CITY OF ALBUQUERQUE

May 18, 2005

Elvidio Diniz, PE
Resource Technology, Inc.
5501 Jefferson Blvd. NE – Suite 200
Albuquerque, NM 87106

Re: Mountain Mahogany Charter School, 5010 4th Street, Grading & Drainage Plan - Engineer's Stamp dated 5-6-05 (F14-D62)

Dear Mr. Diniz,

Based upon the information provided in your submittal dated 5-6-05, the above referenced plan is approved for Grading Permit and Paving Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. Refer to the attachment that is provided with this letter for details. If you have any questions please feel free to call the Municipal Development Department, Hydrology section at 768-3654 (Charles Caruso).

Also, at the completion of the project please provide Certified As-builts for the file.

If you have any questions, you can contact me at 924-3990.

Sincerely,

Phillip J. Lovato

Phillip J. Lovato, E.I.
Engineering Associate, Planning Dept.
Development and Building Services

C: Charles Caruso, DMD
file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

DRAINAGE REPORT

FOR

MOUNTAIN MAHOGANY CHARTER SCHOOL

Prepared for:
Village Architects
120 Main Street
P.O. Box 328
Los Lunas, NM 87031

Prepared By:

Resource Technology, Inc.
5501 Jefferson Blvd. NE. Suite 200
Albuquerque, NM. 87106
(505) 243-7300
(505) 243-7400 (Fax)
rti@nm.net

April 2005

1.1 Introduction

This report provides the supporting hydrologic and hydraulic data for the 3.4 acre site of the proposed Mountain Mahogany Charter School. The detailed computations are provided in the appendices to this report and the results are also summarized on the Grading and Drainage Plan sheet.

Grading and drainage was determined so as to accommodate the site and landscaping plan provided by Village Architects. Plans are to direct and retain on-site surface runoff to areas where trees or grass will be planted, using a series of small retention ponds and swales.

The 100-year, 6-hour storm is the basis for design of all drainage features. In addition to the five retention ponds scattered throughout the project site, a retention pond on the eastern portion of the project site was designed to hold the 100-year, 10-day runoff volume for the total drainage area.

Appendix A provides miscellaneous back-up data for hydrologic and hydraulic analysis for existing and developed conditions.

1.2 Existing Site Description

The 3.4 acre lot is located between 2nd and 4th streets, north of Griegos Road and south of Montano Road. The Alameda Drain runs along the east side of the project site. It is shown in the southeast corner of Zone Atlas map F-14-Z. The boundary survey plat, prepared by Southwest Surveyors, LLC, is entitled "Tract 142-C-1, M.R.G.C.D. map No 32, Together with Lot B, Lands of Hurbert Teague: Section 32, T.11N., R.3E., N.M.P.M, City of Albuquerque, Bernalillo County, New Mexico, January 2001". Figure A is a copy of the play. Remnants of what used to be the Cavalier Motel (concrete pads and what looks like an old swimming pool) are scattered throughout the northwest lot (Lot B) under a 6-inch layer of dirt.

1.3 Proposed Site Description

The site will be the location for the Mountain Mahogany Charter School. Several portable buildings were purchased for the school; the ground under the buildings will be graded at 1% slope to drain away from the buildings which will be set on I-beams supported on concrete pilasters at the corners. Paving and landscaping plans were provided by Village Architects. Road and parking lot dimensions are shown on the Site Plan, prepared by Village Architects. A landscaping plan was also developed by Village Architects and includes plans for planting a mixture of native trees, an orchard, a garden, and a play area/field. The Grading and Drainage Plan was designed to allow surface runoff to drain to developed landscape features (i.e. proposed trees, grass, orchard, and garden). Existing concrete slabs from what used to be the Cavalier Motel will have to be removed.

