

CITY OF ALBUQUERQUE



July 7, 2014

Ronald Bohannon, P.E.
Tierra West, LLC
5571 Midway Park Pl NE
Albuquerque, NM 87109

**Re: FedEx Ground Drainage Report and Conceptual Grading Plan and Drainage Plan
Engineer's Stamp Date 7-3-14 (K09D026A)**

Dear Mr. Bohannon,

Based upon the information provided in your submittal received 7-3-14, the above referenced report and plan are approved for Site Plan for Building Permit action by the DRB:

The plan was not reviewed at the building Permit level; however, when submitting for Building Permit the following items should be addressed:

1. The berm at the edge of pavement should be removed as it is in the clear zone.

PO Box 1293 2. The sedimentation pond near Bruckner's should be proposed out of the ROW. The pond should be positioned so that the street can be constructed without having to change the proposed pond.

Albuquerque

New Mexico 87103

www.cabq.gov

Sincerely,

Curtis Cherne, P.E.
Principal Engineer, Hydrology
Planning Dept.

Copy: e-mail

Grading &
Drainage
2013075



City of Albuquerque

Planning Department

Development & Building Services Division

RAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: FedEX Ground City Drainage #: _____
DRB#: _____ EPC#: 14EPC-40012 (Project #1009982) Work Order#: _____
Legal Description: A portion of Tract 12, Tract 13, and Tract 14A, Town of Atrisco Grant Unit 5
City Address: Not yet assigned

Engineering Firm: Tierra West, LLC Contact: Jeffrey T. Wooten, P.E.
Address: 5571 Midway Park Place NE, Albuquerque, NM 87109
Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: jwooten@tierrawestllc.com

Owner: I-40 South, LLC c/o Thomas Keleher Contact: Thomas Keleher
Address: PO Box AA, Albuquerque, NM 87103
Phone#: 505-346-4646 Fax#: _____ E-mail: tfk@keleher-law.com

Architect: Castles Design Group Contact: Larry L. Christian
Address: 3801 Kirby Drive, Suite 600, Houston, TX 77098
Phone#: 713-664-7974 Fax#: _____ E-mail: lchristian@castlesdesigngroup.com

Surveyor: Precision Surveys Contact: Will Plotner
Address: 5571 Midway Park Place NE, Albuquerque, NM 87109
Phone#: 505-856-5700 Fax#: _____ E-mail: larry@presurv.com

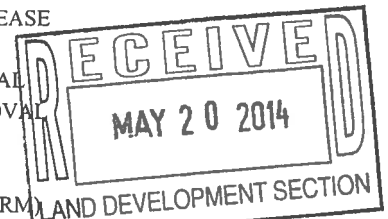
Contractor: W&G Construction Company Contact: Chris White
Address: 470 Central Road, Fredericksburg, VA 22401
Phone#: 540-368-2688 Fax#: _____ E-mail: cwhite@wandgconstruction.com

TYPE OF SUBMITTAL:

- ☒ DRAINAGE REPORT
- ☐ DRAINAGE PLAN 1st SUBMITTAL
- ☐ DRAINAGE PLAN RESUBMITTAL
- ☐ CONCEPTUAL G & D PLAN
- ☒ GRADING PLAN
- ☒ EROSION & SEDIMENT CONTROL PLAN (ESC)
- ☐ ENGINEER'S CERT (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEER'S CERT (TCL)
- ☐ ENGINEER'S CERT (DRB SITE PLAN)
- ☐ ENGINEER'S CERT (ESC)
- ☐ SO-19
- ☐ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- ☐ SIA/FINANCIAL GUARANTEE RELEASE
- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D APPROVAL
- ☒ S. DEV. FOR BLDG. PERMIT APPROVAL
- ☐ SECTOR PLAN APPROVAL
- ☐ FINAL PLAT APPROVAL
- ☐ CERTIFICATE OF OCCUPANCY (PERM)
- ☐ CERTIFICATE OF OCCUPANCY (TCL TEMP)
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ BUILDING PERMIT APPROVAL
- ☒ GRADING PERMIT APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☐ WORK ORDER APPROVAL
- ☐ GRADING CERTIFICATION
- ☐ SO-19 APPROVAL
- ☒ ESC PERMIT APPROVAL
- ☐ ESC CERT. ACCEPTANCE
- ☐ OTHER (SPECIFY)



WAS A PRE-DESIGN CONFERENCE ATTENDED: 7/3/14 Yes ☒ No ☐ Copy Provided ☒
DATE SUBMITTED: May 14, 2014 **REVISED** By: Vincent Carrica, P.E.

Requests for approvals of Site Development Plans and/or Subdivision Plans shall be accompanied by a drainage submittal. The particular nature, location, and scope to the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3. **Drainage Report:** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4. **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

DRAINAGE REPORT

For

**FEDEX GROUND ABQ
ALBUQUERQUE, NEW MEXICO**

Prepared by

Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, New Mexico 87109

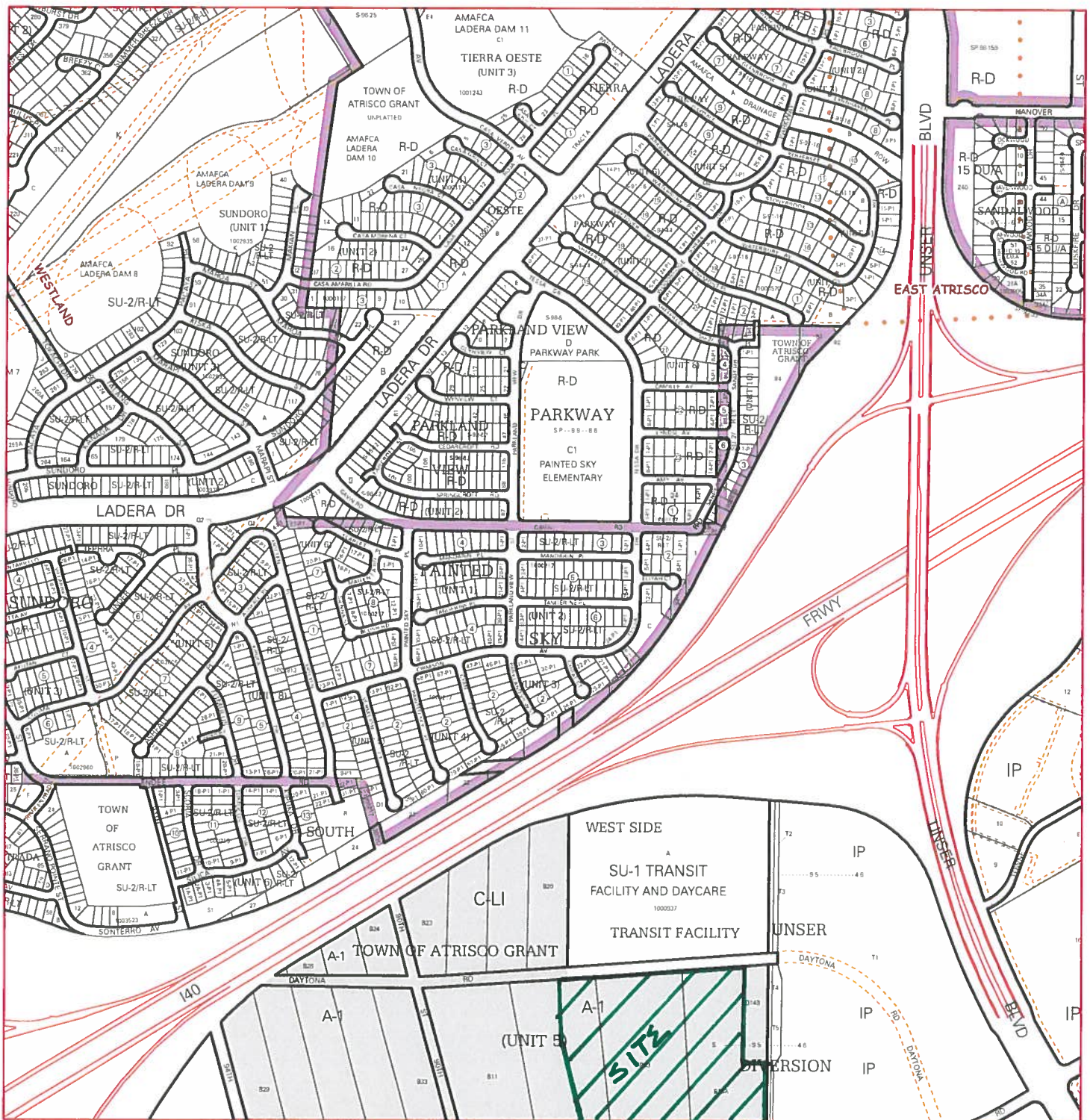
Prepared for

W&G Construction Company
470 Central Rd.
Fredericksburg, VA 22401

July 03, 2014
RONALD R. BOHANNAN
NEW MEXICO
7868
PROFESSIONAL ENGINEER
7/3/14
Ronald R. Bohannon, PE # 7868

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GRADING AND DRAINAGE PLAN	MAP POCKET
INTERIM GRADING AND DRAINAGE PLAN	MAP POCKET



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



Map amended through: 2/4/2010



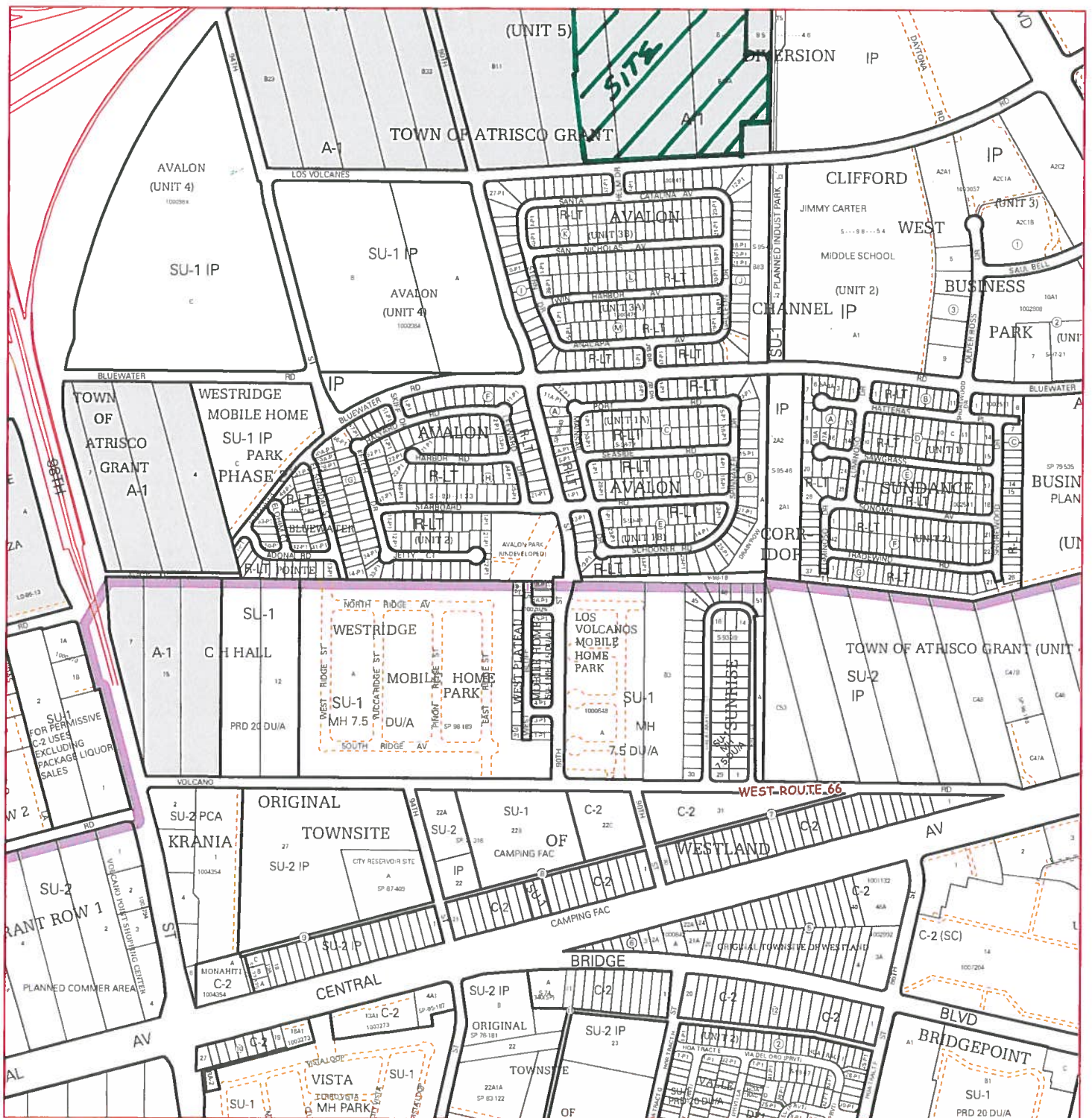
Note: Grey Shading Represents Area Outside of the City Limits

