CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

July 11, 2016

David Aube, P.E.
Hartman + Majewski Design Group
120 Vassar Dr. SE Suite 100
Albuquerque, NM 87106

RE: APS Family School West (A09D004)
Drainage Report, Grading Plan, Engineer's Stamp Date: 7-8-2016

Dear Mr. Aube:

Based upon the information provided in your submittal received 7-8-16, the above referenced submits are approved for Work Order.

The Drainage Report will be the guiding document for future development along the North side of Irving Blvd. Per the Report, this site is allowed to discharge 4.08 cfs into Irving, 1.16 cfs from Basin #1C onto the east property, and 2.47 cfs from Basin #2C onto property to the east.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Planning Dept.
Development Review Services

Orig: Drainage file
c.pdf via Email: Recipient, Don Briggs, Lynn Mazur

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

APS Family School North West Campus
Drainage Report

July 8, 2016

Prepared for:

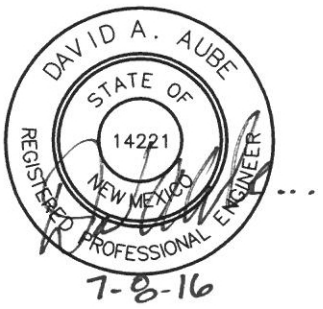
Albuquerque Public Schools

Prepared by:

The Hartman + Majewski Design Group

120 Vassar SE, Suite 100

Albuquerque, NM 87106



APS Family School North West Campus

Purpose and Scope:

The purpose of this drainage plan is to present the existing and proposed drainage management plans for the proposed Albuquerque Public Schools Family School Facility located at the NE Corner of Rainbow Boulevard NW and Irving Boulevard NW. The site is located in Zone Atlas Page A-09-Z. The site is currently vacant. The street frontage along Irving Boulevard NW is only constructed as a street half section on the southern side of the street.

Computation Procedures:

Hydrologic analysis was performed utilizing the design criteria found in the COA-DPM Section 22.2 released in June 1997

Precipitation Criteria:

The 100-yr. 6-hr duration storm was used as the design storm for this analysis. This site is within Zone 1 as identified in the DPM Section 22.2. Tables within the section were used to establish the 6-hr precipitation, excess precipitation and peak discharge.

Existing Conditions:

Several previous Drainage Management Plans were reviewed in the preparation of this report. Those reports include:

1. Drainage Report for Cana Cielo at Ventana Ranch (BHI, September 5, 2003)
2. Drainage Report for Country Meadows Units IV at Ventana Ranch (BHI, January 14, 2004)
3. Drainage Report of Vista De Arenal Unit III at Ventana Ranch, (BHI, March 19, 2004)

These prior studies evaluated offsite basins along Irving Boulevard and Rainbow Boulevard. Three basins were identified in as Irving West (between ridge on west and Rainbow), Rainbow Tract 13 (Rainbow Boulevard and a portion of a Pinon Pointe Subdivision Unit III at Ventana Ranch) and Irving East (between Rainbow and Universe). These Basins were identified as 6.140 ac, 6.528 ac, and 4.928 ac respectively. Flow rates associated with these basins were 19.91 cfs, 25.38 cfs, and 13.52 cfs respectively (data obtained from AHYMO found on sheet A-5 in Canta Cielo Drainage Report).

The development at the southwest (Pinon Pointe Subdivision Unit III at Ventana Ranch) of Rainbow and Irving contains a catch basin constructed in the right turn lane of Irving toward Rainbow. The street slope is approximately 0.5% at the inlet. Street capacity and inlet (Single A with Double Wings) collection charts were used to determine that 10 cfs would be collected in this inlet, leaving 9.9 cfs as bypass. This 9.9 cfs would flow into the Rainbow Tract 13 basin.

When Pinon Pointe Subdivision Unit III at Ventana Ranch was developed the drainage basin identified as Rainbow Tract 13 was modified. Approximately 5 acres of the basin were accounted for within the Pinon Pointe Subdivision Unit III at Ventana Ranch. The remaining 1.5 acres will only generate 5.45 cfs in the 100 year event. The Basin was identified as 25.38 cfs in the Canta Cielo Drainage Report.

The combination of the 10 cfs collection and the 19.83 cfs reduction in Rainbow Tract 13 basin will reduce the flow bypassing the project site toward the sump condition catch basins located within Irving East Basin.

The reason for all this history being contained within this report, is that information on the proposed site that contains land draining toward Irving could not be found. A copy of the Proposed Conditions Basin Map from the Canta Cielo Drainage Report is included with this report. Please note the there is a portion of the project site to the south and west of EX OFFSITE 1 that is required to drain toward Irving Boulevard. This same condition occurs on the west side of Rainbow. These basins are shown on the Master Drainage Plan Exhibit as Ex Offsite #3 and Ex Offsite #4. Between these two basins a peak runoff for current conditions is 18.3 cfs.

Please note that these basins historically drained toward the southeast into Irving. With the removal of the 19.83 cfs from Rainbow Tract 13 basin, and adding in the current conditions for Ex Offsite #3 and Ex Offsite #4 is still a reduction in street flow of approximately 1.5 cfs.

A meeting was held with City of Albuquerque Hydrology to discuss this issue. The result was that even though the basins were not clearly identified in prior studies, **current conditions for drainage patterns and flowrates can remain.**

The Canta Cielo Basin Map shows two Offsite Basins that drain toward the Cana Cielo Subdivision. The subdivision was designed to accept drainage from the west that extended almost up to Rainbow Boulevard. Drainage Basins for this property are a replication of this offsite to ensure that runoff is restricted toward the existing drainage structures and conveyance piping.

Additional drainage basins were defined going west to allow for evaluation of the project site and its offsite basins. A small downstream offsite basin was also analyzed because it is part of the Ex Offsite #3 basin that drains into Irving Boulevard.
Please refer to Sheet CD1 for the Existing Drainage Plan.

There is a ridge line within the project site that diverts water toward the north and south. Water that passes through is limited by this natural ridge line and the off-site basins upstream of the site are fairly small. There are two off-site basins that are defined as Existing Offsite Basins #4A and #6 generate 2.01 cfs and 1.97 cfs respectively. These offsite basins currently flow into the project site from the west.

The Onsite basins have been divided up to follow the proposed boundaries along the property lines and Street ROW. There is a section of the site that will be utilized for the creation of drive lanes in Irving Boulevard (Onsite Basin #7). This portion of the site was already included as fully developed in the Canto Cielo Drainage Report. This basin was treated as fully developed even for the current conditions and generates a peak runoff of 3.19 cfs.

There are four main On-Site Basins #1C, #2C, #3B and #5. Onsite Basin #1C is the extension of the prior studies EX Offsite Basin #1 and was created to ensure that the developed conditions does not exceed allowable discharge along the eastern property line and has a peak discharge for the current conditions of 1.67 cfs. Basins #2C is also within the prior Canta Cielo defined basins and generates 2.47 cfs.

Basin #3B is the southern part of the site and discharges to the east and south into the adjacent property to the east (Downstream Offsite Drainage Basin #3A) or into Irving Boulevard. Basin #3B generate a peak runoff of 9.31 cfs.

Basin #5 drains to the north into the arroyo or the adjacent parcel and generate a peak runoff of 4.95 cfs.

Proposed Conditions:

The proposed Family School site is approximately 7.5 acres of the 15 acre parcel. There is anticipation that a Pre-K Early Childhood Development Campus will be constructed on the remaining land in the future. Rainbow Boulevard will be constructed (as a private driveway for fire lane access only in this phase and the full half street section when the Pre-K is constructed) on the west side of the site that will divert off site flows away from the project site.

The proposed building will have a standing seam metal roof with a gutter system and downspouts. To minimize erosion and to protect the courtyards, the downspouts will be connected to an underground collection system that will convey the runoff to collection ponds. These pond will be sized to contain the Water Quality Volume to comply with the EPA, Bernalillo County and MSSSS permit requirements, but will also be used for a detention basins to restrict the excess runoff back to the current condition flow rates.

The proposed site Drainage plan is shown on Sheet CD2.

A Fire Lane in Rainbow Boulevard will be constructed as part of this proposed development with a bar ditch on each side, will collect this offsite storm runoff and direct the water either north into the county and an established arroyo just north of the project site, or to the south into Irving Boulevard.

The first Onsite Basin #1 is within Rainbow Boulevard. This Onsite Basin #1 accepts runoff from the Offsite Basin #6. The combined flow rate from these basins will be 5.20 cfs. This has been designed to discharge from this basin and the water collected from Offsite Basin #1 into the West Branch of the Calabacillas Arroyo. The Offsite is maintained at current conditions discharge rates and the Public ROW will be allow to increase the peak flowrate (per meeting with AMAFC representative on 7-7-16) uncontrolled discharge into the arroyo. This phase only constructs a gravel fire lane with a peak flow rate increase of 2.03 cfs into the West Branch of the Calabacillas.

Onsite Basin #3 and Offsite Basin #4A are also either within the new roadway or offsite and create a peak discharge of 3.64cfs into the intersection of Rainbow Boulevard and Irving Boulevard.

The northern part of the site will remain undeveloped in this phase. Proposed Onsite Basins #5, #2C and #1C match the Existing Basins #5, #2C and #1C in peak runoff rates and discharge locations. A small discharge from Basins 5A will flow into Basin #2 and drain to the north. The peak flowrate from Proposed Basin #2 is a reduction from Existing Basin #2C of 1.10 cfs into the adjacent property to the north. This reduction should not be considered permanent and could be increased back to current conditions as of June 2016 as Phase 2 Pre-K is developed.

On-site Basin #5A has been designed for detention with a limited discharge rate of 0.1 cfs. The shallow depression (Pond #1) to the west of the building will have capacity of 3,578 cf which would exceed the required volume for the 100 year, 10 day event of 2,675 cf. This pond will also be used to contain the Water Quality Volume of 213 cubic feet for the MSSSS permit.

The project site also contains a basin that will be within the Irving Boulevard ROW. Onsite Basin #8 (same as Existing Basin #7) generates a peak runoff of 3.19 cfs into the Irving Street section. This basin has already been designed for fully developed conditions and drains toward the Sump Condition Inlets in Irving.

The remainder of the site has been divided into 4 basins (#6, #4, #7 and #2) that all drain toward the east and eventually into Irving Boulevard.

On-Site Basin #2 drain toward the eastern property line. This basin in from the natural ridge line toward the south and includes the Soccer Field. The soccer field will be synthetic turf and APS does not allow for any ponding or concentrated flows to pass over the synthetic turf.

The peak runoff from basin On-site #2 is 3.64 cfs. This flow rate combined with the other drainage basins #6, #4 and #7 combined must be limited to 9.31 cfs minus the developed portion of Rainbow flowing south into Irving of 1.59 cfs, giving an allowable discharge from the site detention pond (Pond #3) of 4.08 cfs into Irving.

With the outfall restriction set, the other basins contributing to Pond #3 can be analyzed.

Onsite Basin #4 is primarily the roof structure and courtyards. This basin is collected by underground storm runoff pipe and discharges into Pond #2. This pond is being oversized in this phase to allow for additional flow from the northern part of the site when the Pre-K is constructed. This pond will need to have another discharge pipe added for that future development that will direct 1.67 cfs into the discharge point within Basin #1C and 2.47 cfs into Basin #2C which would add 3.14cfs of discharge from the pond.

Pond #2 will currently only receive flows from Basin #4 which generates a peak flow rate of 4.75 cfs. The Water Quality Volume for this basin is 877 cubic feet. A storm drain pipe has been extended from this Pond #2 that drains to Pond #3. The outlet piping from Pond #2 will be set to restrict the flow rate to 0.5 cfs. The required Volume for Pond #2 is

Onsite Basins #6 and #7 are the roof and parking lot areas of the campus. These basin are either piped or surface flow toward Pond #3. This Pond is a partial retention for water quality volume (4,297 cubic feet) and detention (15,158 cubic feet) pond area. This pond will be up to 3' deep and will accept a combined peak runoff rate of 14.97 cfs.

The allowable discharge from this pond into Irving will be limited to 4.08 cfs. This will create a ponding volume of 15,158 cf required to contain the 100 year 6 hour event. The Water Quality volume required is 3,870 cf and the available ponding volume before the controlled release through a storm drain pipe into Irving is set to contain 15,801 cf. The pone also has an overflow weir in case the 100 year storm is exceeded.

Conclusions:

The project site has some portions being removed to allow for development of public roadways. These portions of the site have been treated as unrestricted discharge into Irving (that was accounted for in prior studies) or directly into the West Branch of the Calabacillas Arroyo (AMAFCA has agreed to the 2 cfs increase for this phase).

The Onsite Drainage Management Plans contained here show that the peak runoff will not be increased to the adjacent properties from current conditions peak runoff rates. In addition the necessary Water Quality Volumes to comply with MSSSS have been fully contained on site in shallow retention areas.

Appendices:

Appendix A	Portions of Canta Cielo Report Calculations and Exhibits
Appendix B	New Drainage Master Plan Basin Map
Appendix C	Street Capacity and Inlet Calculations
Appendix D	Basin Calculations
Appendix E	Ponding Volume Calculations
Appendix F	Flood Zone Map and Prudent Line Map
Appendix G	Zone Atlas Page
Appendix H	Boundary Survey
Appendix I	Existing Drainage Plan
Appendix J	Site Drainage Plan

Appendix A

Portions of Canta Cielo Report

Calculations and Exhibits

DRAINAGE REPORT
FOR CANTA CIELO
AT VENTANA RANCH
(Tract B, Lands of Massachusetts General Hospital)

SEPTEMBER 5, 2003

Prepared for:
Las Ventanas Ltd Partnership
#10 Tramway Loop NE
Albuquerque, NM 87122

Bohannan ▲ Huston INC.

