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PRELIMINARY MASTER DRAINAGE REPORT

BLUE SKY SCOTTSDALE

Plan # _____
Case # 62-DR-2011
Q-S # _____
☒ Accepted
☐ Corrections
[signature] 2-14-13
Reviewed By Date

JANUARY 2013
DEA PROJECT NO. GRYD00001

DAVID EVANS AND ASSOCIATES INC.

5a-11-1-13

PRELIMINARY MASTER DRAINAGE REPORT 3OR

BLUE SKY SCOTTSDALE

PREPARED FOR

GRAY DEVELOPMENT
1400 E. CAMELBACK ROAD, SUITE 275
PHOENIX, AZ 85018

PREPARED BY

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Exp: 3-31-2014

January 2013
DEA PROJECT NO. GRYD00001

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Exp: 3-31-2014

1.0 INTRODUCTION

This preliminary drainage report has been prepared under a contract with Gray Development, LLC, owner and developer of the Blue Sky Scottsdale project in Scottsdale Arizona. The purpose of this report is to provide drainage analysis, required by the City of Scottsdale, to support the Blue Sky Scottsdale improvement plans for Phase 1 and ultimate buildout. Preparation of this report has been done in accordance with the procedures detailed in the *City of Scottsdale Design Standards and Policies Manual* (Reference 1) along with the City of Scottsdale *Supplement to MAG Uniform Standard Specifications For Public Works Construction* (Reference 2) and *Drainage Design Manuals for Maricopa County, Arizona, Volumes I and II* (Reference 3 and 4).

The proposed Blue Sky Scottsdale project is located northeast of the intersection of Scottsdale Road and Camelback Road, within the City of Scottsdale, Maricopa County, Arizona. The site is located within Section 23, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian.

The site is bounded by Coolidge Street to the North, Safari Drive condominium to the northeast, Arizona Canal to the east, Renaissance Center (commercial development) to the south and Scottsdale Road to the West. See Exhibit 1 Vicinity Map, in Appendix A. Access to the site will be provided via two entrances from Scottsdale Road along 72nd Place (Fashion Square) and Coolidge Street. The project is located within what is considered the Downtown Core Area of the City of Scottsdale General Plan. Refer to waiver section in Appendix J.

The proposed Blue Sky Scottsdale project is approximately of 3± acres. There are at least two phases for this project as shown in Exhibit A located in Appendix A, with the first phase consisting of the northern most tower and garage only (265 units). The Blue Sky Scottsdale project will be a mixed use development consist of 749 multi-family residential apartments with 91,000SF of commercial space, the commercial space will consists of 30,000SF grocery store, 15,000SF Restaurant, 13,000SF Retail, 28,000SF Club/fitness house, and 5,000SF office. There will be 4-levels of below grade parking that will provide approximately 1,511 parking spaces.

2.0 EXISTING DRAINAGE CONDITIONS

The initial offsite drainage conditions were analyzed in the previous phase of the project (Safari Drive) and have been referenced and updated based on the latest topographic information and available documents. The updated drainage information is used as the base of the design of the current phase (Blue Sky Scottsdale).

According to the topography in the area, the general lay of the land is in a southeasterly direction towards to the Arizona Canal, where runoff ponds against the canal before it is conveyed through the box culvert or weirs over the canal until such time as the receiving system along the canal has reached capacity to receive the runoff. Offsite runoff that reaches the northeastern portion of the site is conveyed along western boundary of the Arizona Canal in a southwesterly direction through an existing underground box culvert that was constructed as part of the initial phase of the Safari Drive project. According to SRP, the Arizona Canal is to be drained during major storm events,

which would be in addition to the 4-foot of freeboard that exists typically, which would allow the canal to accept even more additional storm runoff.

The site is located in an area that drains into what is known as Reach 4 of the Flood Control District's side channel drainage system. There is a series of grated inlet structures that capture runoff along the western side of the canal and convey runoff into the underground box culvert mentioned above which outfalls into the storm drain system in Camelback Road. Some of the grate inlet structures are several feet in size and can capture large amount of the runoff that reaches the area.

Scottsdale Road is a fully improved street with curb and gutter that drains in a southerly direction, adjacent to the site, towards Camelback Road. The majority of the runoff along Scottsdale Road is conveyed within the street section of the road with a smaller portion conveyed into the existing storm drain system along Scottsdale Road that outfalls into the main storm drain within Camelback Road.

It is estimated that there is approximately 1,202 cfs that would reach the intersection of Camelback and Scottsdale Roads according to the Final Drainage report of the Fill plan prepared by DEA (Reference 10). The runoff will weir over the Arizona Canal bank into the canal itself, which is supposed to convey the runoff. 75 cfs of the runoff will spill over Camelback Road in a southerly direction.

The current published FEMA Flood Insurance Rate Map (FIRM) for this area is 04013C1695H (Effective date is September 30, 2005). Portions of the site were located within Zones A and X. Zone A is defined as the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations or depths are shown within this zone. Zone X is defined as "areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 100-year flood." A copy of the FIRM panel is provided in Appendix B.

A Conditional Letter of Map Revision (CLOMR) has been filed to remove the floodplain from a portion of the site; however, with recent changes in the Scottsdale code, this fill may not be required. Refer to Appendix G for a copy of the CLOMR application.

3.0 PROPOSED DRAINAGE CONCEPT

The proposed drainage concept is presented in three parts: onsite drainage, off-site drainage, and storage requirements. The hydrologic analysis is included in section 4.0 and the hydraulic analysis is included in section 5.0. See Exhibit A, located in Appendix A, for an illustration of the proposed drainage concept.

3.1 On-site Drainage Conveyance

The Blue Sky Scottsdale site runoff is mostly generated on roofs, hardscape and landscape areas associated with the proposed buildings and the courtyard areas (non vehicular surfaces. The runoff generated on the roof is conveyed through roof drains that direct runoff into onsite storm drain system, ultimately directly into the box culvert west of the Arizona Canal. Refer to Exhibit A in Appendix A for a graphical illustration of the proposed onsite grading design. During Phase 1, runoff will bubble up at grade and sheet flow across the site into the channel that currently exists along the canal. No additional runoff will discharge into the canal, as a temporary storage basin will be constructed to match pre versus post runoff conditions.

The pipe layout shown in the Exhibit A illustrates the ultimate drainage intent for the site. During final design the pipes will be shown on the plumbing plans as they are part of the garage structure. The civil documents will show connections from the garage to the existing 8'x6' box Culvert along the Canal. Water treatment will be provided for connections to the box culvert unless it is clean water.

Phasing

If ultimately it is determined to be necessary, the fill on the fill plan will remove the site out of the floodplain through a LOMR-F process.

It should be noted that for Phase 1construction will be outside the floodplain and one foot of freeboard will be maintained for the finish floor elevations and the garage entrances. During Phase 1, there will be stormdrain pipes that run to the east to convey onsite runoff across the drive and then sheet flow into the existing 8'x6' culvert along the Arizona Canal.

Future construction will also consider the floodplain requirements with one foot of freeboard being maintained for the finish floor elevations and the garage entrances. During future phases, the stormdrain pipes conveying Phase 1 onsite runoff, going through Phase 2 area, will be re-routed within the proposed garage to allow for the next phase construction. The connections or stubs to the 8'x6' will be maintained and reused with new storm pipes going through the garage.

The Canal improvements will be part of later phases. At that time, retaining walls will be installed around the existing drainage structures along the canal during the canal improvements to match existing inlet capacities. Any easements for the existing structures will be coordinated with the reviewer during the final design process.

3.2 Off-site Drainage Conveyance

The hydrology for this report is based on the approved final drainage report completed by CVL in 1999 (Reference 8). Since then there has been development that took place to the north and west of project site, which restricted the offsite flow from reaching the Arizona

Canal. Offsite drainage conditions were studied in the initial phase of the project (Safari Drive) and they are modified during the design of the current phase (Blue Sky Scottsdale) based on the latest available drainage information. Although the original drainage information has been used, it is important to mention that Goldwater Boulevard acts as a buffer from offsite flow since it is a raised road in the north east directions and has a major depression that does not flood in the north south directions.

As mentioned earlier, there are only three ways the site can be impacted by offsite runoff. The first area that runoff can impact the site is along the northeastern portion of the site, where runoff is being conveyed in a southwesterly direction along the west bank of the Arizona Canal. The second area offsite runoff that could potentially impact the site is from runoff flowing south along Scottsdale Road. The last potential impact to the site is from runoff reaching the intersection of Camelback Road and Scottsdale Road that weir over the Arizona Canal and backs up towards the site.

The first area of investigation was to quantify the offsite runoff along the northeastern portion of the site. Runoff that may impact the site is generated north of Chaparral Road. During field visits it was observed that an 8'x4' concrete box culvert underneath Chaparral Road, west of the Arizona Canal. Few feet upstream of the culvert, is a 20.5'x13' grate inlet structure. Runoff from the north captured by the grate inlet is conveyed in an easterly direction through an approximately what seemed to be a 96" pipe underneath the Arizona Canal. Any runoff that bypasses the grate inlet structure (which is not likely) will flow through the 8'x4' culvert, underneath Chaparral Road, in a southerly direction.

Based on the maximum capacity of 8'x4' box culvert, 277 cfs will flow in southerly direction, of which 200 cfs will spill into the Arizona Canal and the remaining 77 cfs will continue in the southerly towards the Blue Sky Scottsdale project. This quantification was part of the approved Safari drive final drainage report. However these hydraulic calculations are not included in this report because runoff that reaches the site from the northeast is restricted by existing development to the north or captured by the 10'x6' box culvert inlet (north of Safari Drive). Additional runoff will spill over the Arizona Canal before reaching the BlueSky Scottsdale project. Refer to Picture 1 in Appendix A illustrates how the area north of the site, along the Arizona Canal, does not have hydraulic capacity to convey offsite flow.

The second area of investigation was runoff along Scottsdale Road. The final drainage report for Safari Drive (Reference 12) quantified 378 cfs in the vicinity of Scottsdale Road and Coolidge Road. Exhibit H, in Appendix A reflects the existing drainage conditions prior to the Safari Drive development. Scottsdale Road has a half street capacity, adjacent to the site, of approximately 160 cfs. The remainder of the 189 cfs (half the 378 cfs mentioned previously) used to weir into the Safari Drive site through Coolidge Street. To compensate for not allowing the 29 cfs from entering the site, two catch basins were installed along Coolidge Road as part of Safari Drive development that capture approximately 70 cfs from the street flow in Scottsdale Road. Refer to the StormCAD

output in Appendix D that shows that the existing catch basins will capture approximately 70 cfs.

Exhibit E in Appendix A reflects the grading information at the intersection of Scottsdale Road and Coolidge Road after the development of the Safari Drive project. The grading allows for runoff to enter the catch basins along Coolidge Road, especially when it exceeds two inches of depth at the gutter. This matched and exceeded the existing grading conditions prior to development of the Safari Drive project.

The ponding depth of 1.2' along the gutter elevation was calculated in the Final drainage report of Safari Drive (Reference 12). Hence the finish floors of the proposed buildings within the Blue Sky Project adjacent to Scottsdale Road are set at 1280.80, which is at least 1.2' above the gutter elevation in the street.

Under existing conditions, a flow of 119 cfs resulting from half street runoff of 189cfs along Scottsdale Road with 70 cfs diversion into Coolidge Street mentioned above will reach the intersection of Scottsdale Road and Fashion Square Drive. During phase 1, no changes will be made to this intersection; thereby allowing the existing drainage patterns to be maintained. At that intersection, 80 cfs will continue south along Scottsdale Road and 39 cfs will divert east into Fashion Square Drive. Ultimately, Fashion Square Drive (east of Scottsdale Road) will be raised as part of the future Blue Sky Scottsdale project development, this will not allow the 39 cfs to continue towards the canal along its historic path. However, since Coolidge storm system captured 70 cfs, which is 41 cfs in additional flow that can compensate for raising Fashion Square Drive. This means that the development will not adversely impact the development to the south. It is important to mention that the area south of the site is already in the floodplain and below the calculated high water elevation for the canal.

The third area of investigation and the last area that could impact the site is the intersection of Scottsdale road and Camelback road. CVL's drainage report (Reference 8 with pertinent excerpts in Appendix F) has quantified approximately 3,638 cfs will reach the intersection of Scottsdale Road and Camelback Road. This runoff will weir into canal with 75 cfs of the runoff will spill over Camelback Road. Refer to Appendix C for summary of the estimated peak Flows. During the initial phase of Safari Drive project, this flow is used to calculate the high water adjacent to the Arizona Canal. The modeling did not take into account the 8'x6' box culvert and no hydraulic calculations for the Camelback Road between Goldwater Boulevard and Scottsdale Road was included.

Based on the same drainage report prepared by CVL (Reference 8), the box culvert will carry approximately 1,000 cfs. The capacity of the culvert has been verified with StormCAD software and the data information is included in Appendix D.

There is approximately 823 cfs that spills into Camelback Road, west of Goldwater Boulevard, refer to exhibit C in Appendix A. FlowMaster computer program (Reference 7)

has been used to analyze the split flow at this intersection. The split flow analysis explanation is included in section 5.0 of this report. 184 cfs will flow north along Goldwater Boulevard, 245 cfs will flow south along Goldwater Boulevard and the remainder 393 cfs will continue east along Camelback Road. At the intersection of Marshall Way and Camelback Road; 125 cfs will flow south along Marshall Way and the remaining 268 cfs will continue east along Camelback Road. There are three catch basins along the south side of Camelback Road that will capture the remainder of the flow of 268 cfs. These catch basins can capture 288 cfs. Hence, 823 cfs will be subtracted from the total flow that weirs over the canal. Refer to Appendix D for FlowMaster data.

The drainage report prepared by Rick Engineering (Reference 11) dated 2007 for Scottsdale Fashion Square Phase 10 (pertinent excerpts are included in Appendix F), explains that no onsite or offsite flow will spill into the Scottsdale Road through the Fashion Square Mall. In addition, the grading of the area south of the mall drains to the south towards Camelback Road. Hence, the 543 cfs originally estimated by the final drainage report for Safari Drive that would spill into Scottsdale Road will be subtracted from the total flow that weirs over the canal.

Based on the above explanations, the 3,638 cfs runoff originally estimated is reduced by 2,436 cfs. The reduction is based on removing 70 cfs from Coolidge Street diversion, 823 cfs from Camelback Road diversions, 543 cfs from Fashion Square development and 1,000 cfs from the culvert system capacity diversion along the canal. The new flow used in the weir calculation is 1,202 cfs based on straight reduction for all the diversions which is a conservative approach and since a HEC-1 model has not been part of the scope of this study. Based on this reduced flow, the high-water along the Arizona Canal was calculated to be 1279.50. Refer to CulvertMaster (Reference 9) inputs/outputs in Appendix D. The canal overbank has been surveyed in order to model the weir for this report.

The existing finish floors of the buildings in the Renaissance Center development, south of Blue Sky Scottsdale, vary from 1278.20 to 1278.60, which is approximately 1-foot lower than the existing elevations along the adjacent Arizona Canal. This property may probably flood before runoff weirs over the Arizona Canal. Refer to Exhibit D for a section of the proposed and existing finished grade elevations.

The portion of the Blue Sky Scottsdale project that is under the floodplain will ultimately be raised above the 100-year base flood elevation (1279.50) as depicted on the Fill plans located in Appendix A. Based on the existing FEMA floodplain, a small portion of the flood plain is being replaced by the fill, approximately 5,690 CY. A portion of this volume will be compensated for in the existing box culvert that has excess storage volume of 670 CY.

The City of Scottsdale vertical datum elevation is 1277.619' based on the NAVD elevation. The proposed finish floor elevations and the future grade breaks at the garage entrances are set minimum 1 foot higher (1280.50) than the high water elevation which is 1279.50'. The

fill elevation is 80.00, which is 0.5 feet higher than the weir elevation. It is important to mention that raising the site above the floodplain was very challenging due to a steep transition from Scottsdale Road of almost 10 percent in one location.

Raising the site above the weir elevation should not impact the base flood elevation. The weir elevations along the canal are not altered. In addition two additional grate inlets structure 4'x4' will be added to increase the capacity of the grated inlets along the Canal. This will compensate for volume loss and accounts for the abandonment of an existing inlet structure along the east portion of the site. Refer to Exhibit C in Appendix A for illustration of the proposed structures and to Appendix D for hydraulic data sheets. The addition of the inlet structures will allow for less ponding behind the canal during smaller storm events that do not weir over the canal.

As previously stated, a CLOMR-F was approved for this project by FEMA. A copy of the Conditional Letter of Map Revision (CLOMR-F) has been included in Appendix G. A community support letter is included in the same Appendix. The CLOMR-F is based on raising the portion of the site currently lying in the 100 yr floodplain higher than the base flood elevation. Under this condition, the future proposed structures and finish floors will be free from inundation during a 100-year design storm event.

The future portion of the site that is in the flood plain will likely be raised as the part of fill plans to an elevation of 1280, which is above the 100 year base flood elevation determined in Reference 10 to be 1279.50.

3.3 Storage Requirements

The proposed Blue Sky Scottsdale project has retention waiver that has been approved and is included in Appendix J. Although the project has retention waiver, this project still provide some storage volume in underground/conveyance pipes.

Even though the storage requirements have been waived for the overall BlueSky project, water quality measures are still required in compliance with the Clean Water Act. As such two oil/sand separators have been proposed for this project for the areas subject to vehicular traffic (see attached detail for reference). One will be placed in the garage at the bottom of the ramp to treat anything coming out of the garage / ramp and the other at grade as part of the future canal phase to treat the runoff from the access drive. All other areas are considered clean runoff and not subject to vehicular traffic and water quality treatment. Drains around any mechanical equipment will be isolated and directed to the sanitary sewer system, as required by City of Scottsdale regulations.

4.0 HYDROLOGIC ANALYSIS

The hydrologic analysis for this report will be prepared using City of Scottsdale's *Supplement to MAG Uniform Standard Specifications for Public Works Construction* and the *Drainage Design*

Manuals for Maricopa County, Arizona, Volume I Hydrology. Peak flows will be computed using the Rational Method. The project site will be divided into several drainage areas, to determine peak flows at catch basins and inlet structures. These drainage areas are illustrated in Exhibit F, along with the location of their respective concentration points.

The following establishes the Rational Method equation and the basic input data required:

$$Q = C_{wt} * I * A$$

Where: Q = Peak discharge in cubic feet per second
C_{wt} = Weighted runoff coefficient
I = Rainfall intensity in inches per hour
A = Drainage area in acres

A summary for the peak flows for the 10-year (Q_{10}) and 100-year (Q_{100}) storm events for the developed onsite drainage conditions are summarized in a table format and included in Table 4.1 below.

Table 4.1 Summary of Peak Flows

Drainage Area	Q_{10} (cfs)	Q_{100} (cfs)
CP01	3	5
CP02	2	4
CP03	2	4
CPR4	2	4

Refer to Appendix E for detailed input/output sheets.

5.0 HYDRAULIC ANALYSIS

The hydraulic analyses of the proposed storm water management facilities will be based on the City of Scottsdale's *Supplement to MAG Uniform Standard Specifications for Public Works Construction* and the *Drainage Design Manuals for Maricopa County, Arizona, Volume II Hydraulics*.

StormCAD (Reference 6), a Haestad computer program, will be utilized to analyze the the drainage pipes. The hydraulic grade line will be kept below the ponding depth that is caused by the inlet capacities at different locations onsite.

FlowMaster (Reference 7), a Haestad computer program, has been utilized to analyze the hydraulic capacity for the adjacent street section to determine the 100-year high water surface elevations based on the determined offsite runoff. FlowMaster analysis is based on Manning's equation. Refer

to Appendix D for detailed input and output data sheets and to the Fill Plan report (Reference 10, section 5) for additional explanation of the split flows along Scottsdale Road.

6.0 CONCLUSIONS

Based on the results of this study, it can be concluded that:

- At least two phases of the Blue Sky Scottsdale project will be developed according to the City of Scottsdale Design Standards and Policies Manual.
- The proposed buildings and garage entrances will be free from inundation during a 100-year storm event.
- The site has a retention waiver will directly discharge into the existing box culvert along the western side of the Arizona Canal.
- The ultimate outfall (Elevation 1279.20) is located at the southeast corner of the project site maintaining the historic outfall condition.

7.0 REFERENCES

1. City of Scottsdale Design Standards and Policies Manual, December 1999
2. City of Scottsdale *Supplement to MAG Uniform Standard Specifications for Public Works Construction, June 2010.*
3. *Drainage Design Manuals for Maricopa County, Arizona, Volume I, Hydrology*, April 2002.
4. *Drainage Design Manuals for Maricopa County, Arizona, Volume II, Hydraulics*, April 2002.
5. City of Scottsdale Stormwater Master Plan and Management Program, KVL, 1994.
6. StormCAD Version 5.06.007, Haestad Methods, Inc. 2005.
7. FlowMaster Version 7.0005, Haestad Methods, Inc. 2005.
8. *Drainage Report Scottsdale Riverwalk Center Hotel* prepared by CVL dated April 9, 1999. Revised March 28, 2001.
9. CulvertMaster a Bently program V3.1, dated 2006.
10. Final Drainage Report for Fill Plans prepared for Blue Sky Scottsdale, October 2011, prepared by DEA Jan. 2012.
11. Preliminary Grading and Drainage Report by Rick Engineering Company dated 8-6-2012 for Scottsdale and Fashion Square.
12. Final Drainage Report for Safari Drive, prepared by David Evans and Associates, Oct 2006.

APPENDIX A
FIGURES AND EXHIBITS

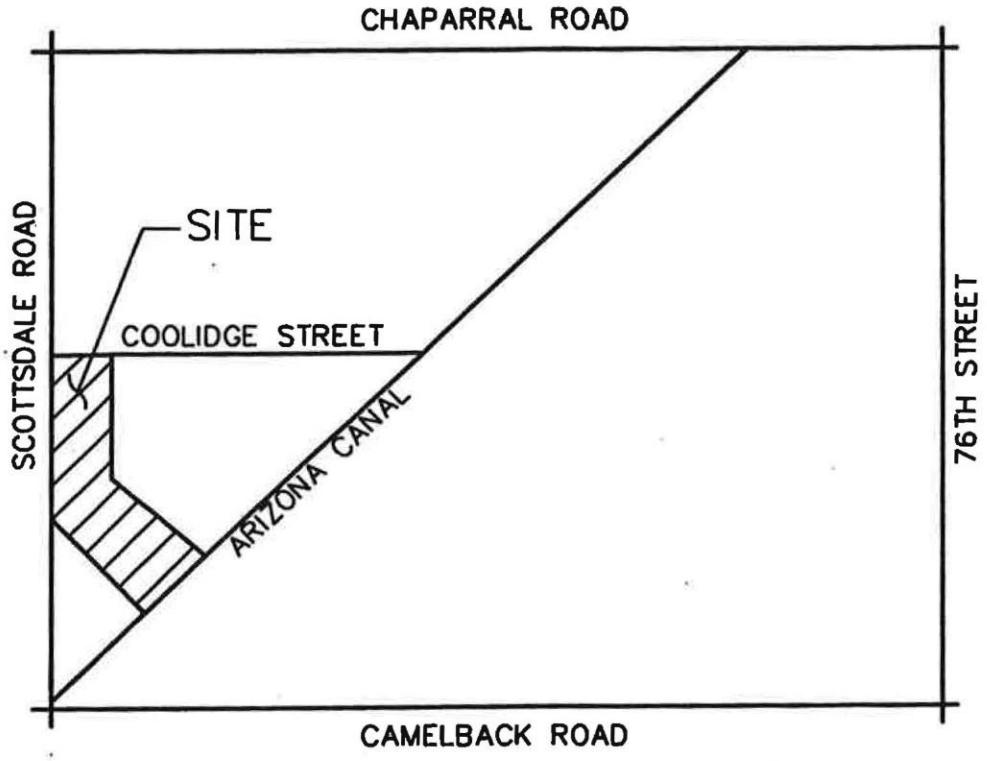

FIGURE 1 - VICINITY MAP

NTS

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CONCEPTUAL MASTER GRADING AND DRAINAGE PLAN
BLUE SKY SCOTTSDALE
SCOTTSDALE, ARIZONA

CHAPARRAL ROAD

NW COR. SEC. 23, T.2N., R.4E. FD 4" MCED BC IN HH

COOLIDGE ROAD

SCOTTSDALE ROAD

EXISTING 20' CURB INLETS

NEW VALLEY GUTTER

N89°57'53"E 252.66'

REMOVE CURB AND GUTTER. SAWCUT REMOVE AND REPLACE EXISTING PAVEMENT

EXIST. 48" STORM DRAIN SYSTEM

NEW MAG 535 CATCH BASIN RIM=79.74 INV=73.65 (60" CASE)

NEW FIRE HYDRANT

NEW STORM DRAIN MANHOLE

UNDERGROUND GARAGE

PROPOSED WATER SERVICE

PROPOSED 8" FIRELINE

FLUSH CURB

6" CURB

2" METER (3 EA.)

2" BACKFLOW (3 EA.)

PROPOSED WATER SERVICES (2 DOMESTIC, 1 LANDSCAPE)

GROUND LEVEL (L1) FFE=80.80

GARAGE LEVEL P1 FFE=65.63

EXISTING SEWER AND WATER LINE TO BE REMOVED

REMOVE THE EXISTING STORM DRAIN

PROPOSED PRIVATE SEWER PUMP AND FORCE MAIN

FEMA FLOOD PLAIN

PHASE 1 FUTURE PHASES

RAISED PLANTER

AREA DRAIN (TYP.) INV=77.63

12" STORM DRN PIPE

380 LF NEW CURB & GUTTER

GARAGE LIMITS

EXTEND THE EXISTING LINE TO CONNECT IT TO THE NEW LINE

EXISTING 12" STORM DRAIN LINE

18" STORM DRAIN PIPE

FF=80.50

FLUSH CURB (TYP.)

AREA DRAIN (TYP.) INV=72.91

EXISTING DRIVEWAY

AREA DRAIN (TYP.) INV=71.76

PROPOSED FIRE HYDRANT

18" STORM DRAIN PIPE 143 LF

FF=80.80

PROPOSED SEWER SERVICE

EX. CURB & GUTTER

6-INCH RAMP

35'± SS

6" WM W/ BACKFLOW (2 EA.)

15'± GAS

65' R/W

20'± WATER

FUTURE WM W/ 4" BACKFLOW

11'± WATER

2' SAWCUT

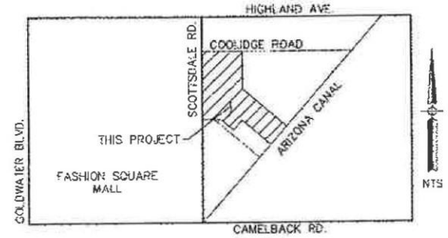
MATCH SHEET GD2

SCALE: 1" = 20'

0 10' 20' 40'

VICINITY MAP

NOT TO SCALE



ENGINEER

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DEVELOPER/OWNER

GRAY DEVELOPMENT LLC
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CONTACT: BRIAN KEARNEY
PHONE: (602) 954-0109

LEGEND

- PROPOSED STORM DRAIN
- 46.00 PROPOSED OUTFALL
- PROPOSED MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED CURB OPENING CATCH BASIN
- FLOW DIRECTION
- +41.00 PROPOSED GRADES
- +41.00EX. EXISTING GRADES
- CURB OPENING
- AREA DRAIN
- CENTERLINE
- PROPERTY LINE
- G EXISTING GAS
- S EXISTING SANITARY SEWER
- SW PROPOSED GRADE AT SIDEWALK
- P PROPOSED GRADE AT PAVEMENT
- 46.00 PROPOSED OUTFALL
- FL PROPOSED GRADE AT FLOWLINE
- TC PROPOSED GRADE AT TOP OF CURB
- FLOOD PLAIN LINE
- GRADE BREAK
- BACKFLOW PREVENTOR
- WATER METER
- W WATER LINE
- SEWER LINE
- FIRE LINE
- FIRE HYDRANT
- SEWER MANHOLE

EXHIBIT A

PRELIMINARY NOT FOR CONSTRUCTION

DESIGNED BY:	RMDI/RHO	PROJECT MANAGER:	BOYCE O'BRIEN				
DRAWN BY:	RMDI						
CHECKED BY:	RYG						
DATE:	1/2013	DATE		REVISION		BY	

DAVID EVANS AND ASSOCIATES INC.
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Exp: 3-31-2014

CONCEPTUAL GRADING & DRAINAGE PLAN
BLUE SKY SCOTTSDALE,
SCOTTSDALE, ARIZONA

SCALE: 1"=20'

SECTION: 23
TOWNSHIP: 2N
RANGE: 4E

JOB NO.: GRYD0000-0001

SHEET GD1 OF 3

PLAN CHECK #: 4894-13 DRB CASE #: 82-DR-2001 CASE #: 2-II-2010 05: 18-45

P:\GRY\GRYD0000\GRYD0001\ECV_DRB-CASE\ECV82DR01_GRADING.dwg rmdi Jan 31, 2013 4:32:09pm

SCALE: 1"= 20'

MATCH SHEET GD1

12" STORM DRAIN PIPE

PROPOSED 8" SEWERLINE

PROPOSED 8" FIRELINE

FASHION SQUARE DR.

SCOTTSDALE ROAD

MAG 533-2 CURB INLET
INV=75.20, 6' WING

PROPOSED SEWER LINE

2' SCUPPER

2' CURB OPENING

EXISTING SEWER MANHOLE
ADJUST RIM PER
MAG STD DET 424
INV(N)=64.24
INV(SE)=64.22
INV(W)=64.16

EXISTING RENAISSANCE
COMMERCIAL PLAZA
EX FF=78.20±

65' R/W

11'± WATER

CAMELBACK ROAD

24" STORM DRAIN PIPE

RIM=79.50
INV=74.75

PROPOSED SEWER SERVICE

EXISTING SEWER LINE

EXISTING PARKING

S49°16'00"E 377.39'

FF=80.80

FEMA FLOOD PLAIN

OIL / SAND SEPARATOR

POOL

UNDERGROUND GARAGE

18" STORM DRAIN PIPE

AREA DRAIN (TYP.)
INV=70.97

CONNECT TO EXISTING
BOX CULVERT
INV=64.39± (8'X5' CULVERT)
INV=68.50 (18" SD)

EXIST. INLET

EXISTING BOX CULVERT

CONNECT TO EXISTING
BOX CULVERT
INV=62.56± (8'X5' CULVERT)
INV=66.56 (24" SD)

BANK IMPROVEMENT LIMITS

10' WALK

AREA DRAIN (TYP)

EXIST. INLET

ARIZONA CANAL

CONTINUED BELOW

SCOTTSDALE ROAD

SCALE: 1"= 20'

CAMELBACK ROAD

BANK IMPROVEMENT LIMITS

2- 4'x4' CATCH BASINS PER
INLET DETAIL ON SHEET 3

126 LF RETAINING WALL
(HEIGHT VARIES, 4'-6")

10' WALK

ARIZONA CANAL

CONTINUED ABOVE

EXHIBIT A

PRELIMINARY NOT FOR CONSTRUCTION

BY	REVISION	DATE

PROJECT MANAGER: BOYCE O'BRIEN

DESIGNED BY: RMD/BHO
DRAWN BY: RMD
CHECKED BY: RYG
DATE: 1/2013

DAVID EVANS AND ASSOCIATES INC.
4600 E. Washington Street, Suite 600
Phoenix, Arizona 85034
Phone: 602.678.5151

9/30/2014

CONCEPTUAL
GRADING & DRAINAGE PLAN
BLUE SKY SCOTTSDALE,
SCOTTSDALE, ARIZONA

SCALE: 1"=20'

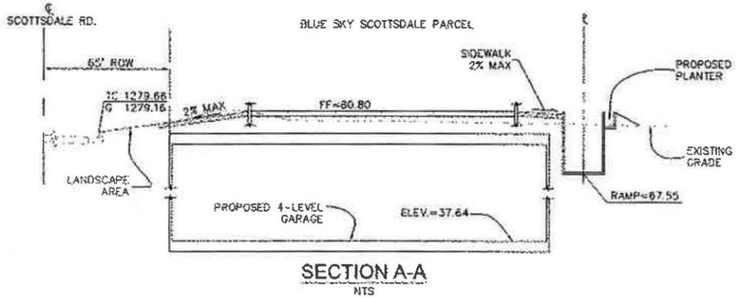
SECTION: 23
TOWNSHIP: 2N
RANGE: 4E

JOB NO.: GRYD0000-0001

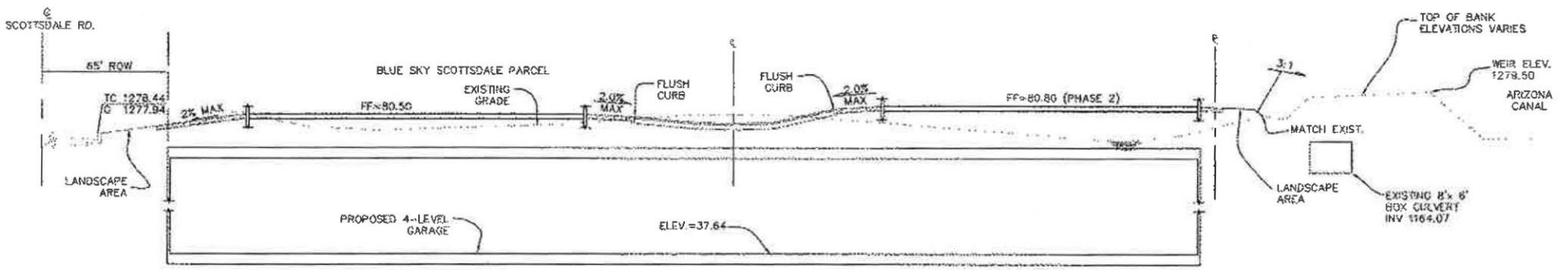
SHEET GD2 OF 3

DRAINAGE REPORT CASE # 49-11 DRB CASE # 62-DR-2011 CASE # 2-6-2012 GS: 18-95

P:\GR\GR0000001\0400CAD\ECI_DRB-CAD\LC-GD002_GRYD2031.dwg rmdl Jan 31, 2013 4:34:28pm

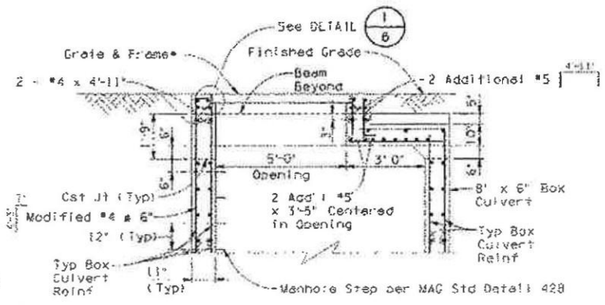


SECTION A-A
NTS

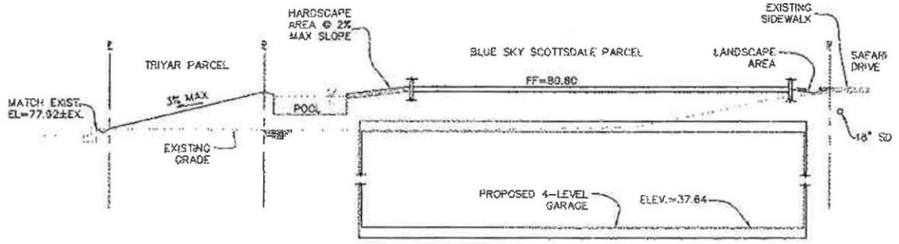


SECTION B-B
NTS

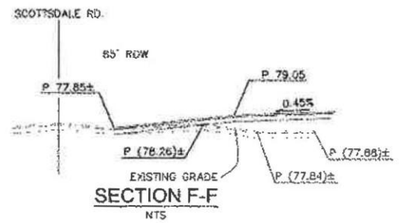
* Contractor shall salvage and reuse the existing catch basin grate & frame. Due care shall be exercised in the removal of the existing grate frame so as not to damage the frame anchors. See as builts for grate & frame details.



