DRAINAGE REPORT

for

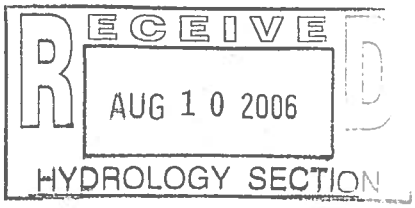
TRACT 8 AT THE TRAILS UNIT II
Albuquerque, New Mexico

AUGUST 2006

I, Steve J. Salazar, do hereby certify that this report was prepared by me or under my direction and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

Steve J. Salazar, P.E.
NM No. 16241

8/8/06
Date



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Introduction

Wilson & Company prepared this drainage report under contract to Longford Homes. The document provides a basis for the design of storm water conveyance systems within Tract 8 of the Trails Unit II (subject property). The objective of this report is to analyze the hydrologic characteristics associated with the existing and developed conditions.

Tract 8 of the Trails Unit II is a single-family residential subdivision with 64 total lots within The Trails master planned community. The "Master Drainage Study for The Trails Subdivision", dated December 2003, prepared by Bohannan-Huston, Inc (BHI Study) outlines the major drainage requirements for the entire Trails development. This DMP covers a large area surrounding the subject property. The master planned area will drain through a series of detention surge ponds to the southeast corner of the Trails project to reduce flows. As established in the "Amendment to The Trails Subdivision Master Drainage Study", dated May 5, 2004 and prepared by Wilson & Company, a future storm drain system (currently under design, COA#761281) is scheduled to carry developed flows from the southeast corner of the Trails south to the Boca Negra Detention Dam. Wilson & Company has revised the BHI Study as the project progresses to more accurately model the drainage conditions. This revised Drainage Master Plan is included in this report as Plate 2 (also referred to as the Overall Pond Grading & Drainage Plan for Future Developed Conditions). The Drainage Master Plan establishes revised Basin, Pond and Hydrologic summary data. Tract 8 of The Trails Unit II drains to the South-Easement storm drain system of The Trails Unit II COA # 730084, which ultimately drains to the Universe Blvd. storm drain system to the Boca Negra dam scheduled to be built with Trails Unit II COA # 761281 as outlined in the "Amendment to The Trails Subdivision Master Drainage Study", dated May 5, 2004.

Project Description

The proposed development is located within the city limits of Albuquerque, New Mexico. The subject property consists of approximately 9.44 acres of undeveloped land on the west side of Albuquerque, south of Ventana Ranch subdivision. The Trails Subdivision is located on Albuquerque's Northwest Mesa, west of Universe Boulevard and south of Paseo Del Norte. The subject property is bound by Tract 9A of the Trails to the west, Universe Blvd. to the east, Town of Alameda Grant to the south, and Tract 7 at the Trails Unit II to the north. See Exhibit A, Vicinity Map.

There are currently eight other tracts within the Trails Subdivision that are developed or under construction - Santa Fe at the Trails (Tract C of the Trails), Taos at the Trails (Tract D of the Trails), Heritage at the Trails Units I and II (Tract A & B of the Trails respectively), The Reserve at the Trails (Tract F of the Trails), Santa Fe II at the Trails Unit II (Tract 6 of the Trails Unit II), Valle Vista at The Trails Unit II (Tract 11 of Trails Unit II) and Santa Fe III at The Trails (Tract 9A of Trails Unit II). The Trails Unit II (COA #730084) is also currently under construction, which includes the development of

Woodmont Avenue, Oakridge Street, Rainbow Boulevard, Paseo Del Norte and Universe Boulevard within the boundaries of The Trails Unit II. Also included is the construction of all major drainage facilities necessary for the development of The Trails Unit II, including facilities within Tract 8.

The current legal description of the proposed development is "Tract 8 of the Trails Unit II (Filed in Book 2004C, Page 332, on 10/18/2004). The site is located on Zone Atlas Sheet C-9-Z. See Exhibit C for site location on this Zone Atlas Sheet. Tract 8 of Trails Unit II is currently zoned R-D. No portion of Tract 8 lies within the 100-year flood zone based on FIRM Map #35001C0111D dated September 20, 1996. See Exhibit B for site location on the Flood Insurance Rate Map.

Existing Conditions

Tract 8 of Trails Unit II consists of approximately 9.44 acres of undeveloped land on the west side of Albuquerque, south of Ventana Ranch subdivision. Currently, the site is located in a local depression with slopes ranging from 2% to 5% and is covered with native grasses, scrub brush, and exposed basaltic ridges. The soils are classified as Alemeda Sandy Loam (AmB) for slopes based on sheet 10 of Soil survey of Bernalillo County. See Exhibit D for site location on the Soils map. A shallow basaltic layer runs subsurface of the natural grade, and varies in depth from 0 ft to 9 ft.

Developed Conditions

(Refer to Plates 1 & 2 – Interim and Developed Conditions)

The developed site will consist of 64 lots of single-family housing. Tract 8 of Trails Unit II is contained within Basins L of the Drainage Master Plan. Proposed flows for individual sub-basins are determined based on an area percentage of the overall Basin L flow. The overall Basin L has an area of 27.03 acres and a fully developed 100-year flow of 78.21 cfs. This plan develops 34.92% (9.44 acres) of the total 27.03acres. The total generated runoff for Tract 8 under fully developed conditions is27.31cfs.

This report divides the proposed development into sub-basins. (See the proposed Basin Map in Plate 4). Drainage & basin boundaries were determined based on the grades established in the grading & drainage plan, and by street flow capacity and storm drain requirements. (See the Grading & Drainage Plans in Plate 3 and Street Flow Capacity Calculations in Appendix C).

Proposed flows from Sub-Basins E1 and E2 are collected through a series of inlets on Road B. See the proposed Sub-Basin Map in Plate 4. (See the HydraFlow Storm Drain Calculations and Inlet Capacity Calculations in Appendix D).

See Plate 1, Overall Pond Grading & Drainage Plan - Interim Conditions for summary tables. See Appendix A for AHYMO input and output.

In the future developed conditions, all ponds will be detention surge ponds. According to the "Amendment to the Trails Subdivision Master Drainage Study", a maximum of flowrate of 200 cfs is allowed from the Trails Subdivision. According to the revised Drainage Master Plan, a maximum flowrate of 198 cfs will enter the Universe Blvd. storm drain system to the Boca Negra Dam. See Plate 2 for the Overall Pond Grading & Drainage Plan for Developed Conditions.

Once the storm drain from The Trails to the Boca Negra Detention Dam is completed, all of the plugs in the ponds within The Trails Unit II can be removed, creating detention facilities and eliminating the need to retain runoff from the Trails.

The hydrologic analysis for the interim and developed condition was completed using the Arid Lands Hydrologic Model (AHYMO) Version 1997.02. The 100-year 24-hour return frequency storm was used as the basis of analysis. (See Appendices A & B for input and output data). Methodology outlined in Section 22.2 of the City of Albuquerque Development Process Manual was also incorporated into this analysis. Street flows have been evaluated using Flow Master by Haested Methods. Street flows were analyzed for the use of roll type curb where capacities permitted. Inlets are located to prevent exceeding the street flow capacities per the DPM. See Appendix C for street capacity analysis. Storm Drain design and analysis was performed using *Hydraflow*. See Appendix D for *Hydraflow* output.