ENGINEERING ▲
SPATIAL DATA ▲
ADVANCED TECHNOLOGIES ▲

V. CANTA CIELO SUBDIVISION ANALYSIS

A. Existing Drainage Conditions

Please refer to FIGURE 3, Existing Conditions Basin Map, to accompany the following text.

In its existing condition, the site consists of largely undisturbed terrain with slopes to the east from 2.5% to less than 1%. Existing drainage patterns direct the runoff of existing offsite basins to the west (42.84 cfs) onto the site and combine with the existing onsite flows (22.81 cfs). Universe Blvd. along the eastern boundary of the site directs all easterly flows to the north and into the West Branch Calabacillas Arroyo.

The West Branch Calabacillas Arroyo located just north of the site is located within an existing FEMA Floodplain. See Exhibit 4. The narrow FEMA floodplain is located within the proposed Tract A, see Exhibit 1-Preliminary Plat, to be granted to AMAFCA with Final Plat.

B. Proposed Drainage Conditions

Please refer to FIGURE 4, Proposed Conditions Basin Map, to accompany the following text. Proposed conditions and storm drain design will make use of the Ventana Ranch North 20 (Canta Cielo) Storm Drain system addressed in Section IV.

1. Off-Site Basins

The existing undisturbed lands to the west of the site (42.84cfs) contains two (2) basins that flow directly to the site, ExOffsite 1 (23.35cfs) and ExOffsite 2 (19.49cfs).See Figure 4. ExOffsite 1 flows mainly to the east and south and will drain to a Type "D" inlet on top of a manhole located in the southeast portion of the basin, AP5. ExOffsite 2 flows mainly to the east and north and will drain to a Type "D" inlet on top of a manhole located in the northeast portion of the basin, AP6. Each inlet is within an existing utility easement which will be graded to convey the flows along the western side for the site boundary wall to the inlets. The inlets are tied to the

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
*SUMMARY	NORTH OUTFALL - MODIFIED 2/12/03										
*S***	NOTES (ADDED 2/3/03 BY A. CAFFREY)										
*S***	1. AHYMO MODEL IS FOR THE NORTH 20 STORM DRAIN DESIGN.										
*S***	THE MODEL IS FOR THE STORM DRAIN WHICH										
*S***	OUTLETS AT THE NORTH OUTFALL.										
*S***	2. UPDATED TO INCLUDE NEW ORIENTATION OF STORM DRAIN,										
*S***	CHANGES TO AREA/GRADING OF CONTRIBUTING BASINS.										
*S***	NOTES (ADDED 2/12/03 BY A. CAFFREY)										
*S***	1. UPDATED TO MODEL THE EFFECT OF STORM DRAIN INLETS.										
*S***											
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.660
SEDIMENT BULK										PK BF =	1.10
*S**** CALC TRACT 29 (AREAS 4 AND 1A) AT AP-2*************											
COMPUTE NM HYD	29.40	-	1	.00940	21.90	.884	1.76310	1.500	3.640	PER IMP=	49.40
*S											
*S**** AP-2A											
*S**** DIVIDE FLOW BETWEEN SD INLET AND STREET											
DIVIDE HYD	AP2A.DRAIN	1	2	.00940	21.90	.884	1.76307	1.500	3.640		
	AP2A.STREET	and	3	.00000	.00	.000	.00000	-.050	.000		
*S											
*S**** CALC TRACT 29 (AREA 1B) AT AP-2B*************											
COMPUTE NM HYD	29.1B	-	1	.00425	9.97	.404	1.78276	1.500	3.665	PER IMP=	50.50
*S											
*S**** ADD STREET FLOW TO TRACT 29-1B AT AP-2B											
ADD HYD	STREET-2B	3& 1	4	.00425	9.97	.404	1.78270	1.500	3.665		
*S**** AP-2B											
*S**** DIVIDE FLOW BETWEEN SD INLET AND STREET											
DIVIDE HYD	AP2B.DRAIN	4	1	.00425	9.97	.404	1.78270	1.500	3.665		
	AP2B.STREET	and	3	.00000	.00	.000	.00000	-.050	.000		
*S**** ADD STORM DRAIN FLOWS AT AP-2B											
ADD HYD	AP-2B	1& 2	4	.01365	31.88	1.288	1.76918	1.500	3.648		
*S***ROUTE DRAIN FLOWS AT AP-2B THRU STORM DRAIN TO AP-3 ********											
ROUTE	SD.2B.3	4	1	.01365	31.91	1.288	1.76924	1.500	3.652		
*S**** CALC TRACT 29 (AREA 1C) AT AP-3*************											
COMPUTE NM HYD	29.1C	-	2	.00561	13.08	.528	1.76668	1.500	3.646	PER IMP=	49.60
*S											
*S*** ROUTE STORM FLOWS AT AP-2B THROUGH STREET TO AP-3 ********											
ROUTE	R.2	3	8	.00000	.00	.000	.00000	-.050	.000		
*S**** ADD STREET FLOW TO TRACT 29-1C											
ADD HYD	STREET-2A	2& 8	4	.00561	13.08	.528	1.76663	1.500	3.646		
*S**** CALC TRACT 23A AND B											
COMPUTE NM HYD	23.00	-	2	.01919	45.79	1.934	1.89000	1.500	3.728	PER IMP=	56.50
*S*** ROUTE TRACT 23 FLOW THROUGH STREET TO AP-1A ********											
ROUTE	R.2	2	3	.01919	41.43	1.934	1.89003	1.550	3.373		
*S**** CALC TRACT 29 (AREA 5) AT AP-1A											
COMPUTE NM HYD	24.00	-	2	.01110	24.28	1.156	1.95255	1.550	3.417	PER IMP=	60.00
*S**** ADD ROUTED 23 AND TRACT 29 (AREA 5) AT AP-1A											
*S**** AP-1A											

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	STREET-1A	2& 3	5	.03029	65.70	3.090	1.91291	1.550	3.389	
*S**** DIVIDE AP-1A (23/29-5)BETWEEN STREET AND STORM DRAIN										
DIVIDE HYD	AP1.A.DRAIN	5	2	.02371	37.84	2.419	1.91290	1.550	2.494	
	AP1.A.STREET	and	3	.00658	27.86	.672	1.91290	1.550	6.612	
*S**** CALC TRACT 24 AT AP-1B										
COMPUTE NM HYD	24.00	-	5	.01944	39.19	1.982	1.91145	1.550	3.150	PER IMP= 57.70
*S**** DIVIDE AP-1B (TRACT 24) BETWEEN STREET AND STORM DRAIN										
*S**** DIVIDE FLOW BETWEEN SD INLET AND STREET										
DIVIDE HYD	AP1.B.DRAIN	5	6	.01487	25.69	1.516	1.91144	1.550	2.699	
	AP1.B.STREET	and	7	.00457	13.50	.466	1.91144	1.550	4.619	
*S**** ADD STORM DRAIN FLOWS										
*S**** AP-1C										
ADD HYD	AP-1AB	2& 6	5	.03858	63.53	3.935	1.91233	1.550	2.573	
*S**** ADD STREET FLOWS AP-1A & AP-1B										
*S**** AP-1C										
ADD HYD	STREET-1C	3& 7	6	.01115	41.36	1.137	1.91230	1.550	5.796	
*S**** DIVIDE AP-1C BETWEEN STREET AND STORM DRAIN										
*S**** DIVIDE FLOW BETWEEN SD INLET AND STREET										
DIVIDE HYD	AP1.C.DRAIN	6	3	.00921	26.70	.940	1.91230	1.550	4.529	
	AP1.C.STREET	and	7	.00194	14.66	.198	1.91230	1.550	11.812	
*S**** ADD STORM DRAIN FLOWS AP-1A & AP-1B & AP-1C										
*S**** AP-1D										
ADD HYD	AP-1	5& 3	6	.04779	90.23	4.874	1.91233	1.550	2.950	
*S***ROUTE AP-1D DRAIN FLOW THRU STORM DRAIN TO AP-1E ********										
ROUTE	AP1D.1E.DRAI	6	2	.04779	89.89	4.874	1.91234	1.550	2.939	
*S***ROUTE AP-1D STREET FLOW TO AP-1E ********										
*S**** ROUTE STREET FLOW TO AP-1E										
ROUTE	STREET-1E	7	3	.00194	12.47	.198	1.91630	1.600	10.048	
*S										
*S**** DIVIDE FLOW BETWEEN SD INLET AND STREET										
*S**** AP-IE										
DIVIDE HYD	AP1.E.DRAIN	3	8	.00193	12.16	.197	1.91597	1.600	9.865	
	AP1.E.STREET	and	9	.00001	.30	.001	1.91597	1.600	38.639	
*S**** ADD STREET FLOWS AP-2 & AP-1										
*S**** AP-3A										
ADD HYD	STREET-3	9& 4	5	.00562	13.08	.529	1.76695	1.500	3.638	
*S**** DIVIDE AP-3A STREET FLOWS BETWEEN STREET AND DRAIN										
DIVIDE HYD	AP3A.DRAIN	5	10	.00562	13.08	.529	1.76695	1.500	3.638	
	AP3A.STREET	and	11	.00000	.00	.000	.00000	-.050	.000	
*S										
*S**** ADD STORM DRAIN FLOWS AT AP-1E										
*S**** AP-1E										
ADD HYD	AP-2B	8& 2	9	.04972	99.61	5.071	1.91247	1.550	3.131	
*S**** ADD STORM DRAIN FLOWS AP-2A & AP-2B										
*S**** AP-3A										
ADD HYD	AP-2.5	1& 9	3	.06337	129.07	6.359	1.88160	1.550	3.182	
*S**** ADD STORM DRAIN FLOWS AT AP-3B										
*S**** AP-3B										
ADD HYD	AP-2.5	3&10	9	.06899	140.69	6.889	1.87226	1.550	3.187	
*S**** CALC TRACT 29A										
COMPUTE NM HYD	29.A	-	1	.01784	42.15	1.756	1.84532	1.500	3.691	PER IMP= 54.00
*S**** ROUTE TRACT 29A STREET FLOW TRHOUGH 29-6 TO AP-2.5										

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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ROUTE	STREET-29A	1	2	.01784	40.77	1.756	1.84534	1.550	3.571	
*S**** TRACT 29 (AREA 2/6/3) AT AP-2.5B										
COMPUTE NM HYD	29.20	-	1	.02044	41.69	1.979	1.81493	1.550	3.187	PER IMP= 52.30
*S**** ADD STREET FLOWS AT AP-3D										
*S**** AP-3D										
*S**** ADD TRACT 29 A AND TRACT 29-2/6/3										
ADD HYD	AP3D	1& 2	4	.03828	82.46	3.734	1.82908	1.550	3.366	
*S**** DIVIDE AP-3D (29A/2/6/3) BETWEEN STREET AND STORM DRAIN										
DIVIDE HYD	AP3.D.DRAIN	4	8	.02904	49.49	2.833	1.82908	1.550	2.663	
	AP3.D.STREET	and	10	.00924	32.97	.902	1.82908	1.550	5.575	
*S**** ADD STREET FLOWS AT AP-3C										
ADD HYD	AP3.C	11&10	1	.00924	32.97	.902	1.82908	1.550	5.575	
*S**** AP-2.5										
*S**** ROUTE THROUGH INLETS										
ROUTE RESERVOIR	DET2.5	1	2	.00924	33.04	.902	1.82923	1.550	5.585	AC-FT= .007
*S**** ADD DETENTION FLOW TO STORM DRAIN										
ADD HYD	AP3C	2& 9	1	.07823	173.73	7.790	1.86718	1.550	3.470	
*S**** ADD AP-3D INLET FLOW TO STORM DRAIN										
ADD HYD	AP3	1& 8	7	.10727	223.22	10.623	1.85687	1.550	3.251	
*S**** ROUTE FLOW TO AP-4										
ROUTE	AP4	7	1	.10727	222.21	10.623	1.85687	1.550	3.237	
*S*** IRVING BLVD (WEST) **********										
COMPUTE NM HYD	IW	-	2	.00959	19.91	1.131	2.21209	1.600	3.243	PER IMP= 75.00
*S**** RAINBOW BLVD, PART OF TRACT 13										
COMPUTE NM HYD	R13	-	3	.01020	25.38	1.097	2.01689	1.500	3.888	PER IMP= 65.00
*S										
*S*** ADD FLOW FROM IRVING (WEST) AND RAINBOW ******										
*S*** AP-4										
ADD HYD	STREET-IR	2& 3	4	.01979	42.07	2.229	2.11144	1.550	3.321	
*S**** ROUTE IRVING/RAINBOW FLOW TO AP-4										
ROUTE	IRV	4	2	.01979	29.23	2.229	2.11146	1.650	2.308	
*S*** IRVING BLVD (EAST) **********										
COMPUTE NM HYD	IE	-	3	.00770	13.52	.908	2.21209	1.650	2.743	PER IMP= 75.00
*S*** ADD FLOW FROM IRVING (W)/RAINBOW AND IRVING (E)******										
*S*** AP-4										
ADD HYD	AP4	2& 3	4	.02749	42.75	3.137	2.13959	1.650	2.430	
*S*** ADD FLOW FROM IRVING TO STORM DRAIN ******										
*S*** AP-4										
ADD HYD	SD.AP4	1& 4	2	.13476	255.98	13.760	1.91454	1.550	2.968	
*S********** OFF-SITE TRACT A-1 ********										
COMPUTE NM HYD	A1	-	1	.01560	36.45	1.476	1.77383	1.500	3.651	PER IMP= 50.00
*S**** OFF-SITE TRACT B-7, NORTH OF IRVING ********										
COMPUTE NM HYD	6.00	-	3	.00317	7.82	.319	1.88851	1.500	3.854	PER IMP= 53.47
*S**** ROUTE FLOW FROM AP-4 TO AP-5A										
ROUTE	201.10	2	4	.13476	254.20	13.760	1.91454	1.600	2.947	
*S										
*S*** ADD TRACT A-1 & TRACT B-7 **********										
ADD HYD	5.A	1& 3	2	.01877	44.27	1.795	1.79316	1.500	3.685	
*S*** ADD TRACT A-1/B-7 & VENTANA RANCH FLOW **********										
*S*** AP-5A										
ADD HYD	5A	2& 4	1	.15353	292.19	15.555	1.89970	1.550	2.974	
*S********** OFF-SITE TRACT A-2 ********										