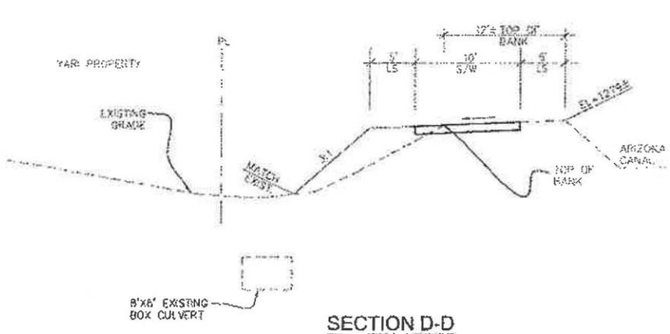
INLET DETAIL
(FOR REFERENCE ONLY)
NTS



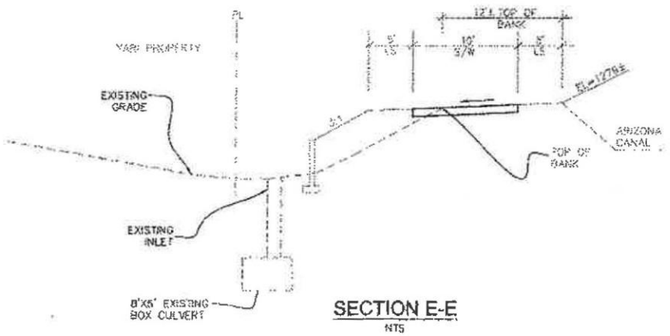
SECTION C-C
NTS



SECTION F-F
NTS



SECTION D-D
NTS



SECTION E-E
NTS

EXHIBIT A

PRELIMINARY NOT FOR CONSTRUCTION

BY	REVISION	DATE

PROJECT MANAGER: BOYCE O'BRIEN

DESIGNED BY: RMDI/BHO
DRAWN BY: RMDI
CHECKED BY: RYG
DATE: 1/2013

DAVID EVANS AND ASSOCIATES, INC.
4600 E. Washington Street, Suite 430
Phoenix, Arizona 85034
Phone: 602.678.3151

CONCEPTUAL
GRADING & DRAINAGE PLAN
BLUE SKY SCOTTSDALE,
SCOTTSDALE, ARIZONA

SCALE:
1"=20'

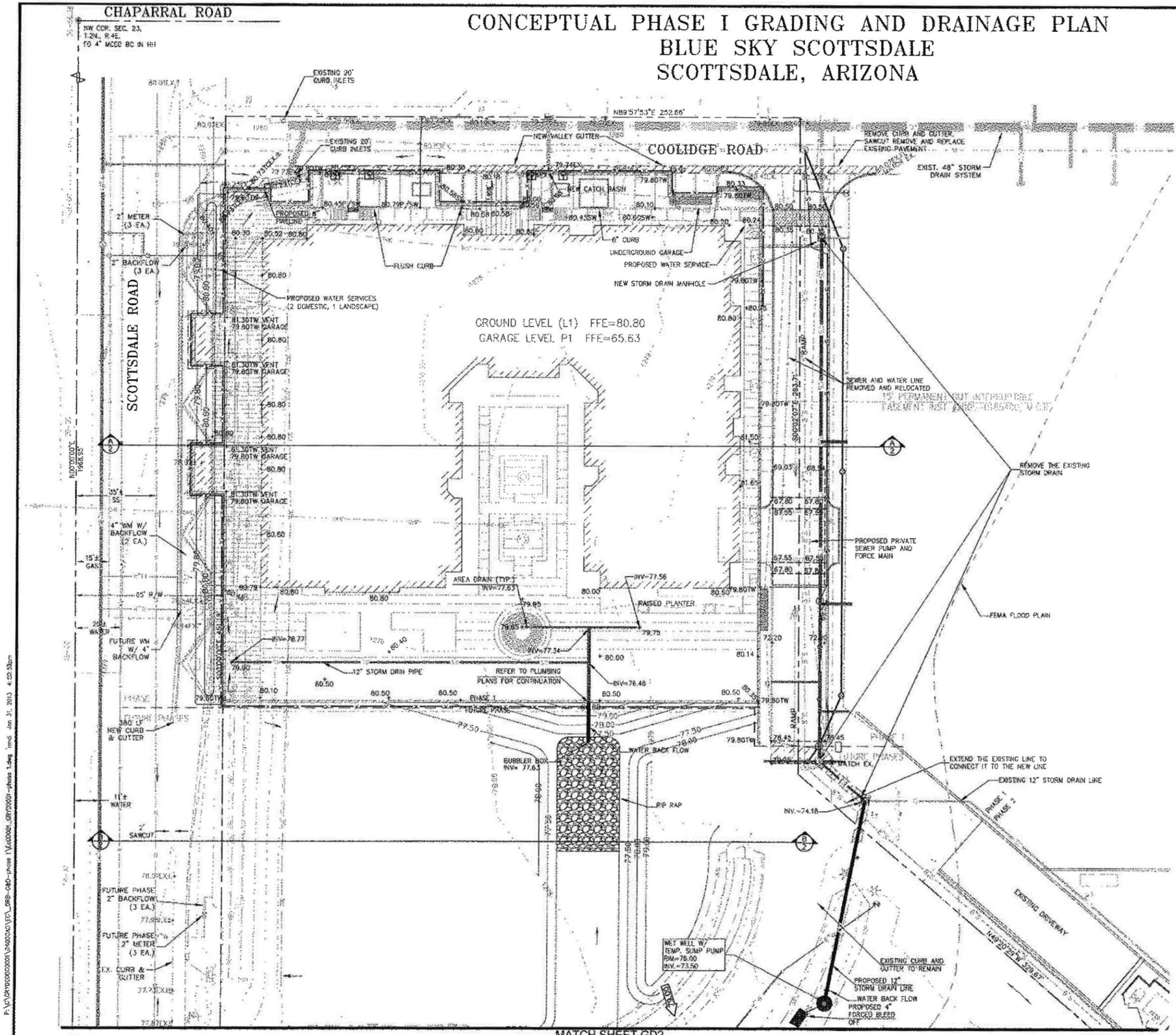
SECTION: 23
TOWNSHIP: 2N
RANGE: 4E

JOB NO.:
GRYD0000-0001

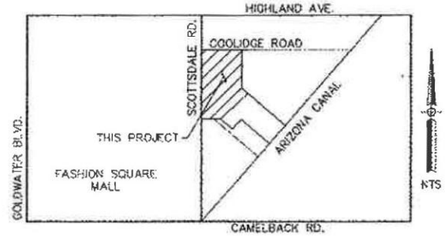
SHEET GD3 OF 3

PLAN CHECK #: 4934-11 DRB CASE #: 62-DR-2011 CASE #: 2-II-2010 QS: 18-45

CONCEPTUAL PHASE I GRADING AND DRAINAGE PLAN
BLUE SKY SCOTTSDALE
SCOTTSDALE, ARIZONA



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



VICINITY MAP
NOT TO SCALE

ENGINEER
DAVID EVANS AND ASSOCIATES, INC.
4600 E. WASHINGTON STREET, SUITE 430
PHOENIX, AZ 85034
CONTACT: BOYCE O'BRIEN
PHONE: (602) 678-5151

ARCHITECT
GRAY DEVELOPMENT LLC
4040 EAST CAMELBACK ROAD, SUITE 275
PHOENIX, ARIZONA 85018
CONTACT: STEPHEN T. PARADY
PHONE: (602) 396-4432

DEVELOPER/OWNER
GRAY DEVELOPMENT LLC
4040 EAST CAMELBACK ROAD, SUITE 275
PHOENIX, ARIZONA 85018
CONTACT: BRIAN KEARNEY
PHONE: (602) 954-0109

LEGEND

- PROPOSED STORM DRAIN
- 46.00 PROPOSED OUTFALL
- PROPOSED MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED CURB OPENING CATCH BASIN
- FLOW DIRECTION
- +41.00 PROPOSED GRADES
- +41.00EX. EXISTING GRADES
- CURB OPENING
- AREA DRAIN
- CENTERLINE
- PROPERTY LINE
- G EXISTING GAS
- S EXISTING SANITARY SEWER
- SW PROPOSED GRADE AT SIDEWALK
- P PROPOSED GRADE AT PAVEMENT
- 80.14 PROPOSED OUTFALL
- FL PROPOSED GRADE AT FLOWLINE
- TC PROPOSED GRADE AT TOP OF CURB
- FLOOD PLAIN LINE
- GRADE BREAK
- BACKFLOW PREVENTOR
- WATER METER
- W WATER LINE
- SEWER LINE
- FIRE LINE
- FIRE HYDRANT
- SEWER MANHOLE

Exhibit A

DESIGNED BY: RMD/BHD
DRAWN BY: RMD
CHECKED BY: RYG
DATE: 1/2013

PROJECT MANAGER: BOYCE O'BRIEN

BY	REVISION	DATE

PRELIMINARY NOT FOR CONSTRUCTION

DAVID EVANS AND ASSOCIATES INC.
4600 E. Washington Street, Suite 430
Phoenix, Arizona 85034
Phone: 602.678.5151

EXP: 3-31-2014

CONCEPTUAL-PHASE I
GRADING & DRAINAGE PLAN
BLUE SKY SCOTTSDALE,
SCOTTSDALE, ARIZONA

SCALE: 1"=20'

SECTION: 23
TOWNSHP: 2N
RANGE: 4E

JOB NO.: GRYD00000-0001

SHEET GD1 OF 3

PLAN CHECK #: 4094-11 ORB CASE #: 82-DR-2011 CASE #: 2-II-2010 OS: 18-45

P:\C\GRY00000003\01\GD\GD1\GD_ORB-GRD-phase 1.dwg [mdl Jan 31, 2013 4:50:58pm

MATCH SHEET GD1

SCALE: 1" = 20'

SCOTTSDALE ROAD

FASHION SQUARE DR.

65' R/W

BUBBLER BOX
RIM=77.50
INV=73.66

BUBBLER BOX
RIM=75.60
INV=73.50

TEMP RIP RAP

FEMA FLOOD PLAIN

76.00

76.00FL

S49°16'00"E 377.32'

N49°20'28"W 328.67'

N90°00'00"W 54.21'

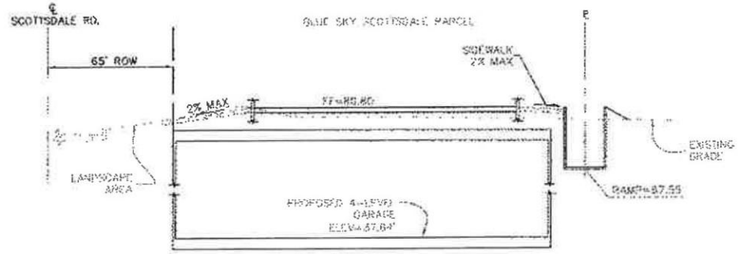
S89°00'00"E 451.18'

CAMELBACK ROAD

W 1/4 COR. SEC. 23
T.2N., R.4E.
FD 4" MCSD W/ 3/4 BR

SECTION A-A

NTS



SECTION B-B

NTS

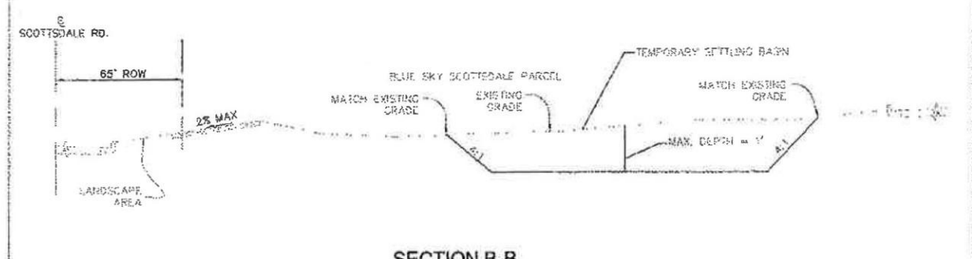


Exhibit A

PRELIMINARY NOT FOR CONSTRUCTION

BY	REVISION	DATE

PROJECT MANAGER: BOYDE O'BRIEN

DESIGNED BY: RMD/BHO
DRAWN BY: RMD
CHECKED BY: RYG
DATE: 1/2013

DAVID EVANS AND ASSOCIATES INC.
4600 E. Washington Street, Suite 430
Phoenix, Arizona 85034
Phone: 602.678.6151

EXP. 3-31-2014

CONCEPTUAL-PHASE I
GRADING & DRAINAGE PLAN
BLUE SKY SCOTTSDALE,
SCOTTSDALE, ARIZONA

SCALE: 1"=20'

SECTION: 23
TOWNSHIP: 2N
RANGE: 4E

JOB NO.: GRYD0000-0001

SHEET GD2 OF 3

PLAN CHECK #: 4994-11 DRB CASE #: 62-DR-2011 CASE #: 2-a-2010 QS: 18-43

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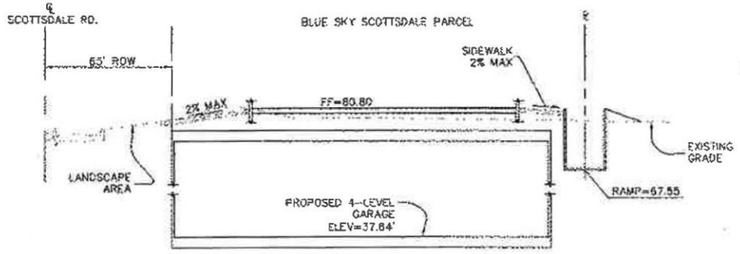
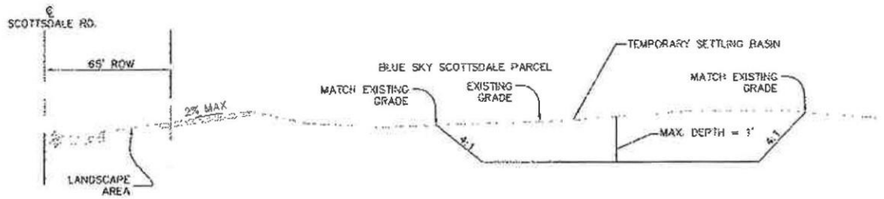


SECTION A-A
NTS



SECTION B-B
NTS

Exhibit A

DESIGNED BY: RMD/BHO
DRAWN BY: RMDI
CHECKED BY: RYG
DATE: 1/2013

PROJECT MANAGER: BOYCE O'BRIEN

BY	REVISION	DATE

PRELIMINARY NOT FOR CONSTRUCTION

DAVID EVANS AND ASSOCIATES INC.
4600 E. Washington Street, Suite 430
Phoenix, Arizona 85034
Phone: 602.678.6151

Exp: 3-31-2014

CONCEPTUAL-PHASE I
GRADING & DRAINAGE PLAN
BLUE SKY SCOTTSDALE,
SCOTTSDALE, ARIZONA

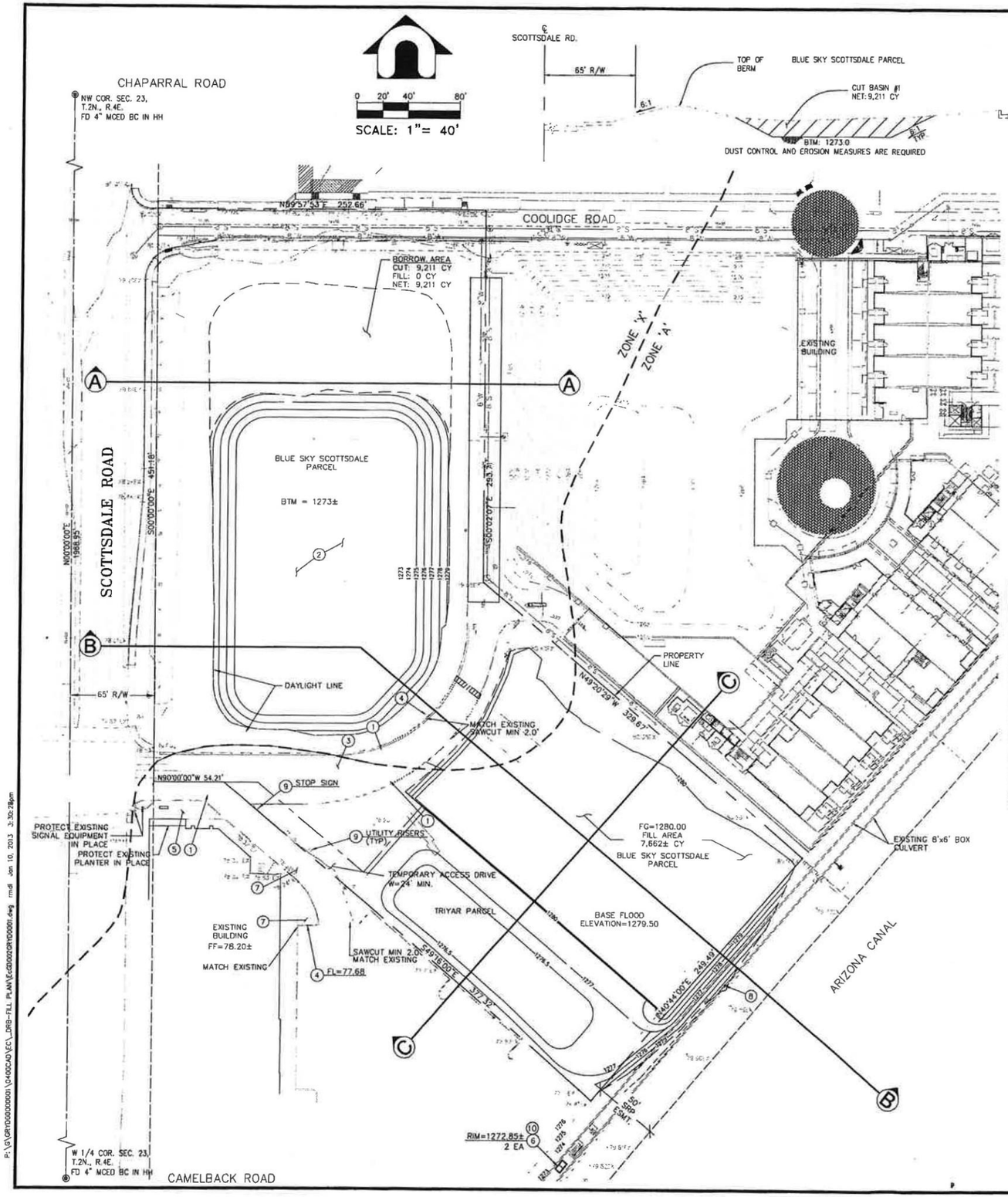
SCALE: 1"=20'

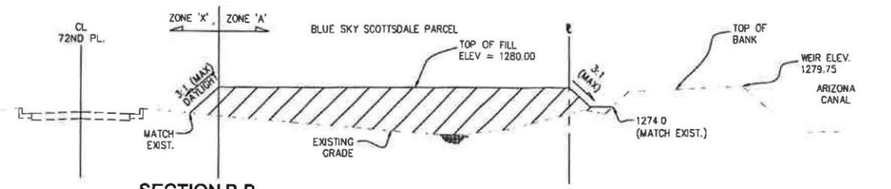
SECTION: 33
TOWNSHIP: 2N
RANGE: 4E

JOB NO.: GRYDDDDD-0001

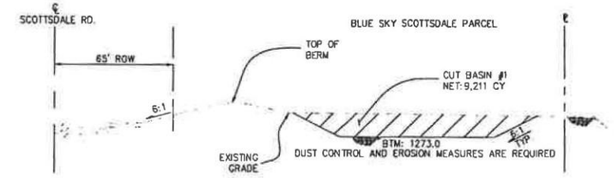
SHEET GD3 OF 3

PLAN CHECK #: 4894-11 DRB CASE #: 82-DR-2011 CASE #: 2-I-2010 QS: 18-48

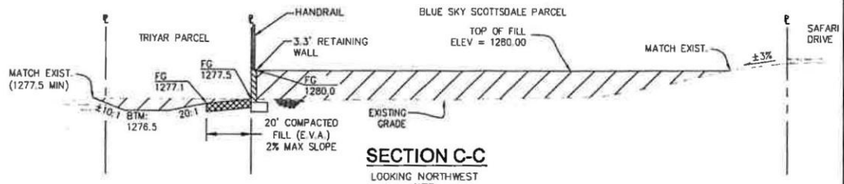




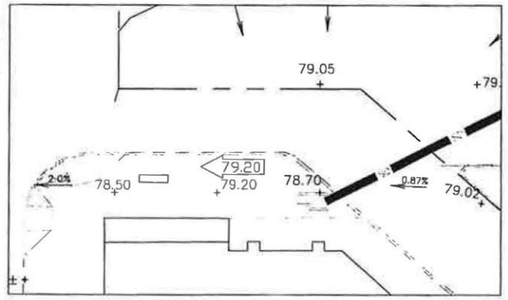
SECTION B-B
LOOKING NORTH AND NORTHEAST
NTS



SECTION A-A
LOOKING NORTH
NTS

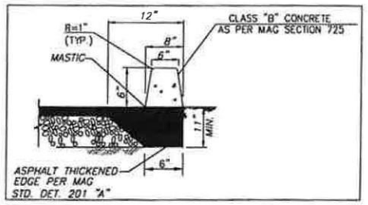


SECTION C-C
LOOKING NORTHWEST
NTS

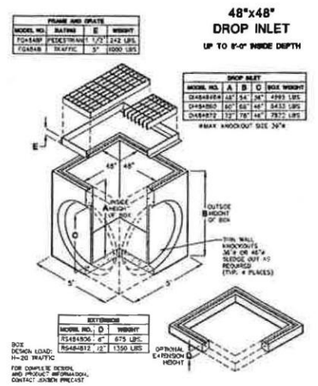


FASHION SQUARE DR. ENTRY DETAIL
SCALE 1"=15'

VOLUME DISPLACEMENT NOTE:
RAISING THE SITE ABOVE THE WEIR ELEVATION SHOULD NOT IMPACT THE BASE FLOOD ELEVATION. THE WEIR ELEVATIONS ALONG THE CANAL ARE NOT ALTERED. IN ADDITION TWO ADDITIONAL GRATE INLETS STRUCTURE 4'X4' WILL BE ADDED TO INCREASE THE CAPACITY OF THE GRATED INLETS ALONG THE CANAL. THIS WILL COMPENSATE FOR VOLUME LOSS AND ACCOUNTS FOR THE ABANDONMENT OF AN EXISTING INLET STRUCTURE ALONG THE EAST PORTION OF THE SITE. THE ADDITION OF THE INLET STRUCTURES WILL ALLOW FOR LESS PONDING BEHIND THE CANAL DURING SMALLER STORM EVENTS THAT DO NOT WEIR OVER THE CANAL.



1 EXTRUDED CURB WITH ASPHALT THICKENED EDGE
N.T.S



4'x4' CATCH BASIN DETAIL
NTS

CONSTRUCTION NOTES

1. CONSTRUCT 6" CONCRETE EXTRUDED CURB PER DETAIL PER DETAIL 1 ABOVE.
2. CONSTRUCT BORROW BASIN. DIMENSIONS PER PLAN WITH MAX SLOPE OF 6:1
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT 2" AC ON COMPACTED NATIVE SOIL.
4. CONSTRUCT DEPRESSED CURB OPENING. WIDTH = 2'
5. EXISTING SIDEWALK. PROTECT IN PLACE.
6. CONSTRUCT 4'x4' CATCH BASIN PER DETAIL ON THIS SHEET OR EQUIVALENT, WITHOUT THE SIDE OPENINGS FOR PIPE. OPENING IS ONLY NEEDED AT BOTTOM OF STRUCTURE.
7. INSTALL RIP RAP W/ FILTER FABRIC PER MAG STD SPECIFICATIONS. RIP RAP FINISH GRADE TO BE ON GRADE TO MATCH GRADING DESIGN.
8. ABANDON GRATED INLET STRUCTURE IN PREPARATION FOR FILL ABOVE IT PER MAG STD SPECIFICATIONS.
9. RELOCATE EXISTING FEATURE AS NOTED.
10. CONTRACTOR TO PROVIDE OPENING IN THE CULVERT TO ALLOW FOR DRAINAGE FROM STRUCTURE. STRUCTURAL INTEGRITY OF CULVERT TO BE MAINTAINED.

EXHIBIT B

BY	REVISION	DATE

DESIGNED BY: JCF
DRAWN BY: JCF
CHECKED BY: RYG
DATE: 11/2013

PROJECT MANAGER: BOYCE O'BRIEN

DAVID EVANS AND ASSOCIATES INC.
4600 E. Washington Street, Suite 430
Phoenix, Arizona 85034
Phone: 602.678.5151

FILL IMPROVEMENT PLANS WITH 3% TRANSITION BLUE SKY SCOTTSDALE SCOTTSDALE, ARIZONA

SCALE: 1" = 40'
SECTION: 23
TOWNSHP: 2N
RANGE: 4E
JOB NO.: GRYD0000-0001
SHEET SP2 OF 2

PLAN CHECK #: 4894-11 DRB CASE #: 62-DR-2011 CASE #: 2-II-2010 GS: 18-45

NOT TO SCALE

LEGEND

- FLOW DIRECTION
- WEIR SECTION LINE
- Q_{100}=XXCFS — 100 YEAR FLOW
- SECTION X — FLOW MASTER X-SECTION AT THIS LOCATION
- EX. 8'x6' BOX CULVERT

GOLDWATER BLVD

HIGHLAND AVENUE

Q_{100}=378CFS

Q_{100}=189CFS(Half Street)

SECTION 13

SECTION 10

SECTION 9

Q_{100}=70CFS

ENTERS COOLIDGE STORM DRAIN SYSTEM

Q_{100}=119CFS

SECTION 7

SECTION 14

SECTION 8

Q_{100}=80CFS

Q_{100}=1,000CFS ENTERS 8x6 CULVERT SYSTEM

EXISTING 8'x6' BOX CULVERT

1ST NEW 4X4 CATCH BASIN

2ND NEW 4X4 CATCH BASIN

EXISTING CATCH BASIN(TYP.)

WEIRS OVER CANAL Q_{100}=1,202CFS

EXISTING CATCH BASIN(TYP.)

EX. GRATE STRUCTURE

REFER TO RUNOFF EXHIBIT UNDER APPENDIX C FOR THIS FLOW

REFER TO APPENDIX D FOR DETAILED CALCULATIONS FOR THESE CATCH BASINS

COLDWATER BLVD

MARSHALL WAY

SCOTTSDALE ROAD

EAST CB

MIDDLE CB

WEST CB

Q_{100}=184 CFS

22%

SECTION 3

SECTION 2

Q_{100}=823 CFS

Q_{100}=393 CFS

48%

SECTION 1

30%

Q_{100}=245 CFS

68%

SECTION 5

Q_{100}=268 CFS

SECTION 4

32%

Q_{100}=125 CFS

Q_{100}=0.0 CFS

SECTION 6

Q_{100}=110 CFS Q_{100}=88 CFS Q_{100}=90 CFS

ENTERS CAMELBACKS STORM DRAIN SYSTEM

Q_{100}=75 CFS

CAMELBACK ROAD

263-1100
1-800-STAKE-IT

DESIGNED BY: DAPA
DRAWN BY: DAPA
CHECKED BY: AYG
DATE: 01/2012

PROJECT MANAGER: RANDY GEORGES

BY	DATE	REVISION

DAVID EVANS AND ASSOCIATES INC.
4600 E. Washington Street, Suite 120
Phoenix, Arizona 85034
Phone: 602.678.5151

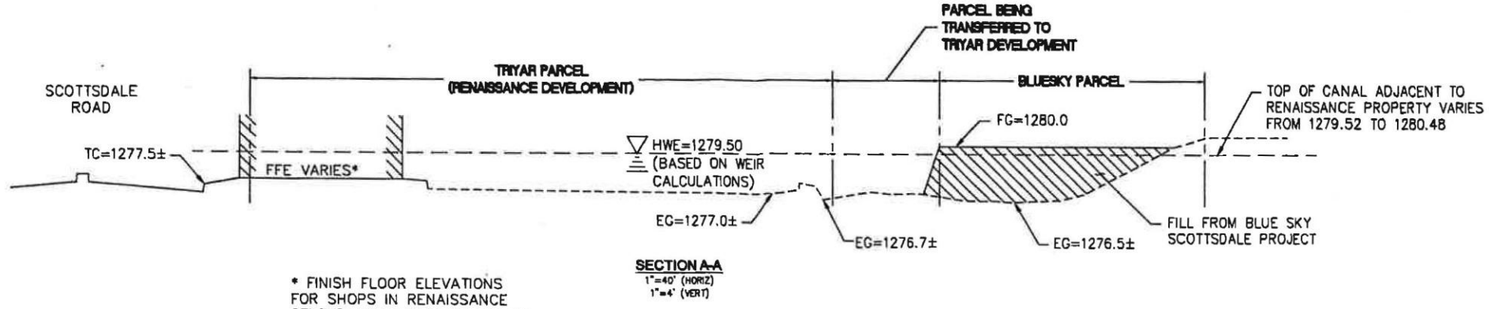
EXHIBIT C
OFFSITE DRAINAGE MAP
FOR
SCOTTSDALE BLUE SKY
SCOTTSDALE , ARIZONA

SCALE:

SECTION: 23
TOWNSHIP: 2N
RANGE: 4E

JOB NO.:
CAYD0000-0001

SHEET 1 OF 1



SECTION A-A
1"=40' (HORIZ)
1"=4' (VERT)

* FINISH FLOOR ELEVATIONS FOR SHOPS IN RENAISSANCE CENTER VARY FROM 1278.6 TO 1277.9

NTS

P:\GRY\GRY0000\Drawings\Exhibits\GRY0000-0001 Exhibit D.dwg 01 Jan 04 2012 11:49:48am

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT
OUTSIDE MARICOPA COUNTY
BLUE STAKE CENTER

PROJECT MANAGER:	RAMZI GEORGES
DESIGNED BY:	DHPA
DRAWN BY:	DHPA
CHECKED BY:	RYG
DATE:	01/2012

DATE	REVISION	BY

DAVID EVANS AND ASSOCIATES INC
4600 E. Washington Street, Suite 430
Phoenix, Arizona 85034
Phone: 602.873.5151