Grading Plan

The Tract 8 of Trails Unit II Grading Plan is attached as Plate 3. It illustrates the overall grading concept for the Tract 8 of Trails Unit 2 as well as the proposed storm drain.

Conclusion

The analysis performed for this report demonstrates that the proposed system of streets and storm drainage improvements will safely convey and adequately detain the 100-year storm runoff from the offsite and the onsite basins contributing to the site development. Wilson & Company recommends that the proposed storm drain system undergo regular maintenance activities. This should include removing debris from grate inlets, as well as removing sediment buildup within the pipe system. The Future area contributing flow to the Tract 8 storm drainage system should be analyzed in greater detail at the time of development to ensure that the runoff is within the constraints of this design.

Per The Trails Unit II Construction Plans, plugs at Pond E, Pond G and Pond K are scheduled to be installed. As a result of the interim conditions analysis, Wilson & Company recommends also installing temporary plugs at Pond D and Pond F to retain runoff from the 100-year, 10-day event, until the Universe storm drain to the Boca Negra Detention Dam is constructed.

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =07/31/2006

INPUT FILE = trails.wpd USER NO.= AHYMO-C-9803c01UNMLIB-AH

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)	PER ACRE NOTATION
*S THE TRAILS OVERALL DRAINAGE - INTERIM CONDITIONS									
*SUMMARY	1 MID. B. PIEDRAS- DEV CONDS WITH BULK - MODIFIED 7/95								
START									
TIME= .00									
RAINFALL TYPE= 2									
RAIN24= 2.660									
SEDIMENT BULK									
PK BF = 1.00									
S									
*S**********									
*S**********									
*S**********	COMPUTE ONSITE BASINS FROM THE TRAILS SUBDIVISION**********								
COMPUTE NM HYD	OFFSITE1	-	50	.19980	38.48	4.588	.43051	2.050	.301 PER IMP= .00
*S BASIN A IS CURRENTLY 0% DEVELOPED									
COMPUTE NM HYD	BASIN.A	-	20	.10480	86.57	2.406	.43051	1.500	1.291 PER IMP= .00
*S BASIN D IS CURRENTLY 73% DEVELOPED									
COMPUTE NM HYD	BASIN.D	-	25	.09110	122.40	6.205	1.27718	1.550	2.099 PER IMP= 36.50
*S BASIN C IS CURRENTLY 0% DEVELOPED									
COMPUTE NM HYD	BASIN.C	-	20	.02110	17.06	.484	.43051	1.500	1.263 PER IMP= .00
*S BASIN F IS CURRENTLY 55% DEVELOPED									
COMPUTE NM HYD	BASIN.F	-	20	.12960	196.82	7.347	1.06295	1.500	2.373 PER IMP= 27.50
*S WITH TRACT 6 IMPROVEMENTS, BASIN G IS CURRENTLY 100% DEVELOPED									
COMPUTE NM HYD	BASIN.G	-	20	.04990	105.96	4.292	1.61257	1.500	3.318 PER IMP= 50.00
COMPUTE NM HYD	OFFSITE2	-	55	.08050	14.42	1.848	.43051	2.050	.280 PER IMP= .00
*S BASIN B IS CURRENTLY 0% DEVELOPED									
COMPUTE NM HYD	BASIN.B	-	30	.03910	31.61	.898	.43051	1.500	1.263 PER IMP= .00
*S BASIN E IS CURRENTLY 22% DEVELOPED									
COMPUTE NM HYD	BASIN.E	-	30	.12060	132.88	4.377	.68044	1.500	

```
1.722 PER IMP=  11.00
    *S BASIN H IS CURRENTLY 16% DEVELOPED
    COMPUTE NM HYD       BASIN.H   -    20        .03110        28.24       1.015       .61193    1.550
1.419 PER IMP=   8.00
    *S BASIN L IS CURRENTLY 4% DEVELOPED
    COMPUTE NM HYD       BASIN.L   -    20        .02770        19.34        .703       .47583    1.550
1.091 PER IMP=   2.00
    *S BASIN J IS CURRENTLY 15% DEVELOPED
    COMPUTE NM HYD       BASIN.J   -    80        .05140        34.57       1.647       .60067    1.600
1.051 PER IMP=   7.50
    ROUTE RESERVOIR       POND.J   80   90        .05140         9.86       1.647       .60066    2.050
.300 AC-FT=     .863
    *S BASIN K IS CURRENTLY 14% DEVELOPED
    COMPUTE NM HYD       BASIN.K   -    85        .07050        55.37       2.215       .58923    1.550
1.227 PER IMP=   7.00
    *S*************************************************************************
    *S****RUNOFF FROM THE TRAILS IS CONVEYED TO THE BOCA NEGRA DETENTION FACILITY
    *S****VIA UNIVERSE SD PER "AMENDMENT TO THE TRAILS SUBDIVISION MASTER DRAINAGE S
    *S****DATED MAY 5, 2004 BY WILSON & CO.
    *S*************************************************************************
    *S****END OF THE TRAILS DRAINAGE ANALYSIS
    FINISH
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =07/31/2006

INPUT FILE = TRAILS3.WPD USER NO.= AHYMO-C-9803c01UNMLIB-AH

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)	PER ACRE NOTATION
	*S THE TRAILS OVERALL DRAINAGE - FULLY DEVELOPED CONDITIONS								
	*SUMMARY 1 MID. B. PIEDRAS- DEV CONDS WITH BULK - MODIFIED 7/95								
	START								
	TIME= .00								
	RAINFALL TYPE= 2								
	RAIN24= 2.660								
	SEDIMENT BULK								
	PK BF = 1.00								
	S								
	*S**********								
	*S**********								
	*S********** COMPUTE ONSITE BASINS FROM THE TRAILS SUBDIVISION**********								
COMPUTE NM HYD	OFFSITE1	-	50	.19980	38.48	4.588	.43051	2.050	.301 PER IMP= .00
ROUTE RESERVOIR	OFF.POND.1	50	53	.19980	9.40	4.588	.43051	3.250	.073 AC-FT= 2.420
COMPUTE NM HYD	BASIN.A	-	20	.10480	222.42	9.013	1.61257	1.500	3.316 PER IMP= 50.00
ADD HYD	1.A	53&20	52	.30460	224.45	13.601	.83721	1.500	1.151
ROUTE RESERVOIR	POND.A	52	50	.30460	16.94	13.601	.83721	2.400	.087 AC-FT= 6.375
COMPUTE NM HYD	BASIN.D	-	25	.09110	151.97	7.835	1.61257	1.550	2.606 PER IMP= 50.00
ADD HYD	1.A.D	50&25	30	.39570	164.89	21.436	1.01571	1.550	.651
