

# CITY OF ALBUQUERQUE



January 3, 2008

Mario Juarez-Infante, PE  
Wilson & Company  
4900 Lang Ave NE  
Albuquerque, NM 87109

**Re: Navajo Elementary School Drainage Report**  
**Engineer Stamp dated 12-11-07 (N11/D2)**

Dear Mr. Juarez-Infante,

Based upon information provided in your submittal dated 12-11-07, the above referenced drainage report cannot be approved for Building Permit until the following comments are addressed.

- Please provide all details necessary to construct this project. The key note sheet was not provided.
- Provide all necessary information with respect to the Storm Tech chambers (i.e. sizing, spacing, bedding detail, cover depth and material, etc).
- Provide all inverts and grate elevations of the storm drains and inlets.
- You have broken the project up into sub-basins 1-7 and provided no basin map showing how these sub-basins relate with basins 201-203. Is basin 204 not contributing any runoff to this area?
- Since you are retaining all runoff, the design event is the 100 yr, 10-day storm. It is acceptable to store part of this volume underground but the remaining volume must be accounted for in your calculations. Please provide the water surface elevation in the parking lot and keep in mind that there is no credit given for pervious pavement voids because over time these voids will fill with silt.
- There is a lot of material overlapping and this makes the plans hard to read and, therefore, hard to construct.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE  
Principal Engineer, Planning Dept.  
Development and Building Services

C: file

P.O. Box 1293

Albuquerque

New Mexico 87103

[www.cabq.gov](http://www.cabq.gov)

# DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003)

PROJECT TITLE: Navajo Elementary School ZONE MAP/DRG. FILE#: N-10 N-11/DOOZ

DRB#: \_\_\_\_\_ EPC#: \_\_\_\_\_ WORK ORDER #: \_\_\_\_\_

LEGAL DESCRIPTION: Map 47 TR 6 4.64 AC

CITY ADDRESS: 2936 Hughes RD

ENGINEERING FIRM: Wilson & Company Inc., E&A CONTACT: Mario Juarez-Infante, PE

ADDRESS: 4900 Lang Ave. NW PHONE: (505) 348-4064

CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: APS CONTACT: Rolden Pasion

ADDRESS: 915 Oak Street PHONE: 505-848-8810

CITY, STATE: Albuquerque, NM ZIP CODE: 87106

ARCHITECT: \_\_\_\_\_ CONTACT: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ PHONE: \_\_\_\_\_

CITY, STATE: \_\_\_\_\_ ZIP CODE: \_\_\_\_\_

SURVEYOR: \_\_\_\_\_ CONTACT: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ PHONE: \_\_\_\_\_

CITY, STATE: \_\_\_\_\_ ZIP CODE: \_\_\_\_\_

CONTRACTOR: - CONTACT: -

ADDRESS: - PHONE: -

CITY, STATE: - ZIP CODE: -

## CHECK TYPE OF SUBMITTAL:

- ☒ DRAINAGE REPORT
- ☒ DRAINAGE PLAN 1<sup>st</sup> SUBMITTAL, REQUIRES TCL OR EQUAL
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☒ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEERS CERTIFICATION (HYDROLOGY)
- ☐ CLOMR\LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION (TCL)
- ☐ ENGINEERS CERTIFICATION (DRB, APPR. SITE PLAN)
- ☐ OTHER

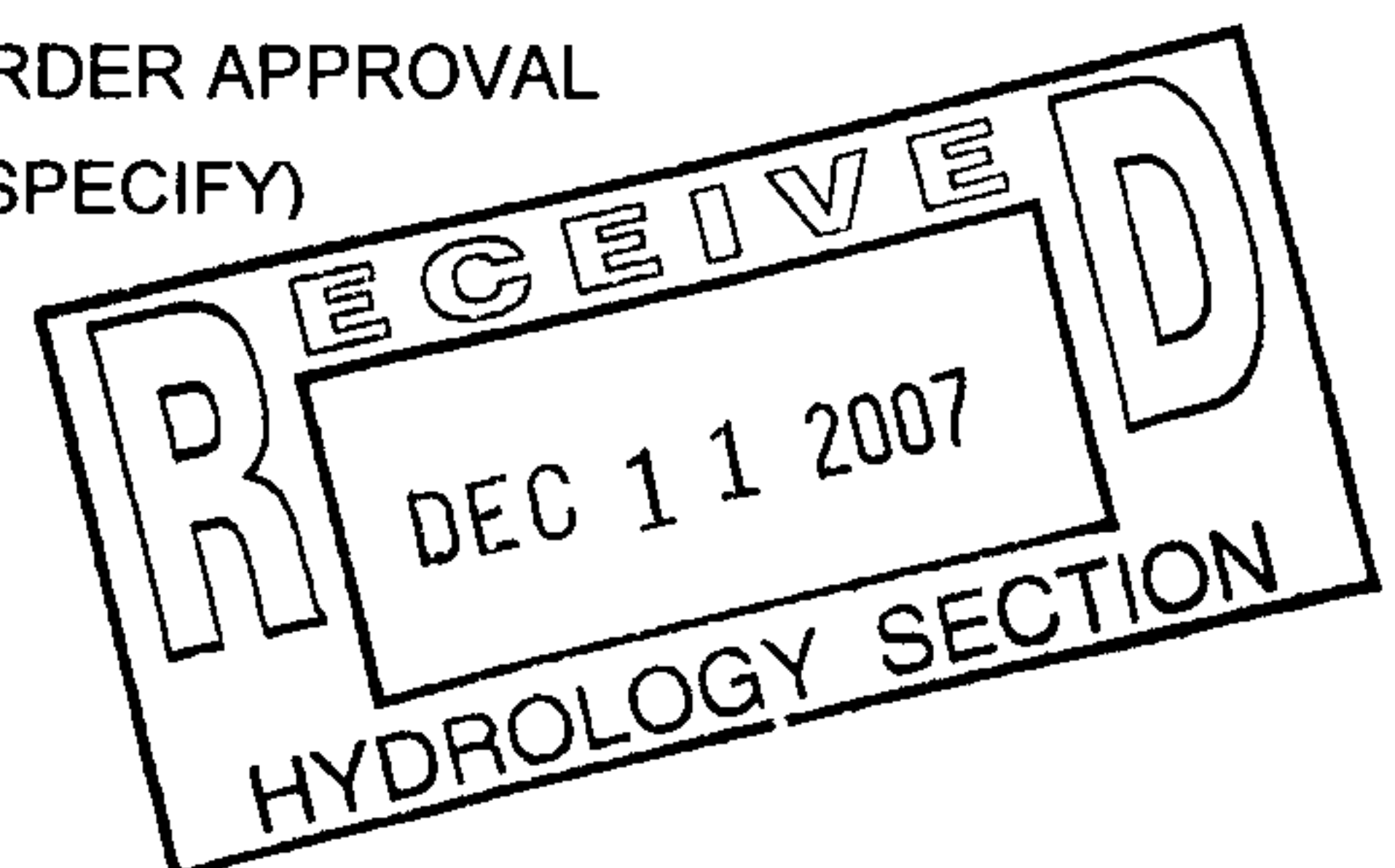
## CHECK TYPE OF APPROVAL SOUGHT:

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

## WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
- ☒ NO

B SO DO



Date Submitted: 12-10-07

By: Marco A. Gamboa

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of 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
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5)
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

# **Navajo Elementary School Drainage Report**

**Prepared for**



**Prepared by:**

**Wilson & Company, Inc.  
4900 Lang Avenue  
Albuquerque, New Mexico 87144  
(505) 348-4000 Phone  
(505) 348-4072 Fax**

# ***Navajo Elementary School***

## **Drainage Report**

Prepared by

**WILSON**  
& COMPANY  
ENGINEERS & ARCHITECTS

4900 Lang Ave. NE  
Albuquerque, NM 87109

**FINAL SUBMITTAL VERSION**

**December 11, 2007**

I, Mario G. Juarez-Infante, P.E., do hereby certify that this document was prepared by me or under my direction, and is true and correct to the best of my knowledge and belief and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

Mario G. Juarez-Infante, P.E., CFM  
NMPE No. 15340

Date

12/11/07



**Navajo Elementary School Drainage Analysis**

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## **NAVAJO ELEMENTARY SCHOOL Drainage Report**

### **I. Site Location**

Navajo Elementary School is located at 2936 Hughes Rd, in Southwest Albuquerque, NM. The School will be undergoing approximately 33,700 ft<sup>2</sup> of new building construction. Building construction includes a new class room addition, media center, administration addition and new cafeteria. The expansion will replace existing classroom portables and buildings. A new parking lot major storm drain conveyance and underground detention facility will be constructed as part of the proposed infrastructure.



Figure 1- Zone Atlas N-10

### **II. Project Description**

The purpose of this drainage report is to determine hydrologic/ hydraulic analysis of post development flows and provide recommendations for mitigating peak flow and volumetric run-off. The site will self contain its volumetric flow in an underground storage system called StormTech.

### **III. Methodology**

Section 22.2 of City of Albuquerque Development Process Manual (DPM) was followed to perform hydrologic analysis. All calculations are based on the 100-year, 6-hour event for peak discharge and 100 year, 24 hour event for volumetric runoff. The site is located in Zone 1.



## IV. Hydrology

### *a. Existing Conditions*

The site topography is relatively flat with no defined off-site outfall. The site has three soil types Gila clay loam (Ge), Vinton loamy sand (Va) and Vinton clay loam (Vc), according to the NRCS website (<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>) the campus is subdivided into seven basins as shown in figure 2. The site is comprised of three different land treatments; Type B, C, and D. Land treatment B is described as irrigated lawns and parks and makes up approximate 1.15 acres of the existing grass field located along the west campus area. Type C describes soil compacted by human activity with minimal vegetation which occupies approximately 3.51 acres. Finally land treatment D, impervious, makes up the remaining area of approximately 6.02 acres.

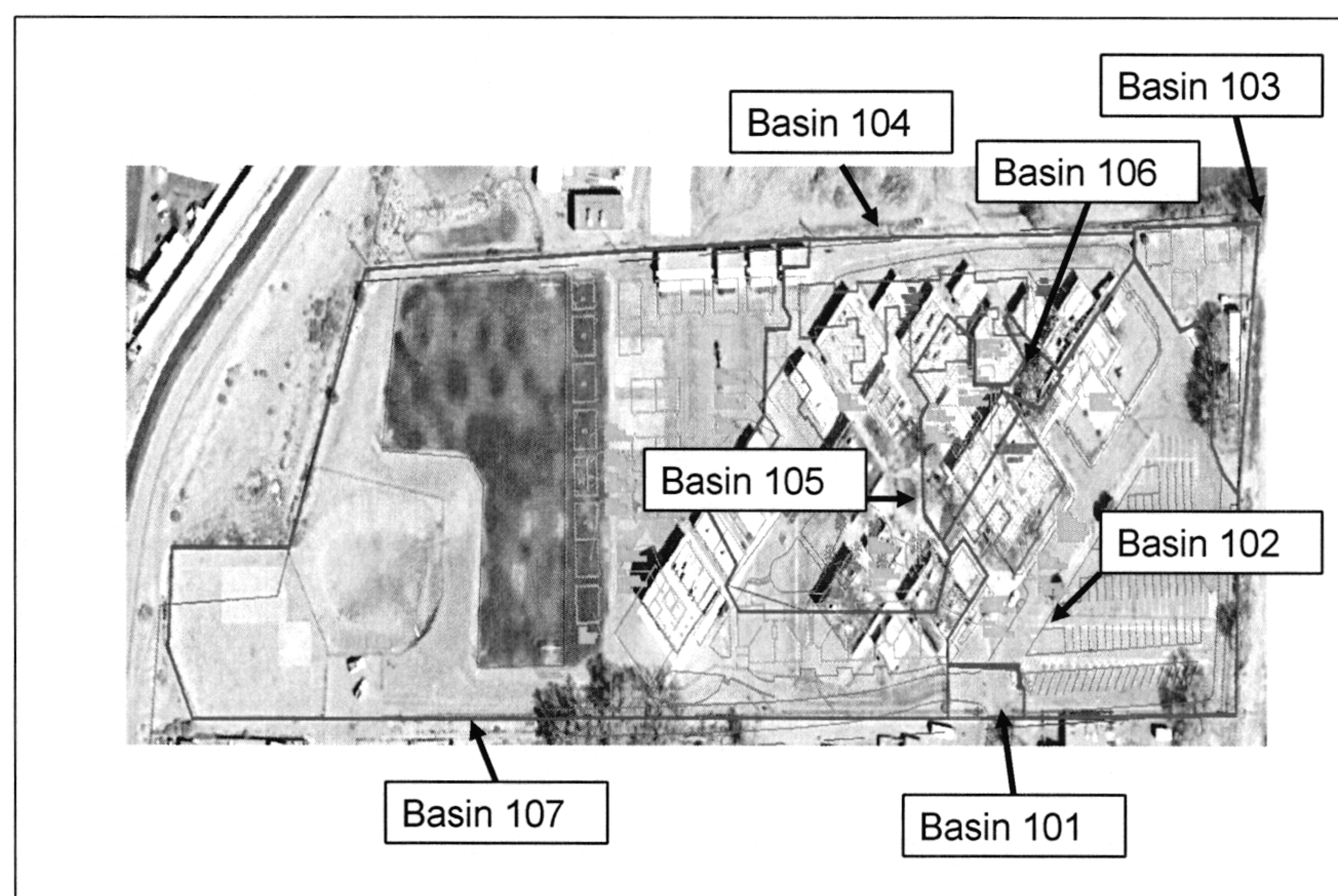


Figure 2- Existing Basin Map

Table 1- Existing Hydrology

<i>Existing Basin</i>	<i>Total Area (acres)</i>	<i>Peak Discharge (ft<sup>3</sup>/s)</i>	<i>Volume (acre-ft)</i>
Basin 101	0.09	0.38	0.01
Basin 102	2.15	9.31	0.34
Basin 103	0.36	1.26	0.04
Basin 104	2.01	7.64	0.26
Basin 105	0.29	1.03	0.04
Basin 106	0.06	0.2	0.01
Basin 107	5.72	19.14	0.61
<b>TOTAL</b>	<b>10.68</b>	<b>38.96</b>	<b>1.31</b>



*b. Proposed Conditions*

Improvements will include new buildings, removing and relocating portables and flat work. The site will have an underground drainage to collect the total runoff from the site, and conveyed to an underground detention facility. The underground system called StormTech will be installed under the parking lot of the site.

