Drainage Reports

Abbreveated Water & Sewer Need Reports

Water Study

Wastewater Study

Stormwater Waiver Application

Engineering

Sewer Basis of Design

For
Northwest Corner of Scottsdale / Gold Dust
N. Scottsdale Rd

Scottsdale, AZ

Scottsdale Plan Check: 10-DR-2017
Job: 243
May 2017

Prepared for:

Land Development Consultants, LLC
602-850-8101
bill@ldcaz.com

Prepared by:

Steve Bowser, PE
Helix Engineering, LLC
3240 E. Union Hills Dr #112
Phoenix, AZ 85050
602-788-2616
sb@hxeng.com

Accepted For:
City of Scottsdale
Water Resources Department
9379 E. San Salvador
Scottsdale, Arizona

By: REZAUR RAHMAN
Date: 6/7/2017

EXPIRES 9-30-17

10-DR-2017
5/26/17

Sewer Basis of Design
FOR
Northwest Corner of Scottsdale / Gold Dust
Scottsdale, Arizona

C. Introduction

The proposed site is located at the Northwest corner of Scottsdale Rd. and Gold Dust in the City of Scottsdale, Arizona. The site is situated within the Northeast quarter of Section 27, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The site is an existing small footprint Circle K convenience store / fuel canopy at the Northwest corner of Gold Dust and Scottsdale Road. This project has access to Scottsdale Road and Gold Dust along with internal onsite access to the remainder of the retail project.

D. Design Documentation

Project will be analyzed using the design criteria from the DSPM. Sewer demand of 0.5 gal per sf per day.

C. Existing Conditions

Currently, the site is a developed convenience store building. Site is served with a direct sewer tap to city main in Gold Dust. Retail building north of the existing Circle K also has a private sewer service to the public main in Gold Dust. The public main in Gold Dust dead ends due south of the existing Circle K building.

D. Proposed Conditions

The New Circle K building will construct a new 4968 SF building and demolish the Existing Circle K. Sewer service will be re-used to serve the new Circle K Building. The private sewer tap serving the retail to the north appears to be located immediately west of the existing Circle K. This private service will be relocated off the Revised Circle K Property and reconnected to the public main in Gold Dust. The Public sewer main may need to be extended a short distance to serve this relocated sewer service.

E. Computations

Circle K SF: 4,968 SF (New building)
Average Day Sewer Demand: 0.5 gallons per SF= 2484 gal per day
Peak Factor: 3x
Peak Day Demand: 3x Average Day Sewer Demand = 3 x 2484= 7452 gal per day
(Peak Demand based on conservative 12 hour operational day) = 10.4 gpm
Existing 6" tap at 0.5% slope capacity=179 GPM

Existing retail - relocate sewer tap SF: 15,200 SF (existing building)
Average Day Sewer Demand: 0.5 gallons per SF= 7600 gal per day
Peak Factor: 3x
Peak Day Demand: 3x Average Day Sewer Demand = 3 x 7600= 22800 gal per day
(Peak Demand based on conservative 12 hour operational day) = 31.6 gpm
Existing 6" tap at 0.5% slope capacity=179 GPM

Both Existing retail and new circle K will outfall to public 8" line. Flattest section of this line (existing portion) is 0.36% slope. Using both peak flows, 42 gpm will be entering the 8" line in Gold Dust. 42 gpm equates to 0.09 cfs (existing and new).

Conservatively using a n factor on an aged 8" VCP line of 0.017 at 0.36% slope, capacity of an 8" line is 0.55 ~~gpm~~ cfs

q/Qfull = 0.09 / 0.55 = 0.16

Using a Pipe not flowing full chart, q/Qfull of 0.16 equates to d/D of 0.27. This d/D is well below DSPM maximum of 0.65 for pipes less than 12" diameter.

This dead end line has additional capacity if extended in the future, however all upstream areas are fully developed with existing sewer connections to other lines. It is not anticipated that this line would be extended in the future. The 8" line in Gold Dust is functionally built out with a d/D at peak flow of 0.27 meeting the DSPM standard for this sewer line.

F. Summary

- This project is the redevelopment of an existing convenience / fuel site
- Existing sewer tap will remain in place and will be reused if possible.
- Existing Retail site sewer service will be relocated west.