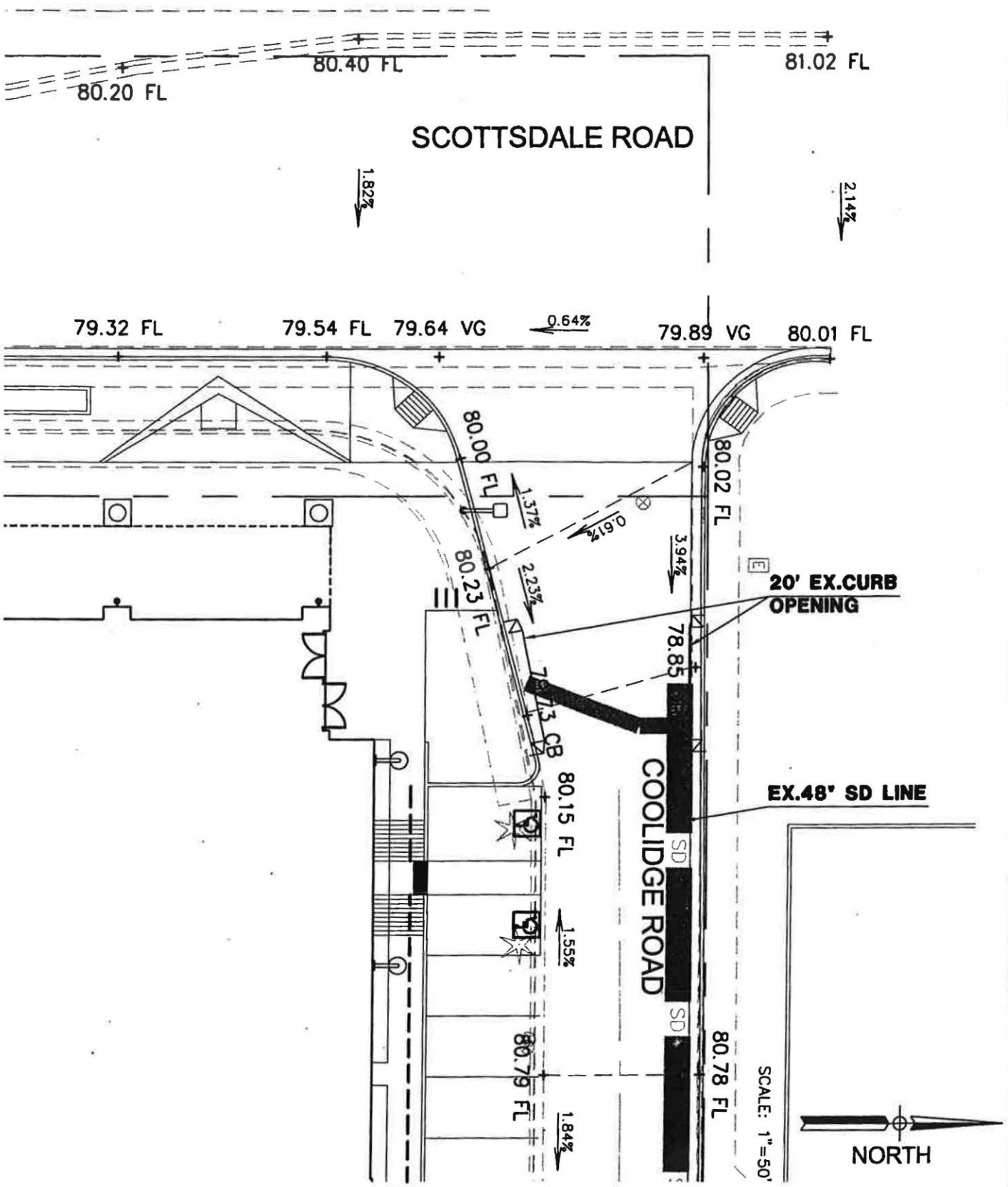
EXHIBIT D
FLOODPLAIN CROSS SECTION FOR SCOTTSDALE BLUE SKY SCOTTSDALE , ARIZONA

SCALE:

SECTION: 23
TOWNSHP: 2N
RANGE: 4E

JOB NO.:
GRY00000-0001

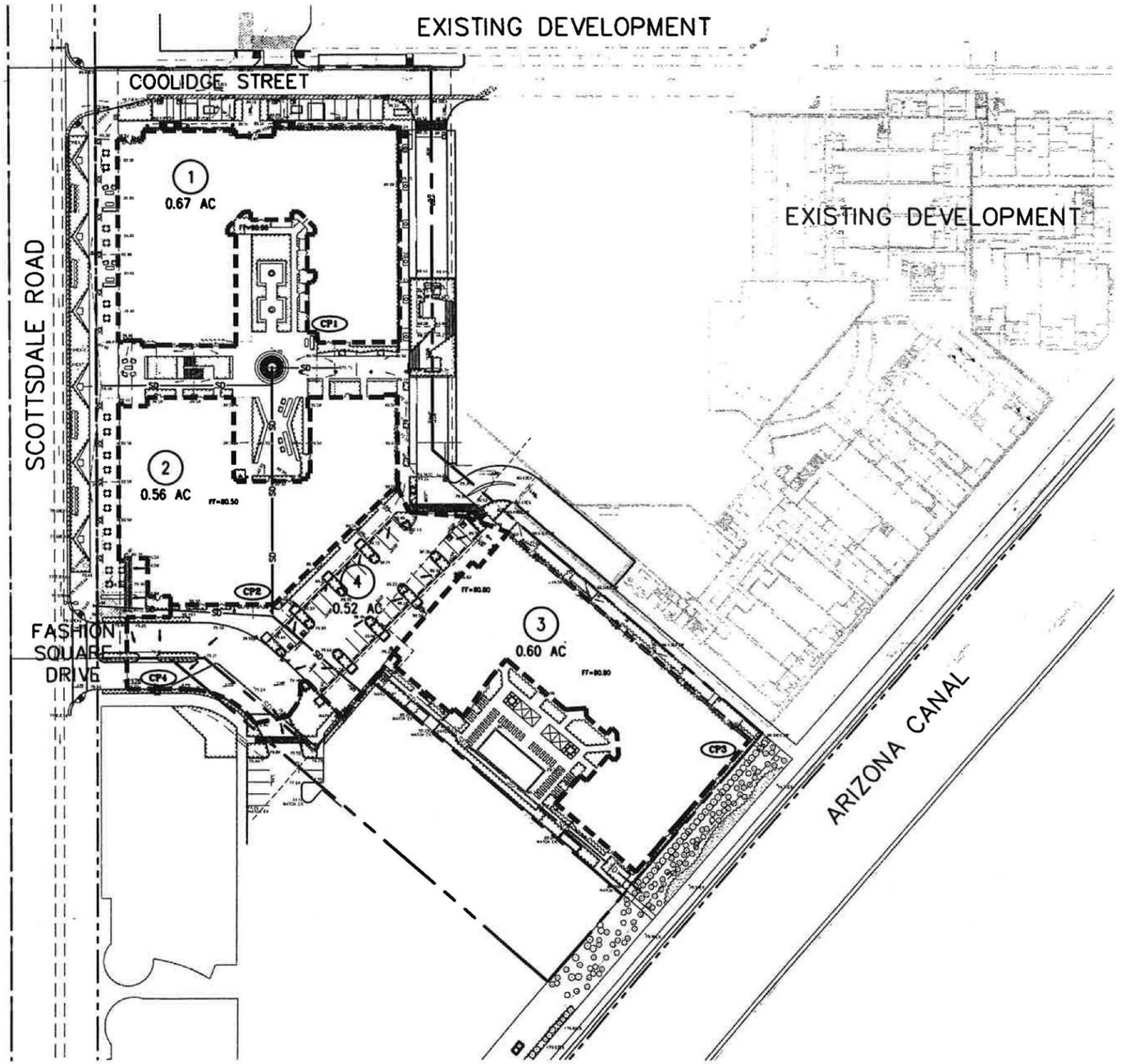
SHEET 1 OF 1



SCALE: 1"=20'	**EXHIBIT E** SCOTTSDALE & COOLIDGE ROAD GRADE ELEVATIONS SCOTTSDALE, ARIZONA	DRAWN BY: JCF
SHEET 1 OF 1		CHECKED BY:
JOB NO.: GRYD00000001		DATE: 10/11

DAVID EVANS AND ASSOCIATES INC.
4600 East Washington Street, Suite 430
Phoenix Arizona 85034
Phone: 602.678.5151

P:\G\GRYD00000001\0400CAD\EC_HY\COOLIDGE GRADES - Exhibit E.dwg jcf Jan 04, 2012 1:14:14pm



LEGEND

- 4D — 1.52 AC — DRAINAGE AREA BOUNDARY LINE
- BASIN 1 — 2.22 AC — STORAGE BASIN
- CP1 — CONCENTRATION POINT
- FLOW DIRECTION
- DRAINAGE AREA DESIGNATION

0 20 40 80

SCALE: 1"=40

NOTE:
RATIONAL CALCULATIONS WILL BE UPDATED DURING THE FINAL DESIGN

DAVID EVANS AND ASSOCIATES INC.
4600 E. Washington Street, Suite 430
Phoenix, Arizona 85034
Phone: 602.678.5191

DESIGNED BY: DMPA
DRAWN BY: DMPA
CHECKED BY: RYG
DATE: 01/2012

PROJECT MANAGER:
RYAN GEORGES

BY	REVISION	DATE

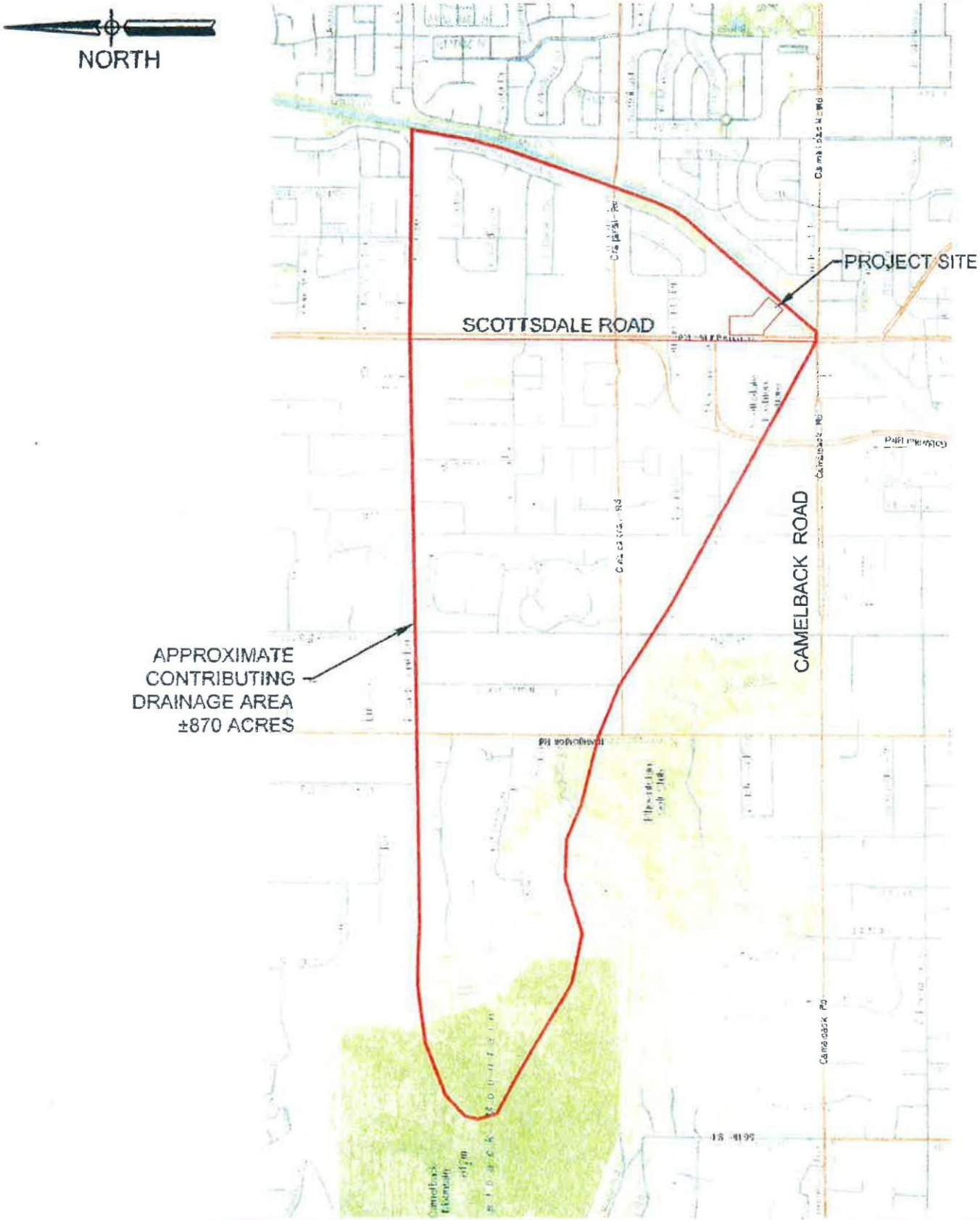
EXHIBIT F
PROPOSED DRAINAGE MAP
FOR
SCOTTSDALE BLUE SKY
SCOTTSDALE, ARIZONA

SCALE:

SECTION: 23
TOWNSHIP: 2N
RANGE: 4E

JOB NO.:
GRY00000-0001

SHEET 1 OF 1



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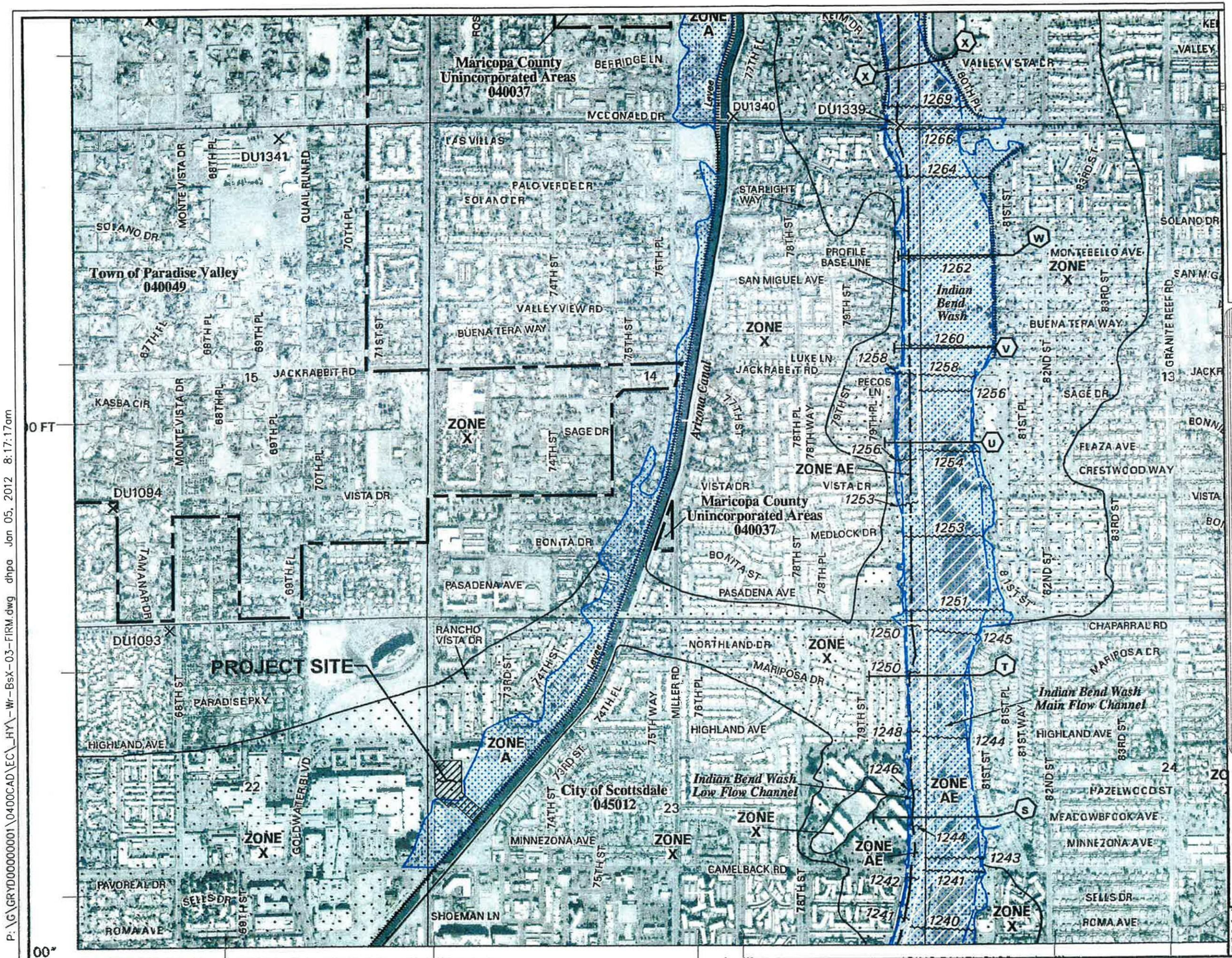
SCALE: N/S	**EXHIBIT G** CONTRIBUTING DRAINAGE AREA SCOTTSDALE BLUE SKY SCOTTSDALE, ARIZONA	DRAWN BY: JCF
SHEET 1 OF 1		CHECKED BY:
JOB NO: GRYD0000000		DATE: 1/12

DAVID EVANS AND ASSOCIATES INC.
4600 East Washington Street, Suite 430
Phoenix Arizona 85034
Phone: 602.678.5151


Existing 8'x6'
Box Culvert
No Conveyance Capacity
Along Canal Over Bank
Any Minimum Offsite Runoff
will Sheet Flow into the Canal
Picture 1

APPENDIX B
FLOOD INSURANCE RATE MAP



NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1695H

FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY, ARIZONA
AND INCORPORATED AREAS

PANEL 1695 OF 4350
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	1695	H
PARADISE VALLEY, TOWN OF	040049	1695	H
SCOTTSDALE, CITY OF	045012	1695	H

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
04013C1695H
MAP REVISED
SEPTEMBER 30, 2005

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

FIGURE 1

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APPENDIX C
RUNOFF EXHIBIT BASED ON SAFARI DRIVE APPROVED DRAINAGE REPORT

SCOTTSDALE RIVERWALK CENTRE HOTEL

DRAINAGE MAP

4550 NORTH 12TH STREET

JOB I
980121

PLATE

Reduced to
1202 cfs

PROPOSED 7' x 6' BOX PIPE

EXISTING 144" CONCRETE PIPE

7769
LEAVING SITE

Reduced

1659cfs

1202cfs

913cfs

543cfs

150cfs

776cfs

Goes to
zero

Goes to
zero

SCOTTSDALE ROAD

HIGHLAND AVE.

CAMELBACK ROAD

SCOTTSDALE FASHION SQUARE

APPENDIX D
HYDRAULIC CALCULATIONS AND DATA SHEETS

Street Section Calculations

Worksheet for Goldwater Blvd South of Camelback Road - Section 1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Discharge	20.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	0.50
0+01	0.00
0+55	1.09
0+56	1.59
0+62	1.59
0+63	1.09
1+06	0.25
1+07	0.75

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 0.50)	(1+07, 0.75)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.51	ft
Elevation Range	0.00 to 1.59 ft	
Flow Area	8.56	ft²
Wetted Perimeter	40.43	ft
Hydraulic Radius	0.21	ft

Cross Section for Goldwater Blvd South of Camelback Road - Section 1

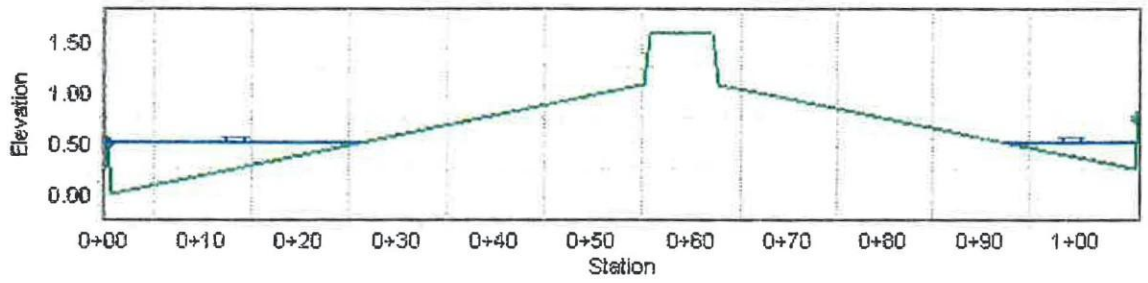
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Normal Depth	0.51	ft
Discharge	20.00	ft^3/s

Cross Section Image



Worksheet for Camelback Road east of Goldwater Blvd - Section 2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Discharge	32.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	0.50
0+01	0.00
0+47	0.85
0+48	1.35
0+55	1.35
0+56	0.85
0+92	0.00
0+93	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 0.50)	(0+93, 0.50)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.5	ft
Elevation Range	0.00 to 1.35 ft	
Flow Area	12.38	ft²
Wetted Perimeter	50.10	ft
Hydraulic Radius	0.25	ft

Worksheet for Camelback Road east of Goldwater Blvd - Section 2

Results

Top Width		49.68	ft
Normal Depth		0.5	ft
Critical Depth		0.48	ft
Critical Slope		0.00607	ft/ft
Velocity		2.58	ft/s
Velocity Head		0.10	ft
Specific Energy		0.60	ft
Froude Number		0.91	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.5	ft
Critical Depth	0.48	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00607	ft/ft

Cross Section for Camelback Road east of Goldwater Blvd - Section 2

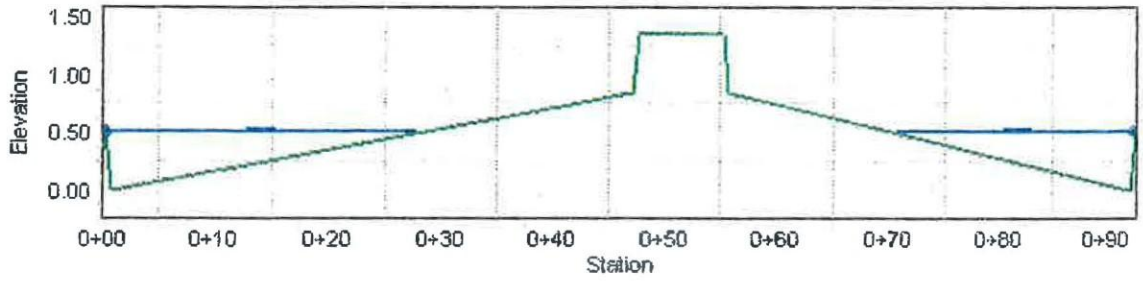
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Normal Depth	0.5	ft
Discharge	32.00	ft³/s

Cross Section Image



Worksheet for Goldwater Blvd North of Camelback Road- Section 3

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Discharge	15.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	0.50
0+01	0.00
0+65	1.27
0+66	1.77
0+73	1.77
0+73	1.27
0+96	0.83
0+97	1.33

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 0.50)	(0+97, 1.33)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.48	ft
Elevation Range	0.00 to 1.77 ft	
Flow Area	5.95	ft²
Wetted Perimeter	25.03	ft
Hydraulic Radius	0.24	ft

Worksheet for Goldwater Blvd North of Camelback Road- Section 3

Results

Top Width	24.83	ft
Normal Depth	0.48	ft
Critical Depth	0.46	ft
Critical Slope	0.00615	ft/ft
Velocity	2.52	ft/s
Velocity Head	0.10	ft
Specific Energy	0.58	ft
Froude Number	0.91	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.48	ft
Critical Depth	0.46	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00615	ft/ft

Cross Section for Goldwater Blvd North of Camelback Road- Section 3

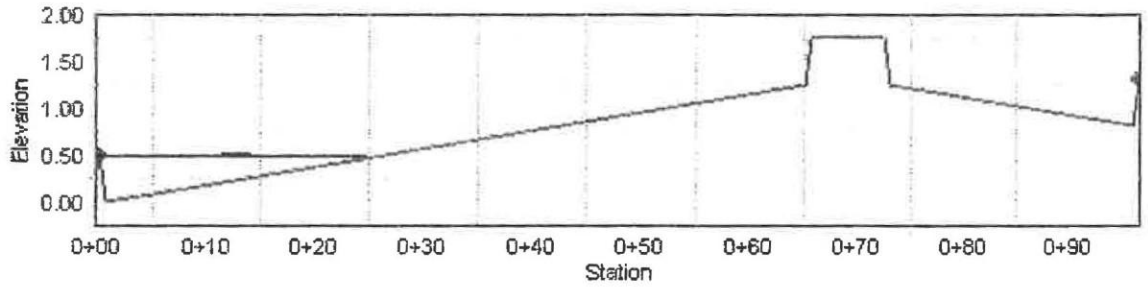
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Normal Depth	0.48	ft
Discharge	15.00	ft³/s

Cross Section Image



Worksheet for Marshall Way South of Camelback Road - Section 4

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00300	ft/ft
Discharge	28.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	80.00
0+01	79.58
0+22	79.74
0+43	79.43
0+44	79.93

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 80.00)	(0+44, 79.93)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.49	ft
Elevation Range	79.43 to 80.00 ft	
Flow Area	12.61	ft²
Wetted Perimeter	43.71	ft
Hydraulic Radius	0.29	ft
Top Width	43.38	ft
Normal Depth	0.49	ft
Critical Depth	0.43	ft

Worksheet for Marshall Way South of Camelback Road - Section 4

Results

Critical Slope		0.00610	ft/ft
Velocity		2.22	ft/s
Velocity Head		0.08	ft
Specific Energy		0.56	ft
Froude Number		0.73	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.49	ft
Critical Depth	0.43	ft
Channel Slope	0.00300	ft/ft
Critical Slope	0.00610	ft/ft

Cross Section for Marshall Way South of Camelback Road - Section 4

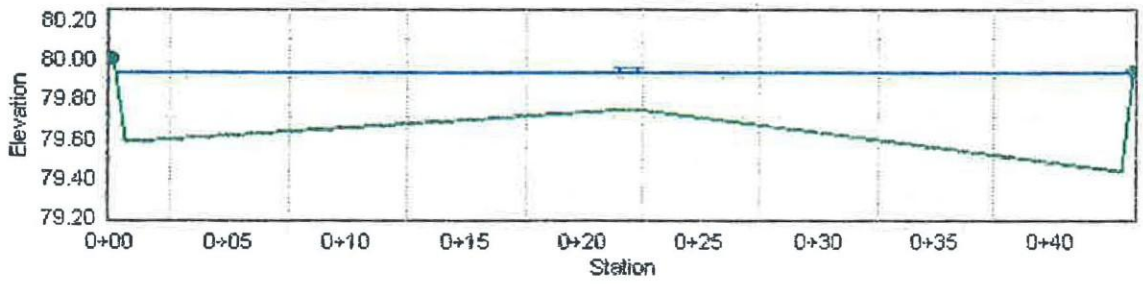
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00300	ft/ft
Normal Depth	0.49	ft
Discharge	28.00	ft^3/s

Cross Section Image



Worksheet for Camelback Road east of Marshall Way - Section 5

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Discharge	60.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	0.50
0+01	0.00
0+52	0.54
0+53	1.04
0+59	1.04
0+60	0.54
0+96	0.00
0+97	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 0.50)	(0+97, 0.50)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.52	ft
Elevation Range	0.00 to 1.04 ft	
Flow Area	22.47	ft²
Wetted Perimeter	86.52	ft
Hydraulic Radius	0.26	ft

Worksheet for Camelback Road east of Marshall Way - Section 5

Results

Top Width	86.06	ft
Normal Depth	0.52	ft
Critical Depth	0.51	ft
Critical Slope	0.00594	ft/ft
Velocity	2.67	ft/s
Velocity Head	0.11	ft
Specific Energy	0.63	ft
Froude Number	0.92	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.52	ft
Critical Depth	0.51	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00594	ft/ft

Cross Section for Camelback Road east of Marshall Way - Section 5

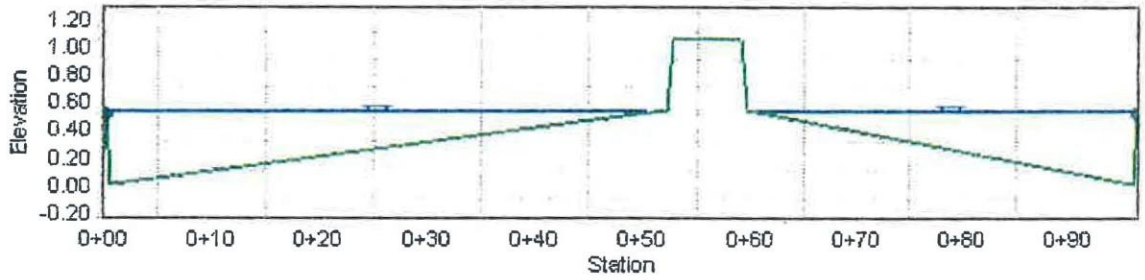
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Normal Depth	0.52	ft
Discharge	60.00	ft³/s

Cross Section Image



Capacity of Half-Scottsdale Road - SECTION 7

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00750	ft/ft
Discharge	160.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	79.34
0+01	78.84
0+02	78.79
0+24	78.34
0+36	77.92
0+38	77.85
0+38	78.38
0+43	78.47
0+55	79.03

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 79.34)	(0+55, 79.03)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	1.18	ft
Elevation Range	77.85 to 79.34 ft	
Flow Area	29.81	ft²
Wetted Perimeter	54.68	ft

Capacity of Half-Scottsdale Road - SECTION 7

Results

Hydraulic Radius		0.55	ft
Top Width		54.34	ft
Normal Depth		1.18	ft
Critical Depth		1.28	ft
Critical Slope		0.00437	ft/ft
Velocity		5.37	ft/s
Velocity Head		0.45	ft
Specific Energy		1.63	ft
Froude Number		1.28	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.18	ft
Critical Depth	1.28	ft
Channel Slope	0.00750	ft/ft
Critical Slope	0.00437	ft/ft

Capacity of Half-Scottsdale Road - SECTION 7

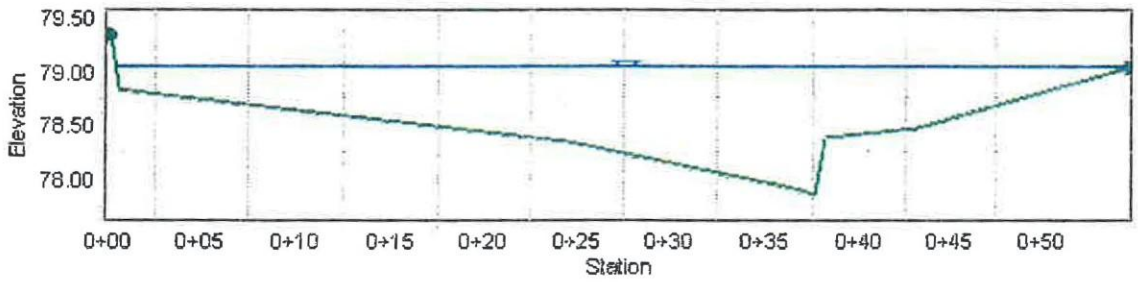
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00750	ft/ft
Normal Depth	1.18	ft
Discharge	160.00	ft³/s

Cross Section Image



Scottsdale Road Capacity=160 cfs

70 cfs spills into Coolidge Street and captured by 2-20' curb inlets installed as a part of Safari Drive project.

