DRAINAGE REPORT

For

HOMES BY KIM BROOKS
OFFICE
Albuquerque, New Mexico

Prepared by

Rio Grande Engineering
2105 Golf Course Road SE, Suite B
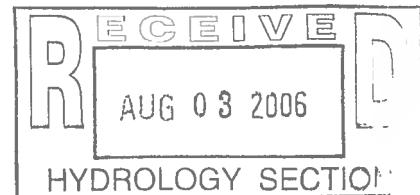Rio Rancho, New Mexico 87124

July 2006

David Soule P.E. No. 14522

TABLE OF CONTENTS

Appendix

Map Pocket

PURPOSE

The purpose of this report is to provide the Drainage Management Plan for the construction of a 6,000 square foot office building with its associated parking lot. This plan was prepared in accordance with the City of Albuquerque's Development Process Manual. This report will demonstrate that the proposed improvements do not adversely affect the surrounding properties, nor the upstream or downstream facilities.

INTRODUCTION

The subject of this report, as shown on the Exhibit A, is a 0.88-acre parcel of land located on the north side of Irving Boulevard between Eagle Ranch road and Golf Course road. The site is located within a small industrial park that is adjacent to the Calabacillas arroyo. The legal description of this site is Tract C-1-B-1-A-1. As shown on FIRM map 35001C0108E, the developed portion of the site is located entirely within Flood Zone X. The site is part of a previously drainage master planed subdivision.

The site is undeveloped, though it appears to have been graded in the past. The site currently discharges .38 cfs directly to the Calabacillas arroyo and .95 cfs to the adjacent down stream tract. This site is part of the storm drainage master plan analyzed with the Rastra Building (1/14/02) as well as the drainage plan completed for Amstoy Dry wall office (8/18/04). Both plans were submitted by Mark Goodwin and Associates. Excerpts for each of these drainage plans are included in Map Pocket A. This site must pass the upland flows and discharge to the down stream property at the location of a swale.

EXISTING CONDITIONS

The site is currently undeveloped. Based upon the grades, it appears the site has been graded in the past. As shown in appendix A, the site contains 2 drainage basins. Basin A contains the northern most quarter of the lot which sheet flow discharges .38 cfs directly into the

Calabacillas arroyo. Basin B contains the majority of the site that discharges .95 cfs to a low point located at the southeast corner of the site. The site is located within the study area of the upstream and downstream drainage system. The site is supposed to have a 9' wide 1' deep swale bisecting the property conveying the upland flows and discharging to the adjacent tract. Based upon field reconnaissance, this swale does not exist. The upland flows have been eliminated by the construction of solid wall around the Rastra site. The down stream site has eliminated the swale, but still accepts flows from this site and collects them with an existing storm drain located on the Amstoy Drywall Building. The flow generated within this basin is collected via the storm drain located on the adjacent Amstoy property and discharged to the Calabacillas arroyo via a 36" storm drain pipe. The system has been designed assuming a developed land treatment of 85%D and 15% B. Based upon this criterion the site is allowed to discharge 3.55 cfs to the adjacent tract at the location specified within the Amstoy Drywall drainage plan.

PROPOSED CONDITIONS

The proposed improvements consist of a 6,000 square foot building with its associated parking lot. As shown in appendix B, the site continues to have two drainage basins. These basins match the exiting basins in size. Basin B is the northerly portion that lies within the prudent line of the arroyo and will continue to discharge as sheet flow directly to the Calabacillas. The flow rate will be increased to .42 cfs, due to an anticipated impact during the construction; no grading will be performed within the prudent line. Basin A contains the entire portion of the site that will be developed. As shown in appendix A, this basin will discharge 2.54 cfs to the adjacent tract. Due to the grades of the existing outfall, a storm drain will be continued through the adjacent site and constructed on site to collect the onsite flows and located to capture the upland flows should Rastra ever eliminate their solid wall. The storm drainage system has been designed using Manning's equation, and the analysis is included within appendix B.

4

SUMMARY AND RECOMMENDATIONS

This site is a development of an undeveloped site sandwiched between two existing site. The property has been analyzed and assigned a developed discharge rate of 3.55 cfs. The down stream outfall has been constructed. The existing collection system will be extended through the adjacent tract and through this site. This site will discharge 2.96 cfs during the 100-year, 6-hour storm event. The site drainage has been designed to accept the upland flows should the Rastra site eliminate their newly constructed perimeter wall.

The proposed site development does not adversely affect the upstream or downstream facilities. The site was designed in conformance to City of Albuquerque Drainage Policy. Therefore, we request approval of the site-grading plan. Since no public improvements will be constructed a work order and Subdivision Improvement Agreement will not be required. Since this site encompasses less than 1 acre, a NPDES permit should not be required prior to any construction activity.

Weighted E Method

Existing Basins

Basin	Area (sf)	Area (acres)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	100-Year Weighted E (ac-ft)	100-Year Volume (ac-ft)	100-Year Flow cfs
A	11020.68	0.253	79%	0.19987	5%	0.013	6%	0.01518	5%	0.013	0.539	0.011	0.38
B	27490.72	0.631	79%	0.498569	5%	0.032	6%	0.03787	5%	0.032	0.539	0.028	0.95
Total	38511.40	0.884		0.698439		0.044		0.05305		0.044		0.040	1.34

Proposed Developed Basins

Basin	Area (sf)	Area (acres)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	100-Year, 6-hr. Weighted E (ac-ft)	100-Year, 6-hr. Volume (ac-ft)	100-Year, 6-hr. Flow cfs	10-day Volume (ac-ft)
A	11020.68	0.253	75%	0.18975	10%	0.025	10%	0.0253	5%	0.013	0.595	0.013	0.42	0.014
B	27486.36	0.631	0%	0	8%	0.050	11%	0.06941	81%	0.511	1.758	0.092	2.54	0.161
ALLOWABLE	38511.40	0.884	0%	0	15%	0.133	0%	0	85%	0.751	1.775	0.131	3.55	0.231
Ttl proposed	38507.04	0.884	0%	0.18975	17%	0.076	15%	0.09471	68%	0.524	1.425	0.105	2.96	0.175

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm

Ea= 0.44	Qa= 1.29
Eb= 0.67	Qb= 2.03
Ec= 0.99	Qc= 2.87
Ed= 1.97	Qd= 4.37

Pipe Capacity

Pipe	D	Slope	Area	R	Q Provided	Q Required	Veloci
	(in)	(%)	(ft^2)		(cfs)	(cfs)	(ft/s)
1	24	0.63	3.14	0.5	16.72	15.56	4.95
2	18	1.41	1.77	0.375	11.61	2.54	1.44
3	18	0.65	1.77	0.375	7.89	7.78	4.40
4	18	0.65	1.77	0.375	7.89	7.78	4.40

Manning's Equation:

$$Q = 1.49/n * A * R^{(2/3)} * S^{(1/2)}$$

A = Area
R = D/4
S = Slope
n = 0.014