

Drainage Reports

PRELIMINARY DRAINAGE REPORT 4-DR-2020

Whataburger Scottsdale Scottsdale, Arizona

Prepared For:

Whataburger Matthew Bartholomew 300 Concord Plaza Dr. San Antonio, TX 78216

Plan # <u>4-DR-2020</u>	
Case #	
Q-S #	
X Accepted	
Correction	
GA	05/12/2020
Reviewed By	Date

Note: Accepted, with drainage stips in "Stips-DR" document



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Kimley **»Horn**



4-DR-2020 5/12/2020

PRELIMINARY DRAINAGE REPORT

4-DR-2020

7134 E. THOMAS ROAD SCOTTSDALE ARIZONA 85251



MAY 2020

Prepared By:

Kimley »Horn

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- Appendix D Hydrologic/Hydraulic Calculations
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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

Whataburger is proposing to construct a Whataburger Restaurant at 7134 E Thomas Road, Scottsdale AZ 85251. The project is anticipated to consist the one-story restaurant building with associated drive thru, parking, and infrastructure improvements.

1.2 SITE LOCATION

The proposed development encompasses approximately 1.43 net acres in a portion of the Northeast Quarter of Section 27, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian in Maricopa County, Arizona. The Site is bound the North and West by commercial development, APN 130-17-016C, APN 130-17-024C and APN 130-17-024L. It is bound to the by E North 71st Street and to the South by E Thomas Rd. See **Appendix A** for the Site Location Map, Legal Description, and Context Aerial Map.

The existing Site contains a 6,800 SF restaurant building with associated utility services. The existing building and parking field is to be demolished.

1.3 PURPOSE

This Preliminary Drainage Report is intended to satisfy City of Scottsdale requirements and demonstrate conformance to the drainage standards and guidelines of the City of Scottsdale and the Flood Control District of Maricopa County (FCDMC). This report provides a description of the current stormwater drainage patterns and systems and a description of the required and proposed drainage improvements.

1.4 OBJECTIVES

This report provides a drainage plan for the Site that is intended to meet the drainage standards and guidelines of the City of Scottsdale and the Flood Control District of Maricopa County (FCDMC). In particular, this report will demonstrate the following:

- 1. The Site will retain onsite a retention volume, which is the greater of the first flush volume or prevs-post 100-year, 2-hour volume plus the existing retention volume onsite.
- 2. Permanent drainage facilities will have a positive outfall and any detained stormwater will be disposed of within 36 hours.
- 3. Drainage facilities will be designed such that the 100-year post-development flows are collected and conveyed in such a manner to not cause damage to buildings and property or exceed predevelopment flows.
- 4. Building finished floor elevations have been set a minimum of 14 inches above the Site outfall and 12 inches above the highest adjacent grade.

2.0 DESCRIPTION OF EXISTING DRAINAGE CONDITIONS AND CHARACTERISTICS

2.1 EXISTING ONSITE DRAINAGE CONDITIONS

The Site currently consists of an existing building and parking lot. The Site is bounded by developed property to the north and east, Thomas Road and existing single-family and commercial developments to the south, and 71st Street to the west. The Site slopes from the northwest to southeast at approximately 0.5%. Stormwater generated onsite currently flows to one existing drywell located within the parking field. The fact that there is a drywell onsite implies that under existing conditions, the drywell was used to drain water collected in the low spot of the parking area, which was utilized for onsite retention.

Refer to Appendix B for the Existing Conditions Exhibit.

2.2 EXISTING OFF-SITE DRAINAGE CONDITIONS

The parcel is affected by stormwater run-on from potions of 71st Street, west of the Site. The street as it exists today is not fully contained by curbs or gutters. In general, 71st Street slopes towards the site from approximately the centerline and drains to the south.

Stormwater generated within Thomas Road is collected in catch basins and conveyed beneath Thomas Road within the City storm drain system. Off-Site flows from Thomas Road and areas along Thomas Road do not affect the Site.

Refer to **Appendix B** for the Existing Conditions Exhibit.

2.3 EXISTING MASTER DRAINAGE REPORTS

There are no existing master drainage reports for this Site.

2.4 FEMA FLOOD HAZARD AREAS

The Site is located in Flood Zone "X" according to the Flood Insurance Rate Map 04013C2235L, dated October 16, 2013. Zone "" is designated by FEMA as ""Areas of 0.2% annual chance flood; areas of 1% annual chance flood 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 flood." Refer to **Appendix C** for the FEMA FIRMette map for the Site.

3.0 PROPOSED DRAINAGE PLAN

3.1 GENERAL DESCRIPTION

In the analysis of the proposed drainage conditions the following items are considered:

- Area Types (concrete pavement, building, and desert landscaping)
- Magnitude of areas
- Slopes

3.2 PROPOSED SITE CONDITIONS

The development of the Whataburger increases landscape and open space areas and proposes less impervious areas such as pavement and buildings. For the infill project, as first flush mitigation is proposed to be provided through onsite basins, the stormwater retention volume required is based on the greater of the first flush volume OR the pre-vs-post conditions for the 100-year, 2-hour storm event PLUS any onsite retention volume utilized under existing conditions. Calculations for the capacity of the existing pavement area retention at the location of the drywell plus the pre-vs-post stormwater run-off, and the first flush storm event can be found in **Appendix D**. Based on these calculations, the first flush volume is the most conservative and will be the basis for the proposed retention onsite, except as noted below.

Retention will be provided within two stormwater surface retention basins – one within the southern area of the site's landscape adjacent to Thomas Road (Basin B), and one within the northern portion of the site's landscape (Basin A). Basin B's design provides a drainage pattern consistent with existing conditions and is therefore designed to retain the first flush volume. Basin A is located at the high end of the site and has therefore been designed to retain the 100-year, 2-hour storm event. Flows more than the proposed onsite retention capacity will leave the site to pre-development outfall locations. Public drainage easements will be dedicated over both basins to allow for city access. The property owner is responsible for maintaining the drainage easement, inspecting the drainage facilities after each storm event of greater than 0.5 inches, removing accumulated trash and debris from inlet and outlet structures, and inspecting all other elements of the drainage system.

The existing onsite drywell will remain in place and in use. Plans will call out for the drywell to be cleaned and inspected/retrofitted to verify it operates correctly. This retrofit makes the entire system far superior to the original design while maintaining the grading of the original site design.

Refer to Appendix D for Stormwater Retention Calculations.

Refer to Appendix E for the Drainage Delineation Map.

3.3 PROPOSED OFF-SITE CONDITIONS

71st Street ROW (30-feet) will be dedicated per a Final Plat. The proposed improvements to 71st Street include curb, gutter, and sidewalk on the east side for the length of the project, and a reconstructed driveway at the intersection of 71st Street and Thomas Road.

3.4 FUTURE CONDITIONS

Future developments to the Site are limited as the north, east, west, and south sides of the Site are fully developed with commercial properties.

3.5 STORMWATER STORAGE REQUIREMENTS

Per the proposed site plan, surface retention provides for onsite retention within two basins. First flush treatment of site generated stormwater is required prior to discharge from the site.