G. Supporting Maps / References

1. City of Scottsdale, Design Standards and Procedures Manual, January 2012.
2. City of Scottsdale, QS 28-44

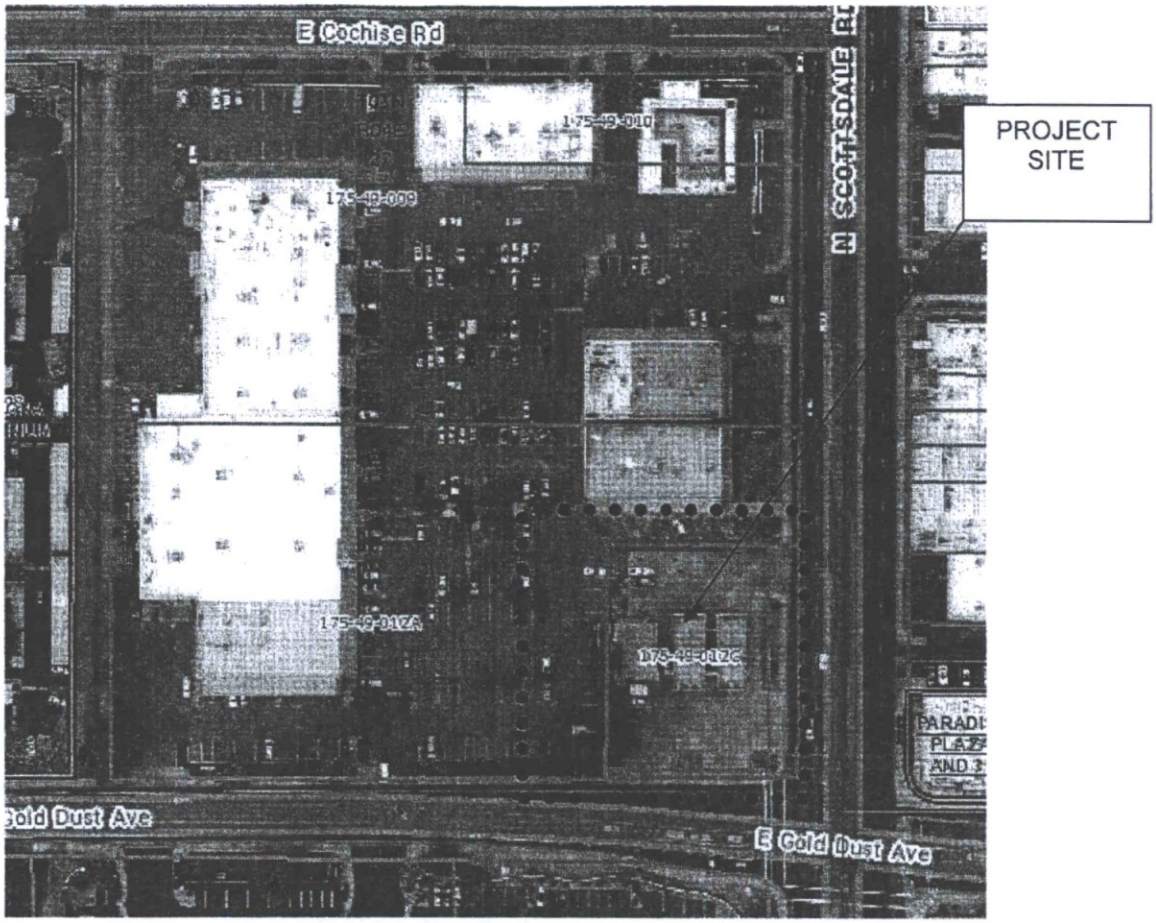


Figure 1-VICINITY MAP

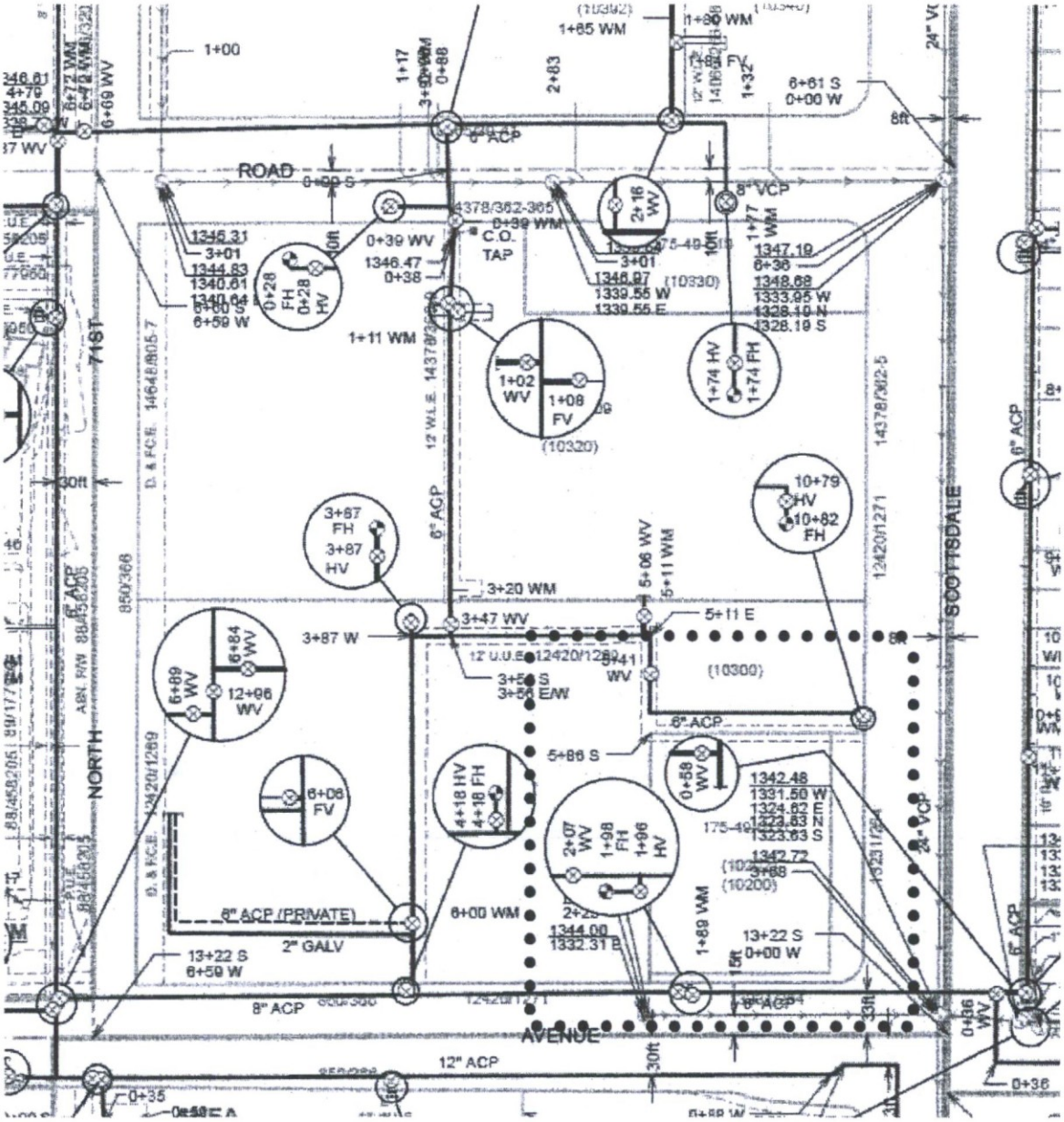
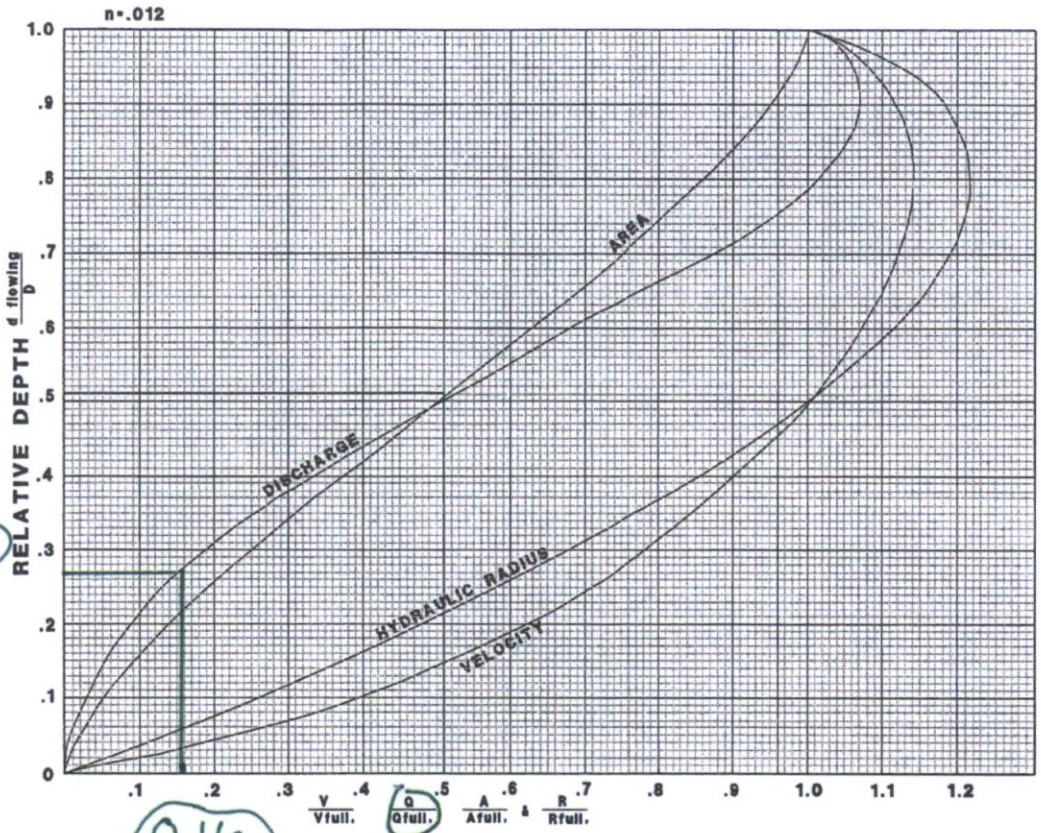


Figure 2-WATER-SEWER QS MAP

Figure 3 - d/D chart



HYDRAULIC ELEMENTS

CIRCULAR SECTION

Water Basis of Design

For
Northwest Corner of Scottsdale / Gold Dust
N. Scottsdale Rd

Scottsdale, AZ

Scottsdale Plan Check: 10-DR-2017
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Water Basis of Design
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Northwest Corner of Scottsdale / Gold Dust
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C. Introduction

The proposed site is located at the Northwest corner of Scottsdale Rd. and Gold Dust in the City of Scottsdale, Arizona. The site is situated within the Northeast quarter of Section 27, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The site is an existing small footprint Circle K convenience store / fuel canopy at the Northwest corner of Gold Dust and Scottsdale Road. This project has access to Scottsdale Road and Gold Dust along with internal onsite access to the remainder of the retail project.

D. Design Documentation

Project will be analyzed using the design criteria from the DSPM. Water use of 0.8 Gallons per SF will be used for design criteria, plus an estimated 1500 gallons per minute for fire requirements based on minimum per fire code. A flow test will be performed to verify flow in the Gold Dust Road hydrant as that hydrant is the likely hydrant to be used in case of a fire event. A flowtest within 6 months of permitting will be provided to verify flow. The primary hydrant for this site is connected to a looped public main should be adequate to provide fire flows however a flow test will be provided to verify. This main should also be adequate to provide duration of fire flow required by fire code.