1.3 Hydrology Method

Hydrology computations were performed using the 40-Acre-Or-Less Method presented in Chapter 22 (Part A) of the City of Albuquerque's Developmental Process Manual (COA DPM). The site is located in Precipitation Zone 2, between the Rio Grande and San Mateo Blvd. Precipitation depths for the 100-year, 6-hour (P_{360}) and 10-day (P_{10D}) storms in Zone 2 are 2.35 inches and 3.95 inches respectively (Table A-2, Chapter 22, COA DPM). Land Treatments (Table A-4, Chapter 22, COA DPM) for the 100-year, 6-hour storm in Zone 2 have excess precipitation (E) values of ~~0.53~~ inch, ~~0.92~~ inch, 1.13 inch, and 2.12 inch for land treatments A, B, C, and D, respectively (Table A-8, Chapter 22,COA DPM). Both existing and developed conditions were analyzed. Proposed drainage features were designed to accommodate the developed condition 100-year 10-day volume (V_{10D}, acre-feet) and peak flow (Q_{100}, cfs).

2.0 Existing Condition Runoff

Existing Condition Sub-Basins

Basin and sub-basin boundaries were drawn along appropriate ridges, high ground, and drains within the project area using field surveys supplemented by the 1999 Bernalillo County topographic mapping. Sub-basin boundaries for existing conditions are shown on Figure B.

Existing Condition Hydrologic Results

The existing condition total site peak 100-year runoff is 11.42 cfs and the 100-year, 10-day volume is 0.34 acre-feet. In comparison, the developed condition values are 12.3 cfs peak flow and 0.51 acre-feet volume. Hydrologic results for existing conditions are summarized in Table 1.

TABLE 1
HYDROLOGIC RESULTS FOR EXISTING CONDITIONS

Area	Land Treatment				Peak Q (cfs)		Volume (acre-feet)	
(ft^2)	A (%)	B (%)	C (%)	D (%)	Q_{10}	Q_{100}	$V_{10\text{-}10day}$	$V_{100\text{-}10day}$
158014	0	0	99.60	0.40	6.23	11.42	0.16	0.34

	Area	Land Treatment			
Sub-Basin	(ft^2)	A (%)	B (%)	C (%)	D (%)
A1	150882	0	0	99.6	0.4
A2	7132	0	0	100	0

3.0 Developed Condition Runoff

A series of retention ponds, swales, and an 8-inch outlet pipe will distribute stormwater runoff to areas where water harvesting and infiltration were desired, according to the landscaping plan. Swales and ponds are shown on Figure C. Pond F was designed to hold the 100-year, 10-day volume for the total contributing area. Developed Condition hydrologic results are summarized in Table 2. Detailed computations are included in Appendix A.

Developed Condition Sub-Basins

The contributing area to each pond was determined according to the proposed Grading and Drainage Plan. Sub-Basin boundaries for developed conditions are shown on Figure C. Sub-basin data for developed conditions is summarized in Table 2.

Developed Condition Hydrologic Results

The developed condition total site peak 100-year runoff is 12.3 cfs peak flow and 0.51 acre-feet volume. Hydrologic Results for developed conditions are summarized in Table 2. Computations are included in Appendix B.

TABLE 2

HYDROLOGIC RESULTS FOR DEVELOPED CONDITIONS

Area	Land Treatment				Peak Q (cfs)		Volume (acre-feet)	
(ft^2)	A (%)	B (%)	C (%)	D (%)	Q_{10}	Q_{100}	$V_{10\text{-}10day}$	$V_{100\text{-}10day}$
158014	0	13	64	23	7.0	12.3	0.250	0.508