Basins are sized according to the City of Scottsdale 2018 Design Standards & Policies Manual (DS&PM):

V = C P A

Where: V = Required volume (cubic feet)

C = Runoff coefficient for the proposed development

P = Precipitation depth (0.5 inches for first flush and 2.16 inches for the 100-year, 2-hour event)

A = Contributing area (square feet)

Table 1 below summarizes the required and provided first flush and 100-yr, 2-hr storms volume for Basins A and B.

Table 1 Volume Required and Provided

Surface Retention Summary							
Retention Basin	Basin Depth	Required Volume	Volume Provided	Excess Volume			
	ft	cf	cf	cf			
Α	3.0	2,971	3,044	73			
B 3.0		1,261	1,738	477			
Total		4,232	4,782	550			

Drywell Summary							
Retention Basin	Volume	Percolation Rate	Drywells Required	Drain Time			
	cf	cfs	ea	hr			
Α	2,971	0.1	1	9			
В	1,261	0.1	1	4			

Refer to Appendix D for the corresponding calculations.

3.6 PRE- AND POST-DEVELOPMENT RUNOFF CHARACTERISTICS AT CONCENTRATION POINTS

In the existing condition, the site outfall is to Thomas Road, either out the driveway to Thomas Road or over to 71st Street and then ultimately to Thomas Road. 71st Street drains to the site and to Thomas Road. In the proposed condition, the drainage patterns remain consistent. Run-off not contained onsite will outfall to either Thomas Road via the driveway to Thomas Road or to 71st Street, which outfalls to Thomas Road at its intersection.

3.7 PROPOSED DRAINAGE STRUCTURES OR SPECIAL DRAINAGE FACILITIES

The existing drywell located towards the southeastern side of the site must be thoroughly cleaned and inspected or retrofitted, if necessary.

The proposed finished floor of the Whataburger restaurant is 1239.80, over one foot above the highest adjacent grade in East Thomas Street and the lowest adjacent grade in 71st Street.

Refer to Appendix D for a Cross Section of the 100-year flows within 71st Street.

Building	Highest Adjacent Grade	Lowest Adjacent Grade	Proposed FF Elevation	Existing Drywell Elevation	Site Outfall Elevation
Whataburger	1238.79	1238.76	1239.80	1238.04	1238.09

Table 2 Proposed Building Finished Floor Elevation

3.8 ADEQ AZPDES REQUIREMENTS

Prior to construction an executed Notice of Intent (NOI) shall be submitted to Arizona Department of Environmental Quality (ADEQ) in conformance with the Arizona Pollution Discharge Elimination System Permit (AZPDES) permit. The NOI and associated stormwater management best management practices will remain active on the Site until construction is complete and a Notice of Termination is filed with ADEQ in conformance with AZPDES permit.

3.9 PROJECT PHASING

This project will be constructed in a single phase.

4.0 SPECIAL CONDITIONS

4.1 404 DISCUSSION

There are no special conditions for this Site.

5.0 DATA ANALYSIS METHODS

5.1 HYDROLOGIC PROCEDURES, PARAMETER SELECTION, AND ASSUMPTIONS

Hydrologic calculations for the Site were performed using the rational equation in the FCDMC Drainage Design Manual Volume I, which is limited to drainage areas of up to 160 acres. Runoff coefficients identified with the City of Scottsdale Design Standards and Policies Manual were used for the Site based upon the amount of landscaping, pavement, and building area.

All flows for proposed conditions will be determined using the rational method as outlined by the Drainage Design Manual by Maricopa County Flood Control District. Due to the small nature of the watersheds for the individual sub-basins, a minimum time of concentration of five minutes will be assumed. All drainage basins will assume a runoff coefficient of 0.95 except for the landscape sub-basins, which will utilize a runoff coefficient of 0.83 per the DS&PM.

For analysis of the development, the Site was sub-divided into eight sub-basins consisting of pavement, landscaping, and building areas. **Appendix E** identifies the drainage sub-basins and concentration points.

5.2 HYDRAULIC PROCEDURES, METHODS, PARAMETER SELECTION, AND ASSUMPTIONS

The following criteria was used to size the proposed basins for onsite stormwater storage and conveyance:

• First flush volume may be computed with the following equation:

Equation 1: V = CPA

Where V is the required volume, C is the runoff coefficient for the disturbed area of the proposed development, P is the required precipitation depth of 0.5 inches or 2.16, and A is the disturbed area of the proposed development.

The software program FlowMaster, by Bentley Systems, was used for the hydraulic modeling. Refer to **Appendix D** for a detailed analysis of an irregular cross-section for 71st Street.

5/12/2020

5.3 STORMWATER STORAGE CALCULATION METHODS AND ASSUMPTIONS

Retention will be provided within two stormwater surface retention basins – one within the southern area of the site's landscape adjacent to Thomas Road (Basin B), and one within the northern portion of the site's landscape (Basin A).

Basin B's design provides a drainage pattern consistent with existing conditions and is therefore designed to retain the first flush volume. Basin A is located at the high end of the site and has therefore been designed to retain the 100-year, 2-hour storm event.

Refer to Section 3.5 of this report for the calculation method.

6.0 CONCLUSION

6.1 OVERALL PROJECT

Based on the results of this Preliminary Drainage Report, the following can be concluded:

- Imperious area was decreased with the development of the Whataburger. The Pre-vs-Post run-off volume is negative.
- Treatment for the stormwater first flush will be provided by two stormwater quality basins, Basins A and Basins B. Basin A, to the north, will also cover the 100-year, 2-hour storm as it alters the sites historic flow pattern.
- The Site will have ultimate outfall per historic conditions into Thomas Road.
- Based on the current Flood Insurance Rate Map (FIRM), the Site is located in the Zone "X".
- The flows within 71st Street have been studied and the finished floor is protected from these flows.

This report is intended to provide a level of assurance that the Site will adhere to all appropriate reviewing agency guidelines with respect to drainage and flood protection.

7.0 REFERENCES

- 1. City of Scottsdale, Design Standards and Policies Manual, Chapter 4: Grading and Drainage, January 2018.
- Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) of Maricopa County, Arizona and Incorporated Areas, Panel 1320 of 4425, Map Number 0413C2235L, October 16, 2013.
- 3. Flood Control District of Maricopa County (FCDMC), Drainage Design Manual for Maricopa County, Hydrology Volume, February 2008.
- 4. Flood Control District of Maricopa County (FCDMC), *Drainage Design Manual for Maricopa County, Hydraulics Volume,* January 1996.

Appendix A – Site Location Map, Legal Description, and Context Aerial Map







PREMIER TITLE AGENCY-UNINSURED RECORDING REQUESTED BY

Premier Title Agency

Escrow Number: N/A - Courtesy Recording

WHEN RECORDED MAIL TO

Cedars Cross, LLC 3238 N. Scottsdale Road Scottsdale, AZ 85251

A.P.N.: 130-17-021A, 130-17-022A

Unofficial ²⁰Document

15 Hoj

SPACE ABOVE THIS LINE FOR RECORDER'S USE

SPECIAL WARRANTY DEED

For the consideration of Ten Dollars, and other valuable considerations, I or we,

Gebran Venture Group, LLC, an Arizona limited liability company

Do/does hereby convey to

Cedars Cross, LLC, an Arizona limited liability company

The following real property situated in Maricopa County, Arizona

SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF FOR LEGAL DESCRIPTION

SUBJECT TO: Current taxes and other assessments, reservations in patents and all easements, rights of way, encumbrances, liens, covenants, conditions, restrictions, obligations and liabilities as may appear of record.

