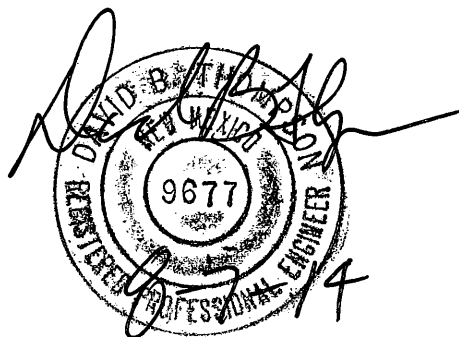


DRAINAGE MASTER PLAN
FOR
ASSISTED LIVING SITE
TRACT 9 LAS LOMITAS

August 2014

DRAINAGE MASTER PLAN
FOR
ASSISTED LIVING SITE
TRACT 9 LAS LOMITAS



Prepared by:
Thompson Engineering Consultants, Inc.
P.O. Box 65760
Albuquerque, NM 87193

August 2014

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION AND SITE LOCATION.....	1
METHODOLOGY	1
EXISTING DRAINAGE CONDITIONS	1
INTRODUCTION	1
OFF-SITE FLOWS	1
ON-SITE FLOWS	2
DEVELOPED DRAINAGE CONDITIONS.....	2
DRAINAGE CONCEPT	2
PHASE 1 GRADING AND DRAINAGE PLAN	3
STORM DRAIN HYDRAULIC ANALYSIS	3

APPENDIX A -- HYDROLOGIC CALCULATIONS

APPENDIX B -- HYDRAULIC CALCULATIONS

LIST OF PLATES

	<u>PAGE</u>
PLATE 1 – CONCEPTUAL GRADING AND DRAINAGE PLAN	POCKET
PLATE 2 – PHASE 1 GRADING AND DRAINAGE PLAN	POCKET
PLATE 3 – PHASE 1 EROSION AND SEDIMENT CONTROL PLAN	POCKET

LIST OF FIGURES

	<u>PAGE</u>
FIGURE 1 FEMA FLOOD INSURANCE RATE MAP	4

LIST OF TABLES

	<u>PAGE</u>
TABLE 1 EXISTING DRAINAGE CONDITIONS.....	2
TABLE 2 DEVELOPED DRAINAGE CONDITIONS.....	3
TABLE 3 STORM DRAIN HYDRAULICS	3

INTRODUCTION AND SITE LOCATION

The proposed Assisted Living site is located on Tract 9, Las Lomas Business Park with access to Cuesta Abajo Court NE. In the future the 4.04-acre property will be developed into an assisted living community with 5 separate buildings. Phase 1 of the development will include one building with access and parking. This report specifically addresses the conceptual grading and drainage plan for the full build-out of the site in the future. Also included is the Phase 1 final grading and drainage plan for the first building to be constructed.

METHODOLOGY

The hydrologic and hydraulic criteria in Section 22 of the City of Albuquerque Development Process Manual (DPM), entitled "Drainage, Flood Control, and Erosion Control," was followed to perform the analyses given in this report. The design storm used for both the existing undeveloped and developed conditions of the Assisted Living Site is the 100-year, 24-hour storm event for peak flow computations. The property is located in Zone 2, which has a 100-year 24-hour storm event of 2.75 inches.

EXISTING DRAINAGE CONDITIONS

INTRODUCTION

The site drains from northeast to southwest. There are retaining walls along the east property line and a second retaining wall on the property paralleling the retaining wall along the east property line. There is also a small retaining in the northeast area of the property. Along the north property line is a 75-foot PNM railroad easement and a 40-foot gas easement. There is a 35-foot wide drainage, water and sewer easement along the south property line. This easement has a 36-inch RCP storm drain that drains into a 48-inch RCP storm drain in Cuesta Abajo that drains to a detention pond located just south of Cuesta Abajo along Las Lomas Drive. This Tract is included in the Las Lomas Industrial Park Drainage Management Plan (LLIPDMP). The allowable discharge from this site to the existing storm drains is 12.43 CFS.

The FEMA Flood Insurance Rate Map Number 35043C0136 G, effective date September 8, 2008, shown in Figure 1, indicates the presence of a Zone X flood hazard zone on the site. Zone X is an area in the 500-year flood or areas less than 1 foot deep 100-year flood.

OFF-SITE FLOWS

There are no off-site flows that drain onto the property.

ON-SITE FLOWS

For the existing conditions hydrologic analysis land treatment Types A is used since the existing site is vacant. The peak flow from the site is 6.22 CFS.

Table 1 Existing Drainage Conditions

BASINS	Area (acres)	100yr-24hr Peak Flow (cfs)	100yr- 24hr Runoff Volume (acre-feet)	Land Treatment
1	2.16	3.32	0.095	100%A
2	1.00	1.55	0.044	100%A
3	0.88	1.35	0.039	100%A

DEVELOPED DRAINAGE CONDITIONS

DRAINAGE CONCEPT

Plate 1 shows the fully developed site to be completed in the future. The site is divided into three drainage basins. Runoff from Basin 1, which is in the northeast part of the property, drains to a detention pond in the middle of the site between two parking areas. This detention pond discharges 6.20 CFS through a stand-pipe into a 12-inch storm drain. The stand-pipe hydraulic calculations using the orifice equation can be found on Appendix B. The 12-inch storm drain drains into an 18-inch storm drain in the main drive aisle that continues east to a manhole near the entrance to the site. The detention pond has a volume of 0.0487 acre-feet with a depth of 2.29 feet. The detention pond and storm drain system will be constructed during Phase 2 of the site development.

Runoff from Basin 2, in the southeast part of the property, drains to the south to two Type D storm inlets located near the entrance to the site. The storm inlets collect 3.91 CFS of flow from Basin 2. This flow is added to the discharge from the Basin 1 detention pond and conveyed in an 18-inch storm drain to the east. This 18-inch storm drain discharges to the existing 36-inch public storm drain via a 6-foot diameter manhole in the drainage easement along the south property line. A total of 9.50 CFS from the 18-inch storm drain is discharged into the existing 36-inch storm drain. The storm drain system will be constructed during Phase 2 of the site development.

Runoff from Basin 3, in the western part of the property, is collected in a swale along the west property line. The swale drains from north to south through a 12-inch sidewalk culvert at the entrance to the site. The total runoff from Basin 3 is 3.10 CFS. The total peak flow from the property is 12.27 CFS, which is less than the 12.43 CFS allowed.