C. Existing Conditions

Currently, the site is a developed convenience store building. Site is served by a meter tapped to the 6" main in Gold Dust. A Fire hydrant is located on this line. The overall center has a public water line in easement that feeds a 2nd hydrant at the Scottsdale Road Driveway.

D. Proposed Conditions

The New Circle K building will construct a new 4968 SF building and Demolish the Existing circle K. Existing Fire Hydrant at the Gold Dust Drive will be remain or slightly relocated as needed. Existing Hydrant near the Northeast corner of the site will remain. Existing water meter will be relocated due to sidewalk widening on Gold Dust.

All systems after the meter are the responsibility of the private land owner. This project does not include any public water lines or new fire hydrants. There are 2 existing hydrants serving the site (One located at each driveway).

This project is in city water zone 2 and does not abut city water zone 1 or 3. This project will require 1500 gpm for fire flows and 19 gpm for the Peak Hour Demand.

E. Computations

Circle K Project SF: 4968 SF
Average Day Demand: 0.8 gallons per SF= 3974 gal per day
Max Day Demand: 2x Average Day Demand = 2 x 3974= 7948 gal per day
Peak Hour Demand: 3.5x Average Day Demand (use a conservative 12 operational hours per day) = (3.5 x 3974) / 12 hours = 1159 gal per hour (19 gpm)

Fire Demand: 1500 gpm
Peak Hour with Fire Demand: 19 gpm + 1500 gpm = 1519 gpm

Flow test performed 5-23-2017 results:
Static: 72 psi, Residual: 47 psi, flow: 2256 gpm (includes 18 psi safety factor)

Minimum required: 30 psi residual, 1519 gpm.

Flow test summary: flow test shows over adequate fire flow available well above minimum required 30 psi.

F. SUMMARY

- This project is the redevelopment of an existing convenience store with fuel.
- Existing water meter will be relocated to serve the new building.
- Fireline will be Constructed to serve new sprinklers within the building.
- Existing hydrants (Scottsdale driveway and Gold Dust Driveway) will remain unchanged (or minor adjustment if needed) and will serve the project.
- Project will require 1500 gpm fire and 19 gpm Peak Hour Demand.
- Flow test performed on 5-23-17 shows adequate fire flows and pressures available.