And the Grantor hereby binds itself and its successors to warrant and defend the title against all acts of the Grantor herein, and no other, subject to the matters set forth.

Dated: November 3, 2017

Gebran Venture Group, LLC, an Arizona limited liability company

By:

Gebran A. Gebran Its: Member and Authorized Agent

20170822144

))

)

State of Arizona County of Maricopa

On this ______ day of November, 2017, before me personally appeared Gebran A. Gebran, as Member and Authorized Agent of Gebran Venture Group, LLC, an Arizona limited liability company, whose identity was proven to me on the basis of satisfactory evidence to be the person who he or she claims to be, and acknowledged that he or she signed the above/attached document.

Unofficial Document

James F. Jahland Notary Public



EXHIBIT "A" LEGAL DESCRIPTION

The West 201.5 feet of Lot 4, Block 32, SECURITY ACRES AMENDED, according to the plat of record in the Office of the County Recorder of Maricopa County, Arizona recorded in Book 8 of Maps, Page 59;

Unofficial Document

Except the North 10 feet of the South 17 feet thereof.

Kimley»Horn Appendix B – Existing Conditions Exhibits







NOTES

THIS SURVEY IS BASED ON COMMITMENT FOR TITLE INSURANCE ISSUED BY CHICAGO TITLE INSURANCE COMPANY NO. 1931283A-001-IMP-MB2, DATED DECEMBER 10, 2019 AT 7:30 A.M.

THE SURVEYOR'S SCOPE-OF-SERVICES IS LIMITED TO PROVIDING SERVICES IN A MANNER CONSISTENT WITH THE DEGREE OF CARE AND SKILL ORDINARILY EXERCISED BY MEMBERS OF THE SAME PROFESSION CURRENTLY PRACTICING UNDER SIMILAR CONDITIONS. SCHEDULE "B" ITEM DOCUMENTS MAY CONTAIN ENCUMBRANCES WHICH AFFECT THE SUBJECT PROPERTY WHICH THE SURVEYOR IS NOT QUALIFIED TO INTERPRET AND/OR ARE NOT WITHIN THE SURVEYOR'S SCOPE-OF-SERVICES (SEE CERTIFICATION). IT IS RECOMMENDED THAT INTERESTED AND AFFECTED PARTIES OBTAIN COUNSEL FOR INTERPRETATION OF ALL SCHEDULE "B" DOCUMENTS REFERENCED IN THE TITLE REPORT.

THE SURVEYOR HAS RELIED SOLELY ON INFORMATION SUPPLIED TO THE SURVEYOR FROM EITHER THE CLIENT OR THE TITLE COMPANY AND HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS OF RECORD, ENCUMBRANCES, RESTRICTIVE COVENANTS, OWNERSHIP TITLE EVIDENCE, OR ANY OTHER MATTERS THAT MAY AFFECT THE SUBJECT PROPERTY.

PURSUANT TO TABLE "A" ITEM 6, THE SURVEYOR HAS SHOWN THE ZONING CLASSIFICATION AS SET FORTH BY THE LOCAL AGENCY OF JURISDICTION AND OR IDENTIFIED IN A ZONING REPORT OR LETTER AS PROVIDED TO THE SURVEYOR BY THE CLIENT OR CLIENT'S REPRESENTATIVE AS NOTED ON THIS SURVEY.

PURSUANT TO TABLE "A" ITEM 7, THE BUILDING LINES AND DIMENSIONS SHOWN DEPICT THE EXTERIOR BUILDING FOOTPRINT AT GROUND OR NEAR GROUND LEVEL BASED ON FIELD MEASUREMENTS. THIS INFORMATION IS INTENDED TO DEPICT THE GENERAL CONFIGURATION OF THE BUILDING AT GROUND LEVEL AND MAY OR MAY NOT BE THE BUILDING FOUNDATION. THE BUILDING AREA SHOWN IS BASED ON THE EXTERIOR BUILDING FOOTPRINT AND IS NOT INTENDED TO REFLECT THE INTERIOR OR LEASE AREA.

PURSUANT TO TABLE A, ITEM 11, UNDERGROUND UTILITY INFORMATION SHOWN IS FROM PLANS AND/OR FIELD MARKINGS OF UTILITIES. IN ADDITION, MAPS AND MARKINGS FROM JURISDICTIONS, 811 OR OTHER SIMILAR UTILITY LOCATING COMPANIES MAY BE INCORRECT OR INCOMPLETE. HOWEVER, WITHOUT EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY DEPICTED. WHERE ADDITIONAL OR MORE DETAILED INFORMATION IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION AND/OR A PRIVATE UTILITY LOCATING COMPANY MAY BE NECESSARY.

PURSUANT TO TABLE "A" ITEM 16, THE SURVEYOR DID NOT OBSERVE RECENT EARTH MOVING WORK. BUILDING CONSTRUCTION, OR BUILDING ADDITIONS OBSERVED IN THE PROCESS OF CONDUCTING THE FIELDWORK.

PURSUANT TO TABLE "A" ITEM 17, THE SURVEYOR HAS NOT BEEN INFORMED OF ANY CHANGES IN THE PROPOSED RIGHTS OF WAY. ADDITIONALLY, ANY CHANGES IN RIGHTS OF WAY, WHICH HAVE ALREADY OCCURRED, SHOULD BE VERIFIED BY ADDITIONAL TITLE SEARCH. THE SURVEYOR HAS NOT OBSERVED ANY RECENT STREET OR SIDEWALK CONSTRUCTION IN THE PROCESS OF CONDUCTING THE FIELDWORK.

SIGNIFICANT OBSERVATION

A EASEMENTS LIE WITHIN THE BUILDING

REFERENCE DOCUMENTS

PLAT FOR SECURITY ACRES AMENDED, ACCORDING TO BOOK 8 OF MAPS, PAGE 59, M.C.R.

ALTA / NSPS LAND TITLE SURVEY WHATABURGER - 71ST ST. & THOMAS RD.

A PORTION OF THE SOUTHEAST QUARTER OF SECTION 27, TOWNSHIP 2 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA.

SCHEDULE 'B' ITEMS

1. PROPERTY TAXES, A LIEN NOT YET DUE AND PAYABLE, INCLUDING ANY PERSONAL PROPERTY TAXES AND ANY ASSESSMENTS COLLECTED WITH TAXES, FOR THE SECOND INSTALLMENT OF 2019 TAXES.

