	52,392	0.76	0.80
WAR-2	0	58,883	32,262	91,145	0.76	0.79
HAW-1	0	31,358	6,790	38,147	0.85	0.87
SEB-1	0	33,170	9,080	42,250	0.83	0.85
SEB-2	0	30,239	11,606	41,845	0.80	0.83
RB-OFF	0	0	23,102	23,102	0.40	0.50

RETENTION CALCULATIONS TABLE

Project: 1833 - Hawes Crossing Village 4
Prepared by: LG/BR
Date: Dec, 2024

Colliers Engineering & Design

100-YEAR, 2-HOUR CALCULATIONS
Retention Volume Required (100-Year, 2-Hour) = C * (P/12) * A

C = Weighted Runoff Coefficient
P = 2.20 in Precipitation depth associated with the 100-year, 2-hour storm event (Mesa,2024)
A = Plan-view area of an individual drainage area

Retention Basin System ID	Retention Basin ID	Drainage Area(s)	Area A [ft^2]	Area A [ac]	Weighted Runoff Coefficient C_w, 100-Yr	Retention Volume Required 100-Yr, 2-Hr [ft^3]	Overflow from Upstream	TOTAL Retention Volume Required [ft^3]	Retention Volume Provided 100-Yr, 2-Hr [ft^3]	TOTAL Retention Volume Provided [ft^3]	Oveflow Volume [ft]	Overflows To
RB-1	**RB-1**	**ON-1**	43,389	1.0	0.65	5,146	-	**5,146**	16,801	**16,801**	**-**	**-**
RB-2	**RB-2**	**ON-2**	307,102	7.1	0.88	49,483	-	**55,814**	40,304	**40,304**	**15,510**	**RB-3**
		SEB-2	41,845	1.0	0.83	6,330						
RB-3	**RB-3**	**ON-3**	593,589	13.6	0.87	94,892	15,510	**110,402**	67,208	**67,208**	**43,194**	**RB-4**
RB-4	**RB-4**	**ON-4**	377,006	8.7	0.84	58,139	43,194	**107,942**	130,516	**130,516**	**-**	**-**
		SEB-1	42,250	1.0	0.85	6,609						
RB-5	**RB-5**	**ON-5**	105,412	2.4	0.82	15,765	-	**36,637**	37,238	**37,238**	**-**	**-**
		WAR-1	52,392	1.2	0.80	7,659						
		WAR-2	91,145	2.1	0.79	13,213						
RB-OFF	**RB-OFF**	**HAW-1**	38,147	0.9	0.87	6,084	-	**8,201**	10,589	**10,589**	**-**	**-**
		RB-OFF	23,102	0.5	0.50	2,118						

36-HOUR DEWATERING OF RETENTION BASINS

Project: 1833 - Hawes Crossing Village 4
Prepared by: LG/BR
Date: Dec, 2024

Colliers Engineering & Design

DEWATERING TYPE	EQUATION	VARIABLES	UNITS
Drywells	**Time to Drain[3]** $T = V_P / 3600\ R_T$	V_P = Volume Provided R_T = TOTAL Drain Rate	**Hours**

Retention Basin ID	Retention Volume [ft^3]	Drywell Disposal Rate[1] (cfs)	Number of Drywells[2] [ea.]	TOTAL Drain Rate (cfs)	Time to Drain [3] $T=V_P/3600\ R_T$ [hr]
RB-1	5,146	0.10	1	0.1	14
RB-2	40,304		4	0.4	28
RB-3	67,208		6	0.6	31
RB-4	107,942		9	0.9	33
RB-5	36,637		3	0.3	34
RB-OFF	8,201		1	0.1	23

NOTE:

1. Perlocation rate of 0.1 is based on Standard 6.10.13 of the FCDMC Drainage Policies and Standards.

2. The required number of drywells can be adjusted based on as-built test data of the basin bottom surface area and as-built drywell percolation test result at the time of construction.

