DRAINAGE REPORT

For

Remaining Portion of Tract B
Cottonwood Corners

REVISED TO INCLUDE
CHUCK-E-CHEESES
PAD SITE

Prepared by

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

Prepared for

Las Colinas Realty
10200 Corrales Road NW
Albuquerque, New Mexico 87114

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Ronald R. Bohannan P.E. No. 7868

TABLE OF CONTENTS

LOCATION:

The 14-acre site is located in the northeast corner of the intersection of Coors Boulevard and Ellison Road, just west of State Road 528. The site is bordered on the east by the Cottonwood Drive. This site is one of the remaining portions of the Cottonwood area to be developed and it includes Tracts B3, B4, B5, and B6. All of the listed tracts are zoned SU-1. The purpose of this report is to revise the drainage analysis and management plan for the commercial site to include the proposed Chuck-E-Cheeses for building permit in the northeast corner of the site.

DRAINAGE BASINS DESIGNATIONS:

For the purpose of this report the existing and developed drainage basins were designated as follows.

Existing Undeveloped Basins:

Basin E1	Entire site consisting of Tracts B3, B4, B5 and B6.

Developed Conditions:

Basins A–K	Developed parcels with on-site detention in parking lots

(Chuck-E-Cheeses is proposed for Basins H & I)

EXISTING DRAINAGE CONDITIONS:

The site is currently undeveloped with the following exceptions. Basin B has been developed with a Carl's Jr. Restaurant, as approved under drainage report A14/D7D, engineer's stamp date 3/14/01. Basins J & K are currently under construction for the development of Olive Garden and Red Lobster restaurants, as approved under drainage report A14/D7E. Basins H and I contains an existing temporary detention pond constructed to aid in the discharge of runoff from the site into the existing storm drain system in cottonwood drive at a controlled rate of 0.69 cfs per acre. Basin D contains an existing temporary retention pond for flows developed in the adjacent developed basin.

For the total 14 acres, the maximum flow rate allowed from the site is just less than 10 cfs. This maximum flow rate allowed from the site was established by the master drainage plan prepared for the entire cottonwood area by Easterling and Associates in 1994.

The site primarily drains from southwest to northeast into the temporary detention pond. All off site flows are intercepted in the existing streets bordering the site. No off site flows enter the site. The calculated undeveloped runoff from this site for a 100-year, 6-hour storm event under existing conditions is 18.46 cfs.

FIRM MAP AND SOIL CONDITIONS:

The site is located on FIRM Map 35001C0108 D and Map 35001C0109 D, Panel Numbers 108 and 109 of 825, as shown on the attached excerpts. The maps show that the site does partially lie within a 100-year flood plain. When the Cottonwood area was developed and the adjacent roadways and storm drains were constructed, the subject site was physically taken out of the flood plain. Easterling and Associates is currently in the process of preparing a Letter of Map Revision (LOMR) to officially remove the site from the flood plain.

The site contains a soil type designated as Bluepoint Series by the Soil Conservation Service Soil Survey of Bernalillo County. The Bluepoint series consists of deep, somewhat excessively drained soils formed in sandy alluvium and eolian sediments on alluvial fans and terraces. Slopes range from one to fifteen percent. Permeability is rapid. Runoff is slow and the hazard of blowing is severe.

ONSITE DRAINAGE MANAGEMENT PLAN:

The on-site developed basins A through K, as shown on exhibit B, consist of parcels containing commercial buildings and parking lots with on site shallow ponding. The basins will drain to individual drop inlets that are connected to an on site underground storm drain system. The storm drain system conveys the flows to the northeast corner of the site where it is tied to the master storm drain in Cottonwood Drive. Shallow parking lot ponds and orifice plates on the storm drains will control the runoff from the site to a maximum of 0.69 cfs per acre or 9.67 cfs for the total site. This is consistent with the master drainage management plan prepared for the Cottonwood area by Easterling and Associates in 1994. A conceptual grading plan has been developed for the overall site including Tracts B-3, B-4, B-5 and B-6. Tract B5 (Carl's Jr.) and a portion of Tract B-3 (Red Lobster/Olive Garden) have been developed to date.

Due to the excessive grade differences between the site and the existing adjacent roadways, a combination of 1:1 rock plating and retaining walls are required along the west and north property lines. The entrance to the commercial center from the north was previously eliminated by Administrative Amendment due to required slopes and walls that would have been in excess of those allowed by the Development Process Manual (DPM). At present, the building sites are conceptual with the exception of those shown in Basins B, H, I, J & K (Carl's Jr., Chuck-E-Cheeses, Red Lobster and Olive Garden).

The initial site developed was Basin B. This site contains a single drop inlet with an orifice plate used to control the runoff to a maximum of 0.69 cfs per acre. Ponding occurs on site in the parking lot. Events larger than a 100-year storm will result in the parking lot pond overflowing to the east into the adjacent tract and continuing into Cottonwood Drive. The finish floor elevations for Tract B-5 and for adjacent tracts will be a minimum of 1.22 feet above the emergency overflow elevation. A temporary retention pond is required under interim conditions until the planned storm drain system is completed to the north and tied to the existing system in Cottonwood Drive.

The restaurants in Basins J & K (Olive Garden & Red Lobster) are currently under construction. Runoff from these two basins will be routed in the proposed storm drain to the existing storm drain in Cottonwood Drive. Orifice plates will be constructed in the drop inlets to limit the discharge from the basins to under 0.69 cfs per acre. Parking lot ponding will occur in each basin. Flows in excess of a 100-yr event will overflow to adjacent basins and into the existing Cottonwood Drive. The finish floor elevations in the basins are above the emergency overflow elevations set for each basin. A chart is attached which tabulates all this pertinent data. The storm drain inlet structures will be constructed with a trap that is designed to intercept sediment and prevent the clogging of the required orifice plates.