Zone Atlas Page:
J-09-Z

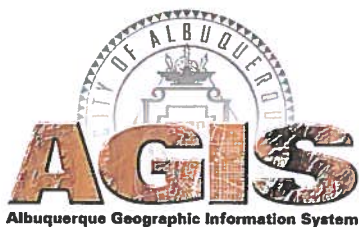
Selected Symbols

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

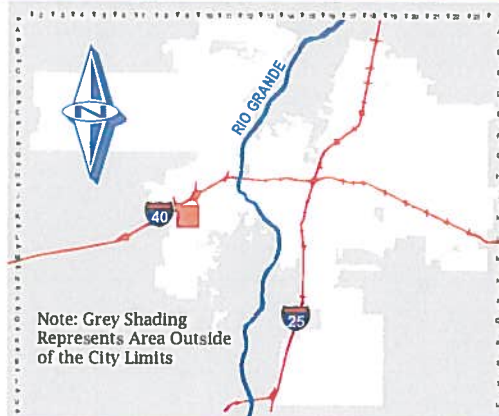
0 750 1,500 Feet



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



Map amended through: 2/4/2010



Zone Atlas Page:

K-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



LOCATION

The proposed commercial development, FedEx Ground ABQ, is comprised of approximately 21.86 acres zoned SU-1 For IP and C-2 Uses and is located in the City of Albuquerque, in Bernalillo County. The site is bordered by Daytona Road to the north, Los Volcanes Road to the south, undeveloped property to the west and storm drain ponds and undeveloped property to the east. An existing ABCWUA water well facility exists adjacent to the southeast corner of the site. The subject property is currently undeveloped with an existing arroyo bisecting the site from northwest to south east.

This report represents a drainage management and grading plan for approval by the City of Albuquerque, for grading and Site Plan for Subdivision and Building Permit submittal.

DRAINAGE BASIN DESIGNATION

The drainage basins for proposed conditions are as indicated on the BASIN MAP included in this report. Under historic conditions the entire site drained across the site from northwest to southeast and into an existing series of storm drain ponds.

EXISTING DRAINAGE CONDITIONS

The site is currently undeveloped and drains from northwest to southeast with an existing slope ranging between two to five percent. The northernmost portion of the site is captured in the Mirehaven Arroyo and drains into the temporary Pond 5 of the Unser diversion Pond system. The remaining southern portion of the site currently drains via surface flow to Los Volcanes Road and into the existing Pond 4 of the Unser Diversion Pond system via curb inlets and storm drain pipes located at the low point in Los Volcanes Road. There is approximately 19 acres to the west of the FedEx site that drains across the site. This upland flow will be accounted for under the proposed drainage conditions.

FIRM MAP AND SOIL CONDITIONS

The FedEx Ground Albuquerque is currently partially located in a designated Flood Hazard Zone AO per FEMA – (Firm Map 35001C0328H – See Attached Map). Per the USDA Soil Conservation Services (SCS), the soils type for this site is Bluepoint Loamy fine sand and Pajarito loamy fine sand and consists largely of undulating excessively drained soils at 1 to 9 percent slopes. Runoff is medium, the hazard of soil blowing is moderate and the hazard of water erosion is slight.

DESIGN-CRITERIA

The drainage plan presented in this report was prepared in accordance with the City of Albuquerque Drainage Ordinances and Chapter 22 of the Development Process Manual DPM. The hydrological analysis is based on the 100-year frequency, 6-hour duration storm, as Represented in Section 22, Part A, Hydrology, of the Development Process Manual. Storage detention ponds are sized for the 100-year, 24-hour storm and ultimately will drain in less than 24 hours.

Rainfall intensities per this report are as follows:

FREQ	ZONE	P60	P360	P1440
100YR	1	1.87	2.20	2.66

Land Treatments:

Proposed Subdivision:

The proposed commercial developed land use values were calculated as follows:

Commercial

A = 0% (Under fully developed conditions, no undisturbed naturally vegetated areas will remain.)

B = 0 % (Under fully developed conditions, no irrigated lawns will be provided)

C = Varies 25% to 100% depending on individual basin which will be landscaped to varying degrees with gravel and Xeriscaping

D= Varies 70% to 100% depending on individual basin which will be paved or covered by buildings

DEVELOPED-DRAINAGE CONDITIONS

The current landowner worked with AMAFCA to cut off flows to the Mirehaven Arroyo from the north side of Interstate-40, which will now be routed in the North I-40 Diversion system. This diversion greatly reduces flows that impact this site. AMAFCA will also cause to have a LOMR completed and submitted to FEMA to adjust the flood plain from what is currently mapped. This adjustment to the flood plain will show the proposed site as being removed from the flood plain.

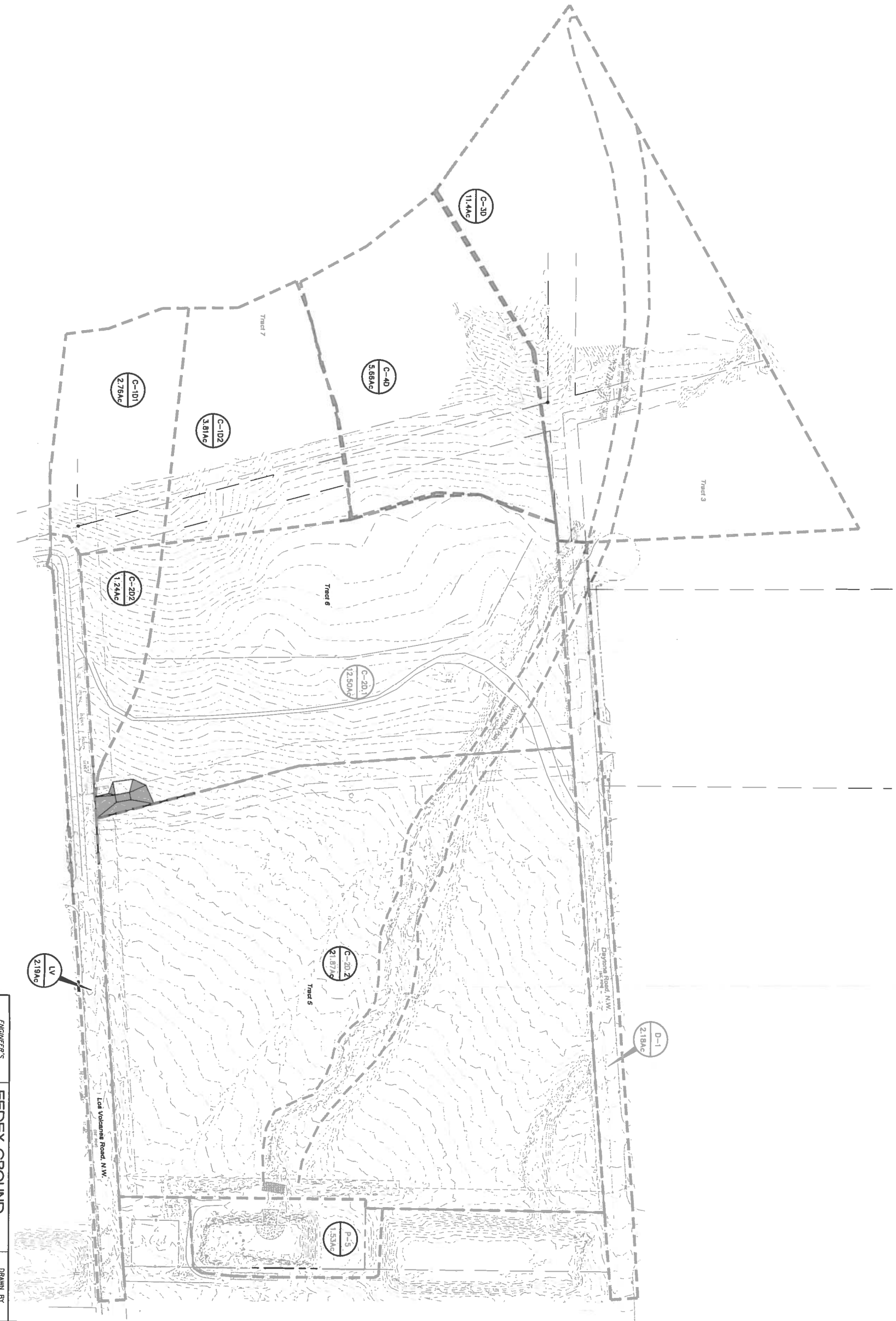
The existing Mirehaven Arroyo that traverses the site from northwest to northeast will be filled in order to construct the proposed improvements including a building, drive aisles and parking facilities. An updated master drainage plan for the area is being prepared by Easterling Consultants, LLC for the City. Approximately 11.4 acres to the west of the subject site will drain to a proposed extension of the existing storm drain in Daytona and the flows will be routed the Unser Diversion Pond 6 located east of the subject site. Another 22 acres directly west of the site will drain to a diversion swale located just west of the FedEx Ground property and will be diverted to Los Volcanes where a storm drain will be extended up from Volcanes and the flows will be routed to the Unser Diversion Pond 4. Flows from 4 acres along Los Volcanes west of the FedEx Ground site will continue to drain to Los Volcanes right of way where they will also be intercepted by the extended storm drain and routed to the Unser Diversion Pond 4. Minor onsite ponding is provided in addition to the existing detention pond that currently outfalls to an adjacent storm drain pipe into the Unser Diversion Pond system. Onsite flows will primarily be diverted to Pond 5 of the Unser Diversion System which will act as a detention pond with an outfall to the Unser Diversion System of less than 10 cfs maximum. An emergency overflow structure exists on the pond and directs flows in excess of the pond's capacity to the east along the arroyo's historic route.

The drainage plan for routing flows from the site and from the upland basins is per the I-40 South and Unser Mini Drainage Master Plan prepared by Easterling Consultants LLC as Revision #1 dated April 2014. The existing outlet structure in Pond 5 will be revised to include a ported outlet riser that will restrict the flow rate out of the pond to less than 10 cfs for the 100-year, 24-hour design storm. The proposed maximum flow rate out of Pond 5 will be far less than the allowable flow rate as provided for in the Daytona Road Storm Drain Master Plan prepared for the West Side Transit Facility by Smith Engineering, February 2001. The proposed Pond 5 volume will be 5.66 ac-ft. The required volume at a maximum 10 cfs outflow is 2.39 ac-ft. The bottom of the pond will be one foot lower than the outfall invert to account for the first flush volume and any future sediment build up.