Worksheet for Goldwater Blvd South of Camelback Road - Section 1

Results

Top Width	40.10	ft
Normal Depth	0.51	ft
Critical Depth	0.49	ft
Critical Slope	0.00640	ft/ft
Velocity	2.34	ft/s
Velocity Head	0.08	ft
Specific Energy	0.60	ft
Froude Number	0.89	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.51	ft
Critical Depth	0.49	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00640	ft/ft

Half St. Scottsdale Rd South of Fashion Sq Dr-Section 8

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00800	ft/ft
Discharge	80.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	78.65
0+18	78.35
0+19	77.72
0+64	78.40
0+65	78.90

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 78.65)	(0+65, 78.90)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.75	ft
Elevation Range	77.72 to 78.90 ft	
Flow Area	19.10	ft²
Wetted Perimeter	53.37	ft
Hydraulic Radius	0.36	ft
Top Width	53.04	ft
Normal Depth	0.75	ft
Critical Depth	0.81	ft

Half St. Scottsdale Rd South of Fashion Sq Dr-Section 8

Results

Critical Slope		0.00513	ft/ft
Velocity		4.19	ft/s
Velocity Head		0.27	ft
Specific Energy		1.02	ft
Froude Number		1.23	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.75	ft
Critical Depth	0.81	ft
Channel Slope	0.00800	ft/ft
Critical Slope	0.00513	ft/ft

Half St. Scottsdale Rd South of Fashion Sq Dr-Section 8

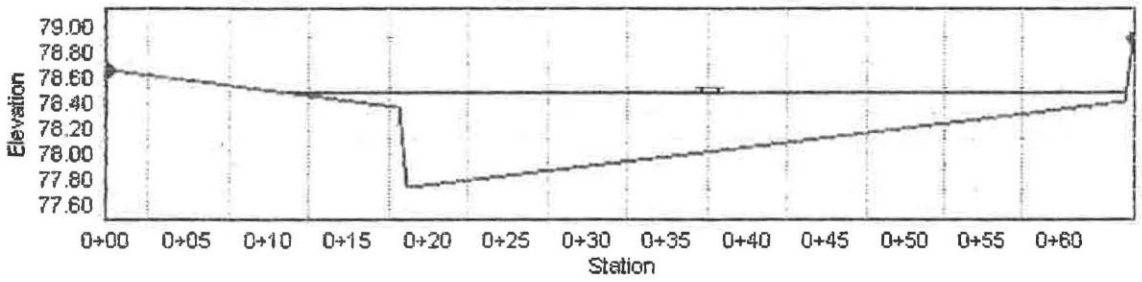
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00800	ft/ft
Normal Depth	0.75	ft
Discharge	80.00	ft³/s

Cross Section Image



Worksheet for Fashion Square Drive - Section 9

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00350	ft/ft
Discharge	39.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	78.50
0+02	78.08
0+02	78.11
0+19	78.15
0+23	78.15
0+39	77.89
0+40	78.39
0+54	78.65

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 78.50)	(0+54, 78.65)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.57	ft
Elevation Range	77.89 to 78.65 ft	
Flow Area	14.67	ft²
Wetted Perimeter	43.58	ft
Hydraulic Radius	0.34	ft

Worksheet for Fashion Square Drive - Section 9

Results

Top Width		43.34	ft
Normal Depth		0.57	ft
Critical Depth		0.52	ft
Critical Slope		0.00556	ft/ft
Velocity		2.66	ft/s
Velocity Head		0.11	ft
Specific Energy		0.68	ft
Froude Number		0.81	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.57	ft
Critical Depth	0.52	ft
Channel Slope	0.00350	ft/ft
Critical Slope	0.00556	ft/ft

Cross Section for Fashion Square Drive - Section 9

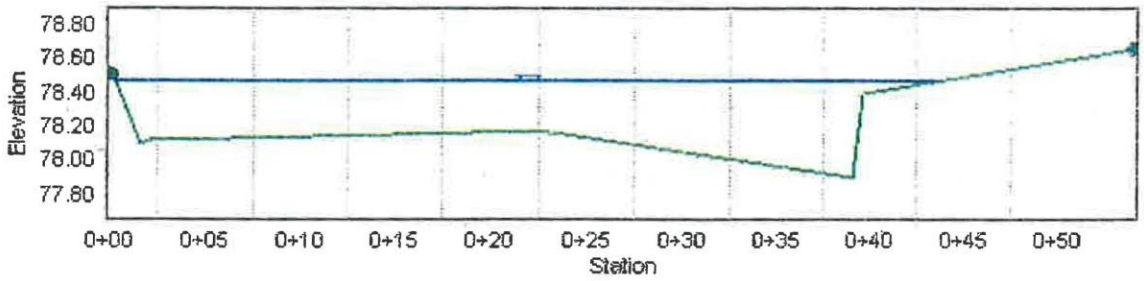
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00350	ft/ft
Normal Depth	0.57	ft
Discharge	39.00	ft³/s

Cross Section Image



Worksheet for Scottsdale Road South of Coolidge Road-Section 10

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Discharge	119.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	80.48
0+06	80.22
0+06	79.61
0+47	80.59
0+48	81.09

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 80.48)	(0+48, 81.09)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.99	ft
Elevation Range	79.61 to 81.09 ft	
Flow Area	22.32	ft²
Wetted Perimeter	47.45	ft
Hydraulic Radius	0.47	ft
Top Width	47.01	ft
Normal Depth	0.99	ft
Critical Depth	1.10	ft

Worksheet for Scottsdale Road South of Coolidge Road-Section 10

Results

Critical Slope		0.00454	ft/ft
Velocity		5.33	ft/s
Velocity Head		0.44	ft
Specific Energy		1.43	ft
Froude Number		1.36	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.99	ft
Critical Depth	1.10	ft
Channel Slope	0.00900	ft/ft
Critical Slope	0.00454	ft/ft

Cross Section for Scottsdale Road South of Coolidge Road-Section 10

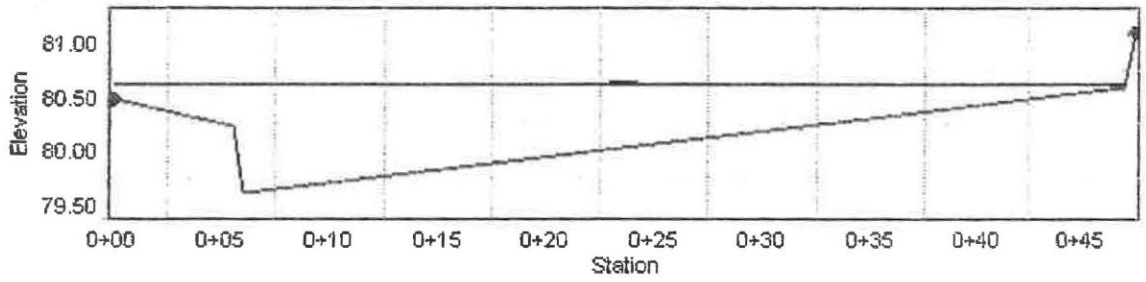
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Normal Depth	0.99	ft
Discharge	119.00	ft^3/s

Cross Section Image



Coolidge St. before Safari Dr. Development-Section 11

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00600	ft/ft
Discharge	29.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	80.76
0+11	80.39
0+27	80.21
0+41	80.22
0+42	80.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 80.76)	(0+42, 80.48)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.35	ft
Elevation Range	80.21 to 80.76 ft	
Flow Area	9.66	ft²
Wetted Perimeter	35.82	ft
Hydraulic Radius	0.27	ft
Top Width	35.67	ft
Normal Depth	0.35	ft
Critical Depth	0.36	ft

Coolidge St. before Safari Dr. Development-Section 11

Results

Critical Slope		0.00578	ft/ft
Velocity		3.00	ft/s
Velocity Head		0.14	ft
Specific Energy		0.49	ft
Froude Number		1.02	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.35	ft
Critical Depth	0.36	ft
Channel Slope	0.00600	ft/ft
Critical Slope	0.00578	ft/ft

Coolidge St. before Safari Dr. Development-Section 11

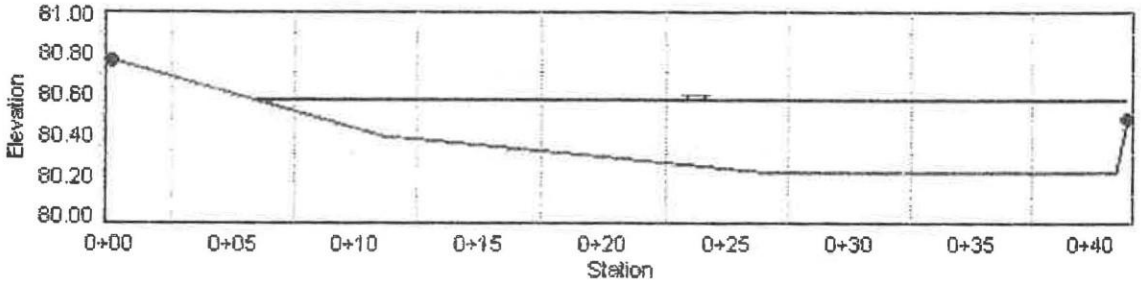
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00600	ft/ft
Normal Depth	0.35	ft
Discharge	29.00	ft³/s

Cross Section Image



Scottsdale Rd North of Coolidge Rd-Section 13

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Discharge	70.00	ft³/s

Section Definitions

INCLUDED BUT NOT USED AS PART OF THE ANALYSIS DUE TO EXPLANATION IN THE REPORT

Station (ft)	Elevation (ft)
0+00	81.51
0+01	81.00
0+47	80.00
0+48	80.52
0+53	80.64

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 81.51)	(0+53, 80.64)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.78	ft
Elevation Range	80.00 to 81.51 ft	
Flow Area	15.57	ft²
Wetted Perimeter	42.71	ft
Hydraulic Radius	0.36	ft
Top Width	42.34	ft
Normal Depth	0.78	ft
Critical Depth	0.86	ft

Scottsdale Rd North of Coolidge Rd-Section 13

Results

Critical Slope		0.00507	ft/ft
Velocity		4.50	ft/s
Velocity Head		0.31	ft
Specific Energy		1.10	ft
Froude Number		1.31	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.78	ft
Critical Depth	0.86	ft
Channel Slope	0.00900	ft/ft
Critical Slope	0.00507	ft/ft

Scottsdale Rd North of Coolidge Rd-Section 13

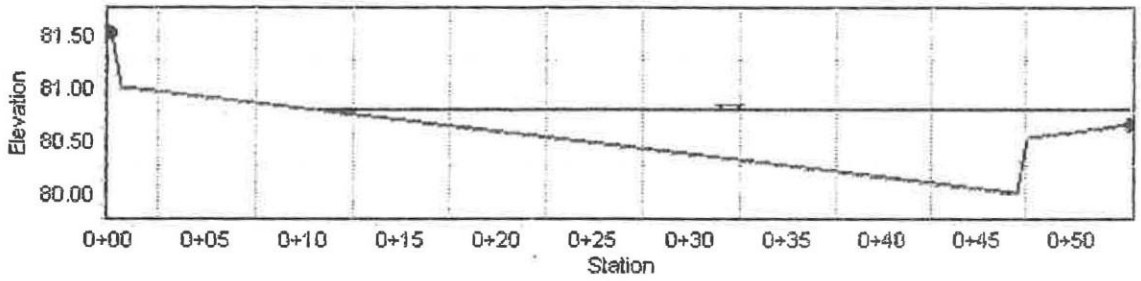
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Normal Depth	0.78	ft
Discharge	70.00	ft^3/s

Cross Section Image



Half St. Scottsdale Rd North of Fashion Sq Dr-Section 14

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00800	ft/ft
Discharge	52.00	ft³/s

Section Definitions

INCLUDED BUT NOT USED AS PART OF THE ANALYSIS DUE TO EXPLANATION IN THE REPORT

Station (ft)	Elevation (ft)
0+00	79.22
0+01	78.79
0+38	77.87
0+39	78.28
0+44	78.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 79.22)	(0+44, 78.48)	0.016

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.74	ft
Elevation Range	77.87 to 79.22 ft	
Flow Area	12.66	ft²
Wetted Perimeter	36.42	ft
Hydraulic Radius	0.35	ft
Top Width	36.13	ft
Normal Depth	0.74	ft
Critical Depth	0.80	ft

Half St. Scottsdale Rd North of Fashion Sq Dr-Section 14

Results

Critical Slope		0.00519	ft/ft
Velocity		4.11	ft/s
Velocity Head		0.26	ft
Specific Energy		1.00	ft
Froude Number		1.22	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.74	ft
Critical Depth	0.80	ft
Channel Slope	0.00800	ft/ft
Critical Slope	0.00519	ft/ft

Half St. Scottsdale Rd North of Fashion Sq Dr-Section 14

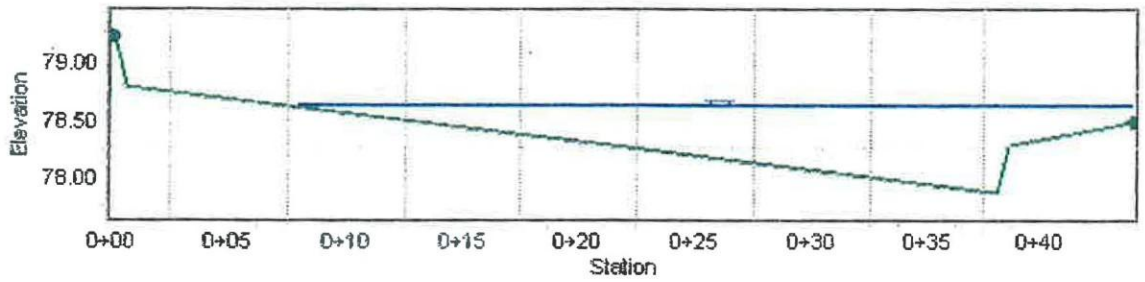
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00800	ft/ft
Normal Depth	0.74	ft
Discharge	52.00	ft³/s

Cross Section Image



Culvert Analysis Report
Arizona Canal OverBank

AZ Canal Weir Analysis, Refer to Exhibit C located under Appendix A

Component:Weir

Hydraulic Component(s): Roadway					
Discharge	1,202.00	cfs	Allowable HW Elevation	79.50	ft
Roadway Width	12.00	ft	Overtopping Coefficient	2.99	US
Low Point	77.52	ft	Headwater Elevation	79.50	ft
Discharge Coefficient (Cr)	2.99		Submergence Factor (Kt)	1.00	
Tailwater Elevation	0.00	ft			

Sta (ft)	Elev. (ft)
-200.00	79.00
0.00	79.56
30.00	79.59
56.00	79.38
109.00	79.64
190.00	79.68
245.00	79.72
303.00	79.74
386.00	79.95
517.00	79.58
661.00	79.47
693.00	79.45
735.00	79.69
802.00	79.46
831.00	79.43
856.00	79.39
955.00	79.21
1,030.00	79.34
1,097.00	79.42
1,146.00	79.29
1,196.00	79.25
1,304.00	79.69
1,330.00	80.36
1,364.00	79.69
1,388.00	78.56
1,467.00	79.08
1,494.00	78.53
1,532.00	79.17
1,532.50	79.59
1,536.00	79.66
1,536.50	79.22
1,561.00	79.03
1,561.50	79.53
1,615.50	78.95
1,616.00	78.43
1,658.00	78.32
1,710.00	77.52
1,710.50	77.96
1,735.00	77.72
1,751.00	77.61
1,752.00	80.18
1,752.50	79.67
1,773.50	79.74
1,794.50	79.58
1,795.00	80.00

The Weir elevations are based on the survey points taken in the field

Culvert Analysis Report
Arizona Canal OverBank

Sta (ft)	Elev. (ft)
1,862.50	79.46

Section 6 (Refer to Exhibit C)

Culvert Analysis Report
Arizona Canal OverBank

Analysis Component			
Storm Event	Design	Discharge	75.00 cfs

Peak Discharge Method: User-Specified			
Design Discharge	75.00 cfs	Check Discharge	75.00 cfs

Tailwater properties: Irregular Channel

Tailwater conditions for Design Storm.			
Discharge	75.00 cfs	Actual Depth	0.00 ft
Velocity	0.00 ft/s		

Name	Description	Discharge	HW Elev.	Velocity
Weir	Roadway	75.00 cfs	78.50 ft	N/A

Culvert Analysis Report
Arizona Canal OverBank

Analysis Component			
Storm Event	Design	Discharge	75.00 cfs

Peak Discharge Method: User-Specified			
Design Discharge	75.00 cfs	Check Discharge	75.00 cfs

Tailwater properties: Irregular Channel

Tailwater conditions for Design Storm.			
Discharge	75.00 cfs	Actual Depth	0.00 ft
Velocity	0.00 ft/s		

Name	Description	Discharge	HW Elev.	Velocity
Weir	Roadway	75.00 cfs	78.50 ft	N/A

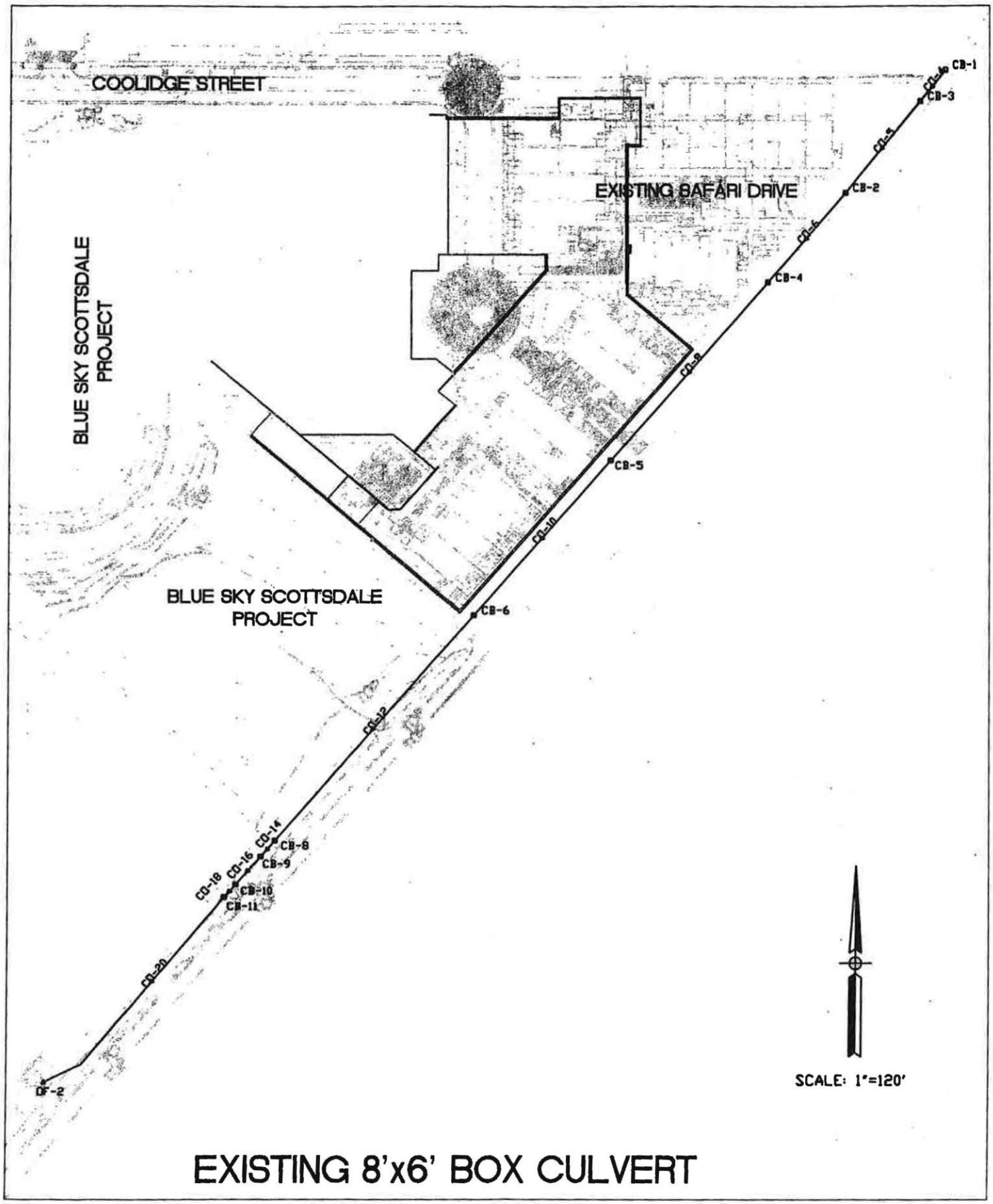
Culvert Analysis Report
Arizona Canal OverBank

Component:Weir

Hydraulic Component(s): Roadway			
Discharge	75.00 cfs	Allowable HW Elevation	78.50 ft
Roadway Width	12.00 ft	Overtopping Coefficient	2.99 US
Low Point	77.52 ft	Headwater Elevation	78.50 ft
Discharge Coefficient (Cr)	2.99	Submergence Factor (Kt)	1.00
Tailwater Elevation	0.00 ft		

Sta (ft)	Elev. (ft)
1,615.50	1,278.95
1,616.00	78.43
1,658.00	78.32
1,710.00	77.52
1,710.50	77.96

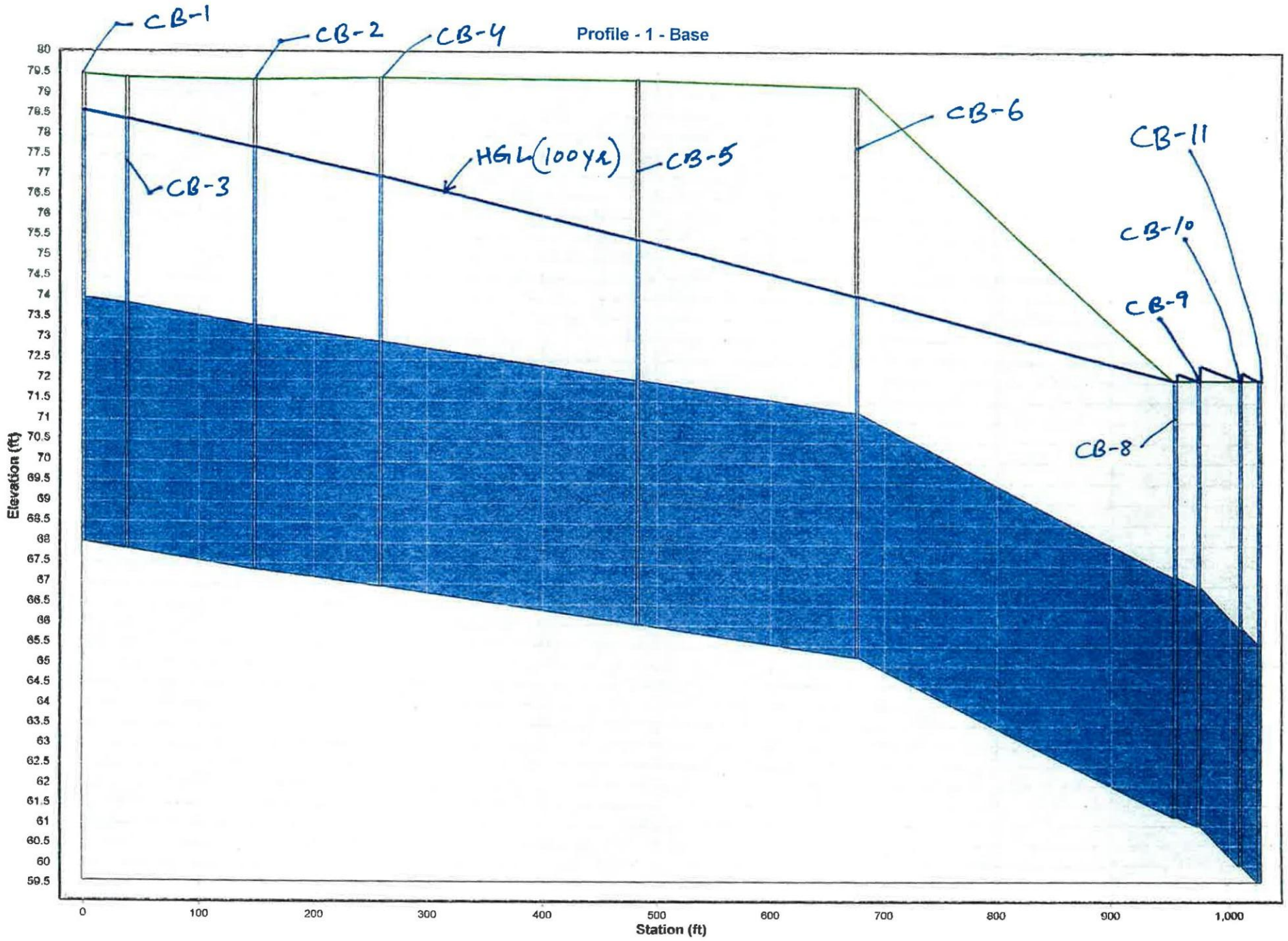
Existing 8'x6' Box Culvert Capacity StormCAD Model
Existing Strom Drain system on Coolidge StormCAD Model

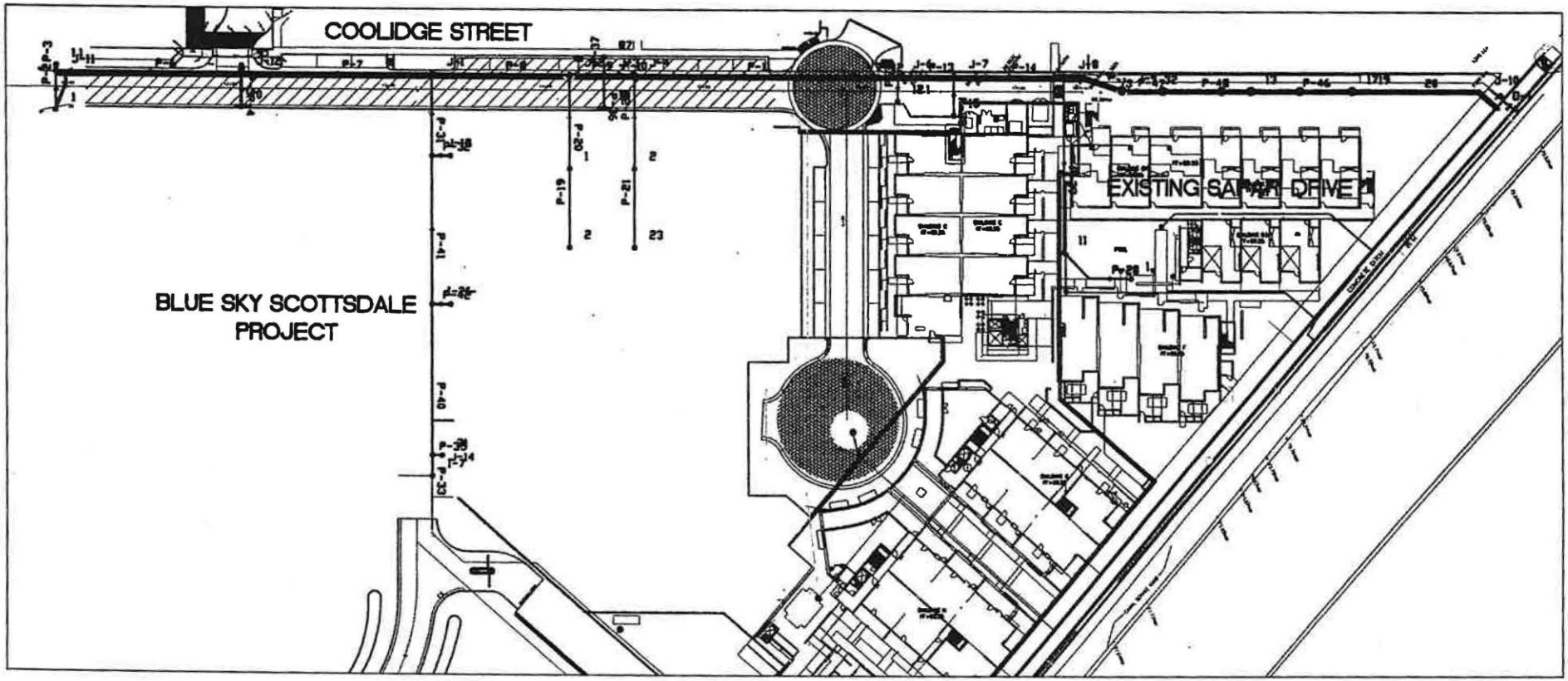


EXISTING 8'x6' BOX CULVERT

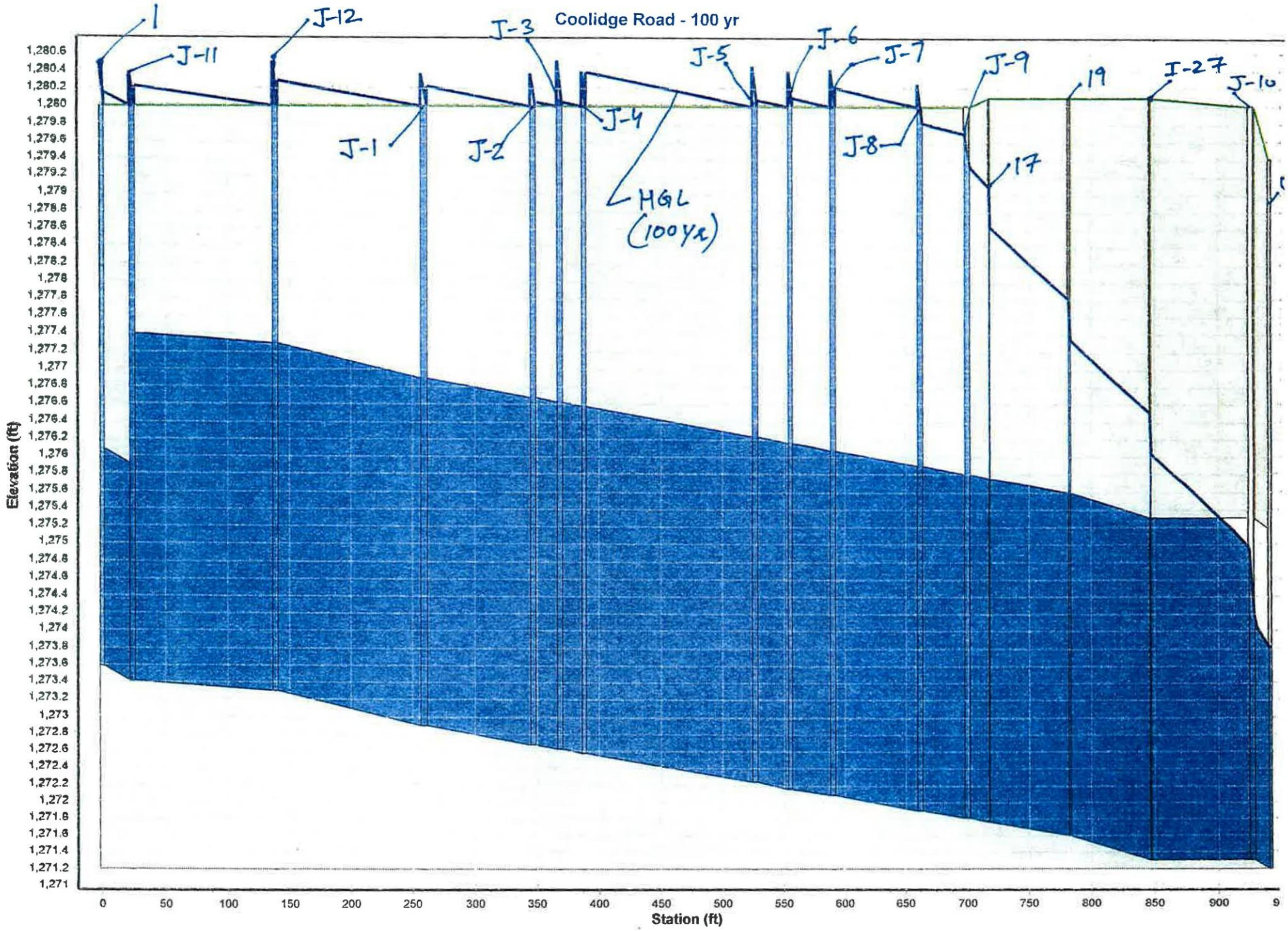
FlexTable: Conduit Table (8'x6' Box Culvert.stc)

Label	Start Node	Invert (Upstream) (ft)	Stop Node	Invert (Downstream) (ft)	Manning's n	Flow (ft^3/s)	Length (Unified) (ft)	Slope (Calculated) (ft/ft)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Velocity (Average) (ft/s)	System Fixed Flow (ft^3/s)
CO-4	CB-1	68.00	CB-3	67.85	0.013	600.00	37.0	0.004	79.50	79.40	78.59	78.37	12.50	600.00
CO-5	CB-3	67.85	CB-2	67.35	0.013	615.00	111.0	0.005	79.40	79.35	78.37	77.69	12.81	615.00
CO-6	CB-2	67.35	CB-4	66.94	0.013	630.00	111.0	0.004	79.35	79.40	77.69	76.98	13.13	630.00
CO-8	CB-4	66.94	CB-5	66.02	0.013	645.00	224.0	0.004	79.40	79.35	76.98	75.47	13.44	645.00
CO-10	CB-5	66.02	CB-6	65.23	0.013	660.00	193.0	0.004	79.35	79.20	75.47	74.11	13.75	660.00
CO-12	CB-6	65.23	CB-8	61.24	0.013	675.00	278.0	0.014	79.20	72.06	74.11	72.06	14.06	675.00
CO-14	CB-8	61.24	CB-9	61.00	0.013	733.00	20.0	0.012	72.06	72.06	72.23	72.06	15.27	733.00
CO-16	CB-9	61.00	CB-10	59.99	0.013	792.00	35.0	0.029	72.06	72.05	72.41	72.05	16.50	792.00
CO-18	CB-10	59.99	CB-11	59.58	0.013	896.00	16.0	0.026	72.05	72.05	72.25	72.05	18.67	896.00
CO-20	CB-11	59.58	OF-2	53.00	0.013	1,000.00	242.0	0.027	72.05	72.50	78.92	75.00	20.83	1,000.00


Profile - 1 - Base
CB-1
CB-2
CB-4
CB-6
CB-11
CB-3
HGL(100yr)
CB-5
CB-10
CB-9
CB-8
Elevation (ft)
80
79.5
79
78.5
78
77.5
77
76.5
76
75.5
75
74.5
74
73.5
73
72.5
72
71.5
71
70.5
70
69.5
69
68.5
68
67.5
67
66.5
66
65.5
65
64.5
64
63.5
63
62.5
62
61.5
61
60.5
60
59.5
0
100
200
300
400
500
600
700
800
900
1,000
Station (ft)


COOLIDGE STREET
BLUE SKY SCOTTSDALE
PROJECT
EXISTING SAMARI DRIVE

SCALE: 1"=100'


Coolidge Road - 100 yr
1
J-12
J-3
J-11
J-5
J-6
J-7
J-9
19
I-27
J-10
J-1
J-2
J-4
J-8
17
HGL
(100yr)
Elevation (ft)
1,280.6
1,280.4
1,280.2
1,280
1,279.8
1,279.6
1,279.4
1,279.2
1,279
1,278.8
1,278.6
1,278.4
1,278.2
1,278
1,277.8
1,277.6
1,277.4
1,277.2
1,277
1,276.8
1,276.6
1,276.4
1,276.2
1,276
1,275.8
1,275.6
1,275.4
1,275.2
1,275
1,274.8
1,274.6
1,274.4
1,274.2
1,274
1,273.8
1,273.6
1,273.4
1,273.2
1,273
1,272.8
1,272.6
1,272.4
1,272.2
1,272
1,271.8
1,271.6
1,271.4
1,271.2
1,271
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
900
Station (ft)

Title: FlexTable: Conduit Table (Coolidge Storm Drain.stc)