Table 2 Developed Drainage Conditions

BASINS	Area (acres)	100yr-24hr Peak Flow (cfs)	100yr- 24hr Runoff Volume (acre-feet)	Land Treatment
1	2.16	8.10	0.323	22.9% B, 22.9% C, 54.3% D
2	1.00	3.91	0.159	19.5% B, 19.5% C, 61.1% D
3	0.88	3.10	0.118	28.7% B, 28.7% C, 42.6% D

PHASE 1 GRADING AND DRAINAGE PLAN

The Phase 1 Grading and Drainage Plan and Erosion and Sediment Control Plan is shown as Plates 2 and 3, in the back pockets. As shown on the Phase 1 Grading and Drainage Plan, the total runoff discharging from the property will be 8.68 CFS, which is less than the 12.43 CFS allowed. Therefore, the detention pond and storm drain system discussed in the fully developed conceptual grading and drainage plan will not be constructed during Phase 1.

STORM DRAIN HYDRAULIC ANALYSIS

A hydraulic analysis of the on-site private storm drains was completed. All storm drains shown on the conceptual grading and drainage plan (Plate 1) were sized as gravity pipes. The storm drains range in size from 12" diameter to 18" diameter. Table 3 shows the flows and velocities for each pipe reach.

Table 3 Storm Drain Hydraulics

Storm Drain Size	Storm Drain Length (FT)	Storm Drain Slope (%)	Peak Flow (CFS)	Flow Velocity (FPS)	Normal Depth (FT)
12"	31	2.70	6.20	8.42	0.89
18"	203	1.20	6.20	6.64	0.78
18"	38	2.00	9.50	8.92	0.87

APPENDIX A
HYDROLOGIC CALCULATIONS

CUESTA DEL ABAJO ASSISTED LIVING CENTER
HYDROLOGIC MODEL--FULLY DEVELOPED CONDITIONS
6 AUG 2014

ATHMO DEVELOPED
CONDITIONS INPUT FILE

HYDROLOGIC MODEL FOR OFFSITE AND ONSITE BASINS
100-YEAR, 24-HOUR STORM:

PRECIPITATION:

P60 = 2.01"
P360 = 2.35"
P1440 = 2.75"

TIME=0.0 HR PUNCH CODE=0

RAINFALL

TYPE=2 RAIN QUARTER=0.0 IN
RAIN ONE=2.01 IN RAIN SIX=2.35 IN
RAIN DAY=2.75 IN DT=0.05 HRS
CODE=1 FACTOR=1.0

SEDIMENT BULK

COMPUTE NM HYD

ID=1 HYD NO=BASIN1 DA=.003375 SQ MI
%A=0 %B=22.8 %C=22.9 %D=54.3
TP=-.133 HR RAIN=-1
ID=1 CODE=10

PRINT HYD

ROUTE RESERVOIR

OUTFLOW	STORAGE	DEPTH
0	0	39
2.13	0.010	40
5.13	0.040	41
8.82	0.070	42

```

*
*
PRINT HYD
*
COMPUTE NM HYD
ID=11 CODE=10
ID=2 HYD NO=BASIN2 DA=.001570 SQ MI
%A=0 %B=19.4 %C=19.5 %D=61.1
TP=-.133 HR RAIN=-1
ID=2 CODE=10
PRINT HYD
*
ADD HYD
PRINT HYD
*
*
COMPUTE NM HYD
ID=12 HYD=BASIN1.2 ID I=11 II=2
ID=12 CODE=10
PRINT HYD
*
*
COMPUTE NM HYD
ID=3 HYD NO=BASIN3 DA=.001372 SQ MI
%A=0 %B=28.7 %C=28.7 %D=42.6
TP=-.133 HR RAIN=-1
ID=3 CODE=10
PRINT HYD
*
ADD HYD
PRINT HYD
*
*
*
FINISH

```

AHYMO DEVELOPED CONDITIONS SUMMARY FILE

AHYMO PROGRAM SUMMARY TABLE (AHYMO 97) -
INPUT FILE = C:\Projects\CUESTA~4.TXT

RUN DATE (MON/DAY/YR) = 08/06/2014
USER NO. = AHYMO-I-9702a01000K21-AH

- VERSION: 1997.02c

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID	TO ID	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE =
---------	---------------------------	---------	-------	--------------	----------------------	-----------------------	-----------------	----------------------	--------------	--------

NOTATION
TIME= .00
RAIN24= 2.750
PK BF = 1.00

START
RAINFALL TYPE= 2
SEDIMENT BULK

*S*****

*S*****

*S*****

COMPUTE NM HYD	BASIN1	-	1	.00338	8.10	.323	1.79475	1.500	3.748	PER IMP= 54.30
ROUTE RESERVOIR	POND1	1	11	.00338	6.20	.323	1.79466	1.600	2.869	AC-FT= .049
COMPUTE NM HYD	BASIN2	-	2	.00157	3.91	.159	1.90227	1.500	3.887	PER IMP= 61.10
ADD HYD	BASIN1.2	11& 2	12	.00495	9.50	.482	1.82874	1.550	3.001	
COMPUTE NM HYD	BASIN3	-	3	.00137	3.10	.118	1.60959	1.500	3.532	PER IMP= 42.60
ADD HYD	BASIN12.3	12& 3	13	.00632	12.27	.600	1.78109	1.550	3.036	

FINISH

AHYMO DEVELOPED CONDITIONS OUTPUT FILE

AHYMO PROGRAM (AHYMO 97) - - Version: 1997.02c
RUN DATE (MON/DAY/YR) = 08/06/2014
START TIME (HR:MIN:SEC) = 14:03:23
INPUT FILE = C:\Projects\CUESTA~4.TXT
USER NO. = AHYMO-I-9702a01000K21-AH

CUESTA DEL ABAJO ASSISTED LIVING CENTER
HYDROLOGIC MODEL--FULLY DEVELOPED CONDITIONS
6 AUG 2014

HYDROLOGIC MODEL FOR OFFSITE AND ONSITE BASINS
100-YEAR, 24-HOUR STORM:

PRECIPITATION:
P60 = 2.01"
P360 = 2.35"
P1440 = 2.75"

TIME=0.0 HR PUNCH CODE=0

START

RAINFALL

TYPE=2 RAIN QUARTER=0.0 IN
RAIN ONE=2.01 IN RAIN SIX=2.35 IN
RAIN DAY=2.75 IN DT=0.05 HRS

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT = .050000 HOURS
END TIME = 24.000000 HOURS
0.0000 .0024 .0049 .0075 .0102 .0130 .0158
.0188 .0219 .0252 .0286 .0321 .0358 .0397
.0439 .0482 .0529 .0578 .0631 .0689 .0751
.0836 .0930 .1201 .1842 .2944 .4649 .7103
1.0460 1.3107 1.4303 1.5302 1.6176 1.6959 1.7667
1.8313 1.8906 1.9452 1.9955 2.0421 2.0851 2.0946
2.1034 2.1115 2.1191 2.1262 2.1330 2.1394 2.1455
2.1513 2.1569 2.1622 2.1673 2.1723 2.1771 2.1817
2.1862 2.1905 2.1948 2.1989 2.2028 2.2067 2.2105

