CITY OF ALBUQUERQUE

October 17, 2005

Douglas L. Andrews, P.E.
Smith Engineering Company
2201 San Pedro NE
Albuquerque, NM 87110

Re: Westgate Park – Phase 2, Intersection of Cartagena & Valley View
Drainage Report - Engineer's Stamp dated 10-17-05 (M9-D19D)

Dear Mr. Andrews,

Based upon the information provided in your submittal dated 9-26-05, the above referenced plan is approved for Grading Permit, Paving Permit and Work Order. Please provide Certified As-builts at the completion of this project for the file.

Additionally, this project requires a National Pollutant Discharge Elimination System (NPDES) permit. Refer to the attachment that is provided with this letter for details. If you have any questions please feel free to call the Municipal Development Department, Hydrology section at 768-3654 (Charles Caruso).

If you have any questions, you can contact me at 924-3990.

Sincerely,

Phillip J. Lovato, E.I., C.F.M.
Engineering Associate, Hydrology,
Development and Building Services,
Planning Department

cc: Charles Caruso, DMD
file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

M-9/D19D

DRAINAGE INFORMATION SHEET

APPLICANT'S NAME: DOUGLAS L. ANDREWS ZONE ATLAS/DRNG. FILE #: M-8 & M-9

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: WESTGATE PARK (COA PROJ. # 656302

CITY ADDRESS: INTERSECTION OF CARTAGENA AVE AND VALLEY VIEW DR.

ENGINEERING FIRM: SMITH ENGINEERING CO. CONTACT: DOUGLAS L. ANDREWS

ADDRESS: 2201 SAN PEDRO NE 87110 PHONE: 884-0700

OWNER: COA, DMD, PARKS CONTACT: DAVID FLORES

ADDRESS: CITY HALL PHONE: 768-3826

ARCHITECT: CONSENSUS PLANNING CONTACT: KELLY QUINN

ADDRESS: 924 PARK AVE 87102 PHONE: 764-9801

SURVEYOR: COA - ON CALL CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: COA - ON CALL CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- ___ DRAINAGE PLAN
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
- ___ GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION
- ___ OTHER _____

PRE-DESIGN MEETING:

- X YES
- ___ NO
- ___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SKETCH PLAT APPROVAL
- ___ PRELIMINARY PLAT APPROVAL
- ___ S. DEV. PLAN FOR SUB'D APPROVAL
- ___ S. DEV PLAN FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- ___ FINAL PLAT APPROVAL
- ___ FOUNDATION PERMIT APPROVAL
- ___ BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY APPROVAL
- X GRADING PERMIT APPROVAL
- X PAVING PERMIT APPROVAL
- ___ S.A.D. DRAINAGE REPORT
- ___ DRAINAGE REQUIREMENTS
- ___ SUBDIVISION CERTIFICATION
- ___ OTHER _____ (SPECIFY)

DATE SUBMITTED: 9-23-05

BY: Douglas L Andrews

Revised 02/98

RECEIVED
SEP 26 2005
HYDROLOGY SECTION

DRAINAGE REPORT

for

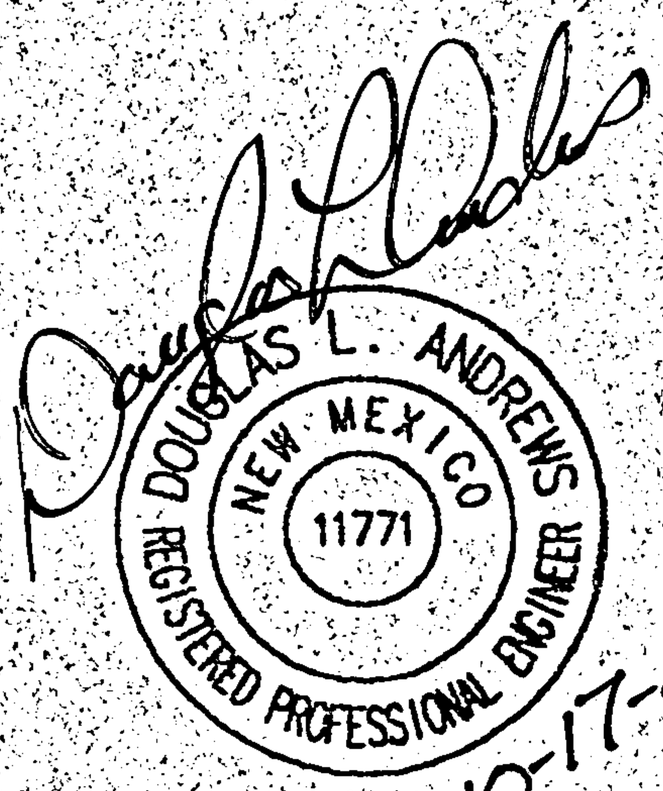
WESTGATE PARK – PHASE 2

CITY OF ALBUQUERQUE, NEW MEXICO

Prepared for:

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
PARK AND MEDIAN DESIGN DIVISION

September, 2005



Prepared by:

Smith Engineering Company
A Full-Service Engineering Company

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RECEIVED
SEP 26 2005
HYDROLOGY SECTION

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Sheet 7 of 22	Civil Point Data
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Appendix F Excerpts from "Drainage Study for El Rancho Grande Unit 10 and Unit 11"

Note: Includes Appendices from Unit 10 and Unit 11 Report – Not to be confused with the Appendices of this drainage report –

I. INTRODUCTION

Westgate Park is located on Albuquerque's Southwest Mesa, north of Gibson Boulevard and west of the Snow Vista Diversion Channel. Please refer to the Vicinity Map (Figure 1, on page 2) for graphical information relative to the park's exact location. Phase 2 consists of the development of approximately 10 acres at the east end of the park site, roughly one third of the total build out area of 30.9 acres of the park area available for development. ***It should be noted that Phase 1 of Westgate Park Improvements included a master plan for the entire 30.9 acres and is yet to be completed. No construction improvements were made as part of Phase 1.***

The City of Albuquerque Park and Median Design Division is planning to construct (as part of Phase 2), a paved parking facility, a concrete basketball court, a play area consisting of concrete and sand, an open multi-purpose turf area and a dog park area. The Civil Site Plan (Sheet 5 of 22 in Appendix E) provides a graphical representation of the improvements to be made as part of Phase 2.

Smith Engineering Company (SEC) has been retained by Consensus Planning Inc. to provide civil engineering services for the proposed park improvements. Included in the civil engineering scope of work is to provide drainage engineering services for the re-development of the site. This drainage report will analyze the impact the park development will have on adjacent and downstream facilities.

II. SITE CHARACTERISTICS

A. Existing Topography

The existing park site generally slopes from the west to the east with an average surface gradient of three percent (3%). The Amole Arroyo (a relatively new shot-crete lined channel) currently meanders through the entire park site from Delgado Drive to the west to Valley View Drive and Del Rey Road to the east. Map No. 1 (located in Appendix D) shows graphically the existing topography of the park site.

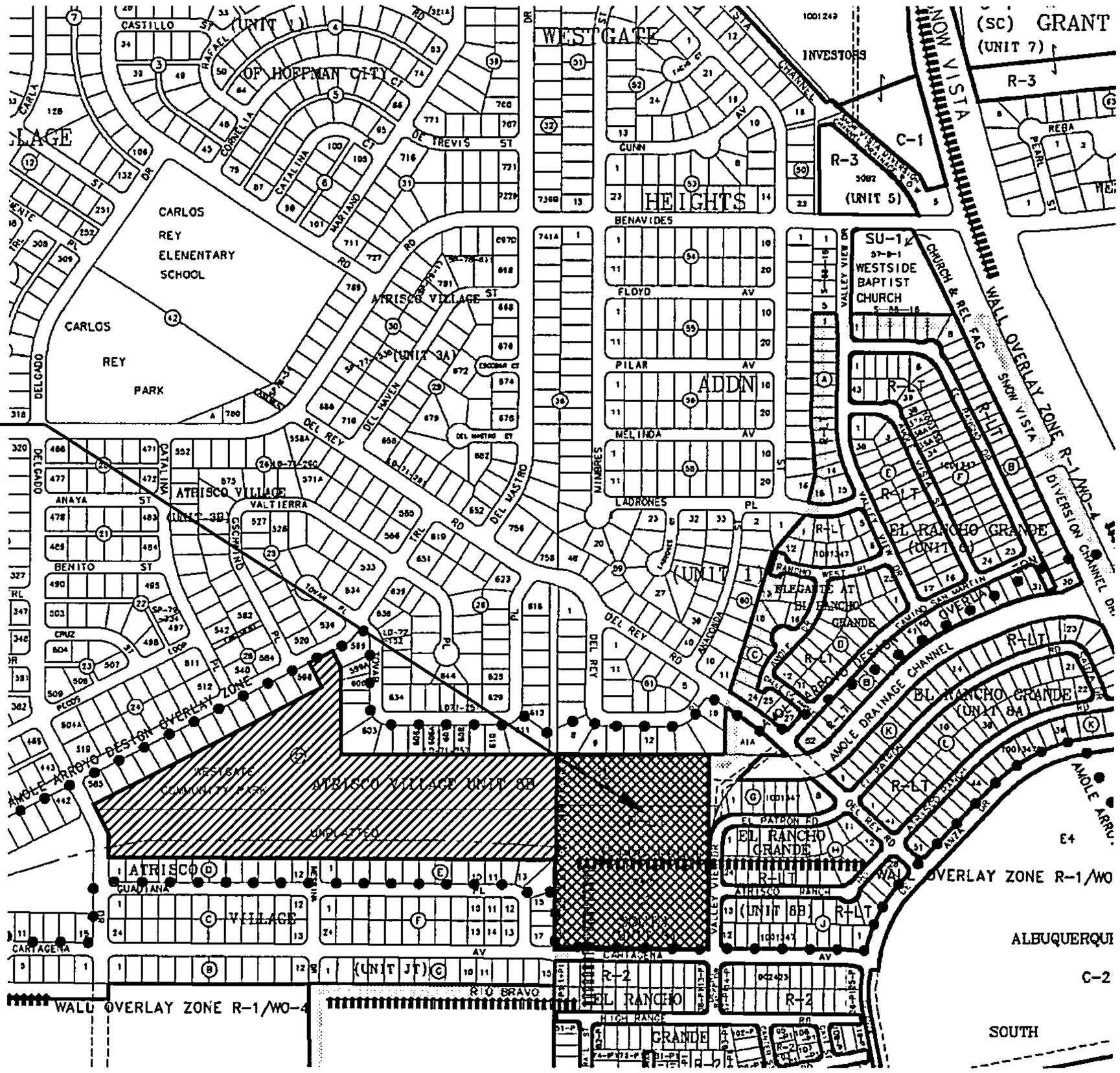
B. Existing Vegetation

The site is approximately 15% developed consisting of a parking facility and an open turf area located at the west end of the park site adjacent to Delgado Drive. The remaining area consists of undeveloped land (native grasses) and the lined Amole Arroyo. The 10 acre site to be developed as part of Phase 2 consists of native grass vegetation.

C. Land Use

Existing condition land uses were determined from aerial photogrammetry provided by Thomas R. Mann & Associates. Map No. 1 (found in Appendix D) shows the existing photography of the park site as of September 5, 2004. Various land uses exist within the park site including native vegetation, grassed park area, paved parking areas and the shot-crete lined Amole Arroyo.

SITE



NOTE:

PHASE 1 CONSISTED ONLY OF A MASTERPLAN PHASE THAT IS NOT YET COMPLETE.

LEGEND:

WESTGATE PARK

WESTGATE PARK PHASE 2

N

NOT TO SCALE
MAP NO. M 8-9

Smith Engineering Company
A Full Service Engineering Company
8400 Uptown Boulevard, N.E. Suite 260E Albuquerque, New Mexico 87110

WESTGATE PARK

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
HYDROLOGY DEVELOPMENT GROUP

VICINITY MAP

PROJECT NUMBER:	DRAWN BY:	DESIGNED BY:	DATE:	FIGURE NO.
101132A	BM	DLA	9/05	1

III. EXISTING DRAINAGE FACILITIES

As stated previously, the Amole Arroyo runs through Westgate Park from Delgado Drive to the west to Del Rey Road to the east. The primary source of storm water entering the park through the Amole Arroyo is the Powerline Channel and the Westgate Dam outfall. A 36" storm drain system also exists within the Phase 2 park site. The 36" storm drain pipe drains a cattle guard inlet located in Cartagena Ave (south of the park). The pipe drains to the north through the park site approximately 680 feet, turns east paralleling the Amole Arroyo for approximately 350 feet where it empties into the Amole Arroyo. Map No. 1 and 2 located in Appendix D show both the Amole Arroyo and the 36 inch storm drain pipe.

IV. FLOOD PLAINS

After reviewing the Flood Insurance Rate Maps for Bernalillo County and Incorporated Areas (Panel 317 of 825 Map No. 35001C0317 D and Panel 336 of 825 Map No. 35001C0336 D) both dated September 20, 1996, a flood plain does exist within the Phase 2 park site. Figure 2 shows the existing flood plain. The flood plain mapped in Figure 2 is the old Amole Arroyo as it existed prior to the shot-crete, realignment work performed in the years 2003 and 2004.

Since the realignment of the Amole Arroyo, a LOMR was issued by FEMA on January 12, 2005 (Case No. 04061904P) remapping the flood plain to within the limits of the relocated Amole Arroyo. No additional CLOMR or LOMR work will be required as part of the Phase 2 park improvements project.



COPY OF:

FIRM: FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL: 317 & 336 OF 825

MAP NUMBERS: 35001C0317 D & 35001C0336 D

EFFECTIVE DATE: SEPTEMBER 20, 1996

FEDERAL EMERGENCY MANAGEMENT AGENCY

N

NOT TO SCALE

Smith Engineering Company

A Full Service Engineering Company

6400 Uptown Boulevard, N.E. Suite 500E Albuquerque, New Mexico 87110

WESTGATE PARK

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
HYDROLOGY DEVELOPMENT GROUP

FLOOD PLAIN MAP

PROJECT NUMBER:	DRAWN BY:	DESIGNED BY:	DATE:	FIGURE NO.
101132A	BM	DLA	9/05	2

V. HYDROLOGY

Frequency flows were quantified using the AHYMO computer program according to "Section 22.2 Hydrology of the Development Process Manual, Design Criteria for the City of Albuquerque, New Mexico". Mapping for the hydrologic analysis utilized the orthophotography and contour composite images prepared by Thomas R. Mann & Associates in September of 2004.

Rainfall amounts for the frequency events were derived from the NOAA Atlas show in "Section 22.2 Hydrology of the Development Process Manual", figures C-1, C-2 and C-3. Drainage basins and sub-basins were determined utilizing existing and well as proposed topographic features shown on the orthophoto mapping.

Existing condition land treatments were determined utilizing the mapping mentioned above. Developed condition land treatments were determined by correlating the proposed improvements to the appropriate land treatments as shown in "Section 22.2 Hydrology of the Development Process Manual", tables A-4 and A-5.

Time of concentration calculations utilized the SCS Upland Method as described in "Section 22.2 Hydrology of the Development Process Manual". Appendix "A" contains AHYMO basin parameter worksheets together with peak flows and volumes for each sub-basin. AHYMO output files are included in Appendix "B". 100-year peak flows and volumes at designated analysis points are shown on Map No. 1 and Map No. 2 located in Appendix D.

VI. PROPOSED IMPROVEMENTS

All of the improvements relative to the Westgate Park – Phase 2 Improvements project will take place within the easterly portion of the entire park site. The improvements include the construction of an asphalt paved parking facility including concrete curb and gutter and concrete sidewalks, a concrete basketball court, a sand and concrete play area, a large multi-purpose turf area and a designated dog park area. Civil Construction Drawings (Sheets 4 through 9 of 22) located in Appendix E show the Phase 2 Improvements.

VII. ANALYSIS

Existing condition storm water (generated from park site) currently drains to three different locations. They are: the Amole Arroyo, El Patron Road and Cartagena Avenue. These same three facilities will convey the storm water runoff generated by the park in its proposed state.

The proposed park infrastructure will increase the one hundred year storm water flow in the Amole Arroyo by 4 cfs from 658 cfs to 662 cfs, an insignificant amount. The one hundred year storm event flows impacting El Patron Road will be decreased from 16 cfs to 1 cfs freeing up needed downstream street capacity. Flows in Cartagena Avenue will increase from 5 cfs to 14 cfs. Hydraulically this 9 cfs increase is okay, with Cartagena Ave. having the capacity to handle the increased storm water runoff. Table 1 on page 7

provides a summary of the existing condition flows compared to the proposed condition flow and impacts downstream of the park. Appendix C provides all hydraulic calculations for the facilities mentioned above as well as hydraulic calculations for the sidewalk drains to be installed adjacent to Valley View Drive. It should be mentioned, the flow from the sidewalk drain in Valley View Drive ultimately drains to Cartagena Ave.

WESTGATE PARK - PHASE 2

HYDRAULIC SUMMARY TABLE

DOWNSTREAM FACILITY	EXISTING CONDITION (cfs)	PROPOSED CONDITION (cfs)	COMMENTS
Amole Arroyo	658	662	No significan impact
El Patron Road	16	1	Decrease of 15cfs - beneficial to downstream roadway capacities
Cartegena Avenue	5	14	Increase of 9 cfs - Cartagena Ave. downstream of park can handle the additional flows. See Appendix C for Cartagena Ave. hydraulic capacity calculations.

VIII. RECOMMENDATIONS

In reviewing Table 1 on page 7 along with the hydraulic calcs in Appendix C, it is clear to see the development of Westgate Park Phase 2 will have no negative impacts to existing downstream facilities. With that said, SEC recommends this drainage report be approved and the park improvements be constructed per the construction drawings shown in Appendix E.

IX. REFERENCES

Anderson-Hydro, August 1997, "AHYMO Computer Program User's Manual"

City of Albuquerque, July 1997, "Development Process Manual, Section 22.2, Hydrology".

Haestad Methods Inc., August 2000, "FlowMaster PE Version 6.0 Computer Software".

Bohannan Huston Inc, June 19, 2003, "Drainage Study For El Rancho Grande Unit and Unit 11".

Isaacson & Arfman, P. A., August 21, 2001, "El Rancho Grande Unit 8 Drainage Report".