Post development flows are based on fully developed land treatments. Proposed condition will increase Type D treatment and decrease Type C land treatment. Basin 204 encompasses the western area of the campus where no development will occur, and therefore not shown for clarity purpose in figure 3. Basins 201-203 will be collected and conveyed to an underground detention facility system called StormTech.

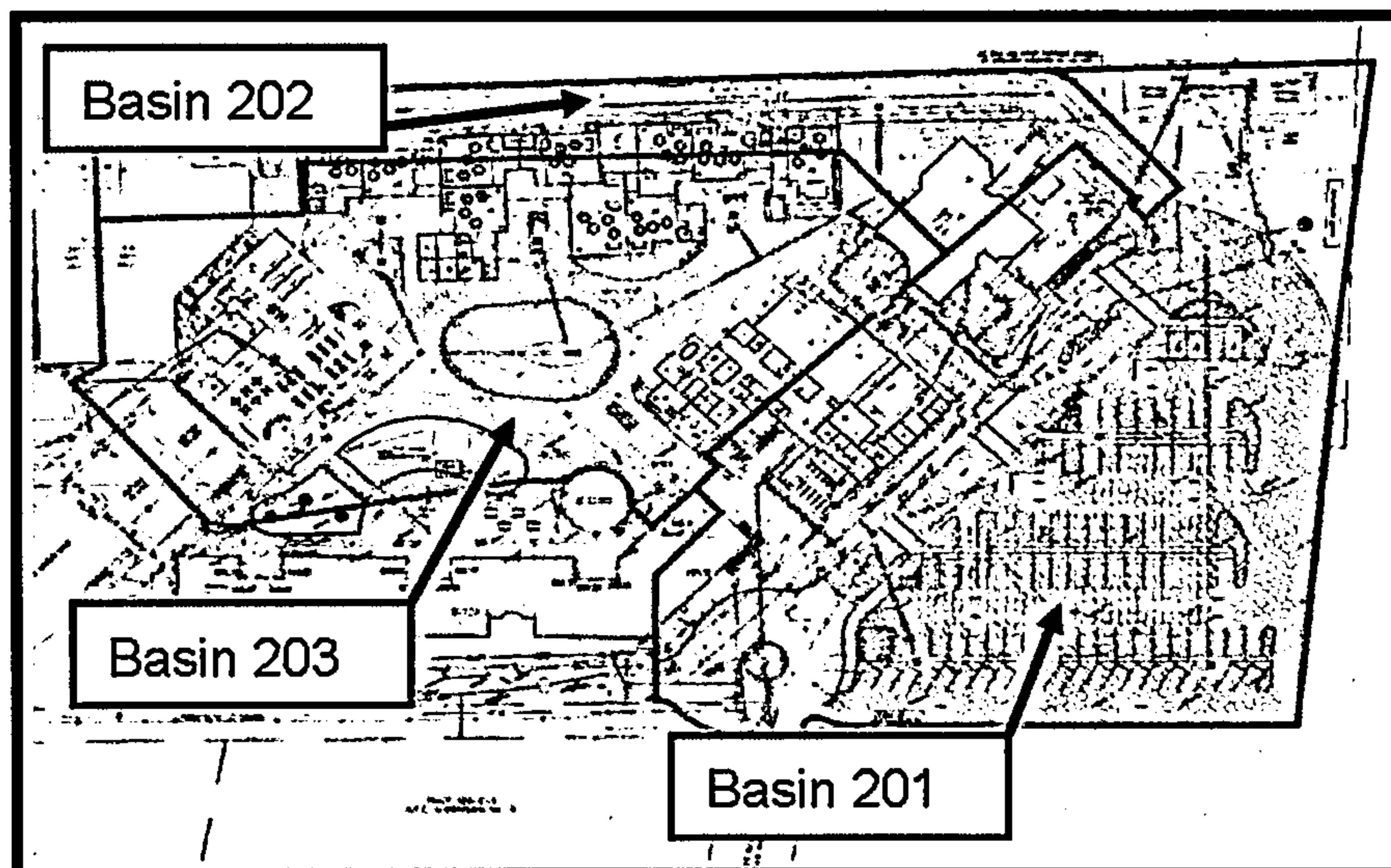


Figure 3- Proposed Basin Map

Table 2- Proposed Hydrology

<i>Proposed Basin</i>	<i>Total Area (acres)</i>	<i>Peak Discharge (ft<sup>3</sup>/s)</i>	<i>Volume (acre-ft)</i>
Basin 201	2.46	10.74	0.4
Basin 202	0.75	3.2	0.12
Basin 203	1.75	7.7	0.28
Basin 204	5.72	20.79	0.70
<b>TOTAL</b>	<b>10.68</b>	<b>42.43</b>	<b>1.50</b>

10-24 The total increase between the proposed conditions and the existing is 8.11% for runoff and 13.7% for volumetric flow. The StormTech system was designed to contain a 100 year, 6 hour event which is equivalent to a volumetric flow of 0.80 acre-ft. Over flow during the 100 year, 24 hour event will be contained within the east parking lot, which is a porous pavement.



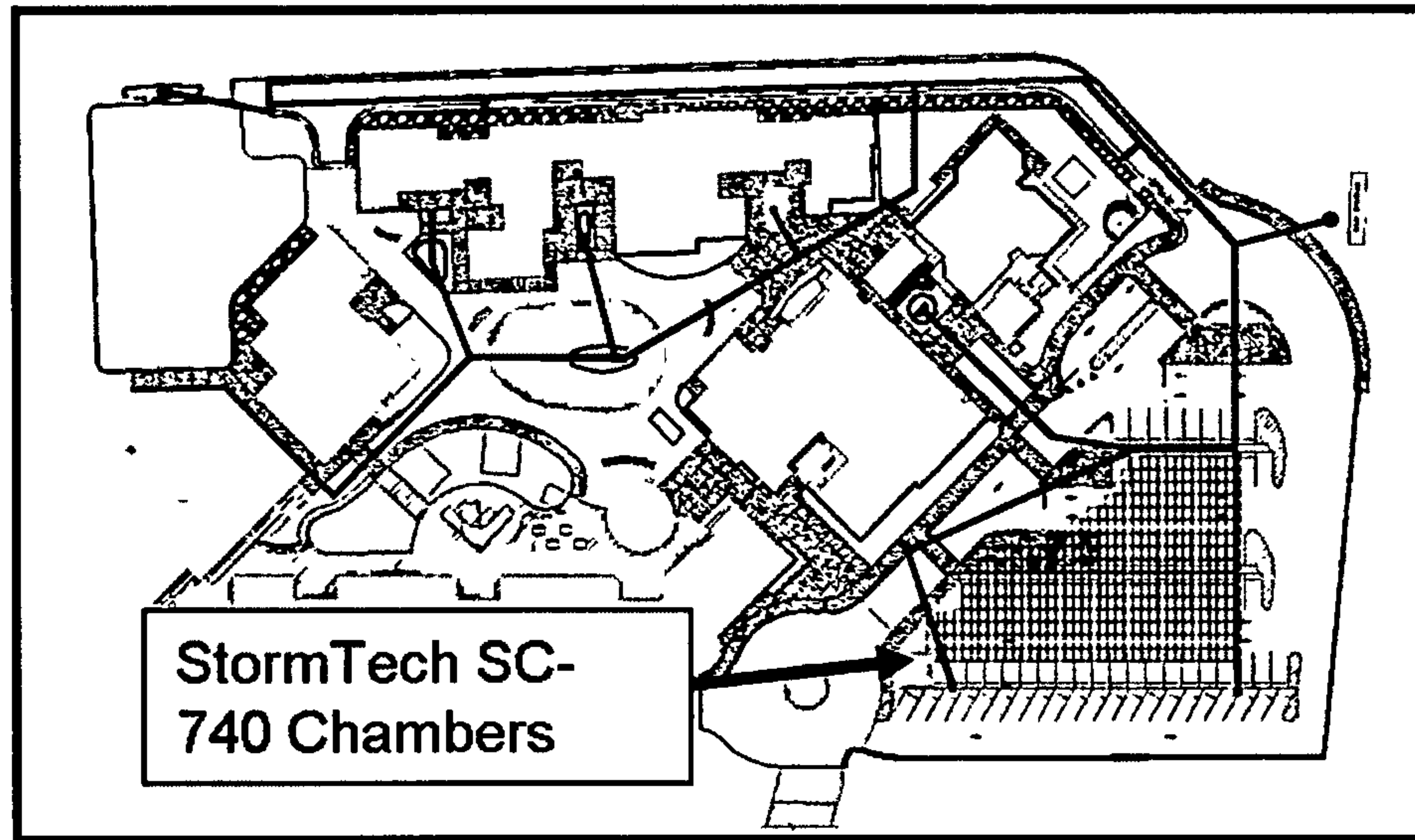


Figure 4- StormTech chambers Map

The total required number of StormTech chambers to detain the volumetric runoff is 394 units, within 18" foundation and type SC-740 chamber.

In order to calculate the number of chambers the following equation was used:

- Volumetric flow for the 100 year, 6 hour of  $V_s = 0.80$  acre-ft = 34,848.1  $\text{ft}^3$
- Chamber Storage = 88.4  $\text{ft}^3$  \*

$$C = \left( \frac{V_s}{\text{ChamberStorage}} \right)$$

$$C = \left( \frac{34848.1}{88.4} \right) = 394 \text{ Chambers}$$

To determine the required bed size for the StormTech System the following formula was used:

- Bed perimeter 347.5 ft
- Bed area per chamber = 33.8  $\text{ft}^2$  \*

$$S = (C \times 33.8 \text{ ft}^2) + (1 \text{ ft} \times \text{bedperimeter})$$

$$S = (394 \times 33.8) + (1 \times 347.5) = 13,732.3 \text{ ft}^2$$

End Caps (Ec) Required

- Number of Rows = 17

$$\text{Ec} = \text{Number of Rows} \times 2$$

$$\text{Ec} = 17 \times 2 = 34 \text{ End Caps}$$

\*For values see tables from the "StormTech Manual Design"

## V. Hydraulic Analysis

To determine the diameter of the pipes for the storm drain system, the peak discharge of 21.62 ft<sup>3</sup>/s was used for the Proposed Basins 201-203. Using Manning's Equation, the diameter of the pipes were determined. A roughness coefficient of 0.013 was assumed for plastic pipe and a constant k coefficient of 1.46 (for USCS). Using these parameters the diameter was calculated to be as shown on Table 3.

Table 3- Proposed Pipe Diameter

<i>Basin</i>	<i>Manning's Equation Diameter (in)</i>	<i>Recommended Pipe Diameter (in)</i>
201	16.83	18
202	10.68	18
203	14.85	18

## VI. Conclusion

Navajo Elementary School will be having some improvements which include several buildings and a new parking lot. Navajo Elementary school has a total area of 10.68 acres. The existing hydrology was calculated to be 38.96 ft<sup>3</sup>/s for the total runoff and has a total volumetric flow of 1.31 acre-ft. For Basin 201-203 the proposed runoff is 21.62 ft<sup>3</sup>/s and has a volumetric flow of 0.80 acre-ft; the entire site has a runoff of 42.43 ft<sup>3</sup>/s and a volumetric flow of 1.50 acre-ft. The proposed minimum diameter for the infrastructure pipe is 18 inches. The StormTech system will be installed below the east parking lot located in basin 201. The project analysis is in compliance with the DPM Volume 2, Design Criteria for the City of Albuquerque, New Mexico.