Upland flows from the west will be routed to Los Volcanes Road to a proposed stormdrain. The ultimate maximum flow rate from these basins is approximately 80 cfs. Runoff from a portion of the FedEx Ground Albuquerque site will drain to this proposed storm drain for a combined total maximum flow rate of approximately 93 cfs. This storm drain will tie to the existing storm drain that connects Pond 6 to Pond 4.

SUMMARY

The proposed grading and drainage plan for the FedEx Ground Albuquerque site provides the grading and drainage elements which are capable of safely passing the 100-year storm and meet the COA DPM requirements. Development of the site will take place after the flows into the Mirehaven Arroyo from north of Interstate-40 were cut off, greatly reducing the upland flows from west of the site and effectively removing the site from the existing flood plain. The remaining upland flows and onsite developed flows will be routed via surface flow and underground storm drains to the existing detention pond which in turn is tied to the Unser Diversion Pond system. The proposed drainage plan for developed conditions follows the I-40 South and Unser Mini Drainage Master Plan.

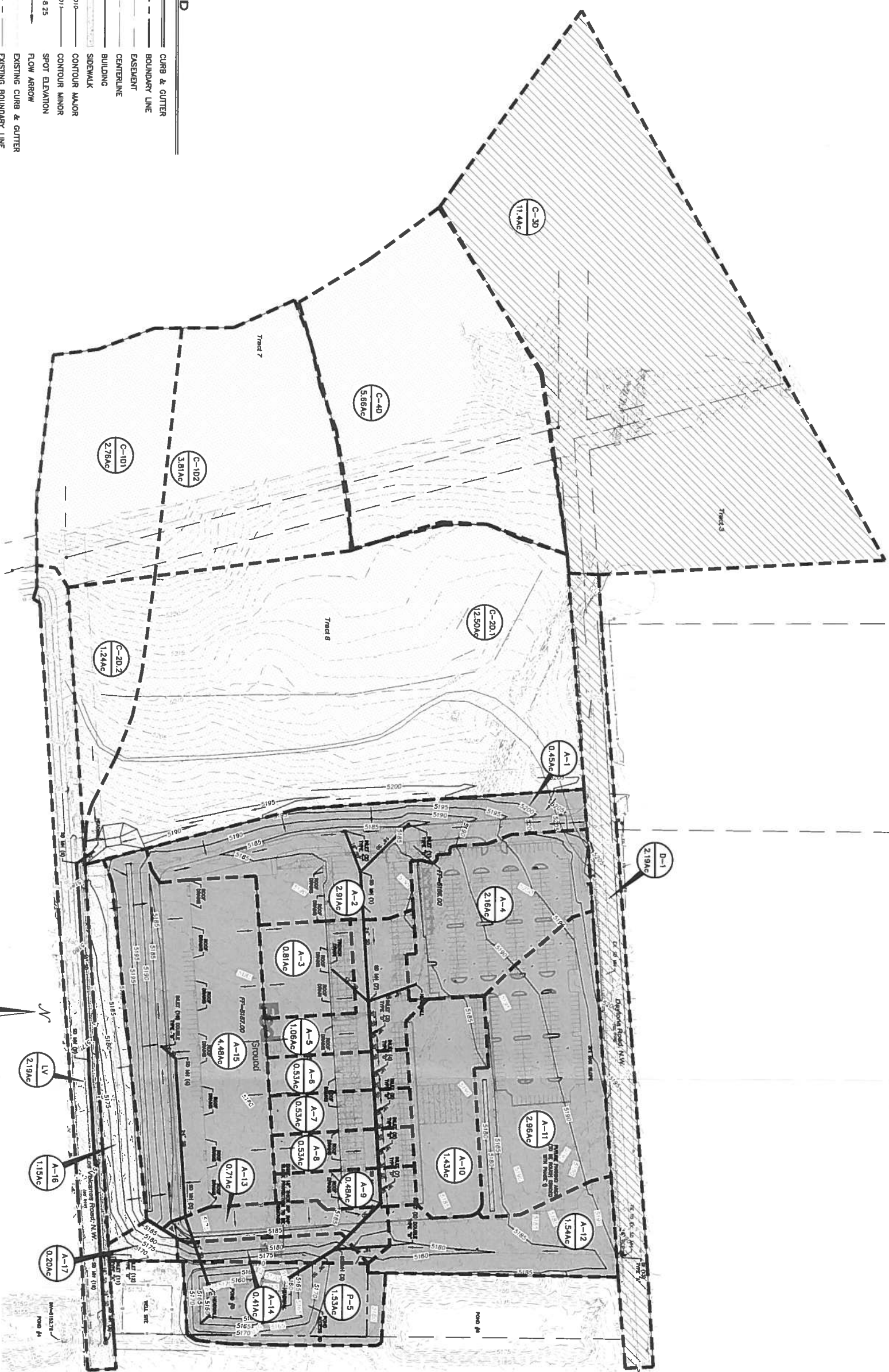


GRAPHIC SCALE



SCALE: 1"=100'

ENGINEER'S SEAL		FEDEX GROUND ALBUQUERQUE, NM		DRAWN BY DY	
 RONALD R. BOYANIAN P.E. #7868		PRE DEVELOPED DRAINAGE BASIN MAP		DATE 7-3-14	
				2013075-BASINS	
				SHEET # C2	
TERRA WEST, LLC 5571 MIDWAY PARK PLACE, NE ALBUQUERQUE, NM 87109 (505) 856-3100 www.terrawestllc.com		JOB # 2013075			



LEGEND

- | | |
|---|------------------------------|
|  | CURB & GUTTER |
|  | BOUNDARY LINE |
|  | EASEMENT |
|  | CENTRILINE |
|  | BUILDING |
|  | SIDEWALK |
|  | CONTOUR MAJOR |
|  | CONTOUR MINOR |
|  | SPOT ELEVATION |
|  | FLOW ARROW |
|  | EXISTING CURB & GUTTER |
|  | EXISTING BOUNDARY LINE |
|  | EXISTING CONTOUR MAJOR |
|  | EXISTING CONTOUR MINOR |
|  | EXISTING SPOT ELEVATION |
|  | R/R - R/WP |
|  | AREA DRAINS TO POND 5 |
|  | AREA DRAINS TO POND 6 |
|  | AREA DRAINS TO LOS VOLCANICS |



GRAPHIC SCALE



SCALE: 1"=100'

ENGINEER'S SEAL	FEDEX GROUND ALBUQUERQUE, NM		DRAWN BY DY
RYLAND R. BOHANNAN P.E. #7866	POST DEVELOPED DRAINAGE BASIN MAP	DATE 7-3-14	2013075-BASINS
	 TERRA WEST LLC 5571 ALBUQUERQUE PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrowestllc.com	SHEET # C2	JOB # 20113075

Interim Post Developed FedEx Ground Drainage Calculations														
FedEx Developed and Upstream Basins Underdeveloped														
This table is based on the COA DPM Section 22, Zone 11														
BASIN	Area (SQ. FT.)	Area (AC.)	Land Treatment Percentages				Q(100) (cfs/acre)	Q(100) (cfs)	WTE (inches)	V(100) ₃₆₀ (CF)	V(100) ₁₄₄₀ (CF)	V(100) _{day} (CF)	Comments	
			A	B	C	D								
C-1D1	120225	2.76	100.0%	0.0%	0.0%	0.0%	1.29	3.56	0.44		4408	4408	20438 To Los Volcanes and Pond 4 (Public)	
C-1D2	165963	3.81	100.0%	0.0%	0.0%	0.0%	1.29	4.91	0.44		6085	6085	28214 To Temp Swale, Los Volcanes and Pond 4 (Public)	
C-2D.1	544591	12.50	100.0%	0.0%	0.0%	0.0%	1.29	16.13	0.44		19568	19568	92560 To Temp Swale, Los Volcanes and Pond 4 (Public)	
C-2D.2	54001	1.24	100.0%	0.0%	0.0%	0.0%	1.29	1.60	0.44		1980	9180	9180 To Los Volcanes and Pond 4 (Public)	
C-3D	497104	11.41	100.0%	0.0%	0.0%	0.0%	1.29	14.72	0.44		18227	18227	84508 To Daylona and Pond 6 (Public)	
C-4D	246344	5.66	100.0%	0.0%	0.0%	0.0%	1.29	7.30	0.44		9033	9033	41878 To Temp Swale, Los Volcanes and Pond 4 (Public)	
D-1	95223	2.19	0.0%	0.0%	10.0%	90.0%	4.22	9.23	1.87		14855	20654	27551 To Pond 6 (Public)	
A-1	19495	0.45	0.0%	0.0%	100.0%	0.0%	2.87	1.28	0.99		1608	1608	4208 To Pond 5 (Private)	
A-2	126840	2.91	0.0%	0.0%	25.0%	75.0%	4.00	11.64	1.73		18248	24912	35173 To Pond 5 (Private)	
A-3	35067	0.81	0.0%	0.0%	0.0%	100.0%	4.37	3.52	1.97		5762	8219	10441 To Pond 5 (Private)	
A-4	94094	2.16	0.0%	0.0%	25.0%	75.0%	4.00	8.63	1.73		13526	18466	26072 To Pond 5 (Private)	
A-5	46006	1.06	0.0%	0.0%	0.0%	100.0%	4.37	4.62	1.97		7553	10773	13687 To Pond 5 (Private)	
A-6	22899	0.53	0.0%	0.0%	0.0%	100.0%	4.37	2.30	1.97		3759	5362	6812 To Pond 5 (Private)	
A-7	22898	0.53	0.0%	0.0%	0.0%	100.0%	4.37	2.30	1.97		3759	5362	6812 To Pond 5 (Private)	
A-8	22896	0.53	0.0%	0.0%	0.0%	100.0%	4.37	2.30	1.97		3759	5361	6812 To Pond 5 (Private)	
A-9	20854	0.48	0.0%	0.0%	0.0%	100.0%	4.37	2.09	1.97		3424	4883	6204 To Pond 5 (Private)	
A-10	62390	1.43	0.0%	0.0%	10.0%	90.0%	4.22	6.04	1.87		9733	13663	18052 To Pond 5 (Private)	
A-11	120032	2.86	0.0%	0.0%	25.0%	75.0%	4.00	11.63	1.73		18548	25323	35753 To Pond 5 (Private)	
A-12	67194	1.54	0.0%	0.0%	90.0%	10.0%	3.02	4.66	1.09		6092	6563	8501 To Pond 5 (Private)	
A-13	30790	0.71	0.0%	0.0%	25.0%	75.0%	4.00	2.82	1.73		4426	6043	7501 To Pond 5 (Private)	
A-14	18000	0.41	0.0%	0.0%	100.0%	0.0%	2.87	1.19	0.99		1485	1485	3885 To Pond 5 (Private)	
A-15	195109	4.48	0.0%	0.0%	30.0%	70.0%	3.92	17.56	1.68		27250	36811	52965 To Pond 5 (Private)	
A-16	49558	1.15	0.0%	0.0%	100.0%	0.0%	2.87	3.29	0.99		4122	4122	10783 To Los Volcanes and Pond 4 (Public)	
A-17	8538	0.20	0.0%	0.0%	100.0%	0.0%	2.87	0.56	0.99		704	704	1843 To Los Volcanes and Pond 4 (Public)	
P-5	66622	1.53	0.0%	0.0%	100.0%	0.0%	2.87	4.39	0.99		5496	5496	14379 To Pond 5 (Private)	
LV	95611	2.19	0.0%	0.0%	10.0%	90.0%	4.22	9.26	1.87		14915	20939	27663 To Pond 4 (Public)	
TOTAL	2857874	65.61						157.73			228726	296550	609776	