G. SUPPORTING MAPS / REFERENCES

1. City of Scottsdale, Design Standards and Procedures Manual, January 2012.
2. City of Scottsdale, QS 28-44

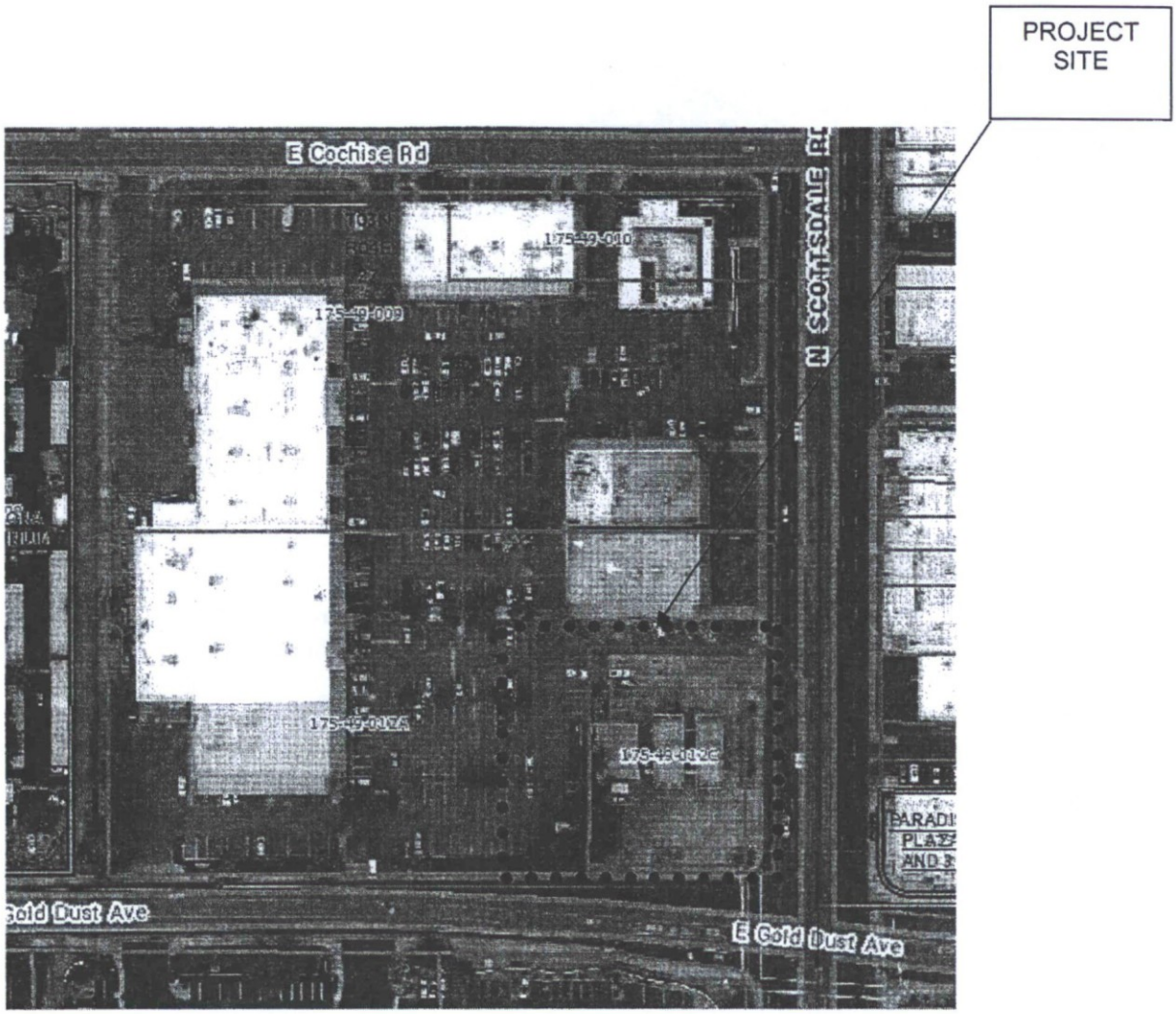


Figure 1-VICINITY MAP

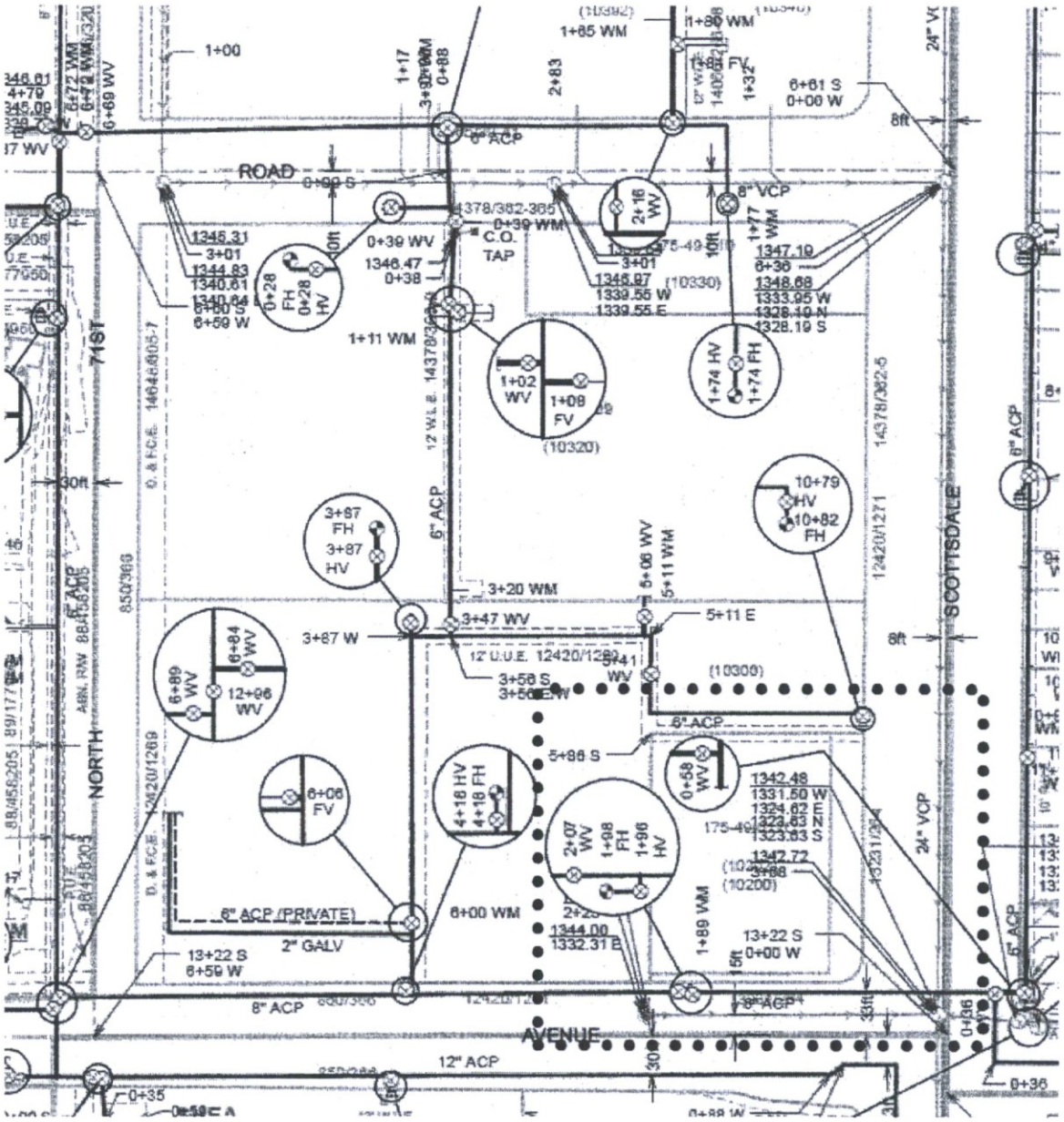


Figure 2-WATER-SEWER QS MAP

Figure 3-Flow Test Results

E·J | Flow Test Summary

Project Name:	EJFT 17103
Project Address:	10200 N Scottsdale Rd, Scottsdale, AZ 85253
Date of Flow Test:	2017-05-23
Time of Flow Test:	8:20 AM
Data Reliable Until:	2017-11-23
Conducted By:	Austin Gourley & Eder Cueva (EJ Flow Tests) 602.999.7637
Witnessed By:	Phil Cipolla (City of Scottsdale) 802.828.0847
City Forces Contacted:	City of Scottsdale (602.828.0847)
Permit Number:	C53144
Note	Scottsdale requires a max static pressure of 72 psi for safety factor.

Raw Flow Test Data

Static Pressure:	90.0 PSI
Residual Pressure:	65.0 PSI
Flowing GPM:	2,256
GPM @ 20 PSI:	3,933

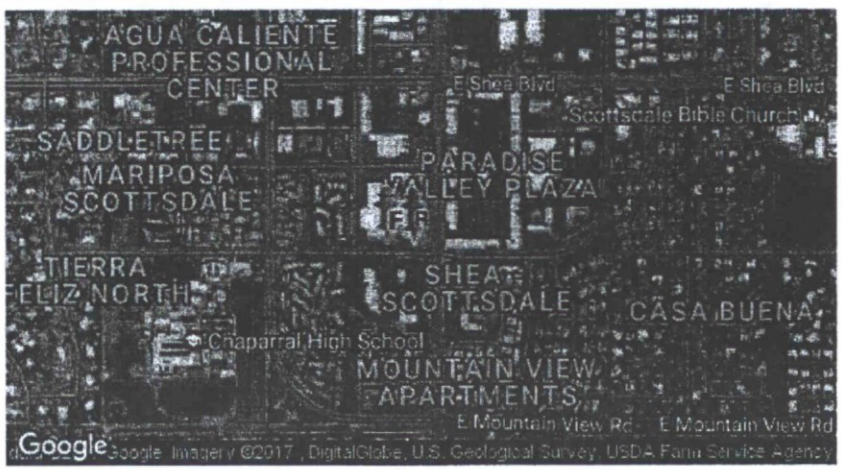
Data with a 18 PSI Safety Factor

Static Pressure:	72.0 PSI
Residual Pressure:	47.0 PSI
Flowing GPM:	2,256
GPM @ 20 PSI:	3,350

Hydrant F_1

Pitot Pressure (1):	40	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	4	inches

Additional Coefficient 0.83 on orifice #1



Static-Residual Hydrant

Flow Hydrant

Distance Between F_1 and R
218 ft (measured linearly)

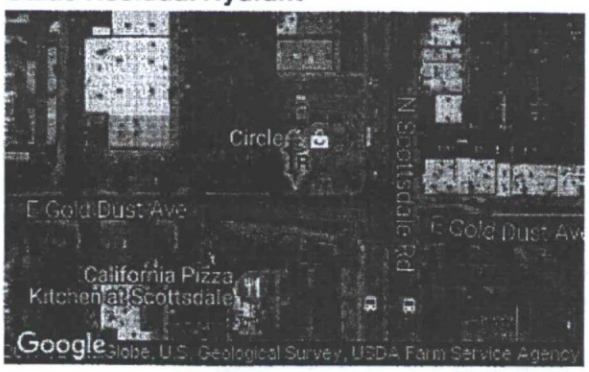
Static-Residual Elevation
1345 ft (above sea level)

Flow Hydrant (F_1) Elevation
1344 ft (above sea level)

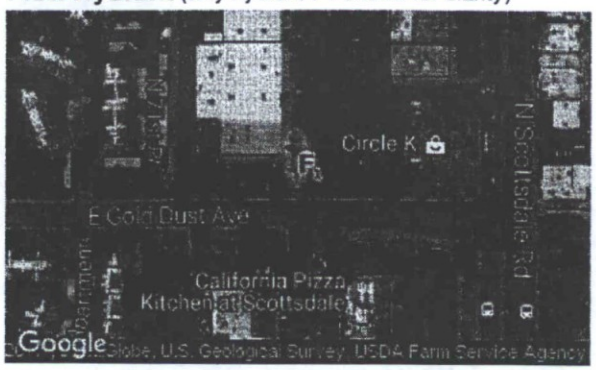
Elevation & distance values are approximate

EJ Flow Tests, LLC
21505 North 78th Ave. | Suite 125 | Peoria, Arizona 85382 | (602) 999-7637 | www.ejengineering.com
John L. Echeverri | NICET Level IV 078493 SME | C-16 FP Contractor ROC 271705 AZ | NFPA CFPS 1915