A-5

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	A2	-	2	.01560	36.45	1.476	1.77383	1.500	3.651	PER IMP= 50.00
*S**** ROUTE FLOW FROM IRVING TO AP-5B										
ROUTE	201.10	1	3	.15353	288.79	15.555	1.89970	1.550	2.939	
*S										
*S*** ADD TRACT A-2 & VENTANA RANCH FLOW **********										
*S*** AP-5B										
ADD HYD	5B	2& 3	1	.16913	321.19	17.031	1.88809	1.550	2.967	
*S*** ROUTE FLOW FROM AP-5B TO AP-6 IN STORM DRAIN										
ROUTE	5.20	1	2	.16913	318.82	17.031	1.88809	1.600	2.945	
*S										
*S**** TRACT B-8 ********										
COMPUTE NM HYD	B.2	-	1	.02333	46.74	2.287	1.83817	1.550	3.130	PER IMP= 53.60
*S										
*S**** ADD B-8 TO STORM DRAIN FLOW **********										
*S*** AP-6										
ADD HYD	SDP1	1& 2	3	.19246	362.56	19.318	1.88203	1.600	2.943	
FINISH										

A-6

CANTA CIELO (NORTH 20 ACRES) AT VENTANA RANCH BASIN CALCULATIONS

Ultimate Development Conditions Basin Data Table

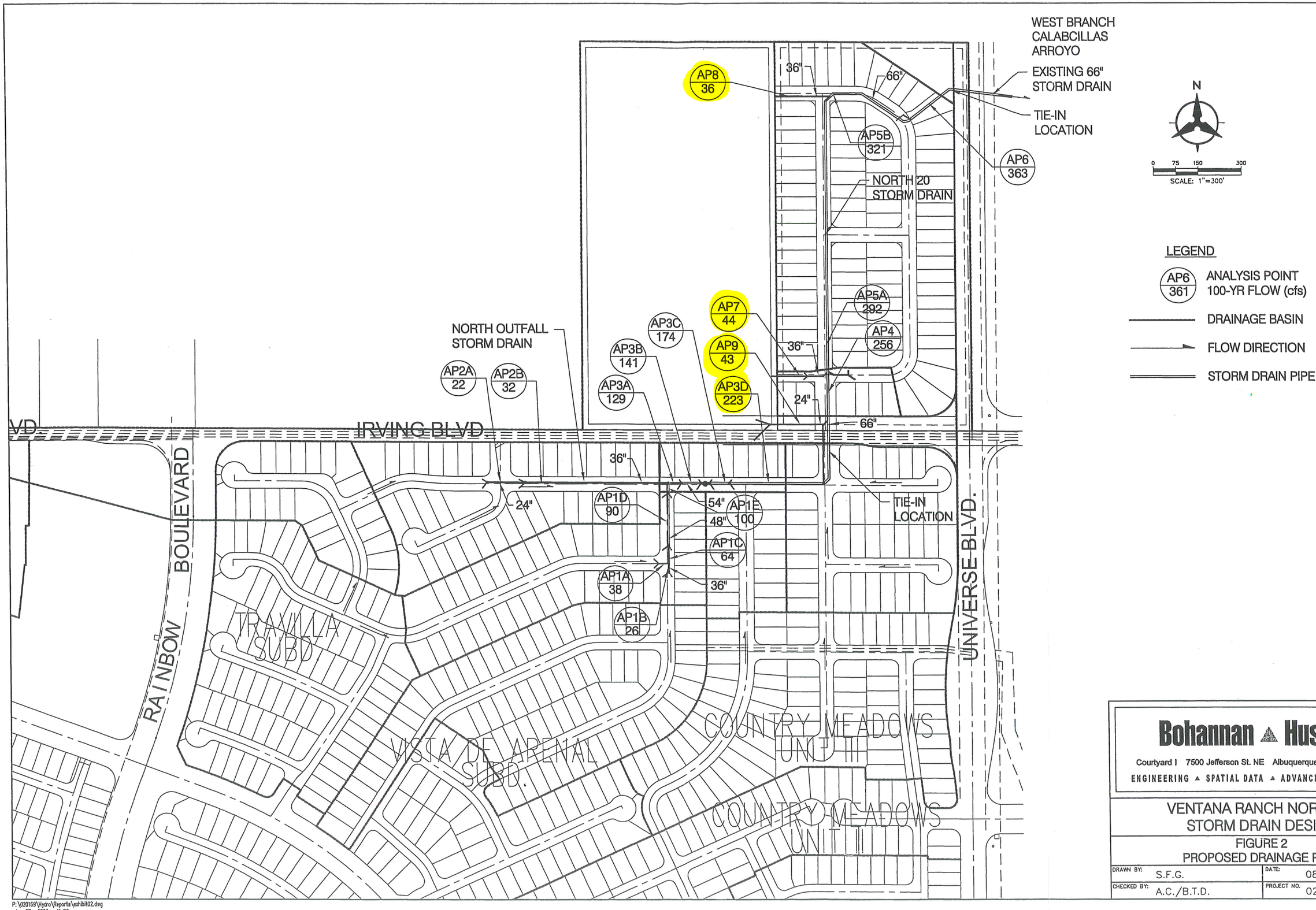
This table is based on the DPM Section 22.2, Zone: 1

BASIN ID	Units #	Area (SQ. FT)	Area (AC.)	Land Treatment Percentages A	B	C	D	Q(100) (cfs/ac.)	Q(100) (cfs)	WT E (inches)	$V(100)_{360}$ (CF)	$V(100)_{1440}$ (CF)
Existing Basins												
ExOffsite 1	0	788357	18.10	100.0%	0.0%	0.0%	0.0%	1.29	23.35	0.44	28906	28906
ExOffsite 2	0	658228	15.11	100.0%	0.0%	0.0%	0.0%	1.29	19.49	0.44	24135	24135
Total									42.84			
ExOnsite 1		24428	0.56	100.0%	0.0%	0.0%	0.0%	1.29	0.72	0.44	896	896
ExOnsite 2		411055	9.44	100.0%	0.0%	0.0%	0.0%	1.29	12.17	0.44	15072	15072
ExOnsite 3		334643	7.68	100.0%	0.0%	0.0%	0.0%	1.29	9.91	0.44	12270	12270
Total		1446585	17.68						22.81		53041	53041
Proposed Basins												
AMAFCA	0	35526	0.82	50.0%	50.0%	0.0%	0.0%	1.66	1.35	0.56	1643	1643
Off Irving		15321	0.35	0.0%	0.0%	10.0%	90.0%	4.22	1.48	1.87	2390	2919
A	3	33654	0.77	0.0%	27.7%	27.7%	44.5%	3.30	2.55	1.34	3751	4325
C	0	5209	0.12	0.0%	0.0%	10.0%	90.0%	4.22	0.50	1.87	813	992
Total flow at AP 1									4.54			
H	2	28661	0.66	0.0%	27.7%	27.7%	44.5%	3.30	2.17	1.34	3194	3683
Total flow at AP 2									2.17			
B	16	156082	3.58	0.0%	27.7%	27.7%	44.5%	3.30	11.84	1.34	17394	20057
D	14	136829	3.14	0.0%	27.7%	27.7%	44.5%	3.30	10.38	1.34	15249	17583
E	13	127085	2.92	0.0%	27.7%	27.7%	44.5%	3.30	9.64	1.34	14163	16331
Total flow at AP 3									31.86			
G	8	80809	1.86	0.0%	27.7%	27.7%	44.5%	3.30	6.13	1.34	9006	10384
F	17	165814	3.81	0.0%	27.7%	27.7%	44.5%	3.30	12.58	1.34	18479	21308
Total flow at AP 4									18.71			
Total Onsite	73	734143	16.85						57.29			
Total Flow From Existing Basins Offsite 1 and 2									42.84			
Total Flow Through backbone Storm Drain									100.13			

NOTES: Impervious percentages are calculated using the DPM equation A-4, the remaining percentages are distributed evenly between land treatment types B and C.

DPM Eqn. A-4 calculation

acres	16.85	
units	73	
N=	4.33	units/ac
%D=	44.5%	



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Aug 07, 2003 - 11:29am

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ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

VENTANA RANCH NORTH 20 STORM DRAIN DESIGN

FIGURE 2 PROPOSED DRAINAGE PLAN

DRAWN BY: S.F.G.	DATE: 08.07.03
CHECKED BY: A.C./B.T.D.	PROJECT NO. 020169

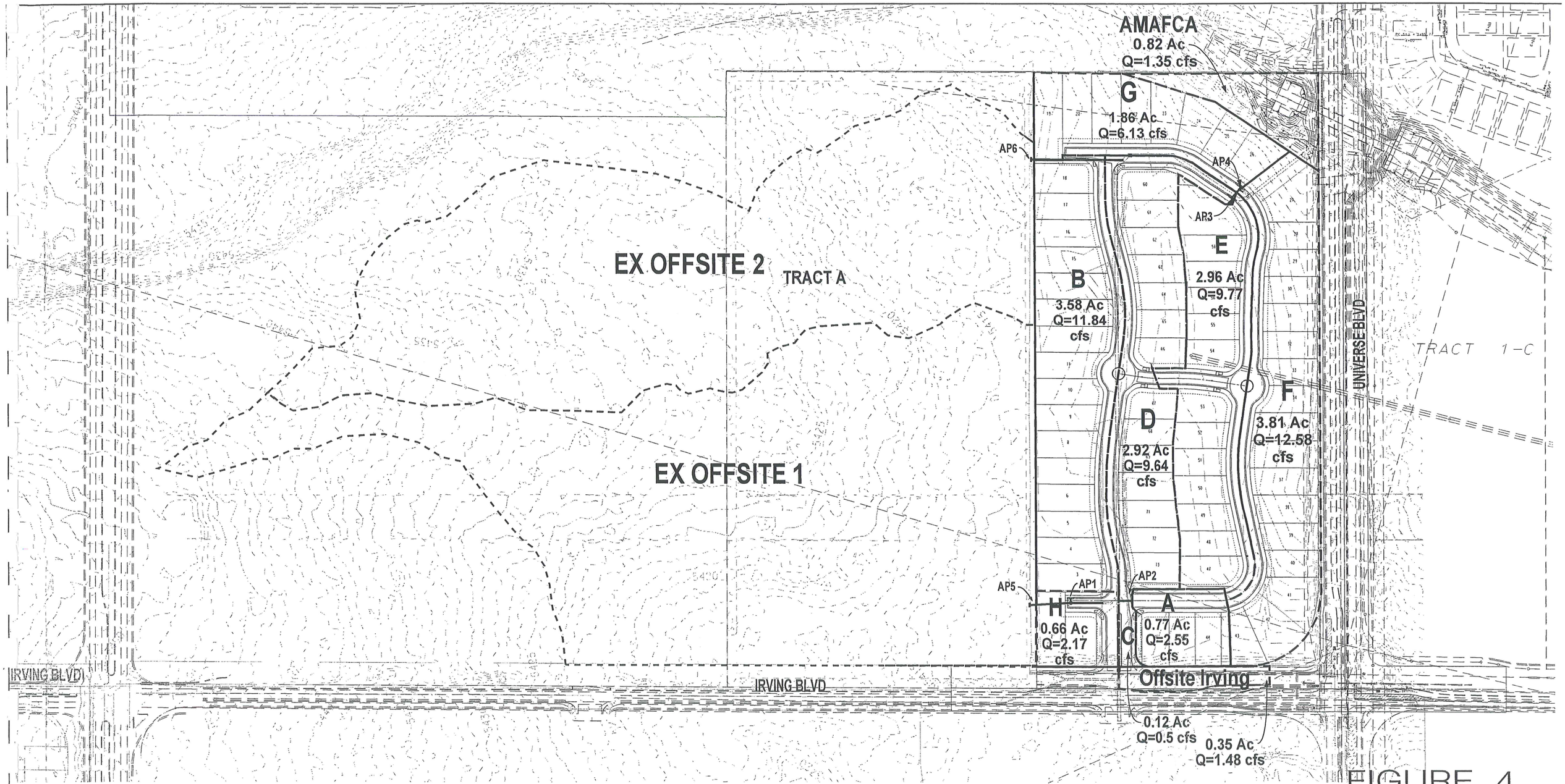

FIGURE 4
PROPOSED CONDITIONS BASIN MAP

LEGEND

BASIN BOUNDARY

FLOW ARROW

CANTA CIELO SUBDIVISION

ALBUQUERQUE, NEW MEXICO
AUGUST, 2003

N

200 100 0 200
SCALE: 1"=200'
(HORIZ.)