Ultimate Post Developed FedEx Ground Drainage Calculations FedEx Developed and Upstream Basins Developed														
BASIN	Area (SQ. FT)	Area (AC)	Land Treatment Percentages				Q(100) (cfs/acre)	Q(100) (cfs)	WTE (inches)	V(100) ₃₆₀ (GF)	V(100) ₁₄₄₀ (GF)	V(100) _{today} (GF)	Comments	
			A	B	C	D								
C-1D1	120225	2.76	0.0%	0.0%	10.0%	90.0%	4.22	11.65	1.87	18755	26329	34785	To Los Volcanes and Pond 4 (Public)	
C-1D2	165963	3.81	0.0%	0.0%	10.0%	90.0%	4.22	16.08	1.87	25690	36346	48019	To Los Volcanes and Pond 4 (Public)	
C-2D.1	544591	12.50	0.0%	0.0%	10.0%	90.0%	4.22	52.76	1.87	84956	119265	157568	To Los Volcanes and Pond 4 (Public)	
C-2D.2	54001	1.24	0.0%	0.0%	10.0%	90.0%	4.22	5.23	1.87	8424	11826	15624	To Los Volcanes and Pond 4 (Public)	
C-3D	497104	11.41	0.0%	0.0%	10.0%	90.0%	4.22	48.16	1.87	77548	108865	143829	To Daylona and Pond 6 (Public)	
C-4D	246344	5.66	0.0%	0.0%	10.0%	90.0%	4.22	23.87	1.87	36430	53949	71276	To Los Volcanes and Pond 4 (Public)	
D-1	95223	2.19	0.0%	0.0%	10.0%	90.0%	4.22	9.23	1.87	14855	20854	27551	To Pond 5 (Private)	
A-1	19495	0.45	0.0%	0.0%	100.0%	0.0%	2.87	1.28	0.99	1608	1608	4208	To Pond 5 (Private)	
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A-6	22898	0.53	0.0%	0.0%	0.0%	100.0%	4.37	2.30	1.97	3759	5362	6812	To Pond 5 (Private)	
A-7	22898	0.53	0.0%	0.0%	0.0%	100.0%	4.37	2.30	1.97	3759	5362	6812	To Pond 5 (Private)	
A-8	22896	0.53	0.0%	0.0%	0.0%	100.0%	4.37	2.30	1.97	3759	5362	6812	To Pond 5 (Private)	
A-9	20854	0.48	0.0%	0.0%	0.0%	100.0%	4.37	2.09	1.97	3759	5361	6812	To Pond 5 (Private)	
A-10	62390	1.43	0.0%	0.0%	0.0%	90.0%	4.22	6.04	1.87	3424	4893	6204	To Pond 5 (Private)	
A-11	129032	2.96	0.0%	0.0%	25.0%	75.0%	4.00	11.63	1.73	18548	25323	35753	To Pond 5 (Private)	
A-12	67194	1.54	0.0%	0.0%	90.0%	10.0%	3.02	4.66	1.09	6092	6563	8531	To Pond 5 (Private)	
A-13	30790	0.71	0.0%	0.0%	25.0%	75.0%	4.00	2.82	1.73	4426	6043	75051	To Pond 5 (Private)	
A-14	18000	0.41	0.0%	0.0%	100.0%	0.0%	2.87	1.19	0.99	1485	1485	3885	To Pond 5 (Private)	
A-15	195109	4.48	0.0%	0.0%	30.0%	70.0%	3.92	17.56	1.68	27250	36811	53265	To Pond 5 (Private)	
A-16	49558	1.15	0.0%	0.0%	100.0%	0.0%	2.87	3.29	0.99	4122	4122	10783	To Los Volcanes and Pond 4 (Public)	
A-17	8538	0.20	0.0%	0.0%	100.0%	0.0%	2.87	0.56	0.99	704	704	1843	To Los Volcanes and Pond 4 (Public)	
P-5	66622	1.53	0.0%	0.0%	100.0%	0.0%	2.87	4.39	0.99	5496	5496	14379	To Pond 5 (Private)	
LV	95611	2.19	0.0%	0.0%	10.0%	90.0%	4.22	9.26	1.87	14915	20939	27663	To Pond 4 (Public)	
TOTAL	2857874	65.61						267.25		423028	583530	804078		

Pipe Capacity

Fed Ex Ground, Albuquerque, NM

Los Volcanes Road

Pipe No.	Run Description	Run Length (ft)	D (in)	Slope (%)	Area (ft^2)	R	Q Required (cfs)	Q Provided (cfs)	Velocity (ft/s)
1	MH 6 to MH 9	400	30	3.31	4.91	0.625	80.01	80.49	16.84
2	MH 9 to MH 10	400	36	1.57	7.07	0.75	80.01	90.11	17.62
3	MH 10 to MH 8	179	36	2.87	7.07	0.75	93.12	121.84	17.24

$$Q = (1.5/N) * A * (R)^{2/3} * (S)^{1/2}$$

Area N=.013
D/4 R=A/P
Slope
0.013

S=
N=

VOLUME CALCULATIONS

Pond 5 - Proposed Conditions

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
59.00	0	0	0.000
60.00	1.00	0.2646	2.745
65.00	6.00	2.1906	8.002
70.00	11.00	5.2846	10.979
70.50	11.50	5.6666	11.233

Emergency Overflow

Orifice Equation

$$Q = CA \text{ SQRT}(2gH)$$

$$C = 0.6$$

$$\text{Diameter (in)} = 8 \text{ Two Each}$$

$$\text{Area (ft}^2\text{)} = 0.34906585$$

$$g = 32.2$$

$$H \text{ (Ft)} = \text{Depth of water above center of orifice}$$

$$Q \text{ (CFS)} = \text{Flow}$$

FedEx Ground, Albuquerque

Pond #5

Detention Pond Volume Calculation

Elev	Area	Elev	Avg			
		Change	Area	Volume	Cumulative Volume	
	SF	FT	SF	CU.FT.	CU.FT.	ACRE-FT
5159	10648					
5160	12400	1	11524	11524	11524	0.264555
5165	21160	5	16780	83900	95424	2.190634
5170	32750	5	26955	134775	230199	5.284642
5170.5	33800	0.5	33275	16637.5	246836.5	5.666586

hymo .txt

```
*****
*                               FEDEX GROUND ALBUQUERQUE, NM                               *
*****
* 100-YEAR, 24-HR STORM (UNDER PROPOSED CONDITIONS) w/ routing *
*****
*
START                TIME=0.0
*
*
RAINFALL              TYPE=2 RAIN QUARTER=0.0 IN
                      RAIN ONE=1.87 IN RAIN SIX=2.20 IN
                      RAIN DAY=2.66 IN DT=0.05 HR
*DEVELOPED CONDITIONS
*
*BASIN A1
*
COMPUTE NM HYD        ID=1 HYD NO=100.1 AREA=0.00070 SQ MI
                      PER A=0.00 PER B=0.00 PER C=100.0 PER D=0.00
                      TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=1 CODE=1
*
*BASIN A2
*
COMPUTE NM HYD        ID=2 HYD NO=100.2 AREA=0.00363 SQ MI
                      PER A=0.00 PER B=0.00 PER C=25.0 PER D=75.00
                      TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=2 CODE=1
*
*BASIN A3
*
COMPUTE NM HYD        ID=3 HYD NO=100.3 AREA=0.00126 SQ MI
                      PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
                      TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=3 CODE=1
*
*
*BASIN A4
*
COMPUTE NM HYD        ID=4 HYD NO=100.4 AREA=0.00389 SQ MI
                      PER A=0.00 PER B=0.00 PER C=25.0 PER D=75.00
                      TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=4 CODE=1
*
*BASIN A5
*
COMPUTE NM HYD        ID=5 HYD NO=100.5 AREA=0.00165 SQ MI
                      PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
                      TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=5 CODE=1
*
*BASIN A6
*
COMPUTE NM HYD        ID=6 HYD NO=100.6 AREA=0.00082 SQ MI
                      PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
                      TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=6 CODE=1
*
*
*BASIN A7
*
COMPUTE NM HYD        ID=7 HYD NO=100.7 AREA=0.00082 SQ MI
                      PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
                      TP=-0.1333 HR MASS RAINFALL=-1
```

hymo .txt

```

PRINT HYD          ID=7 CODE=1
*
*BASIN A8
*
COMPUTE NM HYD      ID=8 HYD NO=100.8 AREA=0.00082 SQ MI
                    PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
                    TP=-0.1333 HR MASS RAINFALL=-1
                    ID=8 CODE=1

PRINT HYD
*
*BASIN A9
*
COMPUTE NM HYD      ID=9 HYD NO=100.9 AREA=0.00075 SQ MI
                    PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
                    TP=-0.1333 HR MASS RAINFALL=-1
                    ID=9 CODE=1

PRINT HYD
*
*BASIN A10
*
COMPUTE NM HYD      ID=10 HYD NO=100.10 AREA=0.00224 SQ MI
                    PER A=0.00 PER B=0.00 PER C=10.0 PER D=90.00
                    TP=-0.1333 HR MASS RAINFALL=-1
                    ID=10 CODE=1

PRINT HYD
*
*BASIN A11
*
COMPUTE NM HYD      ID=11 HYD NO=100.11 AREA=0.00433 SQ MI
                    PER A=0.00 PER B=0.00 PER C=25.0 PER D=75.00
                    TP=-0.1333 HR MASS RAINFALL=-1
                    ID=11 CODE=1

PRINT HYD
*
*BASIN A12
*
COMPUTE NM HYD      ID=12 HYD NO=100.12 AREA=0.00241 SQ MI
                    PER A=0.00 PER B=0.00 PER C=90.0 PER D=10.00
                    TP=-0.1333 HR MASS RAINFALL=-1
                    ID=12 CODE=1

PRINT HYD
*
*BASIN A13
*
COMPUTE NM HYD      ID=13 HYD NO=100.13 AREA=0.00110 SQ MI
                    PER A=0.00 PER B=0.00 PER C=25.0 PER D=75.00
                    TP=-0.1333 HR MASS RAINFALL=-1
                    ID=13 CODE=1

PRINT HYD
*
*BASIN A14
*
COMPUTE NM HYD      ID=14 HYD NO=100.14 AREA=0.00065 SQ MI
                    PER A=0.00 PER B=0.00 PER C=100.0 PER D=0.00
                    TP=-0.1333 HR MASS RAINFALL=-1
                    ID=14 CODE=1

PRINT HYD
*
*BASIN A15
*
COMPUTE NM HYD      ID=15 HYD NO=100.15 AREA=0.00700 SQ MI
                    PER A=0.00 PER B=0.00 PER C=30.0 PER D=70.00
                    TP=-0.1333 HR MASS RAINFALL=-1
                    ID=15 CODE=1

PRINT HYD
*
*BASIN P5
*