DIVIDE HYD	BYPASS.D	30	31	.27474	16.00	14.883	1.01571	1.300	.091
	SURGE.D	and	32	.12096	148.89	6.553	1.01571	1.550	1.923
ROUTE RESERVOIR	POND.D	30	50	.39570	23.56	21.436	1.01571	2.700	.093 AC-FT= 5.387
COMPUTE NM HYD	BASIN.C	-	20	.02110	44.81	1.815	1.61257	1.500	3.319 PER IMP= 50.00
ADD HYD	1.A.D.C	50&20	25	.41680	63.88	23.250	1.04593	1.500	.239

COMPUTE NM HYD	BASIN.F	-	20	.12960	274.98	11.146	1.61257	1.500
3.315 PER IMP= 50.00								
ADD HYD	1.A.D.C.F	20&25	30	.54640	338.86	34.396	1.18033	1.500
.969								
DIVIDE HYD	BYPASS.F	30	31	.41899	46.00	26.376	1.18033	1.300
.172								
	SURGE.F	and	32	.12741	292.86	8.021	1.18033	1.500
3.591								
ROUTE RESERVOIR	POND.F	30	50	.54640	33.92	34.396	1.18033	2.450
.097 AC-FT= 9.405								
COMPUTE NM HYD	BASIN.G	-	20	.04990	105.96	4.292	1.61257	1.500
3.318 PER IMP= 50.00								
ADD HYD	1.A.D.C.F.G	20&50	30	.59630	138.81	38.688	1.21650	1.500
.364								
ROUTE RESERVOIR	POND.G	30	27	.59630	33.51	38.692	1.21664	3.400
.088 AC-FT= 3.656								
COMPUTE NM HYD	OFFSITE2	-	55	.08050	14.42	1.848	.43051	2.050
.280 PER IMP= .00								
ROUTE RESERVOIR	OFFPOND2	55	50	.08050	4.49	1.848	.43051	3.200
.087 AC-FT= .857								
COMPUTE NM HYD	BASIN.B	-	30	.04010	85.15	3.449	1.61257	1.500
3.318 PER IMP= 50.00								
ADD HYD	2.B	50&30	35	.12060	85.67	5.297	.82355	1.500
1.110								
ROUTE RESERVOIR	POND.B	35	50	.12060	3.38	5.297	.82350	6.450
.044 AC-FT= 3.150								
COMPUTE NM HYD	BASIN.E	-	30	.06494	46.06	1.491	.43051	1.550
1.108 PER IMP= .00								
COMPUTE NM HYD	BASIN.E1	-	32	.02480	31.45	.967	.73104	1.500
1.981 PER IMP= 7.00								
ADD HYD	2.B.E	50&30	40	.18554	48.64	6.788	.68595	1.550
.410								
ADD HYD	2.B.E.E1	40&32	41	.21034	78.13	7.755	.69126	1.550
.580								
COMPUTE NM HYD	BASIN.E8	-	**	.00748	15.91	.644	1.61257	1.500
3.321 PER IMP= 50.00								
ADD HYD	2.B.E.E1.E8	41&**	42	.21783	93.29	8.399	.72292	1.500
.669								
ROUTE RESERVOIR	POND.E	42	43	.21783	9.23	8.398	.72291	2.250
.066 AC-FT= 2.293								
COMPUTE NM HYD	BASIN.H1	-	33	.01830	32.46	1.101	1.12838	1.500
2.772 PER IMP= 20.20								
COMPUTE NM HYD	BASIN.H2	-	34	.00900	23.59	1.094	2.28007	1.500
4.096 PER IMP= 90.00								
ADD HYD	H1.H2	33&34	35	.02730	56.06	2.196	1.50804	1.500
3.208								
ADD HYD	2.B.E.E1.H1.	43&35	40	.24513	63.00	10.594	.81035	1.500
.402								

AHYMO.SUM

COMMAND	IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	PER ACRE	NOTATION
COMPUTE NM HYD	BASIN.H	-	20	.01161	26.30	1.109	1.79108	1.500	3.539	PER IMP= 60.00
ADD HYD	2.B.E.H1.H2.	40&20	21	.25674	89.30	11.703	.85470	1.500	.543	
ROUTE RESERVOIR	POND.H	21	30	.25674	27.69	11.703	.85470	1.950	.169	AC-FT= 1.377
DIVIDE HYD	BYPASS.H	21	35	.23804	37.00	10.851	.85470	1.400	.243	
	SURGE.H	and	36	.01870	52.30	.852	.85470	1.500	4.370	

CFS PAGE = 2

COMMAND	IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	PER ACRE	NOTATION
COMPUTE NM HYD	BASIN.L	-	20	.04224	78.21	3.633	1.61257	1.550	2.893	PER IMP= 50.00
ADD HYD	2BEHL	20&30	25	.29898	100.70	15.336	.96177	1.550	.526	
COMPUTE NM HYD	BASIN.J	-	80	.05140	82.74	4.421	1.61257	1.600	2.515	PER IMP= 50.00
ROUTE RESERVOIR	POND.J	80	90	.05140	21.36	4.421	1.61256	2.100	.649	AC-FT= 2.140
COMPUTE NM HYD	BASIN.K	-	85	.07050	128.14	6.063	1.61257	1.550	2.840	PER IMP= 50.00
ADD HYD	J.K	90&85	91	.12190	136.13	10.484	1.61255	1.550	1.745	
ADD HYD	1ADCFG.JK	27&91	95	.71820	164.27	49.176	1.28384	1.550	.357	
ROUTE RESERVOIR	POND.K	95	70	.71820	101.37	49.176	1.28384	1.850	.221	AC-FT= 2.150
DIVIDE HYD	BYPASS.K	95	97	.68793	80.00	47.103	1.28384	1.450	.182	
	SURGE.K	and	98	.03027	84.27	2.073	1.28384	1.550	4.350	
ADD HYD	TRAILS.ALL	25&70	**	1.01718	177.05	64.512	1.18917	1.600	.272	

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    *S*************************************************************************
    *S****RUNOFF FROM THE TRAILS IS CONVEYED TO THE BOCA NEGRA DETENTION FACILITY
    *S****VIA UNIVERSE SD PER "AMENDMENT TO THE TRAILS SUBDIVISION MASTER DRAINAGE S
    *S****DATED MAY 5, 2004 BY WILSON & CO.
    *S*************************************************************************
    *S****END OF THE TRAILS DRAINAGE ANALYSIS
    FINISH
```

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.
1		14.08	24 c	43.8	5410.47	5411.35	2.008	5411.80	5412.68	n/a	5412.68	End
2		7.04	24 c	23.4	5411.45	5411.92	2.009	5413.45	5413.43	0.12	5413.55	1

Project File: SD-INLETS3&4.stm | Number of lines: 2 | Run Date: 07-31-2006

NOTES: c = cir; e = ellip; b = box; Return period = 100 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.
1		13.23	24 c	23.4	5411.73	5412.20	2.011	5413.02	5413.49	n/a	5413.49	End
2		6.60	24 c	21.0	5412.30	5412.72	2.002	5414.30	5414.29	0.10	5414.39	1

Project File: SD-INLETS1&2.stm | Number of lines: 2 | Run Date: 07-31-2006

NOTES: c = cir; e = ellip; b = box; Return period = 100 Yrs.

CITY OF ALBUQUERQUE

August 24, 2006

Steve J. Salazar, P.E.
Wilson & Company, Inc.
2600 The American Road SE, Suite 100
Rio Rancho, NM 87124

Re: Taos at the Trails, Unit 2 – Engineer's Stamp dated 8-8-06 (C9/D1E)
Request for Preliminary Plat, Site Development Plan for Subdivision, Grading Permit

Dear Mr. Salazar,

Upon review of the information provided in your received on August 10, 2006, there are several items that must be addressed prior to approval of the subject requests. Those issues are detailed below.