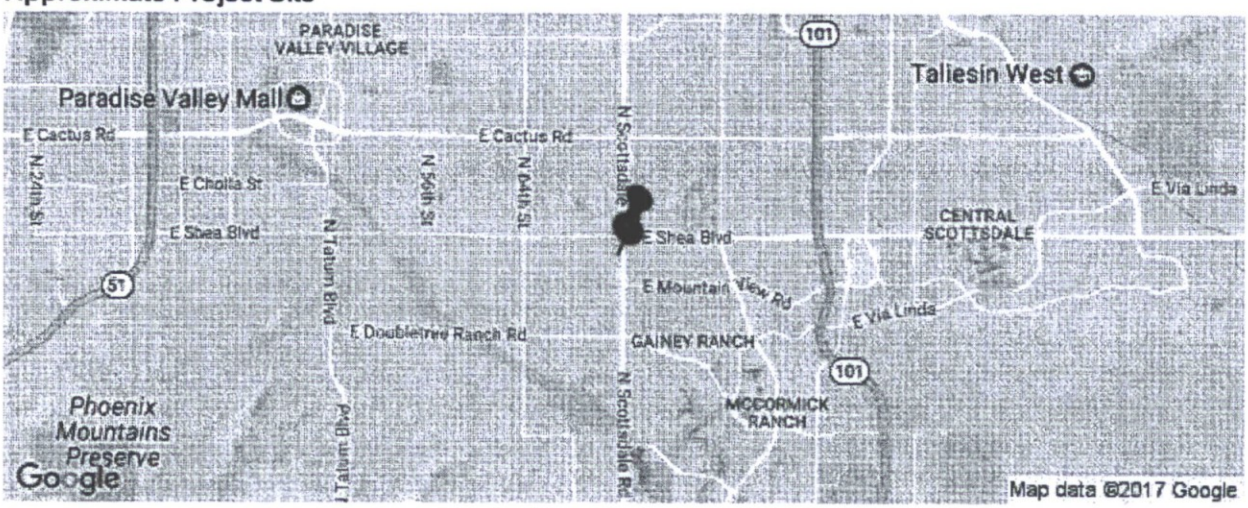
Static-Residual Hydrant



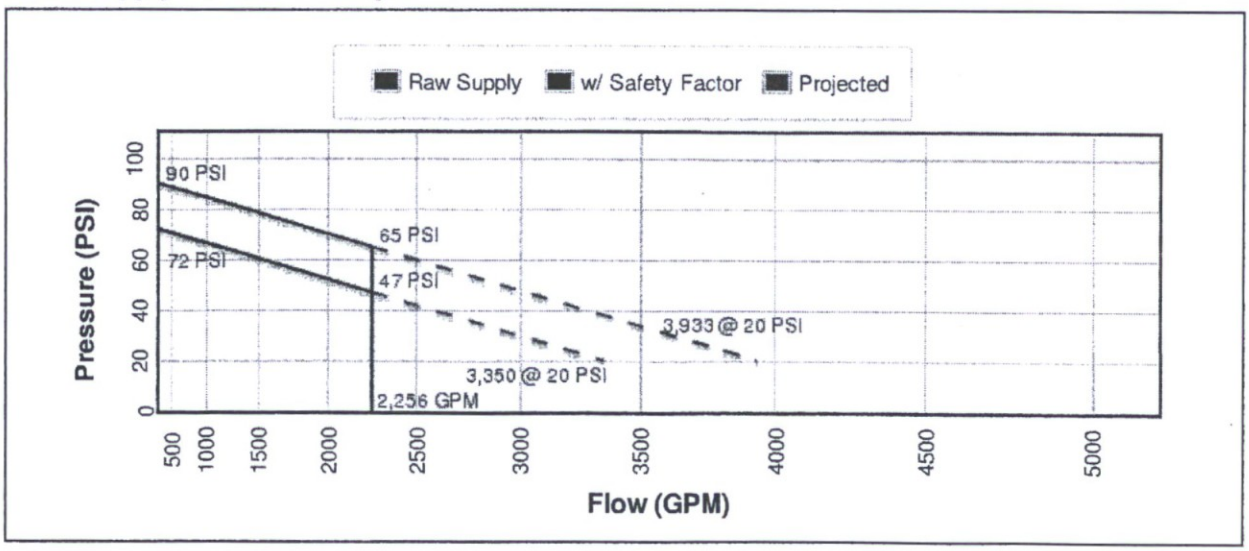
Flow Hydrant (only hydrant F1 shown for clarity)

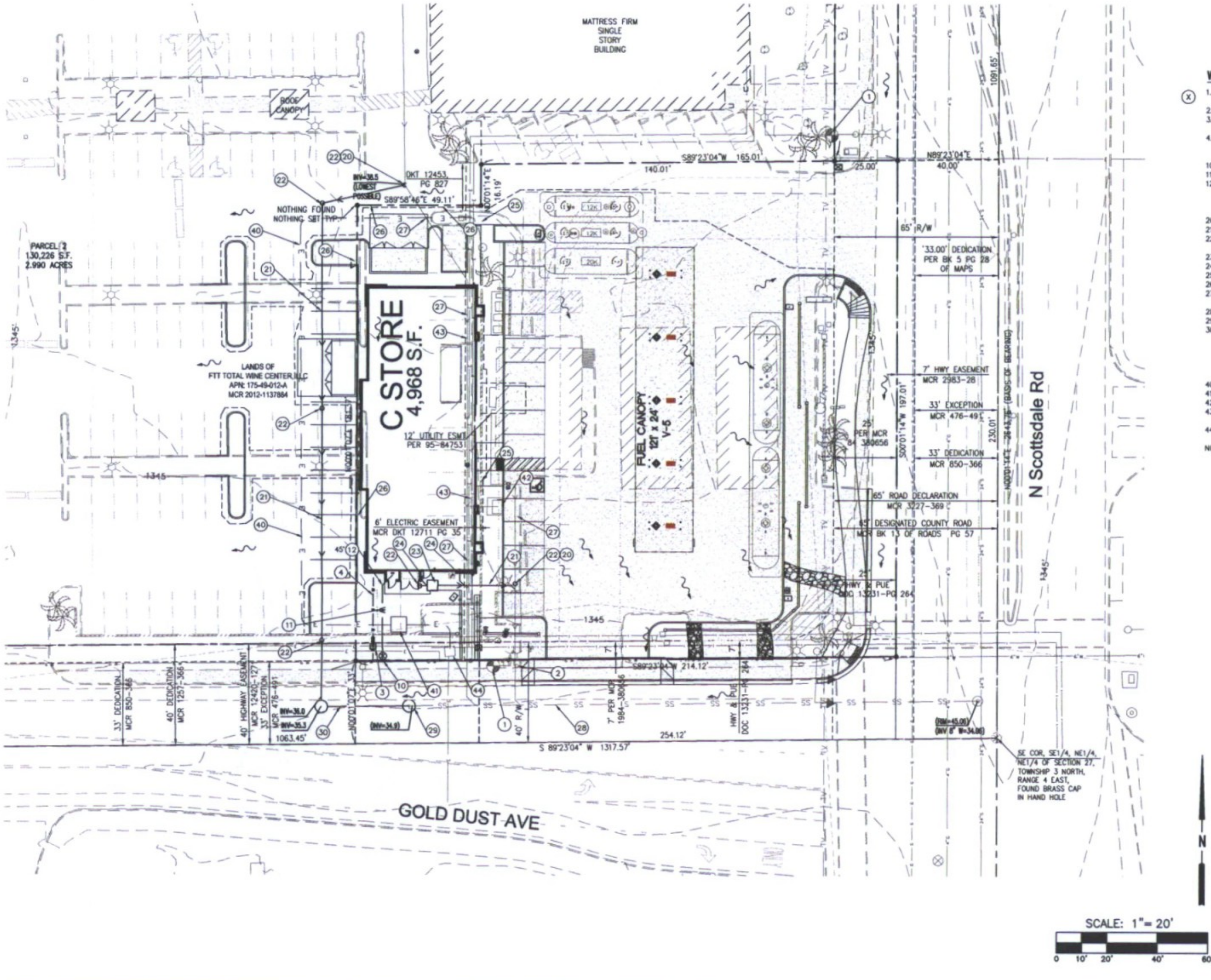


Approximate Project Site



Water Supply Curve $N^{1.85}$ Graph





WATER NOTES

(X)

1. EXISTING FIRE HYDRANT - ADJ GOLD DUST HYDRANT OUT OF NEW WIDENED SIDEWALK.
2. EXISTING WATER SERVICE - REMOVE
3. INSTALL NEW WATER SERVICE WITH BACKFLOW WITH BACKFLOW PER PER COS STD DET WITH LOCKABLE CAGE
4. NEW 2" PVC SC 40 WATER WITH TRACER WIRE

10. INSTALL 6X4 TS&V
11. INSTALL 4" DIP FIRELINE
12. INSTALL BEND PER DEGREE NOTED. RESTRAIN ALL JOINTS

20. LOCATE EXISTING ONSITE SEWER CUT IN AND CONNECT NEW SEWER
21. NEW 4" OR 6" PVC SDR-35 ONSITE SEWER WITH TRACER WIRE
22. NEW CLEANOUT PER MAG STD DET 441 WITH TRAFFIC LID PER MAG STD DET 270.
23. SEE MEP PLANS FOR GREASE INTERCEPTOR
24. SEE MEP PLANS FOR CONTINUATION
25. LOT LINE TO BE RELOCATE
26. NEW LOT LINE
27. REMOVE UNUSED EXISTING ONSITE SEWER AND BACKFILL PER GEOTECH RPT
28. EXISTING PUBLIC SEWER
29. CLEANOUT NOT FOUND
30. EXTEND PUBLIC SEWER WITH TWO NEW MANHOLES.