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Appendix B

New Drainage Master Plan Basin Map

Showing Current Conditions

AMAFCA
0.82 Ac
Q=1.35 cfs

G
1.86 Ac
Q=6.13 cfs

AP6
Q=24.0 per Hydraulics/EGL Calcs

AP4

AR3

E
2.96 Ac
Q=9.77 cfs

57.3 cfs TOTAL

B
3.58 Ac
Q=11.84 cfs

UNIVERSE BLVD

TRACT 1-C

F
3.81 Ac
Q=12.58 cfs

D
2.92 Ac
Q=9.64 cfs

EX OFFSITE 2

TRACT A

Q = 19.49 cfs per BHI Canta Cielo Report

EX OFFSITE 1

Q = 23.35 per BHI Canta Cielo Report

AP1

AP2

AP5

Q = 25.7 per Hydraulics & EGL Calcs

H
0.66 Ac
Q=2.17 cfs

C

A
0.77 Ac
Q=2.55 cfs

Offsite Irving

0.12 Ac
Q=0.5 cfs

0.35 Ac
Q=1.48 cfs

IRVING BLVD

IRVING BLVD

Q = 43 cfs per Exhibit and AHYMO

FIGURE 4
PROPOSED CONDITIONS BASIN MAP

LEGEND

BASIN BOUNDARY

FLOW ARROW

CANTA CIELO SUBDIVISION

ALBUQUERQUE, NEW MEXICO
AUGUST, 2003

N

200 100 0 200
SCALE: 1"=200'
(HORIZ.)

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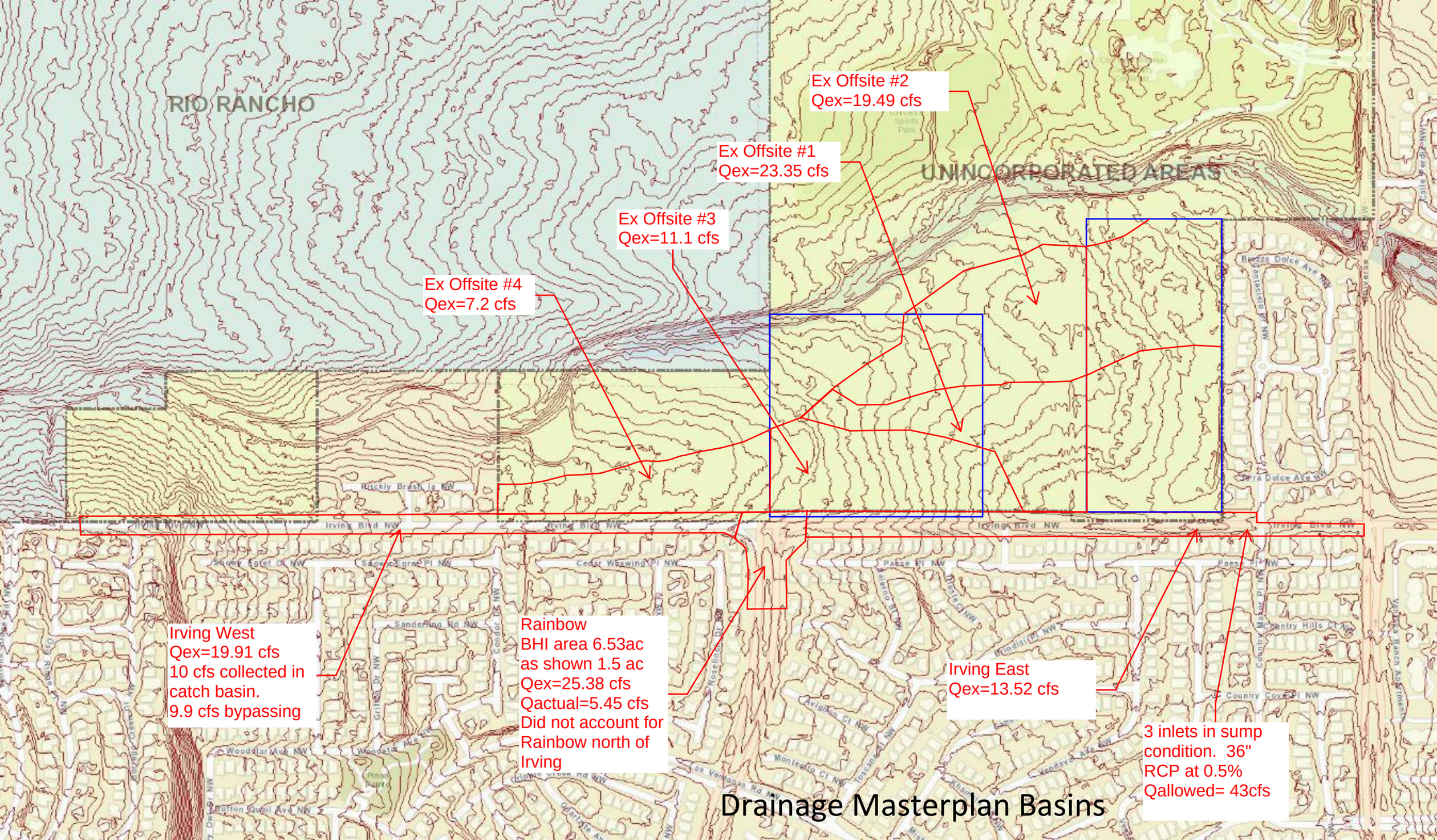
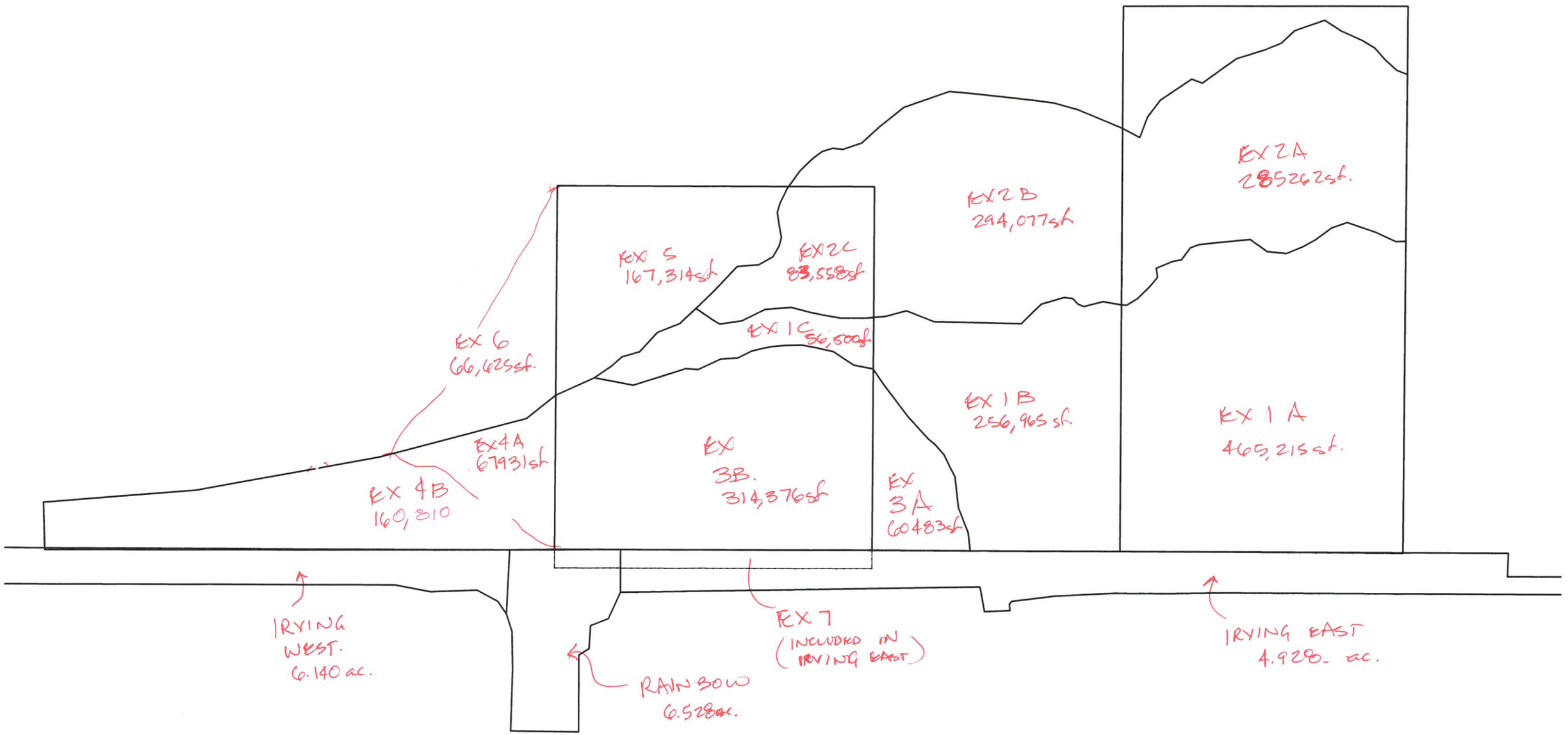

RIO RANCHO
UNINCORPORATED AREAS
Ex Offsite #2
Qex=19.49 cfs
Ex Offsite #1
Qex=23.35 cfs
Ex Offsite #3
Qex=11.1 cfs
Ex Offsite #4
Qex=7.2 cfs
Irving West
Qex=19.91 cfs
10 cfs collected in
catch basin.
9.9 cfs bypassing
Rainbow
BHI area 6.53ac
as shown 1.5 ac
Qex=25.38 cfs
Qactual=5.45 cfs
Did not account for
Rainbow north of
Irving
Irving East
Qex=13.52 cfs
3 inlets in sump
condition. 36"
RCP at 0.5%
Qallowed= 43cfs
Drainage Masterplan Basins


EX 2A
285262sf.
EX 2B
294,077sf
EX 2C
83,558sf
EX 2D
167,314sf
EX 1C 56,500sf
EX 6
66,625sf.
EX 1B
256,965 sf
EX 1A
465,215 sf.
Ex4A
67931sf
EX 4B
160,810
EX
3B.
314,376sf
EX
3A
60483sf
IRVING
WEST.
6.140 ac.
RAIN BOW
6.528ac.
EX 7
(INCLUDED IN
IRVING EAST)
IRVING EAST
4.928. ac.

Appendix C

Street Capacity and Inlet Calculations

For inlet at

Rainbow and Irving

That was installed as part of Pinon Pointe Subdivision

STREET CAPACITY

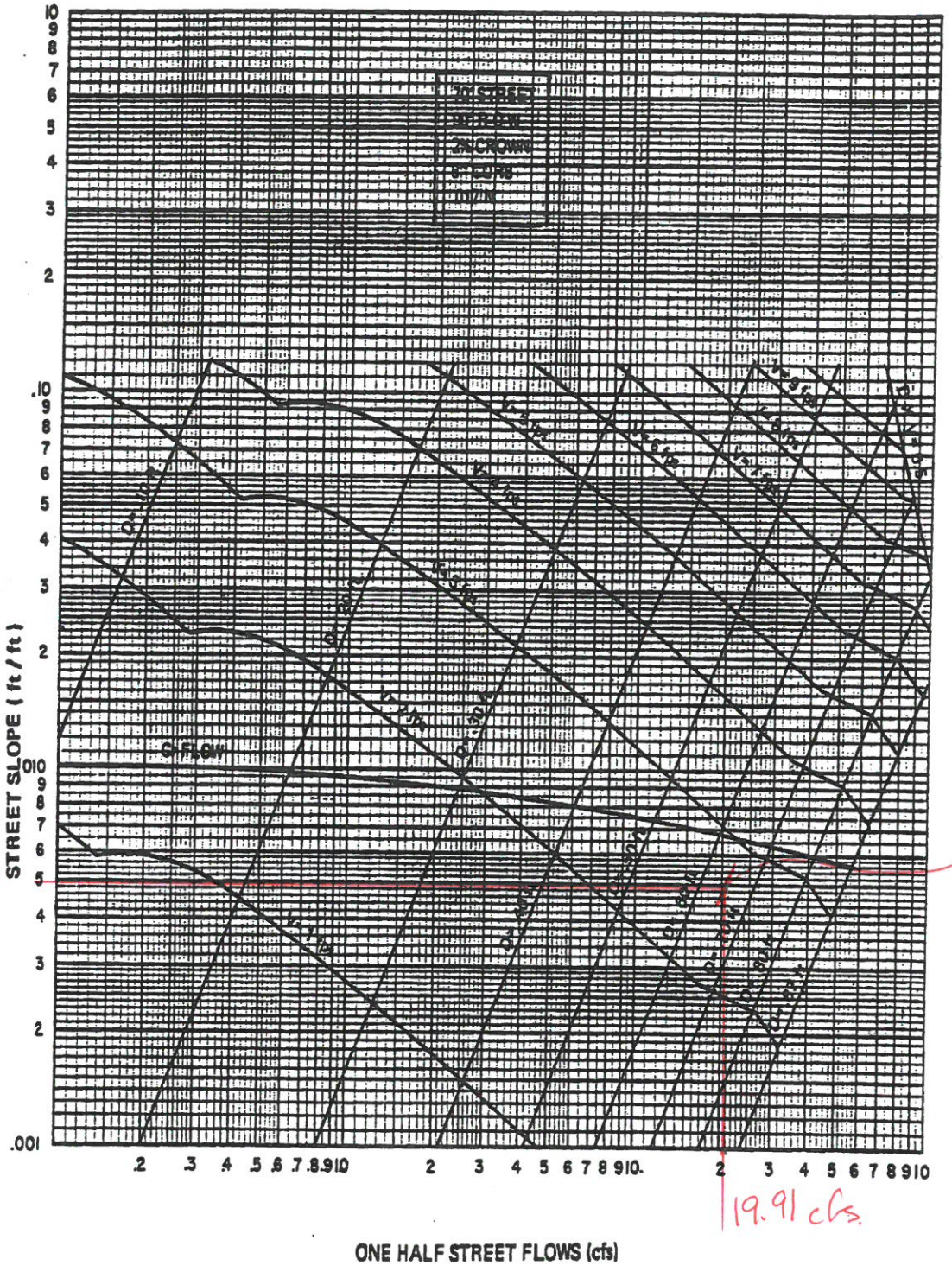
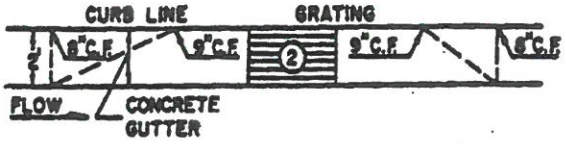
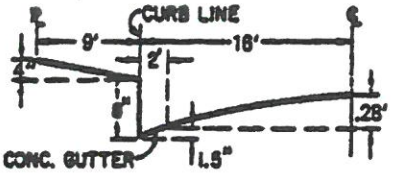