2. ANY OUTSTANDING LIABILITIES AND OBLIGATIONS, INCLUDING UNPAID ASSESSMENTS, IMPOSED UPON SAID LAND BY REASON OF: (A) INCLUSION THEREOF WITHIN THE BOUNDARIES OF THE SALT RIVER PROJECT AGRICULTURAL IMPROVEMENT AND POWER DISTRICT; (B) MEMBERSHIP OF THE OWNER THEREOF IN THE SALT RIVER VALLEY WATER USERS' ASSOCIATION, AN ARIZONA CORPORATION AND (C) THE TERMS OF ANY WATER RIGHT APPLICATION MADE UNDER THE RECLAMATION LAWS OF THE UNITED STATES FOR THE PURPOSES OF OBTAINING WATER RIGHTS FOR SAID LAND.

3. WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT DISCLOSED BY THE PUBLIC RECORDS

4. RESERVATIONS CONTAINED IN THE PATENT FROM: THE UNITED STATES OF AMERICA, TO: SAMUEL A. MURPHY RECORDING. DATE: NOVEMBER 24, 1890 RECORDING NO: BOOK 25 OF DEEDS, PAGE 409, WHICH AMONG OTHER THINGS RECITES AS FOLLOWS: SUBJECT TO ANY VESTED AND ACCRUED WATER RIGHTS FOR MINING, AGRICULTURAL, MANUFACTURING, OR OTHER PURPOSES AND RIGHTS TO DITCHES AND RESERVOIRS USED IN CONNECTION WITH SUCH WATER RIGHTS, AS MAY BE RECOGNIZED AND ACKNOWLEDGED BY LOCAL CUSTOMS, LAWS AND DECISIONS OF THE COURTS; AND ALSO SUBJECT TO THE RIGHT OF THE PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES HEREBY GRANTED. AS PROVIDED BY LAW. "BLANKET IN NATURE"

(5) 5. EASEMENTS, COVENANTS, CONDITIONS AND RESTRICTIONS AS SET FORTH ON THE PLAT RECORDED IN BOOK 8 OF MAPS. PAGE 59. "AS SHOWN"

6. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: PURPOSE: ELECTRIC LINES AND APPURTENANT FACILITIES RECORDING NO: BOOK 337 OF DEEDS, PAGE 236. "BLANKET IN NATURE"

(7) 7. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: PURPOSE: ELECTRIC LINES AND POLES, RECORDING NO: DOCKET 1082, PAGE 384. "AS SHOWN"

- (8) 8. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: PURPOSE: ELECTRIC LINES AND POLES, RECORDING NO: DOCKET 1969, PAGE 125. "APPROXIMATELY SHOWN - DOCUMENT IS PARTIALLY UNREADABLE"
- (9) 9. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: PURPOSE: ROAD OR HIGHWAY, RECORDING NO: DOCKET 4549, PAGE 232. "AS SHOWN"
- (10) 10. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: PURPOSE: ROAD OR HIGHWAY, RECORDING NO: DOCKET 4549, PAGE 233, "AS SHOWN"

(11) 11. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: PURPOSE: TELEPHONE AND TELEGRAPH LINES AND FIXTURES. RECORDING NO: DOCKET 4945, PAGE 522. "AS SHOWN"

(12) 12. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT PURPOSE: PUBLIC UTILITIES, RECORDING NO: DOCKET 7442, PAGE 73. "AS SHOWN"

(13) 13. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: PURPOSE: PUBLIC HIGHWAY, RECORDING NO: DOCKET 10222, PAGE 194. "AS SHOWN"

(14) 14. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: PURPOSE: PUBLIC HIGHWAY. RECORDING NO: DOCKET 10262, PAGE 1416. "AS SHOWN"

15. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: PURPOSE: CONSTRUCT IMPROVEMENTS, RECORDING NO: DOCKET 10343, PAGE 624. "BLANKET IN NATURE"

(16) 16. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: PURPOSE: UNDERGROUND ELECTRIC WIRES AND APPURTENANT FACILITIES, RECORDING NO: DOCKET 10416, PAGE 42. "AS SHOWN"

(17) 17. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: PURPOSE: ELECTRIC LINES AND APPURTENANT FACILITIES, RECORDING NO: 92-0693182. "AS SHOWN"

18. MATTERS CONTAINED IN THAT CERTAIN DOCUMENT ENTITLED: INDEMNITY AGREEMENT, DATED: NOT SHOWN, RECORDING DATE: APRIL 21, 1997, RECORDING NO: 97-0260342, REFERENCE IS HEREBY MADE TO SAID DOCUMENT FOR FULL PARTICULARS. "NO PROPERTY DESCRIBED IN THE DOCUMENT"

19. MATTERS SHOWN ON RECORD OF SURVEY: RECORDING NO .: BOOK 1334 OF MAPS. PAGE 37. "CONTAINS NO ADDITIONAL INFORMATION"

20. MATTERS WHICH MAY BE DISCLOSED BY AN INSPECTION AND/OR BY A CORRECT ALTA/NSPS LAND TITLE SURVEY OF SAID LAND THAT IS SATISFACTORY TO THE COMPANY, AND/OR BY INQUIRY OF THE PARTIES IN POSSESSION THEREOF.

21. ANY RIGHTS OF THE PARTIES IN POSSESSION OF A PORTION OF, OR ALL OF, SAID LAND, WHICH RIGHTS ARE NOT DISCLOSED BY THE PUBLIC RECORDS.

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF MARICOPA, STATE OF ARIZONA, AND IS DESCRIBED AS FOLLOWS: THE WEST 201.5 FEET OF LOT 4, BLOCK 32, SECURITY ACRES AMENDED, ACCORDING TO BOOK 8 OF MAPS, PAGE 59,

RECORDS OF MARICOPA COUNTY, ARIZONA; EXCEPT THE NORTH 10 FEET OF THE SOUTH 17 FEET THEREOF.

AREA

ZONE: C-3





NORTH PROPERTY CONTAINS 60,736 SQUARE FEET OR 1.394 ACRES, MORE OR LESS. SOUTH PROPERTY CONTAINS 1,411 SQUARE FEET OR 0.032 ACRES, MORE OR LESS. TOTAL PROPERTY CONTAINS 62,136 SQUARE FEET OR 1.426 ACRES, MORE OR LESS.

ADDRESS

7134 E. THOMAS ROAD SCOTTSDALE, ARIZONA 85251 PARKING

REGULAR 74 HANDICAP 4

BASIS OF BEARING

THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SECTION 27, AS MEASURED BETWEEN FOUND MONUMENTS. SAID LINE BEARS SOUTH 89 DEGREES 19 MINUTES 57 SECONDS WEST.

ZONING

ZONING INFORMATION OBTAINED FROM MARICOPA COUNTY ASSESSORS WEBSITE.

*PER 2016 ALTA MINIMUM STANDARD DETAIL REQUIREMENTS: CURRENT ZONING CLASSIFICATION. BUILDING SETBACK REQUIREMENTS AND HEIGHT AND FLOOR SPACE AREA RESTRICTIONS ARE TO BE PROVIDED TO THE SURVEYOR BY THE INSURER. THE CLASSIFICATION, REQUIREMENTS AND RESTRICTIONS HAVE NOT BEEN PROVIDED AT THE TIME OF THIS SURVEY. THE ZONING CLASSIFICATIONS SHOWN ARE FOR REFERENCE.