40. RELOCATED APS UNDERGROUND PRIMARY AND SECONDARY.
41. NEW 3 PHASE TRANSFORMER
42. REMOVE EXISTING 3 PHASE TRANSFORMER
43. REMOVE ABANDONED APS CONDUITS UNDER BUILDING FOOTPRINT AND BACKFILL PER GEOTECH REPORT.
44. EXISTING APS SWITCHGEAR TO REMAIN

NOTE: ALL APS WORK SHALL BE THEIR FINAL PLANS AND EASEMENTS

CLIENT:
Land Dev. Consultants
11811 N. Tatum Boulevard, Suite
Phoenix, AZ 85028
ph: 602-494-5210
fax: 602-497-0087
contact: Bill Scarbrough

PRELIMINARY

30489 STEVEN R. BOWSER ARIZONA U.S.A. Expires 09/30/2017

Helix Engineering
Engineering / Surveying / Co
3240 E Union Hills
Suite 112
Phoenix AZ 85050
(ph) 602-788-2616
www.hxeng.com

TWO WORKING DAYS BEFO CALL FOR THE BLUE STA 1-800-782-5348 BLUE STAKE CENTER

RELEASE	
DATE	
10-14-16	Prelim GD
2-17-17	Revised Site plan
2-24-17	Revised Site Plan
2-27-17	Revised Site plan
3-29-17	Revised Site Plan
3-31-17	Revised Site Plan

REVISIONS	
NO.	DATE
△	
△	
△	
△	

PROJECT NAME
CIRCLE K

PROJECT ADDRESS
10200 N. Scottsd
85253
Gold Dust / Scott

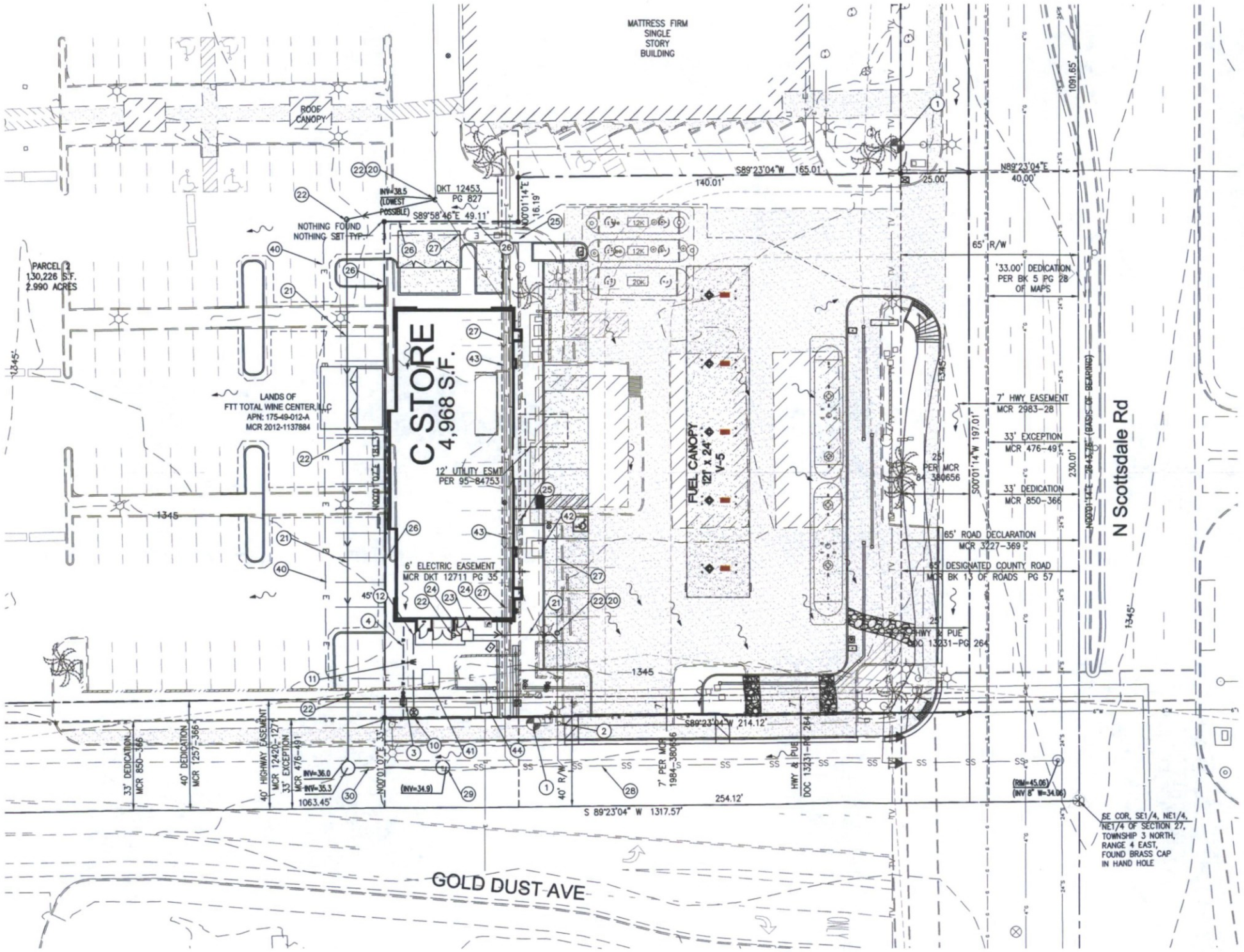
PROJECT AREA

HELIX JOB NUMBER
243

SHEET TITLE
W-S PLAN

SHEET
C-4

PLOT SCALE: 1:1 @ 24"x36"



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11811 N. Tatum Boulevard, Suite 1051
Phoenix, AZ 85028
ph: 602-604-5210
fax: 602-997-0807
contact: Bill Searbrough

PRELIMINARY

Registered Professional Engineer
CERTIFICATE NO.
30489
STEVEN R.
BOWSER
ARIZONA U.S.A.
Expires 09/30/2017

Helix Engineering, LLC
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REVISIONS		
NO.	DATE	
1		
2		
3		

PROJECT NAME
CIRCLE K

PROJECT ADDRESS
10200 N. Scottsdale Rd.
85253
Gold Dust / Scottsdale Rd

PROJECT AREA

HELIX JOB NUMBER	IN HOUSE
243	DRAWN BY: HXE CHECKED BY: SB

SHEET TITLE
W-S PLAN

SHEET	PAGE
C-4	4 OF

3-UP-2016

Mar 24, 2017 – 9:31am
...2085\243 Circle K Gold Dust & Scottsdale\DWGS\PRE GMP\243_prelim gd.dwg

Final Drainage Report

For
Circle K
Northwest Corner of Scottsdale / Gold Dust
N. Scottsdale Rd

Scottsdale, AZ

Case Numbers:
Plan Check Number:
Job: 243
October 2016

Prepared by:

Steve Bowser, PE
Helix Engineering, LLC
3240 E. Union Hills Dr #112
Phoenix, AZ 85050
602-788-2616
sb@hxeng.com

EXP 9-30-17

Plan # _____
Case # 10-DR-2017
Q-S # _____
☑ Accepted
☐ Corrections
N. Baronas 3-24-17
Reviewed By Date

FINAL DRAINAGE REPORT
FOR
Circle K
Northwest Corner of Scottsdale / Gold Dust
Scottsdale, Arizona

1.0 INTRODUCTION

The proposed site is located at the Northwest corner of Scottsdale Rd. and Gold Dust in the City of Scottsdale, Arizona. The site is situated within the Northeast quarter of Section 27, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The site is an existing small footprint Circle K Convenience store along with some adjacent parking on the retail site west of the Convenience store. This project fronts on Scottsdale Road.