*Not quite*



# APPENDIX A

## HYDROLOGY CALCULATIONS

ASSUMED	
ZONE	1.00
Land treatment	C
Land treatment	D
Land treatment	B
100 yr 6 hr event	

Appendix A Hydrology and Volumetric Runoff  
( Existing and Proposed)

HYDROLOGY ( EXISTING CONDITIONS)

	TOTAL AREA (ft <sup>2</sup> )	Type D ft <sup>2</sup>	TYPE C ft <sup>2</sup>	Type B ft <sup>2</sup>
Sub Basin 1	3,920.42	3,528.38	392.04	
Sub Basin 2	93,654.37	88,971.65	4,682.72	
Sub Basin 3	15,681.66	4,704.50	10,977.16	
Sub Basin 4	87,555.95	52,533.57	35,022.38	
Sub Basin 5	12,632.45	5,937.25	6,695.20	
Sub Basin 6	2,613.61	784.08	1,829.53	
Sub Basin 7	249,164.20	105,894.79	93,175.22	50,094.20
<b>TOTAL AREA( ft<sup>2</sup>)</b>	<b>465,222.66</b>	<b>262,354.22</b>	<b>152,774.24</b>	<b>50,094.20</b>
<b>TOTAL AREA(acres)</b>	<b>10.68</b>	<b>6.02</b>	<b>3.51</b>	<b>1.15</b>



HYDROLOGY ( EXISTING CONDITIONS)

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>IMPERVIOUS DATA ft<sup>2</sup></i>	<i>SOIL TYPE C ft<sup>2</sup></i>	<i>Soil Type B ft<sup>2</sup></i>
Sub Basin 1	3,920.42	3,528.38	392.04	0.00

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	392.04
Area of watershed (acres)	0.01
Q <sub>C</sub> =	0.03 ft <sup>3</sup> /s

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	3,528.38
Area of watershed (acres)	0.08
Q <sub>D</sub> =	0.36 ft <sup>3</sup> /s

$Q_T = Q_C + Q_I$	0.38	ft <sup>3</sup> /s
Sum of Areas	0.09	acres

<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	0.00
Area of watershed (acres)	0.00
Q <sub>B</sub> =	0.00 ft <sup>3</sup> /s

TOTAL Q <sub>T</sub> =	0.38	ft <sup>3</sup> /s
TOTAL AREA=	10.68	acres

HYDROLOGY ( EXISTING CONDITIONS)

	TOTAL AREA (ft <sup>2</sup> )	IMPERVIOUS DATA ft <sup>2</sup>	SOIL TYPE C ft <sup>2</sup>	Soil Type B ft <sup>2</sup>
Sub Basin 2	93,654.37	88,971.65	4,682.72	0.00

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	4,682.72
Area of watershed (acres)	0.11
Q <sub>C</sub> =	0.31 ft <sup>3</sup> /s

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	88,971.65
Area of watershed (acres)	2.04
Q <sub>D</sub> =	9.00 ft <sup>3</sup> /s

Q <sub>T</sub> =Q <sub>C</sub> +Q <sub>I</sub>	9.31	ft <sup>3</sup> /s
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Sum of Areas	2.15	acres
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<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	0.00
Area of watershed (acres)	0.00
Q <sub>B</sub> =	0.00 ft <sup>3</sup> /s

TOTAL Q <sub>T</sub> =	9.31	ft <sup>3</sup> /s
TOTAL AREA=	0.00	acres



HYDROLOGY ( EXISTING CONDITIONS)

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>IMPERVIOUS DATA ft<sup>2</sup></i>	<i>SOIL TYPE C ft<sup>2</sup></i>	<i>Soil Type B ft<sup>2</sup></i>
Sub Basin 3	15,681.66	6,272.66	9,409.00	

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	9,409.00
Area of watershed (acres)	0.22
Q <sub>C</sub> =	0.62 ft <sup>3</sup> /s

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	6,272.66
Area of watershed (acres)	0.14
Q <sub>D</sub> =	0.63 ft <sup>3</sup> /s

$Q_T = Q_C + Q_I$	1.26	ft <sup>3</sup> /s
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<i>Sum of Areas</i>	0.36	acres
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<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	0.00
Area of watershed (acres)	0.00
Q <sub>B</sub> =	0.00 ft <sup>3</sup> /s

<i>TOTAL Q<sub>T</sub> =</i>	1.26	ft <sup>3</sup> /s
TOTAL AREA=	0.00	acres

HYDROLOGY ( EXISTING CONDITIONS)

	TOTAL AREA (ft <sup>2</sup> )	IMPERVIOUS DATA ft <sup>2</sup>	SOIL TYPE C ft <sup>2</sup>	Soil Type B ft <sup>2</sup>
Sub Basin 4	87,555.95	52,533.57	35,022.38	0.00

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	35,022.38
Area of watershed (acres)	0.80
Q <sub>C</sub> =	2.32 ft <sup>3</sup> /s

Q <sub>T</sub> =Q <sub>C</sub> +Q <sub>I</sub>	7.64	ft <sup>3</sup> /s
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Sum of Areas	2.01	acres
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TOTAL Q <sub>T</sub> =	7.64	ft <sup>3</sup> /s
TOTAL AREA=	0.00	acres

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	52,533.57
Area of watershed (acres)	1.21
Q <sub>D</sub> =	5.32 ft <sup>3</sup> /s

<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	0.00
Area of watershed (acres)	0.00
Q <sub>B</sub> =	0.00 ft <sup>3</sup> /s



HYDROLOGY ( EXISTING CONDITIONS)

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>IMPERVIOUS DATA ft<sup>2</sup></i>	<i>SOIL TYPE C ft<sup>2</sup></i>	<i>Soil Type B ft<sup>2</sup></i>
Sub Basin 5	12,632.45	5,937.25	6,695.20	0.00

<i>Type C soil</i>		
Rational Coefficient , C	0.61	
Peak Intensity, I (in/hr)	4.70	
Peak Intensity, I (ft/sec)	0.00	
Area of watershed (ft <sup>2</sup> )	6,695.20	
Area of watershed (acres)	0.15	
Q <sub>C</sub> =	0.44 ft <sup>3</sup> /s	

<i>Type D soil</i>		
Rational Coefficient , C	0.93	
Peak Intensity, I (in/hr)	4.70	
Peak Intensity, I (ft/sec)	0.00	
Area of watershed (ft <sup>2</sup> )	5,937.25	
Area of watershed (acres)	0.14	
Q <sub>D</sub> =	0.60 ft <sup>3</sup> /s	

$Q_T = Q_C + Q_I$	1.05	ft <sup>3</sup> /s
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Sum of Areas	0.29	acres
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<i>Type B soil</i>		
Rational Coefficient , C	0.43	
Peak Intensity, I (in/hr)	4.70	
Peak Intensity, I (ft/sec)	0.00	
Area of watershed (ft <sup>2</sup> )	0.00	
Area of watershed (acres)	0.00	
Q <sub>B</sub> =	0.00 ft <sup>3</sup> /s	

TOTAL Q <sub>T</sub> =	1.05	ft <sup>3</sup> /s
TOTAL AREA=	0.00	acres

HYDROLOGY ( EXISTING CONDITIONS)

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>IMPERVIOUS DATA ft<sup>2</sup></i>	<i>SOIL TYPE C ft<sup>2</sup></i>	<i>Soil Type B ft<sup>2</sup></i>
Sub Basin 6	2,613.61	784.08	1,829.53	0.00

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	1,829.53
Area of watershed (acres)	0.04
Q <sub>C</sub> =	0.12 ft <sup>3</sup> /s

$Q_T = Q_C + Q_I$	0.20	ft <sup>3</sup> /s
Sum of Areas	0.06	acres

TOTAL Q <sub>T</sub> =	0.20	ft <sup>3</sup> /s
TOTAL AREA=	0.00	acres

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	784.08
Area of watershed (acres)	0.02
Q <sub>D</sub> =	0.08 ft <sup>3</sup> /s

<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	0.00
Area of watershed (acres)	0.00
Q <sub>B</sub> =	0.00 ft <sup>3</sup> /s

HYDROLOGY ( EXISTING CONDITIONS)

	TOTAL AREA (ft <sup>2</sup> )	IMPERVIOUS DATA ft <sup>2</sup>	SOIL TYPE C ft <sup>2</sup>	Soil Type B ft <sup>2</sup>
Sub Basin 7	249,164.20	105,894.79	93,175.22	50,094.20

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	93,175.22
Area of watershed (acres)	2.14
Q <sub>C</sub> =	6.18 ft <sup>3</sup> /s

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	105,894.79
Area of watershed (acres)	2.43
Q <sub>D</sub> =	10.71 ft <sup>3</sup> /s

Q <sub>T</sub> =Q <sub>C</sub> +Q <sub>I</sub>	19.24	ft <sup>3</sup> /s
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Sum of Areas	5.72	acres
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<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	50,094.20
Area of watershed (acres)	1.15
Q <sub>B</sub> =	2.34 ft <sup>3</sup> /s

TOTAL Q <sub>T</sub> =	19.24	ft <sup>3</sup> /s
TOTAL AREA=	0.00	acres



ZONE	1.00
Land treatment	B
Land treatment	C
Land treatment	D
100 yr 6 hr event	

VOLUMETRIC RUNOFF  
EXISTING CONDITIONS

	TOTAL AREA (ft <sup>2</sup> )	Type D ft <sup>2</sup>	TYPE C ft <sup>2</sup>	Type B ft <sup>2</sup>	Type A ft <sup>2</sup>
Sub Basin 1	3,920.42	3,528.38	392.04		
Sub Basin 2	93,654.37	88,971.65	4,682.72		
Sub Basin 3	15,681.66	4,704.50	10,977.16		
Sub Basin 4	87,555.95	52,533.57	35,022.38		
Sub Basin 5	12,632.45	5,937.25	6,695.20		
Sub Basin 6	2,613.61	784.08	1,829.53		
Sub Basin 7	249,164.20	74,749.26	174,414.94		
TOTAL AREA( ft <sup>2</sup> )	465,222.66	231,208.69	234,013.97		ft <sup>2</sup>
TOTAL AREA(acres)	10.68	5.31	5.37		acres

VOLUMETRIC RUNOFF EXISTING CONDITIONS

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>Type D ft<sup>2</sup></i>	<i>TYPE C ft<sup>2</sup></i>	<i>Type B ft<sup>2</sup></i>	<i>Type A ft<sup>2</sup></i>
Sub Basin 101	3,920.42	3,528.38	392.04	0.00	0.00

<i>E<sub>s</sub></i> =	<i>0.44</i>	<i>in</i>
E <sub>b</sub> =	0.67	in
E <sub>c</sub> =	0.99	in
E <sub>d</sub> =	1.97	in
Area A	0.00	ft <sup>2</sup>
Area A	0.00	acres
Area B	0.00	ft <sup>2</sup>
Area B	0.00	acres
Area C	392.04	ft <sup>2</sup>
Area C	0.01	acres
Area D	3,528.38	ft <sup>2</sup>
Area D	0.08	acres
Total Area Sum	0.09	acres

<i>Weighted E</i>	<i>1.87</i>	<i>in</i>
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<i>V<sub>360</sub></i> =Volume =	<i>0.01</i>	<i>acre-ft</i>
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<i>10 Day storm</i>	
<i>Zone</i>	<i>1.00</i>
P <sub>360</sub>	2.20 in
P <sub>10 days</sub>	3.67 in
A <sub>D</sub>	0.08 acres
V <sub>10 days</sub>	0.02 acre-ft

VOLUMETRIC RUNOFF EXISTING CONDITIONS

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>Type D ft<sup>2</sup></i>	<i>TYPE C ft<sup>2</sup></i>	<i>Type B ft<sup>2</sup></i>	<i>Type A ft<sup>2</sup></i>
Sub Basin 102	93,654.37	88,971.65	4,682.72		

<i>E<sub>s</sub> =</i>	<i>0.44</i>	<i>in</i>
E <sub>b</sub> =	0.67	in
E <sub>c</sub> =	0.99	in
E <sub>d</sub> =	1.97	in
Area A	0.00	ft <sup>2</sup>
Area A	0.00	acres
Area B	0.00	ft <sup>2</sup>
Area B	0.00	acres
Area C	4,682.72	ft <sup>2</sup>
Area C	0.11	acres
Area D	88,971.65	ft <sup>2</sup>
Area D	2.04	acres
Total Area Sum	2.15	acres

<i>Weighted E</i>	<i>1.92</i>	<i>in</i>
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<i>V<sub>360</sub>=Volume =</i>	<i>0.34</i>	<i>acre-ft</i>
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<i>10 Day storm</i>	
<i>Zone</i>	<i>1.00</i>
P <sub>360</sub>	2.20 in
P <sub>10 days</sub>	3.67 in
A <sub>D</sub>	2.04 acres
V <sub>10 days</sub>	0.59 acre-ft



VOLUMETRIC RUNOFF EXISTING CONDITIONS

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>Type D ft<sup>2</sup></i>	<i>TYPE C ft<sup>2</sup></i>	<i>Type B ft<sup>2</sup></i>	<i>Type A ft<sup>2</sup></i>
Sub Basin 103	15,681.66	4,704.50	10,977.16		