	Area	Land Treatment				Peak Q (cfs)		Volume (acre-feet)	
Sub-Basin	(ft^2)	A (%)	B (%)	C (%)	D (%)	Q_{10}	Q_{100}	$V_{10\text{-}10day}$	$V_{100\text{-}10day}$
A1	5652	0	0	59	41	0.3	0.5	0.012	0.024
A2	16884	0	0	57	44	0.9	1.5	0.037	0.073
A3	16118	0	0	91	9	0.7	1.2	0.020	0.040
A4	34783	0	42	59	0	1.1	2.2	0.028	0.066
A5	30334.5	0	0	68	32	1.9	2.9	0.088	0.167
A6	15343	0	39	17	45	0.7	1.2	0.032	0.063
A7	38899	0	0	78	22	1.8	3.1	0.063	0.127

3.1 Sizing the Retention Ponds

The retention ponds were designed to hold the total V_{10D} resulting from their contributing areas. Proposed ponds (Ponds A through F) are shown on Figure C. They vary in depths from 1 foot to 2 feet, using side slopes varying from 5H:1V to 10H:1V. Pertinent data regarding the ponds are summarized in Table 3. Calculations are included in Appendix C of this report.

Volumes were computed using the prismoidal area method (Volume = 1/6 ($A_1 + 4A_m + A_2$). The field and play area on the east side of the project site will act as an ultimate single retention pond, assuming all other ponds are full. A desilting basin, located between the play area and the field, will allow suspended sediment to settle, and keep it from burying grass on the field. This pond was sized to accommodate the 100-year, 6-hour peak flow and 10-day volume for the total contributing area. The 100-year 10-day ponding elevation is 4972.7 feet, which covers the entire grass field. Available freeboard ranges from 0.3 feet to 3.3 feet. The pond will hold 0.8 acre-feet.

TABLE 3
POND SUMMARY

	Pond Elevation		Side	Pond	Available	W.S. Elev	Available
	Top (ft)	Bottom (ft)	Slopes (H:V)	Depth (ft)	Storage (ac-ft)	100-Year, 10-Day (ft)	Freeboard (ac-ft)
Pond A	4972.9	4970.9	5:1	2.0	0.1670	4972.9	0.0
Pond B	4973.5	4971.5	5:1	2.0	0.0650	4973.5	0.0
Pond C	4973.5	4971.5	5:1	2.0	0.0580	4972.7	0.8
Pond D	4975.0	4973.5	10:1 - 5:1	1.5	0.1245	4974.3	0.7
Pond E	4973.0	4972.0	10:1	1.0	0.0824	4972.8	0.2
Pond F*	4973.0	4970.5	5:1	2.5	0.8000	4972.7	0.3

*W.S. Elevation is for 100-year, 10-day Volume for Total Contributing Area

3.2 Sizing the Swales

The swales were sized to hold Q_{100} using Haestad's Methods' FlowMaster program. They are typically 0.5 foot deep, using 7H:1V side slopes. A running slope of 0.5% was used. Proposed swales are shown on Figure C and on the Grading and Drainage Plan sheet. Swale hydraulics are summarized in Table 4.

TABLE 4

SWALE HYDRAULICS

	Swale Invert		Type	Side Slopes	Running Slope	Swale Width	Flow Q100	Velocity V100	Depth D100
	Upstream (ft)	Downstream (ft)	(H:V)	(H:V)	(ft/ft)	(ft)	(cfs)	(ft/s)	(ft)
Swale A	4973.3	4972.5	Earthen/Gravel	Varies	0.005	20'	3.18	1.17	0.61
Swale B	4972.5	4972.2	Earthen	7:1	0.005	7	3.18	1.87	0.49
Swale C	4972.1	4971.9	Earthen	7:1	0.005	7	3.18	1.87	0.49
Swale D	4972.7	4971.7	Earthen	7:1	0.010	7	2.22	2.21	0.38
Swale E	4972.8	4971.7	Earthen	7:1	0.010	7	3.12	1.86	0.49
Swale F	4972.7	4971.8	Earthen	7:1	0.005	7	2.22	2.21	0.38
Rundown A	4973.5	4972.9	Rip Rap	7:1	0.043	7	2.92	2.89	0.38
Rundown B	4974.0	4972.9	Earthen	7:1	0.028	7	2.92	3.49	0.35
Rundown C	4973.2	4972.5	Rip Rap	7:1	0.140	7	2.92	4.59	0.31