2.0 OBJECTIVES – PROJECT DEVELOPMENT AND BACKGROUND

The purpose of this report is to verify the site compliance with the drainage requirements set forth in the *Drainage Design Manual for Maricopa County, Volume II "Hydraulics,* prepared by the Maricopa County Flood Control District; and the City of Scottsdale Design Standards and Procedures Manual dated January 2010 and drainage guidelines revised in 2012.

3.0 EXISTING SITE CONDITIONS

Currently, the site is a developed drive convenience store with two fuel canopies with 4 driveways to public streets. Immediately west of the convenience store is existing retail parking. North of this site is another retail building with parking along the south side of that building. The gas canopies and retail were developed prior to 1980.

Existing convenience store / fuel areas flow from the northwest to the southeast and outfall thru the driveways along Scottsdale Road and Gold Dust. The convenience store currently has no retention.

The Retail site to the west flows to the west to the driveway east of the retail where the inverted crown directs flows the south side of the retail to a drainage channel behind the retail.

Flows in Scottsdale Road flow north to south. Flows in Gold dust flow east to west and outfall to the channel west of the retail.

Regional flows in the area are conveyed to a channel south of Mountain View and Scottsdale Road. These flows outfall to the Indian Bend Wash.

Both the existing Circle K site and Retail site contain no retention within the areas being developed on this project.

4.0 FLOOD PLAIN DESIGNATION

The entire site lies within Zone "X shaded" designated flood zone per the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM), Map Numbers 1760L, dated October 16, 2013.

See Figure 2 for a copy of the FEMA map.

The rebuilt Convenience will be in excess of 14" above the low outfall.

5.0 PROPOSED SITE IMPROVEMENTS

STORMWATER RETENTION / SITE IMPROVEMENTS

This project was reviewed to verify if any increase in C factor will require any site retention. Area reviewed is the area disturbed by this project. Each area was analyzed for existing C factor. Existing non paved areas were analyzed using a C factor of 0.45. Existing paved areas were analyzed using a C factor of 0.95. Pre construction Weighted existing C factor was calculated to be 0.90. Post construction Weighted existing C factor was calculated to be 0.87

The new project will be a net reduction in pervious area, therefore not requiring any new retention. Existing convenience store flow directions will remain unchanged. Retail site flow directions will also remain unchanged. Minor changes are change from outfalls thru former driveways to outfall thru landscape areas (for the two driveways being removed.

ULTIMATE OUTFALLS

This project's ultimate outfall will remain at the southwest corner of the site. The finish floor is in excess of 14" above this elevation. This outfall is unchanged from historical.

DISPOSAL

Site will not construct any new retention.

404 AND CONSTRUCTION STORMWATER

This project is not located in a 404 wash. BMPs during construction will be maintained.

6.0 SUMMARY

- This project is the redevelopment of an existing convenience store, removal of two driveways and conversion of some retail parking to convenience store use.

- The site does not accept any flows from the offsite streets. Both streets are fully developed.

- The Project Site is located within FEMA designated flood zone "X". New building will be greater than 14" above site outfall.

- Site currently has no retention which will remain unchanged. Flow directions will remain unchanged and some onsite retention will flow thru landscape areas that were formerly driveways.

- New construction will be a net significant reduction in C factor and no new formal retention is required.

7.0 REFERENCES

1. Federal Emergency Management Agency, Flood Insurance Rate Map, Maricopa County, Arizona and Incorporated Areas, Map Number 04013C1760L, Oct 16, 2013.

2. City of Scottsdale, Design Standards and Procedures Manual Chapter 4, January 2010.

Figure 1-VICINITY MAP / AERIAL MAP

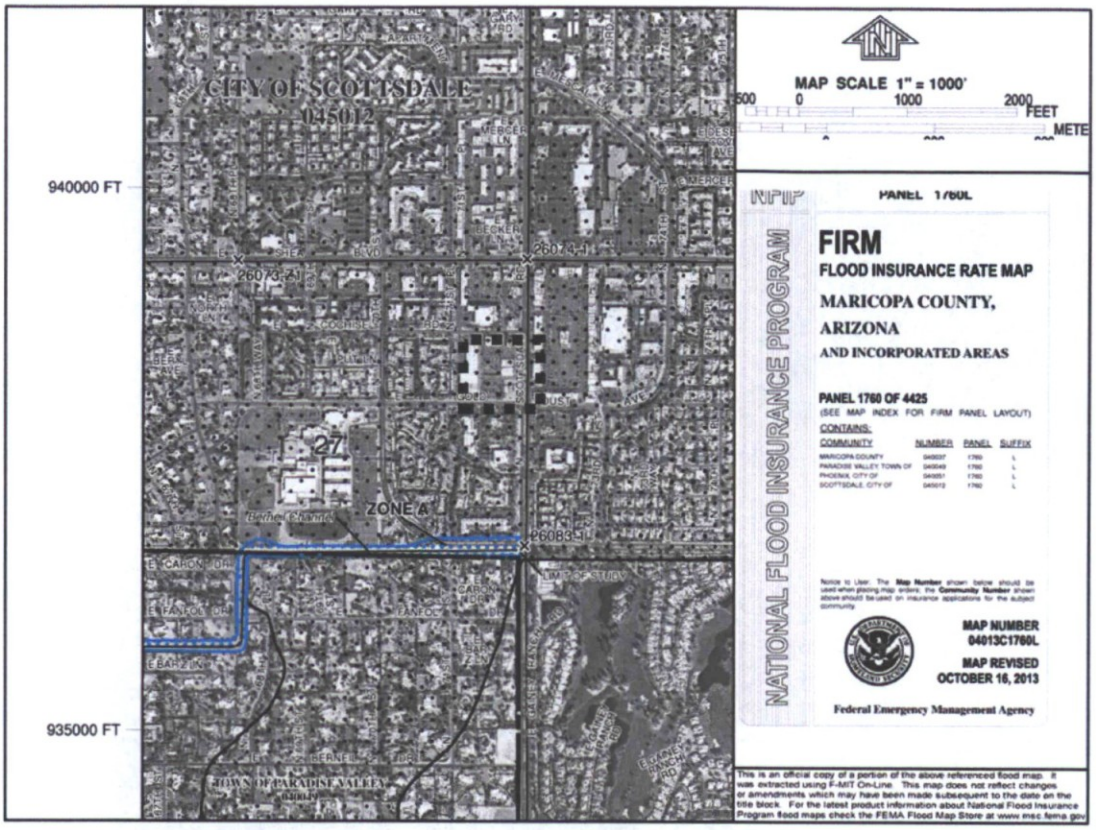


Figure 2-FEMA MAP

Figure 3 - C factor Calculations

Pre Construction		Areas	C	CxA
Impervious Areas	21357 10081			
		31438	0.95	29866
Pervious Areas	2678 160 110 298			
		3246	0.45	1461
TOTALS		34684	**0.90**	31327