FLOOD ZONE

ACCORDING TO THE FLOOD INSURANCE RATE MAP #04013C2235 L, DATED OCTOBER 16, 2013, THIS PROPERTY IS LOCATED IN FLOOD ZONE "X". AREAS OF 0.2% ANNUAL CHANCE FLOOD: AREAS OF 1% ANNUAL CHANCE FLOOD 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 FLOOD.

CERTIFICATION

TO: WHATABURGER RESTAURANTS LLC. A TEXAS LIMITED LIABILITY COMPANY CEDARS CROSS, LLC, AN ARIZONA LIMITED LIABILITY COMPANY CITY OF SCOTTSDALE CHICAGO TITLE INSURANCE COMPANY

THIS IS TO CERTIFY THAT THIS MAP AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 6(a), 7(a), 8, 9, 10(a), 11, 13, 14, 16 AND 17 OF TABLE A THEREOF.

FIELD WORK WAS COMPLETED DECEMBER 20, 2019

22425 N. 16TH STREET, SUITE 1

PHOENIX, ARIZONA 85024 PHONE: 480-922-0780 TONYS@SIGSURVEYAZ.COM

	SURVEY INNO	GROUP, I Land Surveying S
ALTA / NSPS LAND TITLE SURVEY	WHATABURGER - 71ST ST. & THOMAS RD.	SCOTTSDALE, ARIZONA
HEGO	A1894 ERIC L. SOSTRO	M SIL POR
	NS:	
DRAWIN ALTA	IG NAM	ME:
DRAWN:	D. P52 : TS	243



20 SCALE

O	FOUND BRASS CAP IN HANDHOLE
	FOUND BRASS CAP FLUSH
۵	FOUND 'PK' NAIL
	FOUND 1/2" REBAR
0	SET 1/2" REBAR W/CP LS #60370
鉸	BARREL CACTUS
	BOLLARD
	CATCH BASIN
8008	WATER CHECK VALVE
	SEWER CLEANOUT
3	SHRUB
·	DOWN GUY
M	ELECTRIC JUNCTION BOX
	ELECTRIC TRANSFORMER
(SD)	STORM DRAIN MANHOLE
i ss	SEWER MANHOLE
(TMH)	TELEPHONE MANHOLE
\overline{X}	WATER METER
	WATER VALVE
(c)	FIRE DEPARTMENT CONNECTION
\bowtie	GAS VALVE
X	LIGHT POLE
•	LIGHT POLE W/MAST
X	PALM TREE
PVC 88	PVC STUB
Ŷ	SAGUARO
0	SIGN
{ }	TREE
Ē	TELEPHONE RISER
\rightarrow	UTILITY POLE
*	YUCCA
ESMT	EASEMENT
DKT./PG.	DOCKET NO./PAGE
P.U.E.	PUBLIC UTILITY EASEMENT
BK./PG.	BOOK/PAGE
DOC.	DOCUMENT NUMBER
B/C	BACK OF CURB
E/P	EDGE OF PAVEMENT
P/L	PROPERTY LINE
R/W	RIGHT OF WAY
	BOUNDARY LINE
······································	SECTION LINE
	WATER LINE
	SEWER LINE
	GAS BLUE STAKE LINE
	UNDERGROUND ELECTRIC LINE
OHE	
СОММ	
	a area a area and the area to the set the set the

8 TO E/P ELECTRIC ESMT DKT. 1969, PG. 125 NO WIDTH GIVEN (13)(14) 30' PUBLIC HIGHWAY ESMT DKT. 10222, PG. 194 & -DKT. 10262, PG. 1416 (12) 8' P.U.E. 7442, Г

21.4' E/P

TO E/P

APN:130–17–029 NOLTE ARTHUR SCARROLL MARY ELIZABETH TR NOT A PART

 40°

R/W

30.4'E/P то в/с

N0'09'06"E - сомм _____ 10.00'

-

N0'09'06"E 7.00'

SOUTH QUARTER CORNER SEC. 27, T2N, R4E FOUND P.K. NAIL NO I.D.



