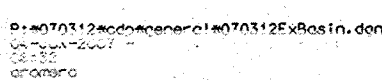
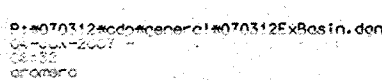


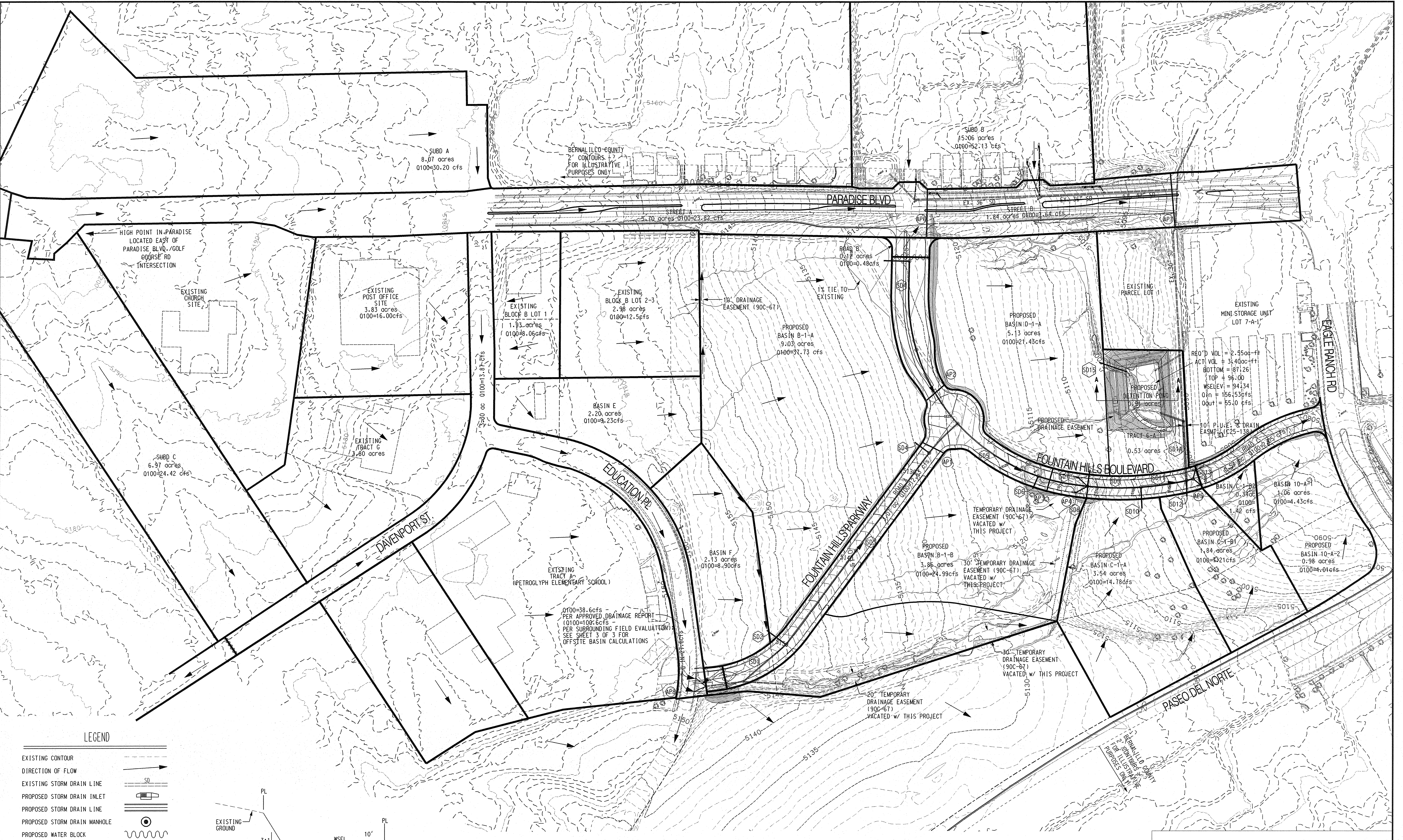
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