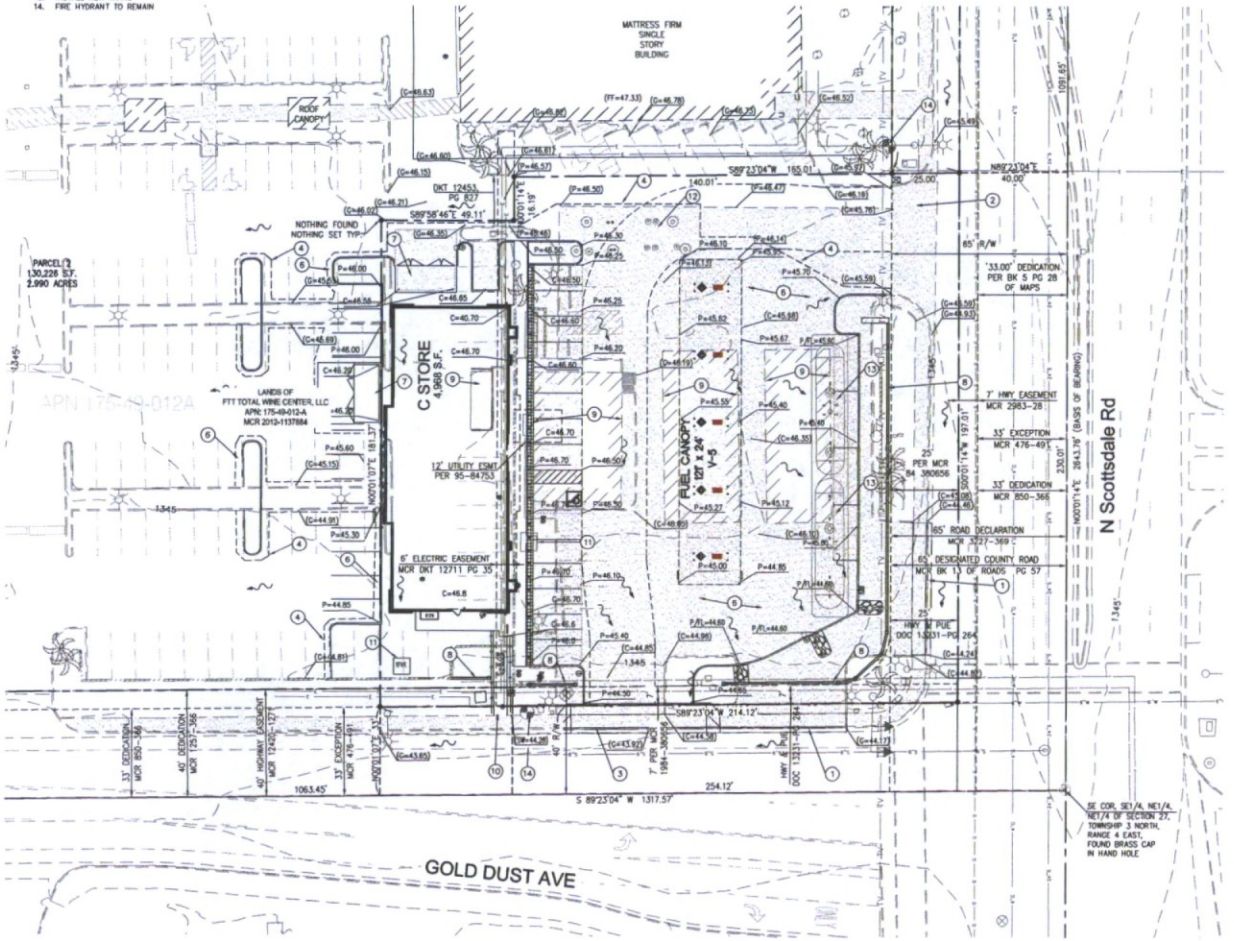
Post Construcion		Areas	C	CxA
Impervious Areas	29242			
		29242	0.95	27780
Pervious Areas	2614 1485 917 426			
		5442	0.45	2449
TOTALS		34684	**0.87**	30229

Figure 4 - GD Plan

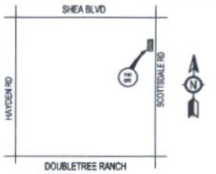
CIRCLE K
PRELIMINARY G/D PLAN
10200 N. SCOTTSDALE RD, 85253

KEYED NOTES

(X)
1. REMOVE DRIVEWAY AND PLACE VERTICAL CURB AND SIDEWALK
2. DRIVEWAY TO REMAIN
3. REPLACE EXISTING DRIVEWAY WITH DRIVEWAY PER COS STD DET XXX
4. SAWCUT LINE
5. NEW CONCRETE PAVING
6. NEW ASPHALT PAVING
7. NEW REFUSE ENCLOSURE
8. NEW SCREEN WALL
9. DEMOLISH EXISTING BUILDING AND STRUCTURES
10. SIDEWALK WITH HANDRAIL
11. EXISTING TRANSFORMER TO BE RELOCATED
12. REMOVE EXISTING TANKS (COMPLY WITH ALL ENVIRONMENTAL REGULATIONS)
13. INSTALL NEW TANKS
14. FIRE HYDRANT TO REMAIN



SCALE: 1" = 20'
0 10' 20' 40' 80'



VICINITY MAP
SECTION 27
T3N R4E G&SRB&M
MARICOPA COUNTY, ARIZONA

DEVELOPER:
CIRCLE K STORES INC.
1130 WEST WARNER ROAD
BUILDING B
TEMPE, ARIZONA 85284

DEVELOPERS REPRESENTATIVE:
LAND DEVELOPMENT
CONSULTANTS, LLC
11811 N. TATUM BLVD. #1051
PHOENIX, ARIZONA 85028
PHONE: 602-850-8101
FAX: 480-393-0946
CONTACT: BILL SCARBROUGH

ARCHITECT:
GREENBERG FARROW
19000 MACARTHUR BLVD., SUITE 250
IRVINE, CA 92612
TEL: 949-296-0450
FAX: 949-296-0437
CONTACT: CAROLINE SHAW

ENGINEER:
HELIX ENGINEERING, LLC
3240 E. UNION HILLS DR #112
PHOENIX, ARIZONA 85050
TEL: 602-788-3618
CONTACT: STEVE BOWSER

PROJECT INFORMATION

PROJECT NAME: CIRCLE K
PROJECT ADDRESS: 10200 N SCOTTSDALE RD, 85253
PROJECT DESCRIPTION: REDEVELOPMENT OF AN EXISTING COMMENCENCE STORE AND FUEL CANOPY.

SITE DRAINAGE DATA

PRE CONSTRUCTION SITE CONDITION:

EXISTING FUEL STATION AND ADJACENT RETAIL CONSTRUCTED PRIOR TO 1980.

IMPERVIOUS AREA (0.95): 31438 SF
PERVIOUS AREA (0.45): 3246 SF
WEIGHTED C: 0.90

POST CONSTRUCTION SITE CONDITION:

IMPERVIOUS AREA (0.95): 29242 SF
PERVIOUS AREA (0.45): 5442 SF
WEIGHTED C: 0.87

DIFFERENCE IN PRE / POST C FACTOR: - NET SUBSTANTIAL REDUCTION IN C FACTOR, THEREFORE NO FORMAL RETENTION REQUIRED OR PROVIDED

CLIENT:
Land Dev, Consultants, LLC
11811 N. Tatum Boulevard, Suite 1051
Phoenix, AZ 85028
ph: 602-404-8210
fax: 602-997-4607
contact: Bill Scarbrough

PRELIMINARY

Helix Engineering, LLC
Engineering / Surveying / Consulting
3240 E Union Hills
Suite 112
Phoenix AZ 85050
ph: 602-788-3618
www.hxeng.com

TWO WORKING DAYS BEFORE YOU DIG, CALL FOR THE BLUE STAKES
1-800-782-5348
BLUE STAKE CENTER

RELEASE	
DATE	
10-14-16	Prelim GD

REVISIONS	
NO.	DATE
1	
2	
3	

PROJECT NAME
CIRCLE K

PROJECT ADDRESS
10200 N. Scottsdale Rd.
85253
Gold Dust / Scottsdale Rd

PROJECT AREA

HELIX JOB NUMBER: 243
IN HOUSE
DRAWN BY: KHK
CHECKED BY: SB

SHEET TITLE
PRELIMINARY GD PLAN

SHEET: GD-1
PAGE: 1 OF 1

PLOT SCALE: 1:1 @ 24"x36", 1:2.2 @ 11"x17"

Oct 14, 2016 - 9:44am
S:\JOBS\243 Circle K Gold Dust & Scottsdale\DWGS\PRE GRD\243 prelim grd.dwg

COS