3.3 Grate Inlet and 8-inch Outlet Pipe

A drop inlet and 8-inch outlet pipe will drain Pond E to Pond F. The proposed grate is a Neenah R-4360.A Cast Iron Grate and Frame (or an equivalent size). The grate is detailed on the Grading and Drainage Plan sheet. The 8-inch outlet pipe should have no less than 6 inches of cover. The top of the grate will be at elevation 4973.5 feet. The upstream invert of the 8-inch outlet pipe will be at elevation 4972.3 feet. With a running slope of 0.5%, the downstream invert of the 8-inch outlet pipe will be at elevation 4971.4 feet, which is 0.9 feet above the bottom of Pond F.

AMENDED

BOUNDARY SURVEY PLAT

TRACT 142-C-1, M.R.G.C.D MAP No.32, TOGETHER WITH LOT B, LANDS OF HURBERT TEAGUE

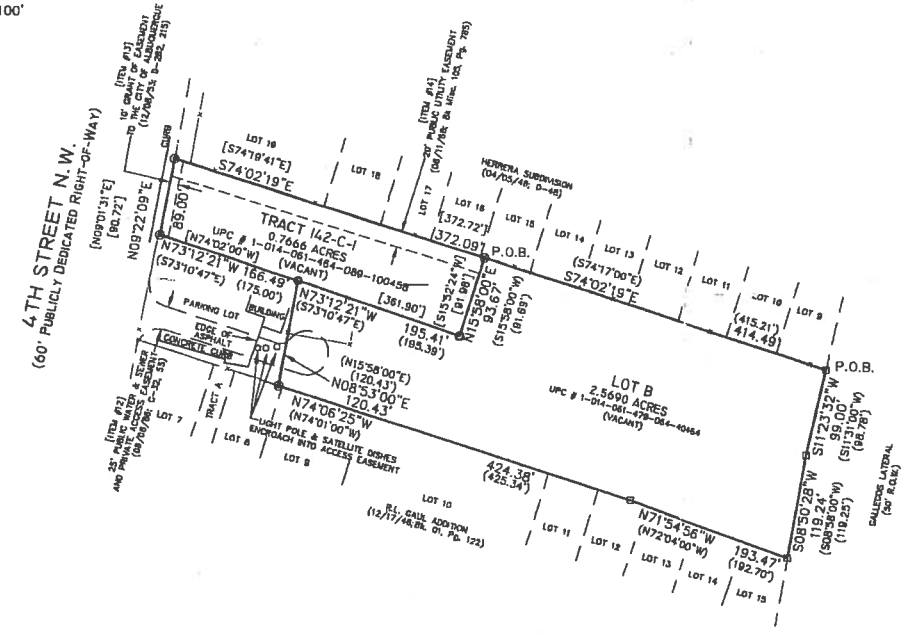
SECTION 32 , T. 11 N., R. 3 E., N.M.P.M.
CITY OF ALBUQUERQUE,
BERNALILLO COUNTY, NEW MEXICO
JANUARY 2001

1" = 100'
PROJECT NO. 0101KH19
DRAWN BY KRH
ZONE ATLAS: F-14-Z
TEAGUE.CR5

SCALE: 1" = 100'

AMENDMENT NOTE:

THIS PLAT IS AMENDED TO CORRECT LANGUAGE IN THE EASEMENT NOTE FOR THE PUBLIC WATER AND SEWER AND PRIVATE ACCESS EASEMENT.