FUTURE DEVELOPED CONDITIONS:

As the remaining tracts are developed the conceptual grading plan will be modified to conform to the required layouts. The temporary retention ponds required under interim conditions will be eliminated or relocated as the storm drain system is extended to the north. When the storm drain system is tied to the existing system in Cottonwood Drive, the need for temporary retention ponds will be eliminated. Each basin will provide for shallow parking lot ponding to detain flows and control the runoff at a release rate of less than the 0.69 cfs allowed per acre. The onsite storm drain system will collect discharge from the parking lot ponds and convey the flows to the outlet at Cottonwood Drive.

CRITERIA:

The site was analyzed using the procedures outlined in the Development Process Manual Volume 2, Chapter 22. The Weighted-E method was used in estimating volumes and flow rates of runoff from off-site basins. The AHYMO computer program was used to analyze on site basins and the pond. The existing and developed conditions for on site basins were analyzed for a 100-year, 6-hour rainfall event. The temporary retention pond required under interim conditions for Tract B-5 was sized for a 100-year, 10-day rainfall event.

SUMMARY:

The remaining portion of Tract B is to be developed as a commercial center. This includes Tracts B-3, B-4, B-5 and B-6. A conceptual master grading and drainage plan has been prepared. The conceptual plan complies with the maximum runoff allowed to enter the existing storm drain in Cottonwood Drive as outlined by the drainage master plan prepared by Easterling and Associates in 1994. The initial site developed was Basin B. Development of Basins J & K is currently under construction. The development of Basins H & I are proposed for a Chuck-E-Cheese Restaurant. The grading and drainage plan for this site has been modified to include the new Chuck-E-Cheese pad site and does follow the overall master plan. The drainage plan for Basins B, H, I, J & K does include parking lot ponding, orifice controlled storm drain inlets and temporary retention ponds. Emergency overflows for the parking lot ponds and temporary retention ponds are provided and are well below the finish floor elevations within each basin.

JN 21049
OLIVE GARDEN & RED LOBSTER @ COTTONWOOD CORNERS
CONCEPTUAL OVERALL DRAINAGE SUMMARY

Basin	Area (ACRE)	Drop Inlet Invert Elev.	Drop Inlet Rim Elev.	Ponding Capacity (AC-FT)	Max. Water Surface Elev.	Maximum Storage (AC-FT)	Orifice Diameter (INCH)	Peak Discharge (CFS)	Emergency Overflow Elevation	Finish Floor Elevation
A	0.773	5041.18	5044.01	0.158	5044.99	0.69	3.20	0.52	5045.50	5045.65
B	0.795	5041.30	5044.13	0.173	5044.88	0.07	3.30	0.53	5045.33	5046.60
C	2.520	5041.30	5044.13	0.385	5045.26	0.22	5.80	1.70	5045.33	5046.55
D	1.082	5041.18	5044.13	0.299	5044.98	0.10	3.70	0.69	5045.25	5045.65
E	1.432	5037.94	5046.70	0.137	5048.12	0.12	3.50	1.02	5048.01	5049.50
F	2.096	5040.81	5044.81	0.547	5042.78	0.19	4.40	1.31	5046.16	5049.50
G	1.594	5037.46	5041.56	0.478	5039.64	0.15	3.90	0.88	5043.06	5047.50
H	1.005	5040.00	5044.10	0.151	5044.78	0.07	4.25	1.05	5045.14	5046.00
I	0.448	5040.00	5044.10	0.077	5044.84	0.04	2.50	0.36	5045.20	5046.00
J	1.191	5039.70	5045.19	0.138	5046.04	0.11	3.30	0.70	5046.14	5047.40
K	1.371	5041.35	5045.97	0.234	5046.77	0.14	4.00	0.94	5047.00	5048.00
Outfall MH In CW DR.		5032.12	5039.48				Total Q =	9.70		

Note: All storm drain pipes to be installed at 0.6 % slope

Cottonwood Corners

Weighted E Method

Developed Basins Zone # 1

											100-Year			10-Year		
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)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
A	33685.00	0.773		0	10%	0.077		0	90%	0.696	1.840	0.119	3.20	1.138	0.073	2.07
B	34640.00	0.795		0	10%	0.080		0	90%	0.716	1.840	0.122	3.29	1.138	0.075	2.13
C	109750.00	2.520		0	10%	0.252		0	90%	2.268	1.840	0.386	10.42	1.138	0.239	6.74
D	47150.00	1.082		0	10%	0.108		0	90%	0.974	1.840	0.166	4.48	1.138	0.103	2.90
E	62371.00	1.432		0	10%	0.143		0	90%	1.289	1.840	0.220	5.92	1.138	0.136	3.83
F	91312.00	2.096		0	10%	0.210		0	90%	1.887	1.840	0.321	8.67	1.138	0.199	5.61
G	69435.00	1.594		0	10%	0.159		0	90%	1.435	1.840	0.244	6.59	1.138	0.151	4.27
H	43762.00	1.005		0	10%	0.100		0	90%	0.904	1.840	0.154	4.16	1.138	0.095	2.69
I	19534.00	0.448		0	10%	0.045		0	90%	0.404	1.840	0.069	1.85	1.138	0.043	1.20
J	51867.00	1.191		0	10%	0.119		0	90%	1.072	1.840	0.183	4.92	1.138	0.113	3.19
K	59712.00	1.371		0	10%	0.137		0	90%	1.234	1.840	0.210	5.67	1.138	0.130	3.67
Totals	623218.00	14.307										2.194	59.17		1.357	38.30

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