PLATE 22.3 D-4

GRATING CAPACITIES FOR TYPE 'A' , 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

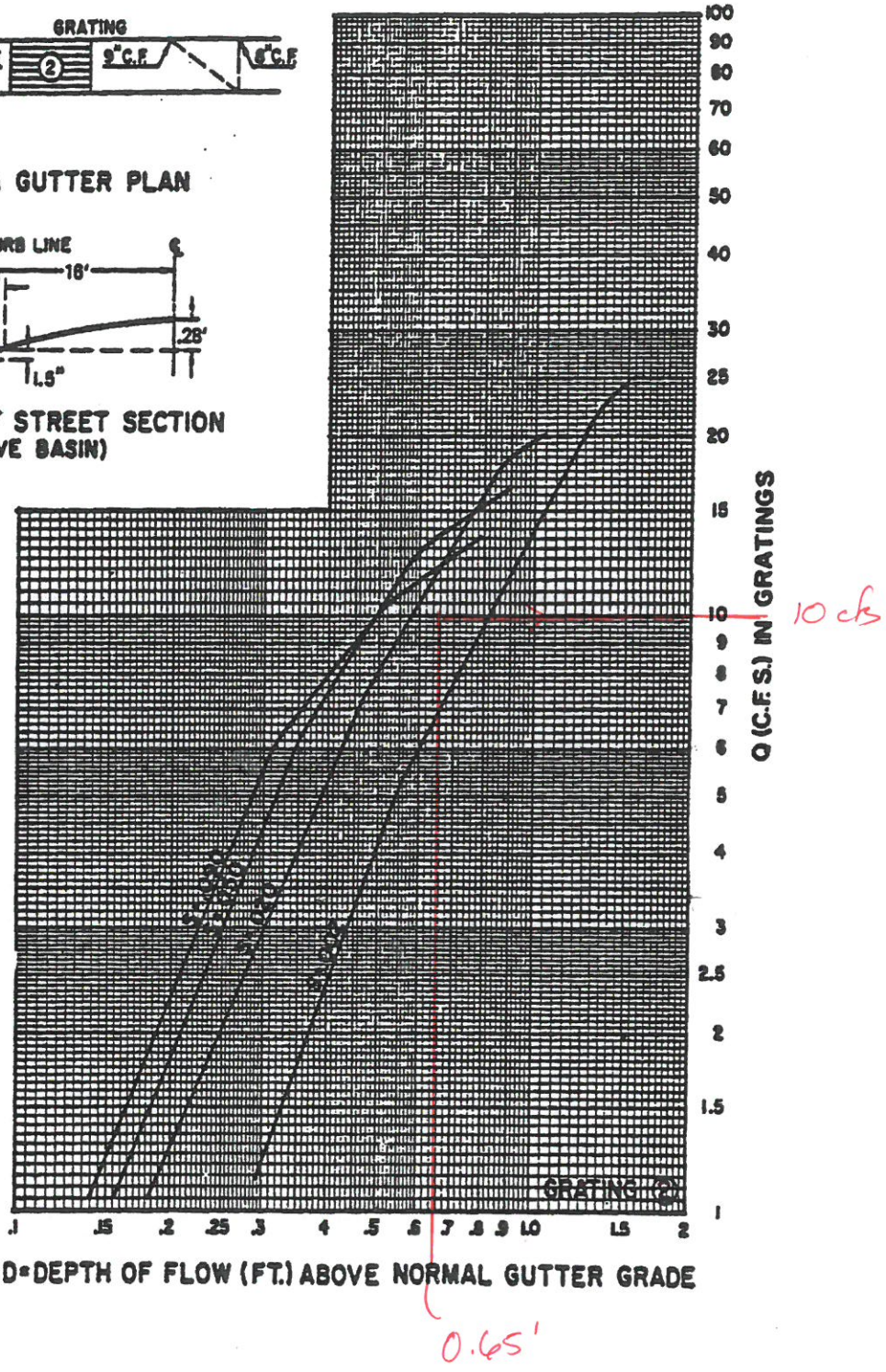


PLATE 22.3 D-5

Appendix D
Basin Calculations

Existing and
Proposed
Conditions

Drainage Summary

Project: APS Family School NW
Project Numbe: 3042
Date: 07/08/16
By: Dave A

Site Location

Precipitaion Zone 1 Per Table A-1 COA DPM Section 22.2

Existing summary

								Information from BHI Reports						
Basin Name	EX 5	EX 2C	EX 1C	Ex 3B	Ex 7	EX OFF 6	EX OFF 4A	Irving East	Rainbow T13	Irving West	School for Deaf Basin #3A	north of irving west of rainbow	School for the deaf	
Area (sf)	167314	83558	56500	314376	35927	66625	67931				60483	228547	356842	
Area (acres)	3.841	1.918	1.297	7.217	0.825	1.529	1.559	4.928	6.528	6.140	1.388	5.247	8.192	
%A Land treatment	100	100	100	100	0	100	100	0	0	0	100	90	90	
%B Land treatment	0	0	0	0	15	0	0	15	25	15	0	10	10	
%C Land treatment	0	0	0	0	10	0	0	10	10	10	0			
%D Land treatment	0	0	0	0	75	0	0	75	65	75	0			
Soil Treatment (acres)														
Area "A"	3.84	1.92	1.30	7.22	0.00	1.53	1.56	0.00	0.00	0.00	1.39	4.72	7.37	
Area "B"	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.74	1.63	0.92	0.00	0.52	0.82	
Area "C"	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.49	0.65	0.61	0.00	0.00	0.00	
Area "D"	0.00	0.00	0.00	0.00	0.62	0.00	0.00	3.70	4.24	4.61	0.00	0.00	0.00	
Excess Runoff (acre-feet)														
100yr. 6hr.	0.1408	0.0703	0.0476	0.2646	0.1153	0.0561	0.0572	0.6887	0.8416	0.8581	0.0509	0.2024	0.3161	acre-ft.
10yr. 6hr.	0.0256	0.0128	0.0086	0.0481	0.0692	0.0102	0.0104	0.4135	0.4923	0.5152	0.0093	0.0411	0.0642	acre-ft.
2yr. 6hr.	0.0000	0.0000	0.0000	0.0000	0.0380	0.0000	0.0000	0.2273	0.2625	0.2832	0.0000	0.0004	0.0007	acre-ft.
100yr. 24hr.	0.1408	0.0703	0.0476	0.2646	0.1390	0.0561	0.0572	0.8304	1.0042	1.0346	0.0509	0.2024	0.3161	acre-ft.
Peak Discharge (cfs)														
100 yr.	4.95	2.47	1.67	9.31	3.19	1.97	2.01	19.07	23.73	23.76	1.79	7.16	11.17	cfs
10yr.	0.92	0.46	0.31	1.73	2.00	0.37	0.37	11.98	14.48	14.92	0.33	1.53	2.39	cfs
2yr.	0.00	0.00	0.00	0.00	1.09	0.00	0.00	6.50	7.53	8.10	0.00	0.02	0.02	cfs

Proposed summary

Basin Name	Pro 1	Pro 9	Pro 3	Pro 4	Pro 2	Pro 6	Pro 7	Pro 8	Pro 5A	Pro 2C	Pro 1C		
Area (sf)	46608	126658	19085	62617	58915	30053	133420	35927	17370	83558	39187		
Area (acres)	1.070	2.908	0.438	1.437	1.353	0.690	3.063	0.825	0.399	1.918	0.900		
%A Land treatment		100			10					100	100		
%B Land treatment	45	0	25	20	20	20	0	15	0	0	0		
%C Land treatment	20	0	10	40	60	45	30	10	65	0	0		
%D Land treatment	35	0	65	40	10	35	70	75	35	0	0		
Soil Treatment (acres)													
Area "A"	0.00	2.91	0.00	0.00	0.14	0.00	0.00	0.00	0.00	1.92	0.90		
Area "B"	0.48	0.00	0.11	0.29	0.27	0.14	0.00	0.12	0.00	0.00	0.00		
Area "C"	0.21	0.00	0.04	0.57	0.81	0.31	0.92	0.08	0.26	0.00	0.00		
Area "D"	0.37	0.00	0.28	0.57	0.14	0.24	2.14	0.62	0.14	0.00	0.00		
Excess Runoff (acre-feet)													
100yr. 6hr.	0.1060	0.1066	0.0565	0.1579	0.1092	0.0730	0.4278	0.1153	0.0443	0.0703	0.0330	acre-ft.	
10yr. 6hr.	0.0554	0.0194	0.0330	0.0858	0.0496	0.0389	0.2552	0.0692	0.0239	0.0128	0.0060	acre-ft.	
2yr. 6hr.	0.0250	0.0000	0.0176	0.0405	0.0165	0.0177	0.1378	0.0380	0.0110	0.0000	0.0000	acre-ft.	
100yr. 24hr.	0.1204	0.1066	0.0674	0.1799	0.1144	0.0822	0.5100	0.1390	0.0496	0.0703	0.0330	acre-ft.	
Peak Discharge (cfs)													
100 yr.	3.23	3.75	1.59	4.75	3.64	2.23	12.01	3.19	1.35	2.47	1.16	cfs	
10yr.	1.77	0.70	0.97	2.74	1.84	1.27	7.57	2.00	0.79	0.46	0.22	cfs	
2yr.	0.75	0.00	0.51	1.25	0.62	0.56	4.06	1.09	0.36	0.00	0.00	cfs	
Impervious Areas	16313	0	12405	25047	5892	10519	93394	26945	6080	0	0		
Water Quality Ponding Voulme (cf)	571	0	434	877	206	368	3269	943	213	0	0	cf	
Water Quality Acre Feet	0.0131	0.0000	0.0100	0.0201	0.0047	0.0085	0.0750	0.0217	0.0049	0.0000	0.0000	acre-ft	

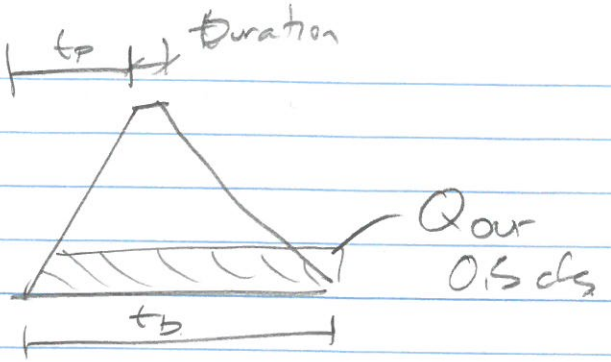
Appendix E

Ponding Volume Calculations

Pond #2

Pond #3

POND #2.



$A_D = 0.57$
$A_T = 1.437$
$A_D/A_T = .4$
$\xi = 1.32$
$t_c = 0.2$
$Q_p = 4.75$ cfs.
$Q_{out} = 0.5$ cfs

$t_c = 0.7(t_c) + (1.6 - A_D/A_T)/12$
$= 0.7(.2) + (1.6 - .4)/12$
$= .14 + .1 = .24$ hours.