2.2142	2.2178	2.2213	2.2248	2.2282	2.2315	2.2347
2.2379	2.2410	2.2440	2.2470	2.2500	2.2529	2.2557
2.2585	2.2613	2.2640	2.2666	2.2693	2.2719	2.2744
2.2769	2.2794	2.2818	2.2842	2.2866	2.2889	2.2913
2.2935	2.2958	2.2980	2.3002	2.3024	2.3046	2.3067
2.3088	2.3109	2.3129	2.3150	2.3170	2.3190	2.3209
2.3229	2.3248	2.3267	2.3286	2.3305	2.3323	2.3342
2.3360	2.3378	2.3396	2.3414	2.3431	2.3449	2.3466
2.3483	2.3500	2.3517	2.3534	2.3551	2.3569	2.3586
2.3602	2.3619	2.3636	2.3653	2.3669	2.3686	2.3703
2.3719	2.3736	2.3752	2.3768	2.3785	2.3801	2.3817
2.3833	2.3849	2.3865	2.3881	2.3897	2.3913	2.3929
2.3944	2.3960	2.3976	2.3991	2.4007	2.4022	2.4038
2.4053	2.4068	2.4084	2.4099	2.4114	2.4129	2.4144
2.4159	2.4174	2.4189	2.4204	2.4219	2.4234	2.4248
2.4263	2.4278	2.4292	2.4307	2.4322	2.4336	2.4350
2.4365	2.4379	2.4394	2.4408	2.4422	2.4436	2.4450
2.4464	2.4478	2.4493	2.4506	2.4520	2.4534	2.4548
2.4562	2.4576	2.4589	2.4603	2.4617	2.4630	2.4644
2.4658	2.4671	2.4685	2.4698	2.4711	2.4725	2.4738
2.4751	2.4765	2.4778	2.4791	2.4804	2.4817	2.4830
2.4843	2.4856	2.4869	2.4882	2.4895	2.4908	2.4921
2.4934	2.4946	2.4959	2.4972	2.4984	2.4997	2.5010
2.5022	2.5035	2.5047	2.5060	2.5072	2.5085	2.5097
2.5109	2.5122	2.5134	2.5146	2.5158	2.5170	2.5183
2.5195	2.5207	2.5219	2.5231	2.5243	2.5255	2.5267
2.5279	2.5291	2.5303	2.5314	2.5326	2.5338	2.5350
2.5361	2.5373	2.5385	2.5396	2.5408	2.5420	2.5431
2.5443	2.5454	2.5466	2.5477	2.5488	2.5500	2.5511
2.5523	2.5534	2.5545	2.5556	2.5568	2.5579	2.5590
2.5601	2.5612	2.5623	2.5635	2.5646	2.5657	2.5668
2.5679	2.5690	2.5701	2.5711	2.5722	2.5733	2.5744
2.5755	2.5766	2.5776	2.5787	2.5798	2.5809	2.5819
2.5830	2.5841	2.5851	2.5862	2.5872	2.5883	2.5893
2.5904	2.5914	2.5925	2.5935	2.5946	2.5956	2.5966
2.5977	2.5987	2.5997	2.6008	2.6018	2.6028	2.6038
2.6049	2.6059	2.6069	2.6079	2.6089	2.6099	2.6109
2.6119	2.6129	2.6139	2.6149	2.6159	2.6169	2.6179
2.6189	2.6199	2.6209	2.6219	2.6229	2.6238	2.6248
2.6258	2.6268	2.6278	2.6287	2.6297	2.6307	2.6316
2.6326	2.6336	2.6345	2.6355	2.6364	2.6374	2.6384
2.6393	2.6403	2.6412	2.6421	2.6431	2.6440	2.6450
2.6459	2.6469	2.6478	2.6487	2.6497	2.6506	2.6515
2.6524	2.6534	2.6543	2.6552	2.6561	2.6571	2.6580
2.6589	2.6598	2.6607	2.6616	2.6625	2.6634	2.6644
2.6653	2.6662	2.6671	2.6680	2.6689	2.6698	2.6707
2.6715	2.6724	2.6733	2.6742	2.6751	2.6760	2.6769

2.6778 2.6786 2.6795 2.6804 2.6813 2.6821 2.6830
 2.6839 2.6848 2.6856 2.6865 2.6874 2.6882 2.6891
 2.6900 2.6908 2.6917 2.6925 2.6934 2.6942 2.6951
 2.6959 2.6968 2.6976 2.6985 2.6993 2.7002 2.7010
 2.7019 2.7027 2.7035 2.7044 2.7052 2.7061 2.7069
 2.7077 2.7085 2.7094 2.7102 2.7110 2.7119 2.7127
 2.7135 2.7143 2.7151 2.7160 2.7168 2.7176 2.7184
 2.7192 2.7200 2.7209 2.7217 2.7225 2.7233 2.7241
 2.7249 2.7257 2.7265 2.7273 2.7281 2.7289 2.7297
 2.7305 2.7313 2.7321 2.7329 2.7337 2.7344 2.7352
 2.7360 2.7368 2.7376 2.7384 2.7392 2.7399 2.7407
 2.7415 2.7423 2.7431 2.7438 2.7446 2.7454 2.7462
 2.7469 2.7477 2.7485 2.7492 2.7500

SEDIMENT BULK CODE=1 FACTOR=1.0

*
 *
 *S*****
 *S*****
 *S*****
 *

COMPUTE NM HYD ID=1 HYD NO=BASIN1 DA=.003375 SQ MI
 %A=0 %B=22.8 %C=22.9 %D=54.3
 TP=-.133 HR RAIN=-1

K = .072485HR TP = .133000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 7.2516 CFS UNIT VOLUME = .9976 B = 526.28 P60 = 2.0100
 AREA = .001833 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .119470HR TP = .133000HR K/TP RATIO = .898273 SHAPE CONSTANT, N = 3.945890
 UNIT PEAK = 4.0768 CFS UNIT VOLUME = .9981 B = 351.55 P60 = 2.0100
 AREA = .001542 SQ MI IA = .42484 INCHES INF = 1.03954 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=1 CODE=10

HYDROGRAPH FROM AREA BASIN1

TIME	FLOW	TIME	FLOW	TIME	FLOW
FLOW		TIME		TIME	
HRS	CFS	HRS	CFS	HRS	CFS
20.000	.000	5.000	.0	10.000	.0
	.0			15.000	.0
	.500	5.500	.0	15.500	.0

20.500	.0	.0	6.000	.0	11.000	.0	16.000	.0
21.000	1.000	.0	6.500	.0	11.500	.0	16.500	.0
21.500	1.500	8.1	7.000	.0	12.000	.0	17.000	.0
22.000	2.000	1.6	7.500	.0	12.500	.0	17.500	.0
22.500	2.500	.2	8.000	.0	13.000	.0	18.000	.0
23.000	3.000	.1	8.500	.0	13.500	.0	18.500	.0
23.500	3.500	.0	9.000	.0	14.000	.0	19.000	.0
24.000	4.000	.0	9.500	.0	14.500	.0	19.500	.0
	4.500	.0						

RUNOFF VOLUME = 1.79475 INCHES = .3231 ACRE-FEET
 PEAK DISCHARGE RATE = 8.10 CFS AT 1.500 HOURS BASIN AREA = .0034 SQ. MI.