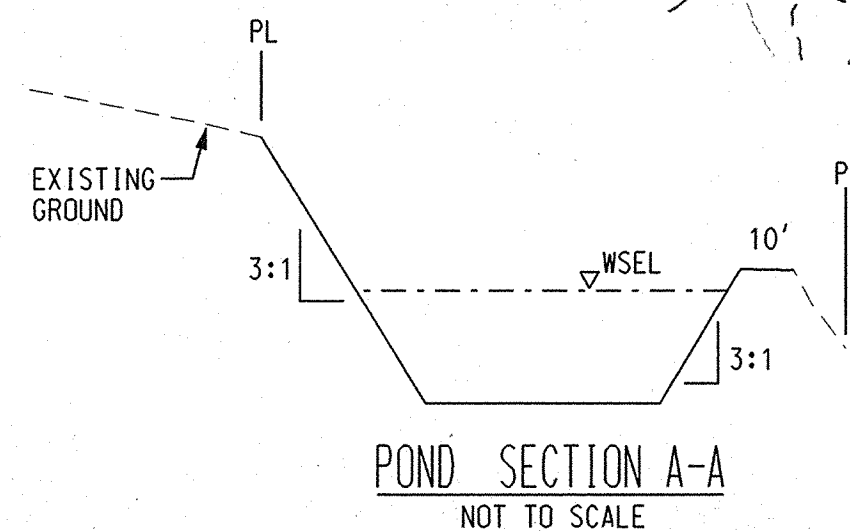
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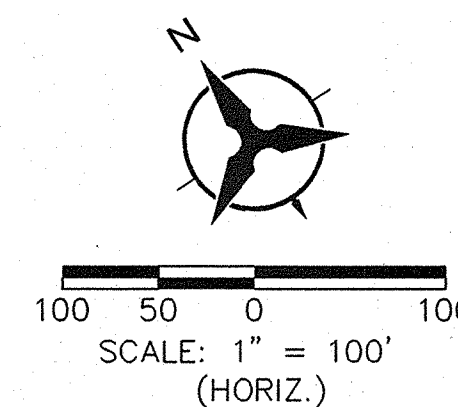
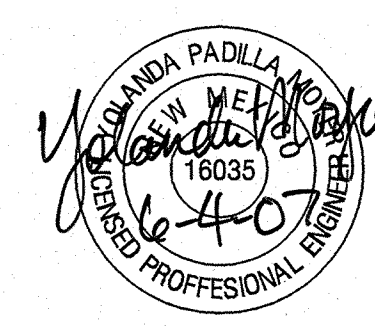
LEGEND