Label	Start Node	Invert (Upstream) (ft)	Stop Node	Invert (Downstream) (ft)	Manning's n	Flow (ft^3/s)	Length (Unified) (ft)	Slope (Calculated) (ft/ft)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Velocity (Average) (ft/s)	System Fixed Flow (ft^3/s)
P-17	J-10	1,271.31	O-1	1,271.19	0.012	89.00	15.0	0.008	1,280.00	1,279.41	1,274.17	1,273.82	11.75	89.00
20	I-27	1,271.31	J-10	1,271.31	0.024	89.00	79.0	0.000	1,280.10	1,280.00	1,276.04	1,274.97	7.08	89.00
P-46	19	1,271.60	I-27	1,271.31	0.024	89.00	64.0	0.005	1,280.10	1,280.10	1,277.34	1,276.50	7.08	89.00
P-4	3	1,273.65	J-12	1,273.30	0.012	5.00	21.0	0.017	1,280.06	1,280.00	1,280.04	1,280.00	2.83	5.00
P-5	2	1,273.23	J-12	1,273.30	0.012	1.00	3.0	-0.023	1,279.99	1,280.00	1,280.00	1,280.00	0.57	1.00
P-7	J-12	1,273.30	J-1	1,272.90	0.012	76.00	121.0	0.003	1,280.00	1,280.00	1,280.29	1,280.00	6.05	76.00
P-8	J-1	1,272.90	J-2	1,272.68	0.012	80.00	88.0	0.003	1,280.00	1,280.00	1,280.23	1,280.00	6.37	80.00
P-9	J-2	1,272.68	J-3	1,272.63	0.012	80.00	22.0	0.002	1,280.00	1,280.00	1,280.06	1,280.00	6.37	80.00
P-10	J-3	1,272.63	J-4	1,272.58	0.012	82.00	19.0	0.003	1,280.00	1,280.00	1,280.05	1,280.00	6.53	82.00
P-11	J-4	1,272.58	J-5	1,272.24	0.012	82.00	138.0	0.002	1,280.00	1,280.00	1,280.38	1,280.00	6.53	82.00
P-12	J-5	1,272.24	J-6	1,272.16	0.012	82.00	29.0	0.003	1,280.00	1,280.00	1,280.08	1,280.00	6.53	82.00
P-13	J-6	1,272.16	J-7	1,272.08	0.012	83.00	35.0	0.002	1,280.00	1,280.00	1,280.10	1,280.00	6.60	83.00
P-14	J-7	1,272.08	J-8	1,271.90	0.012	85.00	71.0	0.003	1,280.00	1,280.00	1,280.21	1,280.00	6.76	85.00
P-15	J-8	1,271.90	J-9	1,271.81	0.012	87.00	39.0	0.002	1,280.00	1,280.00	1,279.82	1,279.70	6.92	87.00
P-19	8	1,273.20	7	1,272.96	0.012	0.00	49.0	0.005	1,280.55	1,280.55	1,280.00	1,280.00	0.00	0.00
P-20	7	1,272.96	J-2	1,272.68	0.012	0.00	58.0	0.005	1,280.55	1,280.00	1,280.00	1,280.00	0.00	0.00
P-21	10	1,273.82	9	1,273.58	0.012	0.00	49.0	0.005	1,280.55	1,280.55	1,280.00	1,280.00	0.00	0.00
P-22	9	1,273.58	J-4	1,272.58	0.012	0.00	59.0	0.017	1,280.55	1,280.00	1,280.00	1,280.00	0.00	0.00
P-28	23	1,273.94	22	1,273.69	0.012	1.00	50.0	0.005	1,280.45	1,280.45	1,280.06	1,280.06	0.57	1.00
P-29	22	1,273.69	J-8	1,273.15	0.012	2.00	109.0	0.005	1,280.45	1,280.00	1,280.03	1,280.00	1.13	2.00
P-2	1	1,273.59	J-11	1,273.41	0.012	35.00	24.0	0.007	1,280.00	1,280.00	1,280.15	1,280.00	7.13	35.00
P-3	1.1	1,273.53	J-11	1,273.41	0.012	35.00	3.0	0.040	1,280.00	1,280.00	1,280.02	1,280.00	7.13	35.00
P-6	J-11	1,273.41	J-12	1,273.30	0.012	70.00	114.0	0.001	1,280.00	1,280.00	1,280.23	1,280.00	5.57	70.00
P-31	J-13	1,273.24	J-1	1,272.90	0.012	4.00	51.0	0.007	1,280.00	1,280.00	1,280.06	1,280.00	2.26	4.00
P-32	6	1,273.30	J-13	1,273.24	0.012	3.00	12.0	0.005	1,280.00	1,280.00	1,280.01	1,280.00	1.70	3.00
P-36	12	1,273.27	J-3	1,273.17	0.012	1.00	21.0	0.005	1,279.41	1,280.00	1,280.00	1,280.00	0.57	1.00
P-37	13	1,273.22	J-3	1,273.17	0.012	1.00	11.0	0.005	1,279.70	1,280.00	1,280.00	1,280.00	0.57	1.00
P-38	12.1	1,274.36	J-6	1,274.27	0.012	1.00	16.0	0.006	1,279.78	1,280.00	1,280.00	1,280.00	0.57	1.00
P-39	15	1,274.57	J-7	1,274.45	0.012	2.00	25.0	0.005	1,280.13	1,280.00	1,280.01	1,280.00	1.13	2.00
P-33	I-7	1,274.20	J-14	1,274.18	0.012	0.00	13.0	0.002	1,279.01	1,280.00	1,280.00	1,280.00	0.00	0.00
P-35	31	1,274.27	J-14	1,274.18	0.012	0.00	6.0	0.015	1,279.80	1,280.00	1,280.00	1,280.00	0.00	0.00
P-40	J-14	1,274.18	I-26	1,273.70	0.012	0.00	94.0	0.005	1,280.00	1,280.00	1,280.00	1,280.00	0.00	0.00
P-41	I-26	1,273.70	J-13	1,273.24	0.012	1.00	92.0	0.005	1,280.00	1,280.00	1,280.01	1,280.00	0.57	1.00
P-42	11	1,273.76	I-26	1,273.70	0.012	1.00	12.0	0.005	1,280.25	1,280.00	1,280.00	1,280.00	0.57	1.00
P-47	J-9	1,271.81	17	1,271.76	0.024	87.00	18.0	0.003	1,280.00	1,280.10	1,279.32	1,279.10	6.92	87.00
P-48	17	1,271.76	19	1,271.60	0.024	88.00	65.0	0.002	1,280.10	1,280.10	1,278.64	1,277.81	7.00	88.00

Grated Inlet Structures Hydraulic Capacity Calculations

Capacity of a catch basin in a Sag operating as an Orifice

$Q = C\,A\,(2gd)^{0.50}$

C = 0.67 Orifice Coefficient, g=32.2 ft/s^2

Capacity of Existing Catch basin along the Canal that will beremoved and replaced with 2-4'x4' catch basins

Concentration Point	1st New Catch Basin along Canal	
High Water at Weir=	79.5	
Rim of Catch Basin=	73	
Head on Rim=	6.5	
Total Area of Grate=	3	
50% of Open area of the inlet	1.5	sq. ft.
Depth of water ponding on the inlet	6.5	ft.
Capacity of the inlet =	21	cfs

Refer to Exhibit A, Fill Plans for the Location of this Catch Basin

Capacity of a catch basin in a Sag operating as an Orifice

$Q = C\,A\,(2gd)^{0.50}$

C = 0.67 Orifice Coefficient, g=32.2 ft/s^2

Capacity of New 2-4'x4' Catch basins that will be added to along the Canal to to replace existing catch basin and to compensate for filling in the flood plain.

Based on HWE of 79.50'

Concentration Point	**1st New Catch Basin along Canal to replace existing catch basin**	
High Water at Weir=	79.5	
Rim of Catch Basin=	72.85	
Head on Rim=	6.65	
Total Area of Grate=	16	
50% of Open area of the inlet	8	sq. ft.
Depth of water ponding on the inlet	6.65	ft.
Capacity of the inlet =	111	cfs

Concentration Point	**2nd New Catch Basin along Canal to compensate for filling in the flood plain**	
High Water at Weir=	79.5	
Rim of Catch Basin=	72.57	
Head on Rim=	6.93	
Total Area of Grate=	16	
50% of Open area of the inlet	8	sq. ft.
Depth of water ponding on the inlet	6.93	ft.
Capacity of the inlet =	113	cfs

Refer to Exhibit A, Fill Plans for the Location of these Catch Basins

Capacity of a catch basin in a Sag operating as an Orifice

$Q = C\,A\,(2gd)^{\wedge}0.50$

C = 0.67 Orifice Coefficient, g=32.2 ft/s^2

Refer to Exhibit C for the location of below Catch Basins along Camelback Road

Based on HWE of 79.50'

Concentration Point	**East Catch Basin**	
High Water at Weir=	79.5	
Rim of Catch Basin=	76.6	
Head on Rim=	2.9	
Total Area of Grate=	19.68	
50% of Open area of the inlet	9.84	sq. ft.
Depth of water ponding on the inlet	2.9	ft.
Capacity of the inlet =	90	cfs

Concentration Point	**Middle Catch Basin**	
High Water at Weir=	79.5	
Rim of Catch Basin=	76.73	
Head on Rim=	2.77	
Total Area of Grate=	19.68	
50% of Open area of the inlet	9.84	sq. ft.
Depth of water ponding on the inlet	2.77	ft.
Capacity of the inlet =	88	cfs

Concentration Point	**West Catch Basin**	
High Water at Weir=	79.5	
Rim of Catch Basin=	75.15	
Head on Rim=	4.35	
Total Area of Grate=	19.68	
50% of Open area of the inlet	9.84	sq. ft.
Depth of water ponding on the inlet	4.35	ft.
Capacity of the inlet =	110	cfs

APPENDIX E
HYDROLOGIC CALCULATIONS AND DATA SHEETS
(REFER TO EXHIBIT F IN APPENDIX A)

RATIONAL FOR WINDOWS

Flood Control District of Maricopa County Rational Method

Project Information

Project Name: BLUE SKY SCOTTSDALE **Project Description:**

Drainage Point: 1 **Location:** CP1

Drainage Basin Data

Water Course Length: 235.00 ft **Basin Area:** 0.670 acres

High Elevation: 0.50 ft **Low Elevation:** 0.00 ft

Average Slope: 0.0021 ft/ft **Roughness, Kb;** 0.0411 (A)

10-Year Runoff Coefficient: 0.760

10-Year 6 Hour Rainfall Depth: 2.00 inches

Hydrological Summary Table

Parameter	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Q (cfs)	2	2	3	4	4	5
C	0.760	0.760	0.760	0.836	0.912	0.950
Tc (min)	8.5	7.5	7.0	6.5	6.1	5.8
i (in/hr)	3.0	4.2	5.0	6.3	7.2	8.3

Computed by: Dhap, DEA
Thursday, January 05, 2012 8:05:25 a

File: P:\G\GRYD00000001\0600INFO\EP\WR\RA\Proposed Rationals.rat

Author: Frank M. Gu, P.E.
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URL: http://www.engsoftwarecenter.com/rational.html

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1616 N. Litchfield Rd. Suite 120, Goodyear, AZ 85338

RATIONAL FOR WINDOWS

Flood Control District of Maricopa County Rational Method

Project Information

Project Name: BLUE SKY SCOTTSDALE

Project Description:

Drainage Point: 2

Location: CP2

Drainage Basin Data

Water Course Length: 200.00 ft

Basin Area: 0.560 acres

High Elevation: 0.50 ft

Low Elevation: 0.00 ft

Average Slope: 0.0025 ft/ft

Roughness, Kb: 0.0416 (A)

10-Year Runoff Coefficient: 0.760

10-Year 6 Hour Rainfall Depth: 2.00 inches

Hydrological Summary Table

Parameter	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Q (cfs)	1	2	2	3	4	5
C	0.760	0.760	0.760	0.836	0.912	0.950
Tc (min)	7.3	6.5	6.1	5.6	5.3	5.0
i (in/hr)	3.2	4.4	5.3	6.5	7.5	8.7

Computed by: Dhap, DEA
Thursday, January 05, 2012 8:05:25 a

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URL: http://www.engsoftwarecenter.com/rational.html

RATIONAL FOR WINDOWS

Flood Control District of Maricopa County Rational Method

Project Information

Project Name: BLUE SKY SCOTTSDALE **Project Description:**

Drainage Point: 3 **Location:** CP3

Drainage Basin Data

Water Course Length: 300.00 ft **Basin Area:** 0.600 acres

High Elevation: 0.50 ft **Low Elevation:** 0.00 ft

Average Slope: 0.0017 ft/ft **Roughness, Kb:** 0.0414 (A)

10-Year Runoff Coefficient: 0.760

10-Year 6 Hour Rainfall Depth: 2.00 inches

Hydrological Summary Table

Parameter	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Q (cfs)	1	2	2	3	4	4
C	0.760	0.760	0.760	0.836	0.912	0.950
Tc (min)	10.8	9.6	8.9	8.1	7.7	7.3
i (in/hr)	2.7	3.8	4.5	5.8	6.6	7.6

RATIONAL FOR WINDOWS

Flood Control District of Maricopa County Rational Method

Project Information

Project Name: BLUE SKY SCOTTSDALE

Project Description:

Drainage Point: 4

Location: CP4

Drainage Basin Data

Water Course Length: 300.00 ft

Basin Area: 0.520 acres

High Elevation: 80.60 ft

Low Elevation: 78.70 ft

Average Slope: 0.0063 ft/ft

Roughness, Kb: 0.0418 (A)

10-Year Runoff Coefficient: 0.760

10-Year 6 Hour Rainfall Depth: 2.00 inches

Hydrological Summary Table

Parameter	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Q (cfs)	1	2	2	3	4	4
C	0.760	0.760	0.760	0.836	0.912	0.950
Tc (min)	6.7	5.9	5.5	5.1	5.0	5.0
i (in/hr)	3.3	4.6	5.5	6.7	7.7	8.7

Computed by: Dhap, DEA
Thursday, January 05, 2012 8:05:25 a

File: P:\G\GRYD00000001\0600INFO\EP\WR\RA\Proposed Rationals.rat

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APPENDIX F
REPORTS BY OTHERS

FINAL DRAINAGE REPORT

SAFARI DRIVE

OCTOBER 2006
DEA PROJECT NO. MHUL0000-0001

TABLE OF CONTENTS

1.0 INTRODUCTION

This final drainage report has been prepared under a contract from Riverwalk Square, LLC for the Safari Drive project in Scottsdale. The purpose of this report is to provide hydrologic and hydraulic analyses, required by the City of Scottsdale, to support the Safari Drive improvement plans. Preparation of this report has been done in accordance with the procedures detailed in the *City of Scottsdale Design Standards and Policies Manual* (Reference #1) along with the City of Scottsdale *Supplement to MAG Uniform Standard Specifications For Public Works Construction* (Reference #2) and *Drainage Design Manuals for Maricopa County, Arizona, Volumes I & II* (References #3 and #4).

The proposed Safari Drive project is located northeast of the intersection of Scottsdale Road and Camelback Road, within the City of Scottsdale, Maricopa County, Arizona. The site is located within Section 23, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian.

The project site is bound by a commercial development to the north (Highland Park), undeveloped parcel to the west (east of Scottsdale Road), a commercial development to the south and the Arizona Canal to the east. Access to the site will be provided via two entrances from Scottsdale Road along 72nd Place and Coolidge Street. The project is located within what is considered the Downtown Area of the City's General Plan.

The proposed Safari Drive project site is approximately 5 acres (for Phase 1 and 2). The project is going to be developed in phases. Onsite improvements include the demolition of existing structures, site grading, and construction of the new Safari Drive buildings with associated hardscape and landscaped areas. Offsite improvements include asphalt pavement for portions of the adjacent street sections and a proposed turning lane along Scottsdale Road.

2.0 EXISTING DRAINAGE CONDITIONS

As mentioned in the section above, the site is located east of Scottsdale Road, west of the Arizona Canal and south of Coolidge Street. Through researching several drainage reports, aerial photos and as built information, it was determined that the site was occupied with a resort known as the Safari Hotel and Resort, See Appendix F. The resort site was demolished in 1998 and it was regarded. Aerial photos and field visits show that there are no washes impacting the site.

Offsite runoff that may impact the site is conveyed along western boundary of the Arizona Canal in a southwesterly direction. According to the topography in the area, the general lay of

the land is in a southeasterly direction, towards to the Arizona Canal, where runoff ponds against the canal before it is conveyed through storm drain systems or weirs over the canal. The Arizona Canal is supposed to be drained during major storm events, in addition to a 4-foot of freeboard that would allow the canal to accept additional storm runoff into its system.

The site is located in an area that drains into what is known as Reach 4 of the Flood Control District's side channel drainage system. This storm drain system runs along Camelback Road and outfalls into the Indian Bend Wash and it was installed in the 1980's through coordination with the City of Scottsdale, Flood Control District and the US Army Corps of Engineers. The system was designed to convey the 25 year storm event. There is a series of grated inlet structures (equivalent to two MAG 535 structures) that capture runoff along the western side of the canal and convey runoff into an underground 54 inch storm drain pipe that changes into a 72 inch pipe which outfalls into the storm drain system in Camelback Road. These area drains and the underground storm drain system traverse the eastern boundary of the Safari Drive site. There is also a large grate inlet structure, northeast of Camelback Road and Scottsdale Road intersection, along the western side of the Canal between the two commercial developments south of the safari site that captures runoff that ponds west of the Arizona Canal.

Scottsdale Road is an improved street with curb and gutter that drains in a southerly direction, adjacent to the site, towards Camelback Road. The majority of the runoff along Scottsdale Road is conveyed within the street section of the road and a smaller portion is conveyed into the existing storm drain system, along Scottsdale Road, that outfalls into the main storm drain in Camelback Road.

It is estimated that there is approximately 3,638 cfs that would reach the intersection of Camelback and Scottsdale Road (based on CVL report, Reference 8). The majority of the runoff will weir over the Arizona Canal bank into the canal itself, whish is supposed to convey the runoff. Some of the runoff may spill over Camelback Road in a southerly direction as well.

The current published FEMA Flood Insurance Rate Map (FIRM) for this area is map number 04013C1695H (Effective date is September 30, 2005). Portions of the site were located within zones A and X. Zone A is defined as the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations or depths are shown within this zone. Zone X is defined as "areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 100-year flood." A copy of the FIRM panel is provided in Appendix B.

A CLOMR has been filed for Safari Drive project by different firm than DEA, before DEA was contracted to finish the design improvement documents for the project. A copy of the Conditional Letter of Map Revision (CLOMR) Response from FEMA is included in Appendix E of this drainage report. The CLOMR was based on fill and that the proposed finish floor elevations are higher than Arizona Canal bank. The proposed structures should be free from inundation during a 100-yeat storm event. A Letter of Map Revision (LOMR) will be submitted after the project is build and all the design documents have been approved.

3.0 PROPOSED DRAINAGE CONCEPT

The proposed drainage concept is presented in three parts: onsite drainage, off-site drainage, and storage requirements. The hydrologic analysis is summarized in section 4.0 and the hydraulic analysis is summarized in section 5.0. See Exhibit A, located in the back pocket, for an illustration of the proposed drainage concept.

3.1 On-site Drainage Conveyance

The Safari Drive site runoff is mostly generated on the roof, the hardscape and landscape areas surrounding the buildings and the courtyard areas. The runoff generated on the roof is conveyed into roof drains that direct the runoff onsite storm drain system or directly into the 54 inch pipe west of the Arizona Canal. Refer to Exhibit A for a graphical illustration of the proposed onsite drainage.

3.2 Off-site Drainage Conveyance

DEA designers have conducted field visits, reviewed aerial maps and available topography to determine the hydraulic/hydrological conditions of the contributing watershed north of the Safari Drive project site. Runoff that may impact the site could enter the site from the northeastern portion of the site, with runoff being conveyed in a southwesterly direction along the west bank of the Arizona Canal. The second area of offsite runoff that could potentially impact the site is runoff flowing south along Scottsdale Road. In addition to that, runoff concentrating at the intersection of Camelback Road and Scottsdale Road weirs over the Arizona Canal could back into the site if the weir high water elevation over the canal bank is higher than the proposed finished grade elevations onsite.

The first area of investigation was to quantify the offsite runoff along the northeastern portion of the site. Runoff that may impact the site is generated north of Chapparal Road. During field visits it was observed that an 8'x4' concrete box culvert exists underneath Chapparal Road, west of the Arizona Canal. Few feet upstream of the culvert, is a 20.5'x13' grate inlet structure. Runoff from the north captured by the grate inlet is conveyed in an easterly direction through an

approximately what seemed to be a 96" pipe underneath the Arizona Canal. Any runoff that by pass the grate inlet structure (which is not likely) will flow through the 8'x4' culvert, underneath Chaparral Road, in a southerly direction. However, field observations have shown that there are sidewalks extending from hotel buildings, west of the Arizona Canal and south of Chapparal Road, to the Arizona Canal bank. These sidewalks create berms/dam situation along the west side of the canal with 2 -18 inch bleed off pipes underneath these sidewalks. This occurs in 3 different locations upstream of the site.

Each of the 18 inch pipes is estimated to convey a flow amount that is less than what the full 8'x4' concrete box culvert can convey. The runoff that ponds upstream of the sidewalks in excess of the 18 inch pipe conveyance capacity would weir into the Arizona Canal (to the west) and over the sidewalk in a southerly direction. The sidewalks and the canal banks seemed to have the same elevations and it is assumed that 50 percent split will occur at each of the sidewalk locations.

Hydraulic analysis has been conducted for the 8'x4' culvert at Chaparral Road in order to determine the maximum capacity of the culvert and it was found to be 277 cfs. The 277 cfs representing the maximum capacity of the culvert is used at the downstream three sidewalk locations to determine the split flows in each direction. The result was that 200 cfs will spill into the Arizona Canal and the remaining 77 cfs will continue in the southerly towards the Safari Drive project. Refer to Appendix D for detailed split flow analysis data sheets.

In addition to the flow calculated above, the existing 54-inch/72 inch storm drain system east of the site will receive runoff from the development north of site. The majority of the runoff generated in the subdivision and the commercial development upstream of the site is bounded by Chapparal Road to the north, Scottsdale Road to the west, the Arizona Canal to the east and the Safari Drive project northern boundary to the south. The runoff outfalls to the channel northeast of the corner of the Safari project site. The Rational method was used to determine the flow and 140 cfs was estimated to be the peak flow that combines with the 77 cfs mentioned above. Thus, the total flow that enters at the northeastern portion of the site is 217 cfs (within the concrete channel, west of the Arizona Canal).

A FlowMaster (Reference 7) was used to determine the high water elevation, using the 217 cfs. An earthen channel, west of the canal and above the 54 inch pipe, was modeled to check the high water elevation in the channel using the 217 cfs. The modeling did not take into account the 54 inch pipe and the high water elevation at the upstream portion of the site was found to be 77.2 which is 3.7 feet lower than the proposed finish floor elevations onsite.

Several drainage reports have quantified the runoff flowing south along Scottsdale Road. Based on the Final Drainage Report prepared by CVL (Reference #8), the flow along

Scottsdale Road is in the vicinity of the project 378 cfs. This flow is approximately consistent with flow quantified DMJM (Reference 9). FlowMaster program was used to determine if the street flow depth can be contained in the street without spilling into the Safari Drive project. The calculations have shown that ponding above the gutter elevation of 1.2 feet. Hence, the entrances and future frontage along Scottsdale Road are and will be elevated to 1.2 feet from the gutter elevation, thus creating a berm minimizing the possibility of the street runoff from entering the site.

The contributing drainage areas to Scottsdale Road extend all the way to the mountains west of Invergordon Road. The majority of the runoff from the mountains will flow in a southeasterly direction towards Scottsdale Road and Camelback Road. Gold Water Boulevard acts as a ridge line because of its elevated topography in some locations, deep dip locations in others and the existing development as well. Any runoff from the mountains that reaches Camelback Road from the north will flow in an easterly direction along Camelback Road, while breaching south into the north-south streets such as 66th Street, 68th Street, Goldwater Boulevard and Scottsdale Road. The CVL report, mentioned earlier, has quantified that approximately 3,638 cfs will reach Scottsdale Road and Camelback Road intersection, where it will then spill into Arizona Canal. From several conversations with different agencies, it is believed that the Arizona Canal is maintained in such a way that it is capable of conveying the additional 3,638 cfs without breaching in a southeasterly direction. Although, the 3,638 cfs seems overly conservative and is questionable because of the hydraulic conditions of Camelback Road (mentioned above), DEA modeled the weir along the Arizona Canal based on that flow. The high water ponding elevation along the Arizona Canal bank canal was determined to be 1280.30, which is 0.65 feet below the lowest proposed finish floor elevation of 1280.95. This indicates that the proposed buildings will not be flooded during the 100-year design storm event.

As mentioned earlier, the Arizona Canal causes ponding along the west side of its bank. An older drainage report that was produced by the Corps of engineers has accounted for inlets west of the canal to reduce or bleedoff the amount ponding that was occurring west of the Arizona Canal. Hence, the Safari project provided a passage for the runoff from Scottsdale Road (approximately 70 cfs) into the inlets along the west side of the canal or the existing 54 inch, west of the canal. This is partially accomplished by adding two 20 foot catch basins on both side of Coolidge Street, east of Scottsdale Road. The two catch basins convey captured runoff into a 48 inch diameter pipe flowing in the easterly direction towards the Arizona Canal that connects into the 54 inch storm drain pipe. The remainder of the flow along Scottsdale Road will continue along its historic path towards Camelback Road and ponds along the west side of the Arizona Canal and enters the inlets that were designed by the Army Corps of engineers or the revised inlets with equal or greater capacity.

3.3 Storage Requirements

Historically, the proposed Safari site used to be a commercial resort with many buildings and associated parking, landscape and hardscape areas. The resort was known as the Safari Hotel and Resort and it did not seem to have onsite retention.

The proposed Safari project has retention waiver that is included in Appendix E. Portions of the site drain through roof drains directly into the existing 54 inch west of the Arizona Canal (which will be replaced with a proposed 8x6 concrete culvert). Also, portions of the site that are surrounding the onsite buildings, along the eastern portion of the site, sheet flow into the landscape area, west of the Arizona Canal. Portions of the site that drain into catch basins onsite will be retained in underground conveyance pipes located at the northeastern portion of the site and along Coolidge Street.

City of Scottsdale requires that runoff generated during a 100-year, 2-hour storm event within the project site to be stored onsite. The required storage volume for the project site is estimated as follows:

$$V_R = C_{wt} * (P / 12) * A$$

Where: V_R = Calculated volume in acre-ft or ft^3
C_{wt} = Weighted Runoff coefficient
P = Rainfall depth in inches (2.82 inches)
A = Drainage area in acres

The proposed site plan allocates some open space for storage. Basins have maximum 4 to 1 side slopes. The volume required is calculated based on a weighted "C" coefficient and 2.82 inches of rainfall. See Exhibit A in back pocket of this report for proposed storage layout.

Summary of Storage Requirements
Table 3.2

Basin Label	Estimated Volume Required ft^3	Estimated Volume Provided ft^3	Excess/Shortage ft^3
Basin 1	1,533	802	-731, overflow to Storage Pipe
Basin 2	456	554	98,
Pipe Storage	32,190	32,229	39

The underground CMP storage pipes will bleedoff in 36 hrs through conveyance pipes into the drainage system west of the Arizona Canal.

Refer to Appendix D that shows detailed volume calculations for the site fill placement. Based on these calculations, the proposed improvements for the site (including the offsite box culvert) have excess capacity of approximately 18 thousand cubic feet. Hence, the site development has provided more than the compensatory volume for the fill that has been placed onsite to keep the finish floors from flooding during a 100-year storm event.

4.0 HYDROLOGIC ANALYSIS

The hydrologic analysis for this report has been prepared using City of Scottsdale's *Supplement to MAG Uniform Standard Specifications for Public Works Construction* and the *Drainage Design Manuals for Maricopa County, Arizona, Volume I Hydrology*. Peak flows were computed using the Rational Method. The project site was divided into several drainage areas, to determine peak flows at catch basins and inlet structures. These drainage areas are illustrated in Exhibit A, along with the location of their respective concentration points.

The following establishes the Rational Method equation and the basic input data required:

$$Q = C_{wt} * I * A$$

Where: Q = Peak discharge in cubic feet per second
C_{wt} = Weighted runoff coefficient
I = Rainfall intensity in inches per hour
A = Drainage area in acres

A summary for the peak flows for the 10-year (Q_{10}) and 100-year (Q_{100}) storm events for the developed onsite drainage conditions are shown on the next page in Table 4.1. Appendix D contains detailed calculation sheets that establish the input data and estimated peak flow values for the developed conditions.

Summary of Peak Flows
Table 4.1

Area Label	Q_{100} (cfs)	Q_{100} (cfs)
1	0	0
2	0	1
3	0	1
4	0	0
5	1	3
6.1	1	2
6	1	1
7	0	0
8	0	0
9	0	0
10	0	0
11	1	1
12.1	0	1
12	1	2
13	1	1
14	3	6
15	1	2
16	0	0
17	0	1
18	0	0
19	0	1
20	1	1
21	1	1
22	0	1
23	0	1
24	0	1
25	0	1
26	0	1
27	1	1
28	0	1
29	0	1
30	1	1
31	1	2
32	0	1
33	1	1

- "0" value stands for Peak flow of less than 0.5 cfs.

5.0 HYDRAULIC ANALYSIS

The hydraulic analyses of the proposed storm water management facilities are based on the City of Scottsdale's *Supplement to MAG Uniform Standard Specifications for Public Works Construction* and the *Drainage Design Manuals for Maricopa County, Arizona, Volume II Hydraulics*.

StormCAD (Reference #6), a Haestad computer program, has been utilized to analyze the curb inlets and the drainage pipes. The hydraulic grade line was kept below the ponding depth that is caused by the inlet capacities at different locations onsite. Refer to Appendix D for detailed input and output data sheets.

FlowMaster (Reference #7), a Haestad computer program, has been utilized to analyze the hydraulic capacity for the adjacent street section and channels to determine the 100-year high water surface elevations based on the determined offsite runoff. FlowMaster analysis is based on Manning's equation. Refer to Appendix D for detailed input and output data sheets.

Scottsdale Road has a half street capacity adjacent to the site of approximately 160 cfs. The remainder of the 189 cfs (half the 378 cfs mentioned previously) will weir into the Safari Drive site. To compensate for not allowing the 29 cfs from entering the site, two catch basins are proposed along Coolidge Road that captures approximately 70 cfs from the street flow in Scottsdale Road.

The 8'x6' culvert was designed for runoff generated during a 100-year storm event using the Rational method. The tailwater condition was used as the weir elevation during the 100-year 24 hour storm event. For a lesser storm, the worst case scenario was used by assuming that the tailwater is at the ground elevation. However, the storm drain can be assumed to be designed for the 25-24 hour storm event because it is the capacity of the downstream receiving system (although the culvert has excess hydraulic capacity)..

The existing inlets capacity along the western portion of the Arizona Canal will be replaced with new inlets. The new inlets have capacity equal or greater than the existing inlet capacity. Refer to Appendix D for hydraulic calculations of the proposed inlets.

6.0 CONCLUSIONS

Based on the results of this study, it can be concluded that:

- The site is developed according to the City of Scottsdale Design Standards and Policies Manual.
- The proposed buildings will should be free from inundation during a 100-year storm event.
- Although the site retains the majority of the runoff generated onsite, the site has a retention waiver and portion of the site will direct discharge into the conveyance system along the western side of the Arizona Canal.
- The ultimate outfall is located at the southeast corner of the project site maintaining the historic outfall condition.

7.0 REFERENCES

1. City of Scottsdale Design Standards and Policies Manual, December 1999
2. City of Scottsdale *Supplement to MAG Uniform Standard Specifications for Public Works Construction, October 2003.*
3. *Drainage Design Manuals for Maricopa County, Arizona, Volume I, Hydrology*, April 2002.
4. *Drainage Design Manuals for Maricopa County, Arizona, Volume II, Hydraulics*, April 2002.
5. City of Scottsdale Stormwater Master Plan and Management Program, KVL, 1994.
6. StormCAD Version 5.06.007, Haestad Methods, Inc. 2005.
7. FlowMaster Version 7.0005, Haestad Methods, Inc. 2005.
8. *Drainage Report Scottsdale Riverwalk Center Hotel* prepared by CVL dated April 9, 1999. Revised March 28, 2001.
9. *Master Drainage Report Scottsdale Portales* prepared by DMJM dated April 13, 1999.
10. Drainage Report For Safari Drive prepared by Pentacor dated 2-7-06.
11. CulvertMaster a Bently program V3.1, dated 2006.

Appendix D

404 Certificate

Section 404 Certification

Before the City issues development permits for a project, the developer's Engineer or the property owner must certify that it complies with, or is exempt from, Section 404 of the Clean Water Act of the United States. Section 404, administered by the U.S. Army Corps of Engineers (COE), regulates the discharge of dredged or fill material into a wetland, lake, (including dry lakes), river, stream (including intermittent streams, ephemeral washes, and arroyos), or other waters of the United States.

Prior to submittal of improvement plans to Project Review the form below must be completed (and submitted with the improvement plans) as evidence of compliance

Owner's Name: VANGUARD City Homes Phone No. 480-993-0472

Project Name/Description: SAFARI DRIVE Case No. 45 DR 2005

Project Location/Address: NW OF INTERSECTIONS OF CAMELBACK ROAD & SCOTTSDALE ROAD

A registered Engineer or the property Owner must check the applicable condition and certify by signing below that:

1. **Section 404 <u>does</u> apply to the project because there will be a discharge of dredged or fill material to waters of the U.S., and:**

   ☐ A Section 404 Permit has already been obtained for this project.

   -or-

   ☐ This project qualifies for a "Nationwide Permit," and this project will meet all terms and conditions of the applicable nationwide permit.

2. **Section 404 <u>does not</u> apply to the project because:**

   ☑ No watercourses or other waters of the U.S. exist on the property.

   ☐ No jurisdictional waters of the U.S. exist on the property. Attached is a copy of the COE's Jurisdictional Determination.

   ☐ Watercourses or other waters of the U.S. do exist on the property, but the project will not involve the discharge of dredged or fill material into any of these waters.

I certify that the above statement is true.

Engineer's Signature and Seal, or Owner's Signature — Date: 5-09-05

Title: Project Manager — Company

DRAINAGE REPORT
SCOTTSDALE RIVERWALK
CENTRE HOTEL
SCOTTSDALE, ARIZONA

April 9, 1999
1st Revision: March 28, 2001

Coe & Van Loo Consultants, Inc.
4550 North 12th Street
Phoenix, Arizona 85014

CVL Project No. 98-0121-01

DRAINAGE REPORT
SCOTTSDALE RIVERWALK
CENTRE HOTEL
SCOTTSDALE, ARIZONA

April 9, 1999
1st Revision: March 28, 2001

CVL Project No. 98-0121-01

DRAINAGE REPORT
SCOTTSDALE RIVERWALK
CENTRE HOTEL
SCOTTSDALE, ARIZONA

April 9, 1999
1st Revision: March 28, 2001

Prepared for:

Ganos Associates Architects
1940 E. Camelback Road, Suite #202
Phoenix, AZ 85016

Prepared by:

Coe & Van Loo Consultants, Inc.
4550 North 12th Street
Phoenix, AZ 85014
(602) 264-6831

CVL Project No. 98-0121-01

CVL

Drainage Report
for
Scottsdale Riverwalk Centre Hotel
Scottsdale, Arizona

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PLATE

3.0 MANAGEMENT OF OFF-SITE STORMWATER RUNOFF

The general direction of drainage flow in the area of this site is from northwest to southeast, with an outfall to the Indian Bend Wash. The *City of Scottsdale Storm Water Master Plan and Management Program* (Reference 1), identifies drainage area boundaries and estimated runoff rates throughout the developed areas of Scottsdale. This report was used as a basis for estimation of off-site discharges within the vicinity of the site.