* ROUTE RESERVOIR ID=11 HYD=POND1 INFLOW ID=1 CODE=5
 OUTFLOW STORAGE DEPTH
 0 39
 2.13 0.010 40
 5.13 0.040 41
 8.82 0.070 42

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	39.00	.000	.00
.25	.00	39.00	.000	.00
.50	.00	39.00	.000	.00
.75	.00	39.00	.000	.00
1.00	.00	39.00	.000	.00
1.25	.58	39.12	.001	.25
1.50	8.10	40.95	.039	4.99
1.75	3.08	40.78	.034	4.48
2.00	1.63	40.07	.012	2.33
2.25	.49	39.32	.003	.69
2.50	.23	39.13	.001	.28
2.75	.12	39.07	.001	.14

3.00	.08	39.04	.000	.08
3.25	.05	39.03	.000	.05
3.50	.04	39.02	.000	.04
3.75	.04	39.02	.000	.04
4.00	.03	39.02	.000	.03
4.25	.03	39.02	.000	.03
4.50	.03	39.01	.000	.03
4.75	.03	39.02	.000	.03
5.00	.03	39.02	.000	.03
5.25	.03	39.02	.000	.03
5.50	.04	39.02	.000	.04
5.75	.04	39.02	.000	.04
6.00	.04	39.02	.000	.04
6.25	.04	39.02	.000	.04
6.50	.04	39.02	.000	.04
6.75	.04	39.02	.000	.04
7.00	.04	39.02	.000	.04
7.25	.04	39.02	.000	.04
7.50	.04	39.02	.000	.04
7.75	.04	39.02	.000	.04
8.00	.04	39.02	.000	.04
8.25	.04	39.02	.000	.04
8.50	.03	39.02	.000	.03
8.75	.03	39.02	.000	.03
9.00	.03	39.02	.000	.03
9.25	.03	39.02	.000	.03
9.50	.03	39.02	.000	.03
9.75	.03	39.02	.000	.03
10.00	.03	39.02	.000	.03
10.25	.03	39.01	.000	.03
10.50	.03	39.01	.000	.03
10.75	.03	39.01	.000	.03
11.00	.03	39.01	.000	.03
11.25	.03	39.01	.000	.03
11.50	.03	39.01	.000	.03
11.75	.03	39.01	.000	.03
12.00	.03	39.01	.000	.03
12.25	.03	39.01	.000	.03
12.50	.03	39.01	.000	.03
12.75	.03	39.01	.000	.03
13.00	.03	39.01	.000	.03
13.25	.03	39.01	.000	.03
13.50	.03	39.01	.000	.03
13.75	.03	39.01	.000	.03

OUTFLOW
(CFS)

VOLUME
(AC-FT)

ELEV
(FEET)

INFLOW
(CFS)

TIME
(HRS)

14.00	.03	39.01	.000	.03
14.25	.03	39.01	.000	.03
14.50	.03	39.01	.000	.03
14.75	.03	39.01	.000	.03
15.00	.02	39.01	.000	.02
15.25	.02	39.01	.000	.02
15.50	.02	39.01	.000	.02
15.75	.02	39.01	.000	.02
16.00	.02	39.01	.000	.02
16.25	.02	39.01	.000	.02
16.50	.02	39.01	.000	.02
16.75	.02	39.01	.000	.02
17.00	.02	39.01	.000	.02
17.25	.02	39.01	.000	.02
17.50	.02	39.01	.000	.02
17.75	.02	39.01	.000	.02
18.00	.02	39.01	.000	.02
18.25	.02	39.01	.000	.02
18.50	.02	39.01	.000	.02
18.75	.02	39.01	.000	.02
19.00	.02	39.01	.000	.02
19.25	.02	39.01	.000	.02
19.50	.02	39.01	.000	.02
19.75	.02	39.01	.000	.02
20.00	.02	39.01	.000	.02
20.25	.02	39.01	.000	.02
20.50	.02	39.01	.000	.02
20.75	.02	39.01	.000	.02
21.00	.02	39.01	.000	.02
21.25	.02	39.01	.000	.02
21.50	.02	39.01	.000	.02
21.75	.02	39.01	.000	.02
22.00	.02	39.01	.000	.02
22.25	.02	39.01	.000	.02
22.50	.02	39.01	.000	.02
22.75	.02	39.01	.000	.02
23.00	.02	39.01	.000	.02
23.25	.02	39.01	.000	.02
23.50	.02	39.01	.000	.02
23.75	.02	39.01	.000	.02
24.00	.02	39.01	.000	.02
24.25	.00	39.00	.000	.01

PEAK DISCHARGE = 6.197 CFS - PEAK OCCURS AT HOUR 1.60
 MAXIMUM WATER SURFACE ELEVATION = 41.289
 MAXIMUM STORAGE = .0487 AC-FT INCREMENTAL TIME= .050000HRS

*
*

PRINT HYD

ID=11 CODE=10

HYDROGRAPH FROM AREA POND1

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
20.000	.0	5.000	.0	10.000	.0	15.000	.0
20.500	.0	5.500	.0	10.500	.0	15.500	.0
21.000	.0	6.000	.0	11.000	.0	16.000	.0
21.500	5.0	6.500	.0	11.500	.0	16.500	.0
22.000	2.3	7.000	.0	12.000	.0	17.000	.0
22.500	.3	7.500	.0	12.500	.0	17.500	.0
23.000	.1	8.000	.0	13.000	.0	18.000	.0
23.500	.0	8.500	.0	13.500	.0	18.500	.0
24.000	.0	9.000	.0	14.000	.0	19.000	.0
	.0	9.500	.0	14.500	.0	19.500	.0

RUNOFF VOLUME = 1.79466 INCHES = .3230 ACRE-FEET
PEAK DISCHARGE RATE = 6.20 CFS AT 1.600 HOURS BASIN AREA = .0034 SQ. MI.