```

```

                                hymo .txt
COMPUTE NM HYD      ID=16 HYD NO=100.16 AREA=0.00239 SQ MI
                    PER A=0.00 PER B=0.00 PER C=100.0 PER D=0.00
                    TP=-0.1333 HR MASS RAINFALL=-1
                    ID=16 CODE=1

PRINT HYD
*
*
ADD HYD      ID=50 HYD NO=100.5 ID=1 ID=2
ADD HYD      ID=50 HYD NO=100.6 ID=50 ID=3
ADD HYD      ID=50 HYD NO=100.8 ID=50 ID=4
ADD HYD      ID=50 HYD NO=100.9 ID=50 ID=5
ADD HYD      ID=50 HYD NO=100.10 ID=50 ID=6
ADD HYD      ID=50 HYD NO=100.11 ID=50 ID=7
ADD HYD      ID=50 HYD NO=100.12 ID=50 ID=8
ADD HYD      ID=50 HYD NO=100.13 ID=50 ID=9
ADD HYD      ID=50 HYD NO=100.14 ID=50 ID=10
ADD HYD      ID=50 HYD NO=100.15 ID=50 ID=11
ADD HYD      ID=50 HYD NO=100.16 ID=50 ID=12
ADD HYD      ID=50 HYD NO=100.17 ID=50 ID=13
ADD HYD      ID=50 HYD NO=100.18 ID=50 ID=14
ADD HYD      ID=50 HYD NO=100.19 ID=50 ID=15
ADD HYD      ID=50 HYD NO=100.20 ID=50 ID=16
*
PRINT HYD      ID=50 CODE=1
*
*
*ROUTE THROUGH DETENTION POND NO 1
ROUTE RESERVOIR  ID=55 HYD NO=200.1 INFLOW ID=50 CODE=24
                  OUTFLOW (CFS) STORAGE(AC-FT) ELEVATION(FT)
                  0.0          0.0          59.00
                  2.745        0.2646        60.00
                  8.002        2.1906        65.00
                  10.979       5.2846        70.00
                  11.233       5.6666        70.50

*
PRINT HYD      ID=55 CODE=1
*
*
FINISH

```


AHYMO.OUT

AHYMO PROGRAM (AHYMO-S4) - Version: S4.01a - Rel: 01a
 RUN DATE (MON/DAY/YR) = 06/25/2014
 START TIME (HR:MIN:SEC) = 15:34:11 USER NO.=
 AHYMO_Temp_User:20122010
 INPUT FILE = C:\Users\vince.TWLLC\Desktop\hymo .txt

 * FEDEX GROUND ALBUQUERQUE, NM *

 * 100-YEAR, 24-HR STORM (UNDER PROPOSED CONDITIONS) w/ routing *

*
 START TIME=0.0
 *

*
 RAINFALL TYPE=2 RAIN QUARTER=0.0 IN
 RAIN ONE=1.87 IN RAIN SIX=2.20 IN
 RAIN DAY=2.66 IN DT=0.05 HR

24-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE
 AREAS (NM & AZ) - D1

DT = 0.050000 HOURS				END TIME = 24.000002 HOURS			
0.0000	0.0022	0.0045	0.0069	0.0096	0.0123	0.0154	
0.0197	0.0264	0.0336	0.0412	0.0494	0.0578	0.0664	
0.0753	0.0844	0.0946	0.1052	0.1168	0.1387	0.1657	
0.2020	0.2430	0.2937	0.3614	0.4375	0.5689	0.7733	
1.1234	1.3695	1.5635	1.6610	1.7465	1.8079	1.8568	
1.8994	1.9306	1.9592	1.9828	1.9979	2.0087	2.0183	
2.0273	2.0352	2.0426	2.0499	2.0568	2.0625	2.0659	
2.0692	2.0724	2.0754	2.0784	2.0813	2.0842	2.0870	
2.0896	2.0923	2.0949	2.0974	2.0999	2.1023	2.1046	
2.1069	2.1092	2.1115	2.1136	2.1158	2.1179	2.1199	
2.1220	2.1240	2.1260	2.1280	2.1299	2.1318	2.1337	
2.1356	2.1374	2.1392	2.1411	2.1428	2.1446	2.1463	
2.1481	2.1498	2.1514	2.1531	2.1548	2.1564	2.1580	
2.1596	2.1612	2.1628	2.1643	2.1658	2.1674	2.1689	
2.1704	2.1718	2.1733	2.1747	2.1762	2.1776	2.1790	
2.1804	2.1818	2.1832	2.1845	2.1859	2.1872	2.1885	
2.1899	2.1912	2.1925	2.1937	2.1950	2.1963	2.1975	
2.1988	2.2000	2.2013	2.2026	2.2038	2.2051	2.2064	
2.2077	2.2089	2.2102	2.2115	2.2128	2.2141	2.2153	
2.2166	2.2179	2.2192	2.2204	2.2217	2.2230	2.2243	
2.2256	2.2268	2.2281	2.2294	2.2307	2.2319	2.2332	
2.2345	2.2358	2.2371	2.2383	2.2396	2.2409	2.2422	
2.2434	2.2447	2.2460	2.2473	2.2486	2.2498	2.2511	
2.2524	2.2537	2.2549	2.2562	2.2575	2.2588	2.2601	
2.2613	2.2626	2.2639	2.2652	2.2664	2.2677	2.2690	
2.2703	2.2716	2.2728	2.2741	2.2754	2.2767	2.2779	
2.2792	2.2805	2.2818	2.2831	2.2843	2.2856	2.2869	
2.2882	2.2894	2.2907	2.2920	2.2933	2.2946	2.2958	
2.2971	2.2984	2.2997	2.3009	2.3022	2.3035	2.3048	
2.3061	2.3073	2.3086	2.3099	2.3112	2.3124	2.3137	
2.3150	2.3163	2.3176	2.3188	2.3201	2.3214	2.3227	
2.3239	2.3252	2.3265	2.3278	2.3291	2.3303	2.3316	
2.3329	2.3342	2.3354	2.3367	2.3380	2.3393	2.3406	
2.3418	2.3431	2.3444	2.3457	2.3469	2.3482	2.3495	
2.3508	2.3521	2.3533	2.3546	2.3559	2.3572	2.3584	
2.3597	2.3610	2.3623	2.3636	2.3648	2.3661	2.3674	
2.3687	2.3699	2.3712	2.3725	2.3738	2.3750	2.3763	
2.3776	2.3789	2.3802	2.3814	2.3827	2.3840	2.3853	
2.3865	2.3878	2.3891	2.3904	2.3917	2.3929	2.3942	

AHYMO.OUT						
2.3955	2.3968	2.3980	2.3993	2.4006	2.4019	2.4032
2.4044	2.4057	2.4070	2.4083	2.4095	2.4108	2.4121
2.4134	2.4147	2.4159	2.4172	2.4185	2.4198	2.4210
2.4223	2.4236	2.4249	2.4262	2.4274	2.4287	2.4300
2.4313	2.4325	2.4338	2.4351	2.4364	2.4377	2.4389
2.4402	2.4415	2.4428	2.4440	2.4453	2.4466	2.4479
2.4492	2.4504	2.4517	2.4530	2.4543	2.4555	2.4568
2.4581	2.4594	2.4607	2.4619	2.4632	2.4645	2.4658
2.4670	2.4683	2.4696	2.4709	2.4722	2.4734	2.4747
2.4760	2.4773	2.4785	2.4798	2.4811	2.4824	2.4837
2.4849	2.4862	2.4875	2.4888	2.4900	2.4913	2.4926
2.4939	2.4952	2.4964	2.4977	2.4990	2.5003	2.5015
2.5028	2.5041	2.5054	2.5067	2.5079	2.5092	2.5105
2.5118	2.5130	2.5143	2.5156	2.5169	2.5182	2.5194
2.5207	2.5220	2.5233	2.5245	2.5258	2.5271	2.5284
2.5297	2.5309	2.5322	2.5335	2.5348	2.5360	2.5373
2.5386	2.5399	2.5412	2.5424	2.5437	2.5450	2.5463
2.5475	2.5488	2.5501	2.5514	2.5527	2.5539	2.5552
2.5565	2.5578	2.5590	2.5603	2.5616	2.5629	2.5642
2.5654	2.5667	2.5680	2.5693	2.5705	2.5718	2.5731
2.5744	2.5757	2.5769	2.5782	2.5795	2.5808	2.5820
2.5833	2.5846	2.5859	2.5872	2.5884	2.5897	2.5910
2.5923	2.5935	2.5948	2.5961	2.5974	2.5987	2.5999
2.6012	2.6025	2.6038	2.6050	2.6063	2.6076	2.6089
2.6102	2.6114	2.6127	2.6140	2.6153	2.6165	2.6178
2.6191	2.6204	2.6217	2.6229	2.6242	2.6255	2.6268
2.6280	2.6293	2.6306	2.6319	2.6332	2.6344	2.6357
2.6370	2.6383	2.6395	2.6408	2.6421	2.6434	2.6447
2.6459	2.6472	2.6485	2.6498	2.6510	2.6523	2.6536
2.6549	2.6562	2.6574	2.6587	2.6600		

*DEVELOPED CONDITIONS

*

*BASIN A1

*

COMPUTE NM HYD

ID=1 HYD NO=100.1 AREA=0.00070 SQ MI
 PER A=0.00 PER B=0.00 PER C=100.0 PER D=0.00
 TP=-0.1333 HR MASS RAINFALL=-1

K = 0.105867HR TP = 0.133300HR K/TP RATIO = 0.794199 SHAPE
 CONSTANT, N = 4.514592
 UNIT PEAK = 2.0382 CFS UNIT VOLUME = 0.9961 B = 388.14
 P60 = 1.8700
 AREA = 0.000700 SQ MI IA = 0.35000 INCHES INF = 0.83000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

PRINT HYD

ID=1 CODE=1

PARTIAL HYDROGRAPH 100.10

RUNOFF VOLUME = 1.08591 INCHES = 0.0405 ACRE-FEET
 PEAK DISCHARGE RATE = 1.41 CFS AT 1.500 HOURS BASIN AREA =
 0.0007 SQ. MI.

*

*BASIN A2

*

COMPUTE NM HYD

ID=2 HYD NO=100.2 AREA=0.00363 SQ MI

AHYMO.OUT
PER A=0.00 PER B=0.00 PER C=25.0 PER D=75.00
TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
CONSTANT, N = 7.106428
UNIT PEAK = 10.749 CFS UNIT VOLUME = 0.9981 B = 526.28
P60 = 1.8700
AREA = 0.002723 SQ MI IA = 0.10000 INCHES INF = 0.04000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

K = 0.105867HR TP = 0.133300HR K/TP RATIO = 0.794199 SHAPE
CONSTANT, N = 4.514593
UNIT PEAK = 2.6424 CFS UNIT VOLUME = 0.9970 B = 388.14
P60 = 1.8700
AREA = 0.000908 SQ MI IA = 0.35000 INCHES INF = 0.83000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 100.20

RUNOFF VOLUME = 2.08322 INCHES = 0.4033 ACRE-FEET
PEAK DISCHARGE RATE = 9.63 CFS AT 1.500 HOURS BASIN AREA =
0.0036 SQ. MI.

*

*BASIN A3

*

COMPUTE NM HYD ID=3 HYD NO=100.3 AREA=0.00126 SQ MI
PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
CONSTANT, N = 7.106428
UNIT PEAK = 4.9745 CFS UNIT VOLUME = 0.9971 B = 526.28
P60 = 1.8700
AREA = 0.001260 SQ MI IA = 0.10000 INCHES INF = 0.04000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 100.30

RUNOFF VOLUME = 2.41566 INCHES = 0.1623 ACRE-FEET
PEAK DISCHARGE RATE = 3.61 CFS AT 1.500 HOURS BASIN AREA =
0.0013 SQ. MI.

*

*

*BASIN A4

AHYMO.OUT

*

COMPUTE NM HYD

ID=4 HYD NO=100.4 AREA=0.00389 SQ MI
PER A=0.00 PER B=0.00 PER C=25.0 PER D=75.00
TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
CONSTANT, N = 7.106428
UNIT PEAK = 11.518 CFS UNIT VOLUME = 0.9981 B = 526.28
P60 = 1.8700
AREA = 0.002918 SQ MI IA = 0.10000 INCHES INF = 0.04000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

K = 0.105867HR TP = 0.133300HR K/TP RATIO = 0.794199 SHAPE
CONSTANT, N = 4.514593
UNIT PEAK = 2.8317 CFS UNIT VOLUME = 0.9977 B = 388.14
P60 = 1.8700
AREA = 0.000973 SQ MI IA = 0.35000 INCHES INF = 0.83000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

PRINT HYD

ID=4 CODE=1

PARTIAL HYDROGRAPH 100.40

RUNOFF VOLUME = 2.08322 INCHES = 0.4322 ACRE-FEET
PEAK DISCHARGE RATE = 10.32 CFS AT 1.500 HOURS BASIN AREA =
0.0039 SQ. MI.