30	0	30	<u> 6</u> 0	
SCALE			FEET	
		GEND	-	
	FOUN	ND BRASS C	AP IN HAN	IDHOLE
	FOUN	ND BRASS C	AP FLUSH	
	FOUN	ND 'PK' NAIL	•	
	FOUN	ND 1/2" REE	BAR	
O the second s	SEI	1/2 REBAR	W/CP LS	#60370
~~~~ @	BOLL	ARD		
	CATC	CH BASIN		
8008	WATE	ER CHECK V	ALVE	
	SEWE	R CLEANOU	Т	
	SHRU	JB		
	DOW	N GUY		
	ELEC	TRIC JUNCTI	ON BOX	
	ELEC	TRIC TRANS	ORMER	
(SD)	STOR	M DRAIN MA	NHOLE	
TMH	JEWE	R MANHULE		
	WATE	R METER		
(2)	WATE	R VALVE		
	FIRE	DEPARTMEN	T CONNEC	TION
$\bowtie$	GAS	VALVE		
XX	LIGHT	POLE		
	LIGHT	POLE W/M	AST	
PVC	PALM	TREE		
8	PVC	STUB		
	SAGU	IARO		
C S	TREE			
	TELEF	PHONE RISE	<b>?</b>	
	UTILI	TY POLE	•	
*	YUCC	A		
ESMT	EASE	MENT		
DKT./PG.	DOCK	ET NO./PAG	E	
P.U.E.	PUBL	IC UTILITY E	ASEMENT	
BK./PG.	BOOK	/PAGE		
DOC.	DOCU	MENT NUMB	ER	
в/С г /о			NT	
⊑/٣ ₽/I	PROP	FRTY LINE	IN I	
R/W	RIGHT	OF WAY		
	BOLIN			
· · · · · · · · · · · · · · · · · · ·				
	LASE	VIENI LINE	· · · · · · · · · · · · · · · · · · ·	
		CENT BOUND	ARY LINE	
	WATEI	R LINE		
2	SEWER	R LINE		
G	GAS	BLUE STAKE	LÎNE	
une 🗧 ununuum ununuum	UNDEI	RGROUND EL	ECTRIC LIN	IE .
OHE	OVERI		RIC LINE	
	COX		ION LINF	
		-1250		
	MAJO	R CONTOURS	;	
		a san san		

SOUTH QUARTER CORNER SEC. 27, T2N, R4E FOUND P.K. NAIL NO I.D.



# TOPOGRAPHIC SURVEY WHATABURGER - 71ST ST. & THOMAS RD.

A PORTION OF THE SOUTHEAST QUARTER OF SECTION 27, TOWNSHIP 2 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA.



N.T.S.

SCOTTSDALE, ARIZONA 85251

ANY UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND REQUESTED UTILITY DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. NOT ALL UTILITY COMPANIES CONTACTED HAVE PROVIDED FACILITY MAPS FOR THEIR UNDERGROUND UTILITIES AND NOT ALL COMPANIES MARKED THEIR FACILITIES BEFORE THE FIELD SURVEY WAS COMPLETED.

THE BOUNDARY AND EASEMENT INFORMATION SHOWN HEREIN IS FOR REFERENCE ONLY. THIS INFORMATION WAS CALCULATED USING THE RECORDED PLAT OR DEED AS DESCRIBED IN THE LEGAL DESCRIPTION AND DOES NOT REPRESENT A FIELD BOUNDARY SURVEY.

THE SURVEYOR HAS RELIED SOLELY ON INFORMATION SUPPLIED TO THE SURVEYOR FROM EITHER THE CLIENT OR THE TITLE COMPANY AND HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS OF RECORD, ENCUMBRANCES, RESTRICTIVE COVENANTS, OWNERSHIP TITLE EVIDENCE, OR ANY OTHER MATTERS THAT MAY AFFECT THE SUBJECT PROPERTY.

ON-SITE PLANT INFORMATION SHOWN HEREON IS FOR REFERENCE ONLY. SURVEYOR ASSUMES NO LIABILITY FOR THE EVALUATION, SALVAGE ABILITY, REMOVAL AND/OR RELOCATION OF ON-SITE PLANT MATERIALS. CONTACT A LANDSCAPE PROFESSIONAL FOR MORE INFORMATION.

## LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF MARICOPA, STATE OF ARIZONA, AND IS DESCRIBED AS FOLLOWS:

THE WEST 201.5 FEET OF LOT 4, BLOCK 32, SECURITY ACRES AMENDED, ACCORDING TO BOOK 8 OF MAPS, PAGE 59, RECORDS OF MARICOPA COUNTY, ARIZONA; EXCEPT THE NORTH 10 FEET OF THE SOUTH 17 FEET THEREOF.

NORTH PROPERTY CONTAINS 60,736 SQUARE FEET OR 1.394 ACRES, MORE OR LESS. SOUTH PROPERTY CONTAINS 1,411 SQUARE FEET OR 0.032 ACRES, MORE OR LESS. TOTAL PROPERTY CONTAINS 62,136 SQUARE FEET OR 1.426 ACRES, MORE OR LESS.

### **BENCHMARK**

EAST QUARTER CORNER OF SECTION 27, T2N, R4E. FOUND CITY OF SCOTTSDALE BRASS CAP IN HANDHOLE AT THE INTERSECTION OF SCOTTSDALE ROAD AND OSBORN ROAD.

### **BASIS OF BEARING**

THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SECTION 27, AS MEASURED BETWEEN FOUND MONUMENTS. SAID LINE BEARS SOUTH 89 DEGREES 19 MINUTES 57 SECONDS WEST.

## FLOOD ZONE

ACCORDING TO THE FLOOD INSURANCE RATE MAP #04013C2235 L, DATED OCTOBER 16, 2013, THIS PROPERTY IS LOCATED IN FLOOD ZONE "X". AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD 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 FLOOD.

## CERTIFICATION

THIS IS TO CERTIFY THAT THIS MAP CORRECTLY REPRESENTS A SURVEY MADE UNDER MY SUPERVISION DURING THE MONTH OF DECEMBER, 2019, AND THAT THE SURVEY IS CORRECT AND ACCURATE TO THE BEST OF MY KNOWLEDGE.

DATE

AMATABURGER - 71ST ST. & THOMAS RD. SCOTTSDALE, ARIZONA	S I G SURVEY INNOVATION GROUP, INC Land Surveying Services
REVISIONS: A BRAWING NAME: ALTA JOB NO. P5243	TOPOGRAPHIC SURVEY WHATABURGER - 71ST ST. & THOMAS RD SCOTTSDALE, ARIZONA
REVISIONS:	CHED LAND SET CHILDENT (FICATE 40) CHILDENT (FICATE 40) CHILDENT (FICATE 40) CHILDENT (FICATE 40) CHILDENT 41894 ERIC L. SOSTROM SOSTROM Sostrom Page Signed 1. PARISON U.S.N.
DRAWING NAME: ALTA JOB NO. P5243	REVISIONS:
	DRAWING NAME: ALTA JOB NO. P5243

UITE 1 85024 2-0780

224 PHC

SHEET:

1 OF

# Appendix C – FEMA Flood Insurance Rate Map (FIRM)

## National Flood Hazard Layer FIRMette



#### Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT Without Base Flood Elevation (BFE) With BFE or Depth Zone AE, AO, AH, VE, AR SPECIAL FLOOD HAZARD AREAS **Regulatory Floodway** 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X Future Conditions 1% Annual Chance Flood Hazard Zone X Area with Reduced Flood Risk due to Levee. See Notes. Zone X OTHER AREAS OF FLOOD HAZARD Area with Flood Risk due to Levee Zone D T2N R4E S26 T2N R4E NO SCREEN Area of Minimal Flood Hazard Zone X Effective LOMRs OTHER AREAS Area of Undetermined Flood Hazard Zone D GENERAL - -- - Channel, Culvert, or Storm Sewer STRUCTURES IIIIII Levee, Dike, or Floodwall 20.2 Cross Sections with 1% Annual Chance 17.5 Water Surface Elevation AREA OF MINIMAL FLOOD HAZARD **Coastal Transect** CITY OF SCOTTSDALE Base Flood Elevation Line (BFE) ~ 513~~~~ 045012 Limit of Study Jurisdiction Boundary **Coastal Transect Baseline** ----OTHER **Profile Baseline** FEATURES Hydrographic Feature **Digital Data Available** No Digital Data Available MAP PANELS Unmapped The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location. This map complies with FEMA's standards for the use of T2N R4E \$35 T2N R4E S34 digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/12/2019 at 9:27:13 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, USGS The National Map: Orthoimagery, Data refreshed April, 2019. legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective 33°28'35.05"N 4-DR-2020 1:6,000 Feet unmapped and unmodernized areas can regulatory purposes. 250 500 1,000 1.500 2,000 n