<i>E<sub>a</sub></i> =	<i>0.44</i>	<i>in</i>
E <sub>b</sub> =	0.67 in	
E <sub>c</sub> =	0.99 in	
E <sub>d</sub> =	1.97 in	
Area A	0.00 ft <sup>2</sup>	
Area A	0.00 acres	
Area B	0.00 ft <sup>2</sup>	
Area B	0.00 acres	
Area C	10,977.16 ft <sup>2</sup>	
Area C	0.25 acres	
Area D	4,704.50 ft <sup>2</sup>	
Area D	0.11 acres	
Total Area Sum	0.36 acres	

<i>Weighted E</i>	<i>1.28</i>	<i>in</i>
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<i>V<sub>360</sub></i> =Volume =	<i>0.04</i>	<i>acre-ft</i>
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<i>10 Day storm</i>	
<i>Zone</i>	<i>1.00</i>
P <sub>360</sub>	2.20 in
P <sub>10 days</sub>	3.67 in
A <sub>D</sub>	0.11 acres
V <sub>10 days</sub>	0.05 acre-ft

VOLUMETRIC RUNOFF EXISTING CONDITIONS

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>Type D ft<sup>2</sup></i>	<i>TYPE C ft<sup>2</sup></i>	<i>Type B ft<sup>2</sup></i>	<i>Type A ft<sup>2</sup></i>
Sub Basin 104	87,555.95	52,533.57	35,022.38	0.00	0.00

<i>E<sub>s</sub> =</i>	<i>0.44</i>	<i>in</i>
E <sub>b</sub> =	0.67	in
E <sub>c</sub> =	0.99	in
E <sub>d</sub> =	1.97	in
Area A	0.00	ft <sup>2</sup>
Area A	0.00	acres
Area B	0.00	ft <sup>2</sup>
Area B	0.00	acres
Area C	35,022.38	ft <sup>2</sup>
Area C	0.80	acres
Area D	52,533.57	ft <sup>2</sup>
Area D	1.21	acres
Total Area Sum	2.01	acres

<i>Weighted E</i>	<i>1.58</i>	<i>in</i>
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<i>V<sub>360</sub>=Volume =</i>	<i>0.26</i>	<i>acre-ft</i>
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<i>10 Day storm</i>	
<i>Zone</i>	<i>1.00</i>
P <sub>360</sub>	2.20 in
P <sub>10 days</sub>	3.67 in
A <sub>D</sub>	1.21 acres
V <sub>10 days</sub>	0.41 acre-ft

VOLUMETRIC RUNOFF EXISTING CONDITIONS

	TOTAL AREA (ft <sup>2</sup> )	Type D ft <sup>2</sup>	TYPE C ft <sup>2</sup>	Type B ft <sup>2</sup>	Type A ft <sup>2</sup>
Sub Basin 105	12,632.45	5,937.25	6,695.20		

<b>E<sub>s</sub> =</b>	<b>0.44</b>	<b>in</b>
E <sub>b</sub> =	0.67	in
E <sub>c</sub> =	0.99	in
E <sub>d</sub> =	1.97	in
Area A	0.00	ft <sup>2</sup>
Area A	0.00	acres
Area B	0.00	ft <sup>2</sup>
Area B	0.00	acres
Area C	6,695.20	ft <sup>2</sup>
Area C	0.15	acres
Area D	5,937.25	ft <sup>2</sup>
Area D	0.14	acres
Total Area Sum	0.29	acres

<b>Weighted E</b>	<b>1.45</b>	<b>in</b>
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<b>V<sub>360</sub>=Volume =</b>	<b>0.04</b>	<b>acre-ft</b>
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<b>10 Day storm</b>	
<b>Zone</b>	<b>1.00</b>
P <sub>360</sub>	2.20 in
P <sub>10 days</sub>	3.67 in
A <sub>D</sub>	0.14 acres
V <sub>10 days</sub>	0.05 acre-ft



VOLUMETRIC RUNOFF EXISTING CONDITIONS

	TOTAL AREA (ft <sup>2</sup> )	Type D ft <sup>2</sup>	TYPE C ft <sup>2</sup>	Type B ft <sup>2</sup>	Type A ft <sup>2</sup>
Sub Basin 106	2,613.61	784.08	1,829.53	0.00	0.00

<b>E<sub>s</sub> =</b>	<b>0.44</b>	<b>in</b>
E <sub>b</sub> =	0.67	in
E <sub>c</sub> =	0.99	in
E <sub>d</sub> =	1.97	in
Area A	0.00	ft <sup>2</sup>
Area A	0.00	acres
Area B	0.00	ft <sup>2</sup>
Area B	0.00	acres
Area C	1,829.53	ft <sup>2</sup>
Area C	0.04	acres
Area D	784.08	ft <sup>2</sup>
Area D	0.02	acres
Total Area Sum	0.06	acres

<b>Weighted E</b>	<b>1.28</b>	<b>in</b>
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<b>V<sub>360</sub>=Volume =</b>	<b>0.01</b>	<b>acre-ft</b>
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<b>10 Day storm</b>	
<b>Zone</b>	<b>1.00</b>
P <sub>360</sub>	2.20 in
P <sub>10 days</sub>	3.67 in
A <sub>D</sub>	0.02 acres
V <sub>10 days</sub>	0.01 acre-ft

VOLUMETRIC RUNOFF EXISTING CONDITIONS

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>Type D ft<sup>2</sup></i>	<i>TYPE C ft<sup>2</sup></i>	<i>Type B ft<sup>2</sup></i>	<i>Type A ft<sup>2</sup></i>
Sub Basin 107	249,164.20	74,749.26	174,414.94	0.00	0.00

<i>E<sub>s</sub> =</i>	<i>0.44</i>	<i>in</i>
E <sub>b</sub> =	0.67	in
E <sub>c</sub> =	0.99	in
E <sub>d</sub> =	1.97	in
Area A	0.00	ft <sup>2</sup>
Area A	0.00	acres
Area B	0.00	ft <sup>2</sup>
Area B	0.00	acres
Area C	174,414.94	ft <sup>2</sup>
Area C	4.00	acres
Area D	74,749.26	ft <sup>2</sup>
Area D	1.72	acres
Total Area Sum	5.72	acres

<i>Weighted E</i>	<i>1.28</i>	<i>in</i>
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<i>V<sub>360</sub>=Volume =</i>	<i>0.61</i>	<i>acre-ft</i>
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<i>10 Day storm</i>	
<i>Zone</i>	<i>1.00</i>
P <sub>360</sub>	2.20 in
P <sub>10 days</sub>	3.67 in
A <sub>D</sub>	1.72 acres
V <sub>10 days</sub>	0.82 acre-ft

ASSUMED	
ZONE	1.00
Land treatment	C
Land treatment	D
Land treatment	B
100 yr 6 hr event	

Appendix A Hydrology and Volumetric Runoff  
( Existing and Proposed)

HYDROLOGY ( EXISTING CONDITIONS)

	TOTAL AREA (ft <sup>2</sup> )	Type D ft <sup>2</sup>	TYPE C ft <sup>2</sup>	Type B ft <sup>2</sup>
Sub Basin 1	107,065.81	104,389.16	2,676.65	
Sub Basin 2	32,754.32	29,478.89	3,275.43	
Sub Basin 3	76,380.31	74,852.70	1,527.61	
Sub Basin 4	249,164.20	122,090.46	127,073.74	
TOTAL AREA( ft <sup>2</sup> )	465,364.64	330,811.21	134,553.43	
TOTAL AREA(acres)	10.68	7.59	3.09	



HYDROLOGY ( EXISTING CONDITIONS)

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>IMPERVIOUS DATA ft<sup>2</sup></i>	<i>SOIL TYPE C ft<sup>2</sup></i>	<i>Soil Type B ft<sup>2</sup></i>
Sub Basin 1	107,065.81	104,389.16	2,676.65	0.00

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	2,676.65
Area of watershed (acres)	0.06
Q <sub>C</sub> =	0.18 ft <sup>3</sup> /s

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	104,389.16
Area of watershed (acres)	2.40
Q <sub>D</sub> =	10.56 ft <sup>3</sup> /s

$Q_T = Q_C + Q_I$	10.74	ft <sup>3</sup> /s
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<i>Sum of Areas</i>	2.46	acres
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<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	0.00
Area of watershed (acres)	0.00
Q <sub>B</sub> =	0.00 ft <sup>3</sup> /s

<i>TOTAL Q<sub>T</sub>=</i>	10.74	ft <sup>3</sup> /s
TOTAL AREA=	10.68 acres	

HYDROLOGY ( EXISTING CONDITIONS)

	TOTAL AREA (ft <sup>2</sup> )	IMPERVIOUS DATA ft <sup>2</sup>	SOIL TYPE C ft <sup>2</sup>	Soil Type B ft <sup>2</sup>
Sub Basin 2	32,754.32	29,478.89	3,275.43	0.00

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	3,275.43
Area of watershed (acres)	0.08
Q <sub>C</sub> =	0.22 ft <sup>3</sup> /s

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	29,478.89
Area of watershed (acres)	0.68
Q <sub>D</sub> =	2.98 ft <sup>3</sup> /s

Q <sub>T</sub> =Q <sub>C</sub> +Q <sub>I</sub>	3.20	ft <sup>3</sup> /s
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Sum of Areas	0.75	acres
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<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	0.00
Area of watershed (acres)	0.00
Q <sub>B</sub> =	0.00 ft <sup>3</sup> /s

TOTAL Q <sub>T</sub> =	3.20	ft <sup>3</sup> /s
TOTAL AREA=	0.00	acres

HYDROLOGY ( EXISTING CONDITIONS)

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>IMPERVIOUS DATA ft<sup>2</sup></i>	<i>SOIL TYPE C ft<sup>2</sup></i>	<i>Soil Type B ft<sup>2</sup></i>
Sub Basin 3	76,380.31	74,852.70	1,527.61	0.00

<i>Type C soil</i>		
Rational Coefficient , C	0.61	
Peak Intensity, I (in/hr)	4.70	
Peak Intensity, I (ft/sec)	0.00	
Area of watershed (ft <sup>2</sup> )	1,527.61	
Area of watershed (acres)	0.04	
Q <sub>C</sub> =	0.10 ft <sup>3</sup> /s	

<i>Type D soil</i>		
Rational Coefficient , C	0.93	
Peak Intensity, I (in/hr)	4.70	
Peak Intensity, I (ft/sec)	0.00	
Area of watershed (ft <sup>2</sup> )	74,852.70	
Area of watershed (acres)	1.72	
Q <sub>D</sub> =	7.57 ft <sup>3</sup> /s	

$Q_T = Q_C + Q_I$	7.68	ft <sup>3</sup> /s
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Sum of Areas	1.75	acres
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<i>Type B soil</i>		
Rational Coefficient , C	0.43	
Peak Intensity, I (in/hr)	4.70	
Peak Intensity, I (ft/sec)	0.00	
Area of watershed (ft <sup>2</sup> )	0.00	
Area of watershed (acres)	0.00	
Q <sub>B</sub> =	0.00 ft <sup>3</sup> /s	

TOTAL Q <sub>T</sub> =	7.68	ft <sup>3</sup> /s
TOTAL AREA=	0.00	acres

HYDROLOGY ( EXISTING CONDITIONS)

	TOTAL AREA (ft <sup>2</sup> )	IMPERVIOUS DATA ft <sup>2</sup>	SOIL TYPE C ft <sup>2</sup>	Soil Type B ft <sup>2</sup>
Sub Basin 4	249,164.20	122,090.46	127,073.74	0.00

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	127,073.74
Area of watershed (acres)	2.92
Q <sub>C</sub> =	8.43 ft <sup>3</sup> /s

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	122,090.46
Area of watershed (acres)	2.80
Q <sub>D</sub> =	12.35 ft <sup>3</sup> /s

Q <sub>T</sub> = Q <sub>C</sub> + Q <sub>D</sub>	20.79	ft <sup>3</sup> /s
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Sum of Areas	5.72	acres
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<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft <sup>2</sup> )	0.00
Area of watershed (acres)	0.00
Q <sub>B</sub> =	0.00 ft <sup>3</sup> /s

TOTAL Q <sub>T</sub> =	20.79	ft <sup>3</sup> /s
TOTAL AREA =	0.00	acres



ZONE	1.00
Land treatment	B
Land treatment	C
Land treatment	D
100 yr 6 hr event	

VOLUMETRIC RUNOFF  
EXISTING CONDITIONS

	TOTAL AREA (ft <sup>2</sup> )	Type D ft <sup>2</sup>	TYPE C ft <sup>2</sup>	Type B ft <sup>2</sup>	Type A ft <sup>2</sup>
Sub Basin 1	107,065.81	104,389.16	2,676.65		
Sub Basin 2	32,754.32	29,478.89	3,275.43		
Sub Basin 3	76,380.31	74,852.70	1,527.61		
Sub Basin 4	249,164.20	122,090.46	127,073.74		
TOTAL AREA( ft <sup>2</sup> )	465,364.64	330,811.21	134,553.43		ft <sup>2</sup>
TOTAL AREA(acres)	10.68	7.59	3.09		acres

VOLUMETRIC RUNOFF EXISTING CONDITIONS

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>Type D ft<sup>2</sup></i>	<i>TYPE C ft<sup>2</sup></i>	<i>Type B ft<sup>2</sup></i>	<i>Type A ft<sup>2</sup></i>
Sub Basin 201	107,065.81	104,389.16	2,676.65	0.00	0.00