Drainage north of Chaparral Road collects behind the Arizona Canal embankment and is intercepted by a large grate structure which outlets to a storm drainage system within Chaparral Road. According to the Storm Water Master Plan, Chaparral Road represents a northern boundary for drainage that approaches the site. It was considered that this assumption was correct in developing the off-site discharges that approach this site.

A fully-developed area north of Highland Avenue and east of Scottsdale Road drains toward the Arizona Canal, and from there southwest within a drainage channel along the Arizona Canal. An existing office building and a two-level parking structure lie immediately north of the site. This office-building site provides some on-site retention within landscaped areas and on the parking surfaces. Drainage of retention areas is through the use of drywells. If the capacity of the site's retention is exceeded, drainage would be directed to the east with an outfall to the drainage channel that parallels the Arizona Canal. Off-site drainage from the north will not enter the Scottsdale Riverwalk Centre.

Runoff from the areas north of the property and west of Scottsdale Road flows south within Scottsdale Road, either within the street cross-section, or within an existing 42-inch storm drain system. These areas are currently under construction and it is anticipated that with future drainage improvements in place, the runoff reaching Scottsdale Road will be reduced. This storm drain interconnects with a 144-inch storm drain pipe structure which outfalls to the Indian Bend Wash along Camelback Road. According to the Storm Water Master Plans, under existing conditions during a 100-year, 6-hour storm event, approximately 3,638 cfs approaches the intersection of Scottsdale Road and Camelback Road. The box culvert outfall has capacity for approximately 1,000 cfs. Planned future drainage improvements include an additional storm drainage outfall along Camelback Road.

1200 says the report for

DRAINAGE MAP
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
JOB NO. 980121-1
PLATE
SCOTTSDALE RIVERWALK CENTRE HOTEL
COE & VAN LOO
KEY TO SYMBOLS
SCALE IN FEET
ARIZONA CANAL
PROPOSED 7' x 6' BOX PIPE
EXISTING 14.4' CONCRETE PIPE
EXISTING SITE
SCOTTSDALE ROAD
HIGHLAND AVE.
CAMELBACK ROAD
SCOTTSDALE FASHION SQUARE
130cfs
376cfs
543cfs
918cfs
1638cfs

SCOTTSDALE RIVERWALK CENTRE

DRAINAGE MAP

JOB 98012

FIGU

KEY TO SYMBOLS

- DIRECTION OF OFF-SITE FLOW
- DIRECTION OF ON-SITE FLOW
- CB = CATCH BASIN
- STORM DRAIN
- 1 AND 2 STORY BUILDINGS (SAFARI HOTEL)
- FLOODPLAIN

SCALE IN FEET

100' 50' 0 100'

PROPOSED 7' x 6' BOX PIPE

ARIZONA CANAL

SCOTTSDALE ROAD

SCOTTSDALE FASHION SQUARE
PHASE 10

PRELIMINARY GRADING AND DRAINAGE REPORT

PREPARED FOR:

WESTCOR
1411 North Tatum Boulevard
Phoenix, Arizona 85028
(602) 953-6379

Robert E. Mohning, P.E., R.L.S.

August 7, 2007

RICK ENGINEERING COMPANY
6150 North 16TH Street
Phoenix, Arizona 85016-1705

JOB NUMBER 3750

TABLE OF CONTENTS

1.0 INTRODUCTION

Scottsdale Fashion Square is located at the northwest corner of Scottsdale Road and Camelback Road. This preliminary drainage report addresses drainage for redevelopment of the easterly portion of Scottsdale Fashion Square bounded on the east by Scottsdale Road, on the south by Camelback Road, on the west by Goldwater Boulevard, and on the north by Highland Avenue, see vicinity map Appendix A

The total net area of this area within the four street rights of way is 35.33 acres. The purpose of this report is to discuss the existing and proposed onsite and offsite drainage for the redevelopment. The redevelopment will remove the former Robinson's-May store and adjoining parking structure, and add two new anchors, new retail and restaurant spaces, and underground parking.

2.0 EXISTING DRAINAGE CONDITIONS AND CHARACTERISTICS

The Scottsdale Fashion Square site is fully developed with the retail mall, restaurants, a Days Inn Motel, office, and parking structures, see aerial photograph, Map Pocket 1.

Onsite drainage flows are generally from northwest to southeast. Onsite flows are intercepted by onsite catch basins or perimeter catch basins and are discharged into an existing 84 inch storm drain in Camelback Road and an existing 42 inch storm drain in Scottsdale Road. These two storm drain pipes connect to a 144 inch storm drain which drains east to the Indian Bend Wash.

All but a small portion of the site lies within Flood Zone "X" (textured) according to map number 04013C1695H of the FEMA Flood Information Map, dated September 30, 2005. A small area at the southeast corner of the site is within Flood Zone "A" because of the ponding of offsite flows against The Arizona Canal. An office building is located in this area and its finish floor is above the depth of the ponding.

Offsite drainage is from northwest to southeast toward the Arizona Canal. The site is higher than the elevation of the ponding at The Arizona Canal as described above.

3.0 PROPOSED DRAINAGE PLAN

The drainage patterns of the redevelopment will be consistent with the existing drainage. No retention will be provided per the approved Master Drainage Plan for Scottsdale Fashion Square, Appendix C, and the site's location within the City of Scottsdale Downtown Infrastructure Master Plan Volume 3 Drainage Study. This study was prepared in December 1986 by Boyle Engineering Corporation and concludes that no detention/retention be provided for the downtown study area. The proposed redevelopment will not alter the amount of impervious area nor the volume or direction of storm water flows. See Preliminary Grading and Drainage Plan in Map Pocket 2.

4.0 SPECIAL CONDITIONS

There are no special site conditions or need for a 404 permit. A Storm Water Pollution Prevention Plan will be prepared

MASTER DRAINAGE PLAN
FOR
SCOTTSDALE FASHION SQUARE

C.W.W. No. 831114-21

Prepared for:
THE WESTCOR COMPANY II, LIMITED PARTNERSHIP
11411 North Tatum Boulevard
Phoenix, Arizona 85028

Prepared by:
COLLAR, WILLIAMS & WHITE ENGINEERING
2702 North 44th Street, Suite 205-B
Phoenix, Arizona 85008

April, 1986
Approved by City of Scottsdale, August 18, 1986
Revised May 10, 1988

COLLAR, WILLIAMS & WHITE ENGINEERING

Drainage System

Scottsdale Fashion Square is an existing 35.0 acre shopping center located at the northwest corner of Camelback Road and Scottsdale Road in the City of Scottsdale, Arizona.

New development will occur on this site in multiple phases. These phases will include the demolition of some existing buildings, renovations to existing buildings, new office and commercial building construction, construction of new underground and elevated parking levels, and construction of a new "retail bridge" to connect Scottsdale Fashion Square to Camelview Plaza to the west. In addition, the proposed "West Couplet Roadway" alignment will be along the westerly boundary of the project.

Existing on-site surface drainage flows are, in general, from the northwest towards the south and east. All existing drainage flows are intercepted by existing on-site catch basins and discharged into an existing 84 inch diameter storm drain in Camelback Road and an existing 42 inch diameter storm drain in Scottsdale Road. These two storm drains connect at the intersection of Camelback and Scottsdale Roads and empty into an existing 144 inch diameter storm drain which conveys the water under the Arizona Canal and to the East towards Indian Bend Wash.

Existing building roof drainage is presently routed via vertical roof drain leader lines to either existing on-site underground storm drainage systems or is discharged at existing grade and directed through existing curbing to the adjacent asphalt paved surfaces, where it sheet flows to existing storm drain inlets bordering the site.

As a part of the remodeling/renovating of existing buildings, additional floors will be added to the buildings. As additional floors are constructed, the existing vertical roof drain leader lines will be extended to the new roof levels. Future roof drainage from all new and renovated buildings will be connected

to on-site underground storm drainage systems, and all ongrade discharges will be eliminated.

There are no existing on-site storm water retention/detention facilities presently provided, and the new site development and modifications will not necessitate new on-site storm water retention/detention facilities (See attached letter from the City of Scottsdale dated December 8, 1987). Since the site is essentially impervious at this time, and will remain so after the redevelopment, no additional drainage flows will be generated.

A field survey made by Collar, Williams & White Engineering, of the top of the existing west bank of the Arizona Canal, indicates the elevations along the top of the existing west bank presently vary from 1378.0 feet to 1375.4 feet between the canal crossing at Highland Avenue and 500 feet south of the intersection of Scottsdale and Camelback Roads. With one foot of freeboard required above the maximum top of existing canal bank elevations, all new first floor building elevations have been established at no less than 1379.0. All existing building elevations are above this elevation. Both Camelback Road and Scottsdale Road are lower than elevation 1379.0.

New site development and modifications have incorporated adequate design measures to assure that no overflow of the Arizona Canal from a 100 year flood event will inundate any existing or proposed on-site building.

In addition, the new development has made adequate provisions to prevent any storm water from a 100 year event, which would flood the intersection of Camelback Raod and Scottsdale Road from entering any underground basement or lower parking level.

This assurance has been achieved by denying direct driveway access from Scottsdale Road or Camelback Road to the new underground parking levels, and by construction of walls around the office building at the southeast corner of the site to prevent flooding of the basement area.

APPENDIX G
CLOMR/ Community Acknowledgement Letter

Federal Emergency Management Agency
Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION BASED ON FILL
COMMENT DOCUMENT

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

STUDY UNDERWAY (This Additional Consideration applies to all properties in the CLOMR-F COMMENT DOCUMENT)

This determination is based on the flood data presently available. However, the Federal Emergency Management Agency is currently revising the National Flood Insurance Program (NFIP) map for the community. New flood data could be generated that may affect this property. When the new NFIP map is issued it will supersede this determination. The Federal requirement for the purchase of flood insurance will then be based on the newly revised NFIP map.

This attachment provides additional information regarding this request. If you have any questions about this attachment, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 7390 Coca Cola Drive, Ste 204, Hanover, MD 21076.

Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION BASED ON FILL
COMMENT DOCUMENT

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

thence North 49°19'55" West, 249.58 feet;

thence South 40°44'00" West, 68.99 feet;

thence North 49°16'00" West, 108.21 feet to a point on the prolongation of the south line of said Tract A;

thence along said prolongated line, North 90°00'00" West, 80.17 feet to the TRUE POINT OF BEGINNING.

PORTIONS OF THE PROPERTY REMAIN IN THE SFHA (This Additional Consideration applies to the preceding 1 Property.)

Portions of this property, but not the subject of the Determination/Comment document, may remain in the Special Flood Hazard Area. Therefore, any future construction or substantial improvement on the property remains subject to Federal, State/Commonwealth, and local regulations for floodplain management.

CONDITIONAL LOMR-F DETERMINATION (This Additional Consideration applies to the preceding 1 Property.)

Comments regarding this conditional request are based on the flood data presently available. Our final determination will be made upon receipt of this Comment Document, certified as-built elevations and/or certified as-built survey. Since this request is for a Conditional Letter of Map Revision based on Fill, we will also require the applicable processing fee, and the "Community Acknowledgement" form. Please note that additional items may be required before a final as-built determination is issued.

This letter does not relieve Federal agencies of the need to comply with Executive Order 11988 on Floodplain Management in carrying out their responsibilities and providing Federally undertaken, financed, or assisted construction and improvements, or in their regulating or licensing activities.

ZONE A (This Additional Consideration applies to the preceding 1 Property.)

The National Flood Insurance Program map affecting this property depicts a Special Flood Hazard Area that was determined using the best flood hazard data available to FEMA, but without performing a detailed engineering analysis. The flood elevation used to make this determination is based on approximate methods and has not been formalized through the standard process for establishing base flood elevations published in the Flood Insurance Study. This flood elevation is subject to change.

Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION BASED ON FILL COMMENT DOCUMENT

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

LEGAL PROPERTY DESCRIPTION (CONTINUED)

COMMENCING at a brass cap in a hand hole found at the west quarter corner of Section 23, Township 2 North, Range 4 East, from which a brass cap in a hand hole found at the northwest corner of said Section 23 bears North 00°00'00" East, 2,657.07 feet; thence along the west line of the northwest quarter of said Section 23, North 00°00'00" East, 688.20 feet; thence North 90°00'00" East, 65.00 feet to a mag nail with washer marked "PLS 19809" found at a point on the easterly right of way line of Scottsdale Road and the southwest corner of said Tract A, said point being the TRUE POINT OF BEGINNING;

thence North 00°00'00" East along the easterly right of way line of Scottsdale Road and the west line of said Tract A, 12.90 feet to the cusp of a non-tangent curve, the radius point of which bears South 36°46'45" East, 75.73 feet;

thence easterly, 41.69 feet along the arc of said curve, concave to the south through a central angle of 31°32'24" to a point of compound curvature having a radius of 322.30 feet;

thence easterly, 102.29 feet along the arc of said curve, concave to the south through a central angle of 18°11'01" to a point of reverse curvature having a radius of 431.86 feet;

thence easterly, 60.46 feet along the arc of said curve, concave to the north through a central angle of 8°01'17" to a point of compound curvature having a radius of 282.48 feet;

thence northeasterly, 47.00 feet along the arc of said curve, concave to the north through a central angle of 9°32'02" to a point of compound curvature having a radius of 92.83 feet;

thence northeasterly, 67.88 feet along the arc of said curve, concave to the north through a central angle of 41°53'48" to a point of compound curvature having a radius of 67.44 feet;

thence northeasterly, 61.06 feet along the arc of said curve, concave to the northwest through a central angle of 51°52'06" to a point on the westerly line of Safari Drive I Plat of Condominium as recorded in Book 850. Page 14, 1ST Amendment recorded in Book 1017, Page 40, and 2nd Amendment recorded in Book 1071, Page 7, Records of Maricopa County, Arizona;

thence along said westerly line, South 49°19'44" East, 235.38 feet to a point on the southeasterly line of said Tract A;

thence along said southeasterly line, South 40°41'18" West, 163.21 feet;

Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

Date: May 03, 2012 | Case No.: 12-09-1615C | CLOMR-F

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION BASED ON FILL COMMENT DOCUMENT

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	CITY OF SCOTTSDALE, MARICOPA COUNTY, ARIZONA	Blue Sky Scottsdale, described as a portion of Tract A, Paradise Triangle, in the Special Warranty Deed recorded as Instrument No. 20110423121, in the Office of the Recorder, Maricopa County, Arizona. The portion of property is more particularly described by the following metes and bounds:
	COMMUNITY NO.: 045012	
AFFECTED MAP PANEL	NUMBER: 04013C1695H	
	DATE: 9/30/2005	
FLOODING SOURCE: ARIZONA CANAL		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 33.504, -111.925 SOURCE OF LAT & LONG: GOOGLE EARTH PRO DATUM: NAD 83

COMMENT TABLE REGARDING THE PROPOSED PROPERTY (PLEASE NOTE THAT THIS IS NOT A FINAL DETERMINATION. A FINAL DETERMINATION WILL BE MADE UPON RECEIPT OF AS-BUILT INFORMATION REGARDING THIS PROPERTY.)

LOT	BLOCK/ SECTION	SUBDIVISION	STREET	OUTCOME WHAT WOULD BE REMOVED FROM THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NGVD 29)	LOWEST ADJACENT GRADE ELEVATION (NGVD 29)	LOWEST LOT ELEVATION (NGVD 29)
--	--	Blue Sky Scottsdale	4601 North Scottsdale Road	Portion of Property	X (shaded)	1277.6 feet	--	1277.6 feet

Special Flood Hazard Area (SFHA) - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

LEGAL PROPERTY DESCRIPTION
PORTIONS REMAIN IN THE SFHA
CONDITIONAL LOMR-F DETERMINATION
ZONE A
STUDY UNDERWAY

This document provides the Federal Emergency Management Agency's comment regarding a request for a Conditional Letter of Map Revision based on Fill for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the proposed described portion(s) of the property(ies) would not be located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) if built as proposed. Our final determination will be made upon receipt of a copy of this document, as-built elevations, and a completed Community Acknowledgement form. Proper completion of this form certifies the subject property is reasonably safe from flooding in accordance with Part 65.5(a)(4) of our regulations. Further guidance on determining if the subject property is reasonably safe from flooding may be found in FEMA Technical Bulletin 10-01. A copy of this bulletin can be obtained by calling the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or from our web site at http://www.fema.gov/mit/tb1001.pdf. This document is not a final determination; it only provides our comment on the proposed project in relation to the SFHA shown on the effective NFIP map.

This comment document is based on the flood data presently available. The enclosed documents provide additional information regarding this request. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 7390 Coca Cola Drive, Ste 204, Hanover, MD 21076.

Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

COMMUNITY ACKNOWLEDGMENT FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.38 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). **NOTE: Do not send your completed form to this address.**

This form must be completed for requests involving the existing or proposed placement of fill (complete Section A) ***OR*** to provide acknowledgment of this request to remove a property from the SFHA which was previously located within the regulatory floodway (complete Section B).

This form must be completed and signed by the official responsible for floodplain management in the community. **The six digit NFIP community number and the subject property address must appear in the spaces provided below. Incomplete submissions will result in processing delays.** Please refer to the MT-1 instructions for additional information about this form.

Community Number: _ **Property Name or Address:** 4601 N SCOTTSDALE RD, SCOTTSDALE 85251

A. REQUESTS INVOLVING THE PLACEMENT OF FILL

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision Based on Fill (LOMR-F) or Conditional LOMR-F request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a Conditional LOMR-F, will be obtained. For Conditional LOMR-F requests, the applicant has or will document Endangered Species Act (ESA) compliance to FEMA prior to issuance of the Conditional LOMR-F determination. For LOMR-F requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might ha an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be remov from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by DHS-FEMA, analyses and documentation used to make this determination. For LOMR-F requests, we understand that this request is being forwarded to DH FEMA for a possible map revision.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
C. Ashley Couch, PE, CFM, Stormwater Manager and Floodplain Administrator		480-312-4317
Community Name: City of Scottsdale, Arizona	Community Official's Signature: (required) C. Ashley Couch	Date: 1/12/2012

B. PROPERTY LOCATED WITHIN THE REGULATORY FLOODWAY

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this request for a LOMA. We understand that this request is being forwarded to DHS-FEMA to determine if this property has been inadvertently included in the regulatory floodway. We acknowledge that no fill on this property has been or will be placed within the designated regulatory floodway. We find that the completed or proposed project meets or is designed to meet all of the community floodplain management requirements.

Community Comments: N/A

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Community Name:	Community Official's Signature (required):	Date:

APPENDIX H
WARNING AND DISCLAIMER LIABILITY FORM

Warning and Disclaimer of Liability

The Drainage and Floodplain Regulations and Ordinances of the City of Scottsdale are intended to "minimize the occurrence of losses, hazards and conditions adversely affecting the public health, safety and general welfare which might result from flooding caused by the surface runoff of rainfall" (Scottsdale Revised Code §37-16).

As defined in S.R.C. §37-17, a flood plain or "*Special flood hazard* area means an area having flood and/or flood related erosion hazards as shown on a FHBM or FIRM as zone A, AO, A1-30, AE, A99, AH, or E, and those areas identified as such by the floodplain administrator, delineated in accordance with subsection 37-18(b) and adopted by the floodplain board." It is possible that a property could be inundated by greater frequency flood events or by a flood greater in magnitude than a 100-year flood. Additionally, much of the Scottsdale area is a dynamic flood area; that is, the floodplains may shift from one location to another, over time, due to natural processes.

WARNING AND DISCLAIMER OF LIABILITY PURSUANT TO S.R.C §37-22
"The degree of flood protection provided by the requirements in this article is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Floods larger than the base flood can and will occur on rare occasions. Floodwater heights may be increased by manmade or natural causes. This article (Chapter 37, Article II) shall not create liability on the part of the city, any officer or employee thereof, or the federal government for any flood damages that result from reliance on this article or any administrative decision lawfully made thereunder."

Compliance with Drainage and Floodplain Regulations and Ordinances does not insure complete protection from flooding. The Floodplain Regulations and Ordinances meet established local and federal standards for floodplain management, but neither this review nor the Regulations and Ordinances take into account such flood related problems as natural erosion, streambed meander or man-made obstructions and diversions, all of which may have an adverse affect in the event of a flood. You are advised to consult your own engineer or other expert regarding these considerations.

I have read and understand the above. If I am an agent for an owner I have made the owner aware of and explained this disclaimer.

Plan Check No. _____ Owner or Agent _____ Date 11/21/11

APPENDIX I
404 CERTIFICATION

Section 404 Certification

Before the City issues development permits for a project, the developer's Engineer or the property owner must certify that it complies with, or is exempt from, Section 404 of the Clean Water Act of the United States. Section 404, administered by the U.S. Army Corps of Engineers (COE), regulates the discharge of dredged or fill material into a wetland, lake, (including dry lakes), river, stream (including intermittent streams, ephemeral washes, and arroyos), or other waters of the United States.

Prior to submittal of improvement plans to Project Review the form below must be completed (and submitted with the improvement plans) as evidence of compliance

Certification of Section 404 Permit Status

Owner's Name: Gray Development Phone No. 602-508-7141

Project Name/Description: Blue sky Scottsdale Case No. 396-PA-2010

Project Location/Address: Southeast Corner of Coolidge Rd & Scottsdale Rd

A registered Engineer or the property Owner must check the applicable condition and certify by signing below that:

1. **Section 404 <u>does</u> apply to the project because there will be a discharge of dredged or fill material to waters of the U.S., and:**

   ☐ A Section 404 Permit has already been obtained for this project.

   -or-

   ☐ This project qualifies for a "Nationwide Permit," and this project will meet all terms and conditions of the applicable nationwide permit.

2. **Section 404 <u>does not</u> apply to the project because:**

   ☒ No watercourses or other waters of the U.S. exist on the property.

   ☐ No jurisdictional waters of the U.S. exist on the property. Attached is a copy of the COE's Jurisdictional Determination.

   ☐ Watercourses or other waters of the U.S. do exist on the property, but the project will not involve the discharge of dredged or fill material into any of these waters.

I certify that the above statement is true.

Registered Professional Engineer (Civil) CERTIFICATE NO. 37287 RAMZI GEORGES Date Signed 11/21/11 ARIZONA, U.S.A.

Exp: 3-31-2014

Engineer's Signature and Seal, or Owner's Signature Date 11/21/11

Title Company

Planning & Development Services Department

7447 E Indian School Road, Suite 100, Scottsdale, AZ 85251 • Phone: 480-312-2500 • Fax: 480-312-7088

APPENDIX J
CORRESPONDENCE, WAIVERS AND SUPPORTING DOCUMENTS

Flood Control District
of Maricopa County

Board of Directors
Fulton Brock, District 1
Don Stapley, District 2
Andrew Kunasek, District 3
Max Wilson, District 4
Mary Rose Wilcox, District 5

www.fcd.maricopa.gov

2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
Fax: 602-506-4601
TT: 602-505-5897

January 18, 2012

Derek Cayton, Project Director
Gray Development
4040 E. Camelback Road, Suite 275
Phoenix, AZ 85018

SUBJECT: District Permit Request 2012P001
Blue Sky Scottsdale – Indian Bend Wash Side Drain

Dear Mr. Cayton:

The Flood Control District of Maricopa County (District) received the plans for the referenced project on January 6, 2012; and they were routed to District staff on January 9, 2012. Because this is the District's first review of this proposal, the review time required is two weeks. Once District staff has completed their initial review, the Right-of-Way Permit Specialist (Specialist) will compile the District's comments and forward them to the applicant and/or the applicant's representative. When revised plans are submitted, they are then routed to the appropriate District staff, who will be given one week to provide their comments. If additional comments are received, the Specialist compiles those comments and forwards them to the applicant. This review process continues until District staff approves the plans, at which time the Specialist issues a Plan Approval Letter.

Conditions for plan approvals and the ensuing permits vary, depending on the proposed use and the District's structure. If the District approves plans for the referenced project, following is a list of conditions that may apply. Please note, however, that these conditions are subject to change as determined by the District:

1. The responsibility for the landscape improvements will belong to the property owner or the City of Scottsdale (City). The District will not accept responsibility for the landscape maintenance. The District will also require written confirmation as to who will be responsible for the landscape.
2. If District staff determines that the proposed changes and discharge does not adversely impact the functionality of the District's structure, please note that the District will accept storm water runoff only; and under no circumstances will the District accept the first flush.

3. Because the District's structure was designed and built by the United States Army Corps of Engineers Los Angeles District, the Corps may have to approve of the proposed installation within the District's right-of-way.
4. In addition to the potential Corps' approval noted above, the applicant is further responsible for obtaining any necessary permits/approvals from the appropriate entity, including, but not limited to, Salt River Project, the City of Scottsdale, and dust control permits.
5. The District's access to the structure may not be restricted. If necessary, the applicant shall provide alternate access to the District at no cost to the District.
6. If the District approves the plans, a videotape of the District's structure must be approved by the District prior to start of construction activities in the District's right-of-way. The cost of the videotape shall be the responsibility of the applicant.
7. If the District's inspectors need to gain access to the drain, the applicant shall be responsible for all costs associated with meeting OSHA Standards for confined space.
8. If the District issues a permit, construction must be in accordance with the District-approved plans. The District must approve any additions and/or changes in writing.

As previously noted in this correspondence, the District has not had an opportunity to conduct a thorough plan review, and therefore cannot issue any kind of approval at this time. Therefore, the conditions noted above are intended only to provide guidance as to what requirements the District may establish. These conditions are also subject to change at the sole discretion of the District.

If you should have any questions concerning the above, please feel free to call Shelby Brown at 602-506-4583.

Sincerely,

Jeffrey R Riddle

Jeffrey R. Riddle, PE
Civil Structures Branch Manager

Request for Stormwater Storage Waiver

City of Scottsdale Case Numbers:

___ - PA - ___ ___ - ZN - ___ ___ - UP - ___ 45 - DR - 2005 ___ - PP - ___ PC# 2013-08-2

The applicant/developer must complete and submit this form to the city for processing and obtain approval of waiver request ***before submitting improvement plans.*** Denial of the waiver may require the developer to submit a revised site plan to the Development Review Board.

(Related) Ref # 2013-08 (Safari-Ph-3)

Date 07-20-2011 **Project Name** Scottsdale BlueSky

Project Location 4601 N SCOTTSDALE RD , SCOTTSDALE, AZ 85251

Applicant Contact Ramzi Georges **Company Name** David Evans and Associates, Inc.

Phone 602-474-9223 Fax 602-678-5155 E-mail ryg@deainc.com

Address 4600 E Washington Street, Phoenix, AZ Suite #430

Waiver Criteria

A project must meet at least one of four criteria listed below for the city to consider waiving some or all required stormwater storage. **However, regardless of the criteria, a waiver will only be granted if the applicant can demonstrate that the effect of a waiver will not increase the potential for flooding on any property.** Check the applicable box and provide a signed engineering report and supporting engineering analysis that demonstrate the project meets the criteria and that the effect of a waiver will not increase the potential for flooding on any property.

If the runoff for the project has been included in a storage facility at another location, the applicant must demonstrate that the stormwater storage facility was specifically designed to accommodate runoff from the subject property and that the runoff will be conveyed to this location through an adequately designed conveyance facility.

☑ 1. The development is adjacent to a watercourse or channel that an engineering analysis shows is designed and constructed to handle the additional runoff.

☐ 2. The development is on a parcel less than one-half acre in size.

☐ 3. Stormwater storage requirements conflict with requirements of the Environmentally Sensitive Lands Ordinance (ESLO). A conflict with ESLO is limited to:

- Property located in the hillside landform as defined in the city Zoning Ordinance.
- Property where more than thirty-five (35) percent is covered by required natural area open space as defined in the city Zoning Ordinance.

☑ 4. The project is located within the Downtown Area as delineated by the Figure 1 below.

By signing below, I certify that the stated project meets the waiver criteria selected above as demonstrated by the attached documentation.

Engineer _____ Date 8/3/11

Planning, Neighborhood & Transportation Division

7447 E Indian School Road, Suite 105, Scottsdale, AZ 85251 • Phone: 480-312-7000 • Fax: 480-312-7088

Request for Stormwater Storage Waiver

City of Scottsdale Case Numbers:

___ - PA - ____ ____ - ZN - ____ ____ - UP - ____ ____ - DR - ____ ____ - PP - ____ PC#_____

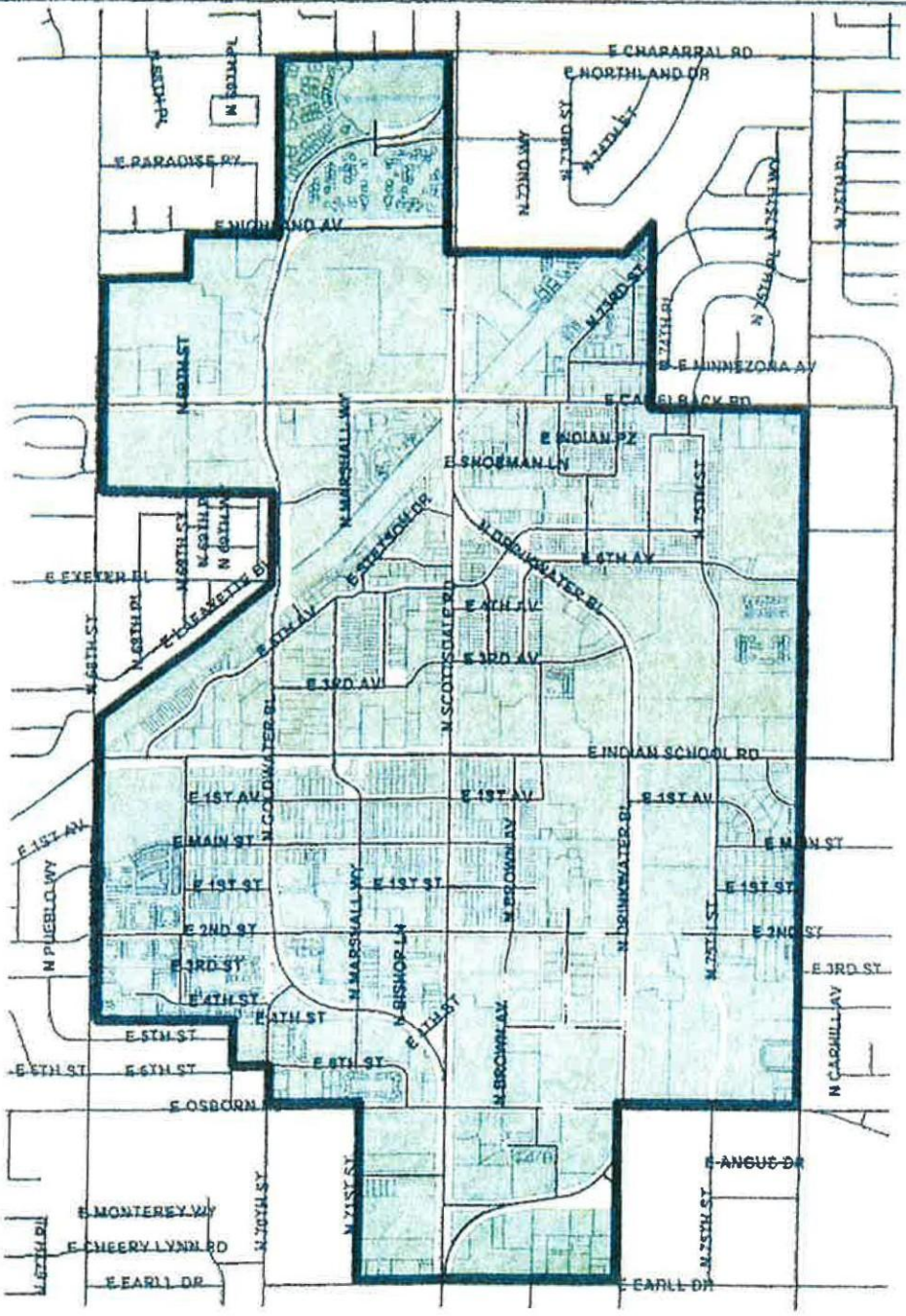


Figure 1. Designated Area for Downtown Stormwater Storage Waivers

Planning, Neighborhood & Transportation Division

7447 E Indian School Road, Suite 105, Scottsdale, AZ 85251 • Phone: 480-312-7000 • Fax: 480-312-7088

Request for Stormwater Storage Waiver

City of Scottsdale Case Numbers:

___ - PA - ___ ___ - ZN - ___ ___ - UP - ___ 45 - DR - 2005 ___ - PP - ___ PC# 2013-18-2

CITY STAFF TO COMPLETE THIS PAGE

Project Name Scottsdale Bluesky

Check Appropriate Boxes:

☐ Meets waiver criteria (specify): ☐1 ☐2 ☐3 ☑4

☑ Recommend approve waiver.

☐ Recommend deny waiver:
- ☐ None of waiver criteria met.
- ☐ Downstream conditions prohibit waiver of any storage.
- ☐ Other:

Explain: _____

☐ Return waiver request:
- ☐ Insufficient data provided.
- ☐ Other: _____

Explain: _____

Recommended Conditions of Waiver:

☑ All storage requirements waived.

☐ Pre development conditions must be maintained.

☐ Other:

Explain: _____

☑ **Waiver approved per above conditions.**

☐ **Waiver denied.**

C. Ashley Couch — Floodplain Administrator or Designee

8/16/11 — Date

Planning, Neighborhood & Transportation Division

7447 E Indian School Road, Suite 105, Scottsdale, AZ 85251 • Phone: 480-312-7000 • Fax: 480-312-7088

Request for Stormwater Storage Waiver

City of Scottsdale Case Numbers:

___ - PA - ___ ___ - ZN - ___ ___ - UP - ___ 45 - DR - 2005 ___ - PP - ___ PC# 2013-08-2

In-Lieu Fee and In-Kind Contributions

If the city grants a waiver, the developer is required to calculate and contribute an in-lieu fee based on what it would cost the city to provide the waived storage volume, including costs such as land acquisition, construction, landscaping, design, construction management, and maintenance over a 75-year design life. The fee for this cost is $3.22 per cubic foot of stormwater storage waived. This unit cost will be updated annually, but the city reserves the right to revise the unit cost at any time.