APPENDIX A

AHYMO BASIN PARAMETER WORKSHEETS, PEAK BASIN FLOWS, AND VOLUMES

DRAINAGE ANALYSIS
WESTGATE PARK IMPROVEMENTS- PHASE 1

AHYMO BASIN PARAMETER WORKSHEET
PEAK BASIN FLOWS AND VOLUMES

BASIN	AREA (sq.mi.)	LENGTH (ft.)	ELEV. DIFF. (ft.)	SLOPE (%)	K	VEL (fps)	T(c) (hr.)	T(p) (hr.)	LAND TREATMENT (%) A	B	C	D	100 YEAR PEAK FLOW (24hr.) (cfs)	100 YEAR RUNOFF VOLUME (24hr.) (ac.ft.)
A1-E	0.0261	160	8.0	5.00	1.0	2.24	0.02	0.01						
		600	15.0	2.50	2.0	3.16	0.05	0.04						
		650	19.0	2.92	2.0	3.42	0.05	0.04						
		1200	30.0	2.50	4.0	6.32	0.05	0.04						
	TOTAL =						0.18	0.12	75		10	15	32	1.08
A2-E	0.0066	400	14.0	3.50	0.7	1.31	0.08	0.06						
		1180	33.0	2.80	2.0	3.34	0.10	0.07						
	TOTAL =						0.18	0.12	80		20		7	0.18
A3-E	0.0094	400	10.0	2.50	0.7	1.11	0.10	0.07						
		200	8.0	4.00	2.0	4.00	0.01	0.01						
	TOTAL =						0.11	0.08	65		35		11	0.30
A4-E	0.0053	400	13.0	3.25	0.7	1.26	0.09	0.06						
		200	10.0	5.00	2.0	4.47	0.01	0.01						
	TOTAL =						0.10	0.07	80		20		5	0.15
A3-P	0.0020	300	14.0	4.67	0.7	1.51	0.06	0.04						
	TOTAL =						0.06	0.04	100				2	0.05
A4-P	0.0026	400	8.0	2.00	0.7	0.99	0.11	0.07						
	TOTAL =						0.11	0.07	97			3	2	0.07
A5-P	0.0006	125	6.0	4.80	0.7	1.53	0.02	0.02						
	TOTAL =						0.02	0.02	94			6	1	0.02
A6-P	0.0098	150	11.0	7.33	0.7	1.90	0.02	0.01						
		260	4.0	1.54	0.7	0.87	0.08	0.06						
		230	5.0	2.17	2.0	2.95	0.02	0.01						
		160	1.5	0.94	3.0	2.90	0.02	0.01						
	TOTAL =						0.14	0.09	55	10		35	14	0.55

APPENDIX B

AHYMO OUTPUT FILES

```
    AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
         RUN DATE (MON/DAY/YR) = 09/19/2005
         START TIME (HR:MIN:SEC) = 08:00:10     USER NO.= C_ANDRSN.I01
         INPUT FILE = EXWG100.IN


START
*
*S    THIS PURPOSE OF THIS MODEL IS TO CALCULATE THE EXISTING RUNOFF
*S    FROM THE PROPOSED WESGATE PARK INTO THE AMOLE ARROYO (WHICH RUNS
*S    THROUGH THE PARK). OFFSITE FLOWS ARE BROUGHT IN VIA RECALL HYD
*S    (THESE ARE FLOWS UPSTREAM OF THE AMOLE ARROYO CROSSING AT DELGADO
*S    STREET).  THIS MODEL EXAMINES THE 100-YEAR EVENT.
*S    ************************************************************
*S    ANALYSIS ASSUMPTIONS:
*S    ************************************************************
*S    1.  ALL LAND IN THIS BASIN IS MODELED AS EXISTING CONDITION.
*S    ************************************************************
*S
*S DATE:  SEPTEMBER 13, 2005
*S
*S FILENAME - input         :  EXWG100.IN
*S FILENAME - output        :  EXWG100.OUT
*S FILENAME - summary table :  EXWG100.SUM
*S
*S PROJECT TITLE:
*S Drainage Report for the WESTGATE PARK PHASE 1
*S
*S EXISTING CONDITIONS (100-YR)
*S
*S SEC PROJECT NUMBER: 101132A
*S CONSULTANT: SMITH ENGINEERING COMPANY
*S CLIENT: CONSENSUS PLANNING
*S WRITTEN BY: DOUGLAS L. ANDREWS, PE
*S ASSUMPTIONS: LAND TREATMENTS ARE PER C.O.A. DPM CHAPTER 22
*S
*S ------------------------------------------------------------
*S        100-YR, 24 HOUR STORM EVENT
*S ------------------------------------------------------------
*
RAINFALL            TYPE=2  RAIN QUARTER=0.0
                    RAIN ONE=1.87 IN    RAIN SIX=2.20 IN
                    RAIN DAY=2.66 IN    DT=0.05 HR

              COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT =     .050000 HOURS          END TIME =     24.000000 HOURS
    .0000   .0025   .0050   .0076   .0103   .0131   .0160
    .0190   .0222   .0254   .0289   .0324   .0362   .0401
    .0443   .0487   .0534   .0584   .0637   .0695   .0758
    .0837   .0924   .1176   .1773   .2798   .4384   .6668
    .9790  1.2253  1.3366  1.4295  1.5109  1.5836  1.6495
   1.7096  1.7648  1.8156  1.8624  1.9057  1.9458  1.9548
   1.9631  1.9708  1.9780  1.9848  1.9912  1.9973  2.0031
   2.0087  2.0140  2.0191  2.0240  2.0287  2.0333  2.0377
   2.0420  2.0462  2.0502  2.0542  2.0580  2.0617  2.0653
   2.0689  2.0724  2.0757  2.0791  2.0823  2.0855  2.0886
   2.0916  2.0946  2.0976  2.1005  2.1033  2.1061  2.1088
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   2.1984  2.2000  2.2020  2.2039  2.2059  2.2078  2.2097
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EXISTING CONDITIONS

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2.2506	2.2524	2.2542	2.2559	2.2577	2.2595	2.2612
2.2630	2.2647	2.2665	2.2682	2.2700	2.2717	2.2734
2.2751	2.2768	2.2785	2.2802	2.2819	2.2836	2.2853
2.2870	2.2887	2.2903	2.2920	2.2937	2.2953	2.2970
2.2986	2.3002	2.3019	2.3035	2.3051	2.3068	2.3084
2.3100	2.3116	2.3132	2.3148	2.3164	2.3180	2.3196
2.3212	2.3227	2.3243	2.3259	2.3274	2.3290	2.3305
2.3321	2.3336	2.3352	2.3367	2.3383	2.3398	2.3413
2.3428	2.3444	2.3459	2.3474	2.3489	2.3504	2.3519
2.3534	2.3549	2.3563	2.3578	2.3593	2.3608	2.3622
2.3637	2.3652	2.3666	2.3681	2.3695	2.3710	2.3724
2.3739	2.3753	2.3767	2.3782	2.3796	2.3810	2.3824
2.3839	2.3853	2.3867	2.3881	2.3895	2.3909	2.3923
2.3937	2.3951	2.3965	2.3978	2.3992	2.4006	2.4020
2.4033	2.4047	2.4061	2.4074	2.4088	2.4101	2.4115
2.4128	2.4142	2.4155	2.4168	2.4182	2.4195	2.4208
2.4222	2.4235	2.4248	2.4261	2.4274	2.4287	2.4300
2.4314	2.4327	2.4340	2.4352	2.4365	2.4378	2.4391
2.4404	2.4417	2.4430	2.4442	2.4455	2.4468	2.4480
2.4493	2.4506	2.4518	2.4531	2.4543	2.4556	2.4568
2.4581	2.4593	2.4606	2.4618	2.4630	2.4643	2.4655
2.4667	2.4680	2.4692	2.4704	2.4716	2.4728	2.4740
2.4753	2.4765	2.4777	2.4789	2.4801	2.4813	2.4825
2.4837	2.4849	2.4860	2.4872	2.4884	2.4896	2.4908
2.4919	2.4931	2.4943	2.4955	2.4966	2.4978	2.4990
2.5001	2.5013	2.5024	2.5036	2.5047	2.5059	2.5070
2.5082	2.5093	2.5105	2.5116	2.5127	2.5139	2.5150
2.5161	2.5172	2.5184	2.5195	2.5206	2.5217	2.5229
2.5240	2.5251	2.5262	2.5273	2.5284	2.5295	2.5306
2.5317	2.5328	2.5339	2.5350	2.5361	2.5372	2.5383
2.5394	2.5404	2.5415	2.5426	2.5437	2.5448	2.5458
2.5469	2.5480	2.5490	2.5501	2.5512	2.5522	2.5533
2.5544	2.5554	2.5565	2.5575	2.5586	2.5596	2.5607
2.5617	2.5628	2.5638	2.5649	2.5659	2.5669	2.5680
2.5690	2.5700	2.5711	2.5721	2.5731	2.5741	2.5752
2.5762	2.5772	2.5782	2.5792	2.5803	2.5813	2.5823
2.5833	2.5843	2.5853	2.5863	2.5873	2.5883	2.5893
2.5903	2.5913	2.5923	2.5933	2.5943	2.5953	2.5963
2.5973	2.5982	2.5992	2.6002	2.6012	2.6022	2.6031
2.6041	2.6051	2.6061	2.6070	2.6080	2.6090	2.6099
2.6109	2.6119	2.6128	2.6138	2.6148	2.6157	2.6167
2.6176	2.6186	2.6195	2.6205	2.6214	2.6224	2.6233
2.6243	2.6252	2.6261	2.6271	2.6280	2.6290	2.6299
2.6308	2.6318	2.6327	2.6336	2.6346	2.6355	2.6364
2.6373	2.6383	2.6392	2.6401	2.6410	2.6419	2.6428
2.6438	2.6447	2.6456	2.6465	2.6474	2.6483	2.6492
2.6501	2.6510	2.6519	2.6528	2.6537	2.6546	2.6555
2.6564	2.6573	2.6582	2.6591	2.6600		

```
*
*
*S   ************************************************************
*S    RECALL HYDROGRAPH AT AP-02.1 (HYD #00104.1) FROM FILE AA100E1B.DAT
*S                  BY RICHARD STOCKTON (6-21-96).
*S   ************************************************************
*
RECALL HYD                          ID=1  HYD NO=00104.1  DT=0.00
PRINT HYD                           ID=1  CODE=1

                                     PARTIAL HYDROGRAPH   104.10
```

RUNOFF VOLUME = .21919 INCHES = 241.9643 ACRE-FEET
PEAK DISCHARGE RATE = 652.20 CFS AT 1.700 HOURS BASIN AREA = 20.6985 SQ. MI.

```
*
*
*S   ***************************************************************
*S    ROUTE OFFSITE FLOW TO AP-1
*S   ***************************************************************
*
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEGS=1
                             MIN ELEV=0.0 FT   MAX ELEV=6 FT
                             CH SLP=0.0300     FP SLP=0.0300
                    N=0.015  DIST=34
                             DIST    ELEV      DIST    ELEV
                               0       6        12       0
                              22       0        34       6
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.32	3.36	25.48	11.26
.63	7.11	82.40	12.53
.95	11.27	165.45	13.79
1.26	15.82	273.50	15.05
1.58	20.78	406.51	16.32
1.89	26.13	564.87	17.58
2.21	31.88	749.23	18.84
2.53	38.03	960.35	20.11
2.84	44.58	1199.07	21.37
3.16	51.52	1466.28	22.63
3.47	58.87	1762.88	23.89
3.79	66.61	2089.79	25.16
4.11	74.76	2447.93	26.42
4.42	83.30	2838.23	27.68
4.74	92.24	3261.61	28.95
5.05	101.58	3718.99	30.21
5.37	111.32	4211.29	31.47
5.68	121.46	4739.40	32.74
6.00	132.00	5304.24	34.00

```
*
COMPUTE TRAVEL TIME  ID=2 REACH NO=1 NO VS=1 L=2700 FT
                     SLP=0.0300
```

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.357	25.48	.0988
.632	7.114	82.40	.0647
.947	11.269	165.45	.0511
1.263	15.823	273.50	.0434
1.579	20.776	406.51	.0383
1.895	26.127	564.87	.0347
2.211	31.878	749.23	.0319
2.526	38.028	960.35	.0297
2.842	44.576	1199.07	.0279
3.158	51.524	1466.28	.0264
3.474	58.870	1762.88	.0250
3.789	66.615	2089.79	.0239

4.105	74.759	2447.93	.0229
4.421	83.302	2838.23	.0220
4.737	92.244	3261.61	.0212
5.053	101.584	3718.99	.0205
5.368	111.324	4211.29	.0198
5.684	121.463	4739.40	.0192
6.000	132.000	5304.24	.0187

```
ROUTE                ID=2  HYD NO=OFFSITE-R INFLOW ID=1 DT=0.0
PRINT HYD            ID=2 CODE=1
```

HYDROGRAPH FROM AREA OFFSITE-R

RUNOFF VOLUME = .21881 INCHES = 241.5437 ACRE-FEET
PEAK DISCHARGE RATE = 647.78 CFS AT 1.750 HOURS BASIN AREA = 20.6985 SQ. MI.

```
*
*
*S   ************************************************************
*S    GENERATE HYDROGRAPH FOR BASIN A1-E
*S   ************************************************************
*
*
COMPUTE NM HYD              ID=3   HYD=A1-E DA=0.0261 SQ MI
                            PER A=75 PER B=0 PER C=10 PER D=15
                                  TP=0.13 HR MASS RAIN=-1
```

K = .070850HR TP = .130000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 15.849 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.8700
AREA = .003915 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .152998HR TP = .130000HR K/TP RATIO = 1.176908 SHAPE CONSTANT, N = 3.014745
UNIT PEAK = 48.299 CFS UNIT VOLUME = .9988 B = 283.02 P60 = 1.8700
AREA = .022185 SQ MI IA = .61471 INCHES INF = 1.57118 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

```
*
PRINT HYD                   ID=3   CODE=1
```

HYDROGRAPH FROM AREA A1-E

RUNOFF VOLUME = .77675 INCHES = 1.0812 ACRE-FEET
PEAK DISCHARGE RATE = 31.65 CFS AT 1.500 HOURS BASIN AREA = .0261 SQ. MI.

```
*
*
*S   ************************************************************
*S    ADD BASIN A1-E TO OFFSITE ROUTED FLOW - TOTAL @ AP-1
*S   ************************************************************
*
*
ADD HYD                  ID=4  HYD=AP-1  ID I=2  ID II=3
PRINT HYD                ID=4  CODE=1
```

HYDROGRAPH FROM AREA AP-1

RUNOFF VOLUME = .21951 INCHES = 242.6249 ACRE-FEET

PEAK DISCHARGE RATE = 658.45 CFS AT 1.750 HOURS BASIN AREA = 20.7246 SQ. MI.

```
*
*
*S   ****************************************************************
*S    GENERATE HYDROGRAPH FOR BASIN A2-E - TOTAL FLOW @ AP-2
*S   ****************************************************************
*
*
COMPUTE NM HYD          ID=6   HYD=AP-2&A2-E DA=0.0066 SQ MI
                        PER A=80 PER B=0 PER C=20 PER D=0
                        TP=0.13 HR MASS RAIN=-1

    K =   .148354HR    TP =   .130000HR    K/TP RATIO =  1.141188     SHAPE CONSTANT, N =  3.102909
    UNIT PEAK =   14.729    CFS   UNIT VOLUME =    .9986       B =   290.11      P60 = 1.8700
    AREA =      .006600 SQ MI    IA =    .59000 INCHES    INF =   1.50200 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

*
PRINT HYD               ID=6   CODE=1

                                        HYDROGRAPH FROM AREA AP-2&A2-E


    RUNOFF VOLUME =      .52015 INCHES     =        .1831 ACRE-FEET
    PEAK DISCHARGE RATE =       6.65 CFS  AT   1.500 HOURS   BASIN AREA =   .0066 SQ. MI.


*
*
*S   ****************************************************************
*S    ROUTE FLOW FROM AP-2 TO AP-3
*S   ****************************************************************
*
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEGS=1
                                MIN ELEV=0.0 FT   MAX ELEV=4 FT
                                CH SLP=0.0300     FP SLP=0.0300
                      N=0.030  DIST=300
                                DIST    ELEV      DIST    ELEV
                                  0       2         10       0
                                290       0        300       2

                                RATING CURVE VALLEY SECTION  1.0
```

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.21	59.17	179.18	282.11
.42	118.78	569.54	284.21
.63	178.84	1120.80	286.32
.84	239.34	1812.52	288.42
1.05	300.28	2632.27	290.53
1.26	361.66	3571.37	292.63
1.47	423.49	4623.33	294.74
1.68	485.76	5783.03	296.84
1.89	548.48	7046.33	298.95
2.11	611.58	8428.51	300.00
2.32	674.74	9928.58	300.00
2.53	737.89	11525.35	300.00
2.74	801.05	13215.95	300.00
2.95	864.21	14997.86	300.00
3.16	927.37	16868.79	300.00

3.37	990.53	18826.68	300.00
3.58	1053.68	20869.62	300.00
3.79	1116.84	22995.88	300.00
4.00	1180.00	25203.87	300.00

*

COMPUTE TRAVEL TIME ID=8 REACH NO=1 NO VS=1 L=600 FT
SLP=0.0300

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	59.169	179.18	.0550
.421	118.781	569.54	.0348
.632	178.837	1120.80	.0266
.842	239.335	1812.52	.0220
1.053	300.277	2632.27	.0190
1.263	361.662	3571.37	.0169
1.474	423.490	4623.33	.0153
1.684	485.762	5783.03	.0140
1.895	548.477	7046.33	.0130
2.105	611.579	8428.51	.0121
2.316	674.737	9928.58	.0113
2.526	737.895	11525.35	.0107
2.737	801.053	13215.95	.0101
2.947	864.210	14997.86	.0096
3.158	927.368	16868.79	.0092
3.368	990.526	18826.68	.0088
3.579	1053.684	20869.62	.0084
3.789	1116.842	22995.88	.0081
4.000	1180.000	25203.87	.0078

ROUTE ID=8 HYD NO=AP-2R INFLOW ID=6 DT=0.0
PRINT HYD ID=8 CODE=1

HYDROGRAPH FROM AREA AP-2R

RUNOFF VOLUME = .52038 INCHES = .1832 ACRE-FEET
PEAK DISCHARGE RATE = 5.83 CFS AT 1.550 HOURS BASIN AREA = .0066 SQ. MI.

*
*
*S ***
*S GENERATE HYDROGRAPH FOR BASIN A3-E
*S ***
*
*
COMPUTE NM HYD ID=9 HYD=A3-E DA=.0094 SQ MI
PER A=65 PER B=0 PER C=35 PER D=0
TP=0.13 HR MASS RAIN=-1

K = .139897HR TP = .130000HR K/TP RATIO = 1.076128 SHAPE CONSTANT, N = 3.282467
UNIT PEAK = 21.988 CFS UNIT VOLUME = .9994 B = 304.10 P60 = 1.8700
AREA = .009400 SQ MI IA = .54500 INCHES INF = 1.37600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

*
PRINT HYD ID=9 CODE=1

HYDROGRAPH FROM AREA A3-E

```
    RUNOFF VOLUME =      .58911 INCHES     =        .2953 ACRE-FEET
    PEAK DISCHARGE RATE =      10.75 CFS  AT   1.500 HOURS   BASIN AREA =    .0094 SQ. MI.


*
*
*S   ****************************************************************
*S    ADD BASIN A3-E TO ROUTE AP-2R @ AP-3
*S   ****************************************************************
*
*
ADD HYD              ID=10  HYD=AP-3  ID I=8  ID II=9
PRINT HYD            ID=10  CODE=1

                                        HYDROGRAPH FROM AREA AP-3

    RUNOFF VOLUME =      .56070 INCHES     =        .4785 ACRE-FEET
    PEAK DISCHARGE RATE =      15.98 CFS  AT   1.550 HOURS   BASIN AREA =    .0160 SQ. MI.


*
*
*S   ****************************************************************
*S    GENERATE HYDROGRAPH FOR BASIN A4-E @ AP-4
*S   ****************************************************************
*
*
COMPUTE NM HYD          ID=11   HYD=AP-4&A4-E DA=0.0053 SQ MI
                        PER A=80 PER B=0 PER C=20 PER D=0
                        TP=0.13 HR MASS RAIN=-1

    K =    .148354HR    TP =    .130000HR    K/TP RATIO =  1.141188     SHAPE CONSTANT, N =  3.102909
    UNIT PEAK =   11.827    CFS   UNIT VOLUME =    .9984       B =   290.11       P60 = 1.8700
    AREA =       .005300 SQ MI    IA =     .59000 INCHES    INF =   1.50200 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

*
PRINT HYD               ID=11   CODE=1

                                        HYDROGRAPH FROM AREA AP-4&A4-E

    RUNOFF VOLUME =      .52015 INCHES     =        .1470 ACRE-FEET
    PEAK DISCHARGE RATE =       5.34 CFS  AT   1.500 HOURS   BASIN AREA =    .0053 SQ. MI.


*
*
FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 08:00:10
```

```
    AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
         RUN DATE (MON/DAY/YR) = 09/22/2005
         START TIME (HR:MIN:SEC) = 14:45:57     USER NO.= C_ANDRSN.I01
         INPUT FILE = PWG100.IN

START
*
*S   THIS PURPOSE OF THIS MODEL IS TO CALCULATE THE PROPOSED RUNOFF
*S   FROM WESGATE PARK PHASE 1 INTO THE AMOLE ARROYO (WHICH RUNS
*S   THROUGH THE PARK). OFFSITE FLOWS ARE BROUGHT IN VIA RECALL HYD
*S   (THESE ARE FLOWS UPSTREAM OF THE AMOLE ARROYO CROSSING AT DELGADO
*S   STREET).  THIS MODEL EXAMINES THE 100-YEAR EVENT.
*S   ************************************************************
*S   ANALYSIS ASSUMPTIONS:
*S   ************************************************************
*S   1.  ALL LAND WEST OF PHASE 1 IS MODELED AS EXISTING CONDITION.
*S   2.  ALL LAND IN PHASE 1 IS MODELED AS PROPOSED CONDITION.
*S   ************************************************************
*S
*S DATE:  SEPTEMBER 13, 2005
*S
*S FILENAME - input          :  PWG100.IN
*S FILENAME - output         :  PWG100.OUT
*S FILENAME - summary table  :  PWG100.SUM
*S
*S PROJECT TITLE:
*S Drainage Report for the WESTGATE PARK PHASE 1
*S
*S PROPOSED CONDITIONS - PHASE 1 (100-YR)
*S
*S SEC PROJECT NUMBER: 101132A
*S CONSULTANT: SMITH ENGINEERING COMPANY
*S CLIENT: CONSENSUS PLANNING
*S WRITTEN BY: DOUGLAS L. ANDREWS, PE
*S ASSUMPTIONS: LAND TREATMENTS ARE PER C.O.A. DPM CHAPTER 22
*S
*S ---------------------------------------------------------------
*S        100-YR, 24 HOUR STORM EVENT
*S ---------------------------------------------------------------
*
RAINFALL              TYPE=2  RAIN QUARTER=0.0
                      RAIN ONE=1.87 IN    RAIN SIX=2.20 IN
                      RAIN DAY=2.66 IN    DT=0.05 HR

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT =     .050000 HOURS        END TIME =    24.000000 HOURS
   .0000   .0025   .0050   .0076   .0103   .0131   .0160
   .0190   .0222   .0254   .0289   .0324   .0362   .0401
   .0443   .0487   .0534   .0584   .0637   .0695   .0758
   .0837   .0924   .1176   .1773   .2798   .4384   .6668
   .9790  1.2253  1.3366  1.4295  1.5109  1.5836  1.6495
  1.7096  1.7648  1.8156  1.8624  1.9057  1.9458  1.9548
  1.9631  1.9708  1.9780  1.9848  1.9912  1.9973  2.0031
  2.0087  2.0140  2.0191  2.0240  2.0287  2.0333  2.0377
  2.0420  2.0462  2.0502  2.0542  2.0580  2.0617  2.0653
  2.0689  2.0724  2.0757  2.0791  2.0823  2.0855  2.0886
  2.0916  2.0946  2.0976  2.1005  2.1033  2.1061  2.1088
  2.1115  2.1142  2.1168  2.1193  2.1219  2.1244  2.1268
  2.1293  2.1316  2.1340  2.1363  2.1386  2.1409  2.1431
  2.1453  2.1475  2.1497  2.1518  2.1539  2.1560  2.1580
  2.1601  2.1621  2.1641  2.1660  2.1680  2.1699  2.1718
  2.1737  2.1756  2.1774  2.1793  2.1811  2.1829  2.1847
  2.1864  2.1882  2.1899  2.1916  2.1933  2.1950  2.1967
```

