

CITY OF ALBUQUERQUE



September 22, 2017

David Soule, P.E.
Rio Grande Engineering
PO Box 93924
Albuquerque, NM 87199

RE: **2100 Osuna NE**
Grading Plan Engineer's Stamp Date 8/1/17
Drainage Report Engineer's Stamp Date: 9/1/17
Drainage File: E16D001

Dear Mr. Soule:

Based on the information provided in your submittal received 9/11/17, the Grading Plan and Drainage Report cannot be approved for Building Permit until the following are addressed:

General.

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

1. Provide an agreement, signed by the 2 lot owners, showing that Lot 1A is allowed cross-lot drainage and ponding onto lot 4B.
2. A Bernalillo County Recorded Private Facility Drainage Covenant, signed by the owner of Lot 4A, is required for the portion of the ponds located on lot 4A. The original notarized form, pond exhibit, and recording fee (\$25 payable to City of Albuquerque) must be turned into DRC (4th, Plaza del Sol) for routing.
3. A Bernalillo County Recorded Private Facility Drainage Covenant, signed by the owner of Lot 1A, is required for the portion of the ponds located on lot 1A. The original notarized form, pond exhibit, and recording fee (\$25 payable to City of Albuquerque) must be turned into DRC (4th, Plaza del Sol) for routing.
4. Please contact Charlotte LaBadie (clabadie@cabq.gov, 924-3996) or Madeline Carruthers (mtafoya@cabq.gov, 924-3997) regarding the routing and recording process for covenants.

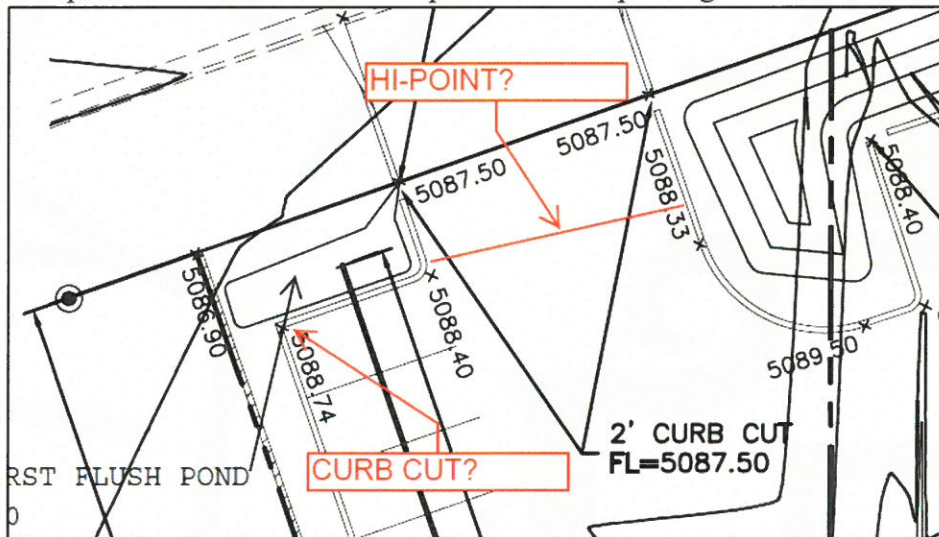
Drainage Report.

1. How does Lot 1B (to the south of this site) drain? It appears to drain to its NE corner and onto the SW corner of your site. Provide additional discussion regarding this. If there are off-site flows, these will need to be routed across your site as well.
2. The Stormwater Studio appendix does not match the grading plan with respect to slopes and inverts of the drain pipe.



Grading Plan.

1. Laying the storm drain pipe at a 0.35% slope does not seem constructible; a slope closer to 1% is recommended.
2. Provide a detail for the outlet/reducer/drain grate at the SW pond.
3. Modify the linetype for the existing contours so they stand out from the proposed contours. Add contour labeling to both.
4. Extending existing topo south and west of the SW pond. It is unclear what flows may be entering/existing at this corner.
5. Clearly define the overland flow-path (emergency overflow) from the SW pond to Osuna. Include elevations, dimensions and erosion protection.
6. Provide a section view through the retaining wall.
7. An additional curb cut and grade break at the new entrance appear necessary at the small NW pond to route flows into the pond from the parking lot:



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If you have any questions, please contact me at 924-3695 or dpeterson@cabq.gov.

Sincerely,

Dana Peterson, P.E.
Senior Engineer, Planning Dept.
Development Review Services



City of Albuquerque

Planning Department
Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: 2100 Osuna NE **Building Permit #:** **City Drainage #:**
DRB#: **EPC#:** **Work Order#:**
Legal Description: lot 1a lands of lively equipment Co, and a portion of lot 4B lands of lively equipment co.
City Address: 2100 Osuna NE

Engineering Firm: RIO GRANDE ENGINEERING **Contact:** DAVID SOULE
Address: PO BOX 93924, ALBUQUERQUE, NM 87199
Phone#: 505.321.9099 **Fax#:** 505.872.0999 **E-mail:** DAVID@RIOGRANDEENGINEERING.COM

Owner: E2 Properties **Contact:**
Address: 2100 Osuna NE, Alb, NM 87107
Phone#: **Fax#:** **E-mail:**

Architect: none **Contact:**
Address:
Phone#: **Fax#:** **E-mail:**

Other Contact: **Contact:**
Address:
Phone#: **Fax#:** **E-mail:**

Check all that Apply:

DEPARTMENT:

- ☒ HYDROLOGY/ DRAINAGE
☐ TRAFFIC/ TRANSPORTATION
☐ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

- ☐ ENGINEER/ ARCHITECT CERTIFICATION
- ☐ CONCEPTUAL G & D PLAN
☒ GRADING PLAN
☐ DRAINAGE MASTER PLAN
☐ DRAINAGE REPORT
☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ TRAFFIC IMPACT STUDY (TIS)
☐ EROSION & SEDIMENT CONTROL PLAN (ESC)
- ☐ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: ☐ Yes ☒ No

DATE SUBMITTED: 8/1/17 By: _____

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: _____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- ☒ BUILDING PERMIT APPROVAL
☐ CERTIFICATE OF OCCUPANCY
- ☐ PRELIMINARY PLAT APPROVAL
☐ SITE PLAN FOR SUB'D APPROVAL
☐ SITE PLAN FOR BLDG. PERMIT APPROVAL
☐ FINAL PLAT APPROVAL
☐ SIA/ RELEASE OF FINANCIAL GUARANTEE
☐ FOUNDATION PERMIT APPROVAL
☒ GRADING PERMIT APPROVAL
☐ SO-19 APPROVAL
☒ PAVING PERMIT APPROVAL
☐ GRADING/ PAD CERTIFICATION
☐ WORK ORDER APPROVAL
☐ CLOMR/LOMR
- ☐ PRE-DESIGN MEETING
☐ OTHER (SPECIFY) _____

DRAINAGE REPORT

For

2100 Osuna NE

Albuquerque, New Mexico

Prepared by

Rio Grande Engineering
PO Box 93924
Albuquerque, New Mexico 87199

SEPTEMBER 2017



David Soule P.E. No. 14522

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Site Grading and Drainage Plan

PURPOSE

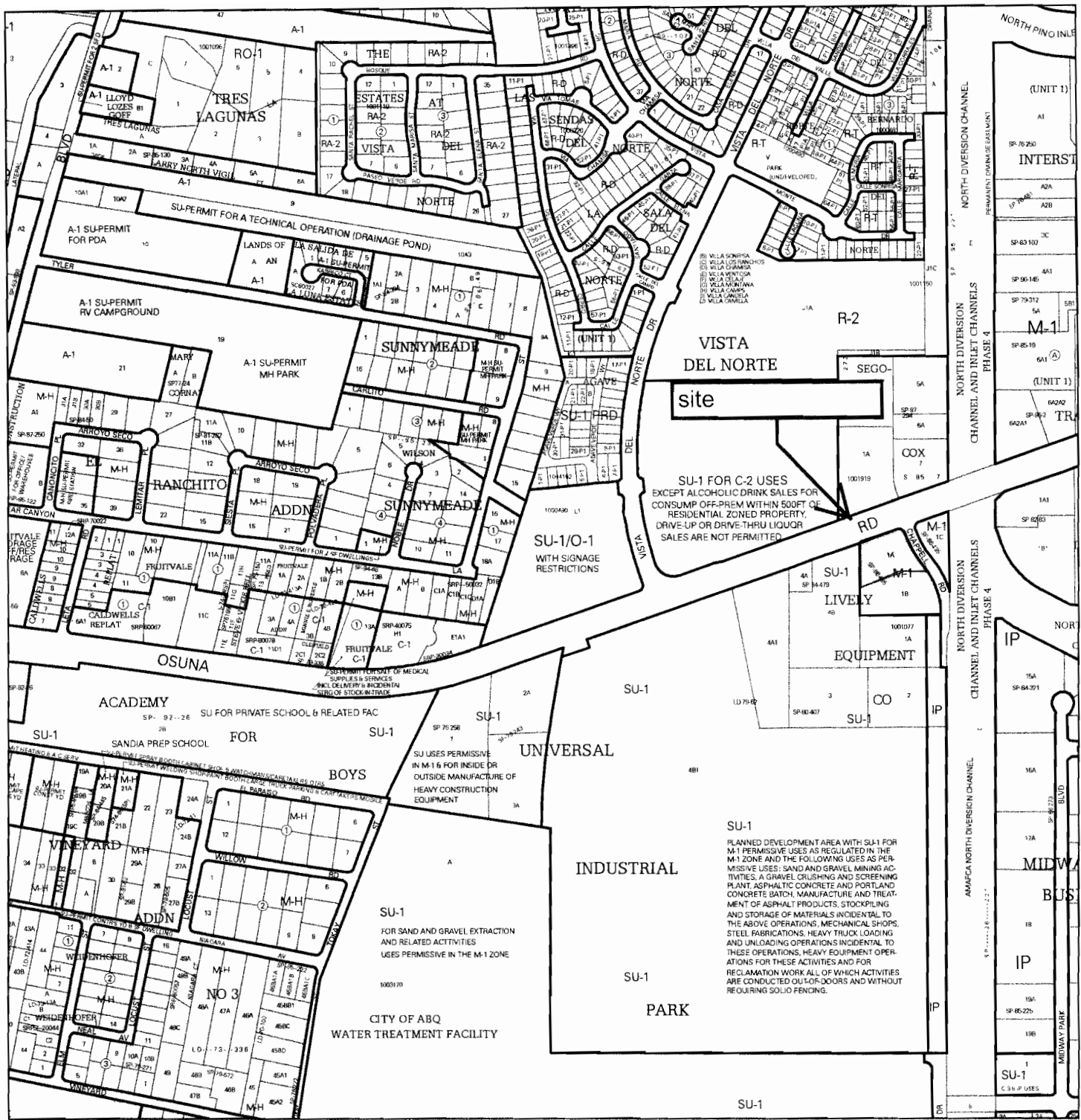
The purpose of this report is to provide the Drainage Management Plan for the addition of parking areas to an existing 1.7 acre parcel. This plan was prepared in accordance with the City of Albuquerque design regulations, utilizing the City of Albuquerque’s Development Process Manual drainage guidelines. This report will demonstrate that the grading does 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 1.7 -acre parcel of land located on the southwest corner of Chappell and Osuna. The legal description of this site is tract 1A Lands of Lively Equipment Company and leasehold interest in portion of lot 4B Lands of Lively Equipment Company. As shown on FIRM map35001C0138H, the entire site is located within Flood Zone X. The AMAFCA North Diversion Channel is 200’ upstream of property; the site is not impacted by upland flow. The site is a completely developed site. The entire parking area is paved, the surrounding landscape is completed and the entire supporting drainage infrastructure is completed. The site free discharges to Osuna, a drainage file for this development does not exist. The proposed improvements include the construction of additional parking on a leased portion of the adjoining tract. Since this site is a redevelopment, the grading plan must conform to the existing conditions and reduce flow to less than existing while capturing the first flush volume.

EXISTING CONDITIONS

The site is currently a developed. The site currently discharges 7.37 cfs to the Osuna. The site is not impacted by upland flows. The south west corner has a small pond that overflows to Osuna. All downstream improvements are in place and maintained by the city of Albuquerque.



For more current information and more details visit: <http://www.cabq.gov/gis>

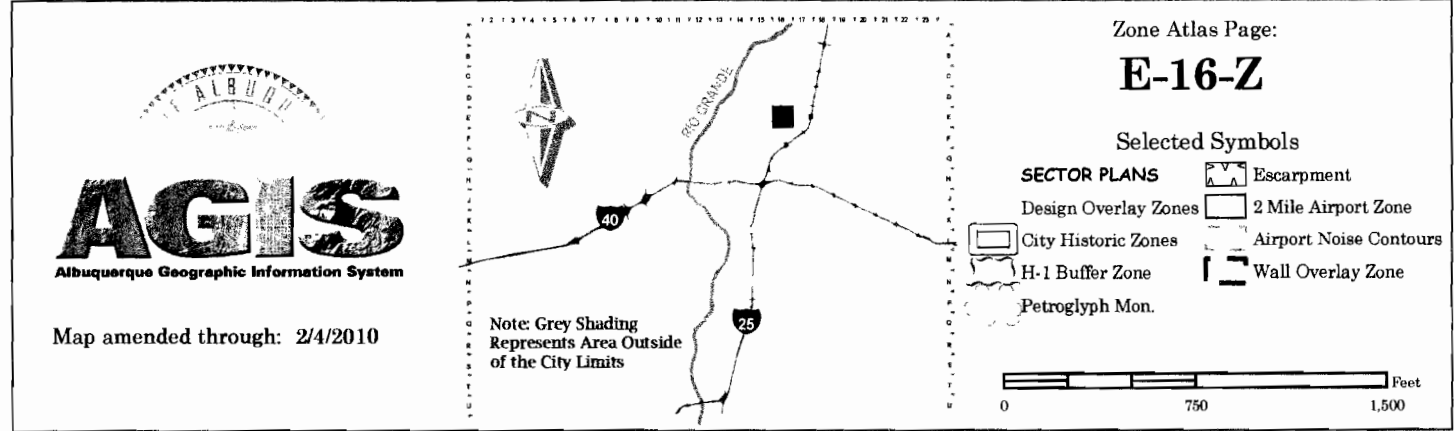


EXHIBIT A

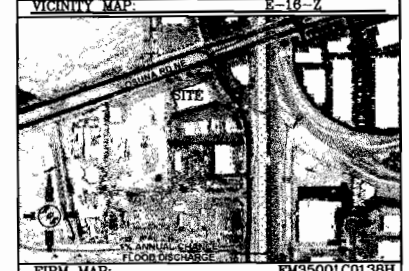
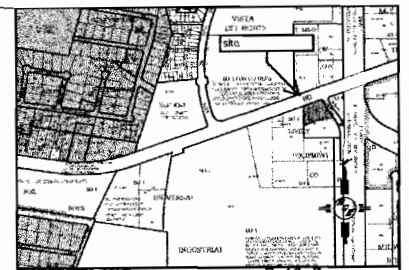
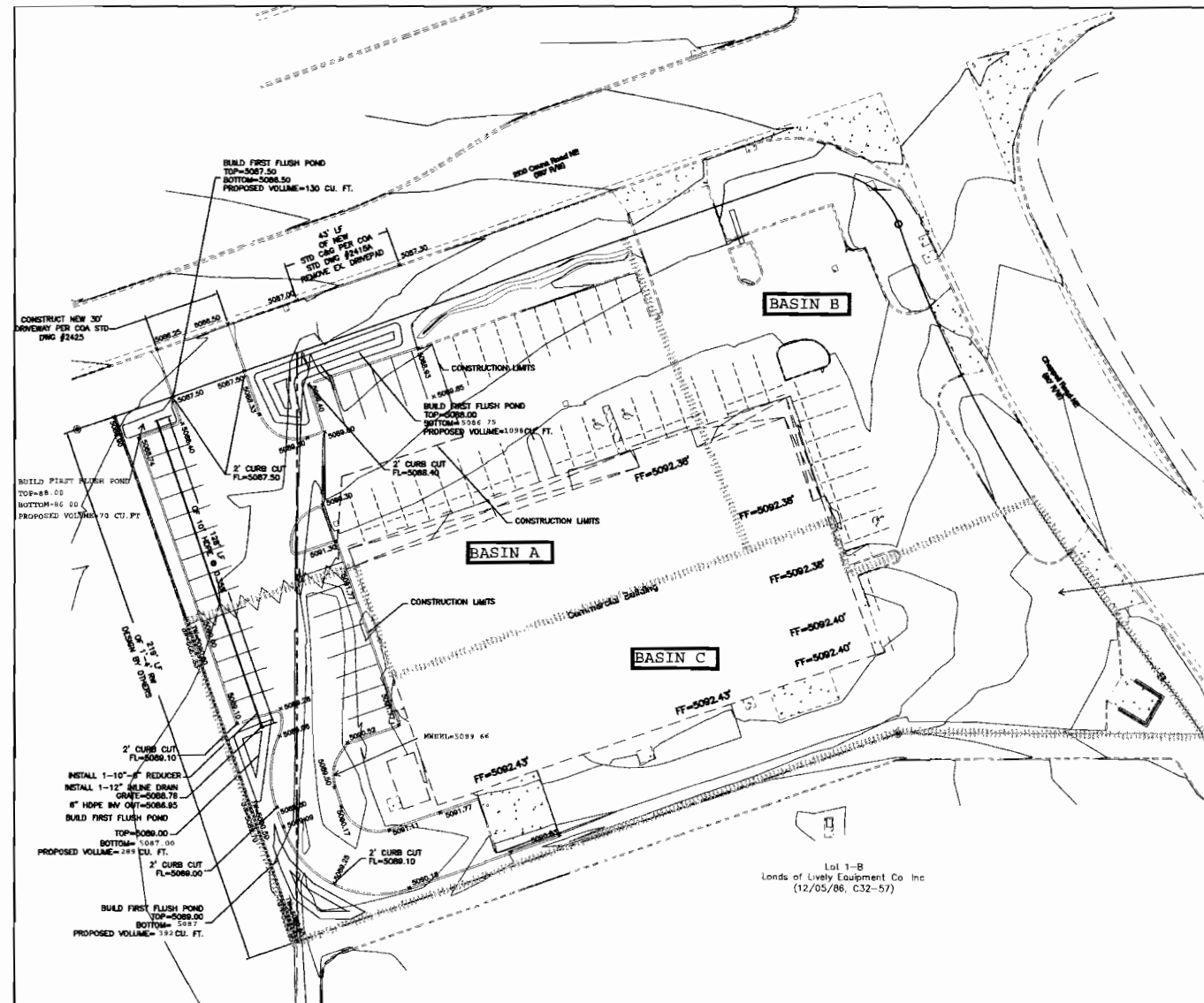
PROPOSED CONDITIONS

The proposed improvements consist of new parking area for the existing building. The affected area is a leasehold portion of the adjacent tract of land. The proposed site development will maintain existing patterns. The site contains 3 drain basins. Basin A contains the front portion of the lot and the improvements will increase the discharge from 2.55 cfs to 2.61 cfs. This basin discharges out an existing driveway to Osuna. Basin B contains the northern portion of the site and will not be modified, therefore the peak discharge of 1.55 cfs will remain to drain out the driveway to Osuna. The rear and southern portion of the lot will generate 3.51 cfs, compared to 3.27 cfs in existing condition. The total site discharge will be reduced by draining basin C to an inlet with a 6" outlet that will throttle the flow. As shown in appendix B, the pond was modeled using AHYMO. The peak discharge is reduced to 1.53 cfs and the max water surface is 5089.66 cfs. This area will overflow to basin A in a clogging event and continue to drain to Osuna. The combination of the three developed basins will be 5.69 cfs which is 1.68 cfs less than existing. The required first flush volume of 1,829 CF is retained onsite.

SUMMARY AND RECOMMENDATIONS

This project is an addition of parking to an existing building on a free discharging site. The parking area is to be located on a leased portion of an adjacent lot. There are no drainage files for the existing building. The drainage patterns will remain, the peak flow is being reduced by 1.53 cfs and the required first flush volume is being retained onsite. The onsite storm drain was designed to convey the flow. The ponds will overflow in an emergency or clogging situation via the parking lot discharging to Osuna. The development of this site will not negatively impact the upstream nor down stream facilities. Since the work area does not exceed 1 acre, erosion and sediment Control Plan should not be required prior to any construction activity.

APPENDIX A
SITE HYDROLOGY



LEGAL DESCRIPTION:
LOT 1A, 4B, LIME EQUIPMENT

- NOTES:
1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.
 2. ALL CURB AND GUTTER TO 6" HEADER UNLESS OTHERWISE NOTED.
 3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.
 4. ALL NEW PAVING SHALL BE 6" PCC OVER 8" SUBGRADE PREPARATION IN CONFORMANCE TO AASHTO-MS-1. UNLESS OTHERWISE NOTED.
 5. ANY CURBS OR PAVEMENT NEGATIVELY IMPACTED BY CONSTRUCTION ACTIVITY SHALL BE REPLACED TO MATCH EXISTING CONDITIONS.
 6. ALL SITE WORK SHALL CONFORM TO CITY OF ALBUQUERQUE STANDARDS FOR PUBLIC WORKS CONSTRUCTION EDITION 9.

LEGEND

---	EXISTING CONTOUR
---	EXISTING INDEX CONTOUR
---	PROPOSED CONTOUR
---	PROPOSED INDEX CONTOUR
---	SLOPE TIE
---	EXISTING SPOT ELEVATION
---	PROPOSED SPOT ELEVATION
---	BOUNDARY
---	CENTERLINE
---	RIGHT-OF-WAY
---	PROPOSED CURB
---	EXISTING CURB AND GUTTER
---	PROPOSED SIDEWALK
---	EXISTING SIDEWALK
---	PROPOSED RETAINING WALL (DESIGN BY OTHERS)

- EROSION CONTROL NOTES:
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
 2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
 3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
 4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
 5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.

CAUTION:
EXISTING UTILITIES ARE NOT SHOWN.
IT SHALL BE THE SOLE RESPONSIBILITY
OF THE CONTRACTOR TO CONDUCT ALL
NECESSARY FIELD INVESTIGATIONS PRIOR
TO ANY EXCAVATION TO DETERMINE THE
ACTUAL LOCATION OF UTILITIES & OTHER
IMPROVEMENTS.



ENGINEER'S SEAL	2100 OSUNA	DATE
8/1/17	GRADING AND DRAINAGE PLAN	8-07-17
DAVID SOULE P.E. #14322	Rio Grande Engineering 1000 CENTRAL AVENUE SE SUITE 201 ALBUQUERQUE, NM 87102 (505) 478-1000	SHEET # 21724

Weighted E Method

2100 osuna

Existing Developed Basins

											100-Year, 6-hr.		
Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
			%	(acres)	%	(acres)	%	(acres)	%	(acres)			
EXISTING A	25233	0.579	0%	0	0.0%	0.000	19.0%	0.11006	81%	0.469	1.932	0.093	2.55
EXISTING B	15415	0.354	0%	0	0.0%	0.000	20.0%	0.07078	80%	0.283	1.922	0.057	1.55
EXISTING C	33657	0.773	0%	0	0.0%	0.000	30.0%	0.2318	70%	0.541	1.823	0.117	3.27
TOTAL EXISTING	74305	1.706	0%	0	0.0%	0.000	24.2%	0.41263	77%	1.293		0.267	7.37
PROPOSED A	25233	0.579	0%	0	0.0%	0.000	13.0%	0.07531	87%	0.504	1.991	0.096	2.61
PROPOSED B	15415	0.354	0%	0	0.0%	0.000	20.0%	0.07078	80%	0.283	1.922	0.057	1.55
PROPOSED C	33657	0.773	0%	0	0.0%	0.000	10.0%	0.07727	90%	0.695	2.021	0.130	3.51
TOTAL PROPOSED	74305	1.706	0%	0		0.000	13.1%	0.223	87%	1.482		0.283	7.669

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

Where for 100-year, 6-hour storm (zone 3)

$E_a = 0.53$
 $E_b = 0.78$
 $E_c = 1.13$
 $E_d = 2.12$

$Q_a = 1.57$
 $Q_b = 2.28$
 $Q_c = 3.14$
 $Q_d = 4.7$

water quality requirement 1829.65362

discharge leaving sige exisitng generated routed

basin a	2.55	2.61	2.61
basin b	1.55	1.55	1.55
basin c	3.27	3.51	1.53
TOTAL	7.37	7.67	5.69

APPENDIX B

HYDRAULIC MODELING AND CALCULATIONS

VOLUME CALCULATIONS

COMMONS POND

OUTLET

POND BOTTOM

POND OVERFLOW

ACTUAL ELEV.	DEPTH (FT)	AREA SF	VOLUME PER UNIT	VOLUME CUMULATIVE	VOLUME AC-FT	Q (CFS)
87	0	285	285	1	0.000	
88.00	0.75	425.00	355	356	0.008	
88.50	1.25	505.00	232.5000	588.5	0.014	0.00
88.76	1.51	545.00	136.5000	725	0.017	1.16
89.00	2.01	1019.00	187.6800	912.68	0.021	1.34
89.50	2.50	2617.00	909.0000	1821.68	0.042	1.49
90.00	3.00	3214.00	1457.7500	3279.43	0.075	1.64

outlet at 87.25

Orifice Equation

Q = CA SQRT(2gH)

C =

0.6

Diameter (in)

6

Area (ft^2)=

0.196349541

g =

32.2

H (Ft) =

Depth of water above center of orifice

Q (CFS)=

Flow

POND.txt

*S AHYMO - BASIN C
*S POND ROUTING

START TIME=0.0 PUNCH CODE=0

RAINFALL TYPE=2
 QUARTER=0.0 ONE= 2.01 IN
 SIX= 2.35 IN DAY= 2.75 IN DT = 0.05 HR

COMPUTE NM HYD ID=1 HYD NO=101 DA= .0012078 SQ MI
 PER A=0 PER B=0.0 PER C=10.0 PER D=90.00

 TP=-.135 MASSRAIN=-1

PRINT HYD ID=1 CODE=3

* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR
ROUTE RESERVOIR ID=2 HYD NO=102 INFLOW=1 CODE=3

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)
0.00	0.014	88.50
1.16	0.017	88.76
1.34	0.021	89.00
1.49	0.042	89.50
1.64	0.075	90.00

PRINT HYD ID=2 CODE=3

FINISH

AHYMO.OUT

AHYMO PROGRAM (AHYMO-S4) - Version: S4.01a - Rel: 01a
 RUN DATE (MON/DAY/YR) = 09/07/2017
 START TIME (HR:MIN:SEC) = 14:02:12 USER NO.=
 RioGrandeSingleA41963517
 INPUT FILE = C:\Documents and Settings\Owner\Desktop\2017
 jobs\1734-2100osuna\POND.txt

*S AHYMO - BASIN C
 *S POND ROUTING

START TIME=0.0 PUNCH CODE=0

RAINFALL TYPE=2
 QUARTER=0.0 ONE= 2.01 IN
 SIX= 2.35 IN DAY= 2.75 IN DT = 0.05 HR

24-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE
 AREAS (NM & AZ) - D1

DT =	0.050000	HOURS	END TIME =	24.000002	HOURS
0.0000	0.0023	0.0046	0.0071	0.0099	0.0127
0.0203	0.0272	0.0347	0.0424	0.0509	0.0595
0.0776	0.0870	0.0974	0.1084	0.1204	0.1437
0.2117	0.2559	0.3104	0.3831	0.4649	0.6062
1.2021	1.4666	1.6752	1.7800	1.8719	1.9379
2.0362	2.0697	2.1005	2.1259	2.1418	2.1530
2.1722	2.1803	2.1879	2.1953	2.2025	2.2084
2.2152	2.2186	2.2217	2.2247	2.2278	2.2307
2.2363	2.2391	2.2417	2.2443	2.2469	2.2494
2.2542	2.2565	2.2588	2.2611	2.2633	2.2654
2.2697	2.2717	2.2738	2.2758	2.2778	2.2798
2.2837	2.2856	2.2874	2.2893	2.2911	2.2930
2.2965	2.2983	2.3000	2.3017	2.3034	2.3051
2.3084	2.3100	2.3117	2.3133	2.3148	2.3164
2.3195	2.3210	2.3225	2.3240	2.3255	2.3269
2.3298	2.3313	2.3327	2.3341	2.3355	2.3368
2.3396	2.3409	2.3422	2.3436	2.3449	2.3462
2.3487	2.3500	2.3513	2.3525	2.3538	2.3551
2.3576	2.3589	2.3601	2.3614	2.3627	2.3639
2.3665	2.3677	2.3690	2.3702	2.3715	2.3728
2.3753	2.3765	2.3778	2.3790	2.3803	2.3815
2.3840	2.3853	2.3865	2.3878	2.3890	2.3903
2.3927	2.3940	2.3952	2.3965	2.3977	2.3989
2.4014	2.4027	2.4039	2.4051	2.4064	2.4076
2.4101	2.4113	2.4125	2.4137	2.4150	2.4162
2.4186	2.4199	2.4211	2.4223	2.4235	2.4247
2.4272	2.4284	2.4296	2.4308	2.4320	2.4333
2.4357	2.4369	2.4381	2.4393	2.4405	2.4417
2.4441	2.4453	2.4465	2.4478	2.4490	2.4502
2.4526	2.4538	2.4550	2.4561	2.4573	2.4585
2.4609	2.4621	2.4633	2.4645	2.4657	2.4669
2.4692	2.4704	2.4716	2.4728	2.4740	2.4752
2.4775	2.4787	2.4799	2.4811	2.4822	2.4834
2.4858	2.4869	2.4881	2.4893	2.4905	2.4916
2.4940	2.4951	2.4963	2.4975	2.4986	2.4998
2.5021	2.5033	2.5044	2.5056	2.5068	2.5079
2.5102	2.5114	2.5125	2.5137	2.5148	2.5160
					2.5171

AHYMO.OUT
2.5183 2.5194 2.5206 2.5217 2.5229 2.5240 2.5252
2.5263 2.5274 2.5286 2.5297 2.5309 2.5320 2.5331
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2.5657 2.5668 2.5679 2.5691 2.5702 2.5713 2.5724
2.5735 2.5746 2.5757 2.5768 2.5779 2.5790 2.5801
2.5812 2.5823 2.5834 2.5845 2.5856 2.5867 2.5878
2.5889 2.5899 2.5910 2.5921 2.5932 2.5943 2.5954
2.5965 2.5976 2.5986 2.5997 2.6008 2.6019 2.6030
2.6040 2.6051 2.6062 2.6073 2.6084 2.6094 2.6105
2.6116 2.6126 2.6137 2.6148 2.6159 2.6169 2.6180
2.6191 2.6201 2.6212 2.6223 2.6233 2.6244 2.6254
2.6265 2.6276 2.6286 2.6297 2.6307 2.6318 2.6328
2.6339 2.6350 2.6360 2.6371 2.6381 2.6392 2.6402
2.6413 2.6423 2.6433 2.6444 2.6454 2.6465 2.6475
2.6486 2.6496 2.6506 2.6517 2.6527 2.6538 2.6548
2.6558 2.6569 2.6579 2.6589 2.6600 2.6610 2.6620
2.6630 2.6641 2.6651 2.6661 2.6672 2.6682 2.6692
2.6702 2.6712 2.6723 2.6733 2.6743 2.6753 2.6763
2.6774 2.6784 2.6794 2.6804 2.6814 2.6824 2.6834
2.6844 2.6854 2.6865 2.6875 2.6885 2.6895 2.6905
2.6915 2.6925 2.6935 2.6945 2.6955 2.6965 2.6975
2.6985 2.6995 2.7005 2.7015 2.7025 2.7034 2.7044
2.7054 2.7064 2.7074 2.7084 2.7094 2.7104 2.7114
2.7123 2.7133 2.7143 2.7153 2.7163 2.7172 2.7182
2.7192 2.7202 2.7211 2.7221 2.7231 2.7241 2.7250
2.7260 2.7270 2.7280 2.7289 2.7299 2.7309 2.7318
2.7328 2.7338 2.7347 2.7357 2.7366 2.7376 2.7386
2.7395 2.7405 2.7414 2.7424 2.7433 2.7443 2.7452
2.7462 2.7472 2.7481 2.7491 2.7500

COMPUTE NM HYD ID=1 HYD NO=101 DA= .0012078 SQ MI
PER A=0 PER B=0.0 PER C=10.0 PER D=90.00
TP=-.135 MASSRAIN=-1

K = 0.073575HR TP = 0.135000HR K/TP RATIO = 0.545000 SHAPE
CONSTANT, N = 7.106428
UNIT PEAK = 4.2376 CFS UNIT VOLUME = 0.9962 B = 526.28
P60 = 2.0100
AREA = 0.001087 SQ MI IA = 0.10000 INCHES INF = 0.04000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

K = 0.108816HR TP = 0.135000HR K/TP RATIO = 0.806046 SHAPE
CONSTANT, N = 4.440407
UNIT PEAK = 0.34314 CFS UNIT VOLUME = 0.9680 B = 383.54
P60 = 2.0100
AREA = 0.000121 SQ MI IA = 0.35000 INCHES INF = 0.83000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

PRINT HYD ID=1 CODE=3

PARTIAL HYDROGRAPH 101.00

TIME	FLOW	TIME	FLOW	TIME	FLOW
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AHYMO.OUT							
TIME	FLOW		TIME	FLOW			
HRS	HRS	CFS	HRS	HRS	CFS	HRS	CFS
	CFS			CFS			
14.850	0.000	0.0	19.800	4.950	0.0	9.900	0.0
	0.0			0.0			
15.000	0.150	0.0	19.950	5.100	0.0	10.050	0.0
	0.0			0.0			
15.150	0.300	0.0	20.100	5.250	0.0	10.200	0.0
	0.0			0.0			
15.300	0.450	0.0	20.250	5.400	0.0	10.350	0.0
	0.0			0.0			
15.450	0.600	0.0	20.400	5.550	0.0	10.500	0.0
	0.0			0.0			
15.600	0.750	0.0	20.550	5.700	0.0	10.650	0.0
	0.0			0.0			
15.750	0.900	0.0	20.700	5.850	0.0	10.800	0.0
	0.0			0.0			
15.900	1.050	0.2	20.850	6.000	0.0	10.950	0.0
	0.0			0.0			
16.050	1.200	0.5	21.000	6.150	0.0	11.100	0.0
	0.0			0.0			
16.200	1.350	1.3	21.150	6.300	0.0	11.250	0.0
	0.0			0.0			
16.350	1.500	3.6	21.300	6.450	0.0	11.400	0.0
	0.0			0.0			
16.500	1.650	2.2	21.450	6.600	0.0	11.550	0.0
	0.0			0.0			
16.650	1.800	1.1	21.600	6.750	0.0	11.700	0.0
	0.0			0.0			
16.800	1.950	0.6	21.750	6.900	0.0	11.850	0.0
	0.0			0.0			
16.950	2.100	0.3	21.900	7.050	0.0	12.000	0.0
	0.0			0.0			
17.100	2.250	0.2	22.050	7.200	0.0	12.150	0.0
	0.0			0.0			
17.250	2.400	0.1	22.200	7.350	0.0	12.300	0.0
	0.0			0.0			
17.400	2.550	0.1	22.350	7.500	0.0	12.450	0.0
	0.0			0.0			
17.550	2.700	0.0	22.500	7.650	0.0	12.600	0.0
	0.0			0.0			
17.700	2.850	0.0	22.650	7.800	0.0	12.750	0.0
	0.0			0.0			
17.850	3.000	0.0	22.800	7.950	0.0	12.900	0.0
	0.0			0.0			
18.000	3.150	0.0	22.950	8.100	0.0	13.050	0.0
	0.0			0.0			
18.150	3.300	0.0	23.100	8.250	0.0	13.200	0.0
	0.0			0.0			
18.300	3.450	0.0	23.250	8.400	0.0	13.350	0.0
	0.0			0.0			
18.450	3.600	0.0	23.400	8.550	0.0	13.500	0.0
	0.0			0.0			
18.600	3.750	0.0	23.550	8.700	0.0	13.650	0.0
	0.0			0.0			
18.750	3.900	0.0	23.700	8.850	0.0	13.800	0.0
	0.0			0.0			
18.900	4.050	0.0	23.850	9.000	0.0	13.950	0.0
	0.0			0.0			
19.050	4.200	0.0	24.000	9.150	0.0	14.100	0.0
	0.0			0.0			
19.200	4.350	0.0	24.150	9.300	0.0	14.250	0.0
	0.0			0.0			

HYDROLOGIC DATA		HYDROLOGIC DATA		HYDROLOGIC DATA	
19.350	4.500	0.0	24.300	9.450	0.0
19.500	4.650	0.0	24.450	9.600	0.0
19.650	4.800	0.0	24.600	9.750	0.0
RUNOFF VOLUME = 2.37568 INCHES		= 0.1530 ACRE-Feet			
PEAK DISCHARGE RATE = 3.61 CFS		AT 1.500 HOURS		BASIN AREA = 0.0012 SQ. MI.	

* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR			
ROUTE	RESERVOIR	ID=2 HYD NO=102 INFLOW=1	CODE=3
	OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)
	0.00	0.014	88.50
	1.16	0.017	88.76
	1.34	0.021	89.00
	1.49	0.042	89.50
	1.64	0.075	90.00

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	88.50	0.014	0.00
0.15	0.00	88.50	0.014	0.00
0.30	0.00	88.50	0.014	0.00
0.45	0.00	88.50	0.014	0.00
0.60	0.00	88.50	0.014	0.00
0.75	0.00	88.50	0.014	0.00
0.90	0.03	88.50	0.014	0.01
1.05	0.23	88.54	0.014	0.18
1.20	0.53	88.60	0.015	0.46
1.35	1.25	88.73	0.017	1.03
1.50	3.61	89.25	0.032	1.42
1.65	2.18	89.64	0.051	1.53
1.80	1.10	89.64	0.051	1.53
1.95	0.63	89.51	0.043	1.49
2.10	0.32	89.23	0.031	1.41
2.25	0.18	88.77	0.017	1.17
2.40	0.12	88.53	0.014	0.13
2.55	0.05	88.51	0.014	0.06
2.70	0.03	88.51	0.014	0.03
2.85	0.02	88.50	0.014	0.02
3.00	0.01	88.50	0.014	0.01
3.15	0.01	88.50	0.014	0.01
3.30	0.01	88.50	0.014	0.01
3.45	0.01	88.50	0.014	0.01
3.60	0.01	88.50	0.014	0.01
3.75	0.01	88.50	0.014	0.01
3.90	0.01	88.50	0.014	0.01
4.05	0.01	88.50	0.014	0.01
4.20	0.01	88.50	0.014	0.01
4.35	0.01	88.50	0.014	0.01

			AHYMO.OUT	
4.50	0.01	88.50	0.014	0.01
4.65	0.01	88.50	0.014	0.01
4.80	0.01	88.50	0.014	0.01
4.95	0.01	88.50	0.014	0.01
5.10	0.01	88.50	0.014	0.01
5.25	0.01	88.50	0.014	0.01
5.40	0.01	88.50	0.014	0.01
5.55	0.01	88.50	0.014	0.01
5.70	0.02	88.50	0.014	0.02
5.85	0.02	88.50	0.014	0.02
6.00	0.02	88.50	0.014	0.02
6.15	0.02	88.50	0.014	0.02
6.30	0.02	88.50	0.014	0.02
6.45	0.02	88.50	0.014	0.02
6.60	0.02	88.50	0.014	0.02
6.75	0.02	88.50	0.014	0.02
6.90	0.02	88.50	0.014	0.02
7.05	0.02	88.50	0.014	0.02
7.20	0.02	88.50	0.014	0.02
7.35	0.02	88.50	0.014	0.02
7.50	0.02	88.50	0.014	0.02
7.65	0.02	88.50	0.014	0.02
7.80	0.02	88.50	0.014	0.02
7.95	0.02	88.50	0.014	0.02
8.10	0.02	88.50	0.014	0.02
8.25	0.02	88.50	0.014	0.02

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
8.40	0.02	88.50	0.014	0.02
8.55	0.02	88.50	0.014	0.02
8.70	0.02	88.50	0.014	0.02
8.85	0.02	88.50	0.014	0.02
9.00	0.02	88.50	0.014	0.02
9.15	0.02	88.50	0.014	0.02
9.30	0.02	88.50	0.014	0.02
9.45	0.02	88.50	0.014	0.02
9.60	0.02	88.50	0.014	0.02
9.75	0.02	88.50	0.014	0.02
9.90	0.02	88.50	0.014	0.02
10.05	0.02	88.50	0.014	0.02
10.20	0.02	88.50	0.014	0.02
10.35	0.02	88.50	0.014	0.02
10.50	0.02	88.50	0.014	0.02
10.65	0.02	88.50	0.014	0.02
10.80	0.02	88.50	0.014	0.02
10.95	0.02	88.50	0.014	0.02
11.10	0.02	88.50	0.014	0.02
11.25	0.02	88.50	0.014	0.02
11.40	0.02	88.50	0.014	0.02
11.55	0.02	88.50	0.014	0.02
11.70	0.02	88.50	0.014	0.02
11.85	0.02	88.50	0.014	0.02
12.00	0.02	88.50	0.014	0.02
12.15	0.02	88.50	0.014	0.02
12.30	0.02	88.50	0.014	0.02
12.45	0.02	88.50	0.014	0.02
12.60	0.02	88.50	0.014	0.02
12.75	0.02	88.50	0.014	0.02
12.90	0.02	88.50	0.014	0.02
13.05	0.02	88.50	0.014	0.02
13.20	0.02	88.50	0.014	0.02

			AHYMO.OUT	
13.35	0.02	88.50	0.014	0.02
13.50	0.02	88.50	0.014	0.02
13.65	0.02	88.50	0.014	0.02
13.80	0.02	88.50	0.014	0.02
13.95	0.02	88.50	0.014	0.02
14.10	0.02	88.50	0.014	0.02
14.25	0.02	88.50	0.014	0.02
14.40	0.02	88.50	0.014	0.02
14.55	0.02	88.50	0.014	0.02
14.70	0.02	88.50	0.014	0.02
14.85	0.02	88.50	0.014	0.02
15.00	0.02	88.50	0.014	0.02
15.15	0.02	88.50	0.014	0.02
15.30	0.02	88.50	0.014	0.02
15.45	0.02	88.50	0.014	0.02
15.60	0.02	88.50	0.014	0.02
15.75	0.02	88.50	0.014	0.02
15.90	0.02	88.50	0.014	0.02
16.05	0.02	88.50	0.014	0.02
16.20	0.02	88.50	0.014	0.02
16.35	0.02	88.50	0.014	0.02
16.50	0.02	88.50	0.014	0.02
16.65	0.01	88.50	0.014	0.02

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
16.80	0.02	88.50	0.014	0.02
16.95	0.02	88.50	0.014	0.02
17.10	0.02	88.50	0.014	0.02
17.25	0.01	88.50	0.014	0.02
17.40	0.02	88.50	0.014	0.02
17.55	0.02	88.50	0.014	0.02
17.70	0.02	88.50	0.014	0.01
17.85	0.01	88.50	0.014	0.01
18.00	0.01	88.50	0.014	0.01
18.15	0.01	88.50	0.014	0.01
18.30	0.01	88.50	0.014	0.01
18.45	0.01	88.50	0.014	0.01
18.60	0.01	88.50	0.014	0.01
18.75	0.01	88.50	0.014	0.01
18.90	0.01	88.50	0.014	0.01
19.05	0.01	88.50	0.014	0.01
19.20	0.01	88.50	0.014	0.01
19.35	0.01	88.50	0.014	0.01
19.50	0.01	88.50	0.014	0.01
19.65	0.01	88.50	0.014	0.01
19.80	0.01	88.50	0.014	0.01
19.95	0.01	88.50	0.014	0.01
20.10	0.01	88.50	0.014	0.01
20.25	0.01	88.50	0.014	0.01
20.40	0.01	88.50	0.014	0.01
20.55	0.01	88.50	0.014	0.01
20.70	0.01	88.50	0.014	0.01
20.85	0.01	88.50	0.014	0.01
21.00	0.01	88.50	0.014	0.01
21.15	0.01	88.50	0.014	0.01
21.30	0.01	88.50	0.014	0.01
21.45	0.01	88.50	0.014	0.01
21.60	0.01	88.50	0.014	0.01
21.75	0.01	88.50	0.014	0.01
21.90	0.01	88.50	0.014	0.01
22.05	0.01	88.50	0.014	0.01

			AHYMO.OUT	
22.20	0.01	88.50	0.014	0.01
22.35	0.01	88.50	0.014	0.01
22.50	0.01	88.50	0.014	0.01
22.65	0.01	88.50	0.014	0.01
22.80	0.01	88.50	0.014	0.01
22.95	0.01	88.50	0.014	0.01
23.10	0.01	88.50	0.014	0.01
23.25	0.01	88.50	0.014	0.01
23.40	0.01	88.50	0.014	0.01
23.55	0.01	88.50	0.014	0.01
23.70	0.01	88.50	0.014	0.01
23.85	0.01	88.50	0.014	0.01
24.00	0.01	88.50	0.014	0.01
24.15	0.01	88.50	0.014	0.01
24.30	0.00	88.50	0.014	0.00
PEAK DISCHARGE = 1.538 CFS - PEAK OCCURS AT HOUR 1.70				
MAXIMUM WATER SURFACE ELEVATION = 89.662				
MAXIMUM STORAGE = 0.0527 AC-FT INCREMENTAL TIME= 0.050000HRS				

PRINT HYD ID=2 CODE=3

PARTIAL HYDROGRAPH 102.00

TIME	TIME	FLOW	TIME	TIME	FLOW	TIME	FLOW
	FLOW			FLOW			
HRS	HRS	CFS	HRS	HRS	CFS	HRS	CFS
	0.000	0.0		4.950	0.0	9.900	0.0
14.850	0.0	0.0	19.800	0.0	0.0	10.050	0.0
	0.150	0.0		5.100	0.0		
15.000	0.0	0.0	19.950	0.0	0.0	10.200	0.0
	0.300	0.0		5.250	0.0		
15.150	0.0	0.0	20.100	0.0	0.0	10.350	0.0
	0.450	0.0		5.400	0.0		
15.300	0.0	0.0	20.250	0.0	0.0	10.500	0.0
	0.600	0.0		5.550	0.0		
15.450	0.0	0.0	20.400	0.0	0.0	10.650	0.0
	0.750	0.0		5.700	0.0		
15.600	0.0	0.0	20.550	0.0	0.0	10.800	0.0
	0.900	0.0		5.850	0.0		
15.750	0.0	0.0	20.700	0.0	0.0	10.950	0.0
	1.050	0.2		6.000	0.0		
15.900	0.0	0.0	20.850	0.0	0.0	11.100	0.0
	1.200	0.5		6.150	0.0		
16.050	0.0	0.0	21.000	0.0	0.0	11.250	0.0
	1.350	1.0		6.300	0.0		
16.200	0.0	0.0	21.150	0.0	0.0	11.400	0.0
	1.500	1.4		6.450	0.0		
16.350	0.0	0.0	21.300	0.0	0.0	11.550	0.0
	1.650	1.5		6.600	0.0		
16.500	0.0	0.0	21.450	0.0	0.0	11.700	0.0
	1.800	1.5		6.750	0.0		
16.650	0.0	0.0	21.600	0.0	0.0	11.850	0.0
	1.950	1.5		6.900	0.0		
16.800	0.0	0.0	21.750	0.0	0.0	12.000	0.0
	2.100	1.4		7.050	0.0		
16.950	0.0	0.0	21.900	0.0	0.0	12.150	0.0
	2.250	1.2		7.200	0.0		
17.100	0.0	0.0	22.050	0.0	0.0	12.300	0.0
	2.400	0.1		7.350	0.0		
17.250	0.0	0.0	22.200	0.0	0.0	12.450	0.0
	2.550	0.1		7.500	0.0		
17.400	0.0	0.0	22.350	0.0			

AHYMO.OUT						
	2.700	0.0		7.650	0.0	12.600
17.550	0.0		22.500	0.0		0.0
	2.850	0.0		7.800	0.0	12.750
17.700	0.0		22.650	0.0		0.0
	3.000	0.0		7.950	0.0	12.900
17.850	0.0		22.800	0.0		0.0
	3.150	0.0		8.100	0.0	13.050
18.000	0.0		22.950	0.0		0.0
	3.300	0.0		8.250	0.0	13.200
18.150	0.0		23.100	0.0		0.0
	3.450	0.0		8.400	0.0	13.350
18.300	0.0		23.250	0.0		0.0
	3.600	0.0		8.550	0.0	13.500
18.450	0.0		23.400	0.0		0.0
	3.750	0.0		8.700	0.0	13.650
18.600	0.0		23.550	0.0		0.0
	3.900	0.0		8.850	0.0	13.800
18.750	0.0		23.700	0.0		0.0
	4.050	0.0		9.000	0.0	13.950
18.900	0.0		23.850	0.0		0.0
	4.200	0.0		9.150	0.0	14.100
19.050	0.0		24.000	0.0		0.0
	4.350	0.0		9.300	0.0	14.250
19.200	0.0		24.150	0.0		0.0
	4.500	0.0		9.450	0.0	14.400
19.350	0.0		24.300	0.0		0.0
	4.650	0.0		9.600	0.0	14.550
19.500	0.0					0.0
	4.800	0.0		9.750	0.0	14.700
19.650	0.0					
RUNOFF VOLUME = 2.37545 INCHES = 0.1530 ACRE-FEET						
PEAK DISCHARGE RATE = 1.54 CFS AT 1.700 HOURS BASIN AREA =						
0.0012 SQ. MI.						

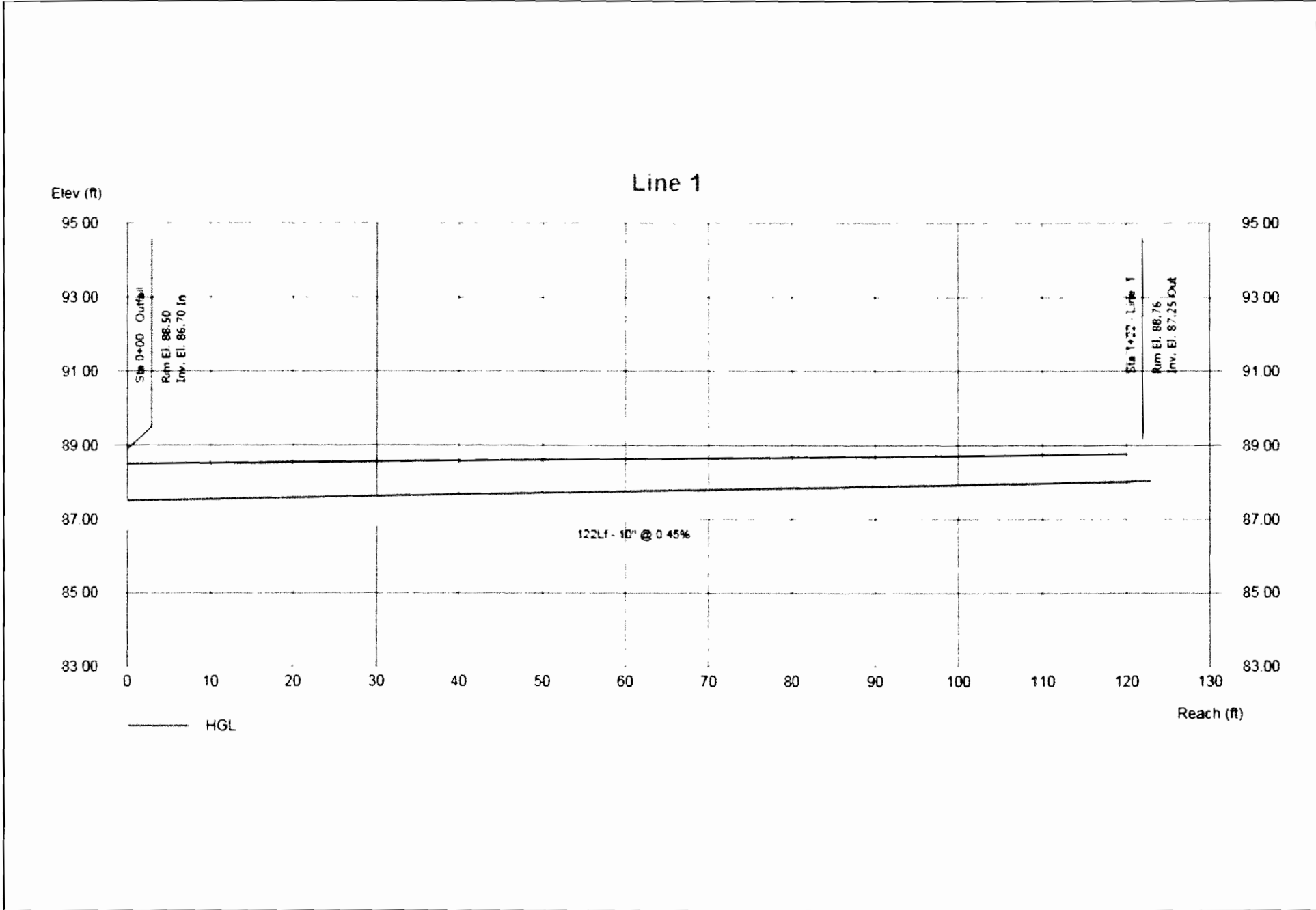
FINISH
NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 14:02:12

Profile View

Stormwater Studio v 1.0.1.12

Project Name: Enter Project Name...

09-07-2017



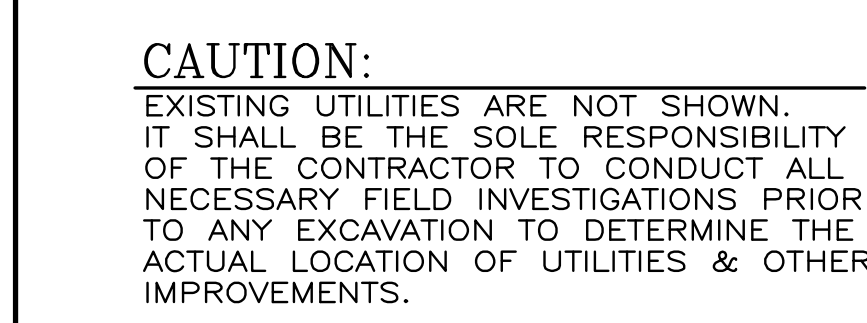
Storm Sewer Tabulation

Project Name: Enter Project Name...

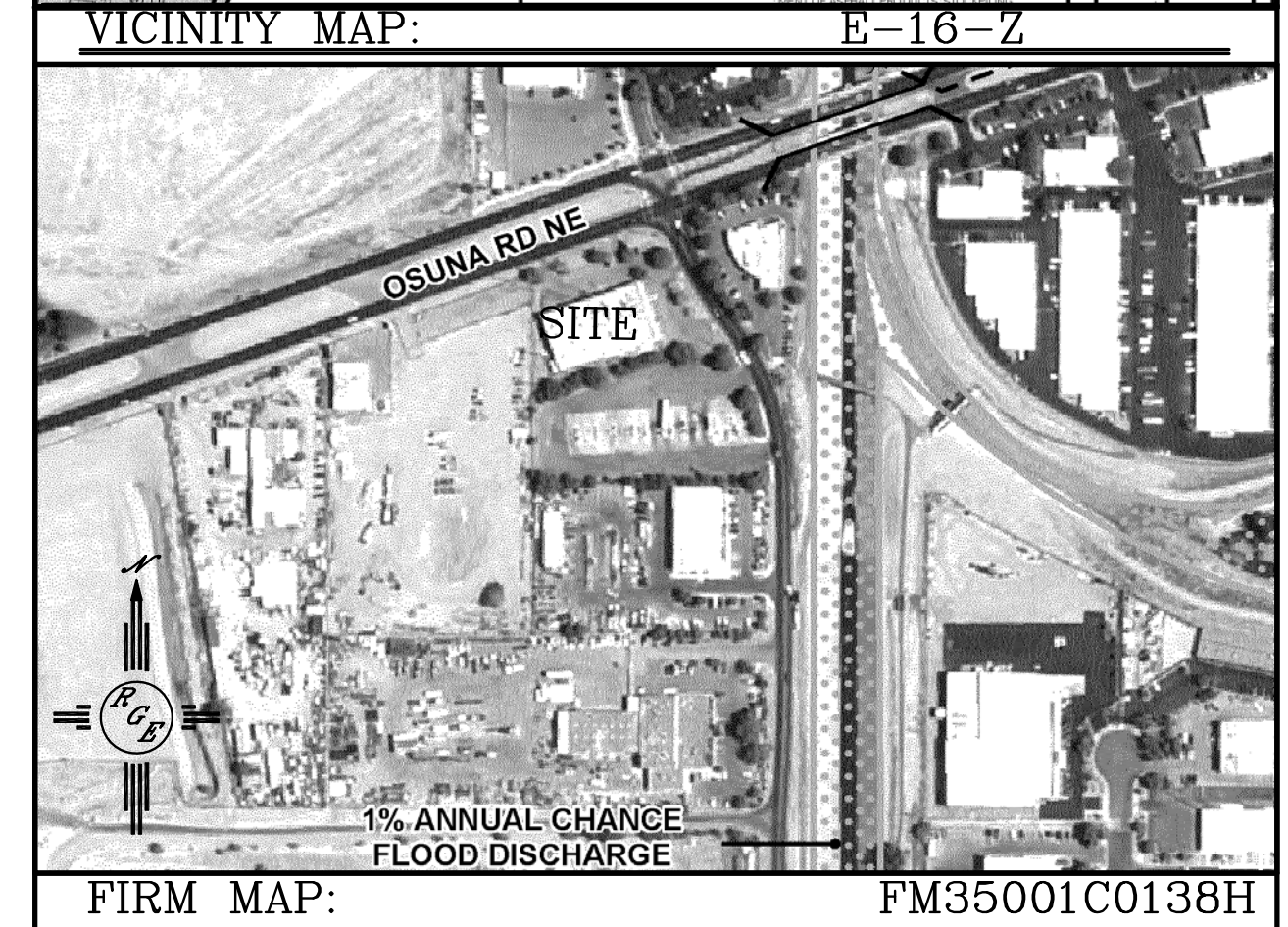
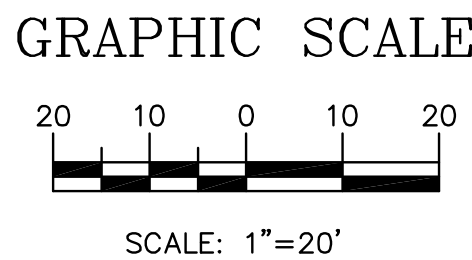
Stormwater Studio v 1.0.1.12

09-07-2017

Line ID	Length (ft)	Drng Area		Rational (C)	C x Area		Tc		Intensity (in/hr)	Total Q (cfs)	Capacity (cfs)	Velocity (ft/s)	Pipe		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ac)	(ac)				(min)	(min)					(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	122	0.00	0.00	0.00	0.00	0.00	0.0	0.00	8.78	1.53	1.47	2.89	10	0.45	86.70	87.25	87.50	88.01	88.50	88.76	1
Notes: IDF File = SampleIDF.idf, Return Period = 2-yrs.																					Project File: pipe flow.sws



1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.



LOT 1A, 4B, LIVELY EQUIPMENT

1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.
2. ALL CURB AND GUTTER TO 6" HEADER UNLESS OTHERWISE NOTED.
3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.
4. ALL NEW PAVING SHALL BE 6" PCC OVER 8" SUBGRADE PREPARATION IN CONFORMANCE TO ACI 330R-08. UNLESS OTHERWISE NOTED.
5. ANY CURBS OR PAVEMENT NEGATIVELY IMPACTED BY CONSTRUCTION ACTIVITY SHALL BE REPLACED TO MATCH EXISTING CONDITIONS.
6. ALL SITE WORK SHALL CONFORM TO CITY OF ALBUQUERQUE STANDARDS FOR PUBLIC WORKS CONSTRUCTION EDITION 9

-----5414-----	EXISTING CONTOUR
-----5415-----	EXISTING INDEX CONTOUR
-----5414-----	PROPOSED CONTOUR
-----5415-----	PROPOSED INDEX CONTOUR
▲	SLOPE TIE
↑	
x 4048.25	EXISTING SPOT ELEVATION
↑	
x 4048.25	PROPOSED SPOT ELEVATION
·	
-----	BOUNDARY
-----	CENTERLINE
-----	RIGHT-OF-WAY
-----	PROPOSED CURB
-----	EXISTING CURB AND GUTTER
=====	PROPOSED SIDEWALK
-----	EXISTING SIDEWALK
=====	PROPOSED RETAINING WALL (DESIGN BY OTHERS)

ENGINEER'S SEAL  8/1/17	2100 OSUNA		DRAWN BY WCVJ
	GRADING AND DRAINAGE PLAN		DATE 8-07-17
			21724-LAYOUT-3-24-17
DAVID SOULE P.E. #14522		<i>Rio Grande Engineering</i> 1606 CENTRAL AVENUE SE SUITE 201 ALBUQUERQUE, NM 87106 (505) 872-0999	SHEET # —
			JOB # 21724