1. The storm drain easement must be shown.
2. The total basin areas in the interim condition do not match the areas in the developed condition. Eleven (11) basins are shown on plate 1 but only nine (9) are tabularized on plate 2.
3. What does the "% Dev (acres)" column mean and how does it affect the calculations?
4. With the density you propose, ~ 6.8 dwelling units per acre, the impervious percentage would be on the order of 62% as per the DPM, Table A.5. Please provide justification of the 27.3 cfs runoff cited for the 9.44-acre development.

   You provided flow rates ranging from 1.09 to 13.06 cfs per acre. At 100 % treatment A in Zone 1, we would expect no less than 1.29 cfs per acre. Based on the DPM evaluation procedure with the land treatments you propose, I am obtaining significantly different numbers than what is shown in your flow tables. Please revisit the flow calculations and correct as necessary.

6. While it is permissible for the velocity head to extend above the top of the curb elevation, the actual flow area must be contained between the curb faces. Your analysis indicates that the 4-inch roll curb will be overtopped and therefore does not meet this criterion. As such, the roll curb will need to be replaced with standard curb for the areas where design street flows exceed the 5.7 cfs capacity described in the report. Furthermore, as the southern inlets will be in a sump condition, all of the curb along that right-of-way must be standard curb.
7. The backyard flow arrows show water progressing from side yards, uphill to the backyards, and then out to the street. Please revise the plan so as to route the flows directly out to the public right-of-way.
8. The flow arrows for lots 42 and 43 do not fit with the proposed high point. The high point adjacent to lots 44 and 46 does not fit with the proposed basin boundaries. No graphical representation was given for the high point between lots 22 and 58.
9. The legend symbols for the retaining walls and storm drain inlets are not consistent with the plan drawings and no symbol is provided for the proposed curb and gutter – mountable or standard.

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

10. The Grading and Drainage Plan line types suggest that your project, not 7300.84, will be constructing the 54-inch storm drain. Furthermore, the construction drawings for that project call out the south-easternmost manhole as "future." Please revise the line types to better define the extent of the storm drain improvements specifically associated with your project.

11. The drawing in Appendix C page 7 needs revision to increase clarity.

12. The figure in Appendix D is illegible due to the overlapping text.

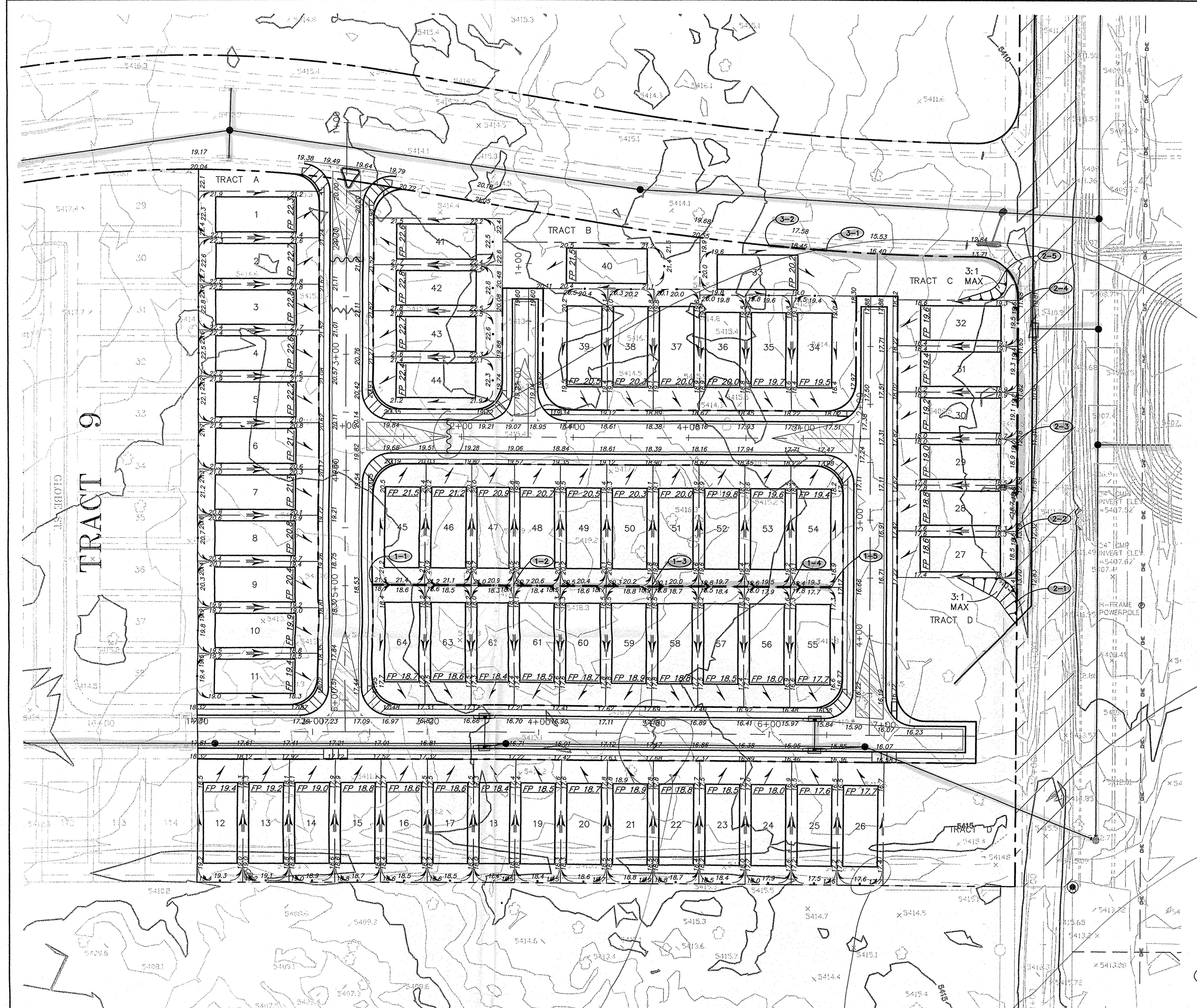
13. Please show the design grades of Universe. Depending on the grades at the intersection with Woodmont, it appears that an additional inlet may be necessary.

I would be willing to meet with you to discuss these issues. If you have any questions, you can contact me at 924-3990.

Sincerely,

Jeremy Hoover, P.E.
Senior Engineer
Hydrology Section
Development and Building Services

cc: file C9/D1E



RETAINING WALL TABLE

WALL POINT	TOP OF WALL ELEV	TOP OF FOOTING ELEV	WALL HEIGHT (FT)	APPROX. WALL LENGTH (FT)
1–1	21.50	18.15		
			3.33	125
1–2	21.50/20.83	18.15		
			2.67	120
1–3	20.83/20.16	18.15/17.48		
			3.33	120
1–4	20.16/19.50	17.48/16.82		
			2.67	36
1–5	19.50	16.82		
2–1	18.37	12.34		
			6.00	30
2–2	18.37/19.04	12.34/11.67		
			7.37	120
2–3	19.04/19.71	11.67/11.00		
			8.71	80
2–4	19.71/18.37	11.00		
			7.37	60
2–5	18.37	11.00		
3–1	19.67	17.00		
			2.67	50
3–2	19.67	17.00		

SITE = 9.4 AC.