PROPOSED CONDITIONS

2.1984	2.2000	2.2020	2.2039	2.2059	2.2078	2.2097
2.2117	2.2136	2.2155	2.2174	2.2193	2.2212	2.2231
2.2249	2.2268	2.2287	2.2305	2.2324	2.2342	2.2361
2.2379	2.2398	2.2416	2.2434	2.2452	2.2470	2.2488
2.2506	2.2524	2.2542	2.2559	2.2577	2.2595	2.2612
2.2630	2.2647	2.2665	2.2682	2.2700	2.2717	2.2734
2.2751	2.2768	2.2785	2.2802	2.2819	2.2836	2.2853
2.2870	2.2887	2.2903	2.2920	2.2937	2.2953	2.2970
2.2986	2.3002	2.3019	2.3035	2.3051	2.3068	2.3084
2.3100	2.3116	2.3132	2.3148	2.3164	2.3180	2.3196
2.3212	2.3227	2.3243	2.3259	2.3274	2.3290	2.3305
2.3321	2.3336	2.3352	2.3367	2.3383	2.3398	2.3413
2.3428	2.3444	2.3459	2.3474	2.3489	2.3504	2.3519
2.3534	2.3549	2.3563	2.3578	2.3593	2.3608	2.3622
2.3637	2.3652	2.3666	2.3681	2.3695	2.3710	2.3724
2.3739	2.3753	2.3767	2.3782	2.3796	2.3810	2.3824
2.3839	2.3853	2.3867	2.3881	2.3895	2.3909	2.3923
2.3937	2.3951	2.3965	2.3978	2.3992	2.4006	2.4020
2.4033	2.4047	2.4061	2.4074	2.4088	2.4101	2.4115
2.4128	2.4142	2.4155	2.4168	2.4182	2.4195	2.4208
2.4222	2.4235	2.4248	2.4261	2.4274	2.4287	2.4300
2.4314	2.4327	2.4340	2.4352	2.4365	2.4378	2.4391
2.4404	2.4417	2.4430	2.4442	2.4455	2.4468	2.4480
2.4493	2.4506	2.4518	2.4531	2.4543	2.4556	2.4568
2.4581	2.4593	2.4606	2.4618	2.4630	2.4643	2.4655
2.4667	2.4680	2.4692	2.4704	2.4716	2.4728	2.4740
2.4753	2.4765	2.4777	2.4789	2.4801	2.4813	2.4825
2.4837	2.4849	2.4860	2.4872	2.4884	2.4896	2.4908
2.4919	2.4931	2.4943	2.4955	2.4966	2.4978	2.4990
2.5001	2.5013	2.5024	2.5036	2.5047	2.5059	2.5070
2.5082	2.5093	2.5105	2.5116	2.5127	2.5139	2.5150
2.5161	2.5172	2.5184	2.5195	2.5206	2.5217	2.5229
2.5240	2.5251	2.5262	2.5273	2.5284	2.5295	2.5306
2.5317	2.5328	2.5339	2.5350	2.5361	2.5372	2.5383
2.5394	2.5404	2.5415	2.5426	2.5437	2.5448	2.5458
2.5469	2.5480	2.5490	2.5501	2.5512	2.5522	2.5533
2.5544	2.5554	2.5565	2.5575	2.5586	2.5596	2.5607
2.5617	2.5628	2.5638	2.5649	2.5659	2.5669	2.5680
2.5690	2.5700	2.5711	2.5721	2.5731	2.5741	2.5752
2.5762	2.5772	2.5782	2.5792	2.5803	2.5813	2.5823
2.5833	2.5843	2.5853	2.5863	2.5873	2.5883	2.5893
2.5903	2.5913	2.5923	2.5933	2.5943	2.5953	2.5963
2.5973	2.5982	2.5992	2.6002	2.6012	2.6022	2.6031
2.6041	2.6051	2.6061	2.6070	2.6080	2.6090	2.6099
2.6109	2.6119	2.6128	2.6138	2.6148	2.6157	2.6167
2.6176	2.6186	2.6195	2.6205	2.6214	2.6224	2.6233
2.6243	2.6252	2.6261	2.6271	2.6280	2.6290	2.6299
2.6308	2.6318	2.6327	2.6336	2.6346	2.6355	2.6364
2.6373	2.6383	2.6392	2.6401	2.6410	2.6419	2.6428
2.6438	2.6447	2.6456	2.6465	2.6474	2.6483	2.6492
2.6501	2.6510	2.6519	2.6528	2.6537	2.6546	2.6555
2.6564	2.6573	2.6582	2.6591	2.6600		

```
*
*
*S    ************************************************************
*S     RECALL HYDROGRAPH AT AP-02.1 (HYD #00104.1) FROM FILE AA100E1B.DAT
*S                    BY RICHARD STOCKTON (6-21-96).
*S    ************************************************************
*
RECALL HYD                          ID=1  HYD NO=00104.1  DT=0.00
PRINT HYD                           ID=1  CODE=1

                                     PARTIAL HYDROGRAPH   104.10
```

RUNOFF VOLUME = .21919 INCHES = 241.9643 ACRE-FEET
PEAK DISCHARGE RATE = 652.20 CFS AT 1.700 HOURS BASIN AREA = 20.6985 SQ. MI.

```
*
*
*S   ****************************************************************
*S    ROUTE OFFSITE FLOW TO AP-1
*S   ****************************************************************
*
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEGS=1
                                MIN ELEV=0.0 FT   MAX ELEV=6 FT
                                CH SLP=0.0300     FP SLP=0.0300
                      N=0.015  DIST=34
                                DIST    ELEV      DIST    ELEV
                                  0       6        12       0
                                 22       0        34       6
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.32	3.36	25.48	11.26
.63	7.11	82.40	12.53
.95	11.27	165.45	13.79
1.26	15.82	273.50	15.05
1.58	20.78	406.51	16.32
1.89	26.13	564.87	17.58
2.21	31.88	749.23	18.84
2.53	38.03	960.35	20.11
2.84	44.58	1199.07	21.37
3.16	51.52	1466.28	22.63
3.47	58.87	1762.88	23.89
3.79	66.61	2089.79	25.16
4.11	74.76	2447.93	26.42
4.42	83.30	2838.23	27.68
4.74	92.24	3261.61	28.95
5.05	101.58	3718.99	30.21
5.37	111.32	4211.29	31.47
5.68	121.46	4739.40	32.74
6.00	132.00	5304.24	34.00

```
*
COMPUTE TRAVEL TIME  ID=2 REACH NO=1 NO VS=1 L=2700 FT
SLP=0.0300
```

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.357	25.48	.0988
.632	7.114	82.40	.0647
.947	11.269	165.45	.0511
1.263	15.823	273.50	.0434
1.579	20.776	406.51	.0383
1.895	26.127	564.87	.0347
2.211	31.878	749.23	.0319
2.526	38.028	960.35	.0297
2.842	44.576	1199.07	.0279
3.158	51.524	1466.28	.0264
3.474	58.870	1762.88	.0250

3.789	66.615	2089.79	.0239
4.105	74.759	2447.93	.0229
4.421	83.302	2838.23	.0220
4.737	92.244	3261.61	.0212
5.053	101.584	3718.99	.0205
5.368	111.324	4211.29	.0198
5.684	121.463	4739.40	.0192
6.000	132.000	5304.24	.0187

```
ROUTE                ID=2  HYD NO=OFFSITE-R INFLOW ID=1 DT=0.0
PRINT HYD            ID=2 CODE=1
```

HYDROGRAPH FROM AREA OFFSITE-R

RUNOFF VOLUME = .21881 INCHES = 241.5437 ACRE-FEET
PEAK DISCHARGE RATE = 647.78 CFS AT 1.750 HOURS BASIN AREA = 20.6985 SQ. MI.

```
*
*
*S   ************************************************************
*S    GENERATE HYDROGRAPH FOR BASIN A1-E
*S   ************************************************************
*
*
COMPUTE NM HYD              ID=3   HYD=A1-E DA=0.0261 SQ MI
                            PER A=75 PER B=0 PER C=10 PER D=15
                                  TP=0.13 HR MASS RAIN=-1

    K =   .070850HR    TP =   .130000HR    K/TP RATIO =   .545000    SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   15.849    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.8700
    AREA =      .003915 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .152998HR    TP =   .130000HR    K/TP RATIO =  1.176908    SHAPE CONSTANT, N =  3.014745
    UNIT PEAK =   48.299    CFS   UNIT VOLUME =    .9988       B =   283.02      P60 = 1.8700
    AREA =      .022185 SQ MI    IA =    .61471 INCHES    INF =   1.57118 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

*
PRINT HYD                   ID=3   CODE=1
```

HYDROGRAPH FROM AREA A1-E

RUNOFF VOLUME = .77675 INCHES = 1.0812 ACRE-FEET
PEAK DISCHARGE RATE = 31.65 CFS AT 1.500 HOURS BASIN AREA = .0261 SQ. MI.

```
*
*
*S   ************************************************************
*S    ADD BASIN A1-E TO OFFSITE ROUTED FLOW - PARTIAL FLOW @ AP-1
*S   ************************************************************
*
*
ADD HYD                 ID=4  HYD=PART-AP-1  ID I=2  ID II=3
PRINT HYD               ID=4  CODE=1
```

HYDROGRAPH FROM AREA PART-AP-1

```
    RUNOFF VOLUME =       .21951 INCHES      =      242.6249 ACRE-FEET
    PEAK DISCHARGE RATE =     658.45 CFS  AT    1.750 HOURS   BASIN AREA = 20.7246 SQ. MI.


*
*
*S   ************************************************************
*S    GENERATE HYDROGRAPH FOR BASIN A2-E - TOTAL FLOW @ AP-2.
*S    THIS FLOW WILL BE COLLECTED IN A TYPE "D" STORM INLET
*S    CONNECTED TO THE 36" STORM DRAIN LOCATED IN THE PARK AREA
*S    THAT DRAINS TO THE AMOLE ARROYO.
*S   ************************************************************
*
*
COMPUTE NM HYD          ID=5   HYD=AP-2&A2-E DA=0.0066 SQ MI
                        PER A=80 PER B=0 PER C=20 PER D=0
                        TP=0.13 HR MASS RAIN=-1

    K =   .148354HR    TP =   .130000HR    K/TP RATIO =  1.141188     SHAPE CONSTANT, N =  3.102909
    UNIT PEAK =   14.729    CFS  UNIT VOLUME =    .9986       B =   290.11       P60 = 1.8700
    AREA =      .006600 SQ MI    IA =    .59000 INCHES    INF =   1.50200 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

*
PRINT HYD               ID=5   CODE=1

                                        HYDROGRAPH FROM AREA AP-2&A2-E

    RUNOFF VOLUME =       .52015 INCHES      =        .1831 ACRE-FEET
    PEAK DISCHARGE RATE =       6.65 CFS  AT    1.500 HOURS   BASIN AREA =    .0066 SQ. MI.


*
*
*S   ************************************************************
*S    ADD BASIN A2-E TO THE AMOLE ARROYO FLOW  - PARTIAL FLOW @ AP-1
*S   ************************************************************
*
*
ADD HYD                 ID=2  HYD=PART-AP-1   ID I=4   ID II=5
PRINT HYD               ID=2  CODE=1

                                        HYDROGRAPH FROM AREA PART-AP-1

    RUNOFF VOLUME =       .21961 INCHES      =      242.8080 ACRE-FEET
    PEAK DISCHARGE RATE =     660.49 CFS  AT    1.750 HOURS   BASIN AREA = 20.7312 SQ. MI.


*
*
*S   ************************************************************
*S    GENERATE HYDROGRAPH FOR BASIN A3-P - TOTAL FLOW @ AP-3.
*S    THIS FLOW WILL BE COLLECTED IN A TYPE "D" STORM INLET
*S    CONNECTED TO THE 36" STORM DRAIN LOCATED IN THE PARK AREA
*S    THAT DRAINS TO THE AMOLE ARROYO.
*S   ************************************************************
*
*
COMPUTE NM HYD          ID=6   HYD=AP-3&A3-P DA=0.0020 SQ MI
                        PER A=100 PER B=0 PER C=0 PER D=0
```

```
                    TP=0.13 HR MASS RAIN=-1

    K =    .159632HR     TP =    .130000HR     K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =    4.2084     CFS    UNIT VOLUME =     .9950        B =    273.54       P60 = 1.8700
    AREA =        .002000 SQ MI     IA =     .65000 INCHES     INF =    1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

*
PRINT HYD                ID=6    CODE=1

                                        HYDROGRAPH FROM AREA AP-3&A3-P


    RUNOFF VOLUME =       .43936 INCHES      =         .0469 ACRE-FEET
    PEAK DISCHARGE RATE =        1.69 CFS   AT    1.500 HOURS    BASIN AREA =    .0020 SQ. MI.

*
*
*S   ***************************************************************
*S    ADD BASIN A3-P TO THE AMOLE ARROYO FLOW  - PARTIAL FLOW @ AP-1
*S   ***************************************************************
*
*
ADD HYD                  ID=3  HYD=PART-AP-1   ID I=2   ID II=6
PRINT HYD                ID=3  CODE=1

                                        HYDROGRAPH FROM AREA PART-AP-1


    RUNOFF VOLUME =       .21963 INCHES      =     242.8548 ACRE-FEET
    PEAK DISCHARGE RATE =     661.02 CFS   AT    1.750 HOURS    BASIN AREA = 20.7332 SQ. MI.



*
*
*S   ***************************************************************
*S    GENERATE HYDROGRAPH FOR BASIN A4-P - TOTAL FLOW @ AP-4.
*S    THIS FLOW WILL ENTER THE AMOLE ARROYO AS OVERLAND FLOW.
*S   ***************************************************************
*
*
COMPUTE NM HYD           ID=7    HYD=AP-4&A4-P DA=0.0026 SQ MI
                         PER A=97 PER B=0 PER C=0 PER D=3
                    TP=0.13 HR MASS RAIN=-1

    K =    .070850HR     TP =    .130000HR     K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    .31577     CFS    UNIT VOLUME =     .9621        B =    526.28       P60 = 1.8700
    AREA =        .000078 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000


    K =    .159632HR     TP =    .130000HR     K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =    5.3068     CFS    UNIT VOLUME =     .9956        B =    273.54       P60 = 1.8700
    AREA =        .002522 SQ MI     IA =     .65000 INCHES     INF =    1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

*
PRINT HYD                ID=7    CODE=1

                                        HYDROGRAPH FROM AREA AP-4&A4-P
```

RUNOFF VOLUME = .49899 INCHES = .0692 ACRE-FEET
PEAK DISCHARGE RATE = 2.36 CFS AT 1.500 HOURS BASIN AREA = .0026 SQ. MI.

```
*
*
*S   ***************************************************************
*S    ADD BASIN A4-P TO THE AMOLE ARROYO FLOW  - TOTAL FLOW @ AP-1
*S   ***************************************************************
*
*
ADD HYD              ID=2  HYD=AP-1  ID I=3  ID II=7
PRINT HYD            ID=2  CODE=1
```

HYDROGRAPH FROM AREA AP-1

RUNOFF VOLUME = .21966 INCHES = 242.9238 ACRE-FEET
PEAK DISCHARGE RATE = 661.78 CFS AT 1.750 HOURS BASIN AREA = 20.7358 SQ. MI.

```
*
*
*S   ***************************************************************
*S    GENERATE HYDROGRAPH FOR BASIN A5-P - TOTAL FLOW @ AP-5.
*S    THIS FLOW WILL ENTER VALLEY VIEW DRIVE AS OVERLAND FLOW.
*S   ***************************************************************
*
*
COMPUTE NM HYD          ID=8   HYD=AP-5&A5-P DA=0.0006 SQ MI
                        PER A=94 PER B=0 PER C=0 PER D=6
                        TP=0.13 HR MASS RAIN=-1
```

K = .070850HR TP = .130000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .14574 CFS UNIT VOLUME = .9239 B = 526.28 P60 = 1.8700
AREA = .000036 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .159632HR TP = .130000HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 1.1868 CFS UNIT VOLUME = .9868 B = 273.54 P60 = 1.8700
AREA = .000564 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

```
*
PRINT HYD               ID=8   CODE=1
```

HYDROGRAPH FROM AREA AP-5&A5-P

RUNOFF VOLUME = .55863 INCHES = .0179 ACRE-FEET
PEAK DISCHARGE RATE = .59 CFS AT 1.500 HOURS BASIN AREA = .0006 SQ. MI.