*

COMPUTE NM HYD

ID=2 HYD NO=BASIN2 DA=.001570 SQ MI
%A=0 %B=19.4 %C=19.5 %D=61.1
TP=-.133 HR RAIN=-1

K = .072485HR TP = .133000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 3.7958 CFS UNIT VOLUME = .9966 B = 526.28 P60 = 2.0100
AREA = .000959 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .119466HR TP = .133000HR K/TP RATIO = .898238 SHAPE CONSTANT, N = 3.946058

UNIT PEAK = 1.6143 CFS UNIT VOLUME = .9932 B = 351.56 P60 = 2.0100
 AREA = .000611 SQ MI IA = .42481 INCHES INF = 1.03946 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=10

HYDROGRAPH FROM AREA BASIN2

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
20.000	.0	5.000	.0	10.000	.0	15.000	.0
20.500	.0	5.500	.0	10.500	.0	15.500	.0
21.000	.0	6.000	.0	11.000	.0	16.000	.0
21.500	3.9	6.500	.0	11.500	.0	16.500	.0
22.000	.8	7.000	.0	12.000	.0	17.000	.0
22.500	.1	7.500	.0	12.500	.0	17.500	.0
23.000	.0	8.000	.0	13.000	.0	18.000	.0
23.500	.0	8.500	.0	13.500	.0	18.500	.0
24.000	.0	9.000	.0	14.000	.0	19.000	.0
	.0	9.500	.0	14.500	.0	19.500	.0

RUNOFF VOLUME = 1.90227 INCHES = .1593 ACRE-FEET
 PEAK DISCHARGE RATE = 3.91 CFS AT 1.500 HOURS BASIN AREA = .0016 SQ. MI.

*
 ADD HYD
 PRINT HYD

ID=12 HYD=BASIN1.2 ID I=11 II=2
 ID=12 CODE=10

HYDROGRAPH FROM AREA BASIN1.2

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS

20.000	.000	.0	5.000	.1	10.000	.0	15.000	.0
	.500	.0	5.500	.1	10.500	.0	15.500	.0
20.500	.0	.0	6.000	.1	11.000	.0	16.000	.0
21.000	.0	8.9	6.500	.1	11.500	.0	16.500	.0
21.500	.0	3.2	7.000	.1	12.000	.0	17.000	.0
22.000	.0	.4	7.500	.1	12.500	.0	17.500	.0
22.500	.0	.1	8.000	.1	13.000	.0	18.000	.0
23.000	.0	.1	8.500	.1	13.500	.0	18.500	.0
23.500	.0	.1	9.000	.1	14.000	.0	19.000	.0
24.000	.0	.0	9.500	.1	14.500	.0	19.500	.0

RUNOFF VOLUME = 1.82874 INCHES = .4823 ACRE-FEET
 PEAK DISCHARGE RATE = 9.50 CFS AT 1.550 HOURS BASIN AREA = .0049 SQ. MI.

*
*

COMPUTE NM HYD ID=3 HYD NO=BASIN3 DA=.001372 SQ MI
 %A=0 %B=28.7 %C=28.7 %D=42.6
 TP=-.133 HR RAIN=-1

K = .072485HR TP = .133000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 2.3127 CFS UNIT VOLUME = .9941 B = 526.28 P60 = 2.0100
 AREA = .000584 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .119497HR TP = .133000HR K/TP RATIO = .898476 SHAPE CONSTANT, N = 3.944947
 UNIT PEAK = 2.0812 CFS UNIT VOLUME = .9951 B = 351.48 P60 = 2.0100
 AREA = .000788 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 CODE=10

HYDROGRAPH FROM AREA BASIN3

TIME	FLOW	TIME	FLOW	TIME	FLOW
------	------	------	------	------	------

TIME	FLOW	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
HRS	HRS	CFS		HRS		HRS		HRS		CFS
20.000	.000	.0	5.000	.0	10.000	.0	15.000	.0	15.000	.0
	.500	.0	5.500	.0	10.500	.0	15.500	.0	15.500	.0
20.500	.0	.0	6.000	.0	11.000	.0	16.000	.0	16.000	.0
21.000	.0	3.1	6.500	.0	11.500	.0	16.500	.0	16.500	.0
21.500	.0	.6	7.000	.0	12.000	.0	17.000	.0	17.000	.0
22.000	.0	.1	7.500	.0	12.500	.0	17.500	.0	17.500	.0
22.500	.0	.0	8.000	.0	13.000	.0	18.000	.0	18.000	.0
23.000	.0	.0	8.500	.0	13.500	.0	18.500	.0	18.500	.0
23.500	.0	.0	9.000	.0	14.000	.0	19.000	.0	19.000	.0
24.000	.0	.0	9.500	.0	14.500	.0	19.500	.0	19.500	.0

RUNOFF VOLUME = 1.60959 INCHES = .1178 ACRE-FEET
PEAK DISCHARGE RATE = 3.10 CFS AT 1.500 HOURS BASIN AREA = .0014 SQ. MI.

*
ADD HYD
PRINT HYD

ID=13 HYD=BASIN12.3 ID I=12 II=3
ID=13 CODE=10

HYDROGRAPH FROM AREA BASIN12.3

TIME	FLOW	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
HRS	HRS	CFS		HRS		HRS		HRS		CFS
20.000	.000	.0	5.000	.1	10.000	.1	15.000	.0	15.000	.0
	.500	.0	5.500	.1	10.500	.1	15.500	.0	15.500	.0
20.500	.0	.0	6.000	.1	11.000	.1	16.000	.0	16.000	.0
21.000	.0	12.0	6.500	.1	11.500	.1	16.500	.0	16.500	.0
21.500	.0	3.7	7.000	.1	12.000	.1	17.000	.0	17.000	.0

22.000	.0								
22.500	2.500	.5	7.500	.1	12.500	.1	17.500	.0	
	.0								
23.000	3.000	.1	8.000	.1	13.000	.1	18.000	.0	
	.0								
23.500	3.500	.1	8.500	.1	13.500	.0	18.500	.0	
	.0								
24.000	4.000	.1	9.000	.1	14.000	.0	19.000	.0	
	.0								
	4.500	.1	9.500	.1	14.500	.0	19.500	.0	

RUNOFF VOLUME = 1.78109 INCHES = .6001 ACRE-Feet
 PEAK DISCHARGE RATE = 12.27 CFS AT 1.550 HOURS BASIN AREA = .0063 SQ. MI.