NARRATIVE: NO BRKDOWN OF 9.4 AC SITE W/ % TRTMENTS TO VERIFY 27.31 CFS

(1) NOT @ HIGH POINT

EASEMENT?

EX @4 17.4 → 17.6?

(EN) HIGH POINT

LOT 44/46

LEGEND (USE CONSISTENT SYMBOLOGY)

- RETAINING WALL
- HIGH POINT
- DIRECTION OF FLOW
- ℄ LINE ELEVATION (XX.XX)
- BASIN BOUNDARY
- TYPE DOUBLE C INLET
- RETAINING WALL POINT (X–X)
- MH TO BE BUILT WITH COA # 730084
- SD TO BE BUILT WITH COA # 730084
- PROPOSED SD MANHOLE
- PROPOSED SD PIPE
- C+G

SCALE 50 0 50 100 FEET

PLATE 3 G+D PLAN

1. NOT HIGH POINT; MOVE WEST TO INTERSECTION
   - (1A) HIGH POINT NOT CALLED OUT LOT 21/59
2. INCONSISTENT LINETYPE
3. BACKYARD FLOWS?
4. C+G ON LEGEND
   - (1B) FLOW ARROW ON LOT 42 POINTS UPSTREAM TO HIGH POINT

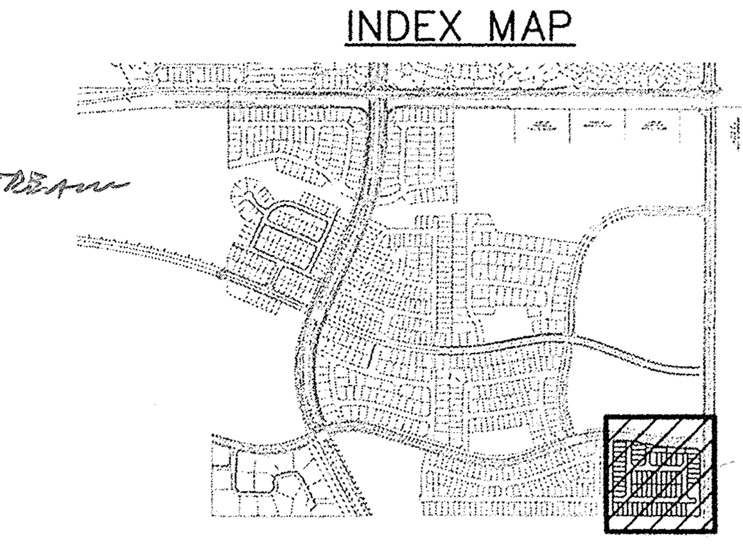
PLATE 1: INTERIM CONDITIONS

1. WHAT DOES "% DEV (ACRES)" MEAN?
2. CALCS OFF; ΣAREA = 385.12 ACRES – "ON H2" YIELDS 13.06 CFS/AC (NOT!)
3. BASIN "ON-E" NOT SHOWN ON P_1 OR P_2; ONLY E1 ON P_1

PLATE 3 = DEVELOPED COND

1. WHAT HAPPENED TO BASIN 'E' + H3 TOT. AREA = 303.15
2. CALCS OFF, BASIN AREAS ON CALCS

INDEX MAP



AS–BUILT INFORMATION

CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO–FILM INFORMATION

RECORDED BY	DATE
NO.	

BENCH MARKS

ACS BRASS TABLET STAMPED "2–B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground–to–Grid Factor = 0.99966354
$\Delta\alpha$ = –00°16'30"
SLD 1929 Elevation = 5429.35

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

REVISIONS

NO.	DATE	REMARKS	BY

WILSON & COMPANY, ENGINEERS & ARCHITECTS

DESIGNED BY	DEC	DATE	SEPT 05
DRAWN BY	DEC	DATE	SEPT 05
CHECKED BY	SJS	DATE	SEPT 05

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
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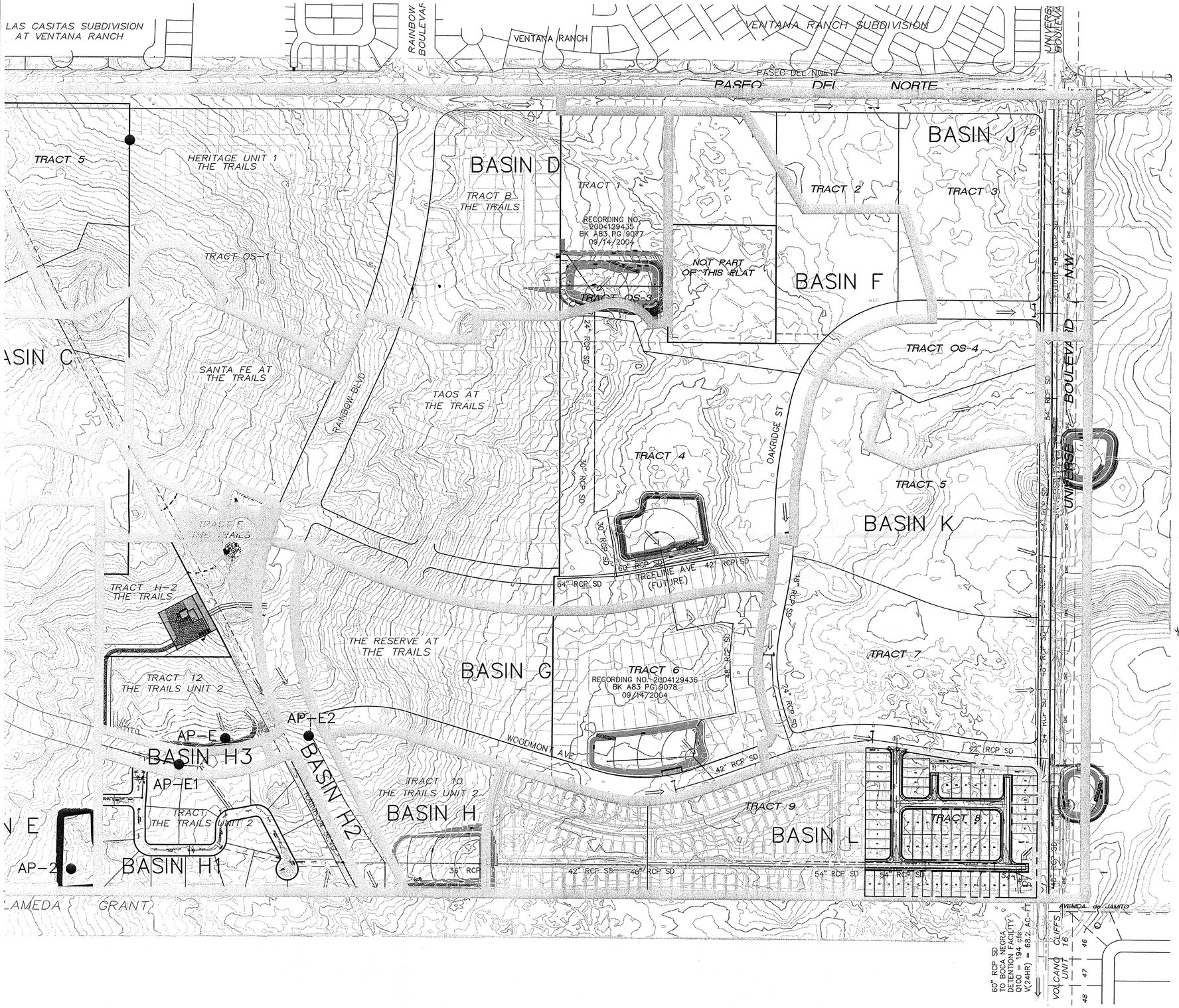
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TRACT 8 AT THE TRAILS UNIT II
GRADING & DRAINAGE PLAN