```
*
*
*S   ***************************************************************
*S    GENERATE HYDROGRAPH FOR BASIN A6-P @ AP-6
*S   ***************************************************************
*
*
COMPUTE NM HYD          ID=11   HYD=AP-6&A6-P DA=0.0098 SQ MI
```

PWG100.OUT
PER A=60 PER B=10 PER C=0 PER D=30
TP=0.13 HR MASS RAIN=-1

K = .070850HR TP = .130000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 11.902 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.8700
AREA = .002940 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .155077HR TP = .130000HR K/TP RATIO = 1.192900 SHAPE CONSTANT, N = 2.977392
UNIT PEAK = 14.774 CFS UNIT VOLUME = .9979 B = 279.97 P60 = 1.8700
AREA = .006860 SQ MI IA = .62857 INCHES INF = 1.61000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

*
PRINT HYD ID=11 CODE=1

HYDROGRAPH FROM AREA AP-6&A6-P

RUNOFF VOLUME = 1.05462 INCHES = .5512 ACRE-FEET
PEAK DISCHARGE RATE = 14.35 CFS AT 1.500 HOURS BASIN AREA = .0098 SQ. MI.

*
*
FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 14:45:57

APPENDIX C

HYDRAULIC CALCULATIONS

Curb Opening Capacity (Parking Area) - Weir
Worksheet for Sharp Crested Rectangular Weir

Project Description	
Worksheet	Curb Opening Capacity (Parking Ar
Type	Sharp Crested Rectangular Weir
Solve For	Discharge

Input Data		
Headwater Elevati	0.50	ft
Crest Elevation	0.00	ft
Tailwater Elevation	0.00	ft
Discharge Coefficie	3.33	US
Crest Length	24.00	ft
Number of Contrac	2	

Results		
Discharge	28.14	cfs
Headwater Height Abov	0.50	ft
Tailwater Height Above	0.00	ft
Flow Area	12.00	ft²
Velocity	2.34	ft/s
Wetted Perimeter	25.00	ft
Top Width	24.00	ft

← Capacity.

FLOW FROM PARKING FACILITY TO SIDEWALK CULVERTS. AP-6.

Q_{100} = 14 CFS < 28 CFS (OK)

CURB OPENING ACTING AS A SHARP CRESTED WEIR.

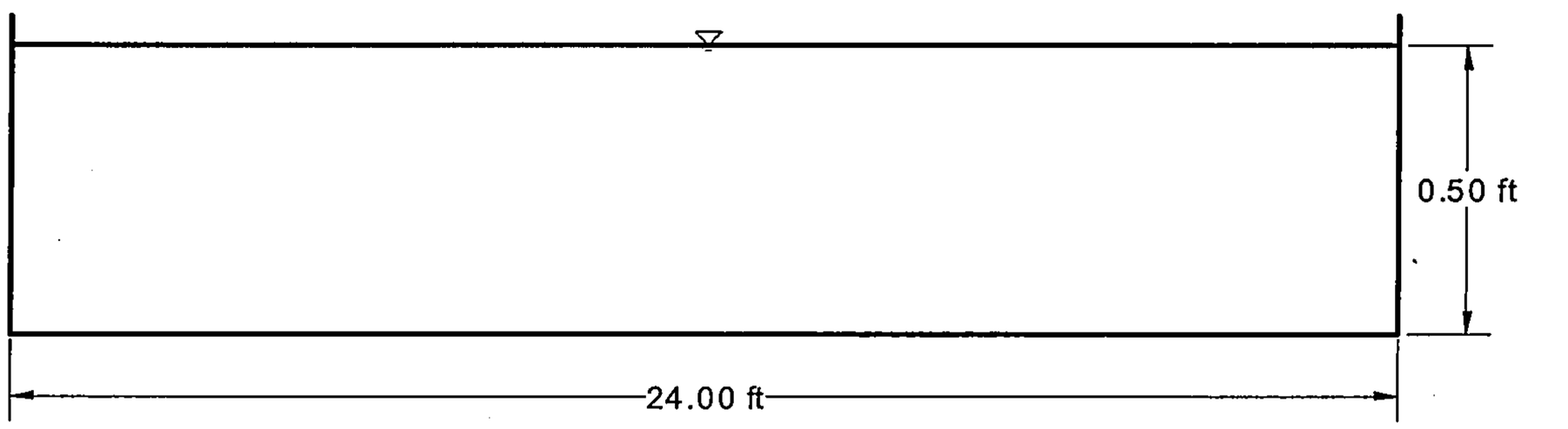
Cross Section
Cross Section for Sharp Crested Rectangular Weir

Project Description	
Worksheet	Curb Opening Capacity (Parking Ar·
Type	Sharp Crested Rectangular Weir
Solve For	Discharge

Section Data		
Discharge	28.14	cfs
Headwater Elevati	0.50	ft
Crest Elevation	0.00	ft
Tailwater Elevation	0.00	ft
Discharge Coefficie	3.33	US
Crest Length	24.00	ft
Number of Contrac	2	

← Capacity

$Q_{100} = 14 cfs < 28 cfs$ (OK)



NTS

Rectangular Channel - From Parking Facilithy to Sidewalk Culverts
Worksheet for Rectangular Channel

Project Description	
Worksheet	Rectangular Channel - Parking Facility to Sidew
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Mannings Coeffic	0.015	
Slope	2.56	%
Depth	0.50	ft
Bottom Width	24.00	ft

Results		
Discharge	116.60	cfs
Flow Area	12.00	ft²
Wetted Perim	25.00	ft
Top Width	24.00	ft
Critical Depth	0.90	ft
Critical Slope	0.37	%
Velocity	9.72	ft/s
Velocity Head	1.47	ft
Specific Energ	1.97	ft
Froude Numb	2.42	
Flow Type	Supercritical	

← Capacity

$Q_{DD} = 14 \text{ CFS} < 116.60 \text{ CFS}$ (OK ✓)

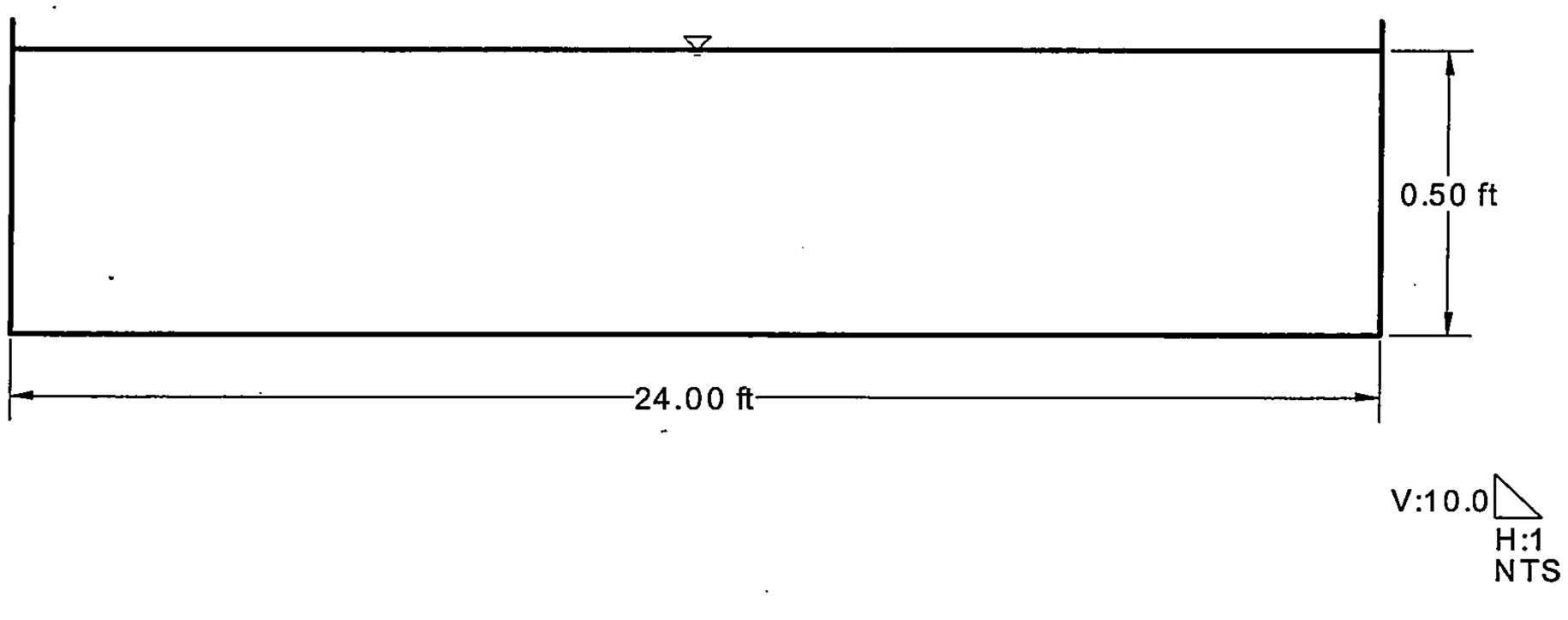
ANALYSIS FROM CURB OPENING IN PARKING AREA TO SIDEWALK CULVERTS

Cross Section
Cross Section for Rectangular Channel

Project Description	
Worksheet	Rectangular Channel - Parking Facility to Sidew
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Mannings Coeffic	0.015	
Slope	2.56	%
Depth	0.50	ft
Bottom Width	24.00	ft
Discharge	16.60	cfs

$Q_{100} = 14 \text{ cfs} < 116.60 \text{ cfs}$ (OK ✓)



SIDEWALK DRAIN CALCS - WEIR FLOW
Worksheet for Sharp Crested Rectangular Weir

Project Description	
Worksheet	Sidewalk Drain - Weir
Type	Sharp Crested Rectangul
Solve For	Discharge

Input Data		
Headwater Elevati	72.93	ft
Crest Elevation	72.26	ft
Tailwater Elevation	72.24	ft
Discharge Coefficie	3.33	US
Crest Length	1.00	ft
Number of Contrac	2	

Results		
Discharge	1.58	cfs
Headwater Height Abov	0.67	ft
Tailwater Height Above	-0.02	ft
Flow Area	0.67	ft²
Velocity	2.36	ft/s
Wetted Perimeter	2.34	ft
Top Width	1.00	ft

CAPACITY OF EACH
12" OPENING = 1.58 CFS

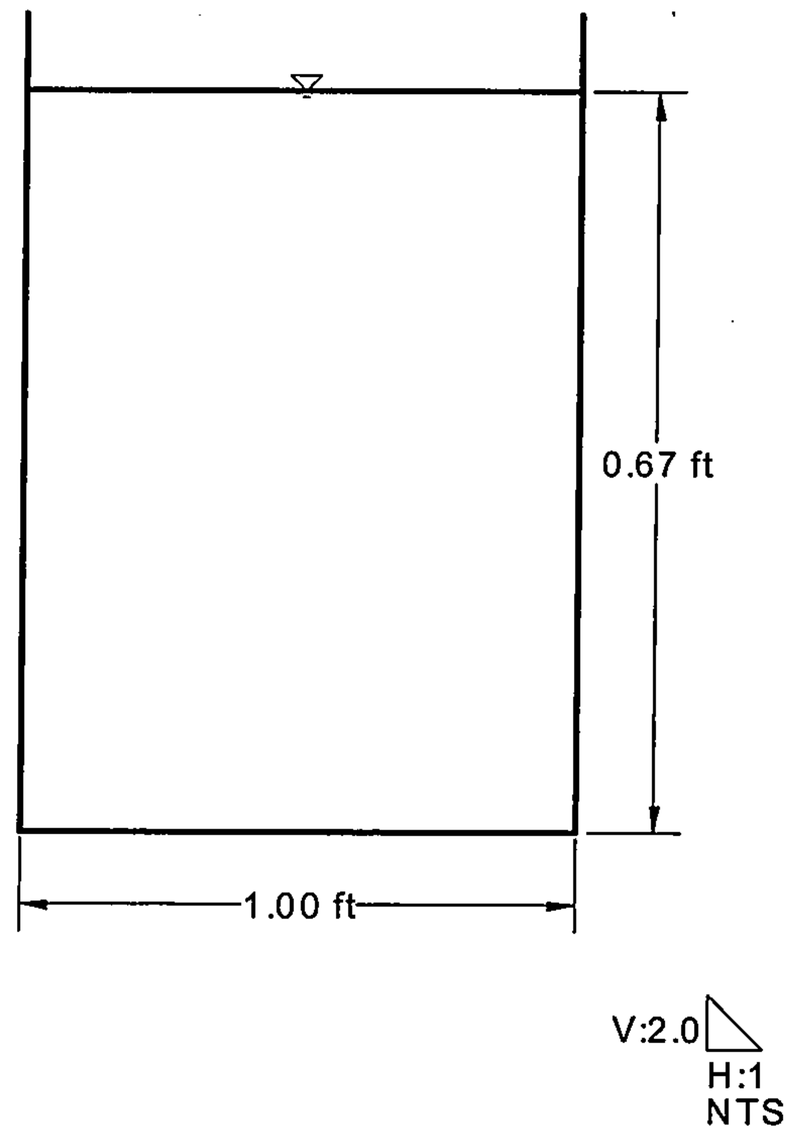
9 OPENINGS X 1.58 CFS = 14.22 CFS

Q100 = 14 CFS < 14.22 CFS
(OK)

Cross Section
Cross Section for Sharp Crested Rectangular Weir

Project Description	
Worksheet	Sidewalk Drain - Weir
Type	Sharp Crested Rectangul
Solve For	Discharge

Section Data		
Discharge	1.58	cfs
Headwater Elevati	72.93	ft
Crest Elevation	72.26	ft
Tailwater Elevation	72.24	ft
Discharge Coefficie	3.33	US
Crest Length	1.00	ft
Number of Contrac	2	



Catagena Ave. 40' Section, 60' ROW
Worksheet for Irregular Channel

Project Description	
Worksheet	Cartagena Ave. 40' Street Capac
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	2.14	%
Discharg	36.00	cfs

Options	
Current Roughness Metho	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Results		
Mannings Coefficie	0.017	
Water Surface Elev.	0.48	ft
Elevation Range	0.00 to 0.87	
Flow Area	8.19	ft²
Wetted Perimeter	40.92	ft
Top Width	40.16	ft
Actual Depth	0.48	ft
Critical Elevation	0.57	ft
Critical Slope	0.65	%
Velocity	4.39	ft/s
Velocity Head	0.30	ft
Specific Energy	0.78	ft
Froude Number	1.72	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
-0+09.83	-0+05.83	0.015
-0+05.83	-0+00.46	0.030
-0+00.46	0+02.17	0.015
0+02.17	0+38.17	0.019
0+38.17	0+40.80	0.015
0+40.80	0+46.17	0.030
0+46.17	0+50.17	0.015

Natural Channel Points	
Station (ft)	Elevation (ft)
-0+09.83	0.87
-0+05.83	0.79
-0+00.46	0.67
0+00.00	0.67

TOTAL 100-YR FLOW IN CARTAGENA AVE.

= 12.9 CFS (FROM EL RANCHO GRANDE UNIT 10 & 11)

= 9.2 CFS (FROM EL RANCHO GRANDE UNIT 8

= 14 CFS (FROM WESTGATE PARK

TOTAL = 36 CFS

HGL = 0.48 FT < 0.67 FT. (OK)

EGL = 0.48 + 0.30 = 0.78 FT < 0.87 FT

(OK)

Catagena Ave. 40' Section, 60' ROW
Worksheet for Irregular Channel

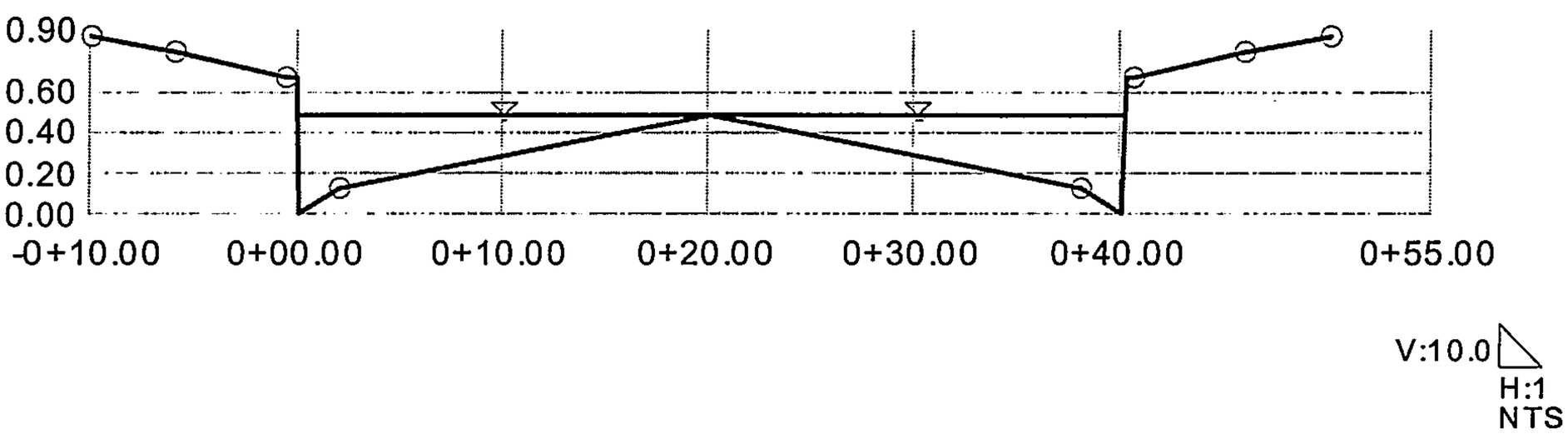
Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.17	0.00
0+02.17	0.13
0+20.17	0.49
0+38.17	0.13
0+40.17	0.00
0+40.34	0.67
0+40.80	0.67
0+46.17	0.79
0+50.17	0.87

Cartagena Ave. 40' Roadway Section, 60' ROW
Cross Section for Irregular Channel

Project Description	
Worksheet	Cartagena Ave. 40' Street Capac
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficie	0.017	
Slope	2.14	%
Water Surface Elev.	0.48	ft
Elevation Range	.00 to 0.87	
Discharge	36.00	cfs

HGL = 0.48' @ 20.67' OK
EGL = 0.78' @ 20.97' OK



APPENDIX D

DRAINAGE MAPS



TABLE 1:
DRAINAGE BASIN HYDROLOGY - EXISTING CONDITIONS, 100-YEAR EVENT

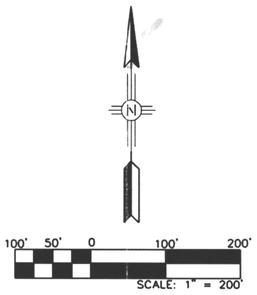
DRAINAGE BASIN	AREA (SQ. MI.)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC. FT.)
A1-E	0.0261	32	1.08
A2-E	0.0066	7	0.18
A3-E	0.0094	11	0.30
A4-E	0.0053	5	0.15

NOTE:
OFFSITE HYDROLOGY (UPSTREAM OF AMOLE ARROYO CROSSING AT DELGADO STREET) TAKEN FROM "AMOLE-HUBBELL DRAINAGE MANAGEMENT PLAN," VOLUMES I, II AND III, PREPARED FOR AMAFCA ON JULY 22, 1999 BY LEEDSHILL-HERKENHOFF, INC.

TABLE 2:
ANALYSIS POINT HYDROLOGY - EXISTING CONDITIONS, 100-YEAR EVENT

ANALYSIS POINT	CONTRIBUTING BASINS	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC. FT.)
AP-1	OFFSITE & A1-E	658	242.62
AP-2	A2-E	7	0.18
AP-3	A2-E & A3-E	16	0.48
AP-4	A4-E	5	0.15

NOTE:
OFFSITE HYDROLOGY (UPSTREAM OF AMOLE ARROYO CROSSING AT DELGADO STREET) TAKEN FROM "AMOLE-HUBBELL DRAINAGE MANAGEMENT PLAN," VOLUMES I, II AND III, PREPARED FOR AMAFCA ON JULY 22, 1999 BY LEEDSHILL-HERKENHOFF, INC.



Smith Engineering Company
A Full Service Engineering Company
2201 San pedro NE Bldg. #4, Suite 200 Albuquerque, New Mexico 87110

WESTGATE PARK-PHASE 2

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPEMENT
PARK AND MEDIAN DESIGN DIVISION

EXISTING CONDITIONS DRAINAGE MAP

PROJECT NUMBER:	DRAWN BY:	DESIGNED BY:	DATE:	MAP NO:
101132A	BM	DLA	09-05	1



TABLE 1:
DRAINAGE BASIN HYDROLOGY - PROPOSED CONDITIONS, 100-YEAR EVENT

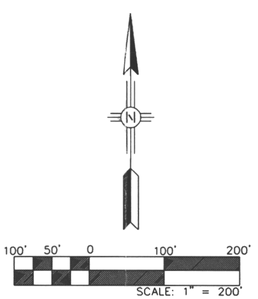
DRAINAGE BASIN	AREA (SQ. MI.)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC. FT.)
A1-E	0.0261	32	1.08
A2-E	0.0066	7	0.18
A3-P	0.0020	2	0.05
A4-P	0.0026	2	0.07
A5-P	0.0005	1	0.02
A6-P	0.0098	14	0.55

NOTE:
OFFSITE HYDROLOGY (UPSTREAM OF AMOLE ARROYO CROSSING AT DELGADO STREET) TAKEN FROM "AMOLE-HUBBELL DRAINAGE MANAGEMENT PLAN," VOLUMES I, II AND III, PREPARED FOR AMAFCA ON JULY 22, 1999 BY LEEDSHILL-HERKENHOFF, INC.

TABLE 2:
ANALYSIS POINT HYDROLOGY - PROPOSED CONDITIONS, 100-YEAR EVENT

ANALYSIS POINT	CONTRIBUTING BASINS	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC.FT.)
AP-1	OFF-SITE, A1-E, A2-E A3-P, A4-P	662	242.92
AP-2	A2-E	7	0.18
AP-3	A3-P	2	0.05
AP-4	A4-P	2	0.07
AP-5	A5-P	1	0.02
AP-6	A6-P	14	0.55

NOTE:
OFFSITE HYDROLOGY (UPSTREAM OF AMOLE ARROYO CROSSING AT DELGADO STREET) TAKEN FROM "AMOLE-HUBBELL DRAINAGE MANAGEMENT PLAN," VOLUMES I, II AND III, PREPARED FOR AMAFCA ON JULY 22, 1999 BY LEEDSHILL-HERKENHOFF, INC.



Smith Engineering Company
A Full Service Engineering Company
2201 San pedro NE Bldg #4, Suite 200 Albuquerque, New Mexico 877110

WESTGATE PARK-PHASE 2

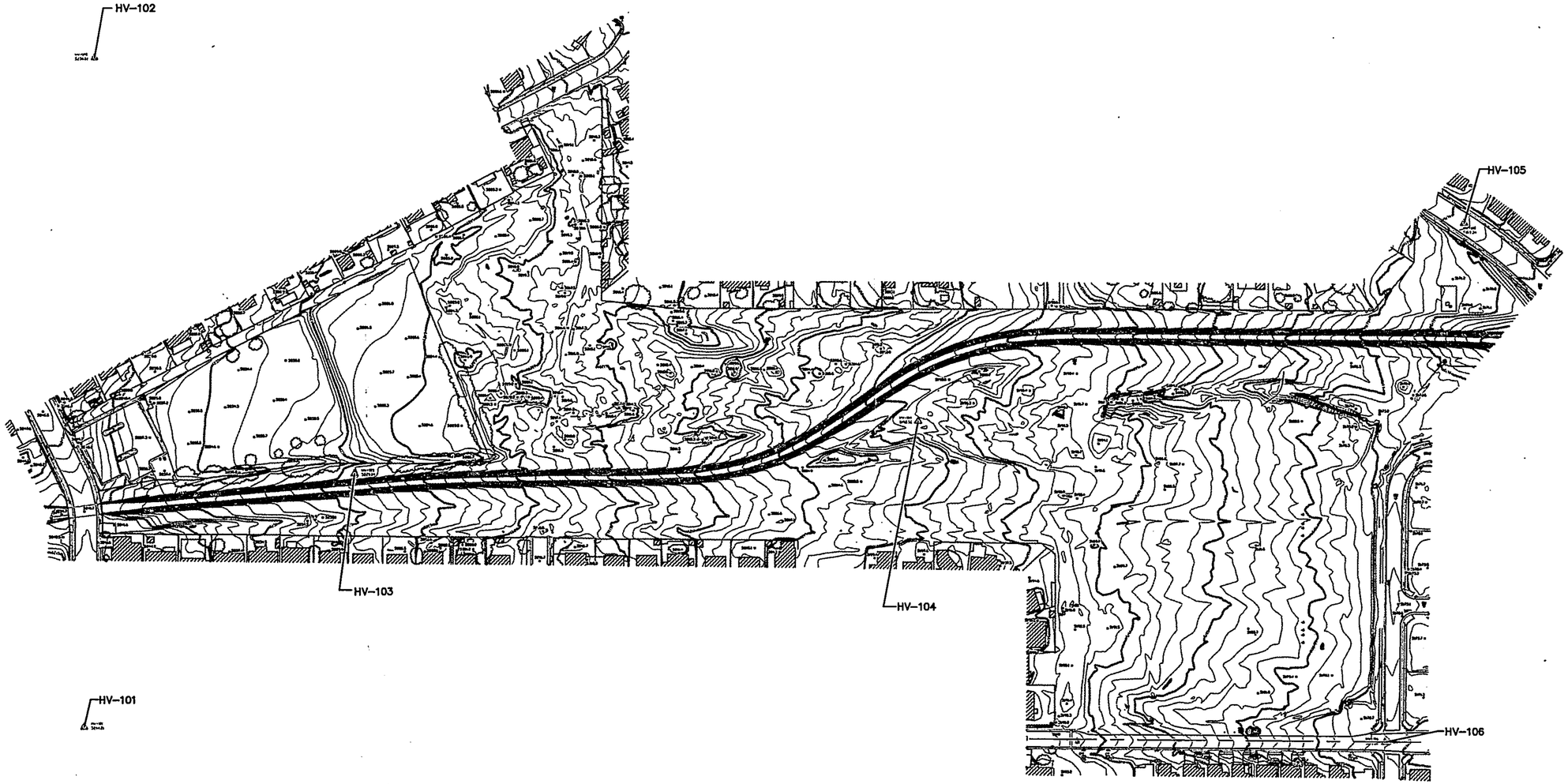
CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPEMENT
PARK AND MEDIAN DESIGN DIVISION

PROPOSED CONDITIONS DRAINAGE MAP

PROJECT NUMBER:	DRAWN BY:	DESIGNED BY:	DATE:	MAP NO:
101132A	BM	DLA	09-05	2

APPENDIX E

CIVIL CONSTRUCTION DRAWINGS



LOCAL SURVEY CONTROL INFORMATION

POINT NUMBER	NORTHING	EASTING	ELEVATION
HV-101	1471720.08	350146.80	5244.21
HV-102	1472953.52	350163.86	5238.51
HV-103	1472188.17	350645.30	5229.24
HV-104	1472284.00	351688.11	5198.36
HV-105	1472848.65	352894.34	5169.34
HV-106	1471691.47	352550.58	5171.26

100' 50' 0 100' 200'
SCALE: 1" = 100'

AS BUILT INFORMATION
CONTRACTOR
WORK STARTED BY DATE
INSPECTOR'S REMARKS BY DATE
FIELD VERIFICATION BY DATE
AS-BUILTS CORRECTED BY DATE
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

ENGINEER'S SEAL
U.S. L. ANDREWS 11771 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		AS-BUILTS DESIGN	
DESIGNED BY	DLA	DATE 09/05	
DRAWN BY	KSH	DATE 09/05	
CHECKED BY	DLA	DATE 09/05	