The Floodplain Administrator considers in-kind contributions on a case-by-case basis. An in-kind contribution can serve as part of or instead of the calculated in-lieu fee. In-kind contributions must be stormwater related and must constitute a public benefit. In-lieu fees and in-kind contributions are subject to the approval of the Floodplain Administrator or designee.

Project Name Scottsdale BlueSky

The waived stormwater storage volume is calculated as follows:

V = CRA; where
V = stormwater storage volume required, in cubic feet,
C = weighted average runoff coefficient over disturbed area,
R = 100-year/2-hour precipitation depth, in feet (DSPM, Appendix 4-1D, page 11), and
A = area of disturbed ground, in square feet

Furthermore,

$V_w = V - V_p$; where
V_w = volume waived,
V = volume required, and
V_p = volume provided

C = 0.66
A = 163,000 SF
V = 25,653
V_p = 0
V_w = 25,653

☐ An in-lieu fee will be paid, based on the following calculations and supporting documentation:
in-lieu fee ($) = V_w (cu. ft.) x $3.22 per cubic foot = _____

☒ An in-kind contribution will be made, as follows:

As previously approved for the overall project, an 8' x 6' box culvert was installed along the SRP canal (See attached plans) in lieu of an in-kind fee.

Approved by: C. Ashley Couch 8/16/11

Floodplain Administrator or Designee — Date

Planning, Neighborhood and Transportation Division
7447 E Indian School Road, Suite 105, Scottsdale, AZ 85251 • Phone: 480-312-7000 • Fax: 480-312-7088

SAFARI DRIVE PHASES 1 & 2
IMPROVEMENT PLANS
SCOTTSDALE, ARIZONA

GENERAL NOTES FOR CONSTRUCTION

1. ALL CONSTRUCTION IN PUBLIC RIGHTS-OF-WAY OR IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO LATEST MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION AS AMENDED BY THE LATEST VERSION OF THE CITY OF SCOTTSDALE (COS) SUPPLEMENTAL STANDARD SPECIFICATIONS AND SUPPLEMENTAL STANDARD DETAILS. IF THERE IS A CONFLICT, LATTER SHALL GOVERN.
2. THE ENGINEERING DESIGNS ON THESE PLANS ARE ONLY APPROVED BY THE CITY IN SCOPE AND NOT IN DETAIL. IF CONSTRUCTION QUANTITIES ARE SHOWN ON THESE PLANS, THEY ARE NOT VERIFIED BY THE CITY.
3. APPROVAL OF PLANS IS VALID FOR SIX (6) MONTHS. IF AN ENCROACHMENT PERMIT FOR THE CONSTRUCTION HAS NOT BEEN ISSUED WITHIN SIX MONTHS, THE PLANS SHALL BE RESUBMITTED TO THE CITY FOR RE-APPROVAL.
4. A PUBLIC WORKS INSPECTOR WILL INSPECT ALL WORKS WITHIN THE CITY OF SCOTTSDALE RIGHTS-OF-WAY AND IN EASEMENTS. NOTIFY INSPECTION SERVICES 24 HOURS PRIOR TO STARTING CONSTRUCTION (TELEPHONE 480-312-5750).
5. WHENEVER EXCAVATION IS TO BE DONE, CALL "BLUE STAKE CENTER," 602-263-1100, TWO WORKING DAYS BEFORE EXCAVATION IS TO BEGIN. THE CENTER WILL SEE THAT THE LOCATION OF THE UNDERGROUND UTILITY LINES IS IDENTIFIED FOR THE PROJECT. CALL "COLLECT" IF NECESSARY.
6. ENCROACHMENT PERMITS ARE REQUIRED FOR ALL WORK IN PUBLIC RIGHTS-OF-WAY AND EASEMENTS GRANTED FOR PUBLIC PURPOSES. AN ENCROACHMENT PERMIT WILL BE ISSUED BY THE CITY UPON RECEIPT OF PAYMENT OF A BASE FEE PLUS A FEE FOR INSPECTION SERVICES TO BE PROVIDED BY THE CITY. COPIES OF ALL PERMITS SHALL BE RETAINED ON-SITE AND SHALL BE AVAILABLE FOR INSPECTION AT ALL ITEMS. FAILURE TO PRODUCE THE REQUIRED PERMITS WILL RESULT IN IMMEDIATE WORK STOPPAGE UNTIL THE PROPER PERMIT DOCUMENTATION IS OBTAINED.
7. ALL EXCAVATION AND GRADING WHICH IS NOT IN PUBLIC RIGHT-OF-WAY OR NOT IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO CHAPTER 70, EXCAVATION AND GRADING, OF THE LATEST EDITION OF THE UNIFORM BUILDING CODE PREPARED BY THE INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS. A PERMIT OF THIS GRADING MUST BE SECURED FROM THE CITY FOR A FEE ESTABLISHED BY THE UNIFORM BUILDING CODE.

LEGEND

NOTE: SYMBOLS SHOWN ON THIS MAP IDENTIFYING TOPOGRAPHIC FEATURES MAY NOT BE TO ACTUAL SCALE. SYMBOLS MAY BE ENLARGED FOR VISUAL PURPOSES.

- FIRE HYDRANT
- WATER VALVE
- SEWER CLEANOUT
- SEWER MANHOLE
- CATCH BASIN
- POWER POLE
- LIGHT POST
- DRY WELL
- EXIST. TELEPHONE
- EXIST. ELECTRICAL
- EXIST. GAS
- RIGHT OF WAY
- CENTERLINE
- BOUNDARY/PROPERTY LINE
- EASEMENT DESIGNATION
- CHAIN LINK FENCE
- EXIST STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING SEWER
- PROPOSED SEWER LATERAL
- EXISTING WATER
- PROPOSED WATER LINE
- PROPOSED SLOPE

STANDARD ABBREVIATIONS

C	CONCRETE
CB	CATCH BASIN
P	PAVEMENT
EX	EXISTING
FH	FIRE HYDRANT
FF	FINISHED FLOOR
FL	FLOWLINE
G	GUTTER ELEVATION
GB	
COS	CITY OF SCOTTSDALE
NG	NATURAL GROUND
S	SEWER
SD	STORM DRAIN
RW	RIGHT OF WAY
TC	TOP OF CURB
pvmt	PAVEMENT
VG	VALLEY GUTTER
⊕70.00	PROPOSED GRADE
⊕70.00 EX	EX GRADE

PRIVATE ENGINEER'S NOTES TO CONTRACTOR

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES, CONDUITS OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT AND CORRECTLY LOCATE THE UTILITY LINES SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POINTS OF CONNECTION AND UTILITY CROSSINGS (PROPOSED & EXISTING). THE CONTRACTOR FURTHER ASSUMES ALL LIABILITY AND RESPONSIBILITY FOR THE UTILITY PIPES, WATER PIPES, SEWER PIPES, CONDUITS AND STRUCTURES SHOWN OR NOT SHOWN ON THESE DRAWINGS.

? Requested letter/utility times with out response
+ Except as noted

NO CONFLICT SIGNATURE BLOCK

UTILITY	UTILITY COMPANY	NAME OF COMPANY REPRESENTATIVE	TELEPHONE NUMBER	DATE SIGNED
ELECTRIC	APS	RYAN JAGELS	602-493-4456	6/14/06
TELEPHONE	QWEST	IAN HOLMES	602-630-0496	7/10/06
NATURAL GAS	SOUTH WEST GAS	CHRIS FAHRENDORF	602-484-5338	6/20/06
CABLE TV	COX CABLE	WALTER COOMBS	623-328-3520	6/07/06
IRRIGATION	SRP WATER	JIM DUNCAN	602-236-5380	
ELECTRIC	SRP ELECTRIC	ALLEN TUCEK	602-236-4809	6/02/06

ENGINEER'S CERTIFICATION

I Adam Aitken AS THE ENGINEER OF RECORD FOR THIS DEVELOPMENT, HEREBY CERTIFY THAT ALL UTILITY COMPANIES LISTED ABOVE HAVE BEEN PROVIDED FINAL IMPROVEMENT PLANS FOR REVIEW, AND THAT ALL CONFLICTS HAVE BEEN RESOLVED. IN ADDITION, NO CONFLICT FORMS HAVE BEEN OBTAINED FROM EACH UTILITY COMPANY AND ARE INCLUDED IN THIS SUBMITTAL. ALL PUBLIC AND PRIVATE UTILITY APPURTENANCES NECESSARY TO SERVE THIS SITE, INCLUDING, BUT NOT LIMITED TO, TRANSFORMERS, CABLE BOXES, AND UTILITY PEDESTALS, SHALL BE PLACED SUCH THAT THEY DO NOT NEGATIVELY IMPACT THE USE OF ANY DEDICATED EASEMENTS OR RIGHTS-OF-WAY INCLUDING, BUT NOT LIMITED TO, STORMWATER STORAGE BASINS, SIGHT DISTANCE EASEMENTS, AND NAOS OR OTHER OPEN SPACE EASEMENTS.

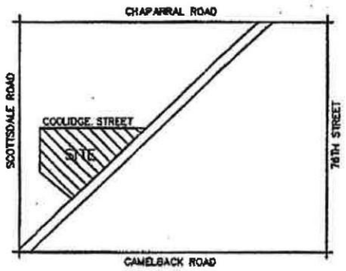
Adam Aitken — 11/10/06
Signature — Date

GENERAL WATER NOTES

1. DEVELOPER IS RESPONSIBLE FOR MAKING PROPER APPLICATION AND PAYING THE PREVAILING FEES PRIOR TO CONSTRUCTION OF ALL SERVICES.
2. BUTTERFLY VALVES ARE NOT ALLOWED IN LINES 12 INCH AND SMALLER.
3. GATE VALVES SHALL BE RESILIENT SEATED, SOLID WEDGE GATE, FULLY ENCAPSULATED AND OPEN LEFT.
4. TAPPING VALVES SHALL BE FLANGE BY MECHANICAL JOINT TO ALLOW TAPPING BY CONTRACTOR.
5. TAPS TO EXISTING CITY OWNED MAINS SHALL BE DONE BY A CITY APPROVED CONTRACTOR. NO TAP SHALL BE MADE UNTIL THE CITY INSPECTOR HAS APPROVED THE INSTALLATION OF THE TAPPING SLEEVE, THRUST BLOCK AND VALVE PLACEMENT. NO TAP TO CITY OWNED MAIN SHALL BE MADE WITHOUT A CITY UTILITIES DEPARTMENT REPRESENTATIVE PRESENT.
6. CONSTRUCTION SURVEY STAKES SHALL BE IN PLACE AND CUT SHEETS SHALL BE PROVIDED TO THE CITY CONSTRUCTION ENGINEERING INSPECTOR PRIOR TO STARTING CONSTRUCTION.
7. CONFLICTS WITH EXISTING UTILITIES DISCOVERED DURING CONSTRUCTION SHALL BE CALLED TO THE ATTENTION OF THE CITY AND RESOLVED PRIOR TO PROCEEDING.
8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR/DEVELOPER TO HAVE THE SERVICE LINE VISIBLE AND ACCESSIBLE WHEN REQUESTING THE INSTALLATION OF A WATER METER OR A PRE-FINAL INSPECTION AND AS-BUILT SERVICES.
9. ONLY CITY FORCES ARE AUTHORIZED TO OPEN AND CLOSE EXISTING CITY OWNED WATER VALVES.
10. THE CITY OF SCOTTSDALE SHALL BE RESPONSIBLE FOR REPLACEMENT OF STANDARD CONCRETE AND ASPHALT ONLY.
11. ALL WATER LINES SHALL BE STAKED PRIOR TO TRENCHING AT A MAXIMUM STAKING INTERVAL OF 50 FEET, EXCEPT WHEN THE CITY ENGINEER APPROVES THE USE OF LASER.
12. LOCATION OF ALL WATER VALVES MUST BE REFERENCED AT ALL TIMES DURING CONSTRUCTION AND MADE AVAILABLE TO THE UTILITIES DEPARTMENT.
13. ALL MATERIALS WHICH MAY COME IN CONTACT WITH DRINKING WATER SHALL CONFORM TO THE NATIONAL SANITATION FOUNDATION STANDARDS 60 AND 61.
14. BLOCKS SHALL BE INSTALLED AT ALL VALVES.
15. COMPACTION SHALL COMPLY WITH M.A.G. SEC. 601 & COS SUPPLEMENTS
16. IT SHALL BE THE WATER CONTRACTOR'S RESPONSIBILITY TO SET WATER VALVES LID AND COVER TO FINISH GRADE AFTER PAVING IN ACCORDANCE WITH MAG STD 391.
17. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY STANDARDS AND REVIEW THE PLANS IN DETAIL WITH THE CITY PRIOR TO START OF CONSTRUCTION.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK AND SHALL MAINTAIN ALL FACILITIES COMPLETED AND UNCOMPLETED UNTIL ACCEPTED BY THE CITY.
19. ALL WATER VALVE BOXES SHALL BE PER CITY OF SCOTTSDALE(COS) DETAIL 391
20. ALL CONSTRUCTION TO CONFORM TO M.A.G. SPECIFICATIONS AND DETAILS, CITY OF SCOTTSDALE SUPPLEMENT TO M.A.G. SPECIFICATIONS AND DETAILS, UNLESS MODIFIED ON THE PLANS.
21. SIX (6) FOOT MINIMUM HORIZONTAL SEPARATION FROM ANY UNDERGROUND UTILITY SHALL BE PROVIDED FOR SEWER MAINS, SEWER SERVICES, WATER MAINS, AND WATER SERVICES. THE MINIMUM HORIZONTAL SEPARATION IS MEASURED FROM OUTSIDE OF SEWER MAIN, SEWER SERVICE, WATER MAIN, OR WATER SERVICE TO OUTSIDE OF UNDERGROUND UTILITY.
22. TWO (2) FOOT MINIMUM VERTICAL SEPARATION FROM ANY DRY UNDERGROUND UTILITY CROSSING SHALL BE PROVIDED FOR SEWER MAINS, SEWER SERVICES, WATER MAIN, OR WATER SERVICE TO OUTSIDE OF UNDERGROUND UTILITY. UNLESS OTHERWISE APPROVED BY WATER RESOURCES.
23. TWO (2) FOOT MINIMUM VERTICAL SEPARATION SHALL BE PROVIDED BETWEEN ANY SEWER MAIN OR STORM DRAIN CROSSING A WATER MAIN. THE MINIMUM VERTICAL SEPARATION IS MEASURED FROM OUTSIDE OF WATER MAIN TO OUTSIDE OF SEWER MAIN OR STORM DRAIN MAIN. SEE M.A.G. STANDARD DETAIL 404 FOR ADDITIONAL INFORMATION AND/OR PROVISIONS FOR CLEARANCE.
24. EXCEPTIONS OR DEVIATIONS FROM THE ABOVE MINIMUM CLEARANCES MUST BE APPROVED AND SHOWN ON THE APPROVED WATER AND SEWER PLANS. WHEN UTILITY CONFLICTS ARE FOUND DURING CONSTRUCTION, ALL CHANGES AND REVISIONS MUST BE PRECEDED BY AN APPROVED PLAN REVISION.
25. ANY AND ALL MORE STRINGENT REQUIREMENTS REQUIRED BY FEDERAL, STATE, COUNTY, OR LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
26. NEITHER WATER SERVICE METER BOX OR ANY PORTION OF A WATER SERVICE SHALL BE INSTALLED UNDER AN EXISTING OR PROPOSED DRIVEWAY OR SIDEWALK RAMP.

ENGINEER'S FEMA CERTIFICATION

THE LOWEST FLOOR ELEVATION(S) AND/OR FLOODPROOFING ELEVATION(S) ON THIS PLANS COMPLY WITH THE CLOMR FOR THIS PROJECT.



VICINITY MAP

GRADING AND DRAINAGE NOTES

1. AN ON-SITE GRADING PERMIT IS REQUIRED
2. A SEPARATE PERMIT IS NECESSARY FOR ANY OFF-SITE CONSTRUCTION.
3. THE CITY SHALL BE NOTIFIED 24 HOURS BEFORE ANY ON-SITE CONSTRUCTION BEGINS.
4. YOU ARE HEREBY ADVISED THAT NO PERSON SHALL USE ANY MECHANICAL EQUIPMENT FOR LAND LEVELING OR CLEARING, ROAD CONSTRUCTION, TRENCHING, EXCAVATING, DEMOLITION OR ENGAGED IN ANY EARTH MOVING ACTIVITY WITHOUT FIRST OBTAINING A PERMIT FROM AIR POLLUTION CONTROL; MARICOPA COUNTY DEPARTMENT OF HEALTH SERVICE'S 1001 N. CENTRAL AVE., SUITE 150 PHOENIX, AZ 85003. PHONE: (602) 506-6666 (THIS NOTICE IS ISSUED PURSUANT TO A.R.S. 36-779.07, NOTICE OF BUILDING AGENCIES.)
5. STAKING PAD AND/OR FINISHED FLOOR ELEVATIONS ARE THE RESPONSIBILITY OF THE DEVELOPER OR HIS ENGINEER. IN NON-CRITICAL AREAS, THE DEVELOPER'S ENGINEER SHALL SUBMIT CERTIFICATIONS OF CONSTRUCTED BUILDING PAD ELEVATIONS PRIOR TO THE CITY'S ACCEPTANCE OF PROJECT.
6. GRADING CONTRACTOR SHALL DESIGNATE THE LOCATION FOR WASTING SPOIL MATERIALS AND A LETTER FROM THE OWNER GIVING PERMISSION FOR SAID DISPOSAL PRIOR TO STARTING ON-SITE CONSTRUCTION.
7. GRADING AND DRAINAGE PLAN APPROVAL INCLUDES: CONSTRUCTION OF DRAINAGE PLAN INCLUDING, BUT NOT LIMITED TO, RETENTION AREAS AND/OR OTHER DRAINAGE FACILITIES, SURFACE GRADING, WALLS, CURBS, ASPHALT PAVEMENT, AND BUILDING FLOOR ELEVATIONS.
8. CONTRACTOR IS RESPONSIBLE FOR LOCATING AND CONFIRMING DEPTHS OF ALL THE EXISTING UTILITY LINES WITHIN PROPOSED RETENTION BASIN AREAS. IF THE BASIN CANNOT BE CONSTRUCTED PER PLAN BECAUSE OF CONFLICTS, THE CONTRACTOR SHOULD DISCUSS MODIFICATION OF BASIN CONFIGURATION WITH THE CITY INSPECTOR TO DETERMINE IF A PLAN REVISION OR A FIELD CHANGE IS REQUIRED.
9. AN APPROVED GRADING AND DRAINAGE PLAN SHALL BE ON THE JOB SITE AT ALL TIMES. DEVIATIONS FROM THE PLAN MUST BE PRECEDED BY AN APPROVED PLAN REVISION.
10. COMPACTION SHALL COMPLY WITH M.A.G. SECTION 601.
11. ALL RAMPS MUST MEET ADA ACCESSIBILITY GUIDELINES (ADAAG) STANDARDS: 2% MAX CROSS SLOPES AND 12:1 MAX LONGITUDINAL SLOPES.

GENERAL SEWER NOTES

1. ALL SEWER LINES SHALL BE PRESSURE TESTED AND MANDREL TESTED PER MAG SPECIFICATIONS. UPON COMPLETION OF TESTING AND FLUSHING, ALL SEWER LINES SHALL BE VIDEO INSPECTED FOLLOWING BACK FILLING AND THE VIDEOTAPE PROVIDED TO THE CITY ENGINEER.
2. MANHOLE TAPS SHALL BE MADE BY CORE DRILLING AND USING A LINK SEAL STYLE MECHANICAL SEAL. BOTH ENDS OF SEAL SHALL BE GROUTED FLUSH WITH NON-SHRINK GROUT.
3. ALL MANHOLE BASE CONCRETE SHALL BE VIBRATED TO ELIMINATE VOIDS.
4. ALL MANHOLES SHALL BE VACUUM PRESSURE TESTED.
5. ALL SEWER LINES 15" IN DIAMETER OR SMALLER SHALL BE SDR35 PVC, UNLESS OTHERWISE NOTED ON THE PLANS.
6. ALL SEWER PIPING SHALL BE INSTALLED USING A LASER AND TARGET. THE INVERTS INDICATED BY THE LASER SHALL BE VERIFIED USING THE SURVEYOR'S STAKEOUT.
7. ALL MANHOLE SECTIONS SHALL BE SEALED WITH BOTH MASTIC (RAMNECK OR EQUIVALENT) AND GROUT PLACED INSIDE EACH MANHOLE SECTION KEY. THE INSIDE JOINTS SHALL BE GROUT FINISHED.
8. UNLESS OTHERWISE APPROVED IN WRITING BY THE ENGINEER OR JOHN REPRESENTATIVE, PIPE SHALL BE LAID UPGRADE FROM THE POINT OF CONNECTION ON THE EXISTING PIPELINE OR FROM A DESIGNATED STARTING POINT. PIPE SHALL BE INSTALLED WITH THE BELL END FORWARD OR UPGRADE, UNLESS APPROVED OTHERWISE. WHEN PIPE LAYING IS NOT IN PROGRESS, THE FORWARD END OF THE PIPE SHALL BE KEPT CLOSED WITH AN APPROVED TEMPORARY PLUG.
9. ALL SEWER LINES SHALL BE FLUSHED AND DISINFECTED WITH 50 MG/L CHLORINE SOLUTION TO CITY INSPECTOR'S SATISFACTION PRIOR TO BEING ABANDONED AND CAPPED.
10. CONTRACTOR SHALL PLUG EXISTING ABANDONED SEWER WHERE DAMAGED OR CUT.
11. THE INSTALLATION OF ALL DUCTILE IRON SEWER PIPE SHALL INCLUDE THE APPLICATION OF GREEN POLYWRAP.

ARCHITECT

MILLER HULL ARCHITECT & PLANNING
71 COLUMBIA - SIXTH FLOOR
SEATTLE, WA-98104
PHONE: (206) 682-6837
CONTACT: MIKE JOBES

OWNER/DEVELOPER

RM 4 K SQUARE DEVELOPMENT, LLC
8351 HARTFORD DR.
SCOTTSDALE, AZ 85255
PHONE: (480) 993-0560
CONTACT- MIKE TRAILOR

ENGINEER

DAVID EVANS & ASSOCIATES, INC.
2141 EAST HIGHLAND AVENUE, STE 200
PHOENIX, ARIZONA 85016
PHONE: (602) 678-5151
CONTACT: BOYCE O'BRIEN

LANDSCAPE ARCHITECT

FLOOR & ASSOCIATES
1425 NORTH FIRST STREET
SECOND FLOOR
PHOENIX, ARIZONA-85004
PHONE: (602)462-1425
CONTACT: KRISTINA FLOOR, ASLA

BASIS OF BEARING

THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 23, TOWNSHIP 2 NORTH, RANGE 4 EAST AS SHOWN ON PARADISE TRIANGLE, A SUBDIVISION RECORDED IN BOOK 46 OF MAPS, PAGE 28, MARICOPA COUNTY RECORDS, SAID LINE BEING NORTH.

LEGAL DESCRIPTION

PARCEL NO. 1

THAT PART OF TRACT A, PARADISE TRIANGLE, ACCORDING TO BOOK 46 OF MAPS, PAGE 28, RECORDS OF MARICOPA COUNTY, ARIZONA, AND THAT PART OF THE NORTHWEST QUARTER OF SECTION 23, TOWNSHIP 2 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA, DESCRIBED AS FOLLOWS:

COMMENCING AT THE WEST QUARTER CORNER OF SAID SECTION 23;
THENCE NORTH 90° 00' 00" EAST, ALONG THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 23, 688.12 FEET;
THENCE NORTH 90° 00' 00" EAST, 65.00 FEET TO A POINT ON A LINE WHICH IS PARALLEL WITH AND 65.00 FEET EASTERLY, AS MEASURED AT RIGHT ANGLES FROM THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 23, SAID POINT BEING THE POINT OF BEGINNING;
THENCE NORTH 00° 00' 00" EAST, ALONG SAID PARALLEL LINE, 451.16 FEET;
THENCE NORTH 86° 57' 53" EAST, 252.86 FEET;
THENCE SOUTH 00° 02' 07" EAST, 293.50 FEET;
THENCE SOUTH 49° 15' 13" EAST, 328.75 FEET;
THENCE SOUTH 40° 42' 38" WEST, 249.27 FEET;
THENCE NORTH 49° 15' 13" WEST, 377.41 FEET;
THENCE SOUTH 90° 00' 00" WEST, 54.15 FEET TO THE POINT OF BEGINNING.

PARCEL NO. 2

INTERRUPTIBLE, RECIPROCAL, NON-EXCLUSIVE EASEMENT: AS SET FORTH IN DOCUMENT RECORDED IN RECORDING NO. 2005-165400.

SHEET INDEX

CITY OF SCOTTSDALE
REVIEW AND RECOMMENDED APPROVAL BY:

PAVING	Approved, Held 1/23/08	TRAFFIC	Approved, Held 1/23/08
GRADING & DRAINAGE	Approved, Held 1/23/08	PLANNING	1-23-08
WATER & SEWER	Approved, Held 1/23/08	FIRE	for 1-23-08 Approved
RET. WALLS	Approved, Held 1/23/08		

APPROVED BY: Joseph D'Amore
ENGINEERING COORDINATION MANAGER (OR DESIGNEE) — 1/23/08 DATE

APPROVED BY FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PERMIT GRANTED — 4/09/07 DATE

APPROVED BY MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPARTMENT
T.E. Cahill 063466 063467 — 8/2/06 DATE

AS-BUILT CERTIFICATION

For Canal Tunnel Only

I CERTIFY THAT THE "RECORD DRAWINGS" AS SHOWN WAS MADE UNDER THE SURVEYOR'S SUPERVISION OR AS NOTED, AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

NAME Robert N. Hermon — DATE 3-2-10
REGISTRATION NO. 5277

ROBERT N. HERMON
Registered Land Surveyor/Engineer
BRADY-AULERICH & ASSOCIATES, INC.
1030 East Guadalupe Road
Tempe, Arizona 85283
(480) 839-4000

CANAL Box CULVERT SHEETS C19-C22 AS-BUILTS

AS-BUILT

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Ave.
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Phoenix Arizona 85016
Phone: 602.678.5151

IN COOPERATION WITH:

MILLER HULL

ARCHITECTURE AND PLANNING
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SEATTLE, WA 98104
206.682.6837
206.682.6922 fax

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Floor & Associates
1425 North First Street
Second Floor
Phoenix, AZ 85004

MEP ENGINEER
Flack & Kurtz
1417 Fourth Avenue, Suite 400
Seattle, WA 98101-2260

SAFARI DRIVE
SCOTTSDALE ARIZONA
VANGUARD CITYHOME

PHASE 1 & 2 IMPROVEMENT PLANS

COVER SHEET

DATE 08-01-2006
DESIGNER DMPA
CHECKED BHD/MSA
DEA PROJ. # M4HU-0001

SHEET C1 OF 22
10-02-12

DRB CASE #46 DR 2005 — ZONING CASE #6-ZN-1982#6 & 65-AZ-1982#5 — PLAN CHECK #4612-2006

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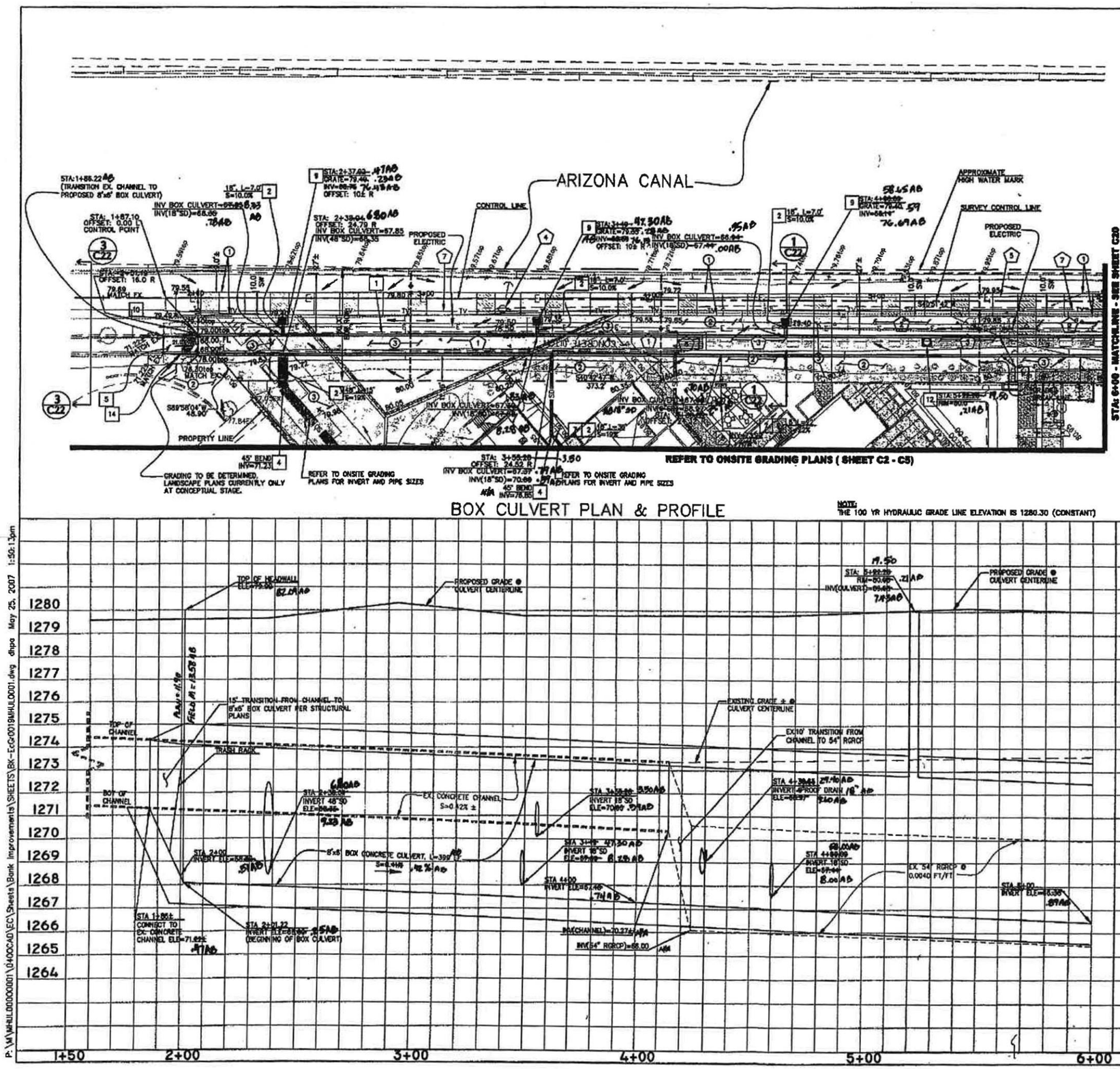


BOX CULVERT PLAN & PROFILE

NOTE:
THE 100 YR HYDRAULIC GRADE LINE ELEVATION IS 1280.30 (CONSTANT)

CONSTRUCTION NOTES

1. INSTALL 10' WIDE D.G. PATH PER LANDSCAPE PLANS, 5% MAX. CROSS SLOPE AND 20:1 MAX. LONGITUDINAL SLOPE.
2. REFER TO LANDSCAPE PLANS FOR DETAILS.
3. REFER TO THE LANDSCAPE PLANS FOR SURFACE TREATMENT. (SECTION, COLOR, TEXTURE AND MATERIALS).
4. CONTRACTOR TO PROVIDE 12" MIN. VERTICAL SEPARATION BETWEEN STORM DRAIN, AND SEWER OR WATER PIPES CROSSING. IF LESS THAN 12" AND/OR SEWER CROSSING ON TOP ENCASE PER M.A.G. STD. DET. 404.
5. PROVIDE 4:1 SLOPE TO MATCH EX.

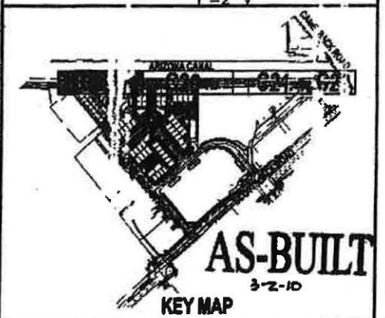
STORM DRAINAGE NOTES

1. INSTALL 8'x6' BOX CULVERT PER ADOT STD DET #C-10.10, TABLE 1 OR APPROVED PRE-CAST BOX CULVERT. ALL PRE-CAST TO CONCRETE CONNECTIONS TO BE MADE WITH DOWELS AS DESCRIBED ON SHEET S4.
2. INSTALL HDPE PIPE BY ADS TYPE N12 OR EQUAL, SIZE AND LENGTH PER PLAN. INSTALL PER COS SUPPLEMENTAL SPECIFICATION SECTION 603.
3. INSTALL 18" INLINE DRAIN OR DRAIN BASIN. (PEDESTRIAN RATED GRATE).SIZE PER PLAN.
4. INSTALL ADS N12 TEE OR BEND. SIZE, INVERT AND ANGLE PER PLAN.
5. CONSTRUCT CHANNEL TRANSITION PER STRUCTURAL PLANS.
6. REFER TO PLUMBING PLAN FOR CONTINUATION.
7. PROPOSED ROOF DRAIN PIPE. INVERTS PER PLAN.
8. NOT USED.
9. INSTALL CATCH BASIN PER MAG STD DET # 535 TYPE "".
10. INSTALL HEADWALL PER MAG STD DET # 501-3 AND MODIFIED PER PLANS.
11. REMOVE WALL OF THE EXISTING JUNCTION BOX AND CONNECT NEW BOX CULVERT PER STRUCTURAL PLANS BY OTHERS. CONTRACTOR TO VERIFY ELEVATION OF EX. INVERT PRIOR TO TRENCHING. NOTIFY ENGINEER OF ANY DISCREPANCY.
12. INSTALL 4' STORM DRAIN MANHOLE PER STRUCTURAL DETAIL.
13. CONSTRUCT NEW CATCH BASIN WITH 41"x60" GRATE PER STRUCTURAL DRAWING
14. INSTALL TRASH RACK PER DETAILS ON SHEET C22.