<i>E<sub>s</sub> =</i>	<i>0.44</i>	<i>in</i>
E <sub>b</sub> =	0.67	in
E <sub>c</sub> =	0.99	in
E <sub>d</sub> =	1.97	in
Area A	0.00	ft <sup>2</sup>
Area A	0.00	acres
Area B	0.00	ft <sup>2</sup>
Area B	0.00	acres
Area C	2,676.65	ft <sup>2</sup>
Area C	0.06	acres
Area D	104,389.16	ft <sup>2</sup>
Area D	2.40	acres
Total Area Sum	2.46	acres

<i>Weighted E</i>	<i>1.95</i>	<i>in</i>
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<i>V<sub>360</sub>=Volume =</i>	<i>0.40</i>	<i>acre-ft</i>
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<i>10 Day storm</i>	
<i>Zone</i>	<i>1.00</i>
P <sub>360</sub>	2.20 in
P <sub>10 days</sub>	3.67 in
A <sub>D</sub>	2.40 acres
V <sub>10 days</sub>	0.69 acre-ft

VOLUMETRIC RUNOFF EXISTING CONDITIONS

	<i>TOTAL AREA (ft<sup>2</sup>)</i>	<i>Type D ft<sup>2</sup></i>	<i>TYPE C ft<sup>2</sup></i>	<i>Type B ft<sup>2</sup></i>	<i>Type A ft<sup>2</sup></i>
Sub Basin 202	32,754.32	29,478.89	3,275.43		

<i>E<sub>s</sub></i> =	<b>0.44</b>	<i>in</i>
E <sub>b</sub> =		0.67 in
E <sub>c</sub> =		0.99 in
E <sub>d</sub> =		1.97 in
Area A		0.00 ft <sup>2</sup>
Area A		0.00 acres
Area B		0.00 ft <sup>2</sup>
Area B		0.00 acres
Area C		3,275.43 ft <sup>2</sup>
Area C		0.08 acres
Area D		29,478.89 ft <sup>2</sup>
Area D		0.68 acres
Total Area Sum		0.75 acres

<i>Weighted E</i>	<b>1.87</b>	<i>in</i>
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<i>V<sub>360</sub></i> =Volume =	<b>0.12</b>	<i>acre-ft</i>
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<b>10 Day storm</b>	
<b>Zone</b>	<b>1.00</b>
P <sub>360</sub>	2.20 in
P <sub>10 days</sub>	3.67 in
A <sub>D</sub>	0.68 acres
V <sub>10 days</sub>	0.20 acre-ft

VOLUMETRIC RUNOFF EXISTING CONDITIONS

	TOTAL AREA (ft <sup>2</sup> )	Type D ft <sup>2</sup>	TYPE C ft <sup>2</sup>	Type B ft <sup>2</sup>	Type A ft <sup>2</sup>
Sub Basin 203	76,380.31	74,852.70	1,527.61		

<b>E<sub>s</sub> =</b>	<b>0.44</b>	<b>in</b>
E <sub>b</sub> =		0.67 in
E <sub>c</sub> =		0.99 in
E <sub>d</sub> =		1.97 in
Area A		0.00 ft <sup>2</sup>
Area A		0.00 acres
Area B		0.00 ft <sup>2</sup>
Area B		0.00 acres
Area C		1,527.61 ft <sup>2</sup>
Area C		0.04 acres
Area D		74,852.70 ft <sup>2</sup>
Area D		1.72 acres
Total Area Sum		1.75 acres

<b>Weighted E</b>	<b>1.95</b>	<b>in</b>
-------------------	-------------	-----------

<b>V<sub>360</sub>=Volume =</b>	<b>0.28</b>	<b>acre-ft</b>
---------------------------------	-------------	----------------

<b>10 Day storm</b>	
<b>Zone</b>	<b>1.00</b>
P <sub>360</sub>	2.20 in
P <sub>10 days</sub>	3.67 in
A <sub>D</sub>	1.72 acres
V <sub>10 days</sub>	0.50 acre-ft



VOLUMETRIC RUNOFF EXISTING CONDITIONS

	TOTAL AREA (ft <sup>2</sup> )	Type D ft <sup>2</sup>	TYPE C ft <sup>2</sup>	Type B ft <sup>2</sup>	Type A ft <sup>2</sup>
Sub Basin 204	249,164.20	122,090.46	127,073.74	0.00	0.00

<b><i>E<sub>s</sub></i></b>	<b>0.44</b>	<b>in</b>
E <sub>b</sub> =	0.67	in
E <sub>c</sub> =	0.99	in
E <sub>d</sub> =	1.97	in
Area A	0.00	ft <sup>2</sup>
Area A	0.00	acres
Area B	0.00	ft <sup>2</sup>
Area B	0.00	acres
Area C	127,073.74	ft <sup>2</sup>
Area C	2.92	acres
Area D	122,090.46	ft <sup>2</sup>
Area D	2.80	acres
Total Area Sum	5.72	acres

<b><i>Weighted E</i></b>	<b>1.47</b>	<b>in</b>
--------------------------	-------------	-----------

<b><i>V<sub>360</sub></i></b> =Volume =	<b>0.70</b>	<b>acre-ft</b>
---	-------------	----------------

<b>10 Day storm</b>	
<b>Zone</b>	<b>1.00</b>
P <sub>360</sub>	2.20 in
P <sub>10 days</sub>	3.67 in
A <sub>D</sub>	2.80 acres
V <sub>10 days</sub>	1.04 acre-ft

# **APPENDIX B**

## **Grading & Drainage plans**

# County of Bernalillo

State of New Mexico



## BOARD OF COUNTY COMMISSIONERS

TOM RUTHERFORD, CHAIR  
DISTRICT 3

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DISTRICT 4

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DISTRICT 1

STEVE D. GALLEGOS, MEMBER  
DISTRICT 2

LES HOUSTON, MEMBER  
DISTRICT 5

JUAN R. VIGIL, COUNTY MANAGER

DAVID K. ANDERSON, ASSESSOR

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THOMAS J. MESSALL, PROBATE JUDGE

JOE BOWDICH, SHERIFF

ORLANDO VIGIL, TREASURER

2400 BROADWAY, S.E.  
ALBUQUERQUE, NEW MEXICO 87102  
PUBLIC WORKS (505) 848-1500

June 20, 1997

James Alarid  
Chavez-Grieves  
5639 Jefferson NE  
Albuquerque New Mexico

**RE: Engineer's Certification for Navajo Elementary School (N11/D2) (PWD 96-154) Submitted for Certificate of Occupancy Approval, Engineer's Stamp Dated 6/3/97.**

Dear Mr. Alarid:

The Engineer's Certification received on June 6, 1997 for the above referenced site is adequate for Certificate of Occupancy release.

If you should have any questions, or if I may be of further assistance to you, please call me at 924-3982.

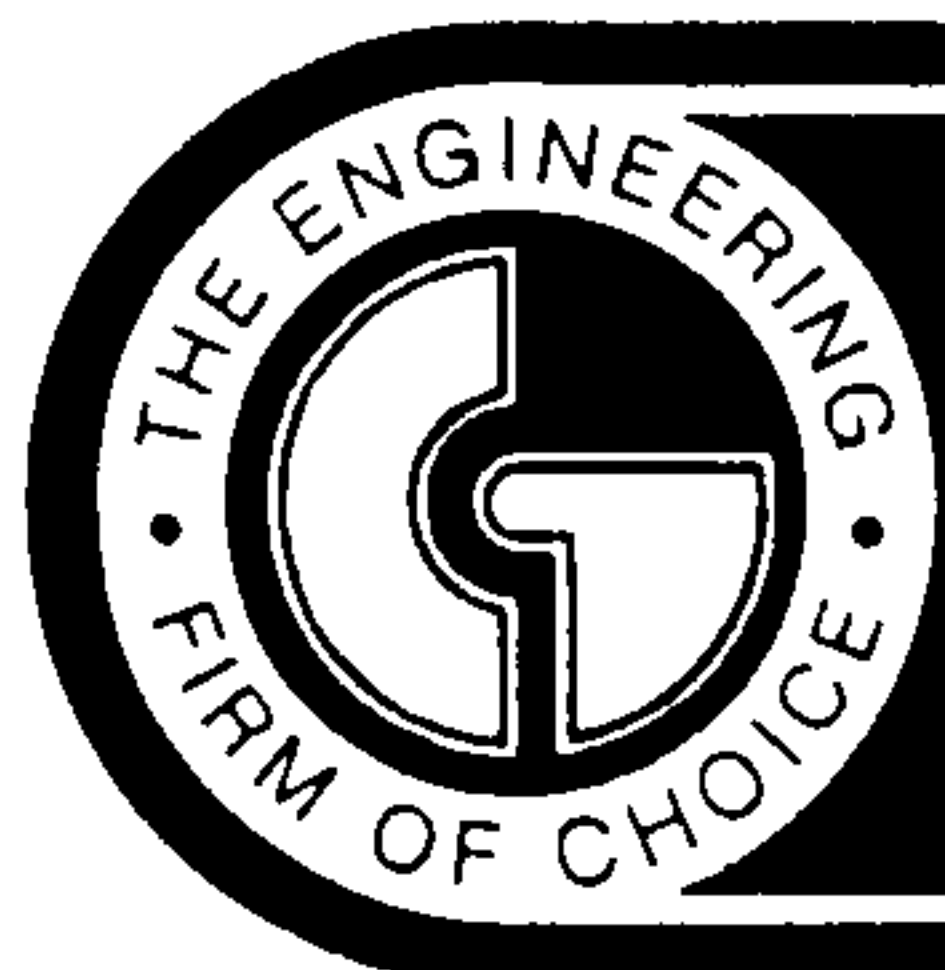
Sincerely,

A handwritten signature in cursive script, reading "Susan M. Calongre".

Susan M. Calongre, P.E.

City/County Floodplain Administrator

c: Roger Paul, Bernalillo County Public Works Division  
Andrew Garcia, City Hydrology  
File 1



**CHAVEZ • GRIEVES**  
**CONSULTING ENGINEERS, INC.**

5639 JEFFERSON STREET NE • ALBUQUERQUE, NEW MEXICO 87109 • PHONE (505) 344-4080 • FAX (505) 343 8759

# **GRADING AND DRAINAGE PLAN**

**FOR**

**NAVAJO  
ELEMENTARY SCHOOL**

***ALBUQUERQUE, NEW MEXICO***

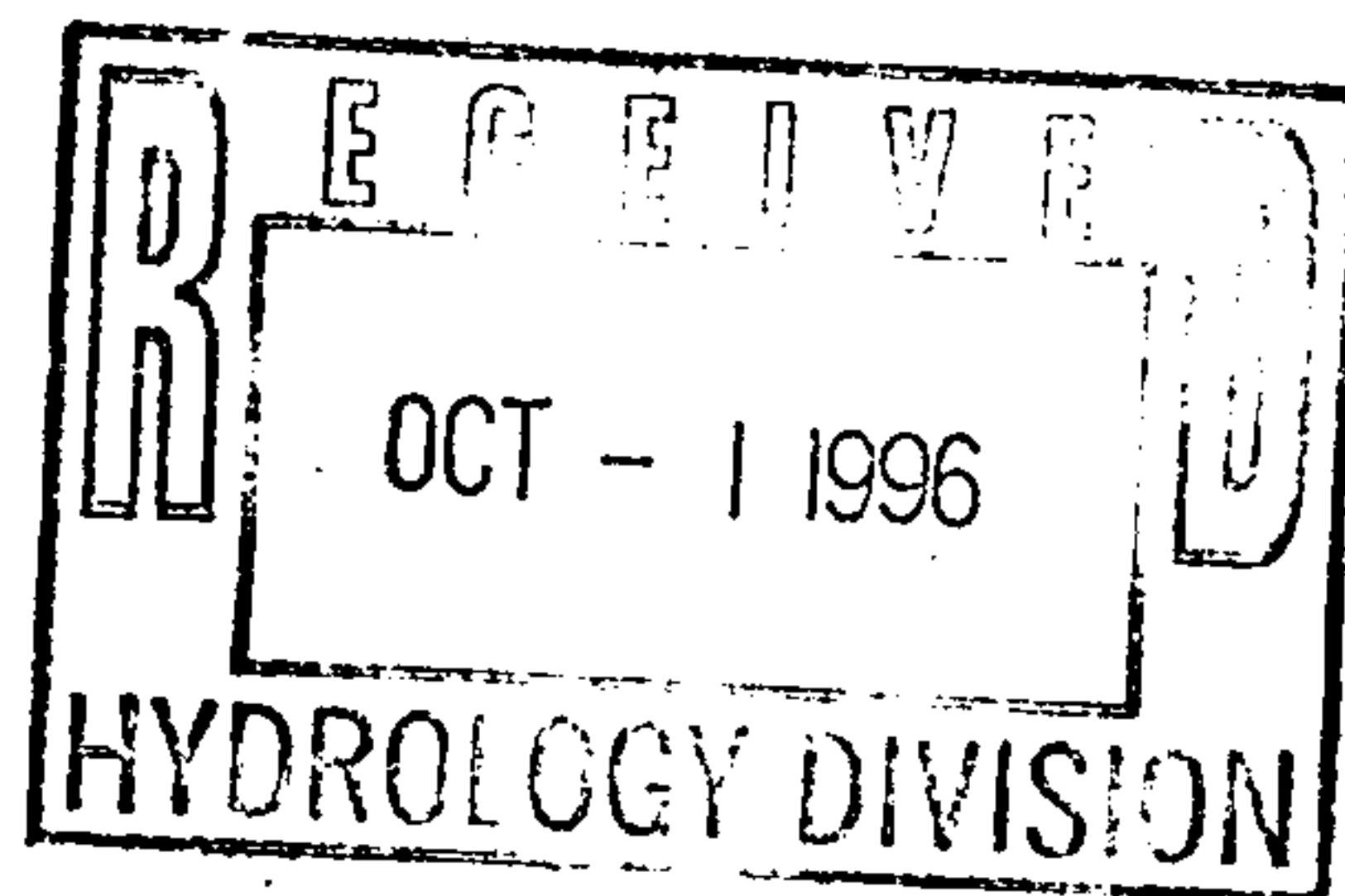
**SEPTEMBER, 1996**



## ENGINEER'S STATEMENT

I certify that I am a Registered Professional Engineer in the State of New Mexico and that this report was prepared by me or under my supervision. I have personally inspected this land, and it appears that no grading, filling, or excavation has occurred thereon since the existing contour map was prepared.