Duration $= .25\, A_D/A_T = 0.25(.4) = 0.1$ hours

$t_B = 2.107\, \xi\, A_T/Q_p - 0.25 A_D/A_T$
$= 2.107(1.32)\, 1.437/4.75 - 0.25(0.4)$
$= 0.8414 - 0.1 = .7414$ hours

$V = \frac{1}{2} Q_p (t_c) + Q_p \text{Duration} + \frac{1}{2} Q_p (t_b - \text{Duration} - t_p) - t_b (0.5 \text{ cfs})$

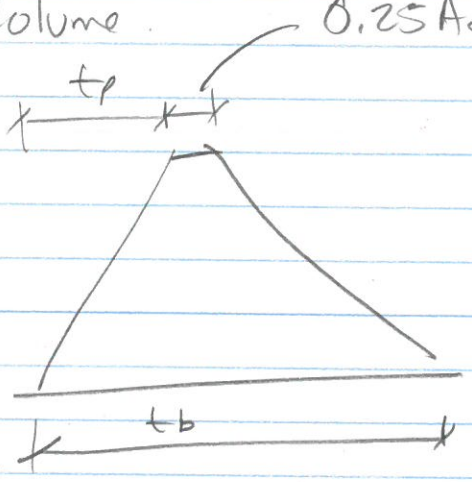
$= .5(4.75)(.24) + 4.75(.1) + .5(4.75)(.7414 - .24 - .1) - .7414(0.5)$

1 cfs·hour = 1 ac·in

$= .57 + .475 + .9533 - .3707$ (cfs·hours)
$= 1.63$ ac·in.
$= .135$ ac-ft.
$= 5908$ cubic feet

POND #3

Pond Volume



Weighted k = 1.42

1 cfs = 1 ac. in/hour

$t_p = 0.7(t_c) + (1.6 - A_D/A_T)/12$

$= 0.7(.2) + (1.6 - (2.96/5.19))/12$

$= .226$

$0.25\, A_D/A_T = .25(2.96/5.19) = .143$

$t_b = 2.107(k)\, A_T/Q_p - 0.25\, A_D/A_T)$

$= 2.107(1.42)\, 5.19/(14.97) - .143$

$= 0.911$

$V = \frac{1}{2} t_p(14.97) + .143(14.97) + \frac{1}{2}(t_b - t_p - dur)\, 14.97 - t_b(Q_{out}) =$

(.911 − .226 − .143 = .542; .5 × .542)

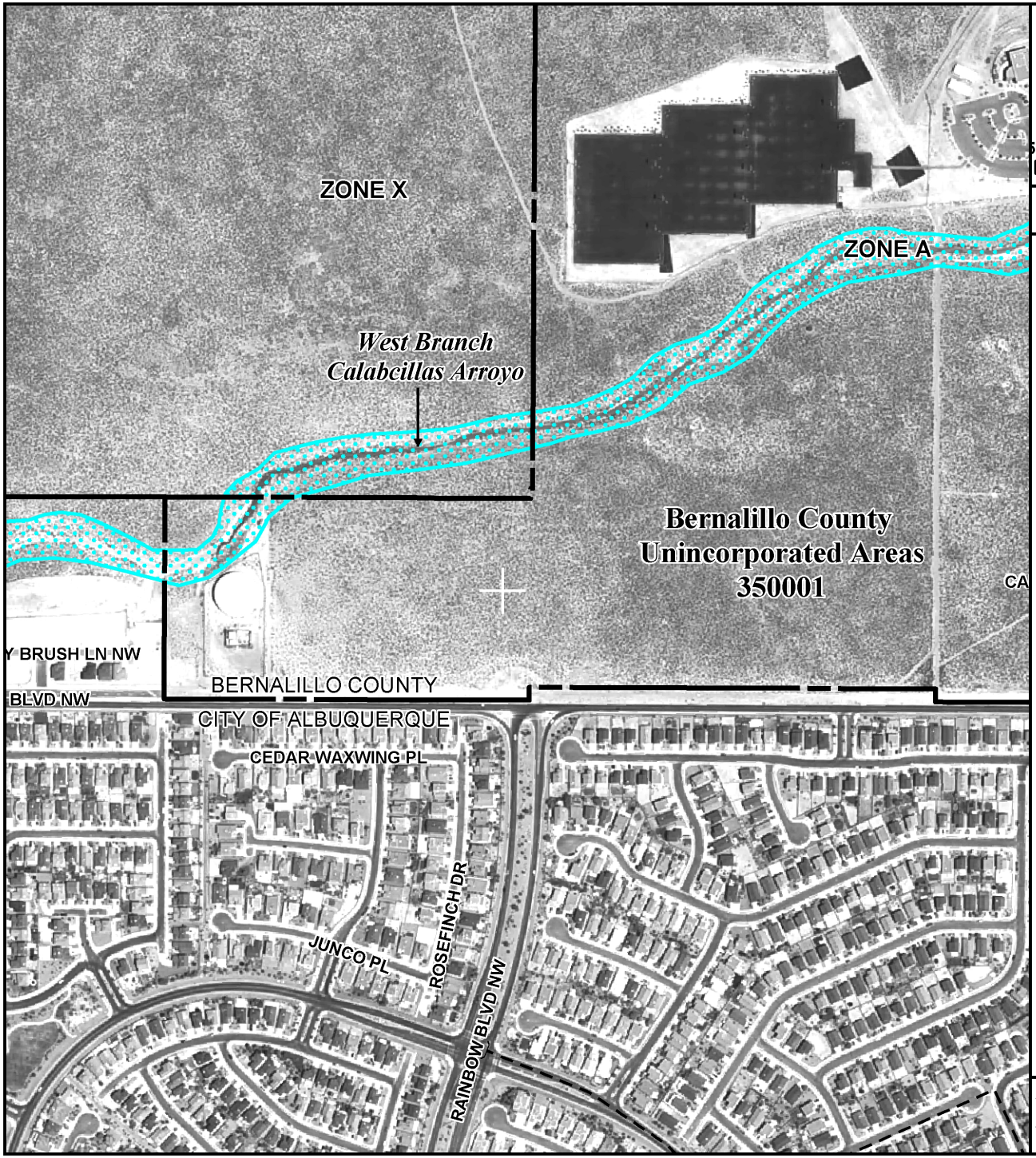
$= .5(.226)14.97 + .143(14.97) + \frac{1}{2}(.542)(14.97) - .911(4.08)$

$= 7.889 - 3.716 = 4.173$ ac·in. $\left(\frac{1\text{ ft}}{12\text{ in}}\right)$

$= .348$ ac-ft $\Rightarrow$ 15,146

Appendix F

Flood Zone Map and Prudent Line Map



MAP SCALE 1" = 500'

50 0 500 1000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0103H

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO

AND INCORPORATED AREAS

PANEL 103 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0103	H
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0103	H
RIO RANCHO, CITY OF	350146	0103	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
35001C0103H

MAP REVISED
AUGUST 16, 2012

Federal Emergency Management Agency

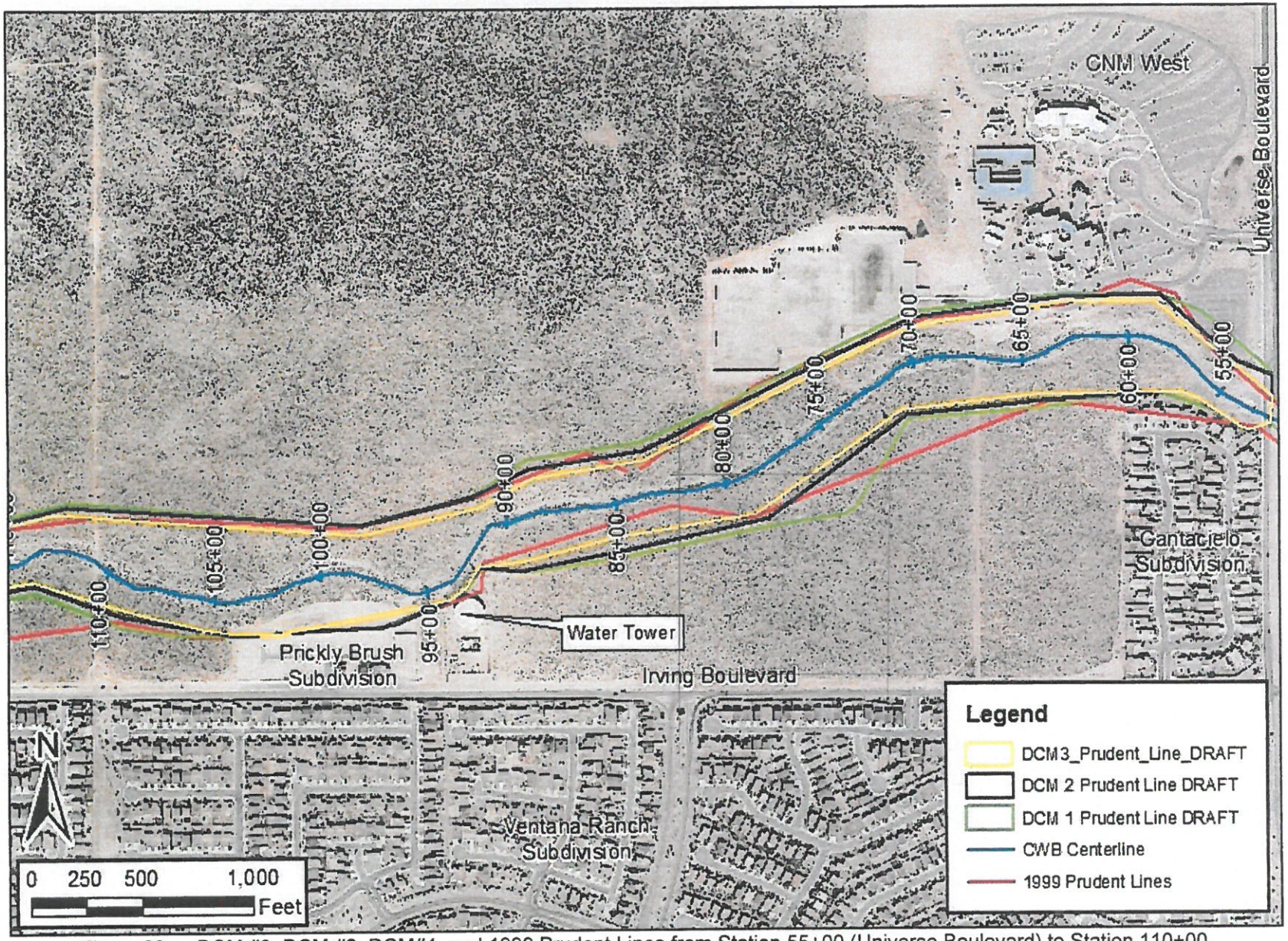
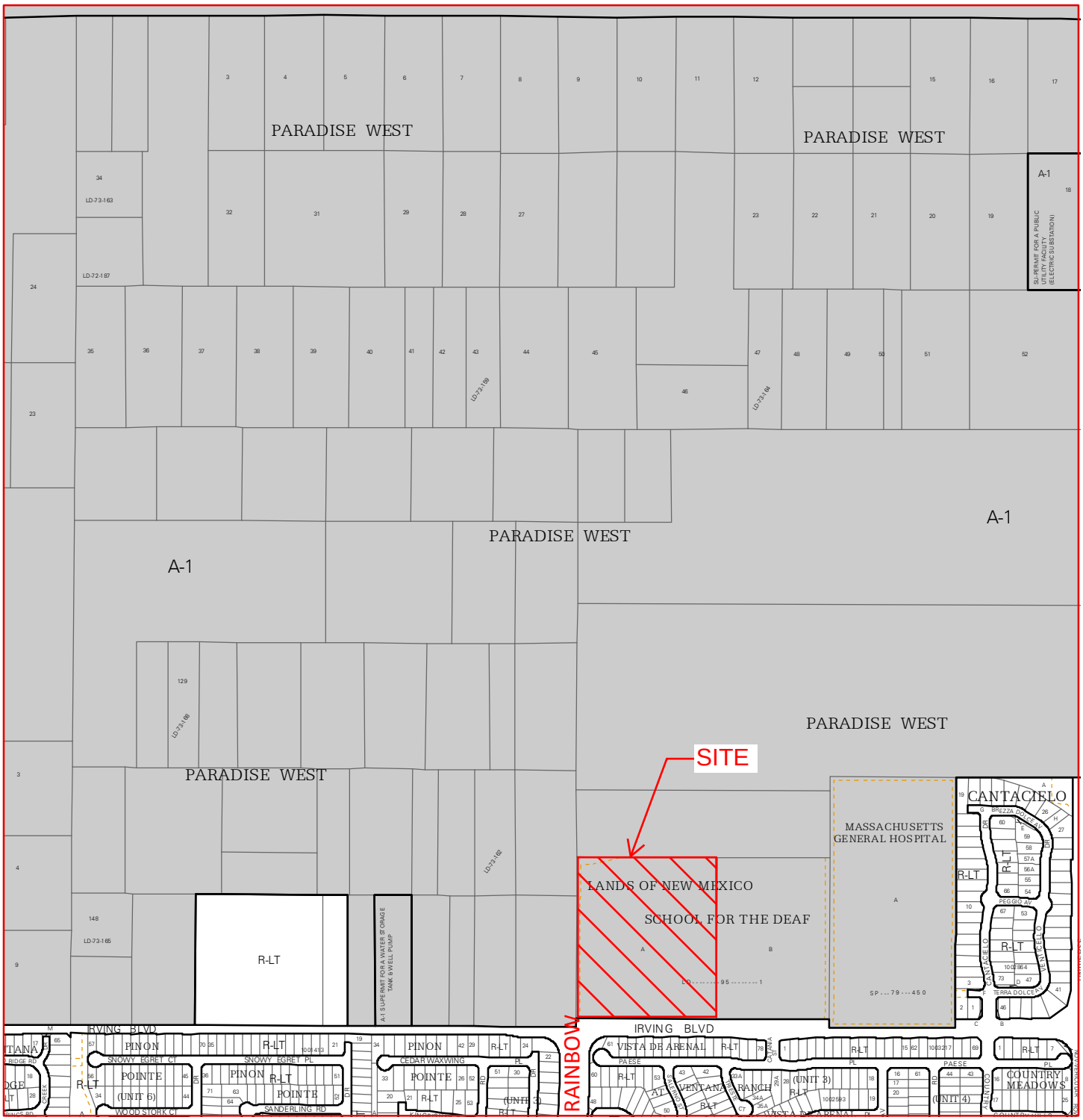


Figure 23 — DCM #3, DCM #2, DCM#1, and 1999 Prudent Lines from Station 55+00 (Universe Boulevard) to Station 110+00.