*

*BASIN A5

*

COMPUTE NM HYD

ID=5 HYD NO=100.5 AREA=0.00165 SQ MI
PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
CONSTANT, N = 7.106428
UNIT PEAK = 6.5143 CFS UNIT VOLUME = 0.9975 B = 526.28
P60 = 1.8700
AREA = 0.001650 SQ MI IA = 0.10000 INCHES INF = 0.04000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

PRINT HYD

ID=5 CODE=1

PARTIAL HYDROGRAPH 100.50

RUNOFF VOLUME = 2.41566 INCHES = 0.2126 ACRE-FEET
PEAK DISCHARGE RATE = 4.73 CFS AT 1.500 HOURS BASIN AREA =
0.0017 SQ. MI.

*

AHYMO.OUT

*BASIN A6

*

COMPUTE NM HYD

ID=6 HYD NO=100.6 AREA=0.00082 SQ MI
PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
CONSTANT, N = 7.106428
UNIT PEAK = 3.2374 CFS UNIT VOLUME = 0.9959 B = 526.28
P60 = 1.8700
AREA = 0.000820 SQ MI IA = 0.10000 INCHES INF = 0.04000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

PRINT HYD

ID=6 CODE=1

PARTIAL HYDROGRAPH 100.60

RUNOFF VOLUME = 2.41566 INCHES = 0.1056 ACRE-FEET
PEAK DISCHARGE RATE = 2.35 CFS AT 1.500 HOURS BASIN AREA =
0.0008 SQ. MI.

*

*

*BASIN A7

*

COMPUTE NM HYD

ID=7 HYD NO=100.7 AREA=0.00082 SQ MI
PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
CONSTANT, N = 7.106428
UNIT PEAK = 3.2374 CFS UNIT VOLUME = 0.9959 B = 526.28
P60 = 1.8700
AREA = 0.000820 SQ MI IA = 0.10000 INCHES INF = 0.04000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

PRINT HYD

ID=7 CODE=1

PARTIAL HYDROGRAPH 100.70

RUNOFF VOLUME = 2.41566 INCHES = 0.1056 ACRE-FEET
PEAK DISCHARGE RATE = 2.35 CFS AT 1.500 HOURS BASIN AREA =
0.0008 SQ. MI.

*

*BASIN A8

*

COMPUTE NM HYD

ID=8 HYD NO=100.8 AREA=0.00082 SQ MI
PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
CONSTANT, N = 7.106428

AHYMO.OUT
 UNIT PEAK = 3.2374 CFS UNIT VOLUME = 0.9959 B = 526.28
 P60 = 1.8700
 AREA = 0.000820 SQ MI IA = 0.10000 INCHES INF = 0.04000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

PRINT HYD ID=8 CODE=1

PARTIAL HYDROGRAPH 100.80

RUNOFF VOLUME = 2.41566 INCHES = 0.1056 ACRE-FEET
 PEAK DISCHARGE RATE = 2.35 CFS AT 1.500 HOURS BASIN AREA =
 0.0008 SQ. MI.

*

*BASIN A9

*

COMPUTE NM HYD ID=9 HYD NO=100.9 AREA=0.00075 SQ MI
 PER A=0.00 PER B=0.00 PER C=0.0 PER D=100.00
 TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
 CONSTANT, N = 7.106428
 UNIT PEAK = 2.9610 CFS UNIT VOLUME = 0.9959 B = 526.28
 P60 = 1.8700
 AREA = 0.000750 SQ MI IA = 0.10000 INCHES INF = 0.04000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

PRINT HYD ID=9 CODE=1

PARTIAL HYDROGRAPH 100.90

RUNOFF VOLUME = 2.41566 INCHES = 0.0966 ACRE-FEET
 PEAK DISCHARGE RATE = 2.15 CFS AT 1.500 HOURS BASIN AREA =
 0.0008 SQ. MI.

*

*

*BASIN A10

*

COMPUTE NM HYD ID=10 HYD NO=100.10 AREA=0.00224 SQ MI
 PER A=0.00 PER B=0.00 PER C=10.0 PER D=90.00
 TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
 CONSTANT, N = 7.106428
 UNIT PEAK = 7.9593 CFS UNIT VOLUME = 0.9978 B = 526.28
 P60 = 1.8700
 AREA = 0.002016 SQ MI IA = 0.10000 INCHES INF = 0.04000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

AHYMO.OUT

K = 0.105867HR TP = 0.133300HR K/TP RATIO = 0.794199 SHAPE
 CONSTANT, N = 4.514592
 UNIT PEAK = 0.65223 CFS UNIT VOLUME = 0.9821 B = 388.14
 P60 = 1.8700
 AREA = 0.000224 SQ MI IA = 0.35000 INCHES INF = 0.83000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 100.10

RUNOFF VOLUME = 2.28268 INCHES = 0.2727 ACRE-FEET
 PEAK DISCHARGE RATE = 6.24 CFS AT 1.500 HOURS BASIN AREA =
 0.0022 SQ. MI.

*
 *BASIN A11
 *

COMPUTE NM HYD ID=11 HYD NO=100.11 AREA=0.00433 SQ MI
 PER A=0.00 PER B=0.00 PER C=25.0 PER D=75.00
 TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
 CONSTANT, N = 7.106428
 UNIT PEAK = 12.821 CFS UNIT VOLUME = 0.9983 B = 526.28
 P60 = 1.8700
 AREA = 0.003248 SQ MI IA = 0.10000 INCHES INF = 0.04000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

K = 0.105867HR TP = 0.133300HR K/TP RATIO = 0.794199 SHAPE
 CONSTANT, N = 4.514593
 UNIT PEAK = 3.1520 CFS UNIT VOLUME = 0.9977 B = 388.14
 P60 = 1.8700
 AREA = 0.001083 SQ MI IA = 0.35000 INCHES INF = 0.83000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 100.11

RUNOFF VOLUME = 2.08322 INCHES = 0.4811 ACRE-FEET
 PEAK DISCHARGE RATE = 11.49 CFS AT 1.500 HOURS BASIN AREA =
 0.0043 SQ. MI.

*
 *BASIN A12
 *

COMPUTE NM HYD ID=12 HYD NO=100.12 AREA=0.00241 SQ MI
 PER A=0.00 PER B=0.00 PER C=90.0 PER D=10.00
 TP=-0.1333 HR MASS RAINFALL=-1

AHYMO.OUT

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
 CONSTANT, N = 7.106428
 UNIT PEAK = 0.95148 CFS UNIT VOLUME = 0.9891 B = 526.28
 P60 = 1.8700
 AREA = 0.000241 SQ MI IA = 0.10000 INCHES INF = 0.04000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

K = 0.105867HR TP = 0.133300HR K/TP RATIO = 0.794199 SHAPE
 CONSTANT, N = 4.514593
 UNIT PEAK = 6.3156 CFS UNIT VOLUME = 0.9999 B = 388.14
 P60 = 1.8700
 AREA = 0.002169 SQ MI IA = 0.35000 INCHES INF = 0.83000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 100.12

RUNOFF VOLUME = 1.21889 INCHES = 0.1567 ACRE-FEET
 PEAK DISCHARGE RATE = 5.06 CFS AT 1.500 HOURS BASIN AREA =
 0.0024 SQ. MI.

*
 *
 *BASIN A13
 *

COMPUTE NM HYD ID=13 HYD NO=100.13 AREA=0.00110 SQ MI
 PER A=0.00 PER B=0.00 PER C=25.0 PER D=75.00
 TP=-0.1333 HR MASS RAINFALL=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE
 CONSTANT, N = 7.106428
 UNIT PEAK = 3.2571 CFS UNIT VOLUME = 0.9959 B = 526.28
 P60 = 1.8700
 AREA = 0.000825 SQ MI IA = 0.10000 INCHES INF = 0.04000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

K = 0.105867HR TP = 0.133300HR K/TP RATIO = 0.794199 SHAPE
 CONSTANT, N = 4.514593
 UNIT PEAK = 0.80073 CFS UNIT VOLUME = 0.9874 B = 388.14
 P60 = 1.8700
 AREA = 0.000275 SQ MI IA = 0.35000 INCHES INF = 0.83000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

PRINT HYD ID=13 CODE=1

PARTIAL HYDROGRAPH 100.13

AHYMO.OUT

RUNOFF VOLUME = 2.01673 INCHES = 0.7529 ACRE-FEET
 PEAK DISCHARGE RATE = 18.26 CFS AT 1.500 HOURS BASIN AREA =
 0.0070 SQ. MI.

*

*

*BASIN P5

*

COMPUTE NM HYD ID=16 HYD NO=100.16 AREA=0.00239 SQ MI
 PER A=0.00 PER B=0.00 PER C=100.0 PER D=0.00
 TP=-0.1333 HR MASS RAINFALL=-1

K = 0.105867HR TP = 0.133300HR K/TP RATIO = 0.794199 SHAPE
 CONSTANT, N = 4.514592
 UNIT PEAK = 6.9591 CFS UNIT VOLUME = 0.9999 B = 388.14
 P60 = 1.8700
 AREA = 0.002390 SQ MI IA = 0.35000 INCHES INF = 0.83000
 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
 0.050000

PRINT HYD ID=16 CODE=1

PARTIAL HYDROGRAPH 100.16

RUNOFF VOLUME = 1.08591 INCHES = 0.1384 ACRE-FEET
 PEAK DISCHARGE RATE = 4.81 CFS AT 1.500 HOURS BASIN AREA =
 0.0024 SQ. MI.

*

*

ADD HYD ID=50 HYD NO=100.5 ID=1 ID=2
 ADD HYD ID=50 HYD NO=100.6 ID=50 ID=3
 ADD HYD ID=50 HYD NO=100.8 ID=50 ID=4
 ADD HYD ID=50 HYD NO=100.9 ID=50 ID=5
 ADD HYD ID=50 HYD NO=100.10 ID=50 ID=6
 ADD HYD ID=50 HYD NO=100.11 ID=50 ID=7
 ADD HYD ID=50 HYD NO=100.12 ID=50 ID=8
 ADD HYD ID=50 HYD NO=100.13 ID=50 ID=9
 ADD HYD ID=50 HYD NO=100.14 ID=50 ID=10
 ADD HYD ID=50 HYD NO=100.15 ID=50 ID=11
 ADD HYD ID=50 HYD NO=100.16 ID=50 ID=12
 ADD HYD ID=50 HYD NO=100.17 ID=50 ID=13
 ADD HYD ID=50 HYD NO=100.18 ID=50 ID=14

ADD HYD AHYMO.OUT
 ID=50 HYD NO=100.19 ID=50 ID=15
 ADD HYD ID=50 HYD NO=100.20 ID=50 ID=16
 *
 PRINT HYD ID=50 CODE=1

PARTIAL HYDROGRAPH 100.20

RUNOFF VOLUME = 1.97292 INCHES = 3.6259 ACRE-FEET
 PEAK DISCHARGE RATE = 89.04 CFS AT 1.500 HOURS BASIN AREA =
 0.0345 SQ. MI.