3. Design of all stormwater storage facilities is such that the stored runoff is completely discharged from the facility within 36 hours after the runoff event has ended.

Colliers
Engineering
& Design

Appendix C

Previous Drainage Report Excerpts

HILGARTWILSON
ENGINEER | PLAN | SURVEY | MANAGE

FINAL
DRAINAGE REPORT

FOR

GATEWAY INTERCHANGE – PHASE 1

MESA, ARIZONA

Prepared For:
EASTGROUP PROPERTIES
2141 East Camelback Road, Suite 250
Phoenix, AZ 85016
Phone: (602)840-8600
Contact: Mike Sacco

Prepared By:
HILGARTWILSON, LLC
2141 E. Highland Ave., Suite 250
Phoenix, Arizona 85016
Contact: Brian Brockman
Phone: (602) 490-0535
Email: bbrockman@hilgartwilson.com

February 2023
Project No.: 1833

HILGARTWILSON
ENGINEER | PLAN | SURVEY | MANAGE

FINAL DRAINAGE REPORT
FOR
GATEWAY INTERCHANGE – PHASE 1

TABLE OF CONTENTS

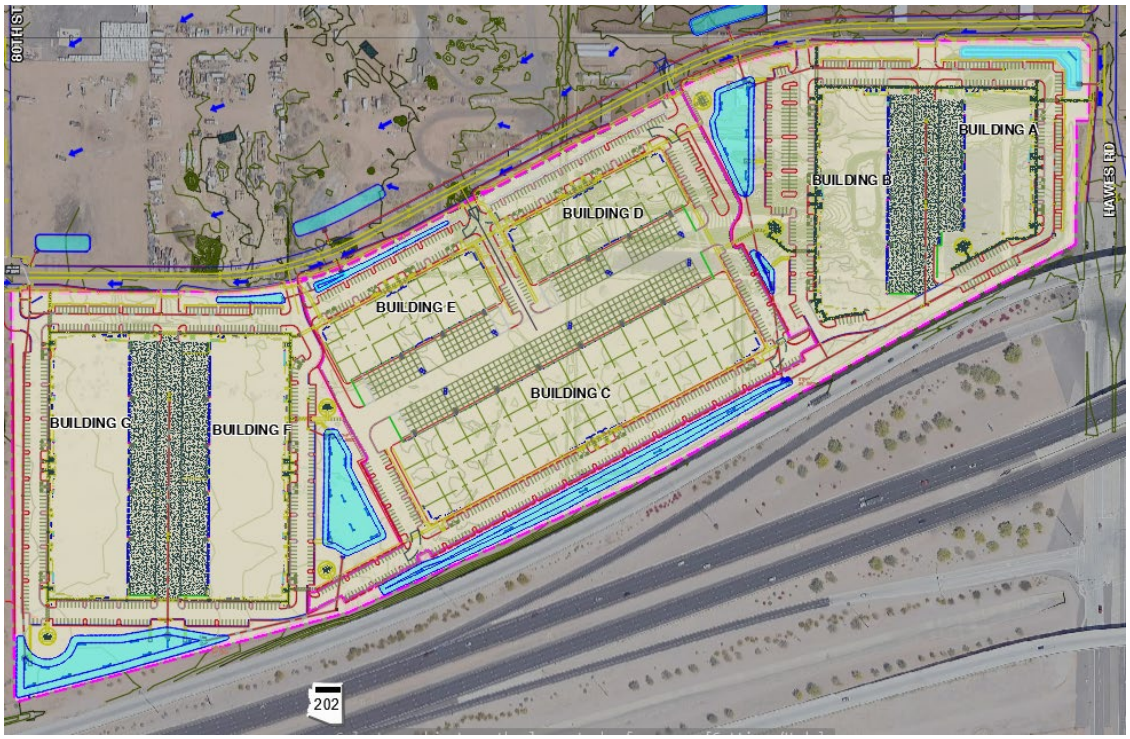
APPENDICES

FIGURES

1.0 INTRODUCTION

1.1 PROJECT NAME, LOCATION, AND TOPOGRAPHY

Gateway Interchange (the Project) is a proposed industrial development currently anticipated to be developed across multiple phases of construction on approximately 51 total acres in the City of Mesa, Arizona (the City). The Project consists of 7 total buildings, of which three buildings have been designated as "future development". As part of Phase 1, the entire site will be graded and Buildings A, B, F, and G are planned to be constructed. Buildings C, D, and E will be will be constructed during Phase 2 of the development. This report addresses Phase 1 of the development as well as the offsite roadways of 80th Street, Sebring Avenue, and Hawes Road. Phase 2 will be designed in a subsequent final drainage report. The Project is located in a portion of Section 20, Township 1 South, Range 7 East of the Gila and Salt River Meridian. More specifically, the Project is bound by existing agricultural land to the north, undeveloped land to the west, Hawes Road and agricultural land to the east, and the Loop 202 Freeway to the south. Refer to the Figure 1 (Vicinity Map) of Appendix A for an overview of the Project location and surrounding area.



Building Layout

The Project site is currently comprised of undeveloped desert land that slopes to the west at approximately 0.5%.

1.2 PURPOSE

The purpose of this report is to describe the design methodology and provide hydrologic and hydraulic calculations for the drainage-related infrastructure of the Project. This report has been prepared in accordance with the drainage policies in the City of Mesa's *Engineering & Design Standards* (EDS) (May 2022) and the Flood