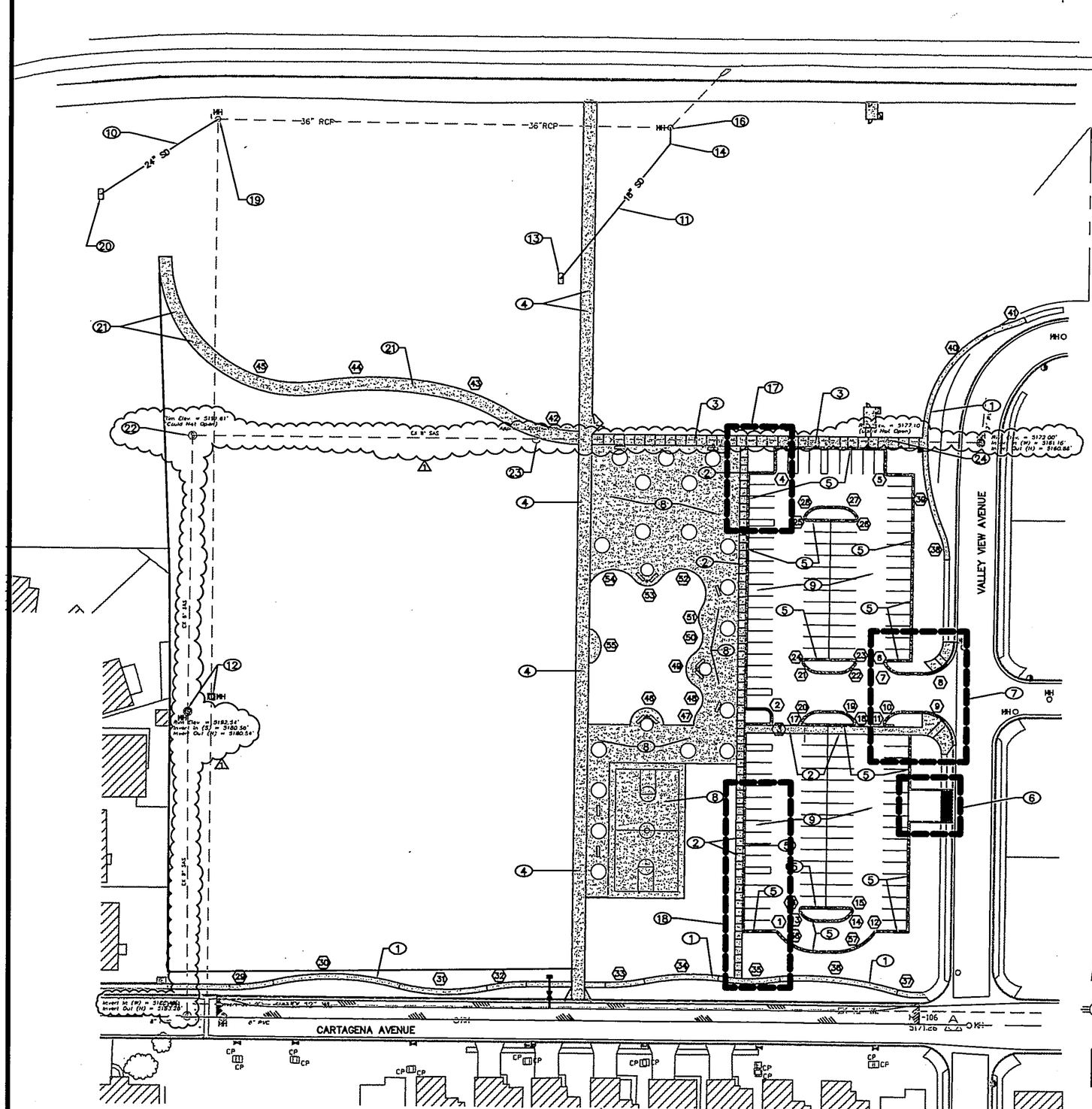
101132A
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A Full Service Engineering Company
2901 San Pedro Boulevard, N.E., Bldg. 21, Suite 200 Albuquerque, New Mexico 87110

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
PARK AND MEDIAN DESIGN DIVISION

TITLE:
WESTGATE PARK – PHASE 2
CIVIL - SURVEY DATA

Design Review Committee	City Engineer Approval	Last Design Update

City Project No. 656302 | Zone Map No. M-8,9 | Sheet 4 Of 22



KEYED NOTES:

1. BUILD 4' WIDE SIDEWALK PER COA STD. DWG.2430.
2. BUILD 6' WIDE SIDEWALK PER STD. DWG 2430.
3. BUILD 8' WIDE SIDEWALK PER STD. DWG 2430.
4. BUILD 10' WIDE PORTLAND CEMENT CONCRETE ACCESS ROAD (6" THICK). (OVER 12" SUBGRADE PREPARATION.)
5. ALL PARKING LOT CURB & GUTTER SHALL BE MEDIAN C&G PER COA STD. DWG. 2415B.
6. SEE CIVIL DETAIL SHEET FOR SIDEWALK CULVERT INFORMATION.
7. SEE CIVIL DETAIL SHEET FOR PARKING LOT ENTRANCE INFORMATION.
8. BUILD PORTLAND CEMENT CONCRETE – 4" THICK (OVER 12" SUBGRADE PREPARATION).
9. ASPHALT CONCRETE PAVEMENT. SEE CIVIL DETAIL SHEET FOR PAVEMENT SECTION.
10. INSTALL 106 LF OF CLASS IV 24" RCP STORM DRAIN. SLOPE=5.14%
11. INSTALL 141.79 LF OF CLASS IV 18" RCP STORM DRAIN. SLOPE=1.00%
12. EXISTING MANHOLES TO REMAIN.
13. INSTALL COA TYPE "D" INLET. STD DWG #2206. 18" INV=5178.52. GRATE ELEV=5181.52.
14. INSTALL 18"–45° CLASS IV BEND.
15. 16.5' DIRT ROAD TO BE REROUTED AROUND NEW BRIDGE.
16. REMOVE & DISPOSE EXISTING MANHOLE. BUILD NEW 6' DIA. MH PER COA STANDARD DRAWING 2101. EXISTING CENTERLINE MH INVERT ELEV=5176.85. NEW 18" INV.=5177.10 NEW RIM ELEVATION=5182.60
17. SEE CIVIL DETAIL SHEET FOR SOUTH RAMP DETAIL INFORMATION.
18. SEE CIVIL DETAIL SHEET FOR NORTH RAMP DETAIL INFORMATION.
19. REMOVE & DISPOSE EXISTING MANHOLE. BUILD NEW 6' DIA. MH PER COA STD DWG 2101. EXISTING CENTERLINE MH INVERT = 5180.30. NEW 24" INVERT=5180.55 NEW RIM ELEVATION=5193.60 OFFSET MANHOLE AS REQUIRED TO FIT ALL PIPES IN MANHOLE BASE.
20. INSTALL COA TYPE "D" INLET, STD DWG 2206. 24" INV=5186.00. GRATE ELEV=5191.00.
21. BUILD 10' WIDE SIDEWALK PER STD DWG 2430.
22. ADJUST SAS MH. RIM ELEV EXISTING RIM=5191.61 PROPOSED RIM=5193.13 AS-BUILT EXISTING INV = 77.45(S) = 77.04(E)
23. ADJUST SAS MH. (NOT FOUND IN FIELD) RIM ELEV AS-BUILT EXISTING RIM=76.26 PROPOSED RIM=5181.52 AS-BUILT EXISTING INV = 69.57(W) = 69.66(E)
24. ADJUST SAS MH. RIM ELEV EXISTING RIM=5177.10 PROPOSED RIM=5176.78 AS-BUILT EXISTING INV = 63.07(W) = 62.85(E)

CURVE DATA

NO.	DELTA	RADIUS	LEN.	TAN.
1	51°21'17"	2.00'	1.79'	0.96'
2	90°00'00"	5.00'	7.85'	5.00'
3	90°00'00"	2.00'	3.14'	2.00'
4	89°58'38"	2.00'	3.14'	2.00'
5	89°56'13"	2.00'	3.14'	2.00'
6	122°54'16"	2.00'	4.29'	3.68'
7	56°53'01"	15.00'	14.89'	8.12'
8	89°41'17"	25.00'	39.06'	23.86'
9	90°18'51"	25.00'	39.13'	25.14'
10	60°05'48"	15.00'	15.73'	8.68'
11	119°37'16"	2.00'	4.18'	3.44'
12	53°00'22"	2.00'	1.85'	1.00'
13	57°25'16"	15.00'	15.03'	8.22'
14	57°25'16"	15.00'	15.03'	8.22'
15	122°34'44"	2.00'	4.28'	3.65'
16	122°34'44"	2.00'	4.28'	3.65'
17	122°34'44"	2.00'	4.28'	3.65'
18	122°34'44"	2.00'	4.28'	3.65'
19	57°25'16"	15.00'	15.03'	8.22'
20	57°25'16"	15.00'	15.03'	8.22'
21	57°25'16"	15.00'	15.03'	8.22'
22	57°25'16"	15.00'	15.03'	8.22'
23	122°34'44"	2.00'	4.28'	3.65'
24	122°34'44"	2.00'	4.28'	3.65'
25	122°34'44"	2.00'	4.28'	3.65'
26	122°34'44"	2.00'	4.28'	3.65'
27	57°25'16"	15.00'	15.03'	8.22'
28	57°25'16"	15.00'	15.03'	8.22'
29	13°05'47"	150.00'	34.29'	17.22'
30	28°04'14"	202.86'	99.38'	50.71'
31	25°53'51"	149.29'	67.48'	34.33'
32	12°10'13"	150.00'	31.86'	15.99'
33	11°31'43"	150.00'	30.18'	15.14'
34	17°18'25"	193.00'	58.30'	29.37'
35	20°34'11"	134.39'	48.25'	24.39'
36	20°17'42"	263.37'	93.29'	47.14'
37	15°53'40"	50.00'	13.87'	6.98'
38	24°12'27"	50.00'	21.13'	10.72'
39	23°42'49"	162.86'	67.40'	34.19'
40	74°41'48"	93.42'	121.79'	71.29'
41	11°14'41"	50.00'	9.81'	4.92'
42	27°04'54"	107.87'	50.99'	25.98'
43	23°26'18"	177.00'	72.55'	36.72'
44	17°42'12"	282.00'	87.13'	43.92'
45	98°14'53"	98.00'	168.05'	113.22'
46	180°00'00"	13.00'	41.06'	N/A
47	38°33'21"	20.00'	13.46'	7.00'
48	96°55'18"	12.50'	21.15'	14.11'
49	111°42'21"	15.00'	29.24'	22.12'
50	80°36'33"	17.00'	23.92'	14.98'
51	60°58'49"	14.00'	14.90'	8.24'
52	177°54'34"	19.50'	60.55'	1068.88'
53	107°25'04"	12.50'	23.43'	17.02'
54	109°01'07"	21.14'	40.22'	29.65'
55	110°32'20"	15.82'	30.52'	22.82'
56	51°10'39"	39.00'	34.84'	18.68'
57	53°00'22"	39.00'	36.06'	19.45'

40' 20' 0 40' 80'
SCALE: 1" = 40'

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CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
PARK AND MEDIAN DESIGN DIVISION

TITLE: WESTGATE PARK – PHASE 2
CIVIL SITE PLAN

Design Review Committee | City Engineer Approval | Last Design Update

City Project No. 656302 | Zone Map No. M-8,9 | Sheet 5 Of 22

AS BUILT INFORMATION
CONTRACTOR — DATE
STAKED BY — DATE
INSPECTION BY
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE
MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

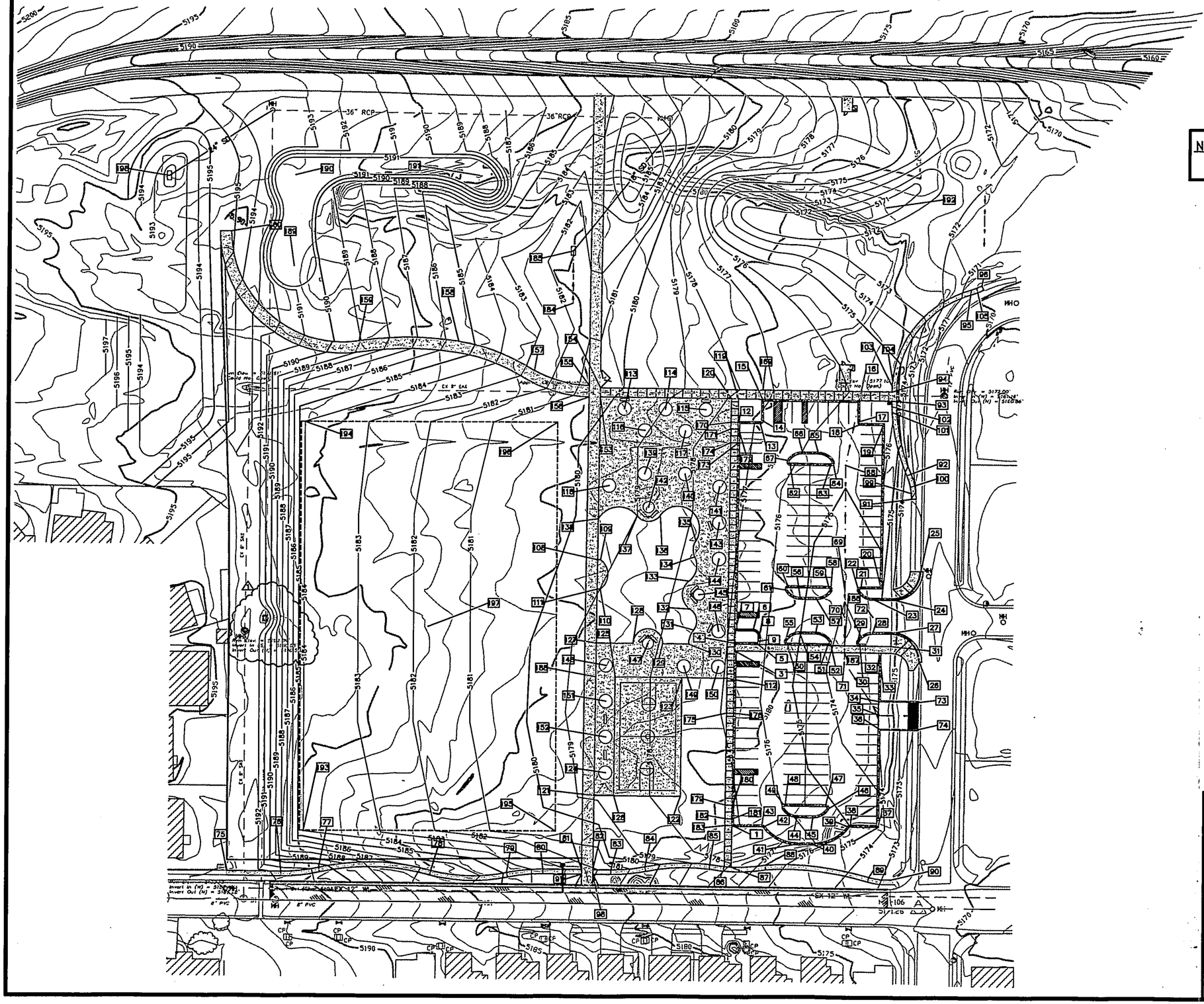
BENCH MARKS

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL
NEW MEXICO — U.S.L. ANDREWS — 11771 — REGISTERED PROFESSIONAL ENGINEER

SHOWING EXISTING SAS

NO.	DATE	REMARKS	BY
1	9/23/05	REVISIONS	
		DESIGN	DESIGNED BY DLA — DATE 09/05
			DRAWN BY KSH — DATE 09/05
			CHECKED BY DLA — DATE 09/05



NOTE: SEE SHEET 7 FOR NODE DATA INFORMATION

SURVEY INFORMATION

BENCH MARKS

NO.	BY	DATE
	FIELD NOTES	

AS BUILT INFORMATION

CONTRACTOR

	DATE
WORK STARTED BY	
INSPECTIONS BY	DATE
TESTS	
FIELD LOCATION BY	DATE
DRAWINGS	
COMPLETED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY DATE

NO.

ENGINEER'S SEAL

DOUGLAS L. ANDREWS
NEW MEXICO
11771
REGISTERED PROFESSIONAL ENGINEER

N

40' 20' 0 40' 80'
SCALE: 1" = 40'

NO.	DATE	REMARKS	BY
		DESIGN	
		DESIGNED BY DLA	DATE 09/05
		DRAWN BY KSH	DATE 09/05
1	9/23/05	MINOR GRADING MODIFICATION	
		CHECKED BY DLA	DATE 09/05

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101132A

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
PARK AND MEDIAN DESIGN DIVISION

TITLE:
WESTGATE PARK – PHASE 2
CIVIL GRADING PLAN

Design Review Committee	City Engineer Approval	Last Design Update

City Project No. 656302 | Zone Map No. M-8,9 | Sheet 6 of 22

☐ NODE DATA

NODE ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	1471763.31	352386.31	5177.25	PFL
2	NOT USED			
3	1471917.08	352387.65	5176.86	PFL
4	1471935.37	352350.84	5176.65	PFL
5	1471923.76	352405.77	--	PFL
6	1471935.52	352402.88	--	PFL
7	1471935.65	352387.81	5176.89	PFL
8	1471930.48	352407.83	--	PFL
9	1471925.74	352407.79	--	PFL
10	NOT USED			
11	NOT USED			
12	1472118.47	352389.40	5177.25	PFL
13	1472118.32	352407.44	5176.91	PFL
14	1472120.30	352409.46	5176.89	PFL
15	1472138.31	352409.62	5177.09	PFL
16	1472137.55	352495.61	5175.75	PFL
17	1472119.56	352495.46	5175.64	PFL
18	1472117.54	352497.44	5175.86	PFL
19	1472116.54	352516.56	5175.92	PFL
20	1471973.37	352518.14	5174.72	PFL
21	1471973.37	352498.28	5174.38	PFL
22	1471970.28	352486.60	5174.32	PFL
23	1471963.43	352509.14	5174.25	PFL
24	1471963.37	352525.69	5173.69	PFL
25	1471988.07	352550.78	5172.77	PFL (MATCH EXISTING)
26	1471908.14	352550.08	5172.48	PFL (MATCH EXISTING)
27	1471933.37	352525.18	5173.63	PFL
28	1471933.43	352509.04	5174.25	PFL
29	1471925.96	352496.01	5173.76	PFL
30	1471922.96	352497.72	5173.78	PFL
31	1471921.88	352525.14	5173.52	PTC
32	1471915.97	352515.66	5173.94	PFL
33	1471910.97	352515.61	5173.84	PFL
34	1471872.96	352515.27	5173.13	PFL
35	1471880.97	352515.16	5172.90	PFL
36	1471848.97	352515.05	5173.10	PFL
37	1471763.30	352514.27	5174.50	PFL
38	1471763.51	352490.10	5174.86	PFL
39	1471762.73	352488.50	5176.68	PFL
40	1471747.47	352457.21	5176.00	PFL
41	1471747.59	352443.12	5177.12	PFL
42	1471762.41	352412.87	5176.87	PFL
43	1471763.17	352411.31	5176.88	PFL
44	1471771.59	352443.34	5175.94	PFL PC
45	1471771.47	352457.43	5175.63	PFL PT
46	1471778.28	352470.13	5175.20	PFL PCC
47	1471781.37	352468.47	5175.20	PFL PC
48	1471781.69	352432.47	5176.00	PFL PT
49	1471778.63	352430.76	5176.07	PFL PCC
50	1471923.52	352433.73	5175.33	PFL PC
51	1471923.21	352468.73	5174.16	PFL PT
52	1471926.27	352471.44	5174.13	PFL PCC
53	1471933.30	352458.86	5174.58	PFL PC
54	1471933.43	352444.77	5175.03	PFL PT
55	1471926.62	352432.07	5175.37	PFL PCC
56	1471964.03	352445.06	5175.16	PFL PC
57	1471963.90	352459.15	5174.74	PFL PT
58	1471970.71	352471.85	5174.20	PFL PCC
59	1471973.80	352470.19	5174.29	PFL PC
60	1471974.96	352434.20	5175.56	PFL PT
61	1471971.06	352432.48	5175.59	PFL PCC
62	1472082.08	352435.08	5176.08	PFL PC
63	1472081.76	352471.08	5175.46	PFL PT
64	1472084.83	352472.80	5175.54	PFL PCC
65	1472091.86	352460.22	5175.72	PFL PC
66	1472091.98	352446.13	5176.00	PFL PT
67	1472082.08	352435.08	5176.14	PFL PCC
68	1472081.20	352484.17	5175.20	PTA
69	1471972.30	352484.17	5174.11	PTA
70	1471947.52	352484.17	5173.86	PTA
71	1471907.56	352484.17	5173.45	PTA
72	1471947.53	352509.04	5174.25	PTA
73	1471872.63	352549.75	5172.26	PFL
74	1471848.63	352549.52	5172.06	PFL
75	1471722.47	351939.79	5193.13	PBSW (MATCH EXISTING)
76	1471722.04	351987.00	5191.71	PBSW PC
77	1471725.63	352021.02	5190.69	PBSW PRC
78	1471723.12	352119.38	5187.24	PBSW PRC
79	1471721.80	352186.27	5184.85	PBSW PRC
80	1471724.68	352217.93	5183.72	PBSW PT
81	1471724.37	352252.39	5182.28	PBSW PI
82	1471724.28	352262.39	5181.97	PBSW PI
83	1471724.13	352278.48	5181.56	PBSW PC
84	1471726.88	352308.48	5180.52	PBSW PRC
85	1471729.27	352366.51	5178.51	PBSW PRC
86	1471727.46	352379.32	5178.06	PBSW POC PI
87	1471727.02	352385.32	5177.94	PBSW POC PI
88	1471728.84	352414.50	5176.79	PBSW PRC
89	1471718.71	352506.75	5173.11	PBSW PRC
90	1471716.63	352525.80	5172.35	PBSW (MATCH EXISTING)
91	1472051.87	352542.28	5173.00	PBSW PC PVC (MATCH EXISTING)
92	1472072.42	352538.10	5173.69	PBSW PRC