- EXISTING CONTOUR
- DIRECTION OF FLOW
- EXISTING STORM DRAIN LINE
- PROPOSED STORM DRAIN INLET
- PROPOSED STORM DRAIN LINE
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED WATER BLOCK
- POND CONTOUR

NOTE:
PROPOSED ROADWAY GRADES ARE APPROXIMATE
AND ARE INTENDED TO ILLUSTRATE GRADING
AND DRAINAGE CONCEPTS ONLY



FOUNTAIN HILLS
GRADING & DRAINAGE MANAGEMENT PLAN
PROPOSED BASIN MAP
ALBUQUERQUE, NEW MEXICO
JUNE, 2007



Bohannon & Huston
Court yard | 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING & SPATIAL DATA & ADVANCED TECHNOLOGIES

SUMMARY OF ROADWAY CAPACITY ANALYSIS FOR FOUNTAIN HILLS										
Fountain Hills Parkway										
Location	Roadway Grade (%)	Roadway Cross-slope (%)	Q (100 YR) in roadway (cfs)	Curb Type	Depth of water in roadway (ft.)	Velocity of storm water in roadway (ft/s)	V ² /2*g	EGL	ROW Elevation (ft.)	Comments
AP1	3.74	2.00	6.38	STD	0.27	3.59	0.20	0.47	0.85	OK
Fountain Hills Blvd.										
Location	Roadway Grade (%)	Roadway Cross-slope (%)	Q (100 YR) in roadway (cfs)	Curb Type	Depth of water in roadway (ft.)	Velocity of storm water in roadway (ft/s)	V ² /2*g	EGL	ROW Elevation (ft.)	Comments
AP2	0.60	2.00	6.74	STD	0.35	1.78	0.05	0.4	0.85	OK
AP3	2.63	2.00	19.99	STD	0.40	4.15	0.27	0.65	0.85	OK
AP4	5.35	2.00	25.53	STD	0.38	5.67	0.50	0.85	0.85	OK
AP5	5.35	2.00	15.39	STD	0.33	5.06	0.40	0.73	0.85	OK
Paradise Blvd.										
Location	Roadway Grade (%)	Roadway Cross-slope (%)	Q (100 YR) in roadway (cfs)	Curb Type	Depth of water in roadway (ft.)	Velocity of storm water in roadway (ft/s)	V ² /2*g	EGL	ROW Elevation (ft.)	Comments
AP6	*north half of road - Q10yr=7.8cfs provides a depth=0.31' < 0.45 for one free lane of traffic									
AP6**	5.00	2.00	11.99	STD	0.35	4.93	0.38	0.73	0.85	OK
**south half of road - Q10yr=10.23cfs provides a depth=0.32' < 0.45 for one free lane of traffic										
AP7	*north half of road - Q10yr=19.0cfs provides a depth=0.38' < 0.45 for one free lane of traffic									
AP7**	6.66	2.00	15.79	STD	0.36	5.80	0.52	0.88	0.85	OK
**south half of road - Q10yr=10.23cfs provides a depth=0.32' < 0.45 for one free lane of traffic										
Note:										
By observation, the product of the depth times the velocity is below 6.5 for the 100-year design storm, therefore for the 10-year design storm the product of the depth times the velocity will be well below the recommended value of 6.5										

DEVELOPED CONDITIONS FOR INLETS IN FOUNTAIN HILLS								
	INLET	CONDITION	TYPE	CONTRIBUTING BASIN AND RESIDUAL INLET	FLOW TO INLET 100-YR	STREET DEPTH (FT.)	GRATE CAP. (cfs)	RESIDUAL FLOW (cfs)
AP4	1	ON 5.35% GRADE	"A" Double Grate	FOUNTAIN HILLS BLVD	12.76	0.38	7.90	4.86
	2	ON 5.35% GRADE	"A" Double Grate	FOUNTAIN HILLS BLVD	12.76	0.38	7.90	4.86
AP5	3	ON 5.35% GRADE	"A" Double Grate	FOUNTAIN HILLS BLVD	7.70	0.33	5.90	1.80
	4	ON 5.35% GRADE	"A" Double Grate	FOUNTAIN HILLS BLVD	7.70	0.33	5.90	1.80

STORM DRAIN ANALYSIS FOR FOUNTAIN HILLS						
PIPE NO.	PIPE LOCATION	SIZE/TYPE	LENGTH (ft.)	SLOPE (%)	PROPOSED Q (100-YR, cfs)	PIPE CAPACITY (100-YR, CFS)
SD1	EXISTING	30" RCP	228.00	1.10	27.60	43.02
SD2	TRACT F	18" RCP	58.00	1.00	7.12	10.50
SD3	TRUNKLINE 1	30" RCP	688.00	3.74	34.72	79.32
SD4	TRACT B-1-A	30" RCP	478.00	1.00	29.91	41.02
SD5	TRUNKLINE 2	30" RCP	386.00	2.63	64.63	66.51
SD6	TRACT B-1-B	30" RCP	57.00	1.00	19.99	41.02
SD7	TRUNKLINE 3	30" RCP	128.00	5.35	84.62	94.87
SD8	INLETS	18" RCP	32.00	1.00	7.90	10.50
SD9	TRUNKLINE 4	36" RCP	134.00	5.35	100.42	154.27
SD10	TRACT C-1-A	18" RCP	59.00	1.00	11.82	10.50
SD11	TRUNKLINE 5	36" RCP	101.00	5.35	112.25	154.27
SD12	TRACT C-1-B1	18" RCP	55.00	1.00	5.77	10.50
SD13	INLETS	18" RCP	84.00	1.00	5.90	10.50
SD14	TRUNKLINE 6	42" RCP	294.00	2.20	129.82	149.23
SD15	TRACT D-1-A	24" RCP	27.74	1.50	21.73	27.72