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.	Zone Map No. C–9–Z	PLATE 3



LEGEND

BASIN BOUNDARY

SUB–BASIN BOUNDARY

FLOW DIRECTION ⟹

Interim Condition POND SUMMARY

Analysis Point	Description	Drainage Area (Ac.)	Q100 (cfs)in	Q100 (cfs)out	MAX STORAGE (Ac–Ft)	TOP ELEV =	BOP ELEV =	MAX WSEL =
AP–D	POND D*	58.30	122.40	0	5.39	5436.85	5430.00	**
AP–E	POND E*	77.19	93.29	0	3.37	5448.00	5441.00	5446.90
AP–F	POND F*	82.94	196.82	0	9.27	5424.33	5416.00	5423.90
AP–G	POND G*	31.93	105.96	0	5.64	5422.50	5416.00	5421.40
AP–J	POND J	1.68	5.73	5.73	–	5423.00	5417.00	
AP–K	POND K*	14.70	50.13	0	2.62	5410.50	5405.00	5410.50
AP–H	POND H	164.29	112.14	–	2.77	5422.00	5418.00	5421.87

** POND ACTS AS A TEMPORARY RETENTION POND IN THE INTERIM CONDITION, UNTIL CONSTRUCTION OF UNIVERSE STORM DRAIN TO THE BOCA NEGRA DAM IS COMPLETE. MAXIMUM STORAGE VOLUME IS THE 10–DAY VOLUME TO BE RETAINED.*

*** THE STORAGE CAPACITY OF POND D IS EXCEEDED FOR THE 10 DAY STORM. RUNOFF OVER–FLOWING FROM THIS POND WILL BE CONVEYED TO THE EXISTING DEPRESSION WITHIN TRACT 4. POND D IS ADEQUATE TO RETAIN THE 24 HOUR VOLUME.*

Interim Condition SUB–BASIN ANALYSIS POINT SUMMARY

Analysis Point	Description	Drainage Area (Ac.)	Q100 (cfs)
AP–D1	PASEO DEL NORTE BYPASS FLOW	–	12.85
AP–D2	FROM HERITAGE–REPORT DATED 03/04	–	172.0
AP–E1	WOODMONT AVE SUMP INLETS	3.27	13.81
AP–E2	FROM TRACTS H AND 12	14.37	0
AP–E3	RAINBOW INLETS	2.62	11.06
AP–F1	FROM SANTA FE/TAOS–REPORT DATED 12/03	–	167.4
AP–F2	OAKRIDGE INLETS	2.36	8.03
AP–G1	FROM RESERVE–REPORT DATED 04/04	–	52.80
AP–G2	WOODMONT AVE SUMP INLETS	4.26	17.99
AP–H1	RAINBOW INLETS	3.15	12.88
AP–J1	PASEO DEL NORTE SUMP INLETS	3.04	0
AP–J2	STUB TO UNIVERSE STORM DRAIN	14.54	0
AP–J3	UNIVERSE INLETS	2.92	0
AP–J4	OAKRIDGE ST INLETS	0.82	3.47
AP–J5	STUB TO UNIVERSE STORM DRAIN	4.22	0
AP–K1	OAKRIDGE SUMP INLETS	1.34	5.65
AP–K2	WOODMONT AVE SUMP INLETS	2.04	8.62
AP–K3	STUB TO UNIVERSE STORM DRAIN	10.84	0
AP–K4	STUB TO UNIVERSE STORM DRAIN	6.37	0
AP–K5	STUB TO UNIVERSE STORM DRAIN	12.85	0
AP–K6	UNIVERSE INLETS	6.24	21.29
AP–K7	TRAILS OUTFALL TO BOCA NEGRA DAM	651.01	0

HYDROLOGIC DATA – INTERIM CONDITIONS

BASIN	AREA (acres)	% DEV. (acres)	LAND TREATMENT PERCENTAGES BY TYPE				YIELD (cfs/ac)	Q_{100} (cfs)	V_{100-24} (ac–ft)
			A	B	C	D			
ON–D	58.30	73%	27	18.2	18.3	36.5	2.10	122.40	6.21
ON–E	77.19	22	78	5.5	5.5	11	1.72	132.88	4.38
ON–H	19.88	16	84	4	4	8	1.42	28.24	1.02
ON–G	31.93	100	0	25	25	50	3.32	105.96	4.29
ON–F	82.94	55	45	13.7	13.8	27.5	2.37	196.82	7.35
ON–J	32.92	15	85	3.7	3.8	7.5	1.05	34.57	1.65
ON–K	45.12	14	86	3.5	3.5	7	1.23	55.37	2.22
ON–L	17.73	4	96	1	1	2	1.09	19.34	0.70
ON–H1	11.71	100	0	39.9	39.9	20.2	2.80	32.86	1.30
ON–H2	5.77	73	0	0	10	90	13.06	23.59	1.52
ON–H3	1.63	100	0	0	10	90	4.22	6.88	0.43

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

N

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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TRACT 8 AT THE TRAILS UNIT II
OVERALL POND GRADING & DRAINAGE PLAN
INTERIM CONDITIONS

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.

Zone Map No. C–9–Z

PLATE 1

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

BENCH MARKS
ACS BRASS TABLET STAMPED "2–B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground–to–Grid Factor = 0.99966354
$\Delta\alpha$ = –00°16'30"
SLD 1929 Elevation = 5429.35

AS–BUILT INFORMATION
CONTRACTOR
WORK STAKED BY DATE
WORK ACCEPTANCE BY DATE
FIELD VERIFICATION BY DATE
DRAWINGS CORRECTED BY DATE
MICRO–FILM INFORMATION
RECORDED BY DATE
NO.