*
*
*

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 14:03:23

AHYMO EXISTING CONDITIONS SUMMARY FILE

AHYMO PROGRAM SUMMARY TABLE (AHYMO 97) -
INPUT FILE = C:\Projects\CU7E63~1.TXT

- VERSION: 1997.02c RUN DATE (MON/DAY/YR) = 08/07/2014
USER NO. = AHYMO-I-9702a01000K21-AH

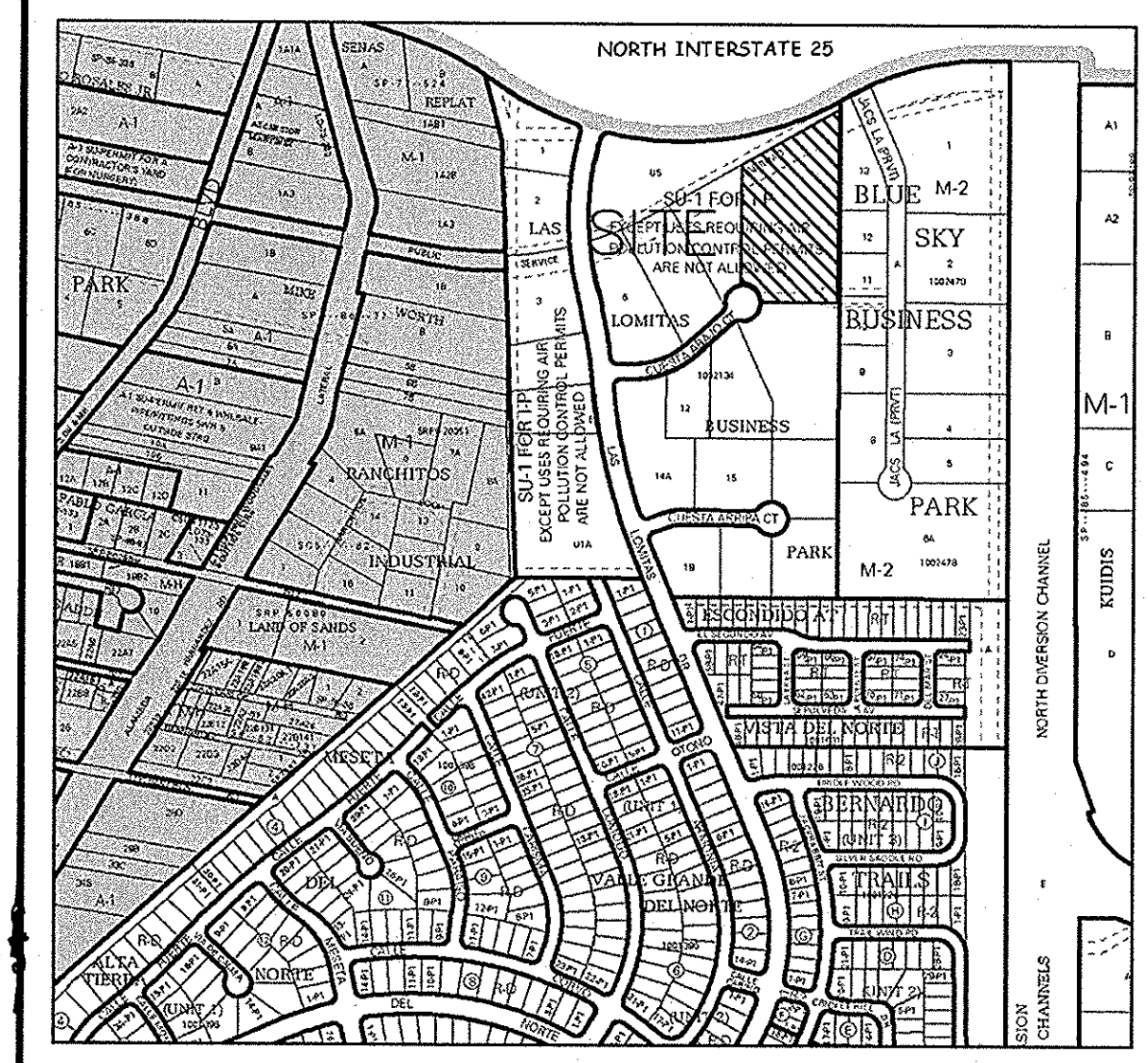
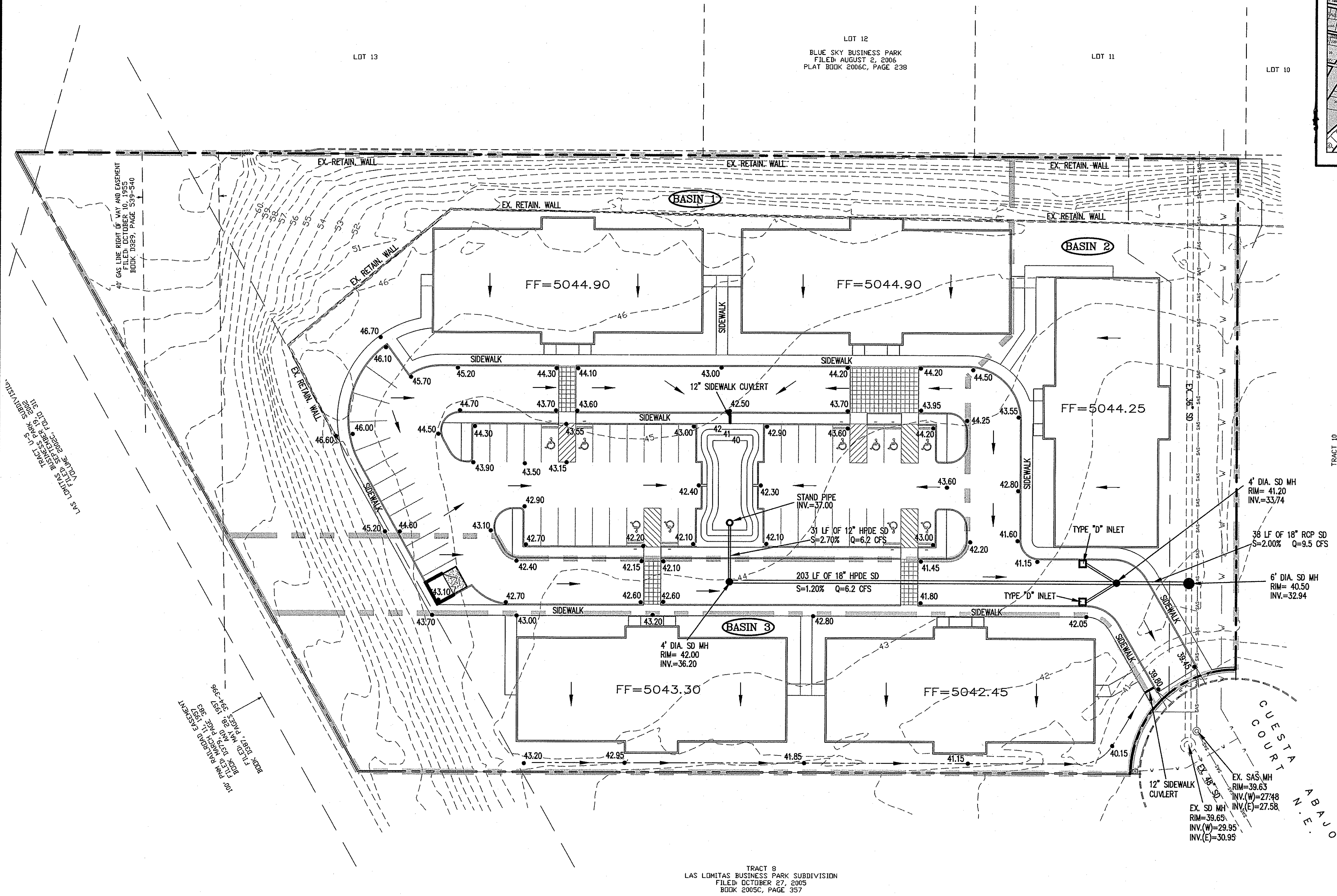
COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE =
START										1
RAINFALL TYPE= 2										
SEDIMENT BULK										
*S*****										
*S*****										
COMPUTE NM HYD	BASIN1	-	1	.00338	3.32	.095	.52958	1.500	1.536 PER IMP=	.00
COMPUTE NM HYD	BASIN2	-	2	.00157	1.55	.044	.52958	1.500	1.539 PER IMP=	.00
ADD HYD	BASIN1.2	1& 2	12	.00495	4.86	.140	.52956	1.500	1.537	
COMPUTE NM HYD	BASIN3	-	3	.00137	1.35	.039	.52958	1.500	1.541 PER IMP=	.00
ADD HYD	BASIN12.3	12& 3	13	.00632	6.22	.178	.52955	1.500	1.538	
FINISH										

TIME= .00
RAIN24= 2.750
PK BF = 1.00

APPENDIX B
HYDRAULIC CALCULATIONS

ASSISTED LIVING MASTER DRAINAGE PLAN RATING CURVE FOR RISER PIPE

[illegible]



Tract 9 Las Lomas

CONCEPTUAL GRADING & DRAINAGE PLAN

LEGEND

- FF=70.20 FINISHED FLOOR SITE ELEVATION
- 73.00 SPOT ELEVATIONS
- EXIST. MAJOR CONTOURS
- EXIST. MINOR CONTOURS
- FLOW DIRECTION
- PROPOSED EASEMENT
- BOUNDARY
- PROPOSED SWALE

CITY/COUNTY REVIEW

DEPARTMENT	SIGN-OFF	DATE
WATER SERVICES		
WATER SERVICES		
STREETS		
TRAFFIC		

PROJECT INFORMATION

NO.	REVISION	BY	DATE

PROJECT: ASSISTED LIVING CENTER TRACT 9 LAS LOMAS

DRAWN BY: BLN

CHECKED BY:

APPROVED BY:

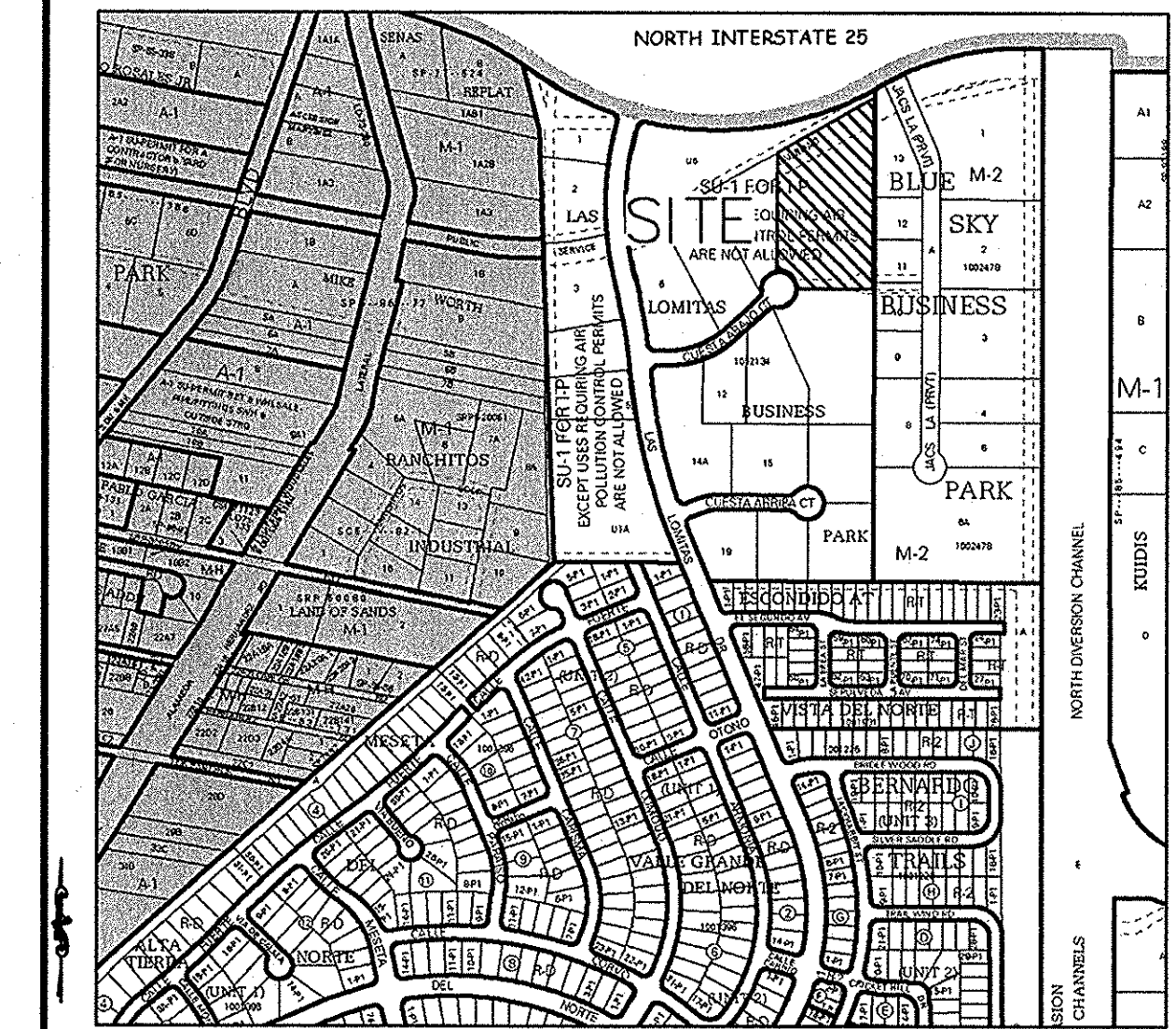
HORIZ. SCALE:

VERT. SCALE:

FILE:

SCALE 1"=30'

1 of 1



WIDTH VARIES (2' MIN. / 4' MAX.)