DRAINAGE BASIN CALCULATIONS FOR FOUNTAIN HILLS									
BASIN I.D.	AREA (AC)	UNITS #	% LAND TREATMENT				DISCHARGE (CFS)		
			A	B	C	D	10 YR*	100YR*	
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (EXISTING CALCULATED)									
BASIN A	15.60		100.0%	0.0%	0.0%	0.0%	3.9	19.79	
BASIN B	8.22		100.0%	0.0%	0.0%	0.0%	2.1	10.43	
BASIN C	7.35		100.0%	0.0%	0.0%	0.0%	1.8	9.32	
BASIN D	2.62		100.0%	0.0%	0.0%	0.0%	0.7	3.32	
BLOCK B LOT 2-3	2.98		100.0%	0.0%	0.0%	0.0%	0.7	3.78	
TRACT E	2.20		60.0%	5.0%	5.0%	30.0%	2.5	5.10	
TRACT F	2.13		100.0%	0.0%	0.0%	0.0%	0.5	2.70	
TOTAL	41.10						12.3	54.46	
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (DEVELOPED)									
ONSITE									
B-1-A	9.03		0.0%	5.0%	5.0%	90.0%	24.5	37.73	
B-1-B	5.98		0.0%	5.0%	5.0%	90.0%	16.2	24.99	
C-1-A	3.54		0.0%	5.0%	5.0%	90.0%	9.6	14.78	
C-1-B1	1.73		0.0%	5.0%	5.0%	90.0%	4.7	7.21	
C-1-B2	0.34		0.0%	5.0%	5.0%	90.0%	0.9	1.42	
D-1-A	5.13		0.0%	5.0%	5.0%	90.0%	13.9	21.43	
6-A-1	1.44		0.0%	5.0%	5.0%	90.0%	3.9	6.02	
E	2.20		0.0%	5.0%	5.0%	90.0%	6.0	9.19	
F	2.13		0.0%	5.0%	5.0%	90.0%	5.8	8.90	
10-A-1	1.06		0.0%	5.0%	5.0%	90.0%	2.9	4.43	
10-A-2	0.98		0.0%	5.0%	5.0%	90.0%	2.6	4.08	
ROAD A	3.07		0.0%	5.0%	5.0%	90.0%	8.3	12.83	
ROAD B	0.12		0.0%	5.0%	5.0%	90.0%	0.3	0.48	
ROAD C	0.49		0.0%	5.0%	5.0%	90.0%	1.3	2.05	
SUBTOTAL	37.23	0.00					100.94	155.5	
OFFSITE									
TRACT A	6.91	0	0.0%	25.0%	25.0%	50.0%	13.8	23.55	
BLOCK B LOT 1	1.93	0	0.0%	5.0%	5.0%	90.0%	5.2	8.06	
TRACT G	3.80	11	0.0%	12.5%	12.5%	75.0%	9.3	14.78	
POST OFFICE	3.83	0	0.0%	5.0%	5.0%	90.0%	10.4	16.00	
SUBD C	6.97	40	0.0%	22.5%	22.5%	55.0%	14.6	24.42	
EDUCATION PL	3.30	0	0.0%	5.0%	5.0%	90.0%	9.0	13.81	
SUBTOTAL	26.74	51					62.3	100.6	
PARADISE BLVD.									
STREET A	5.70	0	0.0%	5.0%	5.0%	90.0%	15.5	23.82	
STREET B	1.84	0	0.0%	5.0%	5.0%	90.0%	5.0	7.69	
SUBD A	8.70	48	0.0%	23.4%	23.4%	53.3%	17.9	30.20	
SUBD B	15.06	82	0.0%	23.6%	23.6%	52.8%	30.9	52.13	
SUBTOTAL	31.30	130					69.3	113.8	

*010 AND 0100 CALCULATED BY RATIONAL METHOD, SECTION 22-2 OF THE DPM

DRAINAGE MANAGEMENT PLAN

I. PURPOSE

The purpose of this submittal is to present the grading and drainage management plan for Fountain Hills Development. The project consists of approximately 38 acres of land to be developed for commercial use.

II. SITE LOCATION AND CHARACTERISTICS

The project is south of Paradise Blvd and north of Paseo Del Norte and bordered to the west by Education Place and to the east by Eagle Ranch Road. The site is currently undeveloped tracts, with native shrubs and grasses.