ENGINEER'S SEAL
STEVEN T. SALAZAR NEW MEXICO 12641 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		REVISIONS	

WILSON & COMPANY, ENGINEERS & ARCHITECTS
DESIGNED BY DMD DATE OCT 2005
DRAWN BY DMD DATE OCT 2005
CHECKED BY S.JS DATE OCT 2005

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HYDROLOGY SECTION

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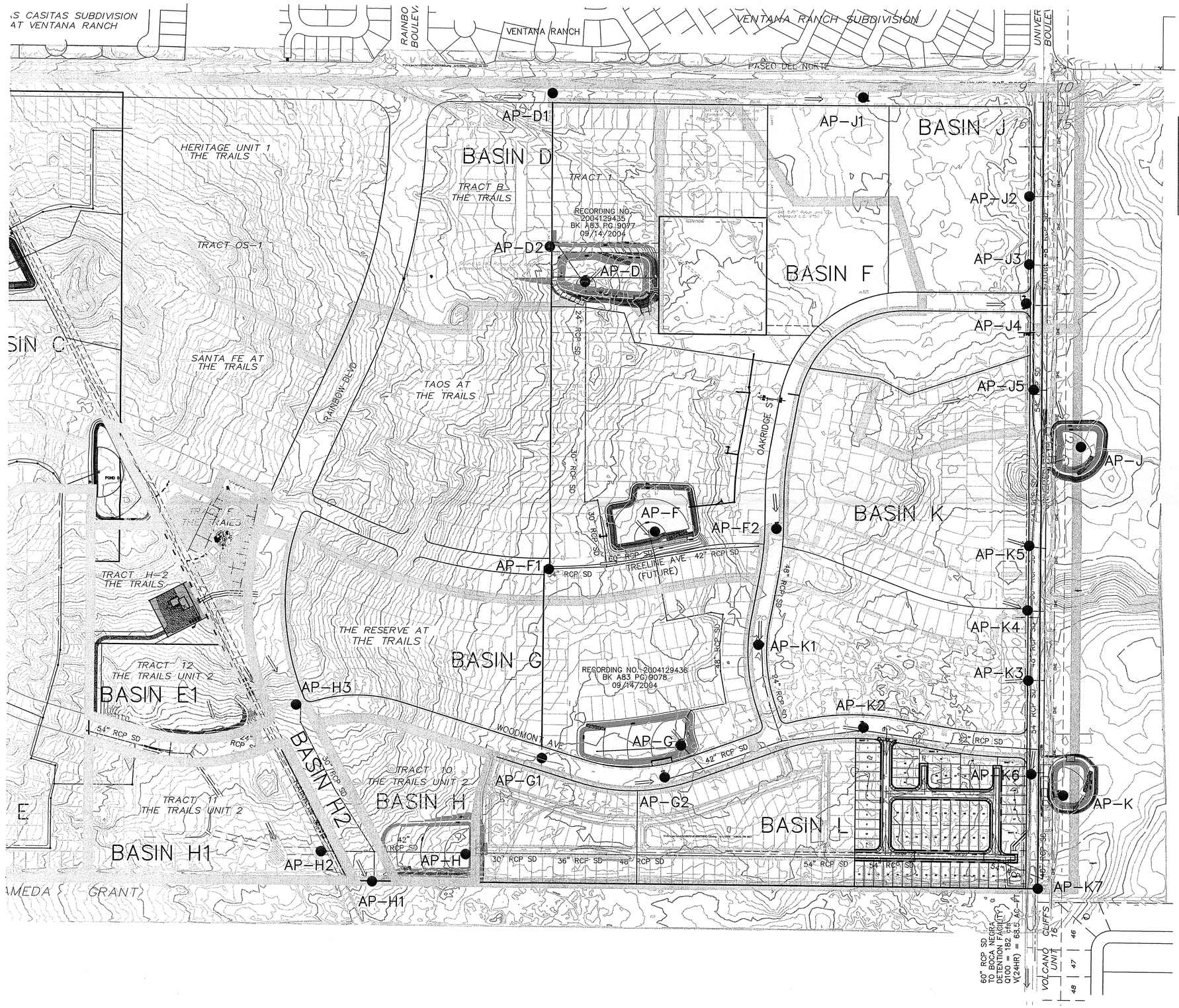

LEGEND

BASIN BOUNDARY

SUB-BASIN BOUNDARY

FLOW DIRECTION ⟹

Developed Condition
SURGE POND SUMMARY

Analysis Point	Description	Drainage Area (Ac.)	Q100 (cfs)in	Q100 (cfs)out	MAX STORAGE (Ac-Ft)	TOP ELEV =	BOP ELEV =	MAX WSEL =
AP-D	POND D	253.25	164.89	23.56	5.39	5436.85	5430.00	5436.21
AP-F	POND F	349.70	338.86	33.92	9.41	5424.33	5416.00	5423.04
AP-G	POND G	381.63	138.81	33.51	3.66	5422.50	5416.00	5420.35
AP-J	POND J	32.90	82.74	21.37	2.14	5423.00	5417.00	5421.87
AP-H	POND H	164.29	112.14	35.28	2.77	5422.00	5418.00	5421.87
AP-K	POND K	459.65	164.27	101.37	2.15	5410.50	5405.00	5410.18

Developed Condition
SUB-BASIN ANALYSIS POINT SUMMARY

Analysis Point	Description	Drainage Area (Ac.)	Q100 (cfs)
AP-D1	PASEO DEL NORTE BYPASS FLOW	–	12.85
AP-D2	FROM HERITAGE-REPORT DATED 03/04	–	172.0
AP-F1	FROM SANTA FE/TAOS-REPORT DATED 12/03	–	167.4
AP-F2	OAKRIDGE ST INLETS	2.36	8.03
AP-G1	FROM RESERVE-REPORT DATED 04/04	–	52.80
AP-G2	WOODMONT AVE SUMP INLETS	4.26	17.99
AP-H1	RAINBOW INLETS	3.15	12.88
AP-H2	TRACT 11 STUB	11.71	33.32
AP-H3	RAINBOW INLETS	2.62	11.06
AP-J1	PASEO DEL NORTE SUMP INLETS	3.04	12.85
AP-J2	STUB TO UNIVERSE STORM DRAIN	14.54	36.65
AP-J3	UNIVERSE INLETS	2.92	12.31
AP-J4	OAKRIDGE ST INLETS	0.82	3.47
AP-J5	STUB TO UNIVERSE STORM DRAIN	4.22	12.00
AP-K1	OAKRIDGE ST SUMP INLETS	1.34	5.65
AP-K2	WOODMONT AVE SUMP INLETS	2.04	8.62
AP-K3	STUB TO UNIVERSE STORM DRAIN	10.84	31.35
AP-K4	STUB TO UNIVERSE STORM DRAIN	6.37	18.41
AP-K5	STUB TO UNIVERSE STORM DRAIN	12.85	36.54
AP-K6	UNIVERSE INLETS	6.24	21.29
AP-K7	TRAILS OUTFALL TO BOCA NEGRA DAM	651.0	181.75

HYDROLOGIC DATA – DEVELOPED

BASIN	AREA (acres)	LAND TREATMENT PERCENTAGES BY TYPE A	B	C	D	YIELD (cfs/ac)	Q_{100} (cfs)	V_{100-24} (ac-ft)
ON-D	58.30	0	25	25	50	2.61	151.97	7.84
ON-H	7.43	0	15	25	60	3.54	26.30	1.11
ON-H1	11.71	0	39.9	39.9	20.2	2.77	32.46	1.10
ON-H2	5.77	0	0	10	90	4.10	23.59	1.09
ON-G	31.93	0	25	25	50	3.32	105.96	4.29
ON-F	82.94	0	25	25	50	3.32	274.98	11.15
ON-J	32.92	0	25	25	50	2.52	82.74	4.42
ON-K	45.12	0	25	25	50	2.84	128.14	6.06
ON-L	27.03	0	25	25	50	2.89	78.21	3.63

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TRACT 8 AT THE TRAILS UNIT II
OVERALL POND GRADING & DRAINAGE PLAN
DEVELOPED CONDITIONS

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.