*
*

*ROUTE THROUGH DETENTION POND NO 1
 ROUTE RESERVOIR ID=55 HYD NO=200.1 INFLOW ID=50 CODE=24
 OUTFLOW (CFS) STORAGE (AC-FT) ELEVATION (FT)
 0.0 0.0 59.00
 2.745 0.2646 60.00
 8.002 2.1906 65.00
 10.979 5.2846 70.00
 11.233 5.6666 70.50

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	59.00	0.000	0.00
1.20	10.40	59.41	0.110	1.14
2.40	2.77	65.18	2.303	8.11
3.60	0.13	63.54	1.630	6.47
4.80	0.20	62.12	1.081	4.97
6.00	0.35	61.06	0.674	3.86
7.20	0.38	60.28	0.371	3.03
8.40	0.38	59.62	0.163	1.69
9.60	0.38	59.31	0.082	0.85
10.80	0.38	59.20	0.053	0.55
12.00	0.38	59.16	0.042	0.44
13.20	0.38	59.15	0.039	0.40
14.40	0.38	59.14	0.037	0.39
15.60	0.38	59.14	0.037	0.38
16.80	0.38	59.14	0.037	0.38
18.00	0.38	59.14	0.037	0.38
19.20	0.38	59.14	0.037	0.38
20.40	0.38	59.14	0.037	0.38
21.60	0.38	59.14	0.037	0.38
22.80	0.38	59.14	0.037	0.38
24.00	0.38	59.14	0.037	0.38
25.20	0.00	59.06	0.015	0.16
26.40	0.00	59.02	0.005	0.06
27.60	0.00	59.01	0.002	0.02
28.80	0.00	59.00	0.001	0.01
30.00	0.00	59.00	0.000	0.00

AHYMO.OUT
PEAK DISCHARGE = 8.196 CFS - PEAK OCCURS AT HOUR 2.10
MAXIMUM WATER SURFACE ELEVATION = 65.325
MAXIMUM STORAGE = 2.3919 AC-FT INCREMENTAL TIME= 0.050000HRS

*

PRINT HYD ID=55 CODE=1

PARTIAL HYDROGRAPH 200.10

RUNOFF VOLUME = 1.97292 INCHES = 3.6259 ACRE-FeET
PEAK DISCHARGE RATE = 8.20 CFS AT 2.100 HOURS BASIN AREA =
0.0345 SQ. MI.

*

*

FINISH

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 15:34:11



TIERRA WEST, LLC

July 03, 2014

Mr. Curtis Cherne
Hydrology Development Section
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

**RE: FEDEX GROUND FACILITY
TOWN OF ATRISCO GRANT UNIT 5
DRAINAGE REPORT AND PLANS UPDATE**

Dear Mr. Cherne,

Per your correspondence dated June 24, 2014, regarding the FedEx Ground Facility, please find the following responses addressing Hydrology comments as well as comments related to the area mini drainage management plan. Please review the comments listed below:

1. The area in the existing conditions that drains to this site appears to be closer to 37 ac, not the 12.5 ac in the report. Show the extents of the offsite basin on a plate.
An Exhibit with the drainage basins under existing conditions was added. Acreages are correctly shown on the exhibit. Drainage from Basin C-3D will be intercepted by the Daytona storm drain that will be extended west into the existing arroyo. A sediment pond will be constructed outside the right of way, upstream of the inlet to the storm drain. Flows from basins C-4D, C-2D.1 and C1D.2 will be intercepted by the proposed swale west of the FedEx property line and conveyed to the Los Volcanos storm drain that will be extended as part of this project. A sediment basin will also be constructed at the inlet to this storm drain. Flows from basins C-1D.1 and C-2D.d will continue to drain to the Los Volcanes right of way as they currently do today.
2. The report references that routing flows from the site and upland basin is by a report prepared by Easterling Consultants, LLC. This report is not approved and uses HEC-HMS. There are some fundamental issues that still need to be worked out. This report should also reference the Master Drainage Plan for the Westside Transit Facility prepared by Smith Engineering February 2001.
Reference to the MDP for the Westside Transit Facility was added to the report.
3. Where does the report provide the flow and volume for the site?
Flow and volume calculations are provided in the tabulated drainage calculation sheet. A summary of these totals was added to the narrative portion of the report.
4. Per Easterling and Consultants engineer the FedEx pond (ex. Pond 5 Unser Diversion) is allowed 10cfs. This should be stated in the report
The outfall structure from Pond 5 will be modified with a ported outlet riser that will restrict the flows out of the pond to less than 10 cfs for a 100-year, 24-hour storm. This was added to the report.
5. Provide calculations that show the required pond volume.
Calculations for required ponding volume were added.

5571 Midway Park Place NE Albuquerque, NM 87109
(505) 858-3100 Fax (505) 858-1118 1-800-245-3102
tierrawestllc.com

6. This report should size the storm drain in Los Volcanes Rd. How far west is the storm drain to be extended in Los Volcanes Rd?
The storm drain in Los Volcanes adjacent to the proposed FedEx Ground site was sized and calculations were added to the report. The size and extension of the storm drain in Los Volcanes west of the site is dependent on the future development to the west and should be sized at that time.
 7. Why is there an interim Post Developed basin Table? Why not just existing and developed?
The interim post developed table was included to show conditions with the FedEx Ground site developed and the upland basins to the west undeveloped. The ultimate developed portion shows conditions for all being developed.
 8. The easement for floodplain and drainage works is to be vacated.
With recent confirmation that the entire easement will be vacated, it is our intent to proceed with the request for this vacation.
 9. A slope easement is required on Tract 6.
We are in the process of preparing the documents for the easement required on Tract 6. The owner has provided confirmation in an email of his intent to provide easement.
 10. Add a LOMR to the infrastructure list with a value of \$30,000.
BHI is contracted with AMAFCA to complete the LOMR. Per recent conversations with AMAFCA the work is near completion. The LOMR was added to the FedEx Ground infrastructure list. A copy of the revised infrastructure list is attached for your review.
- The plan was not reviewed at the building Permit level; however, when submitting for Building Permit the following items should be addressed:
11. The outlet structure for Pond 5 is to be modified as the existing 8" holes easily plug. Hydrology would like a ported riser design. In addition, provide the as-builts for the outlet structure.
A detail for the modification of the Pond 5 outlet structure to include a ported riser was added to the plans. The as-builts for the existing outlet structure are attached.
 12. The offsite area that historically drained to Pond 5 in the existing condition should be accommodated by inlet 9.
The proposed grading plan does accommodate the upland offsite area historically draining to pond 5.

If you have any questions or need additional information regarding this matter, please do not hesitate to contact me.

Sincerely,



Ronald R. Bohannon, P.E.

Enclosure/s

JN: 2013075
RRB/vc/jg

Current DRC
Project Number:

FIGURE 12

Date Submitted: 6/24/14
Date Site Plan Approved:
Date Preliminary Plat Approved:
Date Preliminary Plat Expires:
DRB Project No.:
DRB Application No.:

INFRASTRUCTURE LIST

(Rev. 9-20-05)

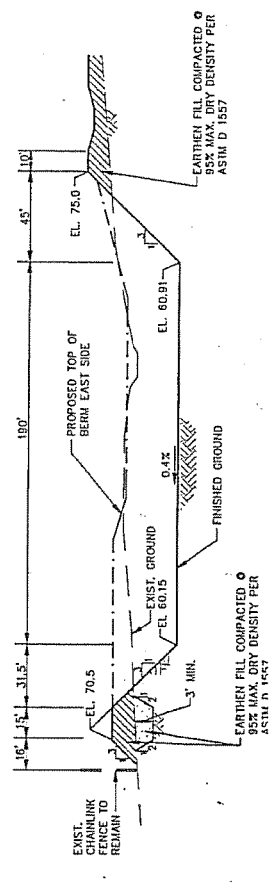
EXHIBIT "A"

TO SUBDIVISION IMPROVEMENTS AGREEMENT
DEVELOPMENT REVIEW BOARD (D.R.B.) REQUIRED INFRASTRUCTURE LIST
FEDEX GROUND ALBUQUERQUE
PROPOSED NAME OF PLAT

EXISTING LEGAL DESCRIPTION PRIOR TO PLATTING ACTION

Following is a summary of PUBLIC/PRIVATE Infrastructure required to be constructed or financially guaranteed for the above development. This Listing is not necessarily a complete listing. During the SIA process and/or in the review of the construction drawings, if the DRC Chair determines that appurtenant items and/or unforeseen items have not been included in the infrastructure listing, the DRC Chair may include those items in the listing and related financial guarantee. Likewise, if the DRC Chair determines that appurtenant or non-essential items can be deleted from the listing, those items may be deleted as well as the related portions of the financial guarantees. All such revisions require approval by the DRC Chair, the User Department and agent/owner. If such approvals are obtained, these revisions to the listing will be incorporated administratively. In addition, any unforeseen items which arise during construction which are necessary to complete the project and which normally are the Subdivider's responsibility will be required as a condition of project acceptance and close out by the City.

Financially Guaranteed DRC #	Constructed Under DRC #	Size	Type of Improvement	Location	From	To	Construction Certification		
							Inspector	P.E.	City Const Engineer
		17" F-E	Residential Paving (Major Local Roadway), Curb & Gutter 6' Sidewalk (North Side)	Los Volcanes Road	West Property Line	East Property Line	/	/	/
		20' F-E	Residential Paving (Major Local Roadway), Curb & Gutter 6' Sidewalk (South Side)	Daytona Road	West Property Line	East Property Line	/	/	/
		12"	Water PVC Line	Daytona Road	90th Street	360' East of 90th Street	/	/	/
		20"	Water PVC Line (includes completion of vault piping and valving)	90th Street	I-40 South Right of Way Line Existing Vault	Daytona Road	/	/	/
		30" to 36"	RCP Storm Sewer	Los Volcanes Road	West Property Line	165' East of East Property Line	/	/	/
		36"	RCP Storm Sewer	Daytona Road	Existing Stub	108' West of Existing Stub	/	/	/
		Water infrastructure to include valves, fittings, valve boxes, and fire hydrants as required.							/
		Catch basins and RCP connections included with storm sewer.							/
		\$30,000	Mirehaven LOMR						



PROPOSED FEATURES

43.9' ϕ SPOT ELEVATION

—5135— CONTOUR

WINTER



RIPRAP

18

100

SOIL CEMENT PAVING

IDEA TO BE
SHEENING ENGINEERS
CONSULTING ENGINEERS
AND ARCHITECTS
A COMMITMENT
TO EXCELLENCE

AREA TO BE
OVEREXCAVATED FOR

**BERM STRUCTURAL
WEAVER**

11/11/11 1209-821 FAX (505) 898-6060

COMPACTED
EARTHEN FILL

ARROYO FLO
A. S. 1990

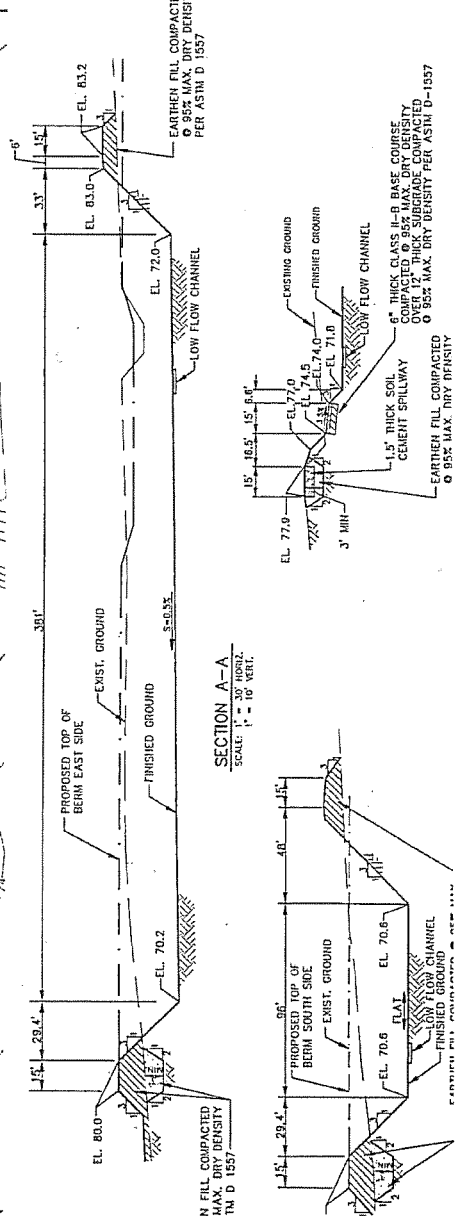
BASE COURSE	AUTH
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DATE: _____ TIME: _____