LEGAL DESCRIPTION:

Lot lettered "B" of THE LANDS OF HUBERT R. TEAGUE, being a replat of Tracts 142-C-2, 145-A, and 146-A, M.R.G.C.D. Map No. 32, as the same is shown and designated on the plat thereof, filed in the office of the County Clerk of Bernalillo County, New Mexico on August 8, 1986 in plat Book C31, folio 55.
AND:
A certain tract of land in Section 32, T.11N., R.3E, N.M.P.M., City of Albuquerque, Bernalillo County, New Mexico, designated as Tract 142-C-1 on M.R.G.C.D. Property Map No. 32, and being more particularly described by metes and bounds as follows: Beginning at the Northeast corner of the tract herein described, being the Northwest corner of Lot B, Lands of Hubert R. Teague, as shown and designated on the plat thereof, filed in the office of the County Clerk of Bernalillo County, New Mexico on August 8, 1986; thence, S. 15°58' 00" W., 83.67 feet to the Southeast corner; thence, N. 73°12' 21" W., 361.90 feet to the Southwest corner; thence, N. 09°22' 09" E., 89.00 feet to the Northwest corner; thence, S. 74° 02' 19"E., 372.09 feet to the point of beginning and containing 0.7666 acre, more or less.

NOTES:

1. Basis of bearings south line of Tract 142-C-1, Map 32 per description provided in warranty deed.
2. Bearings and distances in parentheses ( ) are record, where they differ from measured bearings and distances.
3. Property lies within Flood Zone X, areas outside the 500-year flood plane, according to the Flood Insurance Rate Map of Bernalillo County, New Mexico and Incorporated areas, Map Panel No. 35001C0119D, effective date Sept. 20 1998.
4. Documents used:
   a. Plat of lots A and B, Lands of Hubert R. Teague filed August 8, 1986 in plat Book C31, folio 55.
   b. Warranty Deed filed July 30, 1998 in Book 9813, Pg. 3487.
   c. Warranty Deed filed Sept. 24, 1984 in Book D222-A, Pg 375.
   d. First American Title Company commitment No. 01992025, dated June 3, 1999.

SURVEYOR'S CERTIFICATE

I, GARY E. GRITSKO, A NEW MEXICO PROFESSIONAL SURVEYOR HEREBY CERTIFY THAT THIS BOUNDARY SURVEY PLAT WAS PREPARED FROM AN ACTUAL GROUND SURVEY PERFORMED BY ME OR UNDER MY SUPERVISION, THAT I AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, THAT THIS BOUNDARY SURVEY PLAT AND THE FIELD SURVEY UPON WHICH IT IS BASED MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO, AND THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT. THIS IS A BOUNDARY SURVEY PLAT OF AN EXISTING TRACT OR TRACTS.

Gary E. Gritsko — Jan 24, 2001
GARY E. GRITSKO, N.M.P.S. NO. 8686 — Amended FEB 2, 2001 — DATE

GARY E. GRITSKO NEW MEXICO 8686 REGISTERED PROFESSIONAL LAND SURVEYOR

SYMBOLS LEGEND

- ✲ = LIGHT POLE
- —x— = FENCE
- o = SATELLITE DISH

MONUMENT LEGEND

- ⊡ – FOUND No. 4 REBAR P.S. No.6446
- ◎ – SET 1/2" REBAR W/YELLOW PLASTIC CAP STAMPED "G.GRITSKO, PLS 8686" UNLESS OTHERWISE NOTED
- O – FOUND No. 4 REBAR (WITHOUT CAP)

INDEXING INFORMATION FOR COUNTY CLERK

OWNER	THOMAS McALLEN
LOCATION	T11N R3E SEC.32
SUBDIVISION	TEAGUE ADDITION

FIGURE A.