Zone Map No. C-9-Z

PLATE 2

AS-BUILT INFORMATION
CONTRACTOR — DATE
WORK STAMPED BY — DATE
INSPECTORS — DATE
FIELD VERIFICATION BY — DATE
CORRECTED BY — DATE
MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground-to-Grid Factor = 0.9996354
$\Delta\alpha$ = -00°16'30"
SLD 1929 Elevation = 5429.35

SURVEY INFORMATION
FIELD NOTES — BY — DATE
NO.

ENGINEER'S SEAL
SALAZAR NEW MEXICO (6224) REGISTERED PROFESSIONAL ENGINEER
8/8/06

REVISIONS — NO. — DATE — BY — REMARKS
WILSON & COMPANY, ENGINEERS & ARCHITECTS
DESIGNED BY DMD DATE OCT 2005
DRAWN BY DMD DATE OCT 2005
CHECKED BY SJS DATE OCT 2005

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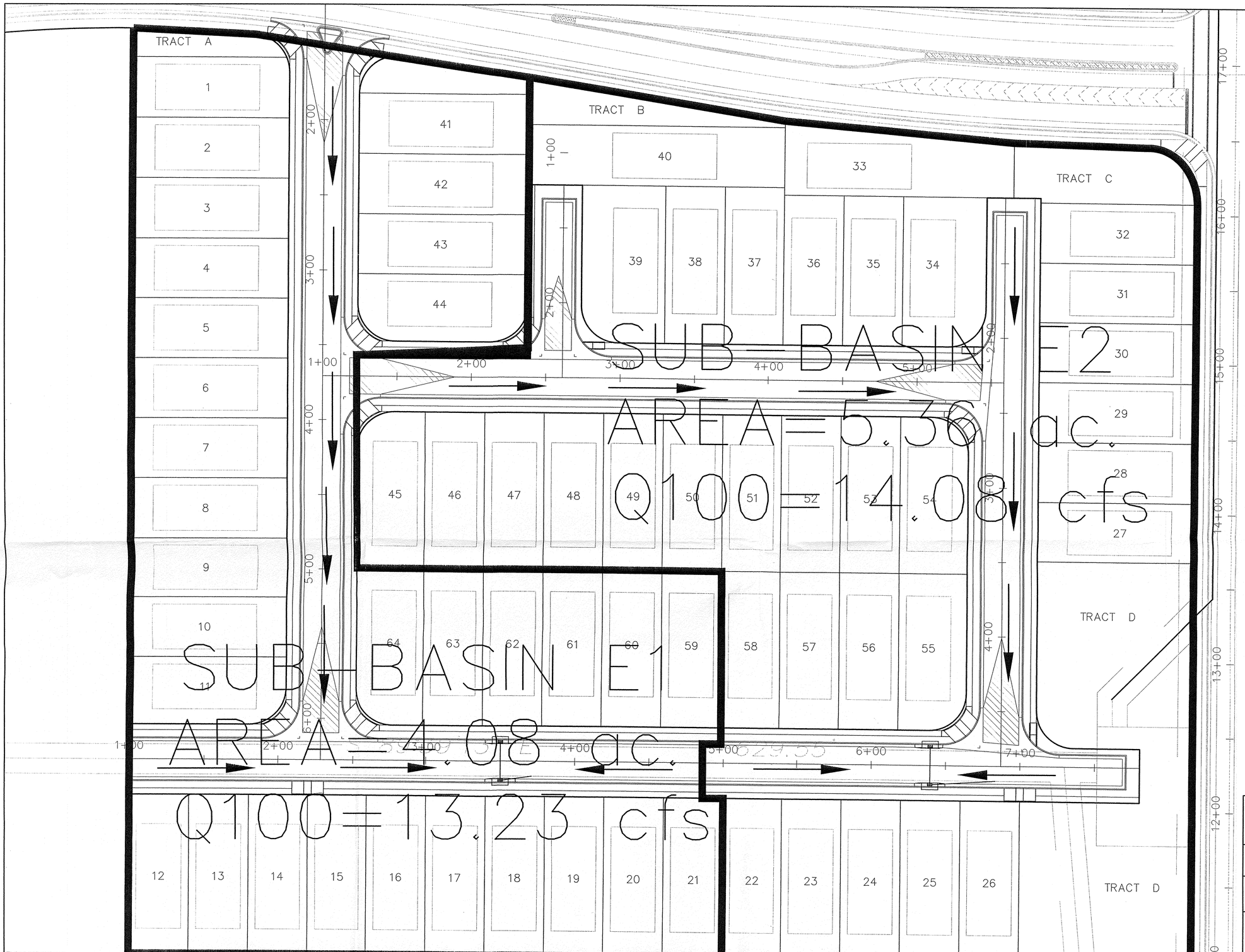

LEGEND

BASIN BOUNDARY

DIRECTION OF FLOW

SCALE: 1"=30'

BENCH MARKS

ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground-to-Grid Factor = 0.99966354
ΔG = -00°16'30"
SLD 1929 Elevation = 5429.35

AS-BUILT INFORMATION
CONTRACTOR
WORK STAKED BY — DATE
ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE
RECORDED BY
NO.

MICRO-FILM INFORMATION

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL
STATE OF NEW MEXICO
SALAZAR
(16241)
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		REVISIONS	
		WILSON & COMPANY, ENGINEERS & ARCHITECTS	
		DESIGNED BY	DATE SEPT 05
		DRAWN BY	DATE SEPT 05
		CHECKED BY	SJS DATE SEPT 05

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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TRACT 8 AT THE TRAILS UNIT II
SUB-BASIN MAP

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.

Zone Map No. C-9-Z

PLATE 4

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TRACT A

TRACT B

TRACT C

TRACT D

TRACT D

TRANSITION ROLLED C&G TO STD. C&G

TRANSITION ROLLED C&G TO STD. C&G

TRANSITION ROLLED C&G TO STD. C&G

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TRANSITION ROLLED C&G TO STD. C&G

TRANSITION ROLLED C&G TO STD. C&G

TRANSITION ROLLED C&G TO STD. C&G

TRANSITION ROLLED C&G TO STD. C&G

LEGEND

CURB & GUTTER

LOCATION OF ROLLED CURB

INLET

STORM DRAIN MANHOLE

SCALE: 1"= 30'

BENCH MARKS

ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
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SLD 1929 Elevation = 5429.35

AS-BUILT INFORMATION

CONTRACTOR
WORK STAKED BY — DATE
FIELD ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE
NO.

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

SALAZAR NEW MEXICO 16241 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY

REVISIONS

WILSON & COMPANY, ENGINEERS & ARCHITECTS
DESIGNED BY — DATE JAN 05
DRAWN BY — DATE JAN 05
CHECKED BY — DATE JAN 05

WILSON & COMPANY
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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TRACT 8 THE TRAILS UNIT II
ROLL CURB EXHIBIT

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No. —

Zone Map No. C-9-Z

PLATE 5

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