93	1472137.94	352524.49	5176.48	PBSW PC PVT PI
94	1472145.94	352524.51	5176.48	PBSW PC PVC PI
95	1472236.05	352593.27	5170.63	PBSW PRC PVC
96	1472239.55	352602.42	5170.30	PBSW PT PVT (MATCH EXISTING)
97	1471720.37	352252.35	5182.20	PFSW PI
98	1471720.28	352262.35	5181.89	PFSW PI
99	1472056.86	352542.08	5173.04	PBSW PVI
100	1472061.81	352541.39	5173.20	PBSW PVT
101	1472127.95	352524.78	5176.26	PBSW PVT
102	1472132.95	352524.56	5176.42	PBSW PVI
103	1472150.94	352524.64	5176.42	PBSW PVI
104	1472155.93	352525.04	5176.23	PBSW PVT
105	1472237.54	352597.83	5170.43	PBSW PVI

☐ NODE DATA

NODE ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
106	NOT USED			
107	NOT USED			
108	1471997.23	352265.19	5179.09	PFSW, PI
109	1471997.21	352267.69	5179.03	PFSW, PI
110	1471971.21	352267.54	5178.82	PFSW, PI
111	1471971.23	352264.92	5178.88	PFSW, PI
112	1471892.88	352380.78	5176.85	PBSW, PI
113	1472130.03	352288.29	--	CENTER OF TREE WELL
114	1472129.72	352324.37	--	CENTER OF TREE WELL
115	1472129.41	352360.55	--	CENTER OF TREE WELL
116	1472110.88	352306.31	--	CENTER OF TREE WELL
117	1472110.31	352342.39	--	CENTER OF TREE WELL
118	1472062.45	352274.88	--	CENTER OF TREE WELL
119	1472139.16	352388.91	5177.85	PFSW, PI
120	1472139.21	352382.91	5177.93	PBSW, PI
121	1471789.37	352263.06	5178.85	PFSW, PI
122	1471788.71	352339.52	5177.76	PTC
123	1471893.23	352340.43	5177.76	PTC
124	1471809.27	352273.09	--	CENTER OF TREE WELL
125	1471893.72	352281.35	5178.30	PTC
126	1471789.72	352280.45	5178.30	PTC
127	1471923.62	352264.43	5178.52	PFSW, PI
128	1471923.33	352297.14	5178.20	PTC
129	1471923.11	352323.14	5177.94	PTC
130	1471922.90	352346.48	5177.70	PTC
131	1471935.37	352350.84	--	PTC PRC
132	1471953.80	352347.62	5177.74	PTC PRC
133	1471978.61	352346.52	5177.80	PTC PRC
134	1472000.03	352351.47	5177.74	PTC PRC
135	1472014.52	352352.90	5177.76	PTC PRC
136	1472009.38	352321.92	5178.46	PTC PRC
137	1472036.00	352300.08	5178.85	PTC PRC
138	1472033.29	352265.56	5179.41	PTC
139	1472072.96	352306.29	--	CENTER OF TREE WELL
140	1472072.63	352342.29	--	CENTER OF TREE WELL
141	1472081.55	352373.09	--	CENTER OF TREE WELL
142	1472043.61	352309.99	--	CENTER OF TREE WELL
143	1472029.99	352373.08	--	CENTER OF TREE WELL
144	1471998.21	352373.08	--	CENTER OF TREE WELL
145	1471966.58	352355.48	--	CENTER OF TREE WELL
146	1471934.65	352373.08	--	CENTER OF TREE WELL
147	1471923.32	352310.14	--	CENTER OF TREE WELL
148	1471903.77	352273.09	--	CENTER OF TREE WELL
149	1471903.16	352342.28	--	CENTER OF TREE WELL
150	1471902.87	352373.08	5176.78	CENTER OF TREE WELL
151	1471872.27	352273.09	--	CENTER OF TREE WELL
152	1471840.77	352273.09	--	CENTER OF TREE WELL
153	1472140.22	352266.67	5180.25	PTC, PI
154	1472148.22	352266.74	5180.41	PTC, PI
155	1472150.32	352256.78	5180.61	PTC, PT
156	1472140.32	352256.67	5180.45	PTC, PT
157	1472163.18	352208.08	5182.68	PTC PRC
158	1472188.74	352140.67	5185.60	PTC PRC
159	1472188.98	352053.88	5189.00	PTC PRC
160	1472285.09	351941.07	5196.00	PTC, PC
161	NOT USED			
162	NOT USED			
163	1472146.54	352459.69	5177.14	PTOC
164	1472137.87	352459.61	5177.14	PFL
165	1472146.61	352451.69	5176.92	PTOC
166	1472137.94	352451.62	5176.76	PFL
167	1472146.89	352419.69	5177.92	PTOC
168	1472137.94	352419.61	5176.76	PFL
169	1472146.98	352409.69	5177.75	PTOC
170	1472118.54	352382.73	5177.87	PTC
171	1472112.54	352382.68	5177.86	PTC
172	1472112.47	352389.35	5177.24	PFL
173	1472100.48	352389.24	5177.22	PFL
174	1472100.54	352382.58	5177.35	PTC
175	1471872.55	352380.59	5176.89	PTC
176	1471872.49	352387.26	5176.76	PFL
177	NOT USED			
178	NOT USED			
179	1471781.37	352379.80	5177.29	PTC
180	1471781.31	352386.47	5177.16	PFL
181	1471769.31	352386.36	5177.22	PFL
182	1471769.37	352379.69	5177.84	PTC
183	1471763.37	352379.64	5177.87	PTC
184	1472192.39	352247.14	5180.54	PFL
185	1472268.71	352241.90	5180.00	PTOG
186	1471922.25	352484.17	5173.60	PTC
187	1471916.25	352484.17	5173.54	PTC
188	1471893.72	352264.13	5178.50	PTC
189	1472255.02	351996.29	5177.22	PTG
190	1472334.61	351997.63	5177.84	PTG
191	1472334.60	352157.16	5177.87	PTG
192	1472308.03	352518.56	5180.54	PTG
193	1471757.50	352007.29	5184.00	PTG
194	1472117.80	352007.29	5184.00	PTG
195	1471757.90	352228.73	5180.75	PTG
196	1472117.90	352228.73	5180.30	PTG
197	1471937.90	352116.23	5181.75	PTG
198	1472333.35	351885.80	5181.75	PTOG

NOTE: TC ≠ FL ANYWHERE

ABBREVIATIONS:

PFL	PROPOSED FLOWLINE
PTA	PROPOSED TOP OF ASPHALT
PBSW	PROPOSED BACK OF SIDEWALK
PFSW	PROPOSED FACE OF SIDEWALK
PTC	PROPOSED TOP OF CONCRETE
PC	POINT OF CURVE
PI	POINT OF INTERSECTION
PT	POINT OF TANGENCEY
PRC	POINT OF REVERSE CURVE
PCC	POINT OF COMPOUND CURVE
PVC	POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
POC	POINT ON CURVE
PTOC	PROPOSED TOP OF CURB
PTOG	PROPOSED TOP OF GRATE
PTG	PROPOSED TOP OF GROUND

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

BENCH MARKS

AS BUILT INFORMATION
CONTRACTOR
WORK STARTED BY | DATE
WORK COMPLETED | DATE
ACCEPTANCE BY | DATE
CERTIFICATION BY | DATE
DRAWINGS CORRECTED BY | DATE

MICRO-FILM INFORMATION
RECORDED BY | DATE
NO.

ENGINEERS SEAL
DOUGLAS L. ANDREWS 11771 NEW MEXICO REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
		DESIGNED BY DLA	DATE 09/05
		DRAWN BY KSH	DATE 09/05
		CHECKED BY DLA	DATE 09/05

101132A
Smith Engineering Company
A Full Service Engineering Company
5906 San Pedro Boulevard, N.E., Bldg. A, Suite 500 Albuquerque, New Mexico 87110

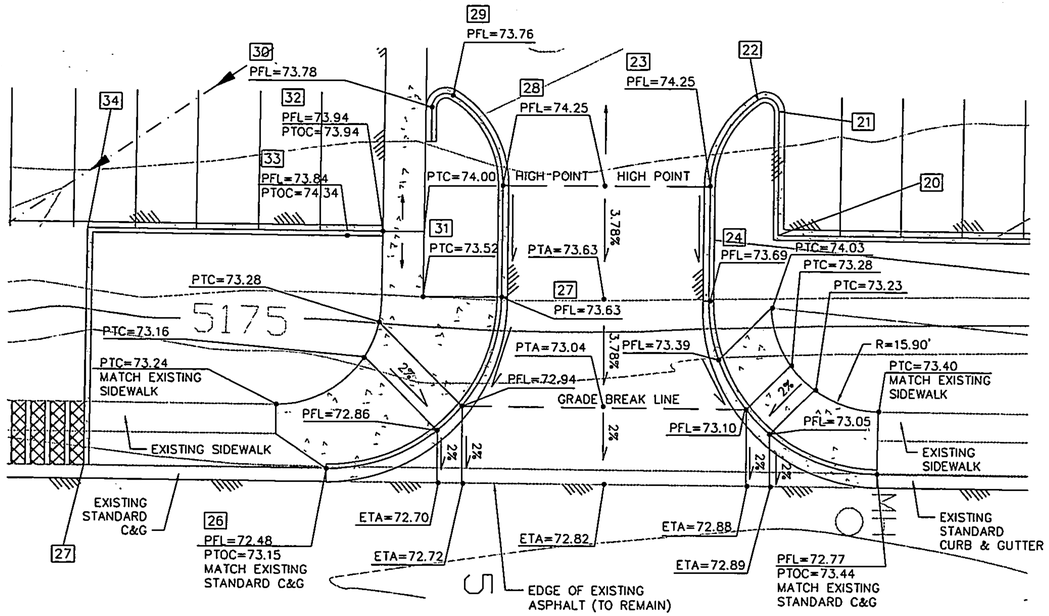
CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
PARK AND MEDIAN DESIGN DIVISION

TITLE: WESTGATE PARK – PHASE 2

CIVIL POINT DATA

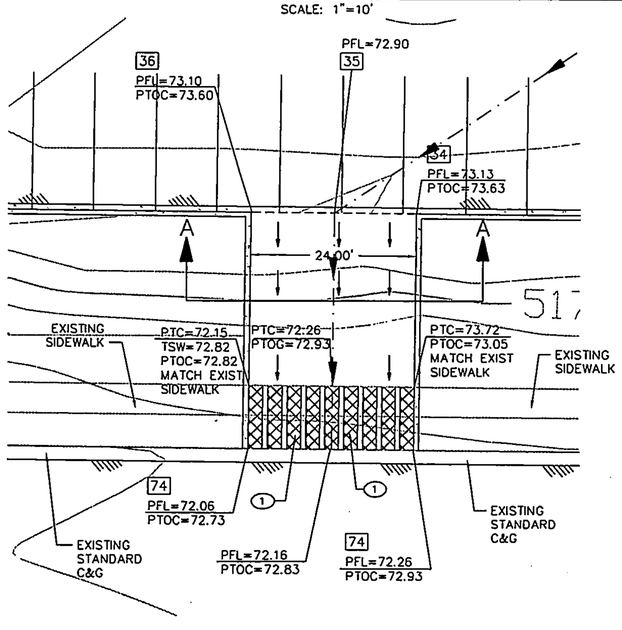
Design Review Committee	City Engineer Approval	Last Design Update	No. / Dsy / Yr.	No. / Dsy / Yr.

City Project No. 656302 | Zone Map No. M-8,9 | Sheet 7 Of 22



PARKING LOT ENTRANCE - DETAIL

SCALE: 1"=10'



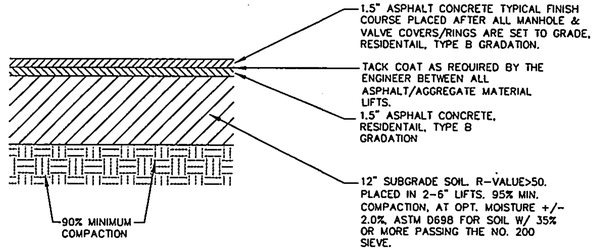
SIDEWALK CULVERT - DETAIL

SCALE: 1"=10'

GENERAL NOTES:

KEYED NOTES: ⬭

1. BUILD 9-24" SIDEWALK CULVERTS WITH STEEL PLATE TOP PER COA STD. DWG 2236.

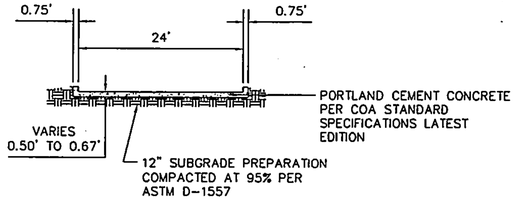


NOTE:

SOIL NOT HAVING THE MINIMUM R-VALUE OF 50 SHALL BE REMOVED TO A DEPTH OF 2 FEET AND REPLACED BY THE CONTRACTOR WITH SUITABLE MATERIAL OR A PAVEMENT SECTION SHALL BE DESIGNED BY THE CONSULTANT ACCOMMODATING THE EXISTING R-VALUE PER COA STANDARD SPECS.

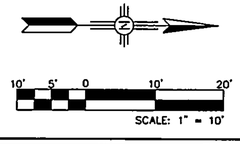
PAVEMENT SECTION - PARKING LOT

NOT TO SCALE



SECTION A-A

SCALE: 1"=10'



AS BUILT INFORMATION
CONTRACTOR — DATE
STAKED BY — DATE
INSPECTION & APPROVED BY
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE
MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

BENCH MARKS

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

ENGINEERS SEAL
DOUGLAS L. ANDREWS 11771 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	DLA 09/05
		DRAWN	KSH 09/05
		CHECKED	DLA 09/05

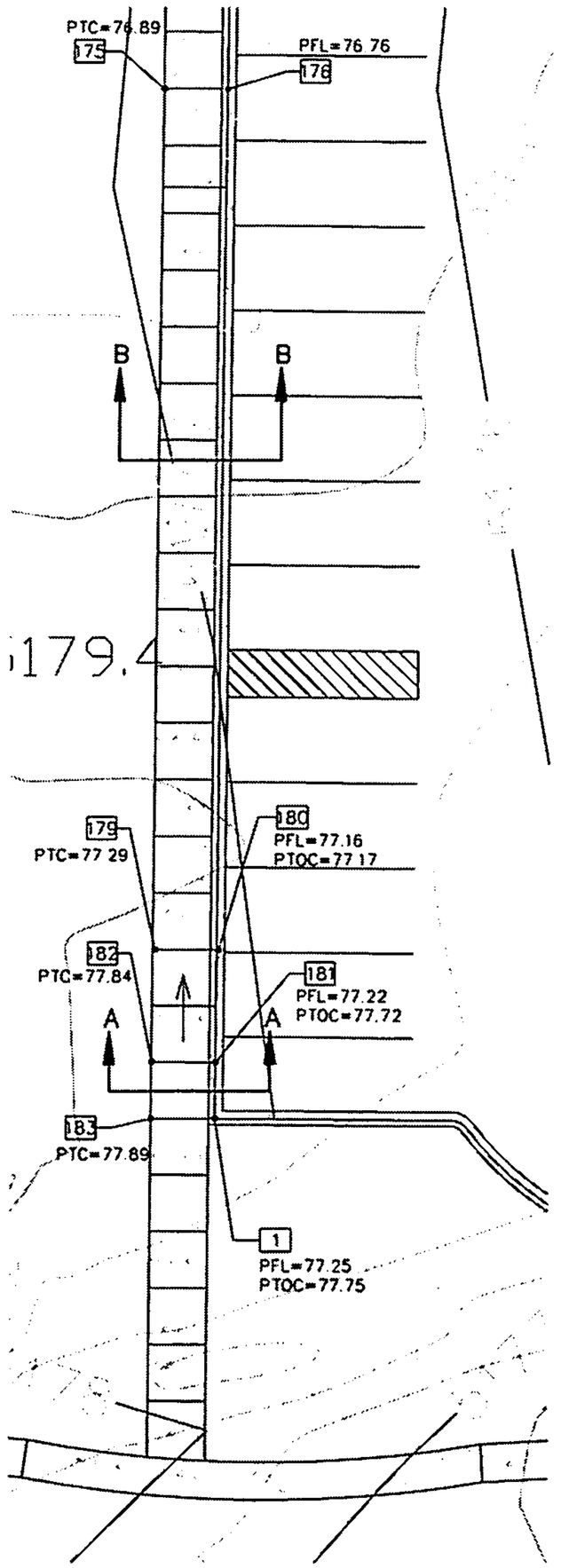
101132A
Smith Engineering Company
A Full Service Engineering Company
2286 Rio Pedro Boulevard, N.E., Bldg. #1, Suite 100 Albuquerque, New Mexico 87106

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
PARK AND MEDIAN DESIGN DIVISION

TITLE: WESTGATE PARK - PHASE 2
CIVIL DETAILS

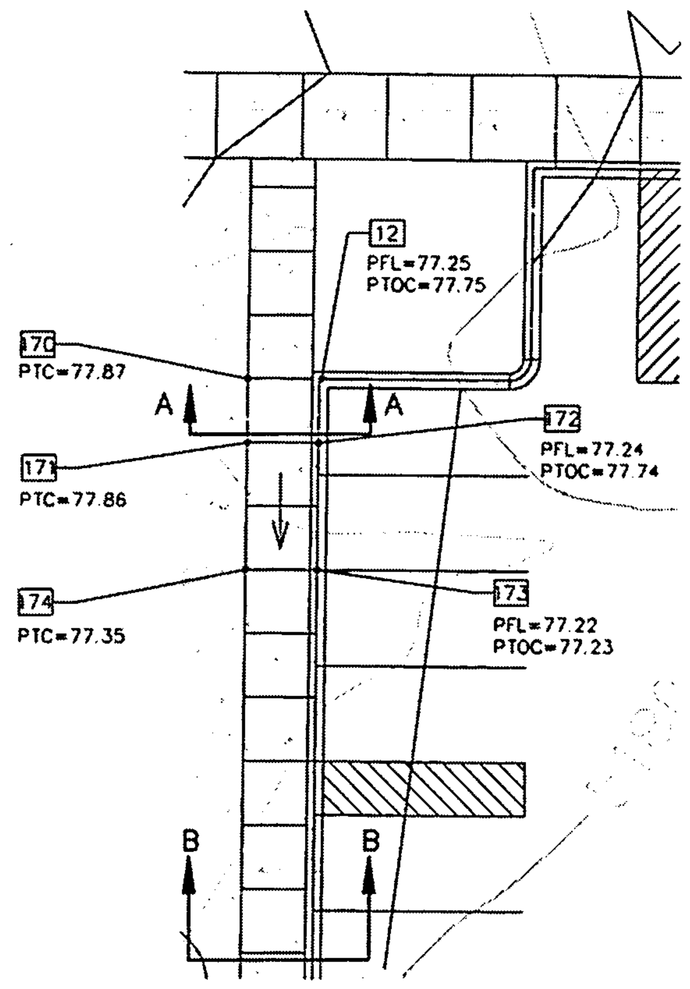
Design Review Committee	City Engineer Approval	Last Design Update	No. / Dwg / Sht.	No. / Dwg / Sht.

City Project No.	Zone Map No.	Sheet	Of
656302	M-8,9	8	22



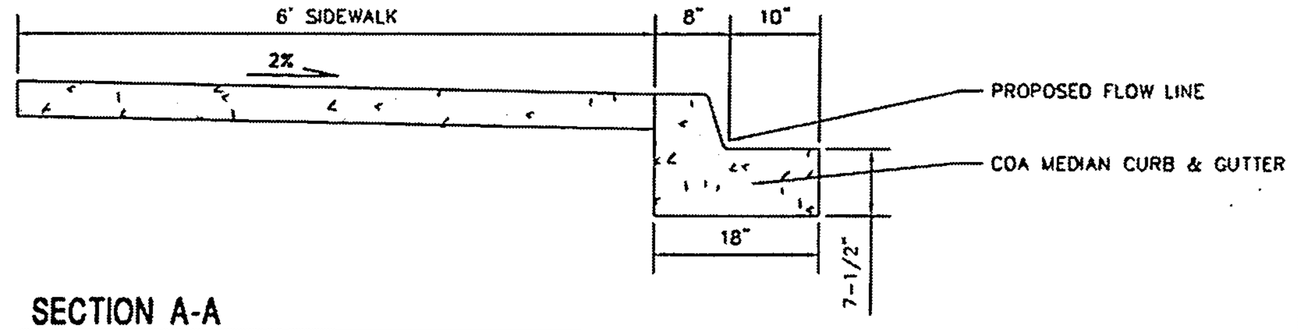
SOUTH RAMP DETAIL

SCALE: 1"=10'



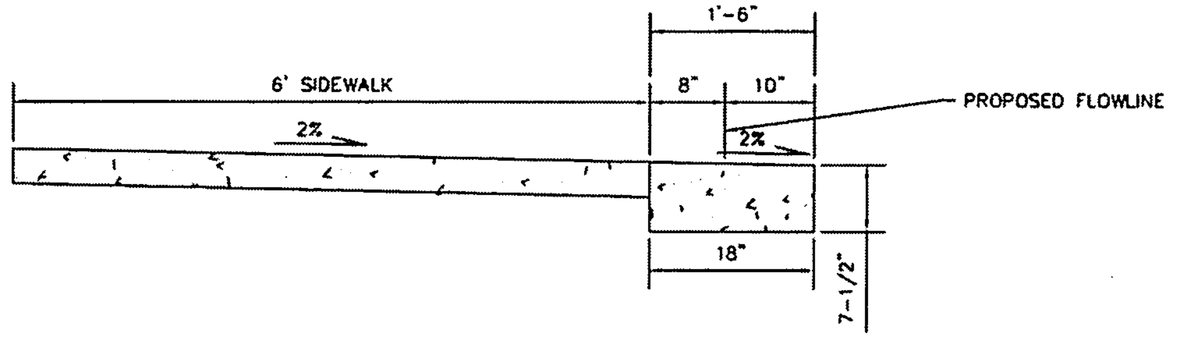
NORTH RAMP DETAIL

SCALE: 1"=10'



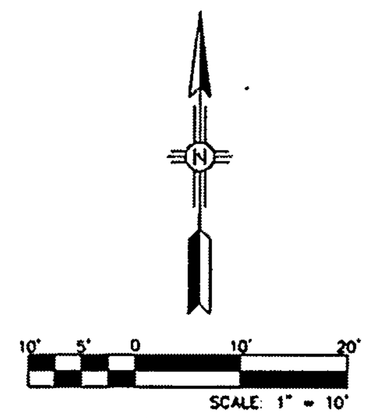
SECTION A-A

SCALE: 1"=1'-0"



SECTION B-B

SCALE: 1"=1'-0"



SCALE: 1" = 10'

AS BUILT INFORMATION

CONTRACTOR — DATE

STAKED BY — DATE

INSPECTED BY — DATE

FIELD VERIFIED BY — DATE

CORRECTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE

NO

BENCH MARKS

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEERS SEAL

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DLA	DATE	09/05
DRAWN BY	KSH	DATE	09/05
CHECKED BY	DLA	DATE	09/05

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DEPARTMENT OF MUNICIPAL DEVELOPMENT
PARK AND MEDIAN DESIGN DIVISION

TITLE: WESTGATE PARK - PHASE 2

CIVIL DETAILS

Design Review Committee	City Engineer Approval	Last Design Update

City Project No.	Zone Map No	Sheet	Of
656302	M-8,9	9	22

APPENDIX F

EXCERPTS FROM "DRAINAGE STUDY FOR ELRANCHO GRANDE UNIT 10 AND UNIT 11"

Note: Includes Appendices from Unit 10 and Unit 11 Report – Not to be confused with the Appendices of this report –

DRAINAGE STUDY
FOR
EL RANCHO GRANDE
Unit 10 and Unit 11



JUNE 19, 2003

Prepared for:

Curb Inc.

6301 Indian School NE - Suite 208

Albuquerque, NM 87110

Bohannan ▲ Huston Inc.

▲ ENGINEERING

▲ ADVANCED TECHNOLOGIES

▲ SPATIAL DATA

APPENDIX B

STREET CAPACITY AND

STORM DRAIN INLET ANALYSIS

11. **Desert Ranch Street (Unit 10)**
Basin 10-E (See Basin Map)
S = 2.0%
Q = 19.5 cfs

Desert Ranch Street is the southern entrance to the subdivision. The entrance will be standard curb per DPM Standards. A water break will be placed midway in the street (see Basin Map). See PC stream output.

12. **Canter Street (Unit 10)**
Basin 10-F (See Basin Map)
S = 1.3%
Q = 11.9 cfs

Total flow at the south end of Canter Street is 4.2 cfs. Due to upstream flows from High Range Road, standard curb will be used. See PC stream output. Water continues flowing into Range Road.

13. **Gait Street (Unit 10)**
Basin 10-F (See Basin Map)
S = 1.5%
Q = 11.9 cfs

Total flow at the south end of Gait Street is 21.0 cfs. Due to upstream flows from High Range Road, standard curb will be used. See PC stream output. Water continues flowing into Range Road.

14. **Messina Drive (Offsite)**
Basin Gibson (See Basin Map)
S = 1.9%
Q = 16.8 cfs