NOTE: WIDTH TO VARY TO ACHIEVE NATURAL APPEARANCE

1'± 1'±

VARIES

FINISHED GRADE

LEGEND

100-YEAR HYDROLOGIC CALCULATIONS											
BASIN #	AREA (acre)	LAND TREATMENT				WEIGHTED E (in)	100-YEAR PRECIPITATION				
		A (%)	B (%)	C (%)	D (%)		V (6-hr) (acre-ft)	V (6-hr) (cu-ft)	V(10 day) (acre-ft)	V(10 day) (cu-ft)	Q (cfs)
EXISTING CONDITIONS											
SITE	4.0425	100.00	0.00	0.00	0.00	0.53	0.18	7,777	0.18	7,777	6.31
TOTAL RUNOFF	4.04						0.18	7777	0.18	7777	6.31
PROPOSED CONDITIONS											
SITE	4.0425	78.00	2.60	2.60	16.80	0.82	0.28	12,021	0.37	15,966	8.68
TOTAL RUNOFF	4.04						0.28	12021	0.37	15966	8.68
EXCESS PRECIP.		0.53	0.78	1.13	2.12	E _i (in)					
PEAK DISCHARGE		1.56	2.28	3.14	4.7	Q _{pk} (cfs)					
										ZONE = 2	
WEIGHTED E (in) = (E _A)(%A) + (E _B)(%B) + (E _C)(%C) + (E _D)(%D)							P _{6-hr} (in.) = 2.35				
V _{6-hr} (acre-ft) = (WEIGHTED E)(AREA)/12							P _{24-hr} (in.) = 2.75				
V _{10DAY} (acre-ft) = V _{6-hr} + (A _D)(P _{10DAY} - P _{6-hr})/12							P _{10DAY} (in.) = 3.95				
Q (cfs) = (Q _{PA})(A _A) + (Q _{PB})(A _B) + (Q _{PC})(A _C) + (Q _{PD})(A _D)											

NATURAL VEGETATION WILL BE USED AS THE INITIAL BMP

LOCATE TEMPORARY CONCRETE WASHOUT, CONSTRUCTION ENTRANCE, AND TRASH CONTAINMENT AREA TO MINIMIZE SITE DISTURBANCE DURING CONSTRUCTION ACTIVITY AND MODIFY AS REQUIRED PER SITE REQUIREMENTS

PROJECT IS REQUIRED TO MAINTAIN A REGIMENT OF STREET SWEEPING AND CLEAN UP MEASURES IN THE EVENT OF TRACK OUT TO MINIMIZE AND PREVENT OFF SITE CONVEYANCES

Diagram illustrating the cross-section of a stormwater management structure, showing the following components and dimensions:

- Optional Wire**: A layer above the filter fabric.
- Filter Fabric**: A layer separating the compacted fill from the underlying structure.
- Compacted Fill**: The main body of the structure.
- Finish Grade**: The top surface of the structure.
- Dimensions**:
 - Vertical dimension: 1'-0" MIN (minimum) and 3'-0" MAX (maximum).
 - Horizontal dimension: 4'-0" (width of the base).
- Steel Concrete**: The base structure supporting the compacted fill.

REGULAR MAINTENANCE SHALL BE PERFORMED IN ACCORDANCE WITH THE SWPPP.

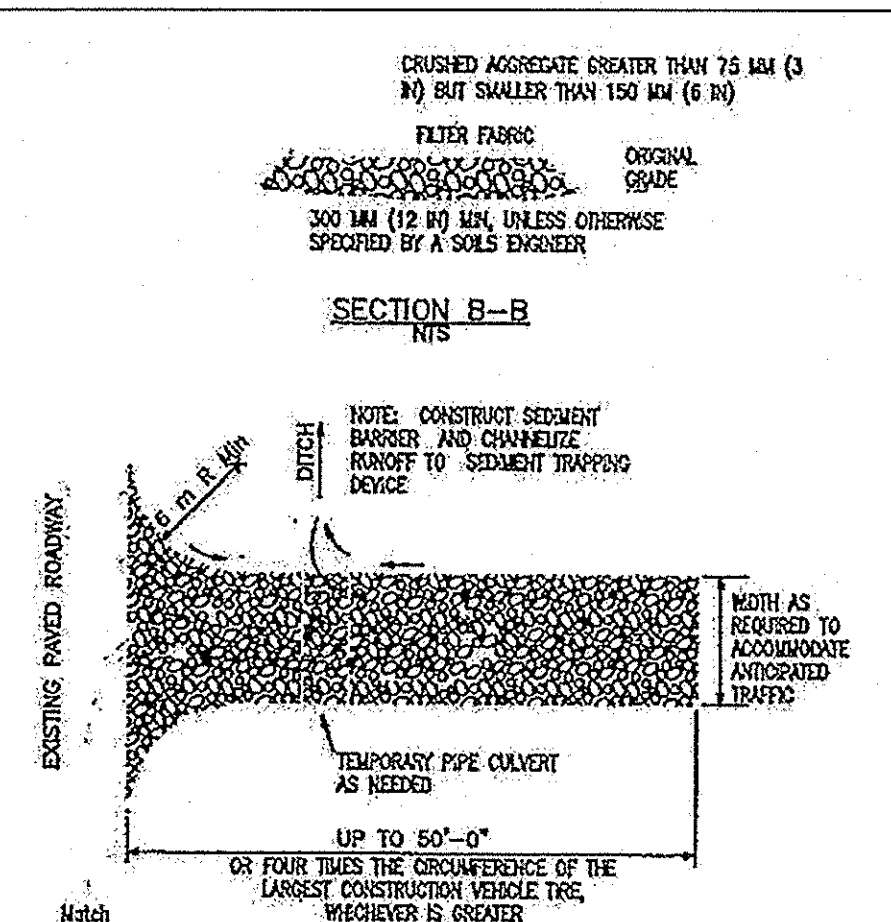
SILT FENCE

NTS

Diagram illustrating a ramp and a container for water. The container is labeled "WATER FOR WATER" and the ramp is labeled "RAMP".

MODULAR CONCRETE WASHOUT

NTS



STABILIZED CONSTRUCTION ENTRANCE

NTS

 PROPOSED SILT FENCE
 CONCRETE WASH OUT AREA
 STABILIZED CONSTRUCTION ENTRANCE
 DISTURBED AREA

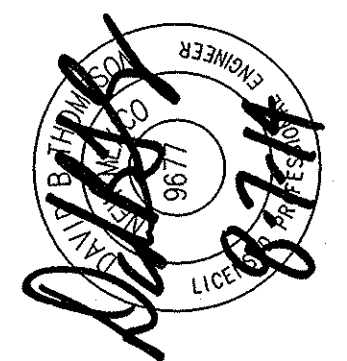


VICINITY MAP ZONE ATLAS: D-16-Z



Thompson
Engineering
Consultants, Inc.

P.O. BOX 65760
ALBUQUERQUE, NM 87193
PHONE: (505) 271-2199
FAX: (505) 830-9248

[illegible]

ASSISTED LIVING CENTER
TRACT 9 LAS LOMITAS

PHASE I EROSION AND SEDIMENT CONTROL PLAN

CITY/COUNTY REVIEW		
DEPARTMENT	SIGN-OFF	DATE
WASTEWATER MGMT. DIV.		
WATER SERVICES		
SUBDIVISION ENG.		
STREETS		
TRAFFIC		
FOR CITY/COUNTY USE ONLY		

SHEET No.

1 of 1