# Appendix D – Hydrologic/Hydraulic Calculations

#### Peak Flow Calculations Using The Rational Method

Project: Proi #:	
Date:	
Prep by:	
Check by:	

Base Sheet Prepared By GA, Version 2

#### Source of Rainfall Data --->NOAA Atlas 14

Rainfa	Rainfall Depth-Duration-Frequency (D-D-F), (inch)						
Storm			Time				
Fequency	5 min	10 min	15 min	30 min	60 min		
10-Yr	0.39	0.59	0.74	0.99	1.23		
100-Yr	0.62	0.94	1.17	1.57	1.95		
Derived Ra	Derived Rainfall Intensity-Duration-Frequency (I-D-F), (in/hr						
10-Yr	4.68	3.56	2.95	1.98	1.23		
100-Yr	7.43	5.65	4.68	3.14	1.95		
Attach source and supporting data for rainfall depths							

AF for Cw per Cw _{10-Yr}					
Freq.	Typical	Applic.			
2-Yr	1.00	1.00			
5-Yr	1.00	1.00			
10-Yr	1.00	1.00			
25-Yr	1.10	1.00			
50-Yr	1.20	1.00			
100-Yr	1.25	1.00			

ibb ١g ep AF=Frequency Adjustment Factor

Drainage	/					Tc,calc m	nethod:	1=Papadak	is and Ka	zan, 2=Av	g Veloc. r	1		10-Yr					100-Yr		
						1	Tc,calc	=11.4*L^0.	5*Kb^0.52	*S^-0.31*	i^-0.38	Cw for eac	ch frequen	cy is adjust	ed as a fu	nction of th	e 100-year	value per	the table	above	
Concent.	Total	Base	Flow	Approx	Approx	Average	K _b	m	b	K _b	Initial/lot	Minim a	llowed T	c,tot =	5.0	Q	Minim a	llowed T	c,tot =	5.0	Q
Point	Area	Cw	Path, L	High pt	Low pt	Slope	Class				Тс	Cw	Tc,calc	Tc,tot	i	10-Yr	Cw	Tc,calc	Tc,tot	i	100-Yr
#	(ac)	(2-10 yr)	(ft)	(ft)	(ft)	ft/ft	A>D				(min)	AF=1.00	(min)	(min)	(in/hr)	(cfs)	AF=1.00	(min)	(min)	(in/hr)	(cfs)
ON-1	0.266	0.95	105	1240.3	1236.7	0.0343	A	-0.00625	0.04	0.0436	5	0.95	2.1	7.1	4.23	1.07	0.95	1.8	6.8	7.07	1.79
ON-2	0.045	0.83	45	1239.9	1239.7	0.0038	А	-0.00625	0.04	0.0484	5	0.83	2.9	7.9	4.23	0.16	0.83	2.4	7.4	6.72	0.25
ON-3	0.220	0.83	194	1237.8	1234.8	0.0155	А	-0.00625	0.04	0.0441	5	0.83	3.7	8.7	4.01	0.73	0.83	3.1	8.1	6.36	1.16
ON-4A	0.039	0.95	106	1238.9	1238.4	0.0047	А	-0.00625	0.04	0.0488	5	0.95	4.1	9.1	3.79	0.14	0.95	3.5	8.5	6.36	0.24
ON-4B	0.044	0.95	106.0	1238.9	1238.4	0.0050	Α	-0.00625	0.04	0.0485	5	0.95	4.1	9.1	3.79	0.16	0.95	3.4	8.4	6.36	0.27
ON-5	0.421	0.95	122	1240.0	1238.4	0.0131	Α	-0.00625	0.04	0.0423	5	0.95	3.0	8.0	4.01	1.60	0.95	2.5	7.5	6.72	2.69
ON-6	0.041	0.83	58	1238.9	1238.8	0.0017	Α	-0.00625	0.04	0.0487	5	0.83	4.2	9.2	3.79	0.13	0.83	3.5	8.5	6.36	0.22
ON-7	0.108	0.83	22	1236.3	1233.3	0.1364	А	-0.00625	0.04	0.0460	5	0.83	0.6	5.6	4.68	0.42	0.83	0.5	5.5	7.43	0.67

Curb Opening Calculations							
Drainage Area	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)	Curb Opening Length Req'd Q ₁₀	Curb Opening Length Req'd Q ₁₀₀	Curb Cut Length Used		
Basin A - ON4A+ON1+ON2		2.3	0.00	2.1	2.5		
Basin B - ON4B+ON5+ON6		3.13	0.00	3.0	3		
			0.00	0.0			

$$C = 3$$
  
H = 0.5 ft  
Q=CLH^{1.5}

	Pre-Development Conditions							
	Existing Basin - Pavement							
Elevation [ft]	Surface Storage Area [ft	Surface Storage Area [ac]	Average Area [ac]					
-	-	-				0.0000		
			0.0005	0.1000	0.0001			
0.10	46.00	0.001				0.0001		
			0.0020	0.1000	0.0002			
0.20	125.00	0.003				0.0002		
			0.0037	0.1000	0.0004			
0.30	278.00	0.006				0.0004		
			0.0083	0.1000	0.0008			
0.40	598.00	0.014				0.0011	47 CF	

#### Whataburger Scottsdale

	Proposed Conditions Retention Summary								
Drainage Area	ainage Area Land Use		Area [A]		Precipitation Depth [P] =0.5 1st flush & 2.16 100-yr, 2-hr	Required Storage (V _{REQ} = CPA/12)		Retention Basin	
		sf	ac		in	cf	ac-ft		
ON 1	Pavement	11,595	0.266	0.95	2.16	1,983	0.046	A	
ON 2	Landscaping	1,948	0.045	0.83	0.50	67	0.002	В	
ON 3	Landscaping	9,565	0.220	0.83	0.50	331	0.008	В	
ON 4A	Building	1,687	0.039	0.95	2.16	288	0.007	A	
ON 4B	Building	1,896	0.044	0.95	0.50	75	0.002	В	
ON 5	Pavement	18,323	0.421	0.95	0.50	725	0.017	В	
ON 6	Landscaping	1,806	0.041	0.83	0.50	62	0.001	В	
ON 7	Landscaping	4,686	0.108	0.83	2.16	700	0.016	A	
TOTAL	-	51,506	1.182	-	-	4,232	0.097	-	

*NOTE: REFER TO APPENDIX E FOR DRAINAGE MAP AND DRAINAGE AREA INFORMATION

North Basin (sized for 100-yr, 2 hr)	Land Use	Runoff Coefficient	Drainage Area (ft²)	Required Volume (ft ³ )	Provided Volume (ft ³ )	Surplus (ft ³ )
А	Landscaping	0.83	4,686	700		
	Building	0.95	1,687	288		
	Pavement	0.95	11,595	1,983		
			17,968	2,971	3,044	73

South Basin (sized for first flush)	Land Use	Runoff Coefficient	Drainage Area (ft ² )	Required Volume (ft ³ )	Provided Volume (ft ³ )	Surplus (ft ³ )
В	Landscaping	0.83	13,319	461		
	Building	0.95	1,896	75		
	Pavement	0.95	18,323	725		
			33,538	1,261	1,738	477

Surface Retention Summary						
Retention Basin	Basin Depth	Required Volume	Volume Provided	Excess Volume		
	ft	cf	cf	cf		
А	3.0	2,971	3,044	73		
В	3.0	1,261	1,738	477		
Total		4,232	4,782	550		

Drywell Summary						
Retention Basin	Volume Percolation Rate		Drywells Required	Drain Time		
	cf	cfs	ea	hr		
А	2,971	0.1	1	9		
В	1,261	0.1	1	4		

Project Description					_
Eriction Method	Manning				_
	Formula				
Solve For N	lormal Depth				_
Input Data					
Channel Slope	0.002 ft/ft				_
Discharge	0.95 cfs				_
	Se	ction Definitio	ons		_
Station (ft)				Elevation (ft)	
		0+00.0			1,239.69
		0+00.5			1,239.69
		0+00.5			1,239.20
		0+24.5			1,238.76
		0+24.5			1,239.26
		0+25.0			1,239.26
	Roughne	ss Segment D	efinitions		
Start Station		Ending Station		Roughness Coefficient	t