Appendix G

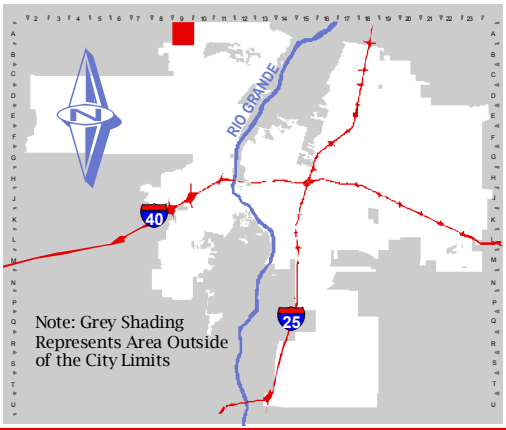
Zone Atlas Page



For more current information and more details visit: http://www.cabq.gov/gis

Albuquerque Geographic Information System

Map amended through: 9/5/2006



Zone Atlas Page:

A-09-Z

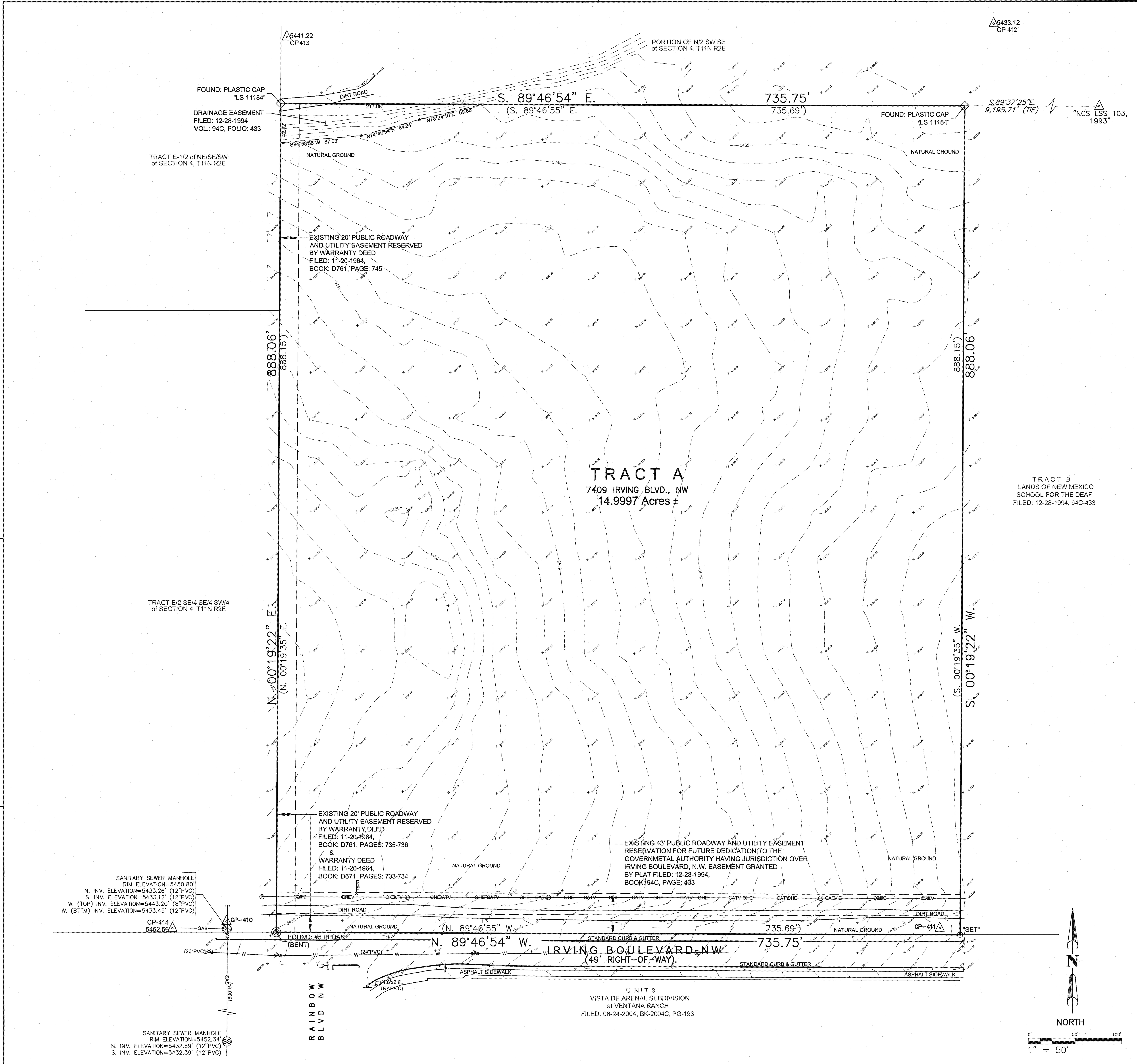
Selected Symbols

- SECTOR PLANS
- Design Overlay Zones
- City Historic Zones
- H-1 Buffer Zone
- Petroglyph Mon.
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone

0 750 1,500 Feet

Appendix H

Boundary Survey



GENERAL SURVEY NOTES

1. BASIS OF BEARING IS THE NEW MEXICO STATE PLANE COORDINATE SYSTEM CENTRAL ZONE, NAD 83 GRID AZIMUTH. ALL BEARINGS ARE GRID BEARINGS. DISTANCES ARE GROUND DISTANCES.
2. IMPROVEMENTS SHOWN ARE CURRENT AS OF DATE OF SURVEY, DECEMBER 2015.
3. RECORD DISTANCES SHOWN IN ( ) PARENTHESIS.
4. DOCUMENTS USED:
   PLAT OF TRACTS A AND B
   LANDS OF NEW MEXICO SCHOOL FOR THE DEAF
   FILED: 12-28-1994, 94C-433

   PLAT OF VISTA DE ARENAL SUBDIVISION
   UNIT 3 AT VENTANA RANCH
   FILED: 06-24-2004, BK-2004C PG-193

LEGAL DESCRIPTION:

TRACT A
LANDS OF NEW MEXICO SCHOOL FOR THE DEAF
FILED IN BOOK: 94C, PAGE 433
ON DECEMBER 28, 1994

PRIMARY BENCHMARK:

CONTROL STATION "NGS, LSS 103" DATA:
THE STATION IS LOCATED IN THE NORTHWEST PART OF ALBUQUERQUE, ABOUT 8 MILES (12.9 KM) NORTHWEST OF THE INTERSECTION OF INTERSTATE HIGHWAYS 25 AND 40.
THE STATION IS A 3-3/4 INCH DIAMETER ALUMINUM DISK, STAMPED "NGS, LSS 103, 1993". SET IN A BRIDGE ABUTMENT AT ROAD LEVEL AND FLUSH WITH THE CONCRETE. LOCATED 50.2 FT. WEST OF THE CENTERLINE OF UNSER BVLD, 49.9 FT. SOUTH OF THE CENTERLINE OF THE BRIDGE OVER THE ARROYO DE LAS CALIBACILLAS, 2.00 FT EAST OF THE EAST FACE OF THE WEST CONCRETE TRAFFIC BARRIER AND 0.49 FT. NORTH OF THE SOUTH END OF THE SOUTH BRIDGE ABUTMENT.

CONTROL POINTS:

CONTROL POINT 410
N: 1530165.445
E: 1495534.423
ELEV: 5451.418
DESCRIPTION: REBAR w/CAP

CONTROL POINT 412
N: 1531126.890
E: 1496360.054
ELEV: 5433.116
DESCRIPTION: REBAR w/CAP

CONTROL POINT 414
N: 1530158.263
E: 1495476.291
ELEV: 5452.556
DESCRIPTION: REBAR w/CAP

CONTROL POINT 411
N: 1530158.054
E: 1496301.857
ELEV: 5433.835
DESCRIPTION: REBAR W/CAP

CONTROL POINT 413
N: 1531113.427
E: 1495599.481
ELEV: 5441.218
DESCRIPTION: REBAR w/CAP

SYMBOL LEGEND:

- SITE, CONTROL POINT
- UTILITY, SANITARY SEWER MANHOLE
- ELEC, POWER POLE
- ELEC, ELECTRICAL BOX
- SITE, SIGN
- SITE, SPOT ELEVATION
- UTILITY, WATER VALVE
- UTILITY, WATER MANHOLE
- UTILITY, NATURAL GAS LINE MARKER
- FOUND MONUMENT (AS NOTED)
- "SET" 5/8" REBAR w/CAP, STAMPED "W.D. NEISH, PS 21081"

LINE STYLE LEGEND:

- OHE — ELEC, OVERHEAD ELECTRICAL LINE
- CATV — UTILITY, CABLE TELEVISION LINE
- EASEMENT LINE (EASEMENT AS NOTED)
- CONTOUR, INDEX
- CONTOUR, INTERMEDIATE

VICINITY MAP: NOT TO SCALE

SURVEYOR'S CERTIFICATE:

I, WILLIAM D. NEISH, NEW MEXICO PROFESSIONAL SURVEYOR NO. 21081, DO HEREBY CERTIFY THAT THIS TOPOGRAPHIC/BOUNDARY SURVEY WAS PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.
I FURTHUR CERTIFY THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT AND THAT THIS IS A BOUNDARY SURVEY PLAT OF AN EXISTING TRACT.