III. EXISTING HYDRAULIC AND HYDROLOGIC CONDITIONS

In the existing conditions, the site drains across relatively steep terrain towards the east. Currently offsite flow from the west flows through Education Pl and is captured by an existing storm drain system (Q100=27.6cfs) and conveyed to the drainage easement bordering the southern edge of the property, which directs the flow to a detention pond through an earthen channel with a series of check dams. Existing Tracts E and F drain to the east, into ponds on the west side of Tract B-1-A, contrary to the Drainage Report for Albuquerque West Unit 1 Improvements, Oct. 1990; however these tracts are not part of this submittal. The existing northern basin (Basin A - 15.6 ac, Q100=19.8cfs), along with offsite basin flow (Block B Lot 2-3 - 2.98 acres, Q100=3.80cfs), currently drains across the site to a detention pond in existing Tract 6-A-1. The southwestern basin (Basin B - 8.22 ac, Q100=10.4cfs) presently drains to a detention pond at the northeastern corner of the basin. The remaining portion of the site (Basin C - 7.35ac, Q100=9.3cfs and Basin D - 2.62 ac, Q100=3.32cfs), located in the southeast corner of the site, drains to the east and directly into Eagle Ranch Road.

IV. PROPOSED HYDRAULIC AND HYDROLOGIC CONDITIONS

In the proposed improvements, the west portion of the site (Basins B-1-A, B-1-B, C-1-A, C-1-B1, D-1-A, E and F) will drain through the proposed roadways or storm drains and ultimately to a permanent detention pond located in existing Tract 6-A-1. The existing earthen channel with check dams and the detention pond in Tract B-1-B will be removed and replaced with a storm drain in Fountain Hills Parkway and Fountain Hills Blvd. The developed tracts west of the proposed detention pond (Basins B-1-A, B-1-B, C-1-A, C-1-B1, D-1-A, E and F) will be assumed to discharge 20% of developed flows directly into the adjacent roadways, where it will be collected by proposed inlets in Fountain Hills Boulevard. The remaining 80% will be captured by proposed storm drain stubs. Runoff from Fountain Hills Boulevard and Fountain Hills Parkway will flow through the streets to inlets, which will tie to the proposed storm drain; see Summary of Roadway Capacities for Fountain Hills and Developed Conditions for Inlets in Fountain Hills. The proposed storm drain will outlet to the proposed detention pond in existing Tract 6-A-1; see Storm Drain Analysis for Fountain Hills. The proposed detention pond will be sized to accept a developed flow of 156.53cfs, based on AHYMO methodology, with a controlled outlet of 55cfs, in accordance with the approved grading and drainage plan, COA Hydrology File C12-D3B mentioned above. The minimum required volume is 2.50 ac-ft with the actual volume being 3.14 ac-ft; see AHYMO Program Summary Table. The east side of the site (Basins 10-A-1 and 10-A-2 and C-1-B2), along with the remaining portion of Fountain Hills Boulevard (0.49ac, Q100=2.05cfs) and the residual from the inlets (Q=3.59cfs), will flow through the street and directly into Eagle Ranch Rd (Q100=15.57cfs).

The south half of Paradise Blvd., fronting the Fountain Hills site, has been analyzed for the 100-yr and 10-yr storm capacities, assuming proposed street width of 30' F-F minimum (south side of road will be widened to include new curb and gutter, as well as new median curb and gutter, as part of this development); see Summary of Roadway Capacities for Fountain Hills. The north half of the street has been analyzed for the 10-yr storm capacities, one lane free. The proposed roadway is adequate to handle these conditions.

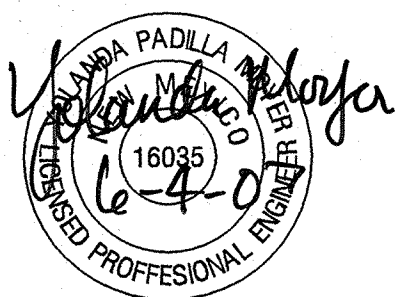
V. CONCLUSION

This plan provides hydrologic and hydraulic considerations of Fountain Hills Development. These flows can be safely conveyed by the improvements proposed in this plan to the existing storm systems, which have adequate capacity to accept such runoff. With the exception of existing Tracts E and F which drain to the east, to ponds on the west side of Tract B-1-A, contrary to the approved Drainage Report for Albuquerque West Unit 1 Improvements, Oct. 1990; this submittal is in compliance with existing approved grading and drainage plans. Tracts E and F are not part of this submittal. This information provides adequate supporting documentation and guidance for approval of this plan.

FOUNTAIN HILLS

GRADING & DRAINAGE MANAGEMENT PLAN

ALBUQUERQUE, NEW MEXICO
JUNE, 2007



Bohannon & Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES