

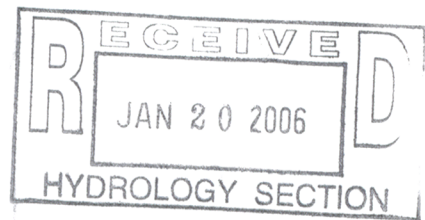
# DRAINAGE REPORT

for

**Hoffmantown West Church  
@ The Northeastern Corner of  
Coors and La Orilla Road  
Albuquerque, New Mexico**

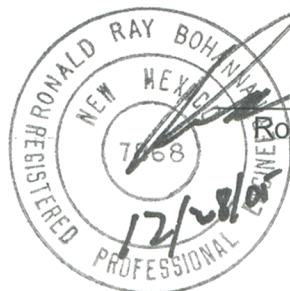
Prepared by:

Tierra West, LLC  
8509 Jefferson NE  
Albuquerque, New Mexico 87113



March, 2005  
Revised Dec, 2005

I certify that this report was prepared under my supervision, and I am a registered professional engineer in the State of New Mexico in good standing.



Ronald R Bohannon, PE

Job No 23080

## **PURPOSE**

The purpose of this report is to provide the drainage management plan for the development of Hoffmantown West Church. This plan will be utilized for the development of the subject 16.3-acre property. This plan is in accordance with the DPM, Chapter 22, Hydrology Section. The purpose of this report is to provide the drainage analysis and management plan for the new site.

## **INTRODUCTION**

The subject of this report, as shown on the Exhibit A vicinity map, is a 16.3-acre parcel of land located at the northeast corner of Coors and La Orilla Road, zone atlas page D-12. The site is in the City of Albuquerque, Bernalillo County, New Mexico and currently is undeveloped. The legal description of the property is Tract 1-A-1, Alban Hills Unit 1. As shown on FIRM map 35001C01116F.

## EXISTING CONDITIONS

Currently the site is undeveloped, and the drainage generally slopes from the west to the east. The 16.3-acre site is bounded on the north by the Bosque Meadows Subdivision, on the east by Middle Rio Grande Conservancy District's Corrales Main Canal, on the west by Coors, and on the south by La Orilla Road.

## PROPOSED CONDITIONS

The proposed church will consist of five buildings comprising approximately 150,000 sq ft. The proposed drainage from the site will sheet flow to the eastern side of the property into two single A and one single C water quality inlets and into a 36" RCP stub that was installed with the Bosque Meadows Subdivision (D12/D2). This site is also covered by the North Coors Drainage Management Plan Middle Area, and is located within basin 17.4E. According to the report this basin is allowed to discharge 87 cfs. For this report the site has been split into 4 basins including 3 offsite basins.

Basin 1 consists of the northwest corner of the site; this includes the northwest corner of the parking lot. The storm runoff from this basin will be conveyed in a concrete swale to a water quality inlet and discharged into the Corrales Main Canal via an existing discharged point. The total runoff from this basin is 14.81cfs and a land treatment of 20% B and 80% D was used.

Basin 2 includes the east side of the site and a portion of the site south of the church. The storm runoff from this basin will be collected in a water quality inlet and then discharge into the Corrales Main Canal. The total runoff from this basin is 22.05cfs and a land treatment of 16% B and 84% D was used.

Basin 3 includes the remaining southern portion of the parking lot area. The storm runoff from this basin will be conveyed in a concrete swale into a water quality inlet and then dis-



charged into the Corrales Main Canal. The total runoff from this basin is 8.06 cfs and a land treatment of 20% B and 80% D was used.

Basin 4 includes the proposed church buildings. The storm runoff from this basin will be directed to the east side of the buildings and discharge into the same water quality inlet as Basin

2. The total runoff from this basin is 16.45 cfs and a land treatment of 100% D was used.

The offsite basin 5 includes the remaining portion of land that is left west of Basins 2 and 3 and south of Basin 1. The runoff from this basin will be conveyed in a concrete swale extended from Basin 3 into a water quality inlet and finally into the Corrales Main Canal. The runoff from Basin 5 is 20 cfs; a land treatment of 15%B and 85%D was used to generate the runoff amounts.