SURVEYS SOUTHWEST LTD.
333 LOMAS BLVD., N.E.
ALBUQUERQUE, NEW MEXICO
87102
PHONE: (505) 998-0303
FAX: (505) 998-0306

T11N R3E SEC. 32

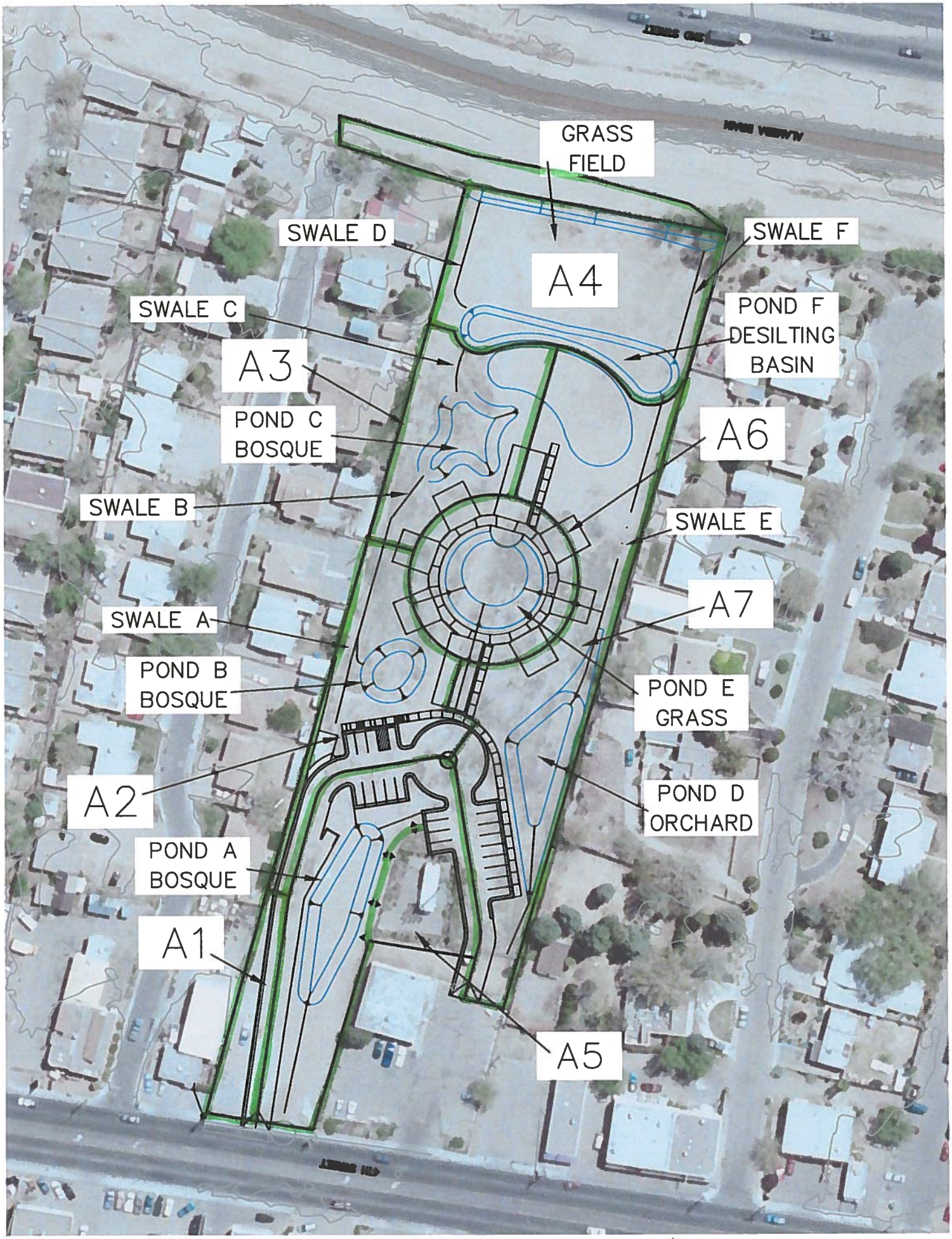


FIGURE C: PROPOSED CONDITIONS SUB-BASIN AREAS N SCALE: 1"= 100'