Control District of Maricopa County's (FCDMC) current versions of the *Drainage Policies and Standards* (DPSM) (FCDMC 2018c), *Drainage Design Manuals* (DDM) *for Maricopa County, - Hydrology* (FCDMC 2018a), and *Hydraulics* (FCDMC 2018b).

1.3 FEMA FLOODPLAIN DESIGNATION

The property is located within the Federal Emergency Management Agency's (FEMA) Zone X (Shaded) as delineated on the FEMA Flood Insurance Rate Map (FIRM) panel number 04013C2760L, dated October 16, 2013. The portion of the FIRM panels corresponding to the Project location is presented on the Figure 2 (FEMA Flood Map) of Appendix A. Zone X (Shaded) is defined below.

Zone X (Shaded):

0.2% Annual chance flood hazard, areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile.

1.4 PREVIOUS DRAINAGE STUDIES

HILGARTWILSON prepared the *Preliminary Drainage Report for Gateway Interchange* (Preliminary Report) in September of 2021. The purpose of this report was to provide preliminary design hydrologic and hydraulic calculations for the drainage-related infrastructure of the Project. The preliminary drainage parameters and design established in the Preliminary Report was generally maintained in the final design discussed in this study. Relevant excerpts from this study have been included in Appendix H.

2.0 MANAGEMENT OF OFFSITE FLOWS

2.1 EXISTING

The Project is not impacted by offsite runoff. An existing 6-inch PVC pipe and concrete apron are located within the agricultural field just northeast of the Project. According to a discussion with the property owner, this pipe was used to irrigate the offsite agricultural field via a pump located within the onsite stock tank hen the facility was operational. Upon development of the Project, this PVC pipe will no longer be used for irrigation and will not impact the Project. The site and surrounding area generally slope to the west at approximately 0.50%. Runoff generated onsite exits the Project's western boundary where it sheetflows southwest and enters an existing ADOT channel that originates at the southwest corner of the site. This existing ADOT channel conveys flow from east to west along the northern boundary of the Loop 202.

2.2 PROPOSED

Retention for the adjacent half-street of Sebring Avenue has been provided onsite. Retention for the eastern half-street of 80th Street, the western half-street of Hawes Road, and the northern half-street of Sebring Avenue, has been provided within temporary offsite retention basins.