(0+00.0, 1,239.69)		(0+25.0	, 1,239.26)		0.016
					_
Options					_
Current Roughness Weighted Method	Pavlovskii's Method				
Open Channel Weighting	Pavlovskii's				
Method	Method				
Closed Channel Weighting	Pavlovskii's				
Method	Method				_
Results					-
Normal Depth	2.4 in				_
Elevation Range	1,238.8 to				
Flow Area	1,235.7 ft 1.1 ft ²				
Wetted Perimeter	11.1 ft				
Hydraulic Radius	1.2 in				
Top Width	10.89 ft				
Normal Depth	2.4 in				
Critical Depth	1.8 in				
Critical Slope	0.009 ft/ft				
Velocity	0.88 ft/s				
Velocity Head	0.01 ft				
Specific Energy	0.21 ft				
Froude Number	0.493				
Flow Type	Subcritical				_

### **Cross Section for Irregular Section - 71st Street Outfall**

WB Scottsdale FlowMaster.fm8 3/31/2020

Bentley Systems, Inc. Haestad Methods Solution Center 27 Siemon Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 FlowMaster [10.02.00.01] Page 1 of 2

GVF Input Data		
Downstream Depth	0.0 in	
Length	0.0 ft	
Number Of Steps	0	
GVF Output Data		
Upstream Depth	0.0 in	
Profile Description	N/A	
Profile Headloss	0.00 ft	
Downstream Velocity	0.00 ft/s	
Upstream Velocity	0.00 ft/s	
Normal Depth	2.4 in	
Critical Depth	1.8 in	
Channel Slope	0.002 ft/ft	
Critical Slope	0.009 ft/ft	

### **Cross Section for Irregular Section - 71st Street Outfall**

WB Scottsdale FlowMaster.fm8 3/31/2020

Bentley Systems, Inc. Haestad Methods Solution Center 27 Siemon Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 FlowMaster [10.02.00.01] Page 2 of 2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Channel Slope Normal Depth Discharge	0.002 ft/ft 2.4 in 0.95 cfs
	1239.90 1239.80 1239.70 1239.60 1239.40 1239.40 1239.40 1239.20 1239.20 1239.00 1238.90 1238.90 1238.90 1238.70 1238.60 0+00 0+05 0+10 0+15 0+20 0+25 Station

#### **Cross Section for Irregular Section - 71st Street Outfall**

WB Scottsdale FlowMaster.fm8 3/31/2020

Bentley Systems, Inc. Haestad Methods Solution Center 27 Siemon Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 FlowMaster [10.02.00.01] Page 1 of 1

### Cross Section for Irregular Section - 71st Street to Center of Proposed Whataburger

Project Description				
Friction Method	Manning			
	Formula			
Solve For	Normal Depth			_
Input Data				
Channel Slope Discharge	0.018 ft/ft 0.95 cfs			
	Se	ction Definitions		
Station	n		Elevation	
(ft)			(ft)	
		0+00.0		1,240.20
		0+00.5		1,240.20
		0+00.5		1,239.70
		0+24.5		1,239.21
		0+24.5		1,239.71
		0+25.0		1,239.71
		0+38.0		1,239.96
	Roughne	ss Segment Definitio	ons	
Start Station		Ending Station	Roughness Coefficier	ıt
(0+00.0, 1,240.20)		(0+38.0, 1,239.9	6)	0.013
Options				
Current Roughness Weighted Method	Pavlovskii's Method			_
Open Channel Weighting Method	Pavlovskii's Method			
Closed Channel Weighting Method	Pavlovskii's Method			
	Tietiloa			
Results				
Normal Depth	1.5 in			
Elevation Range	1,239.2 to 1,240.2 ft			
Flow Area	0.4 ft ²			
Wetted Perimeter	6.3 ft			
Hydraulic Radius	0.7 in			
Top Width	6.18 ft			
Normal Depth	1.5 in			
Critical Depth	1.9 in			
Critical Slope	0.006 ft/ft			
Velocity	2.42 ft/s			
Velocity Head	0.09 ft			
Specific Energy	0.22 ft			
Froude Number	1.691			
WB Scottsdale FlowMaster fm8	Bentley Syste	ems, Inc. Haestad Methods Solut Center	tion	FlowMaster
3/31/2020	27 Siemon Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666			Page 1 of 2

### Cross Section for Irregular Section - 71st Street to Center of Proposed Whataburger

Results		
Flow Type	Supercritical	
GVF Input Data		
Downstream Depth	0.0 in	
Length	0.0 ft	
Number Of Steps	0	
GVF Output Data		
Upstream Depth	0.0 in	
Profile Description	N/A	
Profile Headloss	0.00 ft	
Downstream Velocity	Infinity ft/s	
Upstream Velocity	Infinity ft/s	
Normal Depth	1.5 in	
Critical Depth	1.9 in	
Channel Slope	0.018 ft/ft	
Critical Slope	0.006 ft/ft	

WB Scottsdale FlowMaster.fm8 3/31/2020

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### Cross Section for Irregular Section - 71st Street to Center of Proposed Whataburger

Friction Method	Manning			
Solve For	Formula Normal Denth			
301761101	Normal Depth			
Input Data				
Channel Slope	0.018 ft/ft			
Normal Depth	1.5 in	1.5 in		
Discharge	0.95 cfs			
	1240.40		(	ľ.
	1240.30			
	1240.20			
	1240.10			
	1240.00			
	1239.90			/
	호 1239.80			/
	\$ 1239.70		4	-
	₩ 1239.60			
	1239.50			
	1239.40	7		
	1239.30			
	1239.20			1
	1239.10			
	1239.00			
	0+00	0+10	0+20 Station	0+30

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# Kimley»Horn Appendix E – Drainage Exhibit



### LEGEND



STREET CENTERLINE EXISTING PUBLIC WATER MAIN PROPOSED CONTOUR EXISTING CONTOURS PROPOSED PAVEMENT SPOT ELEVATION

EXISTING SPOT ELEVATION EXISTING SANITARY SEWER MANHOLE

EXISTING DRYWELL

### BENCHMARK

EAST QUARTER CORNER OF SECTION 27, T2N, R4E. FOUND CITY OF SCOTTSDALE BRASS CAP IN HANDHOLE AT THE INTERSECTION OF SCOTTSDALE ROAD AND OSBORN ROAD.

### BASIS OF BEARINGS

PER SURVEY INNOVATION GROUP, THE BASIS OF BEARING IS THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SECTION 27, AS MEASURED BETWEEN FOUND MONUMENTS. SAID LINE BEARS SOUTH 89 DEGREES 19 MINUTES 57 SECONDS WEST.

	Kimley Morn © 2020 1001 W Southern Ave, Suite 131 Mesa, Arizona 85210 (480) 207–2666	
	WHATABURGER	
	WHATABURGER RESTAURANT DRAINAGE EXHIBIT 7134 E THOMAS ROAD SCOTTSDALE, AZ 85251	
	PROJECT No. SCALE (H): 1"=20' SCALE (V): DRAWN BY: PAR DESIGN BY: DH CHECK BY: HDR DATE: 05/11/2020 PRELIMINARY FOR REVIEW ONLY NOT FOR CONSTRUCTION Kimley Horn	
Contact Arizona 811 at least two full working days before you begin excavation ARZONA811 Call 811 or click Arizona811.com	Kimley-Horn and Associates, Inc. Drainage Exhibit – May 2020.dwg O1 OF O1 SHEETS	