Joe Kelley 9/25/96



## **LOCATION**

This site is located between the Arenal Canal and the Isleta Drain. The site is bordered to the north and south by Blake Road S.W. and Barcelona Road S.W., respectively.

## **LEGAL DESCRIPTION**

Tract 1-B-1, Lands of 528 Investors, filed January 19, 1996, in Vol 96C-28.

## **SURROUNDING DEVELOPMENT**

The site is located in a developed residential area, except for the area north of the site is presently undeveloped irrigated farmland. Currently the site is developed as an elementary school with associated parking areas and play grounds.

## **FLOOD HAZARD ZONES**

As shown by Panel 3500020039 of the National Flood Insurance Rate Maps for the City of Albuquerque, dated October 14, 1983, the site is in a designated flood hazard zone AH. Zone AH designates "areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined." The AH Zone, which covers the majority of the site, has a flood water elevation of 4930.

## **EXISTING SITE CONDITIONS AND DRAINAGE PATTERN**

As shown on sheet C-3, the site is divided up into two drainage basins. Basin A drains to a detention pond located within the parking lot at the southeast portion of the site. This pond discharges via pump to the Isleta Drain through a two inch PVC drain line. Runoff generated by Basin B drains to an on site retention pond. This flow is sheet flow overland or is directed by an asphalt swale with a concrete defined flow line.

The site, which has very little topographic relief, lies within a flood plain. Localized ponding occurs at several areas on the site. The majority of the ponding occurs in the courtyard area surrounding the central landscape feature. This area receives a significant amount of direct runoff from adjacent roofs and sidewalks.

The undeveloped land north of the site is topographically lower, and cannot discharge onto the site. Runoff from the property south of the school flows to the south away from the school. The irrigation canals directly to the east and west of the school allow no offsite runoff to enter the school from these directions.

## **PROPOSED SITE CONDITIONS AND DRAINAGE PATTERN**

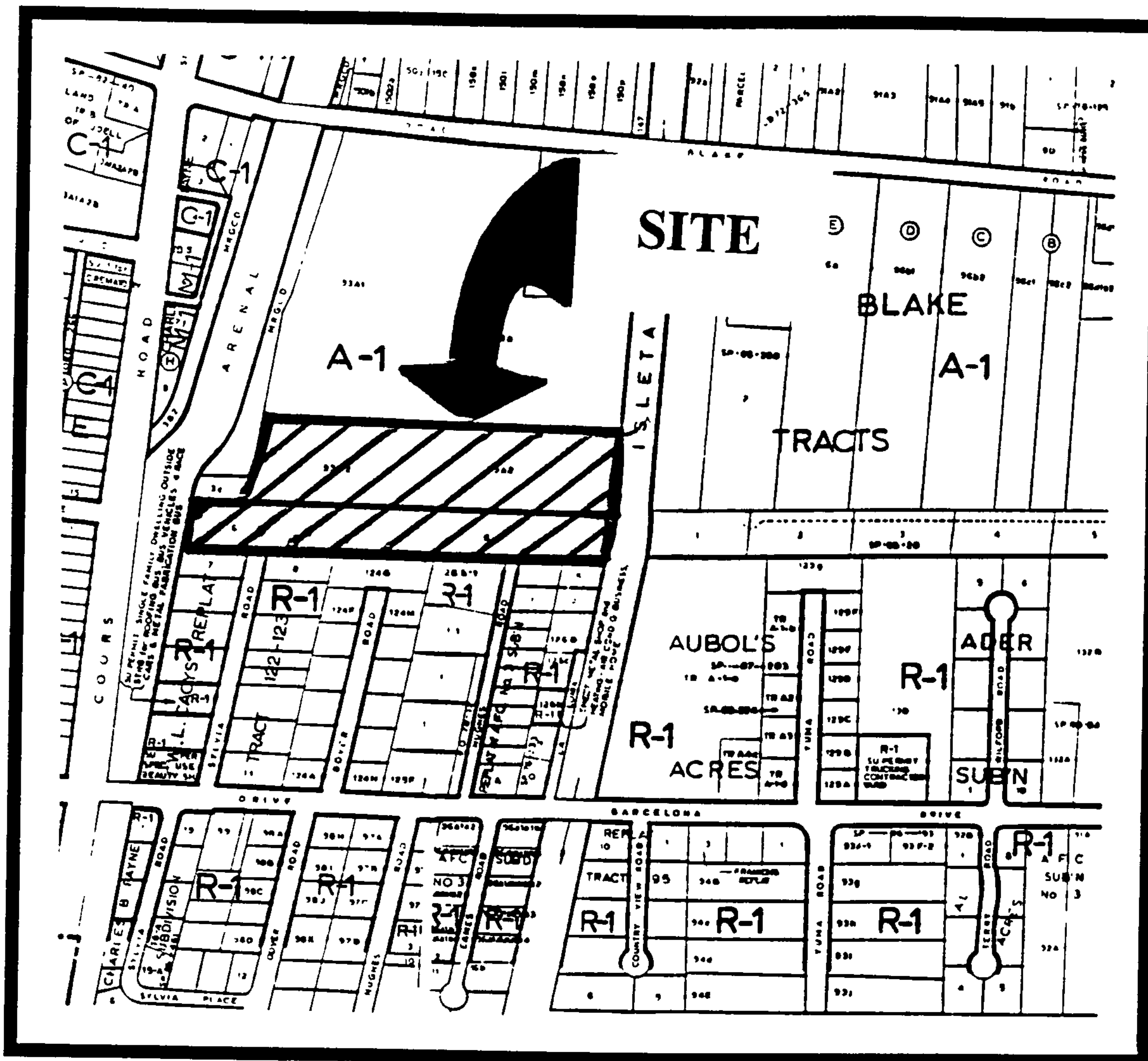
Site modifications include the following proposed changes: 1) a multi-purpose building will be constructed and 2) remedial drainage improvements will be made in areas of existing localized ponding. The existing drainage pattern will not be altered except in specific areas with ponding problems near area of new building construction.

Two dry wells will be installed in the central courtyard area to eliminate surface ponding of water during the more frequent storm events. New concrete will be installed to direct flow to the new dry wells. The dry wells will collect run-off from roofs, sidewalks and landscaping. Runoff from six buildings will be redirected away from the central courtyard and aide in the relief of the ponding problem.

Grading improvements will be made to accommodate the new multi-purpose facility. Run-off from the south and east sides of the new facility will flow to an existing concrete rundown which discharges to an existing pond in the southwest corner of the property. Run-off from the west side of the new facility will flow to a new dry well via concrete surfaces. Three roof drains on the north side of the new multi-purpose building will be piped to the new drywell west of the building. The pond capacity will be expanded to accomodate the volume of floodplain displaced by the fill material. The finished floor of the new facility will be set one foot above the flood water elevation.

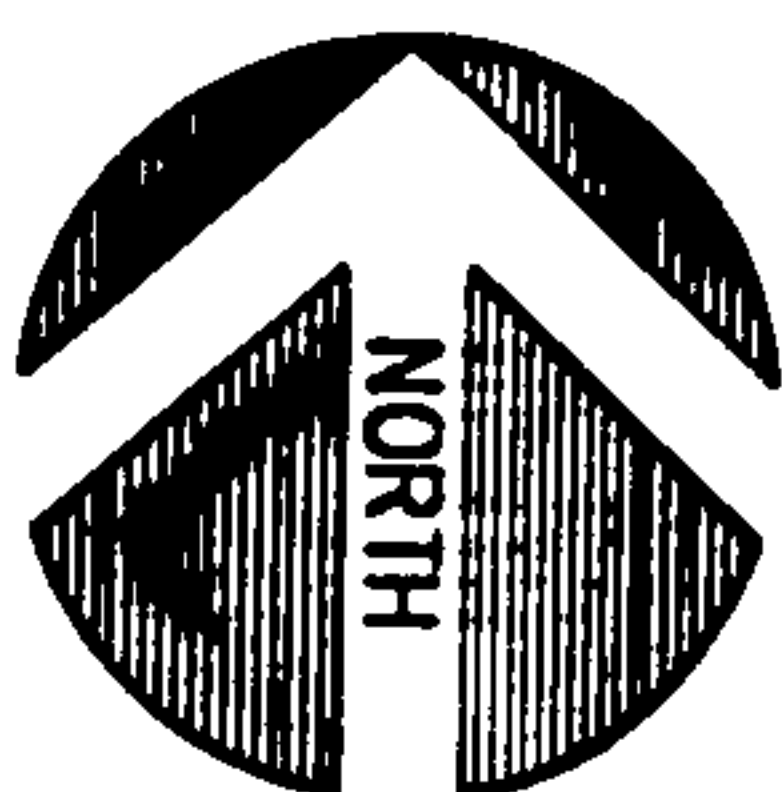
## **HYDROLOGY/HYDRAULICS**

The runoff calculations and design have been done in accordance with Section 22.2 of the Development Process Manual of the City of Albuquerque, January 1993. In addition, the site complies with the requirements of Bernalillo County Ordinance No. 90-6, the Storm Drainage Ordinance.

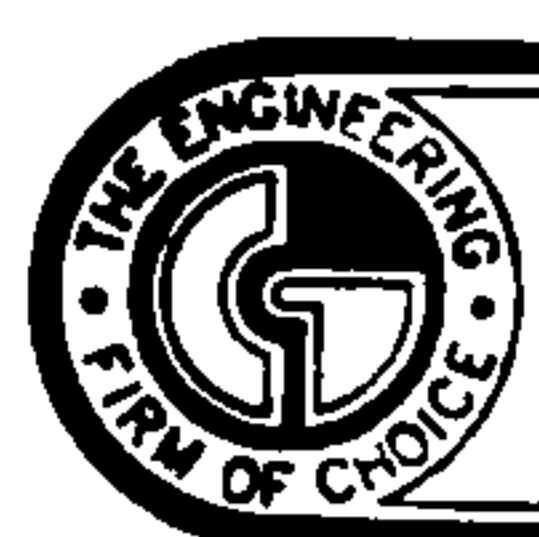


## VICINITY MAP

**N-10, N-11**



**SCALE: 1" = 950'**



**CHAVEZ • GRIEVES**  
**CONSULTING ENGINEERS, INC.**

5639 JEFFERSON STREET N.E. • ALBUQUERQUE, NEW MEXICO 87109  
PHONE (505) 344-4080 • FAX (505) 343-8759

### FIGURE 1



# **HYDRAULIC CALCULATIONS**

Phone (505) 344-4080 - Fax (505) 343-8759

Date: AUGUST, 1996  
Zone Atlas: N10.N11

Precipitation Zone from Figure A-1: 1  
Land treatment descriptions are in Table A-4.

## 1. RUNOFF RATE COMPUTATION

Use Equation a-10:  $Q_P = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$

Values of  $Q_{pi}$  are from Table A-9, and are in CFS/acre. Area values are in acres.

[illegible]

## 2. RUNOFF VOLUME COMPUTATION

Use Equation a-5 to compute weighted excess precipitation:

$$\text{Weighted E} = \text{"E"} = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / (A_A + A_B + A_C + A_D)$$

$$(A_A + A_B + A_C + A_D) = \sum A_i$$

Use Equation a-6 to compute the volume:

$$V_{360} = "E" \times (A_A + A_B + A_C + A_D) \times 3630 \text{ feet}^3/\text{acre} \cdot \text{inch}$$

Values of  $E_i$  are from Table A-8, and are in inches. Area values are in acres.