WARNER RD

80TH ST

SEBRING AVE

HAWES RD

ARIZONA 202

BUILDING A
FF=1369.00

BUILDING B
FF=1369.00

BUILDING C
FP=1361.33

BUILDING D
FP=1361.33

BUILDING E
FP=1361.33

BUILDING F
FF=1362.00

BUILDING G
FF=1362.00

RB-TEMP1
HWE=1351.50
BOT=1350.50
V_{REQ}=15,789 CF
V_{PVD}=16,265 CF

RB-TEMP2
HWE=1359.50
BOT=1358.50
V_{REQ}=6,881 CF
V_{PVD}=7,096 CF

RB-TEMP3
HWE=1362.50
BOT=1361.50
V_{REQ}=5,836 CF
V_{PVD}=5,962 CF

RB-TEMP4
HWE=1365.00
BOT=1364.00
V_{REQ}=7,922 CF
V_{PVD}=8,094 CF

RB-6
HWE=1367.00
BOT=1364.00
V_{REQ}=4,417 CF
V_{PVD}=14,740 CF
DRYWELLS=1

RB-OFF-2B
HWE=1360.00
BOT=1358.00
V_{REQ}=4,594 CF
V_{PVD}=2,890 CF
OVERFLOWS TO RB-1
DRYWELLS=1

RB-OFF-2A
HWE=1361.00
BOT=1359.00
V_{REQ}=7,884 CF
V_{PVD}=3,924 CF
OVERFLOWS TO RB-OFF-2B
DRYWELLS=1

RB-3+RB-4+RB-5
HWE=1359.00
BOT=1356.00
V_{REQ}=125,958 CF
V_{PVD}=134,342 CF
DRYWELLS=10

RB-2
HWE=1356.00
BOT=1353.00
V_{REQ}=107,588 CF
V_{PVD}=67,630 CF
OVERFLOWS TO RB-1
DRYWELLS=9

RB-1
HWE=1353.50
BOT=1349.00
V_{REQ}=124,423 CF
V_{PVD}=127,192 CF
DRYWELLS=10

FUTURE PHASE 2 DRAINAGE DESIGN WILL BE INCLUDED IN A SUBSEQUENT FINAL DRAINAGE REPORT. RETENTION BASINS HAVE BEEN DESIGNED FOR ULTIMATE CONDITIONS WHEN PHASE 2 HAS BEEN DEVELOPED.

ULTIMATE OUTFALL
ELEV=1354.92'

LEGEND

PROJECT BOUNDARY	
DRAINAGE AREA (ONSITE)	
DRAINAGE AREA (OFFSITE)	
FLOW PATH	
UNDERGROUND STORMDRAIN	
DRAINAGE AREA ID (ONSITE)	ON-XX
100-YEAR PEAK FLOW	Q_{100}=XXX cfs
RETENTION BASIN	
FLOW ARROW (OFFSITE)	
FLOW ARROW (STREET)	
ULTIMATE OUTFALL	
DRYWELL	
CATCH BASIN ID	CB-X
CURB OPENING ID	CO-X
INLET ID	I-X
OUTLET ID	O-X

N

120 60 0 120 240
SCALE: 1" = 120'

REV.:

HILGARTWILSON
ENGINEER | PLAN | SURVEY | MANAGE
2141 E. HIGHLAND AVE., STE. 250 | P. 602.490.0535 / F. 602.368.2436
PHOENIX, AZ 85016
www.hilgartwilson.com

GATEWAY INTERCHANGE - PHASE 1

NWC HAWES ROAD & LOOP 202
CITY OF MESA, ARIZONA

FIG 3: FINAL DRAINAGE PLAN

HILGARTWILSON
PROJ NO.: 1833.12
DATE: JAN 2023
SCALE: 1" = 120'
DRAWN: DM
DESIGNED: ZK
APPROVED: BB

DWG. NO.
3

© Copyright 2023, HILGARTWILSON, LLC - This plan document set is the sole property of HILGARTWILSON, LLC. No alterations to these plans, other than adding "as-built" information, are allowed by anyone other than authorized HILGARTWILSON, LLC employees.