WILLIAM D. NEISH NMPS 21081 — DATE 12-7-15

WILLIAM D. NEISH NEW MEXICO 21081 LICENSED PROFESSIONAL SURVEYOR

WILSON & COMPANY
4900 Lang Avenue NE
Albuquerque, NM 87109
Phone: (505) 348-4000

CONSULTANTS

SEAL: WILLIAM D. NEISH, NEW MEXICO, 21081, REGISTERED PROFESSIONAL SURVEYOR

PROJECT NAME: NW Family School TOPOGRAPHIC/ BOUNDARY SURVEY — ALBUQUERQUE, NEW MEXICO

MARK	DATE	DESCRIPTION

PROJECT NO: 15-600-047-00
DRAWN BY: AMT
CHECKED BY: WDN
SHEET TITLE: TOPOGRAPHIC/ BOUNDARY SURVEY

V-101

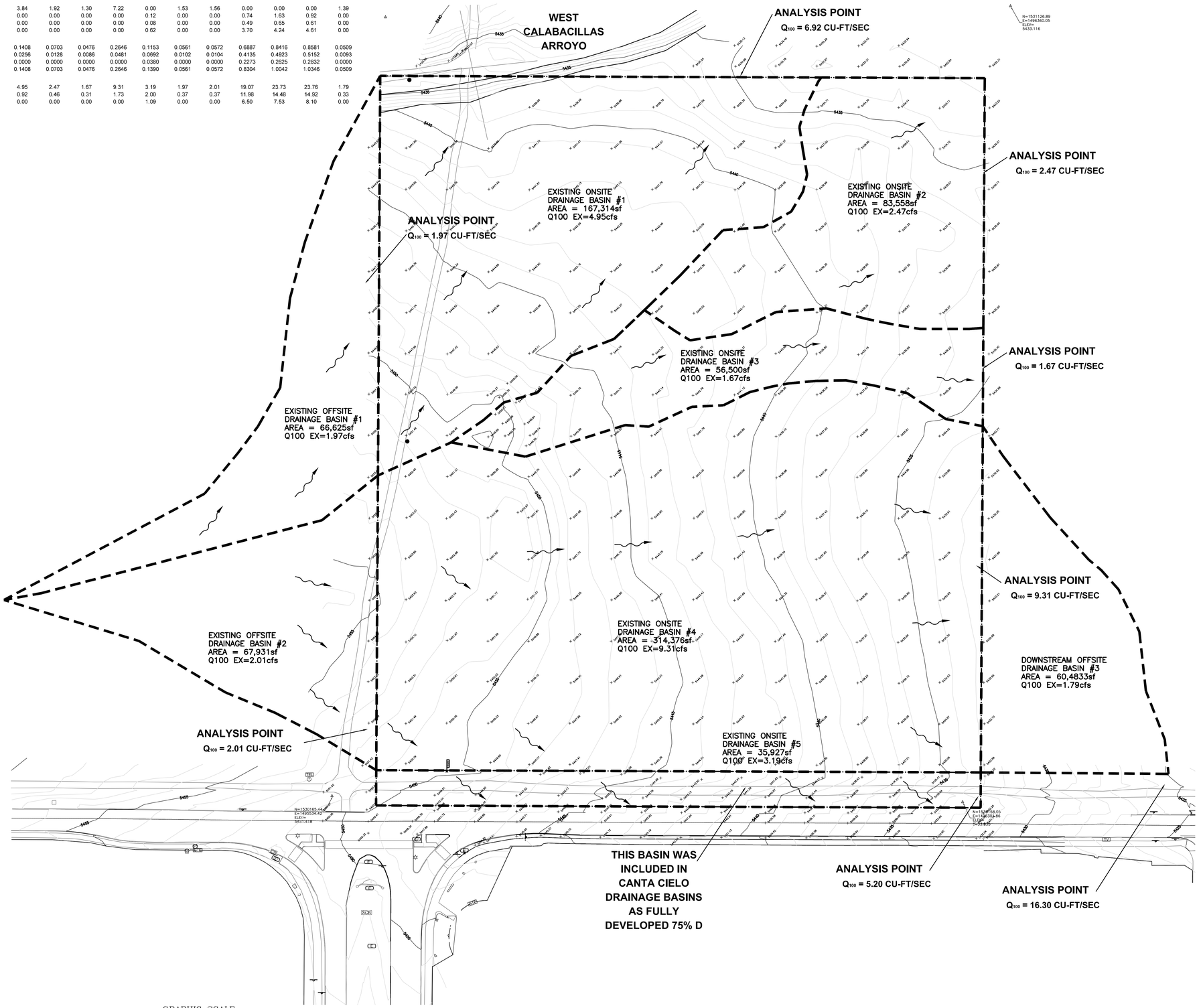
SHEET 1 OF 1

Appendix I
Existing Drainage Plan

Existing summary

Information from BHI Reports

Basin Name	EX 5	EX 2C	EX 1C	Ex 3B	Ex 7	EX OFF 6	EX OFF 4A	Irving East	Rainbow T13	Irving West	School for Deaf Basin #3A
Area (sf)	167314	83558	56500	314376	35927	66625	67931				60483
Area (acres)	3.841	1.918	1.297	7.217	0.825	1.529	1.559	4.928	6.528	6.140	1.388
%A Land treatment	100	100	100	100	0	100	100	0	0	0	100
%B Land treatment	0	0	0	0	15	0	0	15	25	15	0
%C Land treatment	0	0	0	0	10	0	0	10	10	10	0
%D Land treatment	0	0	0	0	75	0	0	75	65	75	0
Soil Treatment (acres)											
Area "A"	3.84	1.92	1.30	7.22	0.00	1.53	1.56	0.00	0.00	0.00	1.39
Area "B"	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.74	1.63	0.92	0.00
Area "C"	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.49	0.65	0.61	0.00
Area "D"	0.00	0.00	0.00	0.00	0.62	0.00	0.00	3.70	4.24	4.61	0.00
Excess Runoff (acre-feet)											
100yr. 6hr.	0.1408	0.0703	0.0476	0.2646	0.1153	0.0561	0.0572	0.6887	0.8416	0.8581	0.0509
10yr. 6hr.	0.0256	0.0128	0.0086	0.0481	0.0692	0.0102	0.0104	0.4135	0.4923	0.5152	0.0093
2yr. 6hr.	0.0000	0.0000	0.0000	0.0000	0.0380	0.0000	0.0000	0.2273	0.2625	0.2832	0.0000
100yr. 24hr.	0.1408	0.0703	0.0476	0.2646	0.1390	0.0561	0.0572	0.8304	1.0042	1.0346	0.0509
Peak Discharge (cfs)											
100 yr.	4.95	2.47	1.67	9.31	3.19	1.97	2.01	19.07	23.73	23.76	1.79
10yr.	0.92	0.46	0.31	1.73	2.00	0.37	0.37	11.98	14.48	14.92	0.33
2yr.	0.00	0.00	0.00	0.00	1.09	0.00	0.00	6.50	7.53	8.10	0.00



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

A1 EXISTING DRAINAGE PLAN
SCALE: 1" = 50'-0"

THE HARTMAN + MAJEWSKI
DESIGN GROUP
ARCHITECTS · ENGINEERS · INTERIOR DESIGN
PLANNERS · URBAN DESIGNERS · LEED ®

120 VASSAR DRIVE SE SUITE 100
ALBUQUERQUE, NEW MEXICO 87106
PHONE: 505.242.6880 FAX: 505.242.6881

CONSULTANT

STAMP

DAVID A. AUSTIN · STATE OF NEW MEXICO · 14221 · REGISTERED PROFESSIONAL ENGINEER
7-5-16

PROJECT NAME

FAMILY SCHOOL NORTHWEST

7125 IRVING BOULEVARD NW
ALBUQUERQUE, NEW MEXICO 87114

REVISIONS

NO.	DATE	DESCRIPTION
1	04/15/16	ADDENDUM 004
2	07/07/16	DRAINAGE MODIFICATIONS

DESIGNER:	DAA
CHECKED:	DAA
DATE:	03.15.2016
SCALE:	1" = 50'-0"
JOB NO.:	3042
CAD FILE:	3042_C201

SHEET TITLE:
EXISTING DRAINAGE PLAN

2

SHEET NUMBER:
CD1

Appendix J

Site Drainage Plan

Proposed summary

Basin Name	Pro 1	Pro 9	Pro 3	Pro 4	Pro 2	Pro 6	Pro 7	Pro 8	Pro 5A	Pro 2C	Pro 1C
Area (sf)	46608	126658	19085	62617	58915	30053	133420	35927	17370	83558	39187
Area (acres)	1.070	2.908	0.438	1.437	1.353	0.690	3.063	0.825	0.399	1.918	0.900
%A Land treatment		100			10					100	100
%B Land treatment	45	0	25	20	20	20	0	15	0	0	0
%C Land treatment	20	0	10	40	60	45	30	10	65	0	0
%D Land treatment	35	0	65	40	10	35	70	75	35	0	0
Soil Treatment (acres)											
Area "A"	0.00	2.91	0.00	0.00	0.14	0.00	0.00	0.00	0.00	1.92	0.90
Area "B"	0.48	0.00	0.11	0.29	0.27	0.14	0.00	0.12	0.00	0.00	0.00
Area "C"	0.21	0.00	0.04	0.57	0.81	0.31	0.92	0.08	0.26	0.00	0.00
Area "D"	0.37	0.00	0.28	0.57	0.14	0.24	2.14	0.62	0.14	0.00	0.00
Excess Runoff (acre-feet)											
100yr. 6hr.	0.1060	0.1066	0.0565	0.1579	0.1092	0.0730	0.4278	0.1153	0.0443	0.0703	0.0330
10yr. 6hr.	0.0554	0.0194	0.0330	0.0858	0.0496	0.0389	0.2552	0.0692	0.0239	0.0128	0.0060
2yr. 6hr.	0.0250	0.0000	0.0176	0.0405	0.0165	0.0177	0.1378	0.0380	0.0110	0.0000	0.0000
100yr. 24hr.	0.1204	0.1066	0.0674	0.1799	0.1144	0.0822	0.5100	0.1390	0.0496	0.0703	0.0330
Peak Discharge (cfs)											
100 yr.	3.23	3.75	1.59	4.75	3.64	2.23	12.01	3.19	1.35	2.47	1.16
10yr.	1.77	0.70	0.97	2.74	1.84	1.27	7.57	2.00	0.79	0.46	0.22
2yr.	0.75	0.00	0.51	1.25	0.62	0.56	4.06	1.09	0.36	0.00	0.00
Impervious Areas	16313	0	12405	25047	5892	10519	93394	26945	6080	0	0
Water Quality Ponding Voulme (cf)	571	0	434	877	206	368	3269	943	213	0	0
Water Quality Acre Feet	0.0131	0.0000	0.0100	0.0201	0.0047	0.0085	0.0750	0.0217	0.0049	0.0000	0.0000

CP-413
N=1531113.43
E=1495599.48
ELEV=
5441.218

ANALYSIS POINT
Q_{100} = 5.20 CU-FT/SEC
INCREASE OF 2.03 CFS
DUE TO PUBLIC
ROADWAY

ANALYSIS POINT
Q_{100} = 3.85CU-FT/SEC
REDUCTION OF 1.10 CFS

N=1531126.89
E=1496360.05
ELEV=
5433.116

PROPOSED ONSITE
DRAINAGE BASIN #1
AREA = 46,608sf
Q100 = 3.23 cfs

PROPOSED ONSITE
DRAINAGE BASIN #9
AREA = 126,658sf
Q100 =3.75cfs

PROPOSED ONSITE
DRAINAGE BASIN #2C
AREA = 83,558sf
Q100 =2.47cfs

ANALYSIS POINT
Q_{100} = 2.47 CU-FT/SEC
MATCHES EXISTING
CONDITIONS

ANALYSIS POINT
Q_{100} = 1.97 CU-FT/SEC

POND #2
DEPTH = 18" MAX
Q in = 4.75 CU-FT/SEC
Q out = 0.5 CU-FF/SEC
V required= 5,908 CF
V wtr qual = 877 CF
V available= 12,823 CF

PROPOSED ONSITE
DRAINAGE BASIN #1C
AREA = 39187sf
Q100 =1.16cfs

ANALYSIS POINT
Q_{100} = 1.16 CU-FT/SEC
REDUCTION OF 0.51 CFS

PROPOSED ONSITE
DRAINAGE BASIN #5A
AREA = 17,370sf
Q100 =1.35cfs

POND #1
DEPTH = 8" MAX
Q in = 1.35 CU-FT/SEC
Q out = 0.10 CU-FT/SEC
V required = 2,675 CF
V wtr qual = 213 CF
V available = 3,578 CF

ANALYSIS POINT OUT
Q_{100} = 0.50 CU-FT/SEC

ANALYSIS POINT IN
Q_{100} = 4.75 CU-FT/SEC

PROPOSED ONSITE
DRAINAGE BASIN #6
AREA = 33,053sf
Q100 =2.23cfs

PROPOSED ONSITE
DRAINAGE BASIN #4
AREA = 62,604sf
Q100 = 4.75cfs

PROPOSED ONSITE
DRAINAGE BASIN #5
AREA = 58,915sf
Q100 =3.64cfs

ANALYSIS POINT
Q_{100} = 3.64 CU-FT/SEC

EXISTING OFFSITE
DRAINAGE BASIN #6
AREA = 66,625sf
Q100 EX=1.97cfs

ANALYSIS POINT
Q_{100} = 2.23 CU-FT/SEC

EXISTING OFFSITE
DRAINAGE BASIN #4A
AREA = 67,931sf
Q100 EX=2.01cfs

ANALYSIS POINT
Q_{100} = 14.97 CU-FT/SEC

POND #3
DEPTH = 36" MAX
Q in = 14.97 CU-FT/SEC
Q out = 4.08 CU-FF/SEC
V required= 15,146 CF
Vwtr qual = 4,297 CF
V Available = 15,801 CF

PROPOSED ONSITE
DRAINAGE BASIN #3
AREA = 19,085sf
Q100 = 1.59cfs

PROPOSED ONSITE
DRAINAGE BASIN #7
AREA = 133,420sf
Q100 = 12.24cfs

ANALYSIS POINT
Q_{100} = 4.08 CU-FT/SEC

ANALYSIS POINT
Q_{100} = 16.30 CU-FT/SEC

ANALYSIS POINT
Q_{100} = 2.01 CU-FT/SEC

CP-410
N=1530165.44
E=1495534.42
ELEV=
5451.418

I R V I N G B O U L E V A R D N W

R A I N B O W B L V D N W

ANALYSIS POINT
Q_{100} = 3.64 CU-FT/SEC

PROPOSED ONSITE
DRAINAGE BASIN #8
AREA = 35,927sf
Q100 = 3.19cfs

ANALYSIS POINT
Q_{100} =6.83 CU-FT/SEC

ANALYSIS POINT
Q_{100} = 10.91 CU-FT/SEC
THIS INCLUDES THE
3.19 CFS FROM PUBLIC
ROADWAY THAT WAS
INCLUDED IN IRVING
EAST BASIN

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

A1 SITE DRAINAGE PLAN
SCALE: 1" = 40'-0"

THE HARTMAN + MAJEWSKI
DESIGN GROUP
ARCHITECTS · ENGINEERS · INTERIOR DESIGN
PLANNERS · URBAN DESIGNERS · LEED ®
120 VASSAR DRIVE SE SUITE 100
ALBUQUERQUE, NEW MEXICO 87106
PHONE : 505.242.6880 FAX : 505.242.6881
CONSULTANT

STAMP

DAVID A. AUBE — STATE OF NEW MEXICO — 14221 — REGISTERED PROFESSIONAL ENGINEER — 7-5-16

PROJECT NAME

FAMILY SCHOOL NORTHWEST

7125 IRVING BOULEVARD NW
ALBUQUERQUE, NEW MEXICO 87114

REVISIONS

NO.	DATE	DESCRIPTION
1	04/15/16	ADDENDUM 004
2	07/07/16	DRAINAGE MODIFICATIONS

DESIGNER:	DAA
CHECKED:	DAA
DATE:	03.15.2016
SCALE:	1" = 40'-0"
JOB NO.:	3042
CAD FILE:	3042_C201

SHEET TITLE:
SITE DRAINAGE PLAN

2
SHEET NUMBER:
CD2