[illegible]



5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 · PHONE (505) 344 4080 · FAX (505) 343-8759

## NEW CONSTRUCTION IMPACT ON FLOODPLAIN

### CALCULATIONS: AVERAGE END AREA METHOD

#### 1. VOLUME OF FILL MATERIAL

ELEVATION	AREA (SF)	VOLUME(CF)
4928.5	21750	
		8825
4929.0	13550	
		12075
4930.0	10600	
		7700
4931.0	4800	
TOTAL VOLUME OF FILL.....		28600

#### 2. EXISTING POND CAPACITY

ELEVATION	AREA (SF)	VOLUME(CF)
4924.0	1450	
		5000
4925.0	8550	
		10550
4926.0	12550	
EXISTING POND CAPACITY.....		15550

#### 3. IMPROVED POND CAPACITY

ELEVATION	AREA (SF)	VOLUME(CF)
4922.5	7000	
		4563
4923.0	11250	
		11881
4924.0	12512	
		13161
4925.0	13810	
		14960
4926.0	16110	
IMPROVED POND CAPACITY.....		44565

#### IMPROVED > EXISTING + FILL MATERIAL

44565 > 28600 + 15550

44565 > 44150

POND HAS SUFFICIENT VOLUME



# NAVAJO ROOF DRAINS TO DRY WELL Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\navajo.fm2
Worksheet	ROOF DRAIN TO DRY WELL
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Mannings Coefficient	0.010
Channel Slope	0.020000 ft/ft
Diameter	4.00 in
Discharge	0.35 cfs



PIPE CAPACITY

$$Q_p = Q_{pipe} \quad \underline{OK!!}$$

Results	
Depth	0.27 ft
Flow Area	0.08 ft <sup>2</sup>
Wetted Perimeter	0.76 ft
Top Width	0.26 ft
Critical Depth	0.31 ft
Percent Full	82.00
Critical Slope	0.017297 ft/ft
Velocity	4.57 ft/s
Velocity Head	0.32 ft
Specific Energy	0.60 ft
Froude Number	1.47
Maximum Discharge	0.38 cfs
Full Flow Capacity	0.35 cfs
Full Flow Slope	0.020015 ft/ft
Flow is supercritical.	

NOTE: USE 9" PIPE FOR ROOF DRAINS TO DRYWELL.

**GEOTECHNICAL INVESTIGATION**

**MULTIPURPOSE BUILDING  
NAVAJO ELEMENTARY SCHOOL  
ALBUQUERQUE, NEW MEXICO**

**Submitted To:**

**Albuquerque Public Schools  
Facilities Planning & Construction  
P. O. Box 25074  
Albuquerque, New Mexico 87125-0704**

**Submitted By:**

**AGRA Earth & Environmental, Inc.  
4700 Lincoln Road, N.E.  
Albuquerque, New Mexico 87109**

**2 August, 1996**

**AEE Job No. 6-517-148**

## **4.0 SITE CONDITIONS & SOIL PROFILE**

### **4.1 SITE CONDITIONS**

The site is located southwest of several existing portable buildings and west of building pod six. To the south, west, and north, the site is bound by an existing bus lane (extending from Sylvia Road to Hughes Road), an existing playing field, and an existing playground, respectively. The site appears to be a former location for portable buildings as evidenced by numerous circular concrete pads and the existence of utilities and sewer connections.

### **4.2 SOIL PROFILE**

As indicated by the exploratory borings, the site soils consist of clayey sand, silty sand and sand. The clayey sand is moderately firm to firm, fine to medium grained, of low plasticity and contains small amounts of gravel. The silty sand and sand varies from medium to coarse, is nonplastic, firm and contains gravel and small cobbles. The density of the sand increases with depth from loose to very dense. Groundwater was encountered at a depth of ten feet in all three boreholes. Surficial man-made fill was encountered in all three borings to depths of up to one foot. The existence of utilities on the site indicate that in localized areas the fill may extend as deep as 6 feet in localized areas.

### **4.3 SOIL MOISTURE & GROUNDWATER CONDITIONS**

Free groundwater was encountered at a depth of 10 feet. Soil moisture contents above the water table ranged from 2.9 to 13.3 percent.

## **5.0 DISCUSSION & RECOMMENDATIONS**

### **5.1 ANALYSIS OF RESULTS**

While the subsurface soils range from a loose to dense state, excessive moisture intrusion into the foundation strata through infiltration from the surface as well as an increase in the water table can reduce the load bearing capacity of the native soils. However, with proper implementation of the earthwork and site grading recommendations presented in this report, the chance of detrimental soil moisture intrusions can be reduced considerably.

The structure, therefore, can be supported on shallow spread- type footings bearing at a uniform depth below finished grade on the naturally deposited soils or on properly compacted structural fill. Detailed recommendations for the required site preparation and foundation design are presented in the following sections of this report.

# **APPENDIX B**

## **DESIGN DRAWINGS**



## DRAINAGE COVENANT

This Drainage Covenant, between [state the name of the present real property owner exactly as shown on the real estate document conveying title to the present owner and state the legal status of the owner, for example, "single person," "husband and wife," "corporation of the State of X," "partnership"] : \_\_\_\_\_

Albuquerque Public Schools

("owner") [his, her, their, or its] heirs, executors, successors, assigns and transferees, whose address is 915 Oak SE

Albuquerque, New Mexico and

the County of Bernalillo, a New Mexico political subdivision ("County"), whose address is One Civic Plaza, Albuquerque, New Mexico 87103, is made in Albuquerque, Bernalillo County, New Mexico and is entered into as of the date Owner signs this Easement.

1. Recital. Owner is the owner of certain real property located at [give general description, for instance, subdivision, lot and block or street address:] 2936 Hughes Road SW  
(Navajo Elementary School) in Bernalillo County, New Mexico (the "Property").

Pursuant to County ordinances, regulations and other applicable laws, the Owner is required to construct and maintain certain drainage facilities on the Property, and the parties wish to enter into this agreement to establish the obligations and responsibilities of the parties.

2. Description and Construction of Drainage Facilities. Owner shall construct the following "Drainage Facility" within the Property at Owner's sole expense in accordance with the standards, plans and specifications approved by the County:  
A storm Water Detention Pond on the south west corner of  
the property.

The Drainage Facility is more particularly described in the attached Exhibit A. The Owner shall not permit the Drainage Facility to constitute a hazard to the health or safety of the general public.

3. Maintenance of Drainage Facility. The Owner shall maintain the Drainage Facility at Owner's cost in accordance with the approved Drainage Report and plans.

4. County's Right of Entry. The County has the right to enter upon the Property at any time and perform whatever inspection of the Drainage Facility it deems appropriate, without liability to the Owner.

5. Demand for Removal, Construction or Repair. The County may send written notice ("Notice") to the Owner requiring the Owner to construct, remove or repair the Drainage Facility within 60 days ("Deadline") of receipt of the Notice, as provided in Section 11, and the Owner shall comply promptly with the requirements of the Notice. The Owner shall perform all required work by the Deadline, at Owner's sole expense.

6. Failure to Perform by Owner and Emergency Work by County. If the Owner fails to comply with the terms of the Notice by the Deadline, or if the County determines that an emergency condition exists, the County may perform the work itself. The County then may assess the Owner for the cost of the work and for any other expenses or damages which result from Owner's failure to perform. The Owner agrees promptly to pay the County the amount assessed. If the Owner fails to pay the County within thirty (30) days after the County gives the Owner written notice of the amount due, the County may impose a lien against Owner's Property for the total resulting amount plus interest.

7. Liability of County for Repair after Notice or as a Result of Emergency. The County shall not be liable to the Owner for any damages resulting from the County's repair, removal or maintenance following notice to the Owner as required in this agreement or in an emergency unless the damages are the result of the reckless conduct or gross negligence of the County.

8. Indemnification. A. As a part of the consideration for this grant, subject to the provisions of the New Mexico Tort Claims Act and all other applicable New Mexico laws, the County agrees to save Owner harmless from any and all liability arising from the County's negligent use of the Drainage Facility. The County does not agree to save Owner harmless from any liability which may arise from Owner's use or misuse of the Drainage Facility and the Property.

B. The Owner hereby agrees to hold harmless, indemnify and defend the Bernalillo County, its Officers, Agents and Employees from and against any and all liability, suits, actions, claims, damages, costs of defense and fees arising out of or resulting from the Owner's and/or any of his employee's, agent's, or officer's conduct, performance, act(s), errors or omissions(s), relating in any manner whatsoever to this Covenant.

Provided, however, such indemnity shall not extend to liability, claims, damages, losses or expenses, including attorney's fees, arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the indemnitee, or the agents or employees of the indemnitee, or the giving of or the failure to give directions or instructions by the indemnitee, or the agents or employees of the indemnitee, where such giving or failing to give directions or instructions is a primary cause of bodily



injury to persons or damage to property.

9. Cancellation of Agreement and Release of Covenant. This agreement may be canceled and Owner's covenants released by the County by the County's mailing to the Owner notice of the County's intention to record a Cancellation and Release with the Bernalillo County Clerk. The Cancellation and Release shall be effective thirty (30) days after the date of mailing the notice to the User unless a later date is stated in the notice or in the Cancellation and Release. After the effective date, the County will record the Cancellation and Release with the Bernalillo County Clerk.

10. Assessment. Nothing in this agreement shall be construed to relieve the Owner, his heirs, assigns, transferees and successors from an assessment against Owner's Property for improvements to the Property under a duly authorized and approved Special Assessment District or applicable law. The Parties specifically agree that the value of the (Drainage Facility) will not reduce the amount assessed by the County.

11. Notice. For purposes of giving formal written notice to the Owner, Owner's address is:

Albuquerque Public Schools-Facilities Planning

915 Oak SE

Albuquerque, New Mexico 87106

Notice may be given to the Owner either in person or by mailing the notice by regular U.S. mail, postage paid. Notice will be considered to have been received by the Owner within six (6) days after the notice is mailed if there is no actual evidence of receipt. The Owner may change Owner's address by giving written notice of the change by certified mail, return receipt requested, to the Bernalillo County Public Works Department, 2400 Broadway S.E., Albuquerque, New Mexico 87102.

12. Term. This agreement shall continue until terminated by the County pursuant to Section 9 above.

13. Binding on Owner's Property. The covenants and obligations of the Owner set forth herein shall be binding on Owner, his heirs, assigns, transferees and successors and on Owner's Property and shall constitute covenants running the Owner's Property until released by the County.

14. Entire Agreement. This agreement contains the entire agreement of the parties and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith.

15. Changes to Agreement. Changes to this agreement are not binding unless made in writing, signed by both parties.

16. Construction and Severability. If any part of this agreement is held to be invalid or unenforceable, the remainder of the agreement will remain valid and enforceable if the remainder is reasonably capable of completion.

17. Captions. The captions to the sections or paragraphs of this agreement are not part of this agreement and will not affect the meaning or construction of any of its provisions.

18. Form Not Changed. Owner agrees that changes to the wording of this form are not binding upon the County unless initialed by the Owner are approved and signed by the County Commission Chairman in writing on this form.

OWNER: Board of Education of the City of Albuquerque

By: [Signature]

Its: Director, Facilities Planning & Construction

Dated: 12-9-96

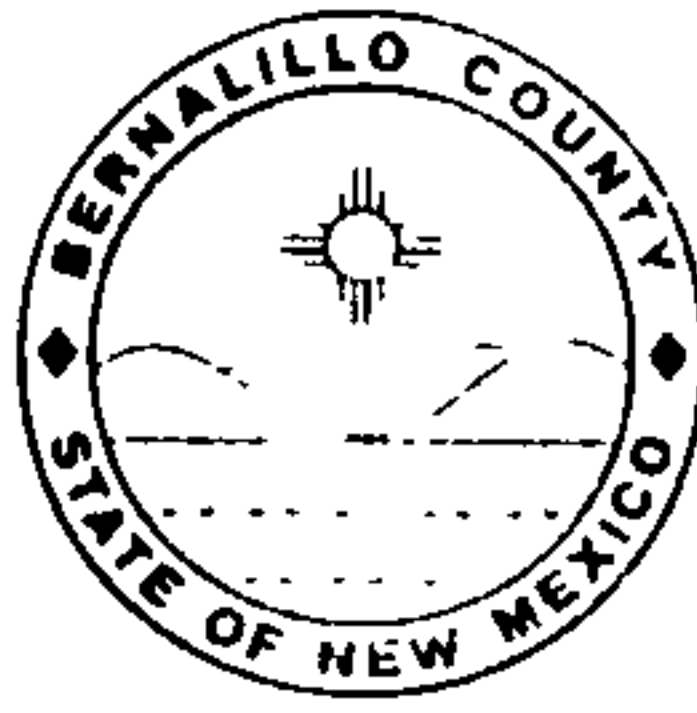
COUNTY OF Bernalillo ) SS

The foregoing instrument was acknowledged before me this 9th day of December, 19 96, by [name of person signing:] Pat McMurray, [Title or capacity, for instance, "President" or "Owner":] Director, Facilities Planning & Const of [name of the entity which owns the Property if other than the individual signing, for instance, the name of the corporation, partnership, or joint venture:] Albuquerque Public Schools.