Total flow at the south end of Messina Drive is approximately 2.0 cfs. At 1.9%, a 24' road with standard curb can handle 33 cfs. The flow from Messina Drive is included in the Gibson Basin.

15. **Gibson Boulevard (Offsite)**
Basin Gibson (See Basin Map)
S = 2.5% (on average)
Q = 16.8 cfs

Gibson Boulevard is a major arterial and will require standard curb. The capacity for Gibson Boulevard is approximately 52 cfs at 3.0%. Street capacity calculations using Manning's equation are on Exhibit 1. These calculations show the water surface elevation allowing one (1) lane open. The total flow from Gibson Basin is well below this capacity, so no inlets will be required until the intersection with De Anza Drive. At this point one (1) inlet will be placed on Gibson Boulevard.

16. **Cartageña Avenue (Offsite)**
Basin 10-A (See Basin Map)
S = 3.2% & 2.1%
Q = 12.9 cfs

Cartageña Road will convey the flows from Lots 1-25 which front the street. At 3.2%, a road with standard curb can handle 27 cfs. Therefore, no inlets are needed. See PC stream output. Water flows south into De Anza Drive.

17. **De Anza Drive (Offsite)**
Basin De Anza (See Basin Map)
S = 2%
Q = 1.6 cfs

Total street flow in this basin is 14.6 cfs; this includes the flow from Basin 10-A conveyed by Cartageña Road. At 2%, a road with standard curb can handle 32 cfs. Therefore, no inlets are required until the intersection with Gibson Boulevard. At this point one (1) inlet will be placed on De Anza Drive. See PC stream output.

CARTAGENA ROAD

PC PROGRAM STREAM SEPTEMBER 1994 *****

ING'S N= .017 SLOPE= .0214

DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
0.00	0.83	5	9.00	0.13	9	31.17	0.67
6.37	0.67	6	19.00	0.33	10	31.63	0.67
6.83	0.67	7	29.00	0.13	11	38.00	0.83
7.00	0.00	8	31.00	0.00	12	0.00	0.00

L	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)	
1	0.01	0.00	0.0	0.33	0.36	0.31	0.00	0.01	
02	0.02	0.01	0.0	0.66	0.57	0.63	0.01	0.03	
03	0.03	0.01	0.0	0.99	0.75	0.94	0.01	0.04	
4	0.04	0.03	0.0	1.32	0.91	1.25	0.01	0.05	
5	0.05	0.04	0.0	1.64	1.06	1.56	0.02	0.07	
06	0.06	0.06	0.1	1.97	1.19	1.88	0.02	0.08	
07	0.07	0.08	0.1	2.30	1.32	2.19	0.03	0.10	
8	0.08	0.10	0.1	2.63	1.45	2.50	0.03	0.11	
9	0.09	0.13	0.2	2.96	1.56	2.81	0.04	0.13	
10	0.10	0.16	0.3	3.29	1.68	3.13	0.04	0.14	
11	0.11	0.19	0.3	3.62	1.79	3.44	0.05	0.16	
2	0.12	0.23	0.4	3.95	1.89	3.75	0.06	0.18	
3	0.13	0.26	0.5	4.28	2.00	4.07	0.06	0.19	
.14	0.14	0.31	0.6	5.30	1.93	5.07	0.06	0.20	
15	0.15	0.37	0.7	6.32	1.91	6.08	0.06	0.21	
6	0.16	0.43	0.8	7.34	1.93	7.08	0.06	0.22	
17	0.17	0.51	1.0	8.36	1.97	8.09	0.06	0.23	
.18	0.18	0.59	1.2	9.38	2.03	9.09	0.06	0.24	
19	0.19	0.69	1.4	10.40	2.09	10.10	0.07	0.26	
20	0.20	0.80	1.7	11.42	2.16	11.10	0.07	0.27	
.21	0.21	0.91	2.0	12.44	2.24	12.11	0.08	0.29	
.22	0.22	1.04	2.4	13.46	2.32	13.11	0.08	0.30	
23	0.23	1.17	2.8	14.49	2.39	14.12	0.09	0.32	
24	0.24	1.32	3.3	15.51	2.47	15.12	0.10	0.34	
.25	0.25	1.48	3.8	16.53	2.55	16.13	0.10	0.35	
.26	0.26	1.64	4.3	17.55	2.64	17.13	0.11	0.37	
27	0.27	1.82	4.9	18.57	2.72	18.14	0.11	0.38	
28	0.28	2.00	5.6	19.59	2.80	19.14	0.12	0.40	
.29	0.29	2.20	6.3	20.61	2.88	20.15	0.13	0.42	
.30	0.30	2.41	7.1	21.63	2.96	21.15	0.14	0.44	
31	0.31	2.62	8.0	22.65	3.04	22.16	0.14	0.45	
32	0.32	2.85	8.9	23.67	3.12	23.16	0.15	0.47	
.33	0.33	3.09	9.9	24.69	3.20	24.17	0.16	0.49	
34	0.34	3.33	11.2	24.71	3.36	24.17	0.18	0.52	
35	0.35	3.57	12.6	24.73	3.52	24.18	0.19	0.54	
36	0.36	3.81	14.0	24.76	3.67	24.18	0.21	0.57	
.37	0.37	4.05	15.5	24.78	3.83	24.19	0.23	0.60	
38	0.38	4.30	17.1	24.80	3.97	24.19	0.25	0.63	
39	0.39	4.54	18.7	24.82	4.12	24.20	0.26	0.65	
.40	0.40	4.78	20.4	24.84	4.26	24.20	0.28	0.68	
.41	0.41	5.02	22.1	24.86	4.40	24.21	0.30	0.71	
42	0.42	5.26	23.9	24.88	4.54	24.21	0.32	0.74	
43	0.43	5.51	25.8	24.90	4.68	24.22	0.34	0.77	

EL	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)	
)									
45	0.45	5.99	29.6	24.94	4.94	24.23	0.38	0.83	
.46	0.46	6.23	31.6	24.96	5.07	24.23	0.40	0.86	STD CURB
.47	0.47	6.48	33.7	24.98	5.20	24.24	0.42	0.89	LIMIT
48	0.48	6.72	35.8	25.00	5.32	24.24	0.44	0.92	
49	0.49	6.96	37.9	25.02	5.45	24.25	0.46	0.95	
.50	0.50	7.20	40.1	25.04	5.57	24.25	0.48	0.98	
.51	0.51	7.45	42.4	25.06	5.69	24.26	0.50	1.01	
52	0.52	7.69	44.7	25.09	5.81	24.26	0.52	1.04	

0.53	0.53	7.93	47.0	25.11	5.93	24.27	0.55	1.08
0.54	0.54	8.17	49.4	25.13	6.05	24.27	0.57	1.11
0.55	0.55	8.42	51.9	25.15	6.16	24.28	0.59	1.14
0.56	0.56	8.66	54.4	25.17	6.28	24.28	0.61	1.17
0.57	0.57	8.90	56.9	25.19	6.39	24.29	0.63	1.20
0.58	0.58	9.15	59.5	25.21	6.50	24.29	0.66	1.24
0.59	0.59	9.39	62.1	25.23	6.62	24.30	0.68	1.27
0.60	0.60	9.63	64.8	25.25	6.73	24.30	0.70	1.30
0.61	0.61	9.87	67.5	25.27	6.83	24.31	0.73	1.34
0.62	0.62	10.12	70.2	25.29	6.94	24.31	0.75	1.37
0.63	0.63	10.36	73.0	25.31	7.05	24.32	0.77	1.40
0.64	0.64	10.60	75.9	25.33	7.16	24.32	0.80	1.44
0.65	0.65	10.85	78.8	25.35	7.26	24.33	0.82	1.47
0.66	0.66	11.09	81.7	25.37	7.36	24.33	0.84	1.50
0.67	0.67	11.33	84.6	25.39	7.47	24.34	0.87	1.54
0.68	0.68	11.58	86.0	26.19	7.42	26.06	0.86	1.54
0.69	0.69	11.84	87.4	26.99	7.38	26.85	0.85	1.54
0.70	0.70	12.13	87.3	28.70	7.20	27.65	0.80	1.50
0.71	0.71	12.41	89.1	29.50	7.18	28.44	0.80	1.51
0.72	0.72	12.70	90.9	30.30	7.16	29.24	0.80	1.52
0.73	0.73	12.99	92.9	31.09	7.15	30.04	0.79	1.52
0.74	0.74	13.30	94.9	31.89	7.14	30.83	0.79	1.53
0.75	0.75	13.61	97.0	32.69	7.13	31.63	0.79	1.54
0.76	0.76	13.93	99.3	33.48	7.13	32.43	0.79	1.55
0.77	0.77	14.26	101.6	34.28	7.13	33.22	0.79	1.56
0.78	0.78	14.59	104.0	35.08	7.13	34.02	0.79	1.57
0.79	0.79	14.94	106.5	35.87	7.13	34.81	0.79	1.58
0.80	0.80	15.29	109.1	36.67	7.14	35.61	0.79	1.59
0.81	0.81	15.65	111.8	37.47	7.15	36.41	0.79	1.60
0.82	0.82	16.02	114.6	38.26	7.16	37.20	0.80	1.62
0.83	0.83	16.39	117.5	39.06	7.17	38.00	0.80	1.63

CARTAGENA ROAD

**** PC PROGRAM STREAM SEPTEMBER 1994 *****

F-F

MANNING'S N= .017 SLOPE= .032

INT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
	0.00	0.83	5	9.00	0.13	9	31.17	0.67
	6.37	0.67	6	19.00	0.33	10	31.63	0.67
2	6.83	0.67	7	29.00	0.13	11	38.00	0.83
3	7.00	0.00	8	31.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	0.01	0.00	0.0	0.33	0.44	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.70	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	0.92	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	1.11	1.25	0.02	0.06
0.05	0.05	0.04	0.1	1.64	1.29	1.56	0.03	0.08
0.06	0.06	0.06	0.1	1.97	1.46	1.88	0.03	0.09
0.07	0.07	0.08	0.1	2.30	1.62	2.19	0.04	0.11
0.08	0.08	0.10	0.2	2.63	1.77	2.50	0.05	0.13
0.09	0.09	0.13	0.2	2.96	1.91	2.81	0.06	0.15
0.10	0.10	0.16	0.3	3.29	2.05	3.13	0.07	0.17
0.11	0.11	0.19	0.4	3.62	2.19	3.44	0.07	0.18
0.12	0.12	0.23	0.5	3.95	2.32	3.75	0.08	0.20
0.13	0.13	0.26	0.6	4.28	2.44	4.07	0.09	0.22
0.14	0.14	0.31	0.7	5.30	2.36	5.07	0.09	0.23
0.15	0.15	0.37	0.9	6.32	2.34	6.08	0.09	0.24
0.16	0.16	0.43	1.0	7.34	2.36	7.08	0.09	0.25
0.17	0.17	0.51	1.2	8.36	2.41	8.09	0.09	0.26
0.18	0.18	0.59	1.5	9.38	2.48	9.09	0.10	0.28
0.19	0.19	0.69	1.8	10.40	2.56	10.10	0.10	0.29
0.20	0.20	0.80	2.1	11.42	2.65	11.10	0.11	0.31
0.21	0.21	0.91	2.5	12.44	2.74	12.11	0.12	0.33
0.22	0.22	1.04	2.9	13.46	2.83	13.11	0.12	0.34
0.23	0.23	1.17	3.4	14.49	2.93	14.12	0.13	0.36
0.24	0.24	1.32	4.0	15.51	3.03	15.12	0.14	0.38
0.25	0.25	1.48	4.6	16.53	3.12	16.13	0.15	0.40
0.26	0.26	1.64	5.3	17.55	3.22	17.13	0.16	0.42
0.27	0.27	1.82	6.0	18.57	3.32	18.14	0.17	0.44
0.28	0.28	2.00	6.9	19.59	3.42	19.14	0.18	0.46
0.29	0.29	2.20	7.7	20.61	3.52	20.15	0.19	0.48
0.30	0.30	2.41	8.7	21.63	3.62	21.15	0.20	0.50
0.31	0.31	2.62	9.8	22.65	3.72	22.16	0.21	0.52
0.32	0.32	2.85	10.9	23.67	3.81	23.16	0.23	0.55
0.33	0.33	3.09	12.1	24.69	3.91	24.17	0.24	0.57
0.34	0.34	3.33	13.7	24.71	4.11	24.17	0.26	0.60
0.35	0.35	3.57	15.4	24.73	4.30	24.18	0.29	0.64
0.36	0.36	3.81	17.1	24.76	4.49	24.18	0.31	0.67
0.37	0.37	4.05	19.0	24.78	4.68	24.19	0.34	0.71
0.38	0.38	4.30	20.9	24.80	4.86	24.19	0.37	0.75
0.39	0.39	4.54	22.9	24.82	5.04	24.20	0.39	0.78
0.40	0.40	4.78	24.9	24.84	5.21	24.20	0.42	0.82
0.41	0.41	5.02	27.0	24.86	5.38	24.21	0.45	0.86
0.42	0.42	5.26	29.2	24.88	5.55	24.21	0.48	0.90
0.43	0.43	5.51	31.5	24.90	5.72	24.22	0.51	0.94

STD CURB LIMIT

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.45	0.45	5.99	36.2	24.94	6.04	24.23	0.57	1.02
0.46	0.46	6.23	38.7	24.96	6.20	24.23	0.60	1.06
0.47	0.47	6.48	41.2	24.98	6.36	24.24	0.63	1.10
0.48	0.48	6.72	43.7	25.00	6.51	24.24	0.66	1.14
0.49	0.49	6.96	46.4	25.02	6.66	24.25	0.69	1.18
0.50	0.50	7.20	49.1	25.04	6.81	24.25	0.72	1.22
0.51	0.51	7.45	51.8	25.06	6.96	24.26	0.75	1.26
0.52	0.52	7.69	54.7	25.09	7.11	24.26	0.78	1.30

53	0.53	7.93	57.5	25.11	7.25	24.27	0.82	1.35
54	0.54	8.17	60.5	25.13	7.40	24.27	0.85	1.39
55	0.55	8.42	63.4	25.15	7.54	24.28	0.88	1.43
56	0.56	8.66	66.5	25.17	7.68	24.28	0.92	1.48
57	0.57	8.90	69.6	25.19	7.82	24.29	0.95	1.52
58	0.58	9.15	72.7	25.21	7.95	24.29	0.98	1.56
59	0.59	9.39	75.9	25.23	8.09	24.30	1.02	1.61
60	0.60	9.63	79.2	25.25	8.22	24.30	1.05	1.65
61	0.61	9.87	82.5	25.27	8.36	24.31	1.08	1.69
62	0.62	10.12	85.9	25.29	8.49	24.31	1.12	1.74
63	0.63	10.36	89.3	25.31	8.62	24.32	1.15	1.78
64	0.64	10.60	92.8	25.33	8.75	24.32	1.19	1.83
65	0.65	10.85	96.3	25.35	8.88	24.33	1.22	1.87
66	0.66	11.09	99.9	25.37	9.01	24.33	1.26	1.92
67	0.67	11.33	103.5	25.39	9.13	24.34	1.29	1.96
68	0.68	11.58	105.1	26.19	9.08	26.06	1.28	1.96
69	0.69	11.84	106.8	26.99	9.03	26.85	1.27	1.96
70	0.70	12.13	106.8	28.70	8.80	27.65	1.20	1.90
71	0.71	12.41	108.9	29.50	8.78	28.44	1.20	1.91
72	0.72	12.70	111.2	30.30	8.76	29.24	1.19	1.91
73	0.73	12.99	113.6	31.09	8.74	30.04	1.19	1.92
74	0.74	13.30	116.0	31.89	8.73	30.83	1.18	1.92
75	0.75	13.61	118.7	32.69	8.72	31.63	1.18	1.93
76	0.76	13.93	121.4	33.48	8.71	32.43	1.18	1.94
77	0.77	14.26	124.2	34.28	8.71	33.22	1.18	1.95
78	0.78	14.59	127.2	35.08	8.71	34.02	1.18	1.96
79	0.79	14.94	130.3	35.87	8.72	34.81	1.18	1.97