REMOVAL NOTES

1. REMOVE AND DISPOSE OF EXISTING CONCRETE CHANNEL PER MAG SPECIFICATIONS.
2. REMOVE AND DISPOSE OF EXISTING CONCRETE PER MAG SPECIFICATIONS.
3. REMOVE AND DISPOSE OF EXISTING STORM DRAIN PER MAG SPECIFICATIONS.
4. EXISTING POWER POLE TO BE REMOVED BY OTHERS.
5. EXISTING POWER LINE TO BE RELOCATED UNDERGROUND BY OTHERS.
6. REMOVE AND DISPOSE OF EXISTING CATCH BASIN PER MAG SPECIFICATIONS. SAVE EX. 41"x60" GRATE FOR REUSE ON STRUCTURES AT LOCATIONS 12+42, 12+27 OR 12+12. FURNISH (1) EACH NEW "X60" GRATE.
7. EXISTING TV CABLE TO BE RELOCATED PER PLANS BY OTHERS. COORDINATE WITH CABLE COMPANY.
8. REMOVE EXISTING TRASH RACK.
9. REMOVE EXISTING STRUCTURE PER STRUCTURAL PLANS. SAVE EXISTING GRATE TO RE-USE ON NEW STRUCTURE.

N/A NOT ACCESSIBLE AT TIME OF AB



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Seattle, WA 98101-2260

SAFARI DRIVE
SCOTTSDALE ARIZONA

VANGUARD CITYHOMES

PHASE 1 & 2 IMPROVEMENT PLANS

BANK IMPROVEMENT PLANS

DATE	
DRAWN	05-17-2007
DESIGNER	DHPA
CHECKED	BHO/MSA
DEA PROJ. #	MHUL-0001

SHEET C19 OF 22
10-02-12

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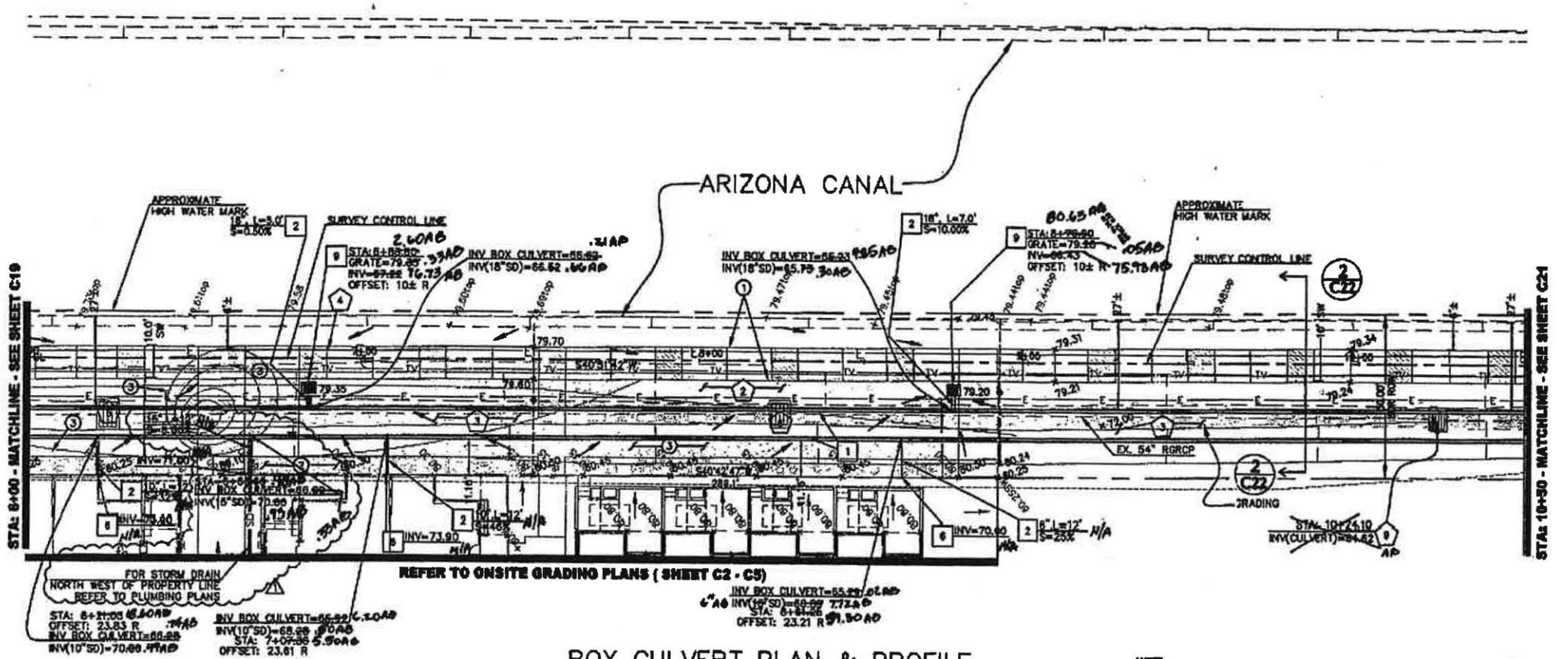

BOX CULVERT PLAN & PROFILE

NOTE:
THE 100 YR HYDRAULIC GRADE LINE ELEVATION IS 1280.30 (CONSTANT)

CONSTRUCTION NOTES

1. INSTALL 10' WIDE D.G. PATH PER LANDSCAPE PLANS, 5%:1 MAX. CROSS SLOPE AND 20:1 MAX. LONGITUDINAL SLOPE.
2. REFER TO LANDSCAPE PLANS FOR DETAILS.
3. REFER TO THE LANDSCAPE PLANS FOR SURFACE TREATMENT (SECTION, COLOR, TEXTURE AND MATERIALS).
4. CONTRACTOR TO PROVIDE 12" MIN. VERTICAL SEPARATION BETWEEN STORM DRAIN, AND SEWER OR WATER PIPES CROSSING. IF LESS THAN 12" AND/OR SEWER CROSSING ON TOP ENCASE PER M.A.G. STD. DET. 404.
5. PROVIDE 4:1 SLOPE TO MATCH EX.

STORM DRAINAGE NOTES

1. INSTALL 8'x6' BOX CULVERT PER ADOT STD DET #B-MC.10, TABLE I OR APPROVED PRE-CAST BOX CULVERT. ALL PRE-CAST TO CONCRETE CONNECTIONS TO BE MADE WITH DOWELS AS DESCRIBED ON SHEET S4.
2. INSTALL HDPE PIPE BY ADS TYPE N12 OR EQUAL, SIZE AND LENGTH PER PLAN. INSTALL PER COS SUPPLEMENTAL SPECIFICATION SECTION 603.
3. INSTALL 18" INLINE DRAIN OR DRAIN BASIN. (PEDESTRIAN RATED GRATE).SIZE PER PLAN.
4. INSTALL ADS TYPE N12 TEE OR BEND. SIZE, INVERT AND ANGLE PER PLAN.
5. CONSTRUCT CHANNEL TRANSITION PER STRUCTURAL PLANS.
6. REFER TO PLUMBING PLAN FOR CONTINUATION.
7. PROPOSED ROOF DRAIN PIPE. INVERTS PER PLAN.
8. NOT USED.
9. INSTALL CATCH BASIN PER MAG STD DET 535 TYPE "F".
10. INSTALL HEADWALL PER MAG STD DET # 501-3 AND MODIFIED PER PLANS.
11. REMOVE WALL OF THE EXISTING JUNCTION BOX AND CONNECT NEW BOX CULVERT PER STRUCTURAL PLANS BY OTHERS. CONTRACTOR TO VERIFY ELEVATION OF EX. INVERT PRIOR TO TRENCHING. NOTIFY ENGINEER OF ANY DISCREPANCY.
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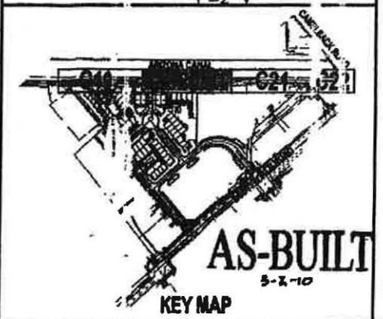
N/A NOT ACCESSIBLE AT TIME OF AS

SCALE: 1"=20' H
1"=2' V



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SAFARI DRIVE
SCOTTSDALE ARIZONA

VANGUARD CITYHOME

05-17-07	RESPONSE TO 1ST SUBMITTAL

PHASE 1 & 2 IMPROVEMENT PLANS

BANK IMPROVEMENT PLANS

DATE	
DRAWN	05-17-2007
DESIGNER	DHPA
CHECKED	BHO/MSA
DEA PROJ. #	3681.0001

SHEET C20 OF 22
10-02-12

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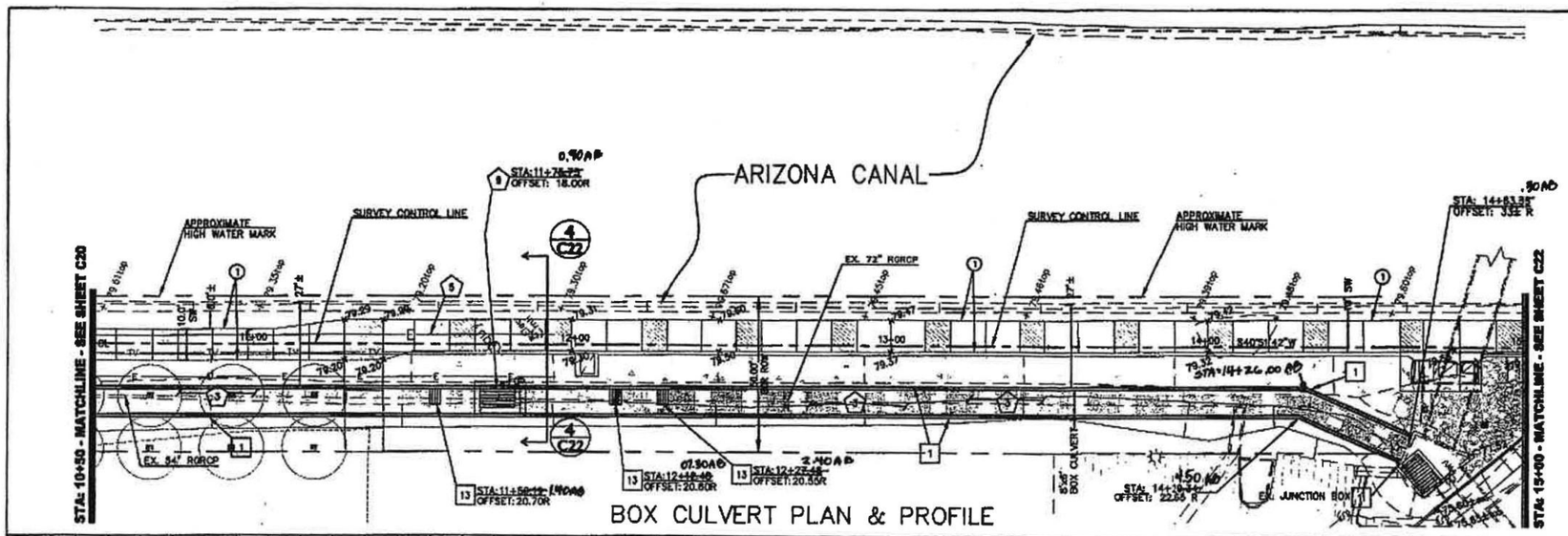
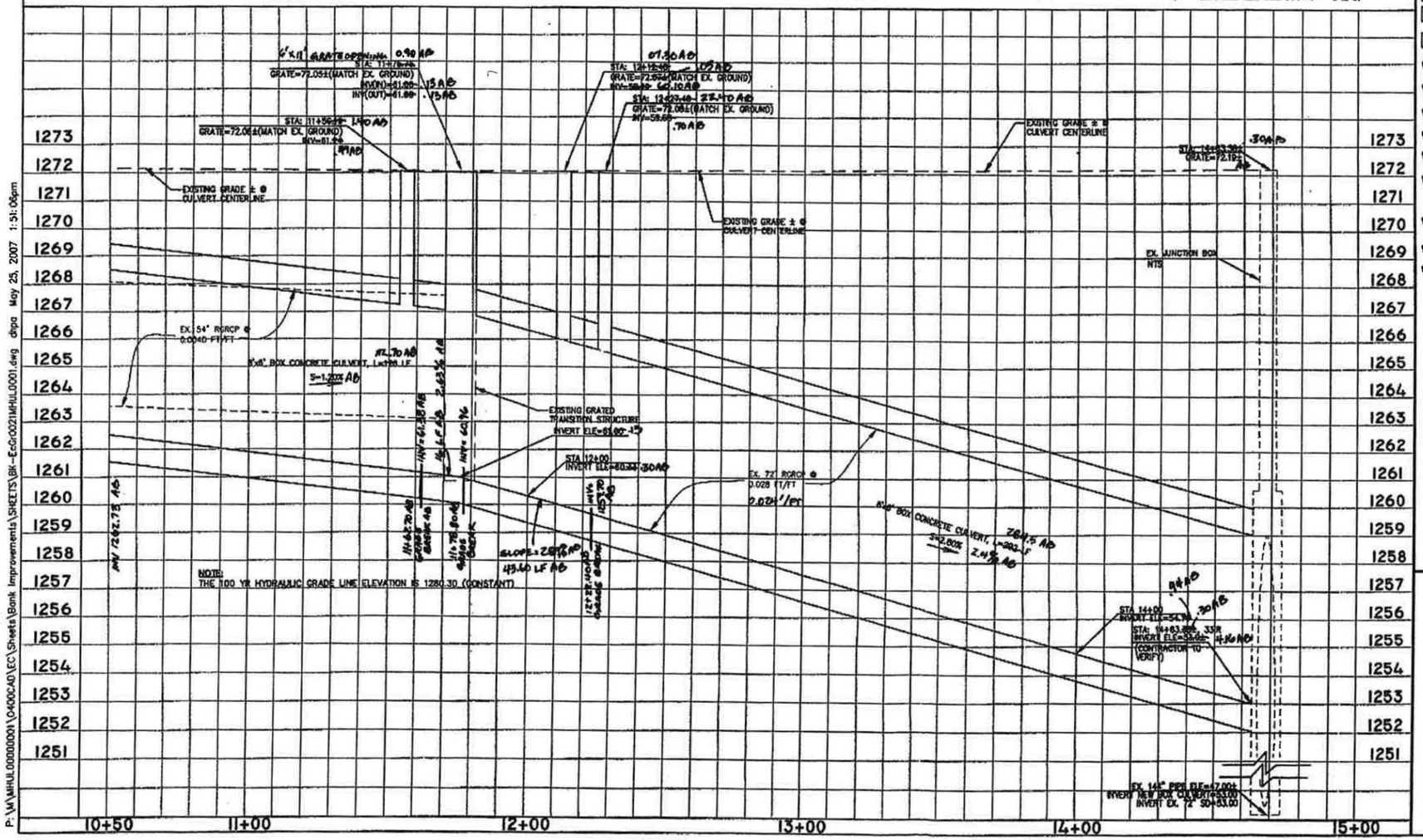


BOX CULVERT PLAN & PROFILE



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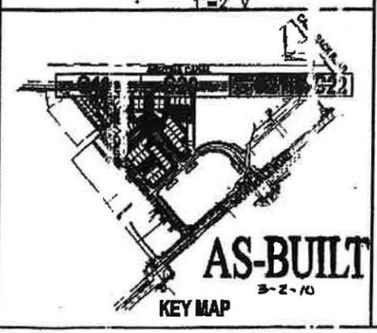

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PHASE 1 & 2 IMPROVEMENT PLANS

BANK IMPROVEMENT PLANS

DATE	05-17-2007
DRAWN	DHPA
DESIGNER	RHO/MSA
CHECKED	RHO/MSA
DEA PROJ. #	MHUL-0001

SHEET C21 OF 22
10-02-12

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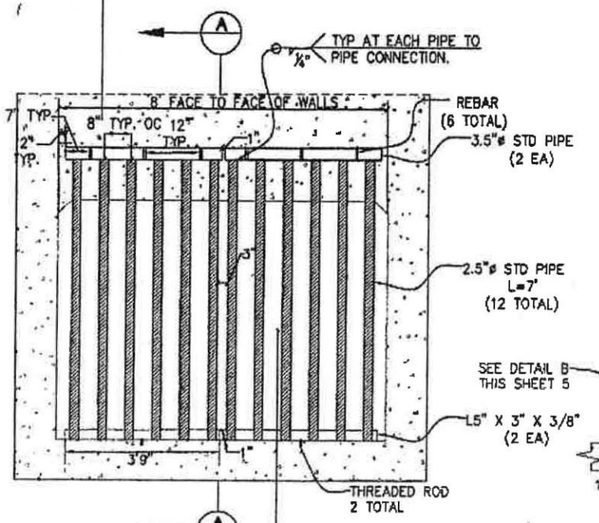
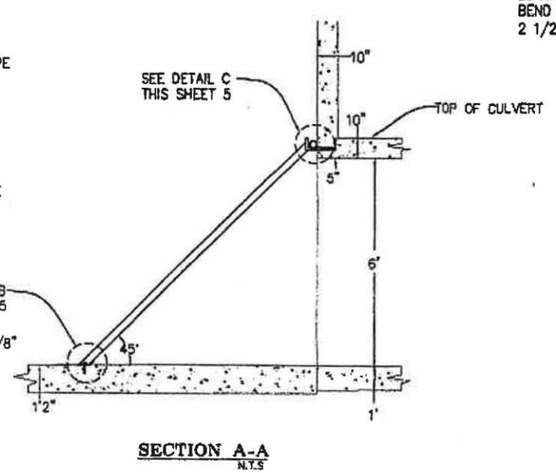


FRONT VIEW
N.T.S



SECTION A-A
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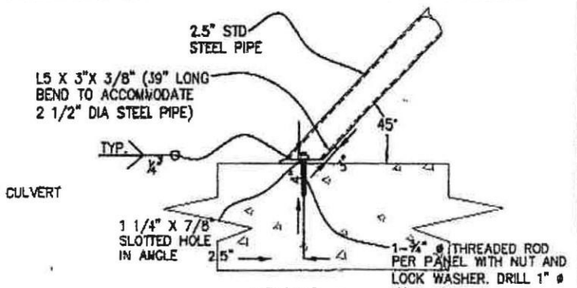

DETAIL B
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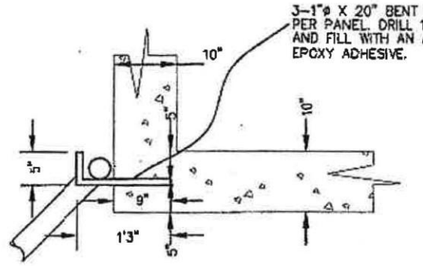

DETAIL C
N.T.S

TRASH RACK DETAIL NOTES

1. CONTRACTOR SHALL PROVIDE ENGINEER A COMPLETE SET OF SHOP DRAWINGS PRIOR TO FABRICATION.
2. CONTRACTOR TO FIELD VERIFY ALL CULVERT, CHANNEL AND WALL DIMENSIONS BEFORE FABRICATION OF GRATE.
3. ALL ANGLES AND RODS SHALL CONFORM TO ASTM A36.
4. ALL PIPES SHALL CONFORM TO ASTM 53 GRADE B, TYPE E OR S.
5. ALL WELDING SHALL CONFORM TO THE REQUIRMENTS OF AWS/ANS D1.1: 1998 STRUCTURAL WELDING CODE.
6. REBARS SHALL CONFORM TO ASTM SPECIFICATION A615 AND FURNISH AS GRADE 60.
7. ALL STRUCTURAL STEEL SHALL BE GALVANIZED.
8. REFER TO SHEETS S1 TO S6 FOR STRUCTURAL DETAILS OF BOX CULVERT.

CONSTRUCTION NOTES

1. INSTALL 10' WIDE D.G. PATH PER LANDSCAPE PLANS, 50:1 MAX. CROSS SLOPE AND 20:1 MAX. LONGITUDINAL SLOPE.
2. REFER TO LANDSCAPE PLANS FOR DETAILS.
3. REFER TO THE LANDSCAPE PLANS FOR SURFACE TREATMENT. (SECTION, COLOR, TEXTURE AND MATERIALS).
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5. PROVIDE 4:1 SLOPE TO MATCH EX.

STORM DRAINAGE NOTES

1. INSTALL 8'x6' BOX CULVERT PER ADOT STD DET#C-02.10, TABLE 1 OR APPROVED PRE-CAST BOX CULVERT. ALL PRE-CAST TO CONCRETE CONNECTIONS TO BE MADE WITH DOWELS AS DESCRIBED ON SHEET S4.
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8. NOT USED.
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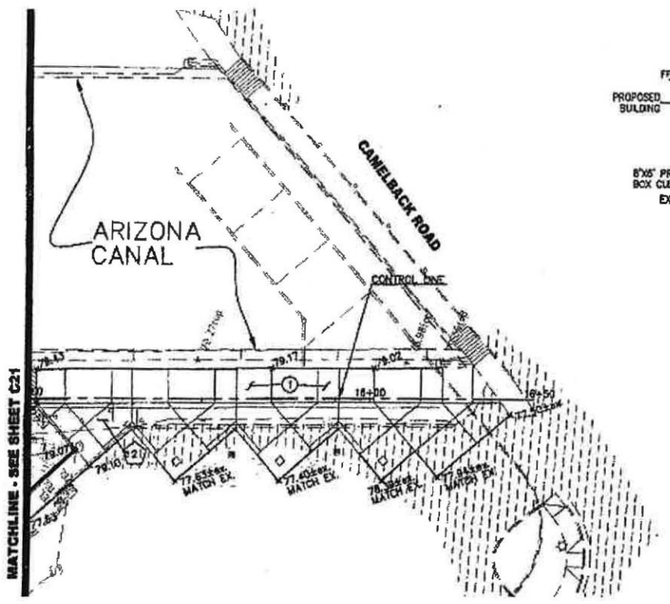
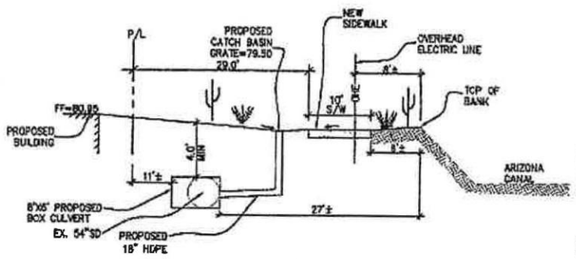
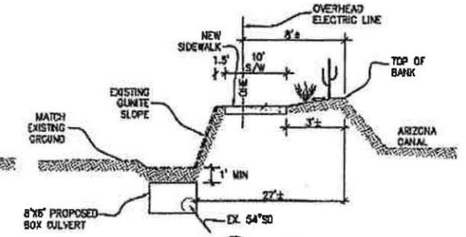
4. EXISTING POWER POLE TO BE REMOVED BY OTHERS.
5. EXISTING POWER LINE TO BE RELOCATED UNDERGROUND BY OTHERS.
6. REMOVE AND DISPOSE OF EXISTING CATCH BASIN PER MAG SPECIFICATIONS. SAVE EX. 41"x60" GRATE FOR REUSE ON STRUCTURES AT STATIONS 12+42, 12+27 OR 12+12. FURNISH (1) EACH NEW 41"x60" GRATE.
7. EXISTING TV CABLE TO BE RELOCATED PER PLANS BY OTHERS. COORDINATE WITH CABLE COMPANY.
8. REMOVE EXISTING TRASH RACK.
9. REMOVE EXISTING STRUCTURE PER STRUCTURAL PLANS. SAVE EXISTING GRATE TO RE-USE ON NEW STRUCTURE.



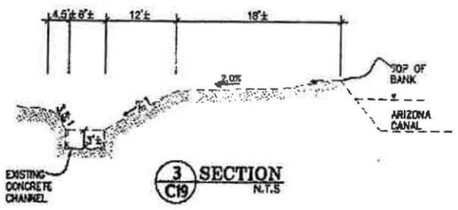
3 BOX CULVERT DETAIL



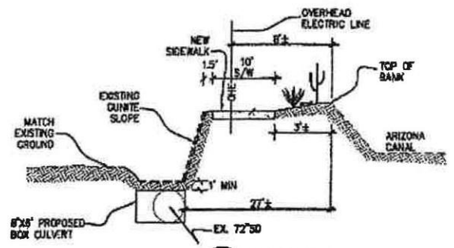
1 SECTION C19
N.T.S



2 SECTION C20
N.T.S

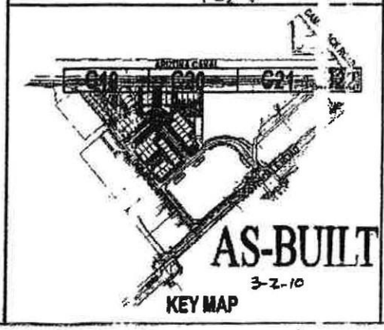


3 SECTION C19
N.T.S



4 SECTION C21
N.T.S

SCALE: 1"=20' H
1"=2' V



AS-BUILT
3-2-10

KEY MAP

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Ave.
Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

IN COOPERATION WITH:

MILLER HULL
ARCHITECTURE AND PLANNING
71 COLUMBIA - EIGTH FLOOR
SEATTLE, WA 98104
206.682.6823
206.682.5699 fax

LANDSCAPE
Floor & Associates
1425 North First Street
Second Floor
Phoenix, AZ 85004

MEP ENGINEER
Flack & Kurtz
1417 Fourth Avenue, Suite 400
Seattle, WA 98101-2260

SAFARI DRIVE
SCOTTSDALE ARIZONA

VANGUARD CITYHOME

PHASE 1 & 2 IMPROVEMENT PLANS

BANK IMPROVEMENT PLANS

DATE	05-17-2007
DRAWN	DHPA
DESIGNER	BHO/MSA
CHECKED	MHUL-0001
DEA PROJ. #	

SHEET C22 OF 22
10-02-12

P:\M\MHUL0000001\0400CAD\ECI\Sheets\Bank Improvements\SHEETS\BK-EcGr0029MHULC001.dwg dhpa May 25, 2007 1:49:42pm

City of Scottsdale Case Numbers 3502-05

PA ____ 45 DR 2005

ZN ____ PP ____

UP ____

Before the submittal of improvement plans the developer must obtain approval of this waiver request. Denial may require a revised site plan be submitted to the DR Board.

REQUEST FOR STORMWATER STORAGE WAIVER FORM (Page 1 of 3)

(To be completed by the applicant and submitted to the city for processing) (4/7/00)

Waiver Criteria

A waiver is an intentional relinquishment of a claim or right. Before the city can waive some or all of the required stormwater storage at least one of the following city ordinance criteria (**In bold**) must be met. Check the criteria below that applies to this project and provide the engineering analyses that demonstrate that the effect of this waiver will not increase the potential for flooding on any property.

☐ 1. **The runoff has been included in a storage facility at another location.** The developer must demonstrate that runoff from this site will be safely conveyed to the other location through an adequately designed conveyance facility.

☐ 2. **Application is for a building permit to construct a single-family residential structure.**

☒ 3. **Development is adjacent to a watercourse or channel that has been designed and constructed to handle the additional runoff flow without increasing the potential for flood damage to any other downstream property.** The developer must demonstrate that the watercourse has the extra capacity needed to convey the additional runoff.

☐ 4. **The development is for a parcel under one-half acre in an area where it can be demonstrated by engineering analysis that no significant increase in the potential for flood damage will be created by the development.**

☐ 5. **There is a possible conflict with the requirements of the city's Environmentally Sensitive Lands Ordinance** (city staff must make the final determination of this).

I, Jonathan S. Joyce (DEVELOPER OR ENGINEER) 5/31/05 (DATE) certify that:

The Riverwalk Square (PROJECT or DEVELOPMENT NAME) meets one of the criteria checked above.

Project Location North of the north east corner of Scottsdale & Camelback Rd.

Applicant Phone (480) 346-3200

Applicant Mailing Address
7272 E. Indian School Rd. Suite 420
Scottsdale AZ 85251

I, _____ (PROJECT COORDINATION STAFF) _____ (DATE) believe that the above is correct and the project (does) / (does not) meet one or more of the waiver criteria.

REQUEST FOR STORMWATER STORAGE WAIVER FORM (PAGE 3 of 3)

(This page to be completed by city staff) (4/7/00)

Project Name _____

CHECK APPROPRIATE BOXES

☒ Waiver criteria met (specify) ☐ 1 ☐ 2 ☒ 3 ☐ 4 ☐ 5

☐ Waiver approval recommended

☐ Waiver recommended for denial

- ☐ None of the waiver criteria met
- ☐ Downstream conditions prohibit the waiver of any storage
- ☐ Other _____

Explain _____

☐ Waiver request returned

- ☐ Insufficient data provided
- ☐ Other _____

Explain _____

Recommended Conditions of Waiver

- ☒ All storage requirements waived
- ☐ Pre development conditions must be maintained
- ☒ Other See in kind contribution

Explain _____

Above Recommended by _____ DRAINAGE PLANNER _____ DATE

WAIVER ✓ APPROVED, OR _____ DENIED, per above conditions

By _____ FLOODPLAIN ADMINISTRATOR 7/1/05 DATE

By _____ DEVELOPMENT QUALITY/COMPLIANCE DIRECTOR 7/1/05 DATE

TRI-CORE ENGINEERING

Transportation Flood Control Water / Wastewater Land Development Planning GIS Services Construction Administration Surveying

Job No 5140.0001 Sheet 1 of 1

Project Riverwalk Square

Subject Storm Drain Retention 100 Yr-2hr

Designed By Durell Date 5-12-05 Checked By _____ Date _____

Standard formula from COS chap 2.2 Sec 2.204

$V_r = \left(\frac{P}{12}\right) AC$

P = 2.82 inches

A = 4.86 acres

C = .87 from figure 2.2-17

Note: Although the site has good infiltration soils, Because of the high density, a 0.87 value for "C" was selected.

$V_r = \left(\frac{2.82}{12}\right)(4.86)(0.87)$

$V_r = 0.9936$ Acre-ft or **43,282 Ft³**

RIVERWALK SQUARE STORAGE W[redacted]ER EXHIBIT

By I David Lopez Ivich, P E

Tri-core Engineering, 7272 E Indian School Rd Suite 420

Scottsdale, AZ Tel 480-346-3200

Table 1 Cost Estimate of Improvements

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
New 54" HDPE	976	L F	$120 00	$117,120 00
Extention of existing 54 pipe	229	L F	$120 00	$27,480 00
Downstream Junbon Box (connects 2-54 pipes to 72" pipe)	1	EA	$3,500 00	$3,500 00
Upstream Junbon Box and Trash Rack (connects 2-54" pipes to Channel)	1	EA	$5,000 00	$5,000 00
Storm water pollutant remover	4	EA	$700 00	$2 800 00
Removal of existing catch basin grates	2	EA	$500 00	$1,000 00
Removal of existing junction box and trash rack	1	EA	$1 500 00	$1,500 00
			Total	$158,400 00

Table 2 Cost Estimate of Retention

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
Retention Required 1 acre/ft (Using storm drain chambers system)	43 282	C F	$3 50	$151,487 00
			Total	$151,500 00

DAVID EVANS
AND ASSOCIATES INC.

August 4, 2011

Joe Rumann
7447 E. Indian School Road, Suite 125
6263 Scottsdale Road, Suite 330
Scottsdale, AZ 85251

SUBJECT: Retention Waiver Application Cover Letter for DR Submittal #2013-08 (Safari – Ph 3)

Dear Mr. Rumann:

This letter is in support of the retention waiver application for the development of the Scottsdale BlueSky project. The site is located within the City of Scottsdale core downtown area near the northeast corner of the intersection of Scottsdale Road and Camelback Road. There will be no adverse impacts on adjacent properties due to the development of the Scottsdale BlueSky project site. The site is located in two flood zones. The southern portion of the site is located in flood Zone A and the northern portion of the site is located in flood Zone X.

The project is comprised of approximately three acres within Section 23, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian. The Scottsdale BlueSky project will be a mixed use development consists of multi-family residential apartments, grocery store, Restaurant, Retail, Club/fitness house, and office. There will be 4-levels of below grade parking that will provide approximately 1,511 parking spaces.

Site grading and drainage is designed to elevate finish floor elevations above the base flood elevation, maintaining at least minimum required freeboard during the design 100-year storm event.

Offsite runoff that reaches the northeastern portion of the site is conveyed along western boundary of the Arizona Canal in a southwesterly direction through an existing underground box culvert that was constructed as part of the initial phase of the project.

Scottsdale Road is an improved street with curb and gutter that drains in a southerly direction adjacent to the site. The majority of the runoff along Scottsdale Road is conveyed within the street section of the road and a smaller portion is conveyed into the existing storm drain system along Scottsdale Road that outfalls into the main storm drain in Camelback Road. There is also a small amount of runoff diverted from Scottsdale Road into Coolidge Street and is then conveyed in an easterly direction into the culvert mentioned above.

The existing runoff conditions were carefully studied in the initial phase of the project (Safari Drive) and they will be maintained during the design of the current phase (Blue Sky). The existing drainage conditions will be used as guidelines in the development and design of the Blue Sky project.

4600 East Washington Street Suite 430 Phoenix Arizona 85034 Telephone: 602.678.5151 Facsimile: 602.678.5155

In addition, the box culvert installed during the initial/previous phase of the project has been constructed in-lieu of onsite retention. Based on the above information and the attached retention waiver application, we respectfully request that you consider the previously approved culvert, built as part of the initial phase of the project, to be utilized in-lieu of onsite retention for the project.

Should you have any questions, please contact me at (602) 474-9223.

Sincerely,

DAVID EVANS AND ASSOCIATES, INC.

Ramzi Georges, P.E., CFM
Senior Project Manager