My Commission Expires:

3/6/97

[Signature]  
Notary Public: Phyllis M. Miller



# County of Bernalillo

State of New Mexico

2400 BROADWAY, S.E.  
ALBUQUERQUE, NEW MEXICO 87102  
PUBLIC WORKS (505) 848-1500

## BOARD OF COUNTY COMMISSIONERS

**ALBERT "AL" VALDEZ**, CHAIRMAN  
DISTRICT 2

**KEN SANCHEZ**, VICE CHAIR  
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DISTRICT 3

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**JUAN R. VIGIL**, COUNTY MANAGER

**DAVID K. ANDERSON**, ASSESSOR

**JUDY D. WOODWARD**, CLERK

**THOMAS J. MESCALL**, PROBATE JUDGE

**JOE BOWDICH**, SHERIFF

**H. R. FINE**, TREASURER

October 8, 1996

James Alarid  
Chavez-Grieves  
5639 Jefferson NE  
Albuquerque New Mexico

REC'D OCT 15 1996

**RE: GRADING AND DRAINAGE PLAN FOR NAVAJO ELEMENTARY SCHOOL  
(N11/D2) (PWD 96-154) SUBMITTED FOR BUILDING PERMIT APPROVAL,  
ENGINEER'S STAMP DATED 9/25/96.**

Dear Mr. Alarid:

Based on the information provided in the submittal of October 1, 1996, the above referenced plan is approved for Building Permit release. A covenant per the Bernalillo County Public Works Division will be required for the pond.

As you are aware, the Engineer's Certification must be submitted to and approved by the review agencies prior to Certificate of Occupancy release.

If you should have any questions, or if I may be of further assistance to you, please call.

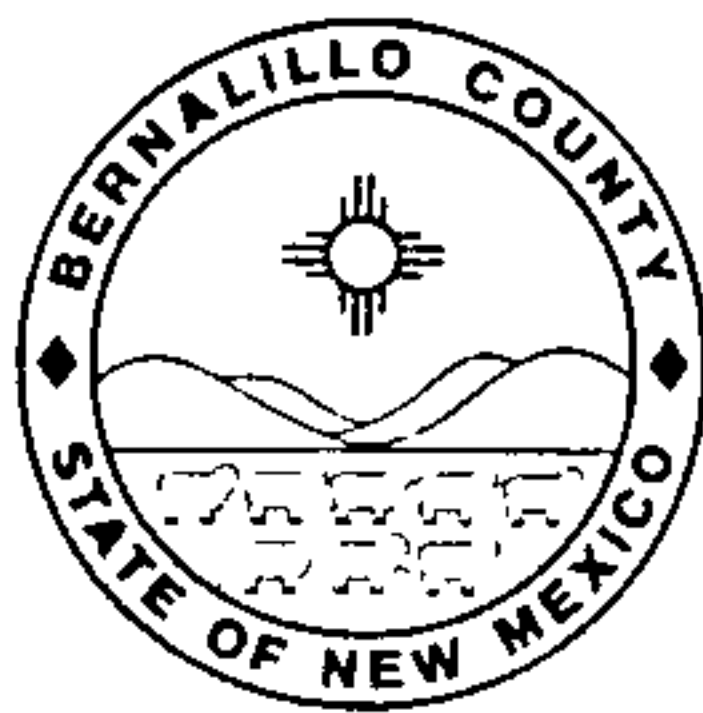
Sincerely,

A handwritten signature in cursive script, reading "Susan Calongne".

Susan M. Calongne, P.E.  
City/County Floodplain Administrator

c: Roger Paul, Bernalillo County Public Works Division  
File





# County of Bernalillo

State of New Mexico

2400 BROADWAY, S.E.  
ALBUQUERQUE, NEW MEXICO 87102  
PUBLIC WORKS (505) 848-1500

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5639 Jefferson NE  
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Based on the information provided in the submittal of October 1, 1996, the above referenced plan is approved for Building Permit release. A covenant per the Bernalillo County Public Works Division will be required for the pond.

As you are aware, the Engineer's Certification must be submitted to and approved by the review agencies prior to Certificate of Occupancy release.

If you should have any questions, or if I may be of further assistance to you, please call.

Sincerely,

A handwritten signature in cursive script, reading "Susan Calongne".

Susan M. Calongne, P.E.

City/County Floodplain Administrator

c: Roger Paul, Bernalillo County Public Works Division  
[File]

*Jusson's Copy*



# County of Bernalillo

State of New Mexico

2400 BROADWAY, S.E.  
ALBUQUERQUE, NEW MEXICO 87102  
PUBLIC WORKS (505) 848-1500

## BOARD OF COUNTY COMMISSIONERS

ALBERT "AL" VALDEZ, CHAIRMAN  
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JUAN R. VIGIL, COUNTY MANAGER

DAVID K. ANDERSON, ASSESSOR  
JUDY D. WOODWARD, CLERK  
THOMAS J. MESSALL, PROBATE JUDGE  
JOE BOWDICH, SHERIFF  
H. R. FINE, TREASURER

Date:

Subject: Submittal

Case No.: PWD-96-154

Zone Map No.: N-10

Street Address: NAVAJO ELEMENTARY SCHOOL

Legal Description: TR 1-B-1 LANDS OF 528 INVESTORS

Name of Applicant: Albuquerque Public Schools

Dear Applicant:

Bernalillo County Public Works Department will require **TWO WEEKS** for review and comment of submittal and resubmittals, and **ONE WEEK** for final review and plat sign-off. Major submittals may require more than two weeks for review and comment.

The issuance of a permit or a review or approval of plan specifications, computations, and shop drawings shall not be interpreted to be a permit for or an approval of any variance or violation of any of the provisions of any County or State codes, ordinances, standards, or policies. Nor shall such issuance of a permit or approval of plans, specifications, computations, and shop drawings prevent any authorized County representative or County inspector from thereafter requiring the correction of errors in said plans, specifications, computations, or shop drawings or from stopping construction operations which are being carried on thereunder when in violation of any County or State codes, ordinances, standards, or policies.

Review of construction plans, specifications, computations, and shop drawings is only for general conformance with the design concept of the project and general compliance with the plans and specifications and shall not be construed as relieving the Contractor, Land Divider, Subdivider, Engineer/Surveyor, or applicant of the full responsibility for: providing materials, equipment, and work required by the contract; the proper fitting and construction for the work; the accuracy and completeness of the submittal; selecting fabrication processes and techniques of construction; and performing the work in a safe manner.

REV 4-22-91 BR

COUNTY OF BERNALILLO

APPLICATION FOR CASE REVIEW

Please complete pages one and two of this application for review of your case. Submit THREE blueines of plat, drawings, or information with case submittals and THREE blueines of plat, drawings, or information along with the original mylar for final sign-off applications. Submit a County Zone Atlas Map with subject property marked on the map. If a Grading and Drainage plan is not included with a land division, replat, or conceptual plan, please submit one 8.5"x11" photocopy of a USGS quad map with the subject property superimposed.

NOTE: INCOMPLETE APPLICATIONS WILL BE RETURNED WITHOUT REVIEW.

1. APPLICANT INFORMATION:

a. Applicant is(check one):

☒ OWNER ☐ SURVEYOR ☐ AGENT  
☐ ENGINEER ☐ DRAINAGE ENGINEER

b. Date of this application: 26-AUG-96

c. Signature of applicant:

(print) \_\_\_\_\_ (sign) \_\_\_\_\_

d. OWNER: Albuquerque Public Schools  
915 Oak SE  
Albuquerque, NM 87106

PHONE: 242-5865

e. AGENT: Chavez-Grieves Engineering  
5639 Jefferson NE  
Albuquerque, NM 87109

PHONE: 505-882-7376

f. OTHER(specify): Chavez-Grieves Engineeri PHONE: 505-882-7376

5639 Jefferson NE  
Albuquerque, NM 87109

2. TYPE OF SUBMITTAL (check one):

☐ REPLAT  
☐ LAND DIVISION (MINOR SUBDIVISION)  
☐ MAJOR SUBDIVISION  
☐ CONSTRUCTION DRAWINGS  
☒ GRADING/DRAINAGE PLAN  
☐ AS-CONSTRUCTED GRADING/DRAINAGE PLAN  
☐ VARIANCE REQUEST  
☐ TRAFFIC IMPACT ANALYSIS/TRAFFIC STUDY  
☐ INFRASTRUCTURE LIST/DESIGN REVIEW FEE  
☐ OTHER (specify): \_\_\_\_\_

# County of Bernalillo

## Floodplain

Your: ☒ submittal of drainage information  
☐ resubmittal of drainage information

is: ☐ approved.  
☐ approved with comments/conditions.  
☐ disapproved.  
☒ deferred to County Floodplain Administrator

TO BE FILLED OUT BY  
COUNTY PUBLIC WORKS  
DEPARTMENT ONLY

Case review comments are:

☒ attached.  
☐ not attached.  
☐ not attached. See remarks below.

Resubmittal is:

☐ not required.  
☒ required. When resubmitting, please use Resubmittal Form.

Please submit:

☒ grading/drainage plan with revisions.  
☐ as-constructed grading/drainage plan.  
☐ other: \_\_\_\_\_

It is required that:

☐ Bernalillo County Public Works Department inspect improvements prior to final sign-off of plat.  
☐ Bernalillo County Public Works Department signature line be placed on plat.

Remarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*T. J. (Paul) Pk 9/19/96*

\* See attached memo for  
AMAFCA Concurrence

Molzen-Corbin & Assoc., for  
County Surface Water Hydrologist  
Bernalillo County Public Works Department

cc: ☐ Sandia Heights Homeowners Association

☒ Owner: *APR*  
☒ Agent: *Charles-Hierres Engineering*  
☒ Case File: *PWD-96-154*  
☐ AMAFCA  
☒ Susan Calongne, County Floodplain Administrator, COA  
☒ Molzen-Corbin & Associates  
☐ Other: \_\_\_\_\_



GENEIVA MEEKER, CHAIR  
DANIEL W. COOK, VICE-CHAIR  
RONALD D. BROWN, SECRETARY-TREASURER  
MICHAEL MURPHY, ASST. SECRETARY-TREASURER  
TIM EICHENBERG, DIRECTOR

LARRY A. BLAIR  
EXECUTIVE ENGINEER



**Albuquerque  
Metropolitan  
Arroyo  
Flood  
Control  
Authority**

2600 PROSPECT N.E. - ALBUQUERQUE, N.M. 87107  
TELEPHONE (505) 884-2215

July 30, 1996

TO: Roger Paul, P.E.  
Bernalillo County Public Works Department

FR: Kurt Browning, P.E.  
AMAFCA

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For grading and drainage submittals that are located in the floodplain, it is not necessary for AMAFCA to sign the County approval/disapproval form. AMAFCA's comments are coordinated with the City/County Floodplain Administrator and are included in the written response.

You may include this memo with the signature sheet as needed, for the closing of floodplain cases.

End



BERNALILLO COUNTY PUBLIC WORKS DEPARTMENT  
CASE FILE COMMENTS

CASE NO: PWD-96-154

ZONE MAP NO.: N-10

REFERENCE CASES:

STREET ADDRESS: NAVAJO ELEMENTARY SCHOOL

LEGAL DESCRIPTION: TR 1-B-1 LANDS OF 528 INVESTORS

COMMENTS OF:

26-AUG-96 DRAN: A portion of this property appears to be within a designated 100 year flood plain as shown on the National Flood Insurance Program's Flood Insurance Rate Map. Defer approval to the County Floodplain Administrator.



# County of Bernalillo

## State of New Mexico

2400 BROADWAY, S.E.  
ALBUQUERQUE, NEW MEXICO 87102  
PUBLIC WORKS (505) 848-1500

September 16, 1996

### BOARD OF COUNTY COMMISSIONERS

**ALBERT "AL" VALDEZ**, CHAIRMAN  
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**JUDY D. WOODWARD**, CLERK

**THOMAS J. MESCALL**, PROBATE JUDGE

**JOE BOWDICH**, SHERIFF

**H. R. FINE**, TREASURER

James Alarid, E.I.T.  
Chavez-Grieves  
5639 Jefferson NE  
Albuquerque New Mexico

RE: GRADING AND DRAINAGE PLAN FOR NAVAJO ELEMENTARY SCHOOL (N11/D2)(PWD 96-154) SUBMITTED FOR BUILDING PERMIT APPROVAL, ENGINEER'S STAMP DATED 8/22/96.

Dear Mr. Alarid:

This letter is a compilation of comments from myself and Bernalillo County Public Works. Prior to approval for Building Permit release for the above referenced site, the following comments must be addressed:

1. The plan must include a copy of Panel 39 of the Flood Insurance Rate Map with the site delineated on it.
2. With the amount of fill material being placed within the existing floodplain for the Multi-Purpose Building, will there be any adverse effect on adjacent properties? Does the existing pond have the capacity for the additional displaced volume for the proposed buildings?
3. What is the groundwater depth at this site? What effect does the groundwater have on the effective volume of the proposed dry wells?
4. The inlets for the dry wells will require maintenance for the long term use. It is assumed that APS will maintain these inlets.

If you should have any questions regarding these comments, please call me at 768-2666, or contact Roger Paul at the County.

Sincerely,

A handwritten signature in cursive script that reads "Susan M. Calongne".

Susan M. Calongne, P.E.

City/County Floodplain Administrator

c: Roger Paul, Bernalillo County Public Works Division  
File