80	0.80	15.29	133.4	36.67	8.73	35.61	1.18	1.98
81	0.81	15.65	136.8	37.47	8.74	36.41	1.19	2.00
82	0.82	16.02	140.2	38.26	8.75	37.20	1.19	2.01
83	0.83	16.39	143.7	39.06	8.77	38.00	1.19	2.02

APPENDIX C

EXCERPTS FROM THE EL RANCHO GRANDE

UNIT 8 DRAINAGE REPORT

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	NOTATION
ROUTE		260.10	36	35	.00793	15.42	.617	1.45978	1.567	3.038	
COMPUTE NM HYD		270.00	-	36	.00926	20.67	.721	1.45975	1.500	3.487	PER IMP= 57.88
*S ~~~~~~~~~~	AP20	~~~~~~~~~~									PAGE = 2
ROUTE		270.10	37	36	.00926	17.21	.721	1.45977	1.567	2.903	
COMPUTE NM HYD		280.00	-	37	.00319	7.13	.248	1.45975	1.500	3.493	PER IMP= 57.88
ADD HYD		280.10	35&37	1	.01112	22.02	.866	1.45970	1.533	3.094	
ROUTE		280.20	1	37	.01112	21.93	.866	1.45975	1.567	3.081	
ADD HYD		280.30	36&37	1	.02038	39.14	1.587	1.45971	1.567	3.000	
*S ~~~~~~~~~~	AP21	~~~~~~~~~~									
ROUTE		280.40	1	37	.02038	39.40	1.587	1.45973	1.567	3.020	
COMPUTE NM HYD		300.00	-	38	.00150	3.36	.117	1.45975	1.500	3.501	PER IMP= 57.88
COMPUTE NM HYD		310.00	-	39	.00080	1.80	.062	1.45975	1.500	3.516	PER IMP= 57.88
COMPUTE NM HYD		320.00	-	40	.00087	1.96	.068	1.45975	1.500	3.515	PER IMP= 57.88
ADD HYD		310.10	12&39	15	.12890	215.69	8.618	1.25361	1.600	2.614	
ADD HYD		310.20	38&15	16	.13040	218.08	8.735	1.25598	1.600	2.613	
ADD HYD		310.30	40&16	1	.13127	219.48	8.803	1.25733	1.600	2.612	
*S ~~~~~~~~~~	AP22	~~~~~~~~~~									
ROUTE		310.40	1	39	.13127	217.23	8.803	1.25733	1.633	2.586	
COMPUTE NM HYD		400.00	-	41	.00602	13.44	.469	1.45975	1.500	3.489	PER IMP= 57.88
ROUTE		400.10	42	41	.00602	11.36	.469	1.45978	1.567	2.949	
*S ~~~~~~~~~~	AP29	~~~~~~~~~~									
*S ~~~~~~~~~~	AP23	~~~~~~~~~~									
DIVIDE HYD		400.20	41	17	.00549	7.78	.428	1.45971	1.500	2.213	
		400.30	AND	18	.00053	3.58	.041	1.45971	1.567	10.625	
COMPUTE NM HYD		410.00	-	43	.01022	22.81	.796	1.45975	1.500	3.487	PER IMP= 57.88
ADD HYD		410.10	17&43	1	.01571	30.59	1.223	1.45972	1.500	3.042	
*S ~~~~~~~~~~	AP24	~~~~~~~~~~									
ROUTE		410.20	1	43	.01571	26.29	1.223	1.45975	1.567	2.614	
COMPUTE NM HYD		500.00	-	44	.00217	4.86	.169	1.45975	1.500	3.497	PER IMP= 57.88
COMPUTE NM HYD		510.00	-	45	.00057	1.29	.044	1.45975	1.500	3.527	PER IMP= 57.88
COMPUTE NM HYD		520.00	-	46	.01730	38.60	1.347	1.45975	1.500	3.486	PER IMP= 57.88
ROUTE		520.10	47	46	.01730	37.24	1.347	1.45976	1.533	3.363	
ADD HYD		520.20	18&46	1	.01783	40.40	1.388	1.45974	1.533	3.541	
ROUTE		520.10	1	46	.01783	37.22	1.388	1.45976	1.567	3.262	
*S ~~~~~~~~~~	AP25	~~~~~~~~~~									
ADD HYD		520.20	43&46	46	.03354	63.51	2.611	1.45972	1.567	2.959	
*S ~~~~~~~~~~	AP26	~~~~~~~~~~									
COMPUTE NM HYD		530.00	-	47	.00411	9.18	.320	1.45975	1.500	3.491	PER IMP= 57.88
COMPUTE NM HYD		540.00	-	48	.00306	7.87	.285	1.74889	1.500	4.016	PER IMP= 80.00
ADD HYD		540.10	47&48	1	.00717	17.05	.605	1.58307	1.500	3.715	
*S ~~~~~~~~~~	AP27	~~~~~~~~~~									
ROUTE		540.20	1	48	.00717	12.69	.605	1.58321	1.567	2.766	
COMPUTE NM HYD		600.00	-	49	.00539	11.25	.386	1.34275	1.500	3.263	PER IMP= 50.00
*S ~~~~~~~~~~	AP28	~~~~~~~~~~									
COMPUTE NM HYD		700.00	-	49	.00179	4.01	.139	1.45975	1.500	3.499	PER IMP= 57.88
FINISH											

2-2

STREET FLOW CAPACITY CALCULATIONS

STREET NAME:	**Atrisco Ranch Rd**	25
LOCATION:	**Del Rey to Sauza**	

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0202	Road Width/2	14
Q_{100}	37.22	Curb Height	0.67
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.448
Road Width	28	1/2 Area(STD)	3.720
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	18.618

Depth: 0.448

RESULTS

HGL

Q_{100} FLOW CAPACITY =	**37.24 cfs**	**OK**		
at an HGL Depth=	**0.45 ft**	**<**	Curb height =	0.67
		OK		

EGL

Velocity	5.01 fps			
$V^2/2g$	0.39 ft			
EGL Depth =	**0.84 ft**	**<**	Right-of-way height =	0.84
		OK		

STREET NAME:	**Atrisco Ranch Rd (stub)**	26	
LOCATION:	**@ AP25 (Sauza to end)**		

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0175	Road Width/2	11
Q_{100}	63.51	Curb Height	0.67
Right-of-way Width	36	1/2 Wetted Perimeter (P)	11.598
Road Width	22	1/2 Area(STD)	4.901
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	31.817

Depth: 0.598

RESULTS

HGL

Q_{100} FLOW CAPACITY =	**63.63 cfs**	**OK**		
at an HGL Depth=	**0.60 ft**	**<**	Curb height =	0.67
		OK		

EGL

Velocity	6.49 fps			
$V^2/2g$	0.65 ft			
EGL Depth =	**1.25 ft**	**>**	Right-of-way height =	0.80
		not contained in right-of-way		

STREET NAME:	**Cartagena Ave**	27	
LOCATION:	**El Patron to Del Rey**		

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0208	Road Width/2	20
Q_{100}	9.18	Curb Height	0.33
Right-of-way Width	60	1/2 Wetted Perimeter (P)	13.311
Road Width	40	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.544
Manning's N	0.017	Discharge (1/2 Q)	4.595

Depth: 0.261

RESULTS

HGL

Q_{100} FLOW CAPACITY =	**9.19 cfs**	**OK**		
at an HGL Depth=	**0.26 ft**	**<**	Curb height =	0.33
		OK		

EGL

Velocity	2.98 fps			
$V^2/2g$	0.14 ft			
EGL Depth =	**0.40 ft**	**<**	Right-of-way height =	0.52
		OK		

STREET FLOW CAPACITY CALCULATIONS

STREET NAME: **De Anza Dr** 28
LOCATION: **Cartagena to Snow Vista**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0248	Road Width/2	20
Q_{100}	12.69	Curb Height	0.67
Right-of-way Width	60	1/2 Wetted Perimeter (P)	11.254
Road Width	40	1/2 Area(STD)	1.664
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	6.367

Depth 0.304

RESULTS

HGL

Q_{100} FLOW CAPACITY = 12.73 cfs OK
at an HGL Depth= 0.30 ft < Curb height = 0.67
OK

EGL

Velocity 3.83 fps
$V^2/2g$ 0.23 ft
EGL Depth = 0.53 ft < Right-of-way height = 0.86
OK

STREET NAME: **De Anza Dr** 29
LOCATION: **Future Capacity - Cartagena to Snow Vista**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0248	Road Width/2	20
Q_{100}	43.49	Curb Height	0.67
Right-of-way Width	60	1/2 Wetted Perimeter (P)	19.057
Road Width	40	1/2 Area(STD)	4.290
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	21.745

Depth 0.457

RESULTS

HGL

Q_{100} FLOW CAPACITY = 43.49 cfs OK
at an HGL Depth= 0.46 ft < Curb height = 0.67
OK

EGL

Velocity 5.07 fps
$V^2/2g$ 0.40 ft
EGL Depth = 0.86 ft < Right-of-way height = 0.86
OK

STREET NAME: **El Patron Rd** 30
LOCATION: **Split Flows across Del Rey**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.01	Road Width/2	14
Q_{100}	7.78	Curb Height	0.33
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.280
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.790
Manning's N	0.017	Discharge (1/2 Q)	3.892

Depth 0.280 depth at centerline

RESULTS

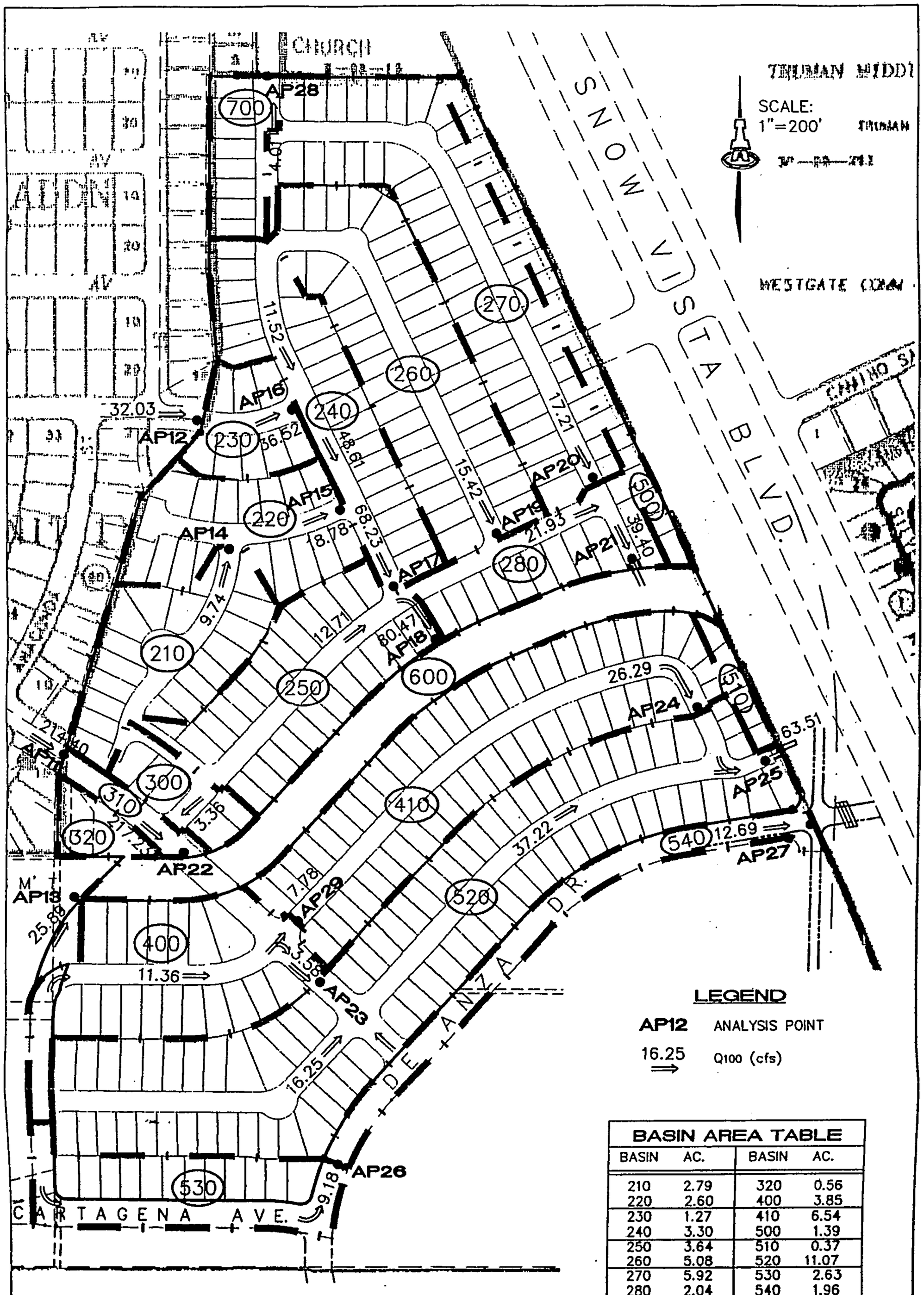
HGL

Q_{100} FLOW CAPACITY = 7.78 cfs OK
at an HGL Depth= 0.28 ft < Curb height = 0.33
OK

EGL

Velocity 2.17 fps
$V^2/2g$ 0.07 ft
EGL Depth = 0.35 ft < Right-of-way height = 0.50
OK

C-4



BASIN AREA TABLE			
BASIN	AC.	BASIN	AC.
210	2.79	320	0.56
220	2.60	400	3.85
230	1.27	410	6.54
240	3.30	500	1.39
250	3.64	510	0.37
260	5.08	520	11.07
270	5.92	530	2.63
280	2.04	540	1.96
300	0.96	600	3.45
310	0.51	700	1.14

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque *New Mexico*

167EXH4.DWGnav 08/21/01

PROPOSED ONSITE BASIN MAP

C-5/5

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

October 28, 2003

Fred Arfman, PE
Isaacson & Arfman
128 Monroe St NE
Albuquerque, NM 87108

Re: Lots 1 & 2, Tr. A1A, Elegante @ El Rancho Grande Grading Plan
Engineer's Stamp dated 9-12-03 (M9/D19D)

Dear Mr. Arfman,

Based upon the information provided in your submittal dated 9-12-03, the above referenced plan is approved for Preliminary/Final Plat action by DRB. Please include these lots in your certification of Elegante, Unit 1.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept.
Development and Building Services

C: file

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: Lots 1&2, Tr. A-1-A, Elegante at El Rancho Grande ZONE MAP/DRG. FILE #: M9

DRB #: _____ EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION: Tr. A-1-A, Elegante at El Rancho Grande

CITY ADDRESS: _____

ENGINEERING FIRM: Isaacson & Arfman, P.A. CONTACT: Åsa Nilsson-Weber

ADDRESS: 128 Monroe Street NE PHONE: (505) 268-8828

CITY, STATE: Albuquerque, NM ZIP CODE: 87108

OWNER: Curb, Inc CONTACT: Bo Johnson

ADDRESS: 6301 Indian School, Ste 680 PHONE: 899-9656

CITY, STATE: Albuq NM ZIP CODE: 87110

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: Aldrich Land Surveying CONTACT: Tim Aldrich

ADDRESS P.O. Box 30701 PHONE: 884-1990

CITY, STATE: Albuq NM ZIP CODE: 87109

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

- ____ DRAINAGE REPORT
- ____ DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal***
- ____ DRAINAGE PLAN RESUBMITTAL
- ____ CONCEPTUAL GRADING & DRAINAGE PLAN
- X GRADING PLAN
- ____ EROSION CONTROL PLAN
- ____ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ____ CLOMR/LOMR
- ____ TRAFFIC CIRCULATION LAYOUT (TCL)
- ____ ENGINEERS CERTIFICATION (TCL)
- ____ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ____ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ____ SIA / FINANCIAL GUARANTEE RELEASE
- ____ PRELIMINARY PLAT APPROVAL
- ____ S. DEV. PLAN FOR SUB'D. APPROVAL
- ____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ____ SECTOR PLAN APPROVAL
- X FINAL PLAT APPROVAL
- ____ FOUNDATION PERMIT APPROVAL
- ____ BUILDING PERMIT APPROVAL
- ____ CERTIFICATE OF OCCUPANCY (PERM.)
- ____ CERTIFICATE OF OCCUPANCY (TEMP.)
- ____ GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ WORK ORDER APPROVAL
- ____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ____ YES
- ____ NO
- ____ COPY PROVIDED

RECEIVED
SEP 12 2003
HYDROLOGY SECTION

DATE SUBMITTED: 9/12/03 BY: Åsa Nilsson-Weber

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature , location and scope ot the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report**: Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.