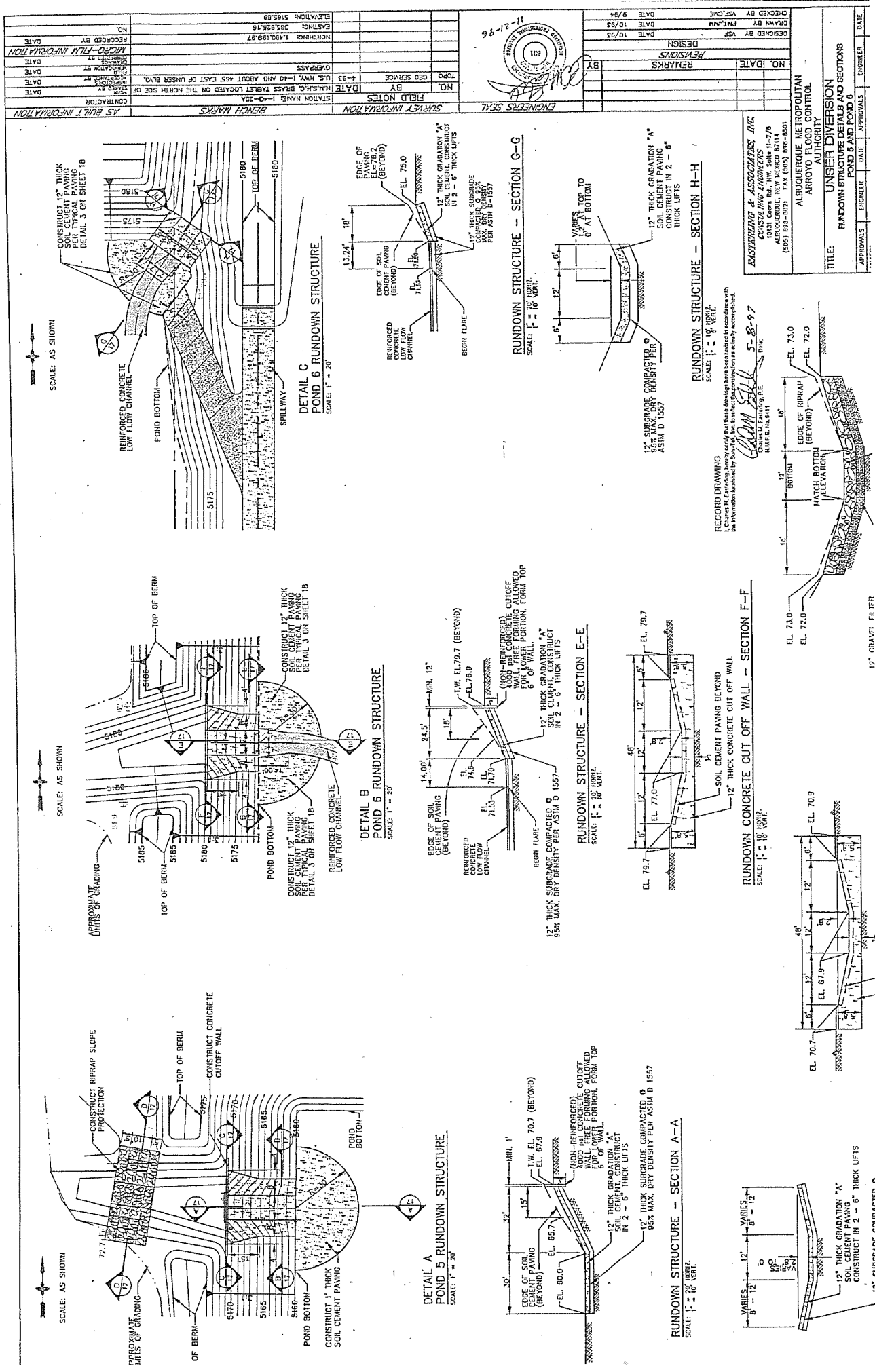
PO	4	5	6	7	8	9	0
1							
2							
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**POND OUTLET
STRUCTURE**

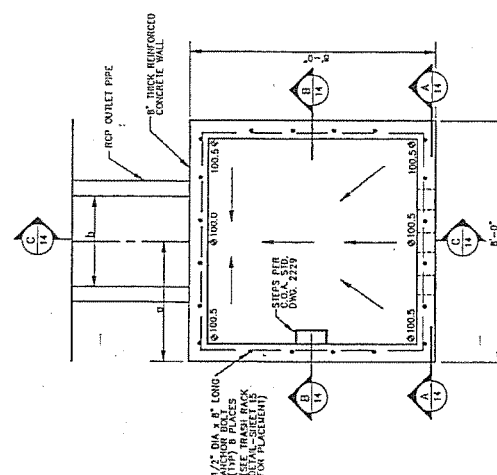
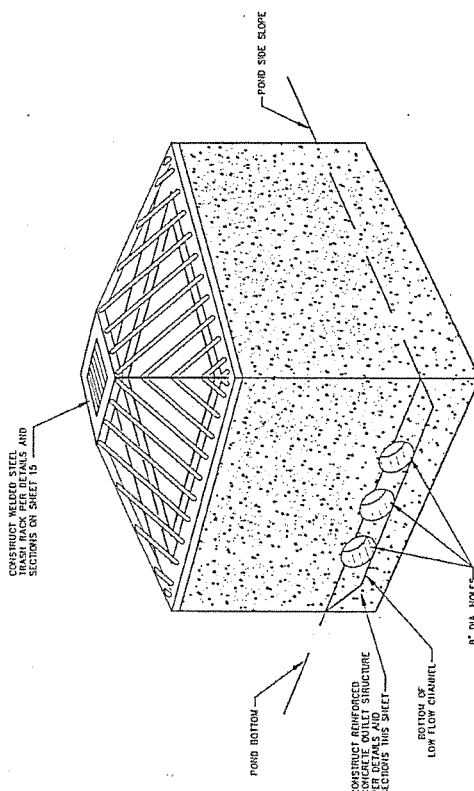
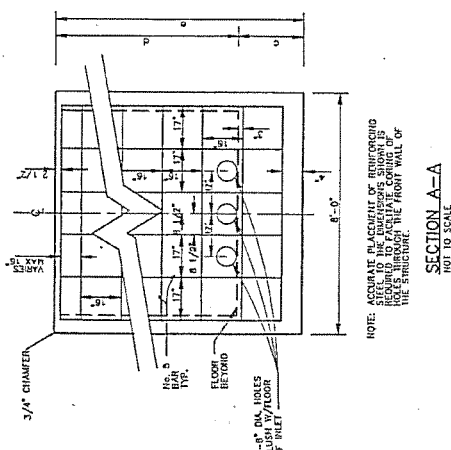
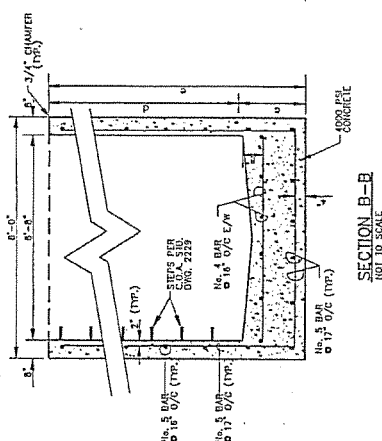
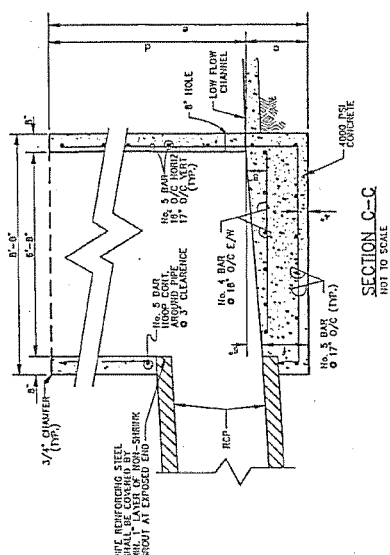
THE UNIVERSITY OF CHICAGO



POINT NO.	STA.	ELEV.	POINT DESCRIPTION	OFFSET (FT.)
1	28+93.4	129.5	N/S KEY WAY	
2	28+93.4	129.5	END OF KEY WAY	
3	28+76.3	26.5	N/S AND E/W BERM	
4	28+76.3	40.0	ACCESS RD/BERM	
5	28+76.3	40.0	ANGLE POINT	
6	31+232.2	156.0	BERM	
7	31+232.2	40.0	TOP OF SLOPE	
8	31+232.2	40.0	SPRINKLING PAVING	
9	32+44.6	40.0	SOUTH EDGE OF PAVING	
10	32+44.6	40.0	SPRINKLING PAVING	
11	32+44.6	40.0	EDGE OF SLOPE	
12	33+59.8	140.0	SPRINKLING PAVING	
13	33+59.8	40.0	NORTH EDGE OF PAVING	
14	33+59.8	40.0	SPRINKLING PAVING	
15	33+59.8	40.0	EDGE OF SLOPE	
16	33+59.8	40.0	E/W BERM	
17	33+59.8	40.0	TOP OF SLOPE	
18	33+59.8	40.0	E/W BERM	
19	33+59.8	40.0	TOP OF SLOPE	
20	33+59.8	40.0	E/W BERM	
21	33+59.8	40.0	TOP OF SLOPE	
22	33+59.8	40.0	E/W BERM	
23	33+59.8	40.0	TOP OF SLOPE	
24	33+59.8	40.0	E/W BERM	
25	33+59.8	40.0	TOP OF SLOPE	
26	33+59.8	40.0	E/W BERM	
27	33+59.8	40.0	TOP OF SLOPE	
28	33+59.8	40.0	E/W BERM	
29	33+59.8	40.0	TOP OF SLOPE	
30	33+59.8	40.0	E/W BERM	
31	33+59.8	40.0	TOP OF SLOPE	
32	33+59.8	40.0	E/W BERM	
33	33+59.8	40.0	TOP OF SLOPE	
34	33+59.8	40.0	E/W BERM	
35	33+59.8	40.0	TOP OF SLOPE	
36	33+59.8	40.0	E/W BERM	



NO.		DATE		REMARKS		BY	

[illegible]

ISOMETRIC - CONCRETE OUTLET STRUCTURE
100' TO SCALE

OUTLET STRUCTURE DETAIL - PLAN
SCALE: 1" = 2'

POUD No.	* a	b	c	d	e	f	TOP OF WALL ELEVATION
1	4'-0"	3'-8"	3'-1"	0'-0"	11'-1"	2'-7"	5141.0
2	4'-0"	4'-0"	2'-11"	7'-14"	10'-3/4"	2'-0"	5144.8
3	4'-0"	3'-8"	2'-5"	5'-0"	7'-5 1/2"	1'-11"	5142.5