The offsite basin 6 includes the portion of Coors Road that borders the property. The runoff from this basin will be conveyed from curb and gutter into the north and south entrances into the site and continue into the water quality inlet and finally into the Corrales Main Canal. The runoff from Basin 6 is 3.60 cfs; a land treatment of 22%B and 78%D was used to generate the runoff amounts.

The offsite basin 7 includes the portion of La Orilla Road that borders the property. The runoff from this basin will be conveyed from curb and gutter into a landscaped pond that is located at the southeast corner of the site. The runoff from Basin ~~6~~<sup>7</sup> is 3.83cfs; a land treatment of 100%D was used to generate the runoff amounts.

The total flow from all 6 basins is 84.97 cfs and will be collected in two single As and one single C water quality inlets with sweepers on each end. An additional 11 cfs from a culvert under Coors Boulevard, which drains basin 17.2W that is located on the west side of Coors will also be collected by the inlets. This brings the total flow into the inlets to 95.97 cfs. From that point the water will continue to an existing manhole and then into the Corrales Main Canal.



## **SUMMARY AND RECOMMENDATIONS**

Per the pervious drainage report this site has free discharge into existing drainage facilities. The development of this site is consistent with the DPM, Chapter 22, Hydrology section. It is recommended this development be approved for rough grading and Site Plan for Building Permit.

## Weighted E Method

Hoffmantown West Church  
TW Job# 23080

### Zone #1

#### Existing Basins

Basin	Area (sf)	Area (acres)	Area (sq miles)	Treatment A		Treatment B		Treatment C		Treatment D		100-Year			10-Year		
				%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
1	712113.00	16.348	0.02554	0%	0	20%	3.270	0%	0	80%	13.078	1.710	2.330	63.79	1.036	1.411	40.28
2	216719.00	4.975	0.00777	0%	0	15%	0.746	0%	0	85%	4.229	1.775	0.736	20.00	1.087	0.451	12.79

#### Developed Basins

Basin	Area (sf)	Area (acres)	Area (sq miles)	Treatment A		Treatment B		Treatment C		Treatment D		100-Year			10-Year		
				%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
1	165343.00	3.796	0.00593	0%	0	20%	0.759	0%	0	80%	3.037	1.710	0.541	14.81	1.036	0.328	9.35
2	240432.00	5.520	0.00862	0%	0	16%	0.883	0%	0	84%	4.636	1.762	0.810	22.05	1.077	0.495	14.07
3	89987.00	2.066	0.00323	0%	0	20%	0.413	0%	0	80%	1.653	1.710	0.294	8.06	1.036	0.178	5.09
4	164004.00	3.765	0.00588	0%	0	0%	0.000	0%	0	100%	3.765	1.970	0.618	16.45	1.240	0.389	10.88
5	216719.00	4.975	0.00777	0%	0	15%	0.746	0%	0	85%	4.229	1.775	0.736	20.00	1.087	0.451	12.79
6	40700.00	0.934	0.00146	0%	0	22%	0.206	0%	0	78%	0.729	1.684	0.131	3.60	1.016	0.079	2.26
7	38180.00	0.876	0.00137	0%	0	0%	0.000	0%	0	100%	0.876	1.970	0.144	3.83	1.240	0.091	2.53
	876485.00	21.056					3.007				18.048		3.131	84.976			

#### Developed Basins

Basin	Area (sf)	Area (acres)	Area (sq miles)	Treatment A		Treatment B		Treatment C		Treatment D		100-Year			10-Year		
				%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
Pond	51861.00	1.191	0.00186	0%	0	100%	1.191	0%	0	0%	0.000	0.670	0.066	2.42	0.220	0.022	0.90
	51861.00	1.191					1.191				0.000		0.066	2.417			

#### Equations:

Weighted E =  $E_a \cdot A_a + E_b \cdot A_b + E_c \cdot A_c + E_d \cdot A_d$  / (Total Area)

Volume = Weighted D \* Total Area

Flow =  $Q_a \cdot A_a + Q_b \cdot A_b + Q_c \cdot A_c + Q_d \cdot A_d$

## DROP INLET CALCULATIONS

Basin	TYPE OF INLET	AREA (SF)	Q (CFS)	H (FT)	H ALLOW (FT)
1 thru 5	Single 'C'	4.36	84	16.0102	0.5
1 thru 5	Single 'C'	4.36	14.845811	0.5001	0.5
1 thru 5	Single 'C'	4.36	20.985914	0.9993	1
1 thru 5	Double 'A'	11.24	84	2.4090	0.5
1 thru 5	Double 'A'	11.24	38.269782	0.5000	0.5
1 thru 5	Double 'A'	11.24	54.101265	0.9993	1
1 thru 5	Single 'A'	9.14	84	3.6471	0.5
1 thru 5	Single 'A'	9.14	31.114569	0.5004	0.5
1 thru 5	Single 'A'	9.14	44.002465	1.0008	1

### ORIFICE EQUATION

$$Q = CA \sqrt{2gH}$$

$$C = 0.6$$

$$g = 32.2$$



## STORM DROP INLET-EFFECTIVE AREA Double 'A'

### Area at the grate:

$$\begin{aligned} L &= 88 \frac{3}{4}" - 2(6"_{\text{ends}}) - 6"_{\text{center piece}} - 14(\frac{1}{2} \text{ middle bars}) \\ &= 63 \frac{3}{4}" \\ &= 5.3125' \end{aligned}$$

$$\begin{aligned} W &= 25 \frac{1}{2}" - 13(\frac{1}{2}" \text{ middle bars}) \\ &= 19" \\ &= 1.5833' \end{aligned}$$

$$\begin{aligned} \text{Area} &= 5.3125' \times 1.5833' \\ &= 8.41 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \text{Effective Area} &= 8.41 - 8.41 (0.5_{\text{clogging factor}}) \\ &= 4.21 \text{ ft}^2 \text{ at the grate} \end{aligned}$$

### Area at the throat:

$$L = 13.50"$$

$$\begin{aligned} H &= 10 \frac{3}{4}" - 4 \frac{1}{2}" \\ &= 6 \frac{1}{4}" \\ &= 0.5208' \end{aligned}$$

$$\begin{aligned} \text{Area} &= 13.50' \times 0.5208' \\ &= 7.03 \text{ ft}^2 \text{ at the throat} \end{aligned}$$

### Total Area:

$$\begin{aligned} \text{Area} &= 4.21_{\text{grate}} + 7.03_{\text{throat}} \\ &= 11.24 \text{ ft}^2 \end{aligned}$$

## Single 'C' Drop Inlet EFFECTIVE AREA

### Area at the grate:

$$\begin{aligned} L &= 38.375" - 7(2@ \text{ middle bars}) \\ &= 34.875" \\ &= 2.906' \end{aligned}$$

$$\begin{aligned} W &= 25.5" - 13(2@ \text{ middle bars}) \\ &= 19" \\ &= 1.583' \end{aligned}$$

$$\begin{aligned} \text{Area} &= 1.583' \times 2.906' \\ &= 4.601 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \text{Effective Area:} &= 4.601 - 4.601 (0.5 \text{ clogging factor}) \\ &= 2.30 \text{ ft}^2 \text{ at the grate} \end{aligned}$$

### Area at the throat:

$$\begin{aligned} L &= 47.375@ \\ &= 3.95' \end{aligned}$$

$$\begin{aligned} H &= 10:@ - 42@ \\ &= 63@ \\ &= 0.5208' \end{aligned}$$

$$\begin{aligned} \text{Area} &= 3.95' \times 0.5208' \\ &= 2.06 \text{ ft}^2 \text{ at the throat} \end{aligned}$$

### Total Area:

$$\begin{aligned} \text{Area} &= 2.30_{\text{grate}} + 2.06_{\text{throat}} \\ &= 4.36 \text{ ft}